

Уплотнения и ремкомплекты  
для гидроцилиндров

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CATALOGO GENERALE

**ARTIC SEALS**



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## ARTIC SEALS

### MISSIONE

**ARTIC SEALS** è una Società che intende giocare un ruolo da protagonista a livello internazionale nella costruzione e vendita di sistemi di tenuta per cilindri oleodinamici e pneumatici.

Le persone che l'hanno fortemente voluta si rivolgono alla clientela per fornire soluzioni di tenuta capaci di soddisfare le esigenze dell'utilizzatore finale focalizzando le proprie sinergie sia sul piano tecnologico che su quello del servizio proponendo un prodotto innovativo ed in continua evoluzione.

Il nostro staff di tecnici con ingegno, creatività ed esperienza sono in grado di offrire una precisa e veloce gestione delle più svariate richieste in campo di sistemi di tenuta, oltre ad una costante consulenza ed assistenza tecnica in fase di progettazione e post-vendita.

Non ultimo, avere cura di garantire il miglior rapporto qualità-prezzo.

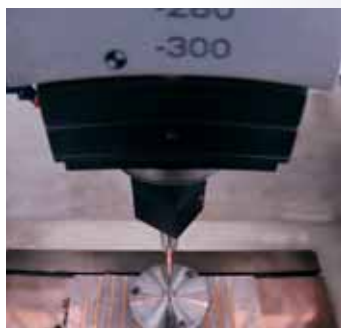
### MISSION

**ARTIC SEALS** wants to play the role of world leader in the manufacturing and marketing of sealing systems for hydraulic and pneumatic cylinders.

The people who saw the need to set up the company and who have invested their energy in it, are focused on clients to supply sealing solutions aiming to customer-satisfaction, developing a synergy-based approach to technology and customer service.

We use our talent, creativity and experience to propose the most suitable products for users' needs providing assistance and technical advice either during project works or post-selling. Our technical staff deals with the most diverse demands on sealing systems, providing quick, precise solutions. And last but not least, we strive to grant the most cost-effective service.





La nostra massima attenzione è rivolta, oltre che al **cliente**, anche ad altri due elementi per una costante crescita: il **fornitore** ed il nostro dipendente.

Il primo con il quale interagire costantemente per ottenere prodotti sempre più qualitativamente elevati, necessari alle sempre più pressanti esigenze dei costruttori.

Il secondo, meglio definirlo come **collaboratore**, orientato al miglioramento del proprio know-how, attivamente coinvolto negli obiettivi aziendali e destinato a divenire un vero e proprio risolutore di problemi.

Averlo in squadra a fianco del cliente e del fornitore completa un team vincente.

E' solo dalla soddisfazione di queste tre componenti che possiamo trarre miglioramenti continui, necessari a definirci una struttura altamente affidabile e competitiva.

*Apart from the **client**, we also devote our utmost attention to the two other important promoters of continuous growth: the **supplier** and the **staff**.*

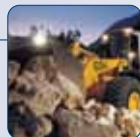
*We cooperate regularly with suppliers in order to keep improving the quality of our products and to respond to the constantly growing requirements of manufacturers.*

*Our staff, which we see as more of a partner in our operations, are involved at all times in achieving the company's objectives, always willing to improve their know-how and become true problem-solvers.*

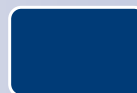
*Together with the client and the supplier, they form a winning team.*

*Only by satisfying these three components can we ensure long-term improvement, and therefore a high degree of reliability and competitiveness.*





SEZIONE TECNICA GENERALE  
*TECHNICAL OVERVIEW*



SISTEMI DI TENUTA PER OLEODINAMICA  
*HYDRAULIC SEALING SYSTEMS*



TENUTE STATICHE  
*STATIC SEALS*

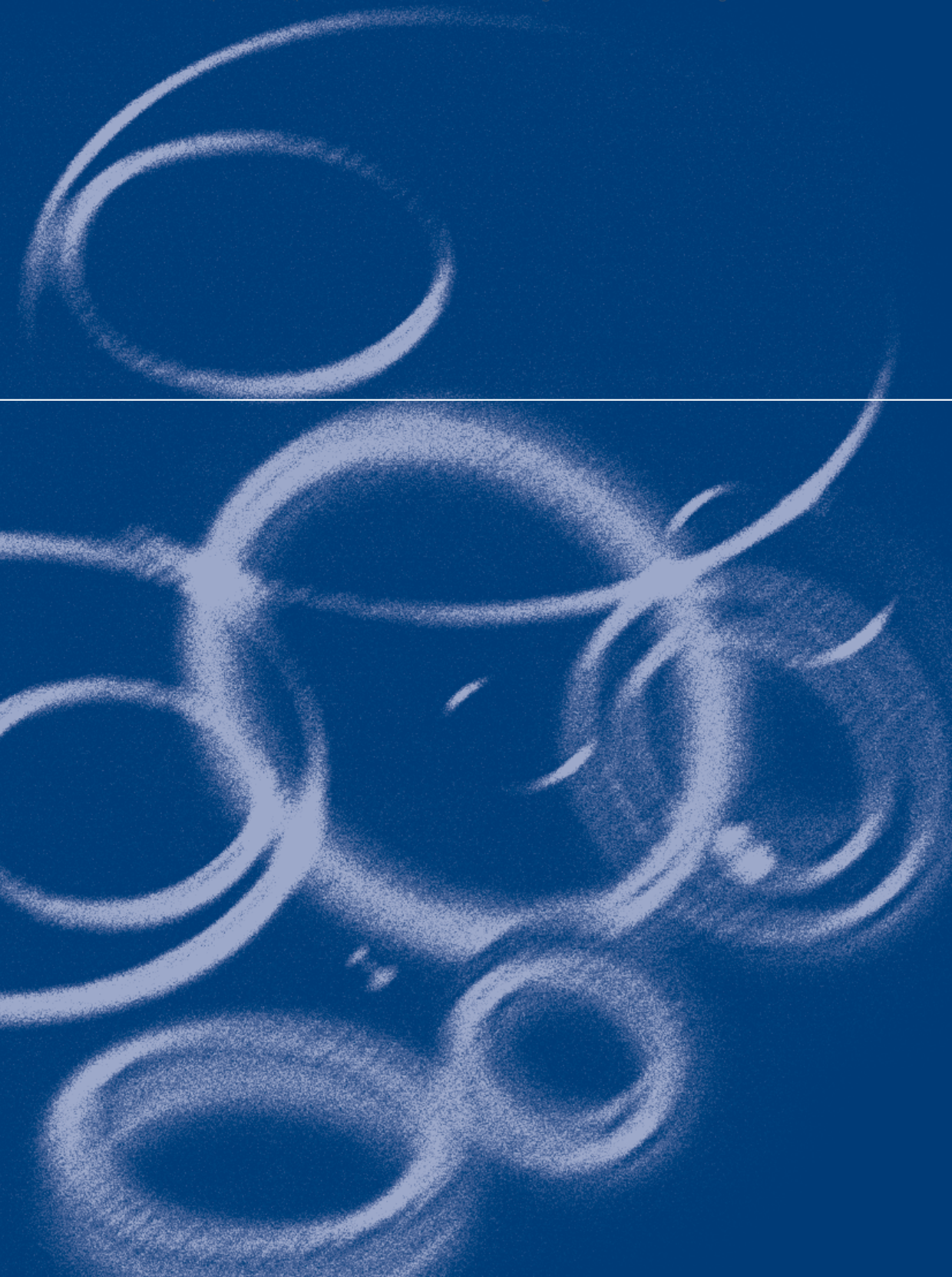


SISTEMI DI TENUTA PER PNEUMATICA  
*PNEUMATIC SEALING SYSTEMS*



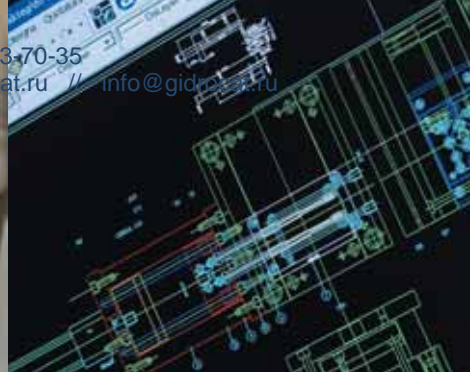
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## SEZIONE TECNICA GENERALE *TECHNICAL OVERVIEW*



**ARTIC SEALS**



## INTRODUZIONE

In un cilindro i fattori che influenzano l'intero sistema di tenuta sono molteplici e vanno tutti presi in seria considerazione fin dalla fase di progettazione.

Anche il costruttore di ogni singolo componente quale una tenuta, un raschiatore o un anello di guida, deve sentire questa responsabilità utilizzando i materiali più idonei e progettando i profili più adatti.

La collaborazione fra entrambe le parti diviene così fondamentale per la realizzazione nel tempo di un team unico che mette a disposizione informazioni ed esperienze con lo scopo di migliorare sempre il proprio prodotto. Un semplice rapporto cliente/fornitore non fa parte delle nostre aspettative.

Nei paragrafi che seguono **ARTIC SEALS** intende perseguire questa filosofia di lavoro iniziando a puntare l'obiettivo sui fattori che intervengono durante l'esercizio di un sistema di tenuta e proseguendo con ulteriori informazioni e consigli di carattere generale.

## INTRODUCTION

*Many factors play a role in the sealing capacity of a cylinder and they all must be taken into account from the initial project phase.*

*Even the manufacturer of a single component, such as a seal, a wiper or a wear ring, must accept this responsibility and therefore use the most appropriate materials and design the most suitable profiles.*

*This means that the cooperation between these two parts is fundamental in the process of building, over time, a unique team capable of providing the information and experience necessary for continuous product enhancement .  
A simple client/supplier relationship is not the answer to our expectations.*

*In the following paragraphs **ARTIC SEALS** puts into practice this work philosophy and highlights the factors involved in the operation of a sealing system. Some general information and advice will follow.*

## PRESSIONE

Valori di pressione troppo elevati combinati con giochi d'accoppiamento eccessivi tra stelo/testata e camicia/pistone, nel medio termine, provocano un deterioramento della guarnizione causato dall'estrusione con conseguenti perdite del fluido.

Oltre alla normale pressione di esercizio generata dal sistema idraulico, nel cilindro possono intervenire altre pressioni: variabili, improvvise e di valore altissimo. Ciò accade quando la macchina, equipaggiata con cilindri idraulici, a causa di fattori esterni, incorre in situazioni anomale e di forte carico. I picchi di pressione che ne conseguono influenzano negativamente tutto il sistema.

In situazioni opposte e cioè con pressioni modeste o prossime allo zero diviene più apprezzabile la qualità e la conseguente efficacia della guarnizione. La perfetta tenuta è infatti più difficile da realizzare perchè affidata principalmente al modulo elastico del materiale con cui è realizzata ed al suo profilo, progettato per ottimizzare il precarico iniziale di montaggio. L'assenza o quasi di pressione non permette il relativo carico dei labbri della guarnizione contro la superficie di contatto.

In entrambe le situazioni risulta appropriato l'impiego di tenute in resina uretanica che grazie alla loro durezza ed all'elevato modulo elastico risultano più resistenti all'estrusione e più efficaci in presenza di pressioni minime.

Quelle realizzate da **ARTIC SEALS** possono essere utilizzate da 0 a 400 bar a temperatura di 60° C.

## TEMPERATURA

In un cilindro la temperatura del fluido, quella generata dall'attrito dell'elemento di tenuta e quella ambientale influenzano notevolmente il comportamento delle guarnizioni e le loro prestazioni.

I valori critici che vengono presi in considerazione, oltre i quali possono comparire problemi, sono quelli superiori a 90° C e inferiori a -30° C.

In entrambi i casi varia notevolmente la viscosità del fluido e il suo potere di lubrificazione, basilari per il mantenimento del microfilm d'olio che si crea tra il labbro di tenuta e la superficie di scorrimento.

Tale pellicola lubrificante è funzione della pressione idrodinamica generata dalla velocità del sistema ed in sua assenza l'attrito che ne deriva "brucia" la guarnizione in poco tempo.

A queste temperature il rischio maggiore è però una conseguente variazione di stato dell'elemento di tenuta che riguarda la sua forma, la sua durezza ed il suo modulo elastico.

Il cambiamento repentino di queste caratteristiche porta inevitabilmente ad una perdita del fluido.

La gamma dei poliuretani impiegati da **ARTIC SEALS** consente di operare con temperature da -35° C a +100° C.

## PRESSURE

*Excessive pressure and high clearance in the rod/head and bore/piston couplings trigger extrusion and therefore, in the mid-term, seal wears and leaks.*

*Besides the normal operating pressure generated by the hydraulic system, other forms of pressure can develop in the cylinder, which can be unstable, sudden and extremely high. This happens when external factors cause the machinery with the hydraulic systems to work under unusual conditions and heavy load. The subsequent pressure peaks have negative consequences for the whole system.*

*Given the opposite set of circumstances, that is when the pressure is low or close to zero, the quality and therefore the efficiency of the seal improve remarkably. It is harder to reach perfect sealing capacity, because it mainly lies in the modulus of elasticity of the material and in its profile, which had been conceived to make the most of the initial assembly preload. The almost complete absence of pressure prevents the loading of the seal's lips against the contact surface.*

*In both cases the use of seals in urethane resin is recommended. Thanks to their hardness and the high modulus of elasticity, they deal with extrusion more effectively and therefore work more efficiently. Those produced by **ARTIC SEALS** can be used from 0 up to 400 bar at the temperature of 60° C.*

## TEMPERATURE

*The temperature of the fluid, of the environment, and the temperature generated by the friction of the sealing element considerably affect the behaviour and performance of the seals in a cylinder:*

*The critical values, beyond which problems can arise, are higher than 90° C and lower than -30° C.*

*In these two cases huge changes appear in the viscosity of the fluid and in its lubricating power, both of which are of paramount importance for the conservation of the oil microfilm between the sealing lip and the running surface.*

*This lubricating film is related to the hydraulic pressure resulting from the system speed. The friction created in case of absence of the film will quickly "burn" the seal.*

*Given these temperature conditions, however, the highest risk is a modification of the properties of the sealing part: its form, its hardness, its modulus of elasticity.*

*The sudden alteration of these features leads to inevitable leakages.*

*The range of polyurethanes used by **ARTIC SEALS** allows operation at temperatures between -35° C and +100° C.*

## VELOCITA'

Quando si parla di velocità alcune sono le variabili da tenere in considerazione: la rugosità delle superfici di contatto, la temperatura dell'olio, la pressione d'esercizio. Queste tre variabili insieme al tipo di materiale della guarnizione possono determinare il valore massimo della velocità sostenibile dal sistema.

La velocità con valori compresi tra 0,03 e 0,3 m/s normalmente non compromette il funzionamento del sistema di tenuta.

In presenza di velocità molto basse la modesta pressione idrodinamica non riesce a mantenere costante lo spessore del meato d'olio che si crea tra i labbri della guarnizione e superficie di scorrimento. Esso tende a rompersi e ricrearsi in continuazione e l'attrito che ne deriva genera un movimento a "scatti" (stick slip) con conseguente usura della guarnizione.

Al contrario, a velocità troppo elevate la pressione idrodinamica tende invece a "staccare" il labbro di tenuta dalla superficie di contatto. In questa zona aumenta la temperatura e diminuisce la viscosità del fluido con conseguente perdita.

La tipologia dei poliuretani utilizzati da **ARTIC SEALS** ed i profili appositamente studiati permettono di operare fino a 0,5 m/s. Oltre questi valori occorre prendere in considerazione elementi di tenuta in PTFE.

## FLUIDI

In un cilindro idraulico sono normalmente utilizzati oli a base minerale oppure oli ecologici biodegradabili.

Le caratteristiche di ciascun tipo di fluido vengono abitualmente vagliate dal produttore e dall'utilizzatore finale in base ad esigenze specifiche.

Possono però insorgere dubbi sulla compatibilità con le guarnizioni di tenuta.

Sono stati effettuati parecchi test, soprattutto con oli ecologici, che hanno sempre dato esito positivo.

Quando però manca questa sicurezza, per esempio nel caso di un lubrificante poco noto o comunque mai testato, **ARTIC SEALS** si rende disponibile a verificare la compatibilità nel proprio laboratorio.

In caso di fluidi diversi da quelli tradizionali o comunque addizionati con sostanze particolari si pone il problema della resistenza chimica delle guarnizioni.

La tabella che segue vuole fornire indicazioni in tal senso e si riferisce specificatamente ai materiali utilizzati da **ARTIC SEALS**.

## SPEED

*When talking about speed, some variables must be kept in mind: the roughness of the contact surfaces, the oil temperature and the operating temperature.*

*These three variables, together with the kind of seal material, can account for the maximum speed tolerable by the system.*

*Speed values ranging from 0.03 to 0.3 m/s do not usually compromise the functioning of the sealing system. In the case of very low speed, the minimal hydraulic pressure cannot ensure a standard thickness of the oil film between the seal lips and the running surface. The film will rather break and reform continuously. The resulting friction will induce a stick slip effect and result in the wearing of the seal.*

*In the case of excessive speed on the contrary, hydraulic pressure tends to "detach" the sealing lip from the contact surface. In this area the temperature will rise and the fluid viscosity will fall. Leakages will occur.*

*The types of polyurethane used by **ARTIC SEALS**, together with specially conceived profiles, tolerate operating values reaching 0.5 m/s. Above this value, PTFE sealing systems are recommended.*

## FLUIDS

*In a hydraulic cylinder mineral oils or green biodegradable oils are usually employed.*

*The manufacturer and the end-user generally examine the characteristics of each fluid, according to their specific requirements.*

*Doubts can arise regarding the tolerance of the sealing systems.*

*Many tests were carried out, especially with green oils, and the outcome was always positive.*

*In case of uncertainty, for example when the lubricant is not very well known, or has never been tested before, **ARTIC SEALS** is ready to assess its compatibility in its laboratories.*

*In the event of non-traditional fluids or of particular additives, the chemical resistance of the seals comes into question.*

*The following table is meant to provide useful insight into these occurrences. It refers in particular to the materials used by **ARTIC SEALS**.*



TABELLA I

RESISTENZA CHIMICA DEI MATERIALI

RESISTENZA CHIMICA DEI MATERIALI  
CONDIZIONI DI PROVA A TEMPERATURA AMBIENTE  
TESTATA SU PROVETTE

TABLE I

CHEMICAL RESISTANCE OF MATERIALS

CHEMICAL RESISTANCE OF MATERIALS  
OPERATING CONDITIONS: ROOM TEMPERATURE TESTED  
ON SPECIMENS

FLUIDO		MATERIALI							
FLUID		COMPOUNDS							
		COLLETTINO TOLUENE	RESINA AETALICA METALIC RESIN	ELASTOMERO TEMPISTO THERMOPLASTIC ELASTOMER	GOMMA NITRILICA NBR RUBBER	GOMMA NITRILICA CROCIATA HYDROGENATED NBR RUBBER	ETILENE PROPILENE ETHYLENE PROPYLENE	FLUORURATO STERENICO FLUOR ELASTOMER VITON	FLUORURATO FLUOROSULFONE
		PU	POM	TPE	NBR	HNBR	EPDM	FKM	VMQ
acetato di etilene	ethyl acetate	1	3	2	1	1	3	1	1
aceto	vinegar	1	3	3	2	2	3	2	3
acetone	acetone	1	3	3	1	1	3	1	1
acido acetico (20%)	acetic acid (20%)	1	2	3	2	2	3	2	2
acido acetico (5%)	acetic acid (5%)	1	3	3	2	2	3	2	3
acido acetico (50%)	acetic acid (50%)	1	1	2	1	1	3	1	1
acido citrico	citric acid	1	2	2	3	3	3	3	3
acido cloridrico (10%)	chloric acid (10%)	1	1	2	1	1	2	2	1
acido cloroacetico (10%)	chloroacetic acid (10%)	1	1	2	1	1	3	1	1
acido cromatico (10%)	chromic acid (10%)	1	1	2	1	1	2	3	1
acido fluoridrico (10%)	hydrofluoric acid (10%)	1	1	2	1	1	2	1	1
acido formico	formic acid	1	1	2	1	1	2	1	1
acido fosforico (30%)	phosphoric acid (30%)	1	1	2	1	1	3	3	1
acido muriatico	muriatic acid	1	1	2	1	1	2	3	1
acido nitrico (10%)	nitric acid (10%)	1	1	2	1	1	1	3	1
acido oleico	oleic acid	1	3	2	3	3	1	3	1
acido palmitico	palmitic acid	2	3	3	2	2	1	3	1
acido perclorico (10%)	perchloric acid (10%)	1	1	3	1	1	2	3	1
acido solforico (30%)	sulphuric acid (30%)	1	1	3	1	1	3	3	1
acido tartarico	tartaric acid	1	1	2	3	3	2	3	3
acido tricloroacetico	trichloroacetic acid	1	1	3	2	2	2	1	2
alcol metilico	methyl alcohol	1	3	2	3	3	3	1	3
acqua	water	2	3	2	3	3	3	3	3
acqua 100°C	water 100°C	1	3	2	2	3	3	2	2
acqua clorurata >0,5 ppm	chlorine ater >0.5 ppm	1	3	3	1	1	2	3	1
acqua distillata	distilled water	2	3	3	2	3	2	2	3
acqua glicole	glycol water	2	3	2	3	3	3	3	3
acqua marina	sea water	3	3	3	3	3	3	3	2
acqua olio	oil water	2	3	3	3	3	1	3	3
acqua ossigenata (1%)	hydrogen peroxine (1%)	1	3	3	2	2	2	3	3
acqua ossigenata (30%)	hydrogen peroxine (30%)	1	1	3	1	1	1	3	2
alcol etilico	ethanol	1	2	3	3	3	1	3	2
ammoniaca (10%)	ammonia (10%)	1	1	-	3	3	3	1	1
anidride carbonica	carbon dioxide (wet and dry)	1	3	3	3	3	2	3	2
anidride solforosa	sulphur dioxide	1	1	3	1	1	3	2	2
anilina	aniline	1	2	1	1	1	3	1	1
aria	air	3	3	3	3	3	3	3	3
azoto	nitrogen	3	2	3	3	3	3	3	3
benzina	benzine (gasoline)	3	3	3	2	1	1	3	1
benzolo	benzol	1	3	2	1	1	1	2	1
birra	beer	1	-	3	3	3	3	3	3
butano	butane	3	3	3	3	3	1	3	1
caffè	coffee	1	3	2	3	3	3	3	3
candeggiante (10%)	bleach solution (10%)	1	1	2	1	1	3	3	1
carburante diesel	diesel fuel	2	3	3	3	3	1	3	1
cherosene	kerosene	2	3	3	3	3	1	3	1
ciclo esano	cyclo hexane	3	3	3	3	3	1	3	1
cloroformio	chloroform	1	2	2	1	1	1	2	1

Legenda / Legend: 3 = BUONO / GOOD - 2 = SUFFICIENTE / FAIR - 1 = INSUFFICIENTE / UNFAIR

FLUIDO		FLUID		MATERIALI COMPOUNDS							
				POLIPETANO POLYETHANE	RESINA AETALICA ACETALD RESIN	ELASTOMERO TERMOPLASTICO THERMOPLASTIC ELASTOMER	GOMMA NITRILICA NITRILE RUBBER	GOMMA NITRILICA CROCIANTO HYDROGENATED NITRILE RUBBER	ETILENE PROPYLENE ETHYLENE PROPYLENE	FLUOROELASTOMERO VITON FLUOROELASTOMER VITON	FLUOROSILICONE FLUOROSILOXANE
				PU	POM	TPE	NBR	HNBR	EPDM	FKM	VMQ
cloruro di calcio (10%)	calcium chloride (10%)	1	3	3	3	3	3	3	3	3	3
cloruro di sodio (10%)	sodium chloride (10%)	1	2	3	3	3	3	3	3	3	3
eptano	heptane	3	3	3	3	3	3	1	3	1	1
esano	hexane	3	3	3	3	3	3	1	3	1	1
etanolo	ethanol	1	3	-	1	1	2	1	1	1	1
etere etilico	ether	1	3	-	1	1	2	1	1	1	1
fluido per freni	brake fluid	1	3	1	1	1	3	1	1	1	1
formaldeide (37%)	formaldehyde (37%)	1	3	2	1	1	3	1	1	1	1
freon 11	freon 11	1	3	2	2	2	1	2	1	2	1
freon 12	freon 12	2	3	3	2	2	2	3	1	1	1
freon 21	freon 21	2	3	3	1	1	1	1	1	1	1
freon 22	freon 22	1	3	2	1	1	3	1	1	1	1
freon 113	freon 113	3	3	3	2	3	1	2	1	2	1
freon 114	freon 114	3	3	3	3	3	3	3	2	1	1
gas naturale	natural gas	2	3	3	3	3	1	3	1	3	1
gas propano	propane gas	3	3	3	3	3	1	3	1	3	1
gasolio	diesel oil	3	3	3	3	3	1	3	1	3	1
glicerina	glycerine	1	3	2	3	3	3	3	3	3	3
glicole	ethylene glycol	1	3	3	3	3	3	3	3	3	3
glucosio	glucose solution	1	3	-	3	3	3	3	3	3	3
grasso minerale	mineral grease	3	3	3	3	3	3	1	3	2	2
idrogeno gas	hydrogen gas	3	3	3	3	3	3	3	3	3	1
ipoclorito di sodio (5%)	sodium hypochlorite (5%)	1	1	3	2	2	3	3	3	2	2
latte	milk	1	3	-	3	3	3	3	3	3	3
mercurio	mercury	3	3	3	3	3	3	3	3	3	3
metano	methane	3	3	3	3	3	1	3	1	3	3
metiletilchetone	methyl ethyl ketone	1	2	3	1	1	2	2	1	2	1
oli vegetali	vegetal oils	3	3	3	3	3	3	1	3	1	1
olio al silicone	silicone oil	3	3	3	3	3	2	3	1	3	1
olio ASTM 1	oil ASTM 1	3	3	3	3	3	1	3	3	3	3
olio ASTM 3	oil ASTM 3	3	3	3	3	3	1	3	1	3	2
olio combustibile	fuel oil	3	3	3	2	2	1	3	1	3	1
olio lubrificante	lubricating oil	3	3	3	3	3	1	3	1	3	2
olio minerale	mineral oil	3	3	3	3	3	1	3	1	3	2
olio paraffinico	paraffin oil	3	3	3	3	3	1	3	1	3	1
olio per motore	engine oil	2	3	3	-	-	1	3	-	-	-
ossido di carbonio	carbon dioxide	3	3	3	3	3	2	3	3	3	3
ossigeno	oxygen	2	3	3	1	1	3	3	3	3	3
ozono	ozone	2	3	3	1	1	3	3	3	3	3
paraffina	paraffin	-	3	3	3	3	1	3	2	2	2
percloro etilene	perchloro ethylene	1	2	3	1	1	1	3	3	3	3
succo di frutta	fruit juices	1	3	-	2	2	3	2	3	2	3
trementina/acquaragia	turpentine	1	3	-	3	3	1	3	1	3	1
urea (5%)	urea (5%)	1	3	-	3	3	3	3	3	3	3
vapore	vapour	1	3	-	1	1	2	3	2	2	2
vaselina	vaseline	2	3	3	3	3	2	3	1	3	1
vino	wine	1	2	2	3	3	3	3	3	3	3

Legenda / Legend: 3 = BUONO / GOOD - 2 = SUFFICIENTE / FAIR - 1 = INSUFFICIENTE / UNFAIR

## MATERIALI

Gli elementi di un sistema di tenuta sono molteplici ed ognuno deve avere caratteristiche che gli permettano di svolgere la propria funzione nel migliore dei modi ed in condizioni non sempre simili.

La scelta dei materiali assume così un'importanza tale da farne il primo fattore strategico per ogni costruttore.

**ARTIC SEALS**, forte della propria esperienza, ha scelto:

- **resine uretaniche** in cinque differenti tipologie. Presentano tutte alto modulo elastico e bassa deformazione permanente e con durezze diverse a seconda dell'utilizzo.  
Con esse vengono realizzate guarnizioni di tenuta per stelo e pistone, anelli raschiatori ed alcuni tipi di tenuta statica;
- **resine acetaliche** di due differenti tipologie. La prima caricata con fibre di vetro ed elevata resistenza alla deformazione permanente sotto carico, utilizzata in oleodinamica. La seconda, priva di cariche, ma additivata con sostanze autolubrificanti, impiegata in pneumatica quando direttamente a contatto con metalli teneri come l'alluminio e l'ottone. Con esse vengono realizzati anelli di guida per steli e pistoni o componenti aventi la stessa funzione di alcune guarnizioni composte;
- **resine poliesteri** e caricate, utilizzate per la costruzione di anelli antiestrusione e di alcuni particolari di guarnizioni composte;
- **elastomeri** di mescole differenti a seconda dell'applicazione. Il più utilizzato è quello a base nitrilica NBR per la costruzione di o-ring o di alcuni componenti di guarnizioni composte. Più specifiche altre mescole (FKM, EPDM, ecc..) descritte nella sezione o-ring (pagg. 128-129)

### Nota:

Eventuali variazioni di tonalità di colore possono verificarsi quale garanzia di utilizzo di master-batch esenti da metalli pesanti. Tali leggere variazioni non influiscono sulle caratteristiche meccaniche delle guarnizioni.

Descrizioni più dettagliate e proprietà fisiche dei materiali sono presenti nel catalogo alle sezioni inerenti ai particolari con essi costruiti.

Nel laboratorio di analisi di **ARTIC SEALS** è possibile eseguire tests sui materiali e fornire al cliente prove meccaniche sia sul polimero che sul prodotto finito.

*By **ARTIC SEALS** laboratory of analysis it is possible to carry out tests on raw materials and provide to customers trials on mechanical properties either on polymer or on finished product.*

## MATERIALS

*A sealing system is composed of many parts and the features of each of them must enable the best performance in conditions which often vary.*

*The choice of materials is therefore important enough to make it the primary strategic factor for all manufacturers.*

**ARTIC SEALS**, on the basis of its experience, has chosen the following materials:

- **five types of urethane resins.** *They have a high modulus of elasticity, low compression-set and the hardness used varies according to the application. They are used for producing rod and piston seals, scraper rings and some static seals;*
- **two types of acetalic resins.** *The first one, used for hydraulic applications, is filled with fibreglass and has low compression-set. The second one is not filled but has self-lubricating additives. It is used in pneumatic systems where there is direct contact with soft metals like aluminium or brass. They are used in the manufacture of rods and pistons wiper rings or other components which function like some assembled seals;*
- **filled polyester resins,** *used in the production of anti-extrusion rings and in parts of some assembled seals;*
- **elastomers** *of different compounding according to the application. The most widely employed is the nitrile-based NBR, used for o-rings or some assembled seals parts. Other compounds are more specific (FKM, EPDM, etc..) and are described in the o-ring section (pages 128-129)*

### Remark:

**Possible deviation in colour shade may occur due to use of metal-free master batch. Such a slightly variation does not influence the mechanical characteristics of seals.**

*More detailed information, together with the physical properties of the materials, can be found in the sections referring to each specific sealing part.*

## RUGOSITA' SUPERFICIALI

La durata e l'efficacia di una guarnizione dipendono dalla qualità della superficie dell'area di contatto.

Graffi, fori, porosità, segni di lavorazione di utensile non sono ammessi.

E' necessario porre molta attenzione alla qualità delle superfici, soprattutto dove scorre dinamicamente la guarnizione. Vedi **Tab II**

I parametri utilizzati per definire la finitura superficiale sono  $R_a$ ,  $R_z$ ,  $R_{max}$  e sono in conformità alla ISO 4287/1.

La **Tabella III** evidenzia chiaramente che non è sufficiente considerare solo i valori di  $R_a$  e  $R_z$  per valutare il tipo di guarnizione da adottare.

I picchi superficiali mostrano chiaramente che a parità di valori  $R_a$  e  $R_z$ , il profilo con minori asperità (vedi  $R_{MR}$ ) ha con la guarnizione una maggiore superficie di contatto con evidente beneficio per la durata della stessa.

Per il poliuretano utilizzato da **ARTIC SEALS** sono consigliate le rugosità di lavorazione qui di seguito indicate in tabella III:

Tab. II

rugosità superficiale / surface roughness		
	superficie di scorrimento consigliata per il poliuretano <i>sliding surface recommended for polyurethane</i>	superficie della cava <i>static surface</i>
$R_{max}$	1,00 - 4,00	< 10,0
$R_z$ DIN	0,63 - 2,50	< 6,3
$R_a$	0,10 - 0,60	< 1,6

## SURFACE ROUGHNESS

The service life of a seal depends on the quality of the contact area's surface.

Scratches, holes, snicks, porosity and tooling scores in the system should be avoided.

The utmost care for smooth surface finish is necessary for seal performance, especially for surfaces in relative dynamic work. See **Table II**



The most used finish definitions are  $R_a$ ,  $R_z$ ,  $R_{max}$  and they're in accordance with ISO 4287/1.

**Table III** clearly highlights that taking into consideration  $R_a$  and  $R_z$  is not enough to choose the most suitable sealing system.

In fact, given a surface of equal roughness  $R_a$  e  $R_z$ , a flat, smoother profile (see  $R_{MR}$ ) shows a higher seal contact area, thus a more suitable sealing performance. Consequently, a better sealing performance implies a long lasting service life.

Given the features of the polyurethane moulded by **ARTIC SEALS** the following roughness rates are recommended in the following table III:

Tab. III

profili superficiale <i>surface profile</i>	$R_a$	$R_z$	$R_{MR}$
 profilo aperto <i>open profile</i>	0,25	1	15%
 profilo chiuso <i>closed profile</i>	0,25	1	70%

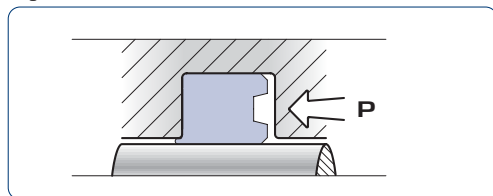


## GIOCO DI ACCOPPIAMENTO

L'ampiezza massima consentita del gioco di accoppiamento tra testata/stelo e pistone /camicia deve essere attentamente valutata affinché non intervengano problemi di estrusione nella parte posteriore della guarnizione. (vedi fig. 1 e 2)

Tale gioco dipende principalmente dalla durezza del materiale con cui è costruita la tenuta, dalla pressione massima presente nel cilindro, dalla temperatura e dalla resistenza al carico radiale degli anelli di guida.

fig. 1



Nella figura 3 qui di seguito si vede il gioco di accoppiamento che si deve mantenere tra stelo/testata e tra pistone/camicia. Il test è stato eseguito con olio a temperatura a 60° C.

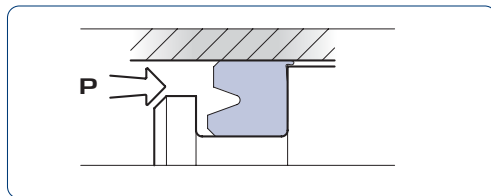
## COUPLING CLEARANCE

The maximum width allowed for coupling clearance between head/rod and piston/bore must be carefully assessed to prevent any extrusion problems at the rear of the seal.

(see fig. 1 and 2)

Such clearance depends mainly on the hardness of the seal material, on the maximum pressure in the cylinder, on the temperature and on the radial load resistance of the wear rings.

fig. 2



Here following figure 3 shows the coupling in the rod/head and bore/piston which should be maintained. The test has been executed with oil at temperature of 60° C.

fig. 3

gioco di accoppiamento / coupling clearance	
pressione / pressure BAR	G mm
50	0,50
100	0,40
150	0,30
200	0,15
300	0,10
400	0,05

La figura 4 mostra i valori indicativi del gioco massimo ammesso in funzione della pressione di esercizio utilizzando guarnizioni di materiale e durezza differenti.

The reference values of the maximum clearance allowed in relation to the operating pressure are in the figure 4. Different seal materials and hardnesses are given.

fig. 4

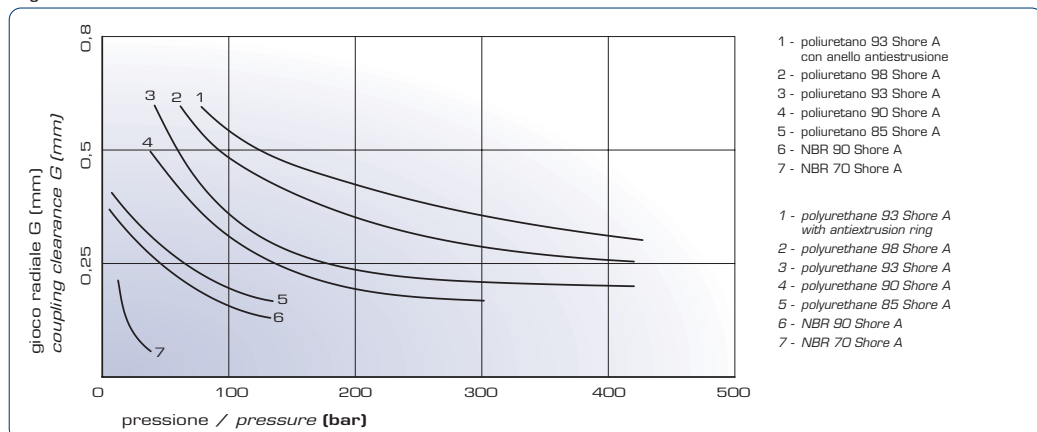
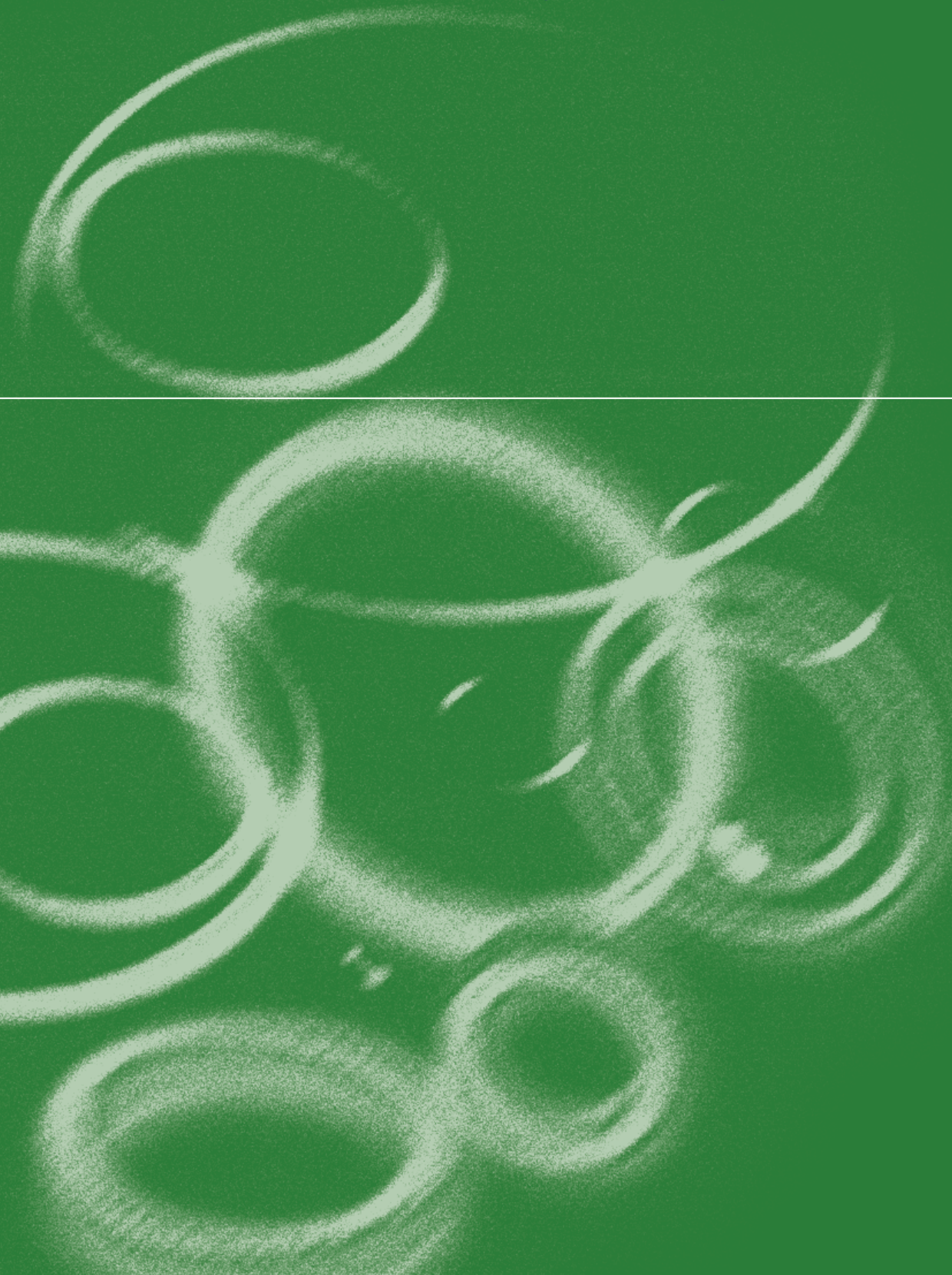


TABELLA TOLLERANZE / TOLERANCES TABLE

dimensioni nominali nominal dimensions Ø mm		albero base rod (0.001 mm)								foro base bore (0.001 mm)			
from	to	e9	f7	f8	f9	h8	h9	h10	h11	H8	H9	H10	H11
1.6	3	-14 -39	-6 -16	-6 -20	-6 -31	0 -14	0 -25	0 -40	0 -60	+14 0	+25 0	+40 0	+60 0
3	6	-20 -50	-10 -22	-10 -28	-10 -40	0 -18	0 -30	0 -48	0 -75	+18 0	+30 0	+48 0	+75 0
6	10	-25 -61	-13 -28	-13 -35	-13 -49	0 -22	0 -36	0 -58	0 -90	+22 0	+36 0	+58 0	+90 0
10	18	-32 -75	-16 -34	-16 -43	-16 -59	0 -27	0 -43	0 -70	0 -110	+27 0	+43 0	+70 0	+110 0
18	30	-40 -92	-20 -41	-20 -53	-20 -72	0 -33	0 -52	0 -84	0 -130	+33 0	+52 0	+84 0	+130 0
30	50	-50 -112	-25 -50	-25 -64	-25 -87	0 -39	0 -62	0 -100	0 -160	+39 0	+62 0	+100 0	+160 0
50	80	-60 -134	-30 -60	-30 -76	-30 -104	0 -46	0 -74	0 -120	0 -190	+46 0	+74 0	+120 0	+190 0
80	120	-72 -159	-36 -71	-36 -90	-36 -123	0 -54	0 -87	0 -140	0 -220	+54 0	+87 0	+140 0	+220 0
120	180	-85 -185	-43 -83	-43 -106	-43 -143	0 -63	0 -100	0 -160	0 -250	+63 0	+100 0	+160 0	+250 0
180	250	-100 -215	-50 -96	-50 -122	-50 -165	0 -72	0 -115	0 -185	0 -290	+72 0	+115 0	+185 0	+290 0
250	315	-110 -240	-56 -108	-56 -137	-56 -186	0 -81	0 -130	0 -210	0 -320	+81 0	+130 0	+210 0	+320 0
315	400	-125 -265	-62 -119	-62 -151	-62 -212	0 -89	0 -140	0 -230	0 -360	+89 0	+140 0	+230 0	+360 0

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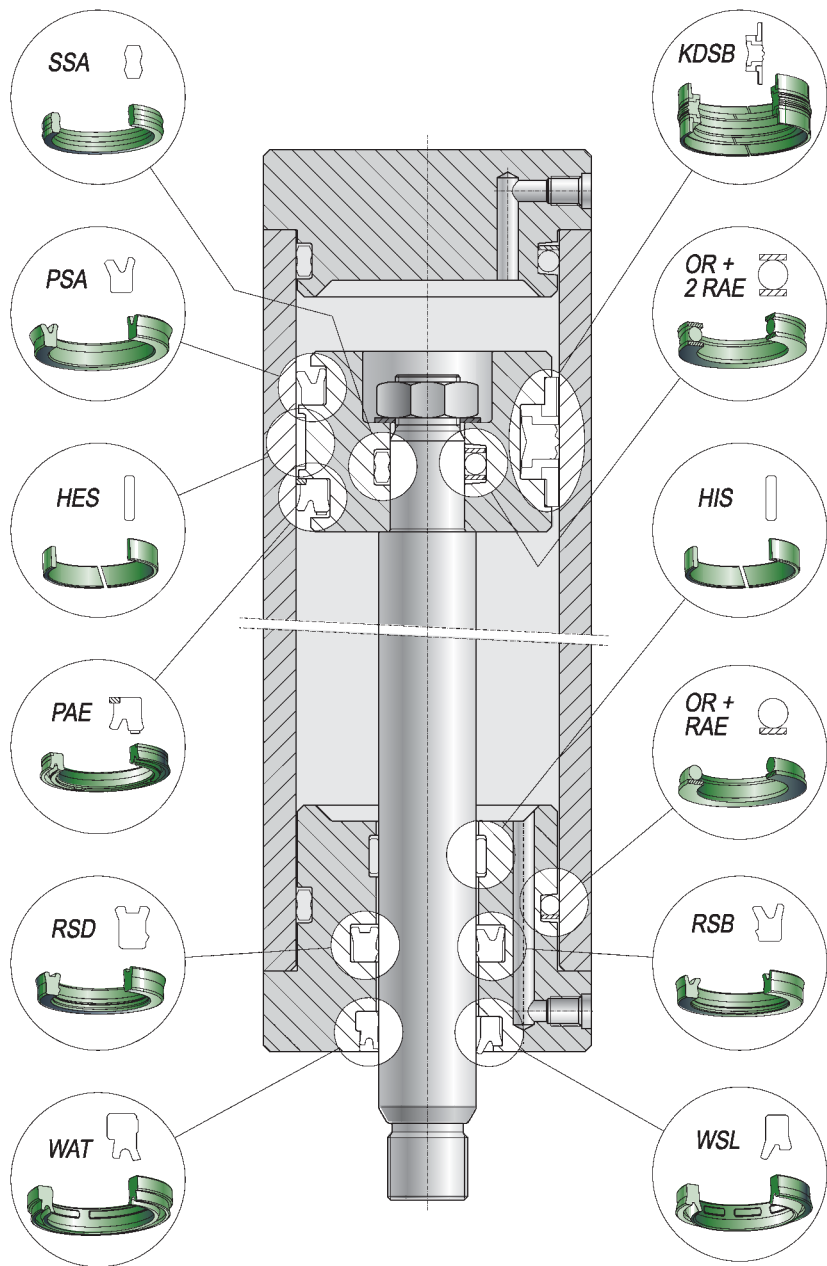
SISTEMI DI TENUTA PER OLEODINAMICA  
*HYDRAULIC SEALING SYSTEMS*

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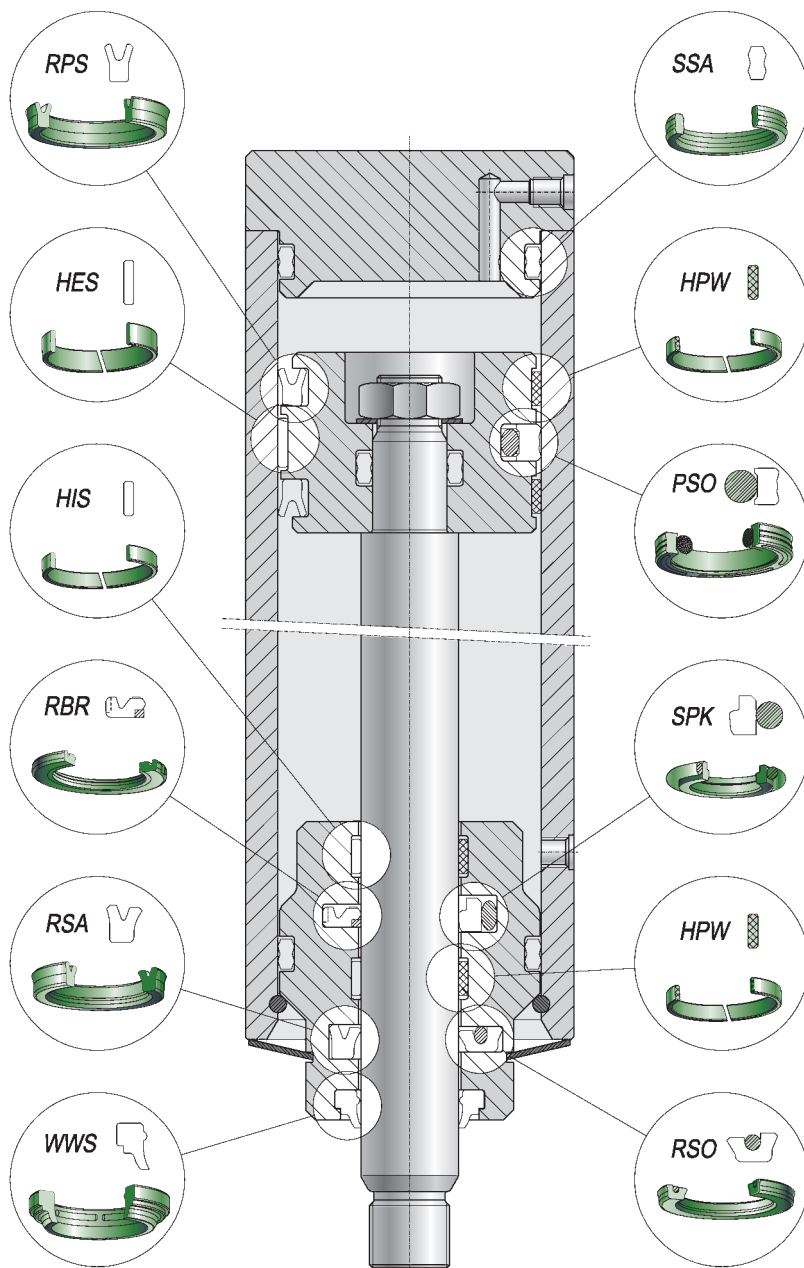


**ARTIC SEALS**

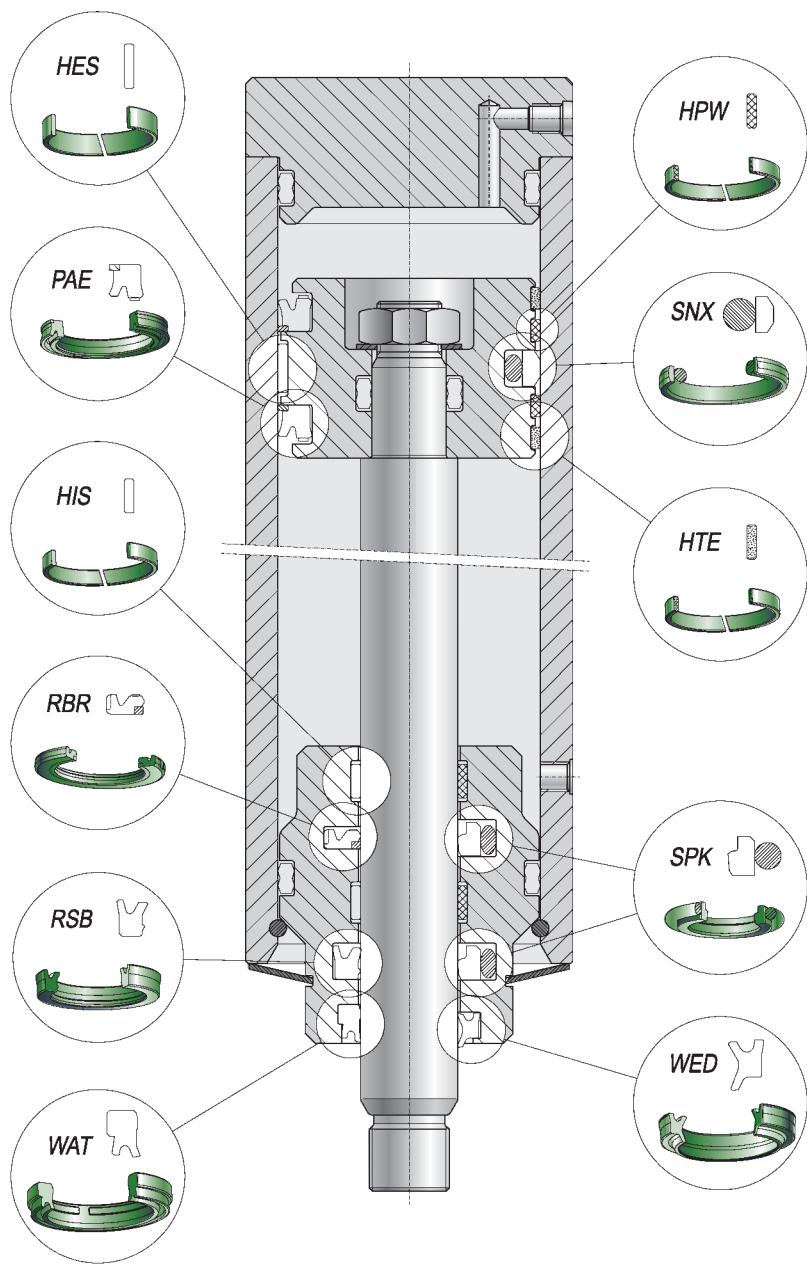
schema cil indro idraulico A / hydraulic cylinder sketch A



schema cil indro idraulico B / hydraulic cylinder sketch B



schema cil indro idraulico C / hydraulic cylinder sketch C





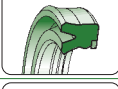
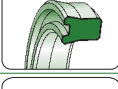
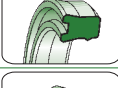
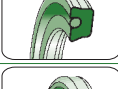

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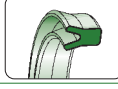
### GUARNIZIONI STELO / ROD SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>RSA</b>	- 35 + 100	< 400	< 0,5	TPU	30
	<b>RSB</b>	- 35 + 100	< 400	< 0,5	TPU	36
	<b>RSB2</b>	- 35 + 100	< 500	< 0,5	TPU + POM	42
	<b>RSC</b>	- 35 + 100	< 400	< 0,5	TPU	44
	<b>RSD</b>	- 35 + 100	< 400	< 0,5	TPU	48
	<b>RSO</b>	- 35 + 100	< 250	< 0,5	TPU	52
	<b>RBR</b>	- 35 + 100	< 400	< 0,8	TPU	56

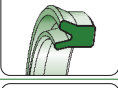
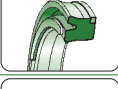

### GUARNIZIONI STELO-PISTONE / ROD-PISTON SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>RPS</b>	- 35 + 100	< 400	< 0,5	TPU	58

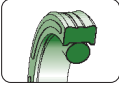

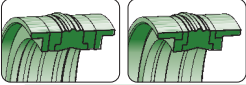
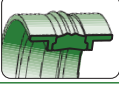
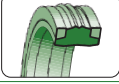
### GUARNIZIONI PISTONE / PISTON SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>PSA</b>	- 35 + 100	< 400	< 0,5	TPU	66
	<b>PAE</b>	- 35 + 100	< 500	< 0,5	TPU + POM	70
	<b>PSH + RR</b>	- 35 + 100	< 400	< 0,5	TPU + POM	72

## GUARNIZIONI PISTONE / PISTON SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>PSO</b>	- 30 + 100	< 250 materiali standard standard materials < 500 materiali alternativi alternative materials	< 0,5	TPU + NBR	74
	<b>PSQ</b>	- 30 + 100	< 250 materiali standard standard materials < 500 materiali alternativi alternative materials	< 0,5	TPU + NBR	78
	<b>KDSA KDSB</b>	- 30 + 100	< 300	< 0,5	NBR + TPE + POM	80
	<b>KDSP</b>	- 30 + 100	< 400	< 0,5	POM + TPU	84
	<b>KDAE</b>	- 30 + 100	< 400	< 0,5	TPE + TPU	86

## ANELLI DI GUIDA / WEAR RINGS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>HIS</b>	- 40	-	< 0,8	POM	88
	<b>HES</b>	+ 115	-	< 0,8	fibre di vetro glass fibres	92


## RASCHIATORI / WIPERS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>WSL</b>	- 35 + 100	-	< 1	TPU	98
	<b>WSG</b>	- 35 + 100	-	< 1	TPU	102
	<b>WWS</b>	- 35 + 100	-	< 1	TPU	104
	<b>WAT</b>	- 35 + 100	-	< 1	TPU	108
	<b>WED</b>	- 35 + 100	< 20	< 1	TPU	110

**RASCHIATORI PER ESTERNO / EXTERNAL WIPERS**

**Condizioni massime non simultanee / Maximum non simultaneous conditions**

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	<b>WEL</b>	- 35 + 100	-	< 1	TPU	114

**AVVERTENZE E PRECAUZIONI DI  
MONTAGGIO NEI SISTEMI  
OLEODINAMICI**

Per un ottimo funzionamento delle guarnizioni occorre che durante il montaggio non vengano tagliate o deformate in modo permanente.

Si raccomanda anche di rispettare le norme internazionali ISO sia per quanto riguarda le dimensioni degli alloggiamenti che per le tolleranze.

Per le finiture delle superfici, vedere le figure 1 e 2 sotto indicate, che riportano i valori cui attenersi.

**Le finiture di sola rettifica non sono mai consigliate ma si raccomanda un'ulteriore lavorazione di lucidatura prima del montaggio.**

**INSTRUCTIONS AND CARE FOR  
INSTALLATION IN HYDRAULIC  
SYSTEMS**

*For the most suitable seals working condition it's necessary to avoid scratches or permanent deformation of the seals during assembly.*

*The respect of international ISO rules on housing dimensions as well as on tolerance is strongly recommended. Figures 1 and 2 describe the main criteria for surface finish.*

***Finish by grinding only is not suggested and an additional polishing work of the surface itself is recommended previous to mounting.***

fig. 1

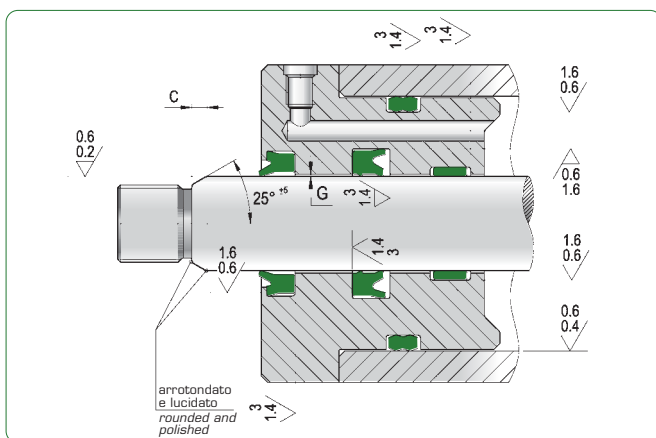
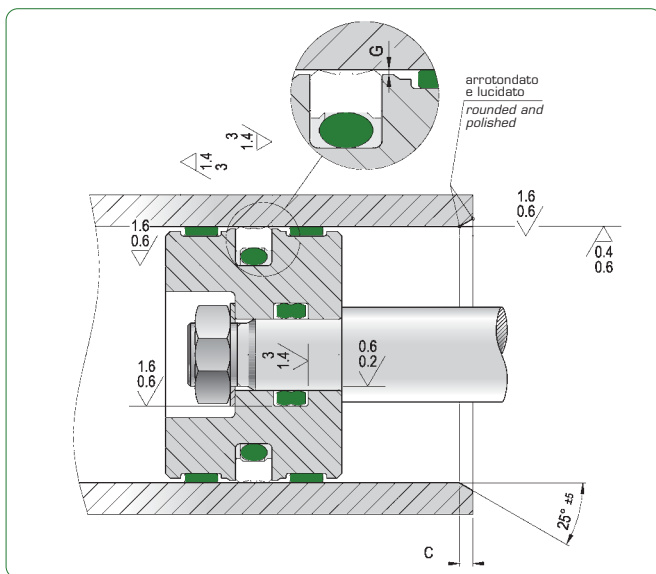


fig. 2





**ARTIC SEALS** desidera offrire alla propria clientela un prodotto impeccabile. Un obiettivo che perseguiamo anche attraverso i sistemi a visione artificiale di alta tecnologia con cui controlliamo i nostri articoli.

***ARTIC SEALS** intends to offer to its customers a flawless product. Aim which we pursue also thanks to hi-tech artificial vision sorting machine to check our articles.*

## GUARNIZIONI STELO

Nei cilindri oleodinamici il sistema di tenuta è composto da vari elementi, tutti necessari a concorrere alla risoluzione delle problematiche che intervengono durante l'esercizio.

Il cuore del sistema è però rappresentato dalla **guarnizione stelo** che deve impedire l'uscita del fluido dal cilindro in condizioni di pressione, velocità e temperature differenti. Risulta pertanto evidente l'importanza di una scelta corretta circa il profilo ed il tipo di materiale che, oltre a tener conto del perfetto controllo del fluido, risulti economica e di minimo ingombro.

Le tenute **ARTIC SEALS**, in poliuretano, rispondono totalmente a queste caratteristiche perché realizzate con l'esperienza di chi è presente nel settore da molto tempo.

Spesso condizioni di esercizio gravose consigliano l'impiego di un sistema di tenuta stelo composto da un tandem di guarnizioni. In questo caso la guarnizione primaria, quella a diretto contatto con il fluido in pressione, non deve creare residui di pressione con la tenuta secondaria. Deve pertanto avere un profilo appropriato che permetta di scaricare questa pressione residua verso l'interno del cilindro.

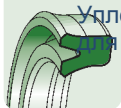
## ROD SEALS

*In hydraulic cylinders the sealing system is made up of different elements, which all contribute to solving the problems which might occur during operation.*

*That said, the heart of the system is the **rod seal**, which must prevent the fluid from leaking under different pressure, speed and temperature conditions. It is therefore easy to understand how important the choice of profile and material can be. Besides ensuring perfect control of the fluid, they must also be economical and take up little space.*

**ARTIC SEALS** sealing parts, which are made of polyurethane, fully comply with these requirements as a result of an experience acquired through many years of activity in the sector.

*Harsh operating conditions often encourage the use of a rod sealing system made up of two seals. The main seal - the one in direct contact with the fluid under pressure - must not generate residual pressure with the secondary seal. It therefore needs a suitable profile to transfer the residual pressure towards the centre of the cylinder.*



**TENUTA STELO TIPO RSA**

**DESCRIZIONE**

La guarnizione tipo **RSA**, progettata con labbro dinamico più corto rispetto a quello statico, ha impieghi dove risultano elevati i disallineamenti dello stelo e dove le pressioni possono raggiungere valori elevati.

**DATI TECNICI**

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	fluidi idraulici a base minerale (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set ed elevata resistenza all'abrasione.

Ha un durezza di 93 Sh A ± 2.

**Codice materiale: CO**

**MONTAGGIO**

Per evitare che la guarnizione si danneggi occorre eliminare le bave e gli spigoli taglienti presenti nella sede e sullo stelo.

E' sempre consigliato lubrificare la tenuta prima del montaggio per agevolare l'inserimento dello stelo.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

**ROD SEAL TYPE RSA**

**DESCRIPTION**

The **RSA** seal has a dynamic lip which is shorter than the static one and it is used in cases of high rod misalignments and possible high pressure.

**TECHNICAL DATA**

Pressure:	< 400 bar, at a temperature of 60° C
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C, with peaks till 110° C
Fluids:	mineral hydraulic fluids (see TABLE I on pages 12-13)

**MATERIAL**

The proposed material is a **CO**-type polyurethane, with high elasticity modulus, low compression-set and high resistance to abrasion.

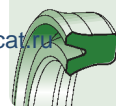
The hardness is 93 Sh A ± 2.

**Compound reference: CO**

**ASSEMBLY**

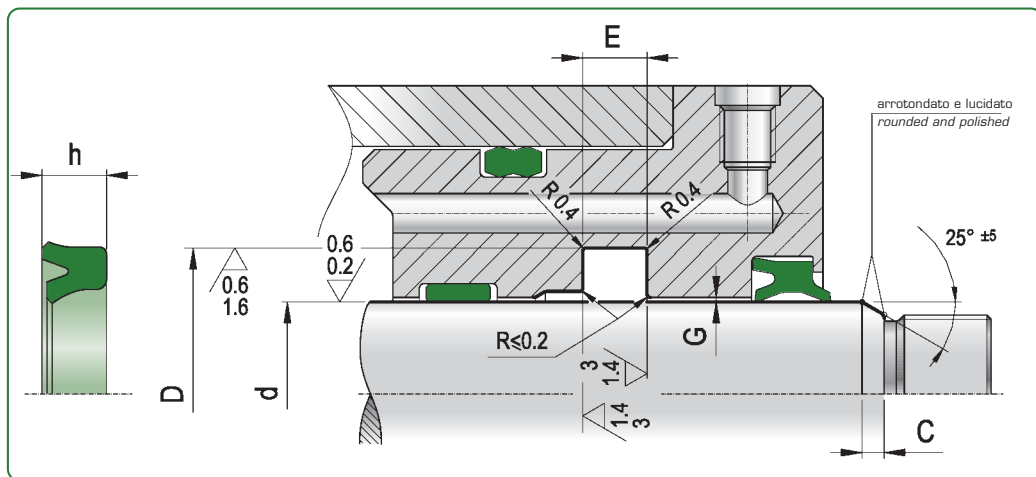
To prevent any damage to the seal, remove any flash and cutting edges in the housing and on the rod. The seal should always be lubricated before assembly to facilitate the insertion of the rod.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

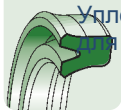
RSA



$d_{H9}$	$D_{H10}$	$h$	$E_{+0,2}$	$C$	ART / ITEM				
* 6,0	14,0	5,7	6,3	3,5	RSA	0060	0140	057	CO
8,0	16,0	4,7	5,3	3,5	RSA	0080	0160	047	CO
* 8,0	16,0	5,7	6,3	3,5	RSA	0080	0160	057	CO
8,0	18,0	8,0	9,0	3,5	RSA	0080	0180	080	CO
* 10,0	18,0	5,7	6,3	3,5	RSA	0100	0180	057	CO
10,0	20,0	7,2	8,0	4,5	RSA	0100	0200	072	CO
* 12,0	20,0	5,0	5,5	3,5	RSA	0120	0200	050	CO
* 12,0	20,0	5,7	6,4	3,5	RSA	0120	0200	057	CO
12,0	22,0	4,7	5,3	4,5	RSA	0120	0220	047	CO
* 12,0	22,0	7,2	8,0	4,5	RSA	0120	0220	072	CO
* 14,0	22,0	5,7	6,3	3,5	RSA	0140	0220	057	CO
* 14,0	24,0	7,2	8,0	4,5	RSA	0140	0240	072	CO
15,0	23,0	5,7	6,3	3,5	RSA	0150	0230	057	CO
15,0	25,0	8,0	9,0	4,5	RSA	0150	0250	080	CO
16,0	20,6	3,3	3,6	3,5	RSA	0160	0206	033	CO
* 16,0	24,0	5,7	6,3	3,5	RSA	0160	0240	057	CO
* 16,0	26,0	7,2	8,0	4,5	RSA	0160	0260	072	CO
18,0	24,0	4,7	5,3	3,5	RSA	0180	0240	047	CO
* 18,0	26,0	5,7	6,3	3,5	RSA	0180	0260	057	CO
18,0	26,0	8,0	9,0	3,5	RSA	0180	0260	080	CO
* 18,0	28,0	7,2	8,0	4,5	RSA	0180	0280	072	CO
18,0	28,0	8,0	9,0	4,5	RSA	0180	0280	080	CO
* 20,0	26,0	5,0	5,5	3,5	RSA	0200	0260	050	CO
* 20,0	28,0	5,7	6,3	3,5	RSA	0200	0280	057	CO
20,0	28,0	6,2	7,0	3,5	RSA	0200	0280	062	CO
* 20,0	30,0	7,2	8,0	3,5	RSA	0200	0300	072	CO
20,0	30,0	7,2	8,0	4,5	RSA	0200	0300	072	CO
20,0	30,0	8,0	9,0	4,5	RSA	0200	0300	080	CO
* 22,0	35,0	10,0	11,0	5,5	RSA	0200	0350	100	CO
22,0	30,0	5,7	6,4	3,5	RSA	0220	0300	057	CO
22,0	30,0	8,0	9,0	3,5	RSA	0220	0300	080	CO
* 22,0	32,0	7,2	8,0	4,5	RSA	0220	0320	072	CO
22,0	32,0	9,0	10,0	4,5	RSA	0220	0320	090	CO
24,0	34,0	7,2	8,0	4,5	RSA	0240	0340	072	CO
* 25,0	33,0	5,7	6,3	3,5	RSA	0250	0330	057	CO
25,0	33,0	6,3	7,0	3,5	RSA	0250	0330	063	CO
25,0	33,0	7,2	8,0	3,5	RSA	0250	0330	072	CO
* 25,0	35,0	10,0	11,0	3,5	RSA	0250	0350	010	CO
25,0	35,0	7,2	8,0	4,5	RSA	0250	0350	072	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1





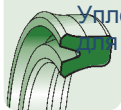
d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>±0,2</sub>	C	ART / ITEM				
25,0	38,0	9,0	10,0	5,0	RSA	0250	0380	090	CO
25,0	40,0	10,0	11,0	5,5	RSA	0250	0400	100	CO
28,0	36,0	5,7	6,3	3,5	RSA	0280	0360	057	CO
* 28,0	38,0	7,2	8,0	4,5	RSA	0280	0380	072	CO
28,0	38,0	8,0	9,0	4,5	RSA	0280	0380	080	CO
28,0	38,0	10,0	11,0	4,5	RSA	0280	0380	100	CO
* 28,0	40,0	8,5	9,5	4,5	RSA	0280	0400	085	CO
28,0	43,0	11,5	12,5	5,5	RSA	0280	0430	115	CO
30,0	38,0	5,7	6,3	3,5	RSA	0300	0380	057	CO
30,0	40,0	7,2	8,0	4,5	RSA	0300	0400	072	CO
30,0	40,0	8,0	9,0	4,5	RSA	0300	0400	080	CO
30,0	40,0	9,5	10,5	4,5	RSA	0300	0400	095	CO
30,0	43,0	10,0	11,0	4,5	RSA	0300	0430	100	CO
30,0	43,0	9,0	10,0	4,5	RSA	0300	0430	090	CO
30,0	45,0	8,0	9,0	5,5	RSA	0300	0450	080	CO
32,0	40,0	5,7	6,3	3,5	RSA	0320	0400	057	CO
32,0	40,0	8,0	9,0	3,5	RSA	0320	0400	080	CO
* 32,0	42,0	7,2	8,0	4,5	RSA	0320	0420	072	CO
32,0	42,0	10,0	11,0	4,5	RSA	0320	0420	100	CO
32,0	45,0	10,0	11,0	4,5	RSA	0320	0450	100	CO
32,0	47,0	10,0	11,0	5,5	RSA	0320	0470	100	CO
33,0	43,0	10,0	11,0	4,5	RSA	0330	0430	100	CO
35,0	43,0	5,7	6,3	3,5	RSA	0350	0430	057	CO
35,0	43,0	8,0	9,0	3,5	RSA	0350	0430	080	CO
35,0	45,0	7,2	8,0	4,5	RSA	0350	0450	072	CO
35,0	45,0	10,0	11,0	4,5	RSA	0350	0450	100	CO
35,0	46,0	8,0	9,0	4,5	RSA	0350	0460	080	CO
35,0	47,0	8,0	9,0	4,5	RSA	0350	0470	080	CO
35,0	50,0	10,0	11,0	5,5	RSA	0350	0500	100	CO
36,0	44,0	5,0	5,5	3,5	RSA	0360	0440	050	CO
36,0	44,0	5,7	6,4	3,5	RSA	0360	0440	057	CO
36,0	44,0	8,0	9,0	3,5	RSA	0360	0440	080	CO
* 36,0	46,0	7,2	8,0	4,5	RSA	0360	0460	072	CO
36,0	46,0	10,0	11,0	4,5	RSA	0360	0460	100	CO
36,0	48,0	7,0	8,0	4,5	RSA	0360	0480	070	CO
36,0	48,0	8,0	9,0	4,5	RSA	0360	0480	080	CO
36,0	51,0	10,0	11,0	5,5	RSA	0360	0510	100	CO
* 36,0	51,0	11,5	12,5	5,5	RSA	0360	0510	115	CO
38,0	44,5	4,7	5,3	3,5	RSA	0380	0445	047	CO
38,0	45,0	6,2	7,0	3,5	RSA	0380	0450	062	CO
40,0	48,0	5,7	6,3	4,0	RSA	0400	0480	057	CO
* 40,0	48,0	8,0	9,0	4,0	RSA	0400	0480	080	CO
40,0	50,0	7,2	8,0	4,5	RSA	0400	0500	072	CO
40,0	50,0	9,0	10,0	4,5	RSA	0400	0500	090	CO
* 40,0	50,0	10,0	11,0	4,5	RSA	0400	0500	100	CO
40,0	52,0	8,0	9,0	4,5	RSA	0400	0520	080	CO
40,0	55,0	10,0	11,0	5,5	RSA	0400	0550	100	CO
* 40,0	55,0	11,5	12,5	5,5	RSA	0400	0550	115	CO
40,0	60,0	12,0	13,0	6,0	RSA	0400	0600	120	CO
45,0	53,0	5,7	6,3	4,0	RSA	0450	0530	057	CO
45,0	53,0	10,0	11,0	4,0	RSA	0450	0530	100	CO
* 45,0	55,0	7,2	8,0	4,5	RSA	0450	0550	072	CO
45,0	55,0	10,0	11,0	4,5	RSA	0450	0550	100	CO
45,0	58,0	9,0	10,0	5,0	RSA	0450	0580	090	CO
* 45,0	60,0	10,0	11,0	5,5	RSA	0450	0600	100	CO
45,0	60,0	11,5	12,5	5,5	RSA	0450	0600	115	CO
* 45,0	65,0	12,0	13,0	5,5	RSA	0450	0650	120	CO
50,0	60,0	7,2	8,0	4,5	RSA	0500	0600	072	CO
50,0	60,0	10,0	11,0	4,5	RSA	0500	0600	100	CO
50,0	60,0	12,0	13,0	4,5	RSA	0500	0600	120	CO
50,0	62,0	9,0	10,0	5,0	RSA	0500	0620	090	CO
50,0	63,0	10,0	11,0	5,0	RSA	0500	0630	100	CO
* 50,0	65,0	10,0	11,0	5,5	RSA	0500	0650	100	CO
50,0	65,0	11,5	12,5	5,5	RSA	0500	0650	115	CO
50,0	70,0	12,0	13,0	6,5	RSA	0500	0700	120	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>-0,2</sub>	C	ART / ITEM				
52,0	62,0	10,0	11,0	4,5	RSA	0520	0620	100	CO
55,0	63,0	12,0	13,0	3,5	RSA	0550	0630	120	CO
55,0	65,0	7,2	8,0	4,5	RSA	0550	0650	072	CO
55,0	65,0	10,0	11,0	4,5	RSA	0550	0650	100	CO
55,0	68,0	10,0	11,0	5,0	RSA	0550	0680	100	CO
55,0	70,0	10,0	11,0	5,5	RSA	0550	0700	100	CO
55,0	75,0	12,0	13,0	6,5	RSA	0550	0750	120	CO
56,0	66,0	10,0	11,0	5,0	RSA	0560	0660	100	CO
56,0	71,0	10,0	11,0	6,0	RSA	0560	0710	100	CO
* 56,0	71,0	11,5	12,5	6,0	RSA	0560	0710	115	CO
56,0	71,0	12,5	13,5	6,0	RSA	0560	0710	125	CO
56,0	76,0	12,0	13,0	6,5	RSA	0560	0760	120	CO
56,0	76,0	15,0	16,0	6,5	RSA	0560	0760	150	CO
60,0	68,0	12,5	13,5	4,5	RSA	0600	0680	125	CO
60,0	70,0	7,2	8,0	5,0	RSA	0600	0700	072	CO
60,0	70,0	10,0	11,0	5,0	RSA	0600	0700	100	CO
60,0	72,0	8,0	9,0	5,5	RSA	0600	0720	080	CO
60,0	72,0	9,0	10,0	5,5	RSA	0600	0720	090	CO
60,0	73,0	10,0	11,0	5,5	RSA	0600	0730	100	CO
60,0	75,0	10,0	11,0	6,0	RSA	0600	0750	100	CO
60,0	75,0	11,5	12,5	6,0	RSA	0600	0750	115	CO
60,0	80,0	12,0	13,0	6,5	RSA	0600	0800	120	CO
63,0	73,0	12,0	13,0	5,0	RSA	0630	0730	120	CO
63,0	75,0	8,6	9,6	5,5	RSA	0630	0750	086	CO
63,0	78,0	10,0	11,0	6,0	RSA	0630	0780	100	CO
* 63,0	78,0	11,5	12,5	6,0	RSA	0630	0780	115	CO
63,0	83,0	15,0	16,0	6,5	RSA	0630	0830	150	CO
65,0	75,0	10,0	11,0	5,0	RSA	0650	0750	100	CO
65,0	77,0	8,6	9,6	5,5	RSA	0650	0770	086	CO
65,0	77,0	9,0	10,0	5,5	RSA	0650	0770	090	CO
65,0	80,0	10,0	11,0	6,0	RSA	0650	0800	100	CO
65,0	85,0	12,0	13,0	6,5	RSA	0650	0850	120	CO
* 70,0	80,0	7,2	8,0	5,0	RSA	0700	0800	072	CO
70,0	80,0	12,0	13,0	5,0	RSA	0700	0800	120	CO
70,0	82,0	8,6	9,6	6,0	RSA	0700	0820	086	CO
70,0	85,0	10,0	11,0	6,0	RSA	0700	0850	100	CO
* 70,0	85,0	11,5	12,5	6,0	RSA	0700	0850	115	CO
* 70,0	85,0	12,0	13,0	6,0	RSA	0700	0850	120	CO
* 70,0	90,0	15,0	16,0	7,0	RSA	0700	0900	150	CO
75,0	85,0	7,2	8,0	7,0	RSA	0750	0850	072	CO
75,0	87,0	8,6	9,6	6,0	RSA	0750	0870	086	CO
75,0	90,0	12,0	13,0	6,0	RSA	0750	0900	120	CO
75,0	95,0	12,0	13,0	7,0	RSA	0750	0950	120	CO
80,0	90,0	7,2	8,0	5,0	RSA	0800	0900	072	CO
80,0	90,0	10,0	11,0	5,0	RSA	0800	0900	100	CO
80,0	90,0	10,0	11,0	5,0	RSA	0800	0900	100	CO
80,0	92,0	8,6	9,6	5,5	RSA	0800	0920	086	CO
80,0	95,0	10,0	11,0	6,0	RSA	0800	0950	100	CO
* 80,0	95,0	11,5	12,5	6,0	RSA	0800	0950	115	CO
80,0	95,0	12,0	13,0	6,0	RSA	0800	0950	120	CO
80,0	100,0	12,0	13,0	7,0	RSA	0800	1000	120	CO
80,0	100,0	12,5	13,5	7,0	RSA	0800	1000	125	CO
* 80,0	100,0	15,0	16,0	7,0	RSA	0800	1000	150	CO
85,0	100,0	11,0	12,0	6,0	RSA	0850	1000	110	CO
85,0	100,0	12,0	13,0	6,0	RSA	0850	1000	120	CO
85,0	105,0	12,0	13,0	7,0	RSA	0850	1050	120	CO
90,0	100,0	11,5	12,5	5,5	RSA	0900	1000	115	CO
* 90,0	105,0	8,5	9,5	6,0	RSA	0900	1050	085	CO
* 90,0	105,0	11,5	12,5	6,0	RSA	0900	1050	115	CO
* 90,0	105,0	12,0	13,0	6,0	RSA	0900	1050	120	CO
90,0	110,0	12,0	13,0	7,0	RSA	0900	1100	120	CO
* 90,0	110,0	15,0	16,0	7,0	RSA	0900	1100	150	CO
95,0	110,0	12,0	13,0	6,0	RSA	0950	1100	120	CO
95,0	115,0	12,0	13,0	7,0	RSA	0950	1150	120	CO
* 100,0	115,0	12,0	13,0	6,0	RSA	1000	1150	120	CO
* 100,0	120,0	12,0	13,0	7,0	RSA	1000	1200	120	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>h9</sub>	D <sub>H10</sub>	h	E <sub>±0,2</sub>	C	ART / ITEM				
* 100,0	120,0	15,0	16,0	7,0	RSA	1000	1200	150	CO
* 100,0	125,0	19,0	20,0	8,0	RSA	1000	1250	190	CO
105,0	120,0	11,5	12,5	6,0	RSA	1050	1200	115	CO
105,0	125,0	12,0	13,0	7,0	RSA	1050	1250	120	CO
105,0	125,0	15,0	16,0	7,0	RSA	1050	1250	150	CO
110,0	125,0	11,0	12,0	6,0	RSA	1100	1250	110	CO
* 110,0	130,0	12,0	13,0	7,0	RSA	1100	1300	120	CO
* 110,0	130,0	15,0	16,0	7,0	RSA	1100	1300	150	CO
115,0	135,0	12,0	13,0	7,0	RSA	1150	1350	120	CO
120,0	135,0	11,5	12,5	6,0	RSA	1200	1350	115	CO
120,0	140,0	12,0	13,0	7,0	RSA	1200	1400	120	CO
120,0	140,0	15,0	16,0	7,0	RSA	1200	1400	150	CO
* 125,0	145,0	15,0	16,0	7,0	RSA	1250	1450	150	CO
130,0	150,0	12,0	13,0	7,0	RSA	1300	1500	120	CO
130,0	150,0	15,0	16,0	7,0	RSA	1300	1500	150	CO
* 140,0	160,0	15,0	16,0	7,0	RSA	1400	1600	150	CO
150,0	170,0	15,0	16,0	7,0	RSA	1500	1700	150	CO
160,0	180,0	12,0	13,0	7,0	RSA	1600	1800	120	CO
160,0	180,0	15,0	16,0	7,0	RSA	1600	1800	150	CO
170,0	190,0	15,0	16,0	7,0	RSA	1700	1900	150	CO
180,0	200,0	15,0	16,0	7,0	RSA	1800	2000	150	CO
190,0	210,0	15,0	16,0	7,0	RSA	1900	2100	150	CO
200,0	220,0	15,0	16,0	7,0	RSA	2000	2200	150	CO
200,0	225,0	16,0	17,0	8,0	RSA	2000	2250	160	CO
210,0	230,0	15,0	16,0	7,0	RSA	2100	2300	150	CO
220,0	240,0	15,0	16,0	7,0	RSA	2200	2400	150	CO
230,0	250,0	15,0	16,0	7,0	RSA	2300	2500	150	CO
240,0	260,0	15,0	16,0	7,0	RSA	2400	2600	150	CO
250,0	270,0	15,0	16,0	7,0	RSA	2500	2700	150	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

Уплотнения и ремкомплекты  
для гидроцилиндров

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## TENUTA STELO TIPO RSB e RSB2

### DESCRIZIONE

La guarnizione tipo **RSB** è molto simile al tipo RSA, ma presenta sul lato dinamico un doppio labbro che ha più di una funzione:

- attenua eventuali fenomeni di stick-slip grazie al fluido trattenuto nell'intercapedine fra i due labbri;
- evita alle impurità di entrare dall'esterno;
- contrasta il ritiro del materiale alle basse temperature;
- funge da stabilizzatore.

### DATI TECNICI

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	fluidi idraulici a base minerale (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set ed elevata resistenza all'abrasione.

Ha un durezza di 93 Sh A  $\pm$  2.

**Codice materiale: CO**

### MONTAGGIO

Per evitare che la guarnizione si danneggi occorre eliminare le bave e gli spigoli taglienti presenti nella sede e sullo stelo.

E' sempre consigliato lubrificare la tenuta prima del montaggio per agevolare l'inserimento dello stelo. Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

**NOTA:** E' disponibile anche la versione **RSB2\_CR** (v. pag. 42) con anello antiestrusione. Si utilizza questa tenuta quando non è possibile ridurre i giochi di accoppiamento tra la testata e lo stelo e dove esistono picchi di pressione (500 bar).

## ROD SEAL TYPE RSB AND RSB2

### DESCRIPTION

The **RSB** seal type is very similar to the RSA type, but on the dynamic side it has a multifunctional double lip which:

- mitigates any stick-slip effect thanks to a fluid ring between the secondary lip and the main one;
- blocks any external impurities;
- counters the shrinking of the material at low temperatures;
- works as a stabilizer.

### TECHNICAL DATA

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C with peaks till 110° C
Fluids:	mineral hydraulic fluids (see TABLE I, pages 12-13)

### MATERIAL

The proposed material is a **CO**-type polyurethane, with high elasticity modulus, low compression-set and high resistance to abrasion.

The hardness is of 93 Sh A  $\pm$  2.

**Compound reference: CO**

### ASSEMBLY

To prevent any damage to the seal, remove any flash and cutting edges in the housing and on the rod. The seal should always be lubricated before assembly to facilitate the insertion of the rod.

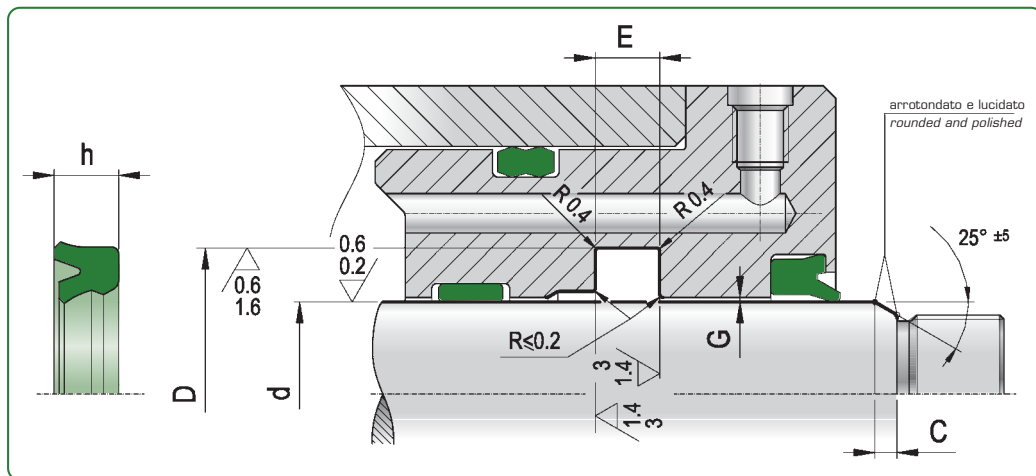
For further information please refer to the installation instructions on page 27.

**NOTE:** **RSB2\_CR** version (see page 42) with anti-extrusion ring is also available. This seal is recommended when the coupling clearance between the head and the rod cannot be reduced and in the event of pressure peaks (500 bar).



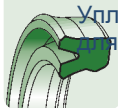
disegno / DRAWING

RSB



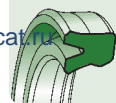
$d_{H9}$	$D_{H10}$	h	$E_{+0,2}$	C	ART / ITEM				
* 6,0	14,0	5,7	6,3	3,5	RSB	0060	0140	057	CO
* 8,0	16,0	5,7	6,3	3,5	RSB	0080	0160	057	CO
* 10,0	18,0	5,7	6,3	3,5	RSB	0100	0180	057	CO
* 10,0	20,0	7,0	8,0	4,5	RSB	0100	0200	070	CO
* 12,0	19,0	5,0	5,6	3,5	RSB	0120	0190	050	CO
* 12,0	20,0	5,7	6,3	4,0	RSB	0120	0200	057	CO
* 12,0	22,0	7,0	8,0	4,5	RSB	0120	0220	070	CO
12,0	22,0	8,0	9,0	4,5	RSB	0120	0220	080	CO
14,0	20,0	5,8	6,3	4,0	RSB	0140	0200	058	CO
* 14,0	21,0	5,0	5,6	4,0	RSB	0140	0210	050	CO
* 14,0	22,0	5,7	6,3	4,0	RSB	0140	0220	057	CO
* 14,0	24,0	7,3	8,0	4,5	RSB	0140	0240	073	CO
15,0	23,0	5,7	6,3	4,0	RSB	0150	0230	057	CO
* 16,0	24,0	5,7	6,3	4,0	RSB	0160	0240	057	CO
* 16,0	26,0	7,3	8,0	4,5	RSB	0160	0260	073	CO
* 18,0	25,0	5,0	5,6	3,5	RSB	0180	0250	050	CO
* 18,0	26,0	5,7	6,3	4,0	RSB	0180	0260	057	CO
* 18,0	28,0	7,3	8,0	4,5	RSB	0180	0280	073	CO
* 20,0	28,0	4,3	5,0	4,0	RSB	0200	0280	043	CO
* 20,0	28,0	5,7	6,3	4,0	RSB	0200	0280	057	CO
* 20,0	30,0	7,3	8,0	4,5	RSB	0200	0300	073	CO
* 22,0	29,0	5,0	5,6	3,5	RSB	0220	0290	050	CO
22,0	30,0	5,5	6,0	4,5	RSB	0220	0300	055	CO
* 22,0	32,0	7,3	8,0	4,5	RSB	0220	0320	073	CO
* 25,0	33,0	5,7	6,3	4,0	RSB	0250	0330	057	CO
25,0	33,0	7,3	8,0	4,0	RSB	0250	0330	073	CO
* 25,0	35,0	7,3	8,0	4,5	RSB	0250	0350	073	CO
* 28,0	36,0	5,7	6,3	4,0	RSB	0280	0360	057	CO
28,0	36,0	7,3	8,0	4,0	RSB	0280	0360	073	CO
* 28,0	38,0	5,7	6,3	4,5	RSB	0280	0380	057	CO
* 28,0	38,0	7,3	8,0	4,5	RSB	0280	0380	073	CO
* 28,0	43,0	11,5	12,5	5,0	RSB	0280	0430	115	CO
30,0	38,0	5,7	6,3	4,0	RSB	0300	0380	057	CO
30,0	40,0	7,3	8,0	4,5	RSB	0300	0400	073	CO
30,0	40,0	8,0	9,0	4,5	RSB	0300	0400	080	CO
32,0	40,0	5,7	6,3	4,0	RSB	0320	0400	057	CO
32,0	40,0	6,0	7,0	4,0	RSB	0320	0400	060	CO
32,0	40,0	6,7	7,7	4,0	RSB	0320	0400	067	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>+0,2</sub>	C	ART / ITEM				
* 32,0	42,0	5,7	6,3	4,5	RSB	0320	0420	057	CO
* 32,0	42,0	7,3	8,0	4,5	RSB	0320	0420	073	CO
35,0	42,0	7,0	8,0	4,0	RSB	0350	0420	070	CO
35,0	43,0	5,7	6,3	4,0	RSB	0350	0430	057	CO
35,0	43,0	6,0	7,0	5,0	RSB	0350	0430	060	CO
35,0	45,0	6,0	7,0	5,0	RSB	0350	0450	060	CO
35,0	45,0	6,7	7,7	5,0	RSB	0350	0450	067	CO
35,0	45,0	7,0	8,0	5,0	RSB	0350	0450	070	CO
35,0	45,0	7,3	8,0	5,0	RSB	0350	0450	073	CO
35,0	45,0	12,0	13,0	5,0	RSB	0350	0450	120	CO
* 36,0	44,0	5,7	6,3	4,5	RSB	0360	0440	057	CO
36,0	44,0	6,3	7,0	4,5	RSB	0360	0440	063	CO
36,0	46,0	7,0	8,0	5,0	RSB	0360	0460	070	CO
* 36,0	46,0	7,3	8,0	5,0	RSB	0360	0460	073	CO
36,0	46,0	8,0	9,0	5,0	RSB	0360	0460	080	CO
38,0	48,0	8,0	9,0	5,0	RSB	0380	0480	080	CO
40,0	48,0	5,7	6,3	4,5	RSB	0400	0480	057	CO
40,0	50,0	7,0	8,0	5,0	RSB	0400	0500	070	CO
* 40,0	50,0	7,3	8,0	5,0	RSB	0400	0500	073	CO
40,0	50,0	10,0	11,0	5,0	RSB	0400	0500	100	CO
40,0	55,0	10,0	11,0	5,5	RSB	0400	0550	100	CO
* 40,0	55,0	11,5	12,5	5,5	RSB	0400	0550	115	CO
42,0	50,0	8,0	9,0	4,5	RSB	0420	0500	080	CO
42,0	50,0	11,5	12,5	4,5	RSB	0420	0500	115	CO
42,0	53,0	9,0	10,0	5,0	RSB	0420	0530	090	CO
* 45,0	53,0	5,7	6,3	4,5	RSB	0450	0530	057	CO
45,0	53,0	10,0	11,0	4,5	RSB	0450	0530	100	CO
45,0	53,0	11,5	12,5	4,5	RSB	0450	0530	115	CO
* 45,0	55,0	5,7	6,3	5,0	RSB	0450	0550	057	CO
* 45,0	55,0	7,3	8,0	5,0	RSB	0450	0550	073	CO
45,0	55,0	11,5	12,5	5,0	RSB	0450	0550	115	CO
* 45,0	60,0	11,5	12,5	5,5	RSB	0450	0600	115	CO
46,0	56,0	10,0	11,0	5,0	RSB	0460	0560	100	CO
48,0	56,0	11,5	12,5	4,5	RSB	0480	0560	115	CO
48,0	56,0	12,0	13,0	4,5	RSB	0480	0560	120	CO
50,0	57,0	7,3	8,0	4,5	RSB	0500	0570	073	CO
50,0	57,0	10,0	11,0	4,5	RSB	0500	0570	100	CO
50,0	58,0	11,5	12,5	4,5	RSB	0500	0580	115	CO
50,0	59,0	10,0	11,0	5,0	RSB	0500	0590	100	CO
* 50,0	60,0	7,3	8,0	5,0	RSB	0500	0600	073	CO
50,0	60,0	10,0	11,0	5,0	RSB	0500	0600	100	CO
50,0	65,0	10,0	11,0	5,5	RSB	0500	0650	100	CO
* 50,0	65,0	11,5	12,5	5,5	RSB	0500	0650	115	CO
50,0	70,0	10,0	11,0	6,0	RSB	0500	0700	100	CO
50,0	70,0	12,0	13,0	7,0	RSB	0500	0700	120	CO
55,0	63,0	11,5	12,5	4,5	RSB	0550	0630	115	CO
55,0	65,0	7,3	8,0	5,0	RSB	0550	0650	073	CO
55,0	65,0	8,5	9,5	5,0	RSB	0550	0650	085	CO
55,0	65,0	10,0	11,0	5,0	RSB	0550	0650	100	CO
* 56,0	71,0	11,5	12,5	5,5	RSB	0560	0710	115	CO
* 56,0	76,0	15,0	16,0	6,0	RSB	0560	0760	150	CO
60,0	68,0	11,5	12,5	4,5	RSB	0600	0680	115	CO
60,0	70,0	7,3	8,0	5,0	RSB	0600	0700	073	CO
60,0	70,0	10,0	11,0	5,0	RSB	0600	0700	100	CO
60,0	70,0	11,5	12,5	5,0	RSB	0600	0700	115	CO
60,0	75,0	11,5	12,5	5,5	RSB	0600	0750	115	CO
60,0	80,0	12,0	13,0	7,0	RSB	0600	0800	120	CO
* 63,0	78,0	11,5	12,5	5,5	RSB	0630	0780	115	CO
63,0	83,0	12,0	13,0	7,0	RSB	0630	0830	120	CO
63,0	83,0	15,0	16,0	7,0	RSB	0630	0830	150	CO
65,0	73,0	11,5	12,5	4,5	RSB	0650	0730	115	CO
65,0	75,0	7,0	8,0	5,5	RSB	0650	0750	070	CO
65,0	75,0	7,3	8,0	5,0	RSB	0650	0750	073	CO
65,0	75,0	10,0	11,0	5,0	RSB	0650	0750	100	CO
65,0	75,0	12,0	13,0	5,5	RSB	0650	0750	120	CO
65,0	80,0	11,5	12,5	5,5	RSB	0650	0800	115	CO

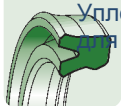
\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>+0,2</sub>	C	ART / ITEM				
67,0	75,0	11,5	12,5	5,0	RSB	0670	0750	115	CO
70,0	78,0	11,5	12,5	4,5	RSB	0700	0780	115	CO
70,0	80,0	7,3	8,0	5,5	RSB	0700	0800	073	CO
* 70,0	80,0	11,5	12,5	5,0	RSB	0700	0800	115	CO
* 70,0	85,0	11,5	12,5	6,0	RSB	0700	0850	115	CO
* 70,0	90,0	12,0	13,0	7,0	RSB	0700	0900	120	CO
* 70,0	90,0	15,0	16,0	7,0	RSB	0700	0900	150	CO
75,0	83,0	7,0	8,0	5,0	RSB	0750	0830	070	CO
75,0	83,0	11,5	12,5	5,0	RSB	0750	0830	115	CO
75,0	85,0	10,0	11,0	5,5	RSB	0750	0850	100	CO
75,0	85,0	11,5	12,5	5,5	RSB	0750	0850	115	CO
75,0	90,0	11,5	12,5	6,0	RSB	0750	0900	115	CO
78,0	86,0	11,5	12,5	5,0	RSB	0780	0860	115	CO
80,0	88,0	11,5	12,5	5,0	RSB	0800	0880	115	CO
80,0	90,0	7,3	8,0	5,5	RSB	0800	0900	073	CO
80,0	90,0	10,0	11,0	5,5	RSB	0800	0900	100	CO
80,0	95,0	10,0	11,0	6,0	RSB	0800	0950	100	CO
* 80,0	95,0	11,5	12,5	6,0	RSB	0800	0950	115	CO
* 80,0	100,0	12,0	13,0	7,0	RSB	0800	1000	120	CO
* 80,0	100,0	15,0	16,0	7,0	RSB	0800	1000	150	CO
85,0	93,0	11,5	12,5	5,0	RSB	0850	0930	115	CO
85,0	100,0	11,5	12,5	6,0	RSB	0850	1000	115	CO
85,0	105,0	12,0	13,0	7,0	RSB	0850	1050	120	CO
90,0	98,0	11,5	12,5	5,0	RSB	0900	0980	115	CO
90,0	100,0	7,3	8,0	5,5	RSB	0900	1000	073	CO
90,0	100,0	11,5	12,5	5,5	RSB	0900	1000	115	CO
* 90,0	105,0	11,5	12,5	6,0	RSB	0900	1050	115	CO
* 90,0	110,0	12,0	13,0	7,0	RSB	0900	1100	120	CO
* 90,0	110,0	15,0	16,0	7,0	RSB	0900	1100	150	CO
93,0	101,0	11,5	12,5	5,0	RSB	0930	1010	115	CO
95,0	103,0	11,5	12,5	5,0	RSB	0950	1030	115	CO
95,0	105,0	12,0	13,0	5,5	RSB	0950	1050	120	CO
95,0	115,0	13,5	14,5	5,5	RSB	0950	1150	135	CO
97,0	105,0	11,5	12,5	5,0	RSB	0970	1050	115	CO
100,0	108,0	11,5	12,5	5,5	RSB	1000	1080	115	CO
100,0	115,0	10,0	11,0	6,0	RSB	1000	1150	100	CO
* 100,0	120,0	12,0	13,0	7,0	RSB	1000	1200	120	CO
* 100,0	120,0	15,0	16,0	7,0	RSB	1000	1200	150	CO
105,0	113,0	11,5	12,5	5,0	RSB	1050	1130	115	CO
105,0	115,0	11,5	12,5	5,5	RSB	1050	1150	115	CO
105,0	125,0	12,0	13,0	7,0	RSB	1050	1250	120	CO
110,0	118,0	11,5	12,5	5,0	RSB	1100	1180	115	CO
* 110,0	125,0	9,6	10,6	6,0	RSB	1100	1250	096	CO
* 110,0	130,0	15,0	16,0	7,0	RSB	1100	1300	150	CO
* 110,0	135,0	19,0	20,0	8,0	RSB	1100	1350	190	CO
115,0	123,0	11,5	12,5	5,0	RSB	1150	1230	115	CO
115,0	125,0	12,0	13,0	5,5	RSB	1150	1250	120	CO
118,0	126,0	11,5	12,5	5,0	RSB	1180	1260	115	CO
120,0	128,0	11,5	12,5	5,0	RSB	1200	1280	115	CO
120,0	140,0	15,0	16,0	7,0	RSB	1200	1400	150	CO
125,0	133,0	11,5	12,5	5,0	RSB	1250	1330	115	CO
125,0	145,0	12,0	13,0	7,0	RSB	1250	1450	120	CO
* 125,0	145,0	15,0	16,0	7,0	RSB	1250	1450	150	CO
* 125,0	150,0	19,0	20,0	8,0	RSB	1250	1500	190	CO
128,0	136,0	11,5	12,5	5,0	RSB	1280	1360	115	CO
130,0	150,0	15,0	16,0	7,0	RSB	1300	1500	150	CO
135,0	143,0	11,5	12,5	5,0	RSB	1350	1430	115	CO
140,0	148,0	11,5	12,5	5,0	RSB	1400	1480	115	CO
* 140,0	155,0	9,6	10,6	6,0	RSB	1400	1550	096	CO
* 140,0	160,0	15,0	16,0	7,0	RSB	1400	1600	150	CO
* 140,0	165,0	19,0	20,0	8,0	RSB	1400	1650	190	CO
143,0	151,0	11,5	12,5	5,0	RSB	1430	1510	115	CO
150,0	170,0	15,0	16,0	7,0	RSB	1500	1700	150	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1





$d_{H9}$	$D_{H10}$	$h$	$E_{+0,2}$	$C$	ART / ITEM				
152,0	160,0	11,5	12,5	5,0	RSB	1520	1600	115	CO
155,0	163,0	11,5	12,5	5,0	RSB	1550	1630	115	CO
160,0	168,0	11,5	12,5	5,0	RSB	1600	1680	115	CO
170,0	180,0	12,0	13,0	5,0	RSB	1700	1800	120	CO
170,0	190,0	15,0	16,0	7,0	RSB	1700	1900	150	CO
180,0	200,0	15,0	16,0	7,0	RSB	1800	2000	150	CO
* 180,0	205,0	15,0	16,0	8,0	RSB	1800	2050	150	CO
* 200,0	225,0	15,0	16,0	8,0	RSB	2000	2250	150	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

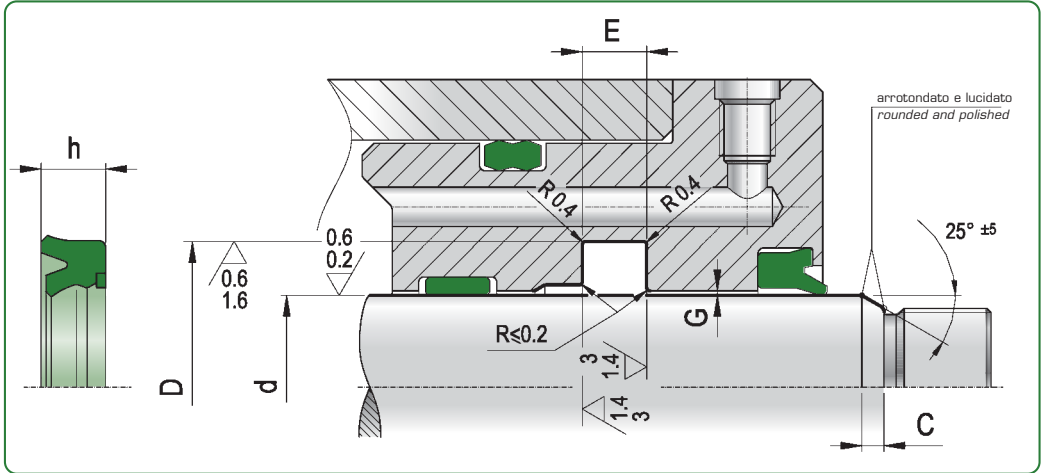
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SISTEMI DI TENUTA PER OLEODINAMICA  
HYDRAULIC SEALING SYSTEMS



disegno / DRAWING **RSB2**



$d_{h9}$	$D_{H10}$	h	$E_{+0,2}$	C	ART / ITEM				
40,0	55,0	10,0	11,0	5,5	RSB2	0400	0550	100	CR
42,0	51,0	10,0	11,0	4,5	RSB2	0420	0510	100	CR
45,0	60,0	10,0	11,0	5,5	RSB2	0450	0600	100	CR
50,0	59,0	10,0	11,0	4,5	RSB2	0500	0590	100	CR
50,0	60,0	7,3	8,0	5,0	RSB2	0500	0600	073	CR
50,0	65,0	10,0	11,0	5,5	RSB2	0500	0650	100	CR
50,0	70,0	12,0	13,0	6,0	RSB2	0500	0700	120	CR
56,0	71,0	11,5	12,5	5,5	RSB2	0560	0710	115	CR
60,0	69,0	10,0	11,0	4,5	RSB2	0600	0690	100	CR
60,0	75,0	11,5	12,5	5,5	RSB2	0600	0750	115	CR
60,0	80,0	12,0	13,0	6,0	RSB2	0600	0800	120	CR
63,0	78,0	11,5	12,5	5,5	RSB2	0630	0780	115	CR
63,0	83,0	12,0	13,0	6,0	RSB2	0630	0830	120	CR
65,0	80,0	11,5	12,5	5,5	RSB2	0650	0800	115	CR
70,0	80,0	7,3	8,0	5,0	RSB2	0700	0800	073	CR
70,0	85,0	11,5	12,5	5,5	RSB2	0700	0850	115	CR
75,0	95,0	13,5	14,5	6,0	RSB2	0750	0950	135	CR
80,0	95,0	11,5	12,5	5,5	RSB2	0800	0950	115	CR
80,0	100,0	13,5	14,5	7,0	RSB2	0800	1000	135	CR
85,0	105,0	12,0	13,0	7,0	RSB2	0850	1050	120	CR
85,0	105,0	13,5	14,5	7,0	RSB2	0850	1050	135	CR
90,0	105,0	11,5	12,5	6,0	RSB2	0900	1050	115	CR
95,0	115,0	13,5	14,5	7,0	RSB2	0950	1150	135	CR
100,0	120,0	12,0	13,0	7,0	RSB2	1000	1200	120	CR
100,0	120,0	13,5	14,5	7,0	RSB2	1000	1200	135	CR
105,0	125,0	12,0	13,0	7,0	RSB2	1050	1250	120	CR
110,0	130,0	12,0	13,0	7,0	RSB2	1100	1300	120	CR
120,0	140,0	12,0	13,0	7,0	RSB2	1200	1400	120	CR
125,0	145,0	12,0	13,0	7,0	RSB2	1250	1450	120	CR

CR = CO (TPU 93 shore A) + RO (POM)

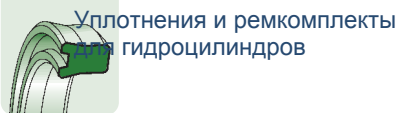
Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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SISTEMI DI TENUTA PER OLEODINAMICA  
HYDRAULIC SEALING SYSTEMS



## TENUTA STELO TIPO RSC

### DESCRIZIONE

La guarnizione tipo **RSC** è stata realizzata con ingombri limitati e per quei cilindri dove è possibile avere variazioni di pressione e di velocità elevate.

Il profilo è stato progettato con una gola poco profonda per garantire un forte contatto tra le parti statiche e le parti dinamiche anche in assenza di pressione.

### DATI TECNICI

Pressione: < 400 bar a temperatura di 60° C

Velocità: < 0.5 m/s

Temperatura: da - 35° C a + 100° C con punte fino a 110° C

Fluidi: fluidi e oli minerali  
(vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set, alta resistenza all'abrasione.

Ha una durezza di 93 Sh A ± 2.

**Codice materiale: CO**

### MONTAGGIO

Per evitare che si danneggino le guarnizioni durante il montaggio occorre eliminare le bave e gli spigoli taglienti nella sede e sullo stelo.

E' consigliabile lubrificare la tenuta durante il montaggio per agevolare l'inserimento dello stelo.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## ROD SEAL TYPE RSC

### DESCRIPTION

The **RSC** seal has small dimensions and has been created for cylinders under possible high pressure and speed variations.

The profile has been designed with a shallow groove to ensure tight contact between the static and dynamic part, even in zero pressure situations.

### TECHNICAL DATA

Pressure: < 400 bar at a temperature of 60° C

Speed: < 0.5 m/s

Temperature: from - 35° C to + 100° C, with peaks till 110° C

Fluids: mineral oils and fluids  
(see TABLE I, pages 12-13)

### MATERIAL

The proposed material is a **CO**-type polyurethane with a high modulus of elasticity, low compression-set and high resistance to abrasion.

The hardness is 93 Sh A ± 2.

**Compound reference: CO**

### ASSEMBLY

To avoid any damage to the seals during installation, remove any flash or cutting edges in the housing and on the rod.

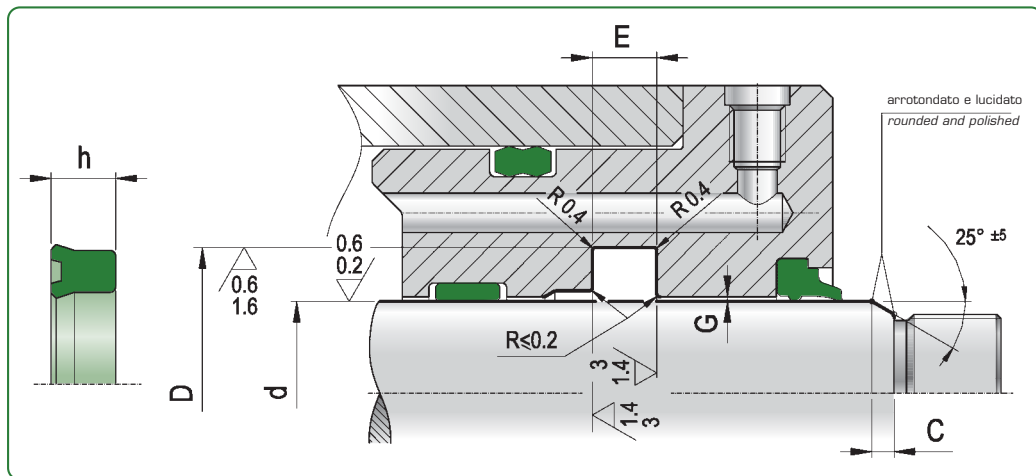
The seal should be lubricated during assembly to ease the insertion of the rod.

For further information please refer to the installation instructions on page 27.



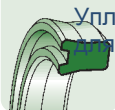
disegno / DRAWING

RSC



$d_{H9}$	$D_{H10}$	h	$E_{\pm 0.2}$	C	ART / ITEM				
6,0	14,0	5,8	6,3	4,5	RSC	0060	0140	058	CO
8,0	14,0	5,8	6,3	4,0	RSC	0080	0140	058	CO
8,0	16,0	5,8	6,3	4,5	RSC	0080	0160	058	CO
10,0	18,0	5,8	6,3	4,5	RSC	0100	0180	058	CO
12,0	18,0	4,5	5,0	4,0	RSC	0120	0180	045	CO
12,0	20,0	5,8	6,3	4,5	RSC	0120	0200	058	CO
14,0	21,0	5,0	5,5	4,0	RSC	0140	0210	050	CO
14,0	22,0	5,8	6,3	4,5	RSC	0140	0220	058	CO
16,0	22,0	4,0	4,5	3,5	RSC	0160	0220	040	CO
16,0	24,0	5,8	6,3	4,5	RSC	0160	0240	058	CO
16,0	24,0	6,0	7,0	4,5	RSC	0160	0240	060	CO
18,0	22,0	4,0	4,5	3,0	RSC	0180	0220	040	CO
18,0	26,0	5,8	6,3	4,5	RSC	0180	0260	040	CO
20,0	25,0	4,0	4,5	4,0	RSC	0200	0250	040	CO
20,0	26,0	5,0	5,5	4,0	RSC	0200	0260	050	CO
* 20,0	28,0	5,8	6,3	4,5	RSC	0200	0280	058	CO
* 20,0	30,0	7,0	8,0	5,0	RSC	0200	0300	070	CO
22,0	28,0	4,5	5,0	4,0	RSC	0220	0280	045	CO
22,0	28,0	5,8	6,3	3,5	RSC	0220	0280	058	CO
22,0	29,0	5,0	5,5	4,0	RSC	0220	0290	050	CO
* 22,0	30,0	5,8	6,3	4,5	RSC	0220	0300	058	CO
22,0	30,0	7,0	8,0	4,5	RSC	0220	0300	070	CO
22,0	32,0	7,0	8,0	5,0	RSC	0220	0320	070	CO
24,0	32,0	5,7	6,3	4,5	RSC	0240	0320	057	CO
24,0	34,0	5,7	6,3	4,5	RSC	0240	0340	057	CO
* 25,0	31,0	5,0	5,5	3,5	RSC	0250	0310	050	CO
* 25,0	33,0	5,8	6,3	4,5	RSC	0250	0330	058	CO
25,0	33,0	8,0	9,0	4,5	RSC	0250	0330	080	CO
25,0	35,0	5,0	5,5	5,0	RSC	0250	0350	050	CO
25,0	35,0	7,0	8,0	5,0	RSC	0250	0350	070	CO
* 28,0	36,0	5,8	6,3	4,5	RSC	0280	0360	058	CO
28,0	38,0	5,8	6,3	5,0	RSC	0280	0380	058	CO
28,0	38,0	7,0	8,0	5,0	RSC	0280	0380	070	CO
30,0	38,0	5,8	6,3	4,5	RSC	0300	0380	058	CO
30,0	38,0	6,0	7,0	4,5	RSC	0300	0380	060	CO
30,0	38,0	7,0	8,0	4,5	RSC	0300	0380	070	CO
30,0	38,0	8,0	9,0	4,5	RSC	0300	0380	080	CO
30,0	40,0	7,0	8,0	5,0	RSC	0300	0400	070	CO
30,0	40,0	10,0	11,0	5,0	RSC	0300	0400	100	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>h9</sub>	D <sub>H10</sub>	h	E <sub>+0,2</sub>	C	ART / ITEM				
32,0	40,0	6,0	7,0	4,5	RSC	0320	0400	060	CO
32,0	40,0	8,0	9,0	4,5	RSC	0320	0400	080	CO
* 32,0	42,0	7,0	8,0	5,0	RSC	0320	0420	070	CO
32,0	42,0	8,0	9,0	5,0	RSC	0320	0420	080	CO
32,0	42,0	9,0	10,0	5,0	RSC	0320	0420	090	CO
35,0	43,0	5,8	6,3	4,5	RSC	0350	0430	058	CO
35,0	43,0	6,0	7,0	4,5	RSC	0350	0430	060	CO
35,0	43,0	6,3	7,0	4,5	RSC	0350	0430	063	CO
35,0	43,0	7,0	8,0	4,5	RSC	0350	0430	070	CO
35,0	43,0	8,0	9,0	4,5	RSC	0350	0430	080	CO
35,0	45,0	7,0	8,0	5,0	RSC	0350	0450	070	CO
35,0	45,0	10,0	11,0	5,0	RSC	0350	0430	070	CO
35,0	45,0	10,0	11,0	5,0	RSC	0350	0450	100	CO
35,0	45,0	11,0	12,0	5,0	RSC	0350	0450	120	CO
* 36,0	44,0	5,8	6,3	4,5	RSC	0360	0440	058	CO
36,0	44,0	6,0	7,0	4,5	RSC	0360	0440	060	CO
36,0	44,0	6,3	7,0	4,5	RSC	0360	0440	063	CO
36,0	44,0	7,0	8,0	4,5	RSC	0360	0440	070	CO
36,0	44,0	8,0	9,0	4,5	RSC	0360	0440	080	CO
36,0	44,0	9,0	10,0	4,5	RSC	0360	0440	090	CO
36,0	46,0	7,0	8,0	5,0	RSC	0360	0460	070	CO
36,0	46,0	7,2	8,0	4,5	RSC	0360	0440	072	CO
36,0	46,0	10,0	11,0	5,0	RSC	0360	0460	100	CO
36,0	46,0	11,0	12,0	5,0	RSC	0360	0460	110	CO
38,0	45,0	6,0	7,0	4,5	RSC	0380	0450	060	CO
40,0	48,0	5,8	6,3	4,5	RSC	0400	0480	058	CO
40,0	48,0	6,0	7,0	4,5	RSC	0400	0480	060	CO
40,0	48,0	7,0	8,0	4,5	RSC	0400	0480	070	CO
40,0	48,0	8,0	9,0	4,5	RSC	0400	0480	080	CO
40,0	50,0	6,0	7,0	5,0	RSC	0400	0500	060	CO
* 40,0	50,0	7,0	8,0	5,0	RSC	0400	0500	070	CO
40,0	50,0	10,0	11,0	5,0	RSC	0400	0500	100	CO
42,0	50,0	6,0	7,0	4,5	RSC	0420	0500	060	CO
* 42,0	50,0	7,0	8,0	4,5	RSC	0420	0500	070	CO
* 45,0	53,0	5,8	6,3	4,5	RSC	0450	0530	058	CO
45,0	53,0	6,0	7,0	4,5	RSC	0450	0530	060	CO
45,0	53,0	6,3	7,0	4,5	RSC	0450	0530	063	CO
45,0	53,0	7,0	8,0	4,5	RSC	0450	0530	070	CO
45,0	53,0	8,0	9,0	4,5	RSC	0450	0530	080	CO
45,0	53,0	8,0	9,0	4,5	RSC	0450	0530	080	CO
* 45,0	55,0	5,8	6,3	5,0	RSC	0450	0550	058	CO
45,0	55,0	6,3	7,0	5,0	RSC	0450	0550	063	CO
* 45,0	55,0	7,0	8,0	5,0	RSC	0450	0550	070	CO
46,0	54,0	7,0	8,0	4,5	RSC	0460	0540	070	CO
46,0	54,0	7,5	8,5	4,5	RSC	0460	0540	075	CO
46,0	54,0	8,0	9,0	4,5	RSC	0460	0540	080	CO
50,0	58,0	8,0	9,0	4,5	RSC	0500	0580	080	CO
50,0	58,0	9,0	10,0	4,5	RSC	0500	0580	090	CO
* 50,0	60,0	7,0	8,0	5,0	RSC	0500	0600	070	CO
50,0	60,0	8,0	9,0	5,0	RSC	0500	0600	080	CO
50,0	60,0	10,0	11,0	5,0	RSC	0500	0600	100	CO
50,0	60,0	11,0	12,0	5,0	RSC	0500	0600	110	CO
50,0	62,0	8,0	9,0	5,5	RSC	0500	0620	080	CO
55,0	63,0	8,0	9,0	4,5	RSC	0550	0630	080	CO
55,0	65,0	7,0	8,0	5,0	RSC	0550	0650	070	CO
55,0	65,0	11,0	12,0	5,0	RSC	0550	0650	110	CO
56,0	66,0	10,0	11,0	5,0	RSC	0560	0660	100	CO
56,0	66,0	11,0	12,0	5,0	RSC	0560	0660	110	CO
* 56,0	71,0	11,5	12,5	6,0	RSC	0560	0710	115	CO
56,0	71,0	12,5	13,5	6,0	RSC	0560	0710	125	CO
60,0	68,0	8,0	9,0	5,0	RSC	0600	0680	080	CO

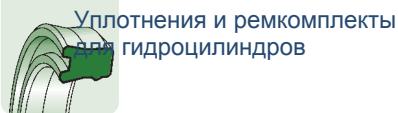
\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1

d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>+0,2</sub>	C	ART / ITEM				
60,0	68,0	9,0	10,0	4,5	RSC	0600	0680	090	CO
60,0	70,0	7,0	8,0	5,5	RSC	0600	0700	070	CO
60,0	70,0	7,5	8,5	5,5	RSC	0600	0700	075	CO
60,0	70,0	8,0	9,0	5,0	RSC	0600	0700	080	CO
60,0	70,0	8,5	9,5	5,0	RSC	0600	0700	085	CO
60,0	70,0	10,0	11,0	5,5	RSC	0600	0700	100	CO
60,0	70,0	11,0	12,0	5,0	RSC	0600	0700	110	CO
60,0	70,0	12,0	13,0	5,5	RSC	0600	0700	120	CO
60,0	70,0	13,0	14,0	5,0	RSC	0600	0700	130	CO
60,0	72,0	8,0	9,0	5,5	RSC	0600	0720	080	CO
60,0	72,0	9,0	10,0	5,5	RSC	0600	0720	090	CO
63,0	71,0	8,0	9,0	5,0	RSC	0630	0710	080	CO
65,0	73,0	8,0	9,0	5,0	RSC	0650	0730	080	CO
65,0	73,0	9,0	10,0	4,5	RSC	0650	0730	090	CO
65,0	75,0	12,0	13,0	5,0	RSC	0650	0750	120	CO
70,0	78,0	8,0	9,0	5,0	RSC	0700	0780	080	CO
70,0	78,0	9,0	10,0	4,5	RSC	0700	0780	090	CO
* 70,0	80,0	6,5	7,5	5,5	RSC	0700	0800	065	CO
70,0	80,0	7,0	8,0	5,5	RSC	0700	0800	070	CO
70,0	80,0	7,5	8,5	5,0	RSC	0700	0800	075	CO
70,0	80,0	8,0	9,0	5,0	RSC	0700	0800	080	CO
70,0	80,0	12,0	13,0	5,5	RSC	0700	0800	120	CO
70,0	80,0	13,0	14,0	5,0	RSC	0700	0800	130	CO
70,0	82,0	9,5	10,5	6,0	RSC	0700	0820	095	CO
70,0	82,0	10,5	11,5	6,0	RSC	0700	0820	105	CO
* 70,0	85,0	11,5	12,5	6,0	RSC	0700	0850	115	CO
70,0	85,0	12,5	13,5	6,5	RSC	0700	0850	125	CO
75,0	83,0	8,0	9,0	5,0	RSC	0750	0830	080	CO
75,0	83,0	9,0	10,0	4,5	RSC	0750	0830	090	CO
75,0	85,0	7,0	8,0	5,5	RSC	0750	0850	070	CO
75,0	85,0	8,0	9,0	5,0	RSC	0750	0850	080	CO
76,0	84,0	8,0	9,0	5,0	RSC	0760	0840	080	CO
76,0	84,0	9,0	10,0	4,5	RSC	0760	0840	090	CO
80,0	88,0	8,0	9,0	5,0	RSC	0800	0880	080	CO
80,0	88,0	9,0	10,0	4,5	RSC	0800	0880	090	CO
80,0	90,0	7,0	8,0	5,5	RSC	0800	0900	070	CO
80,0	90,0	8,0	9,0	5,0	RSC	0800	0900	080	CO
80,0	90,0	12,0	13,0	5,0	RSC	0800	0900	120	CO
* 80,0	95,0	11,5	12,5	6,5	RSC	0800	0950	115	CO
80,0	95,0	12,5	13,5	6,5	RSC	0800	0950	125	CO
85,0	93,0	8,0	9,0	5,5	RSC	0850	0930	080	CO
85,0	93,0	9,0	10,0	4,5	RSC	0850	0930	090	CO
90,0	98,0	8,0	9,0	5,5	RSC	0900	0980	080	CO
90,0	98,0	9,0	10,0	4,5	RSC	0900	0980	090	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.  
Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





## TENUTA STELO TIPO RSD

### DESCRIZIONE

La guarnizione tipo **RSD** è molto simile al tipo RSC, ma presenta sul lato dinamico un doppio labbro che ha più di una funzione:

- attenua eventuali fenomeni di stick-slip grazie al fluido trattenuto nell'intercapedine fra i due labbri;
- evita alle impurità di entrare dall'esterno;
- contrasta il ritiro del materiale alle basse temperature;
- funge da stabilizzatore;

### DATI TECNICI

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	fluidi e oli minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set, alta resistenza all'abrasione.

Ha una durezza di 93 Sh A  $\pm$  2.

**Codice materiale: CO**

### MONTAGGIO

Per evitare che si danneggino le guarnizioni durante il montaggio occorre eliminare le bave e gli spigoli taglienti nella sede e sullo stelo.

E' consigliabile lubrificare la tenuta durante il montaggio per agevolare l'inserimento dello stelo.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## ROD SEAL TYPE RSD

### DESCRIPTION

The **RSD** seal type is very similar to the RSC type, but on the dynamic side it has a multifunctional double lip which:

- mitigates any stick-slip effect thanks to a fluid ring between the secondary lip and the main one;
- blocks any external impurities;
- counters the shrinking of the material at low temperatures;
- works as a stabilizer;

### TECHNICAL DATA

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C with peaks till 110° C
Fluids:	mineral fluids and oils (see TABLE I, pages 12 and 13)

### MATERIAL

The proposed material is a **CO**-type polyurethane with high modulus of elasticity, low compression set, high resistance to abrasion.

The hardness is 93 Sh A  $\pm$  2.

**Compound reference: CO**

### ASSEMBLY

To avoid any damage to the seals during the installation, remove any flash or cutting edges in the housing and on the rod.

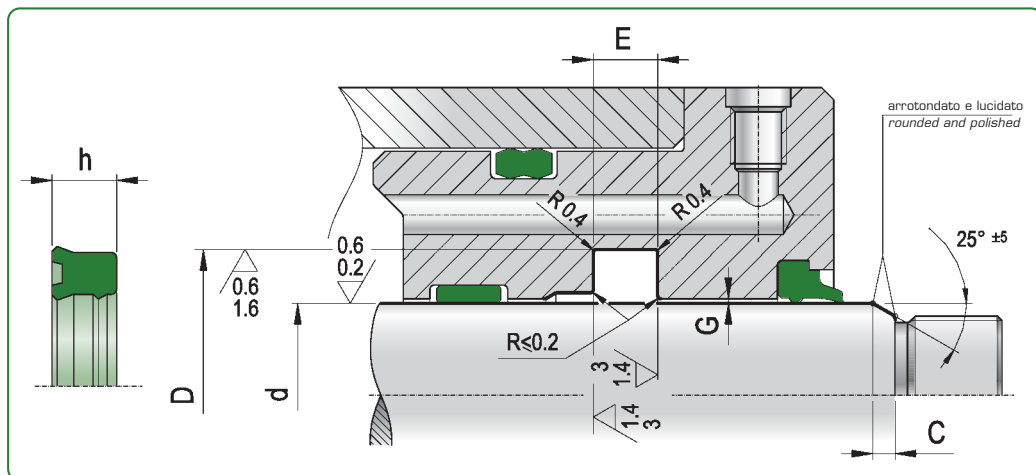
The seal should be lubricated during assembly to ease the insertion of the rod.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

RSD



$d_{H9}$	$D_{H10}$	$h$	$E_{-0,2}$	$C$	ART / ITEM				
* 6,0	14,0	5,8	6,3	3,5	RSD	0060	0140	058	CO
* 8,0	14,0	5,7	6,3	3,5	RSD	0080	0140	057	CO
* 8,0	16,0	5,8	6,3	3,5	RSD	0080	0160	058	CO
* 10,0	18,0	5,8	6,3	3,5	RSD	0100	0180	058	CO
12,0	19,0	5,0	5,6	3,5	RSD	0120	0190	050	CO
* 12,0	20,0	5,8	6,3	4,5	RSD	0120	0200	058	CO
14,0	21,0	5,0	5,6	4,0	RSD	0140	0210	050	CO
14,0	22,0	5,8	6,3	4,5	RSD	0140	0220	058	CO
15,0	23,0	6,0	7,0	4,5	RSD	0150	0230	060	CO
16,0	22,0	5,0	5,6	3,5	RSD	0160	0220	050	CO
* 16,0	24,0	5,8	6,3	4,5	RSD	0160	0240	058	CO
18,0	22,0	4,0	4,5	3,0	RSD	0180	0220	040	CO
18,0	25,0	5,0	5,7	4,0	RSD	0180	0250	050	CO
* 18,0	26,0	5,8	6,3	4,5	RSD	0180	0260	058	CO
18,0	26,0	8,0	9,0	4,5	RSD	0180	0260	080	CO
20,0	26,0	5,2	6,0	3,5	RSD	0200	0260	052	CO
* 20,0	28,0	5,8	6,3	4,5	RSD	0200	0280	058	CO
* 20,0	30,0	7,0	8,0	5,0	RSD	0200	0300	070	CO
22,0	28,0	4,5	5,5	3,5	RSD	0220	0280	045	CO
22,0	28,0	5,8	6,3	3,5	RSD	0220	0280	058	CO
22,0	29,0	5,0	5,6	4,0	RSD	0220	0290	050	CO
* 22,0	30,0	5,8	6,3	4,5	RSD	0220	0300	058	CO
24,0	32,0	5,8	6,3	4,5	RSD	0240	0320	058	CO
25,0	31,0	5,0	5,6	3,5	RSD	0250	0310	050	CO
* 25,0	33,0	5,8	6,3	4,5	RSD	0250	0330	058	CO
25,0	33,0	6,5	7,5	4,5	RSD	0250	0330	065	CO
25,0	33,0	7,0	8,0	4,5	RSD	0250	0330	070	CO
* 25,0	35,0	7,0	8,0	5,0	RSD	0250	0350	070	CO
25,0	35,0	8,0	9,0	5,0	RSD	0250	0350	080	CO
* 28,0	36,0	5,8	6,3	4,5	RSD	0280	0360	058	CO
* 28,0	38,0	5,8	6,3	5,0	RSD	0280	0380	058	CO
* 28,0	38,0	7,0	8,0	5,0	RSD	0280	0380	070	CO
30,0	38,0	5,8	6,3	4,5	RSD	0300	0380	058	CO
30,0	38,0	7,0	8,0	4,5	RSD	0300	0380	070	CO
30,0	40,0	6,5	7,5	5,0	RSD	0300	0400	065	CO
30,0	40,0	10,0	11,0	5,0	RSD	0300	0400	100	CO
32,0	40,0	5,8	6,3	4,5	RSD	0320	0400	058	CO
32,0	40,0	6,0	7,0	4,5	RSD	0320	0400	060	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1

d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>±0,2</sub>	C	ART / ITEM				
* 32,0	40,0	8,0	9,0	4,5	RSD	0320	0400	080	CO
32,0	42,0	7,0	8,0	4,5	RSD	0320	0420	070	CO
32,0	42,0	8,0	9,0	5,0	RSD	0320	0420	080	CO
32,0	42,0	10,0	11,0	5,0	RSD	0320	0420	100	CO
32,0	45,0	8,0	9,0	7,0	RSD	0320	0450	080	CO
35,0	43,0	5,8	6,3	4,5	RSD	0350	0430	058	CO
35,0	43,0	6,0	7,0	4,5	RSD	0350	0430	060	CO
35,0	43,0	8,0	9,0	4,5	RSD	0350	0430	080	CO
35,0	45,0	7,0	8,0	5,0	RSD	0350	0450	070	CO
35,0	45,0	10,0	11,0	5,0	RSD	0350	0450	100	CO
* 36,0	44,0	5,8	6,3	4,5	RSD	0360	0440	058	CO
36,0	44,0	8,0	9,0	4,5	RSD	0360	0440	080	CO
40,0	48,0	5,8	6,3	4,5	RSD	0400	0480	058	CO
40,0	48,0	8,0	9,0	4,5	RSD	0400	0480	080	CO
* 40,0	50,0	7,0	8,0	5,0	RSD	0400	0500	070	CO
40,0	50,0	10,0	11,0	5,0	RSD	0400	0500	100	CO
40,0	55,0	10,0	11,0	6,5	RSD	0400	0550	100	CO
42,0	50,0	6,0	7,0	4,5	RSD	0420	0500	060	CO
42,0	52,0	8,0	9,0	5,0	RSD	0420	0520	080	CO
* 45,0	53,0	5,8	6,3	4,5	RSD	0450	0530	058	CO
45,0	53,0	8,0	9,0	4,5	RSD	0450	0530	080	CO
45,0	53,0	10,0	11,0	4,5	RSD	0450	0530	100	CO
* 45,0	55,0	5,7	6,3	5,0	RSD	0450	0550	057	CO
* 45,0	55,0	7,0	8,0	5,0	RSD	0450	0550	070	CO
45,0	55,0	10,0	11,0	5,0	RSD	0450	0550	100	CO
46,0	54,0	8,0	9,0	4,5	RSD	0460	0540	080	CO
50,0	58,0	8,0	9,0	4,5	RSD	0500	0580	080	CO
* 50,0	60,0	7,0	8,0	5,0	RSD	0500	0600	070	CO
50,0	60,0	9,0	10,0	5,0	RSD	0500	0600	090	CO
50,0	60,0	10,0	11,0	5,0	RSD	0500	0600	100	CO
50,0	65,0	8,0	9,0	6,5	RSD	0500	0650	080	CO
50,0	65,0	10,0	11,0	6,5	RSD	0500	0650	100	CO
55,0	63,0	8,0	9,0	4,5	RSD	0550	0630	080	CO
55,0	65,0	7,0	8,0	5,0	RSD	0550	0650	070	CO
55,0	65,0	10,0	11,0	5,0	RSD	0550	0650	100	CO
56,0	64,0	8,0	9,0	4,5	RSD	0560	0640	080	CO
* 56,0	66,0	6,5	7,5	5,0	RSD	0560	0660	065	CO
56,0	71,0	11,5	12,5	6,5	RSD	0560	0710	115	CO
60,0	68,0	8,0	9,0	4,5	RSD	0600	0680	080	CO
60,0	70,0	7,0	8,0	5,5	RSD	0600	0700	070	CO
60,0	70,0	7,5	8,5	5,5	RSD	0600	0700	075	CO
60,0	70,0	10,0	11,0	5,5	RSD	0600	0700	100	CO
60,0	70,0	12,0	13,0	5,5	RSD	0600	0700	120	CO
60,0	72,0	9,0	10,0	6,0	RSD	0600	0720	090	CO
61,0	69,0	8,0	9,0	4,5	RSD	0610	0690	080	CO
63,0	71,0	8,0	9,0	4,5	RSD	0630	0710	080	CO
65,0	73,0	8,0	9,0	4,5	RSD	0650	0730	080	CO
65,0	75,0	12,0	13,0	5,0	RSD	0650	0750	120	CO
65,0	77,0	9,0	10,0	6,0	RSD	0650	0770	090	CO
68,0	76,0	8,0	9,0	4,5	RSD	0680	0760	080	CO
70,0	78,0	8,0	9,0	4,5	RSD	0700	0780	080	CO
* 70,0	80,0	6,5	7,5	5,5	RSD	0700	0800	065	CO
70,0	80,0	7,0	8,0	5,0	RSD	0700	0800	070	CO
70,0	80,0	12,0	13,0	5,5	RSD	0700	0800	120	CO
70,0	82,0	9,5	10,5	6,0	RSD	0700	0820	095	CO
* 70,0	85,0	11,5	12,5	6,5	RSD	0700	0850	115	CO
75,0	83,0	8,0	9,0	4,5	RSD	0750	0830	080	CO
75,0	85,0	7,0	8,0	5,5	RSD	0750	0850	070	CO
75,0	85,0	12,0	13,0	5,5	RSD	0750	0850	120	CO
76,0	84,0	8,0	9,0	4,5	RSD	0760	0840	080	CO
76,0	86,0	8,0	9,0	5,0	RSD	0760	0860	080	CO
78,0	86,0	8,0	9,0	4,5	RSD	0780	0860	080	CO
80,0	88,0	8,0	9,0	4,5	RSD	0800	0880	080	CO
80,0	90,0	12,0	13,0	5,0	RSD	0800	0900	120	CO
* 80,0	92,0	9,0	10,0	6,0	RSD	0800	0920	090	CO
80,0	95,0	11,5	12,5	6,5	RSD	0800	0950	115	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



d <sub>H9</sub>	D <sub>H10</sub>	h	E <sub>-0,2</sub>	C	ART / ITEM				
85,0	93,0	8,0	9,0	4,5	RSD	0850	0930	080	CO
85,0	95,0	12,0	13,0	5,5	RSD	0850	0950	120	CO
90,0	98,0	8,0	9,0	4,5	RSD	0900	0980	080	CO
* 90,0	100,0	6,5	7,5	5,5	RSD	0900	1000	065	CO
* 90,0	105,0	11,5	12,5	6,5	RSD	0900	1050	115	CO
91,0	99,0	8,0	9,0	4,5	RSD	0910	0990	080	CO
95,0	103,0	8,0	9,0	4,5	RSD	0950	1030	080	CO
100,0	108,0	6,5	7,5	4,5	RSD	1000	1080	065	CO
100,0	108,0	8,0	9,0	4,5	RSD	1000	1080	080	CO
105,0	113,0	8,0	9,0	4,5	RSD	1050	1130	080	CO
107,0	115,0	8,0	9,0	4,5	RSD	1070	1150	080	CO
108,0	116,0	8,0	9,0	4,5	RSD	1080	1160	080	CO
* 110,0	125,0	9,5	10,5	6,5	RSD	1100	1250	095	CO
110,0	125,0	11,0	12,0	6,5	RSD	1100	1250	110	CO
115,0	123,0	8,0	9,0	4,5	RSD	1150	1230	080	CO
115,0	130,0	11,3	12,0	6,5	RSD	1150	1300	113	CO
120,0	128,0	11,5	12,5	4,5	RSD	1200	1280	115	CO
120,0	135,0	15,0	16,0	6,5	RSD	1200	1350	150	CO
125,0	133,0	8,0	9,0	4,5	RSD	1250	1330	080	CO
126,0	134,0	8,0	9,0	4,5	RSD	1260	1340	080	CO
130,0	145,0	15,0	16,0	6,5	RSD	1300	1450	150	CO
135,0	143,0	8,0	9,0	4,5	RSD	1350	1430	080	CO
135,0	150,0	11,5	12,5	6,5	RSD	1350	1500	115	CO
140,0	150,0	11,5	12,5	5,0	RSD	1400	1500	115	CO
145,0	153,0	8,0	9,0	4,5	RSD	1450	1530	080	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



**TENUTA STELO TIPO RSO**

**DESCRIZIONE**

La tenuta tipo **RSO** è stata sviluppata per sostituire o per lavorare in tandem con guarnizioni a gradino in PTFE, avendo le stesse dimensioni di sede.

Presenta al suo interno una gola arrotondata dove può essere alloggiato ed inserito un o-ring che ha la funzione di energizzare i labbri di tenuta dinamico e statico anche in assenza di pressione.

Questo profilo può essere utilizzato anche a bassissima velocità e pressione con risultati eccellenti per il basso attrito sviluppato.

Ha dei ridotti ingombri assiali e quindi lavorazioni di sede semplici.

**DATI TECNICI**

Pressione: < 250 bar a temperatura di 60° C

Velocità: < 0.5 m/s

Temperatura: da - 35° C a + 100° C con punte fino a 110° C

Fluidi: oli a base minerale  
(vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale proposto per la tenuta è il poliuretano tipo **CO** ad alto modulo elastico (standard 93 Sh A), basso compression-set ed elevata resistenza all'abrasione energizzato da un o-ring in NBR 70 (NO).

**Codice materiale: CN (•)**

**MONTAGGIO**

Come per tutte le sedi dove alloggia la guarnizione occorre eliminare le bave e gli spigoli taglienti.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

**ROD SEAL TYPE RSO**

**DESCRIPTION**

The **RSO** seal type has been developed to replace or work jointly with seals with steps in PTFE, given the same dimensions of the grooves.

*Internally it has a round groove where an o-ring can be inserted and housed. It will help energize the static and dynamic sealing lips even with no pressure.*

*This profile can also be used with excellent results at very low speed and pressure, because of the low friction created.*

*The small axial dimensions reduce the turning work.*

**TECHNICAL DATA**

Pressure: < 250 bar at a temperature of 60° C

Speed: < 0.5 m/s

Temperature: from - 35° C to + 100° C, with peaks till 110° C

Fluids: mineral oils (see TABLE I, pages 12-13)

**MATERIAL**

The chosen material is polyurethane 93 Sh A type **CO** which has a high modulus of elasticity, a low compression-set and a high abrasion resistance energized with o-ring in NBR 70 (NO).

**Compound reference: CN (•)**

**ASSEMBLY**

As for all seal housings, remove any flash or cutting edges.

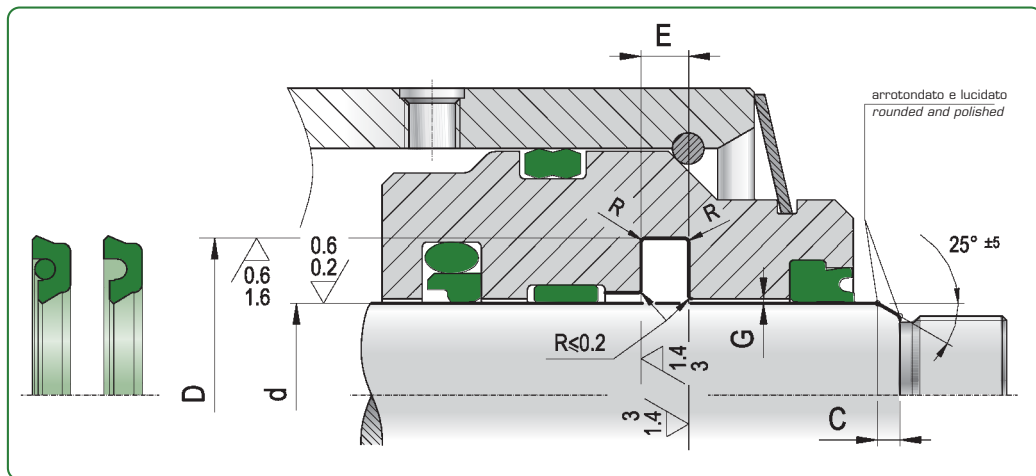
For further information please refer to the installation instructions on page 27.

• = per RSO con sezione 3,75 mm non viene fornito con o-ring - for cross section 3.75mm RSO is supplied without o-ring



disegno / DRAWING

RSO



d <sub>h9</sub>	D <sub>H10</sub>	E <sub>+0,2</sub>	R	C	o-ring	ART / ITEM				
* 12,0*	19,5	3,2	0,5	3,0	-	RSO	0120	0195	032	CO
* 14,0*	21,5	3,2	0,5	3,0	-	RSO	0140	0215	032	CO
* 16,0*	23,5	3,2	0,5	3,0	-	RSO	0160	0235	032	CO
* 18,0*	25,5	3,2	0,5	3,0	-	RSO	0180	0255	032	CO
* 20,0*	27,5	3,2	0,5	3,0	-	RSO	0200	0275	032	CO
* 20,0**	31,0	4,2	0,5	4,0	OR 119	RSO	0200	0310	042	CN
* 22,0*	29,5	3,2	0,5	3,0	-	RSO	0220	0295	032	CO
* 22,0**	33,0	4,2	0,5	4,0	OR 120	RSO	0220	0330	042	CN
* 25,0*	32,5	3,2	0,5	3,0	-	RSO	0250	0325	032	CO
* 25,0**	36,0	4,2	0,5	4,0	OR 122	RSO	0250	0360	042	CN
* 26,5*	34,0	3,2	0,5	3,0	-	RSO	0265	0340	032	CO
* 28,0**	39,0	4,2	0,5	4,0	OR 124	RSO	0280	0390	042	CN
* 32,0**	43,0	4,2	0,5	4,0	OR 127	RSO	0320	0430	042	CN
* 36,0**	47,0	4,2	0,5	4,0	OR 129	RSO	0360	0470	042	CN
* 40,0**	51,0	4,2	0,5	4,0	OR 132	RSO	0400	0510	042	CN
* 40,0	55,5	6,3	0,9	5,0	OR 224	RSO	0400	0555	063	CN
* 45,0	56,0	4,2	0,5	4,0	OR 135	RSO	0450	0560	042	CN
45,0	60,5	6,3	0,9	5,0	OR 226	RSO	0450	0605	063	CN
* 50,0	61,0	4,2	0,5	4,0	OR 138	RSO	0500	0610	042	CN
50,0	65,5	6,3	0,9	5,0	OR 227	RSO	0500	0655	063	CN
55,0	66,0	4,2	0,5	4,0	OR 141	RSO	0550	0660	042	CN
55,0	70,5	6,3	0,5	4,0	OR 229	RSO	0550	0705	063	CN
* 56,0	67,0	4,2	0,5	4,0	OR 142	RSO	0560	0670	042	CN
* 56,0	71,5	6,3	0,9	5,0	OR 229	RSO	0560	0715	063	CN
* 63,0	74,0	4,2	0,5	4,0	OR 146	RSO	0630	0740	042	CN
* 63,0	78,5	6,3	0,9	5,0	OR 231	RSO	0630	0785	063	CN
65,0	80,5	6,3	0,9	5,0	OR 232	RSO	0650	0805	063	CN
* 70,0	85,5	6,3	0,9	5,0	OR 234	RSO	0700	0855	063	CN
75,0	86,0	4,2	0,5	4,0	OR 152	RSO	0750	0860	042	CN
75,0	90,5	6,3	0,9	5,0	OR 236	RSO	0750	0905	063	CN
* 80,0	95,5	6,3	0,9	5,0	OR 237	RSO	0800	0955	063	CN
* 90,0	105,5	6,3	0,9	5,0	OR 240	RSO	0900	1055	063	CN
95,0	110,5	6,3	0,9	5,0	OR 242	RSO	0950	1105	063	CN
* 100,0	115,5	6,3	0,9	5,0	OR 243	RSO	1000	1155	063	CN
105,0	120,5	6,3	0,9	5,0	OR 245	RSO	1050	1205	063	CN
110,0	125,5	6,3	0,9	5,0	OR 246	RSO	1100	1255	063	CN

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1

- = per RSO con sezione 3,75 mm non viene fornito con o-ring - for cross section 3.75mm RSO is supplied without o-ring
- = si consiglia la sede aperta per facilitare montaggio - open groove housing is recommended to facilitate installation



d <sub>H9</sub>	D <sub>H10</sub>	E <sub>+0,2</sub>	R	C	o-ring	ART / ITEM				
115,0	130,5	6,3	0,9	5,0	OR 248	RSD	1150	1305	063	CN
120,0	135,5	6,3	0,9	5,0	OR 250	RSD	1200	1355	063	CN
130,0	145,5	6,3	0,9	5,0	OR 253	RSD	1300	1455	063	CN
135,0	150,5	6,3	0,9	5,0	OR 255	RSD	1350	1505	063	CN
* 140,0	155,5	6,3	0,9	5,0	OR 256	RSD	1400	1555	063	CN
145,0	160,5	6,3	0,9	5,0	OR 258	RSD	1450	1605	063	CN
150,0	165,5	6,3	0,9	5,0	OR 259	RSD	1500	1655	063	CN
* 160,0	175,5	6,3	0,9	5,0	OR 260	RSD	1600	1755	063	CN
* 160,0	181,0	8,1	0,9	7,0	OR 363	RSD	1600	1810	081	CN
* 180,0	195,5	6,3	0,9	5,0	OR 263	RSD	1800	1955	063	CN
190,0	205,5	6,3	0,9	5,0	OR 265	RSD	1900	2055	063	CN
200,0	215,5	6,3	0,9	5,0	OR 267	RSD	2000	2155	063	CN
* 200,0	221,0	8,1	0,9	7,0	OR 370	RSD	2000	2210	081	CN

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

- = per RSD con sezione 3,75 mm non viene fornito con o-ring – for cross section 3.75mm RSD is supplied without o-ring
- = si consiglia la sede aperta per facilitare montaggio – open groove housing is recommended to facilitate installation

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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**BUFFER RING TIPO RBR**

**DESCRIZIONE**

L'anello **RBR**, avente funzione di buffer ring, è stato appositamente progettato come guarnizione primaria per lavorare esclusivamente in tandem con tenute a labbri asimmetrici (vedi RSA, pag 30).

La sua funzione è quella di permettere alla tenuta secondaria di lavorare comunque in pressione. Non effettuando una tenuta assoluta tra le due guarnizioni si crea una camera d'olio con pressione crescente che, grazie al particolare profilo dell'anello RBR, raggiunto un certo valore, viene "liberata" all'interno del cilindro. Il tutto funziona come una valvola di massima. Inoltre svolge il compito di contrastare i picchi di pressione.

**DATI TECNICI**

Pressione:	< 400 bar a temperature di 60° C
Velocità:	< 0.8 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	oli minerali HL e HLP (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale proposto è il poliuretano tipo **CO** a 93 Sh A con buona resistenza all'abrasione, ottimo compression-set, elevato modulo elastico necessario per la tenuta. Per l'anello antiestrusione viene proposta una resina poliacetaleica (**RO**) con elevata resistenza al carico di rottura.

**Codice materiale: CR**

**MONTAGGIO**

Il montaggio avviene in cava chiusa. E' pertanto necessario montare prima la guarnizione in poliuretano poi l'anello antiestrusione.

**BUFFER RING TYPE RBR**

**DESCRIPTION**

The **RBR** ring, working as buffer ring, has been specially designed to work as the main seal in conjunction with asymmetrical lip seals (see RSA, page 30).

Its function is to maintain working pressure for the second seal. It does not provide full sealing effect so an oil space will thus form between the two seals. Thanks to the special profile of the RBR ring, the growing pressure in the space will be released into the cylinder once a certain value is attained. It works as a valve. It is also designed to compensate for pressure peaks.

**TECHNICAL DATA**

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0.8 m/s
Temperature:	from - 35° C to + 100° C with peaks till 110° C
Fluids:	HL and HLP mineral oil (see TABLE I, pages 12-13)

**MATERIAL**

The material we propose is a **CO**-type polyurethane at 93 Sh A, with good resistance to abrasion, excellent compression-set and high modulus of elasticity, a fundamental feature of a seal.

For the anti-extrusion ring we propose a polyacetaleic resin (**RO**) with high tensile strength.

**Compound reference: CR**

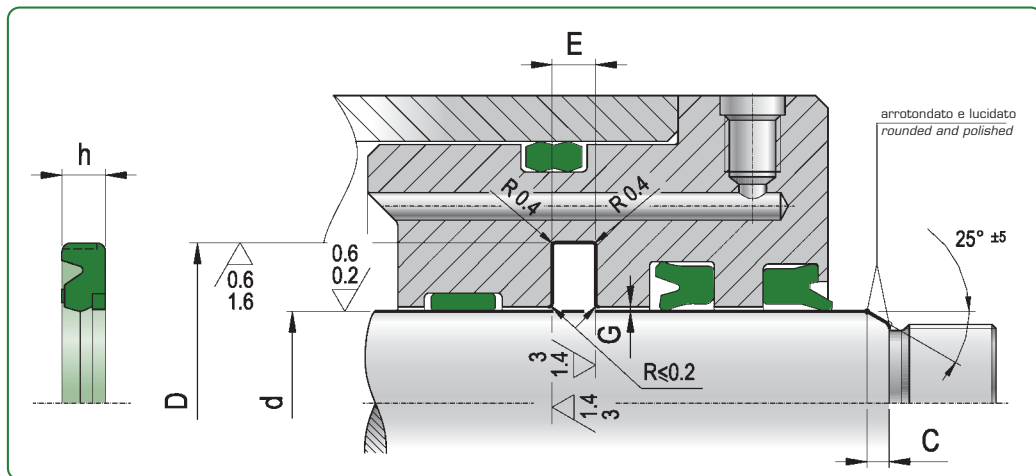
**ASSEMBLY**

The assembly is done in closed groove. The polyurethane seal must therefore be fitted before the anti-extrusion ring.



disegno / DRAWING

RBR

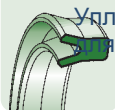


$d_{H9}$	$D_{H10}$	$h$	$E_{+0,2}$	$C$	ART / ITEM				
45,0	60,1	5,9	6,3	5,5	RBR	0450	0601	059	CR
50,0	65,1	5,9	6,3	5,5	RBR	0500	0651	059	CR
56,0	71,1	5,9	6,3	5,5	RBR	0560	0711	059	CR
60,0	75,1	5,9	6,3	5,5	RBR	0600	0751	059	CR
63,0	78,1	5,9	6,3	5,5	RBR	0630	0781	059	CR
70,0	85,1	5,9	6,3	6,0	RBR	0700	0851	059	CR
80,0	95,1	5,9	6,3	6,0	RBR	0800	0951	059	CR
85,0	100,1	5,9	6,3	6,0	RBR	0850	1001	059	CR
90,0	105,1	5,9	6,3	6,0	RBR	0900	1051	059	CR
100,0	115,1	5,9	6,3	6,0	RBR	1000	1151	059	CR
125,0	140,1	5,9	6,3	6,0	RBR	1250	1401	059	CR
150,0	165,1	5,9	6,3	6,0	RBR	1500	1651	059	CR
170,0	185,1	5,9	6,3	6,0	RBR	1700	1851	059	CR
180,0	195,1	5,9	6,3	6,0	RBR	1800	1951	059	CR
200,0	220,5	7,6	8,1	7,5	RBR	2000	2205	076	CR

CR = CQ (TPU 93 shore A) + RQ (POM)

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



**TENUTA STELO / PISTONE tipo RPS**

**DESCRIZIONE**

La guarnizione tipo **RPS** permette, grazie al suo profilo, due differenti montaggi ed applicazioni.

Avendo due labbri simmetrici può essere utilizzata sia per tenuta su stelo che per tenuta su pistone e per cilindri che lavorano a semplice o a doppio effetto.

Il profilo a labbri uguali e la profondità della gola garantiscono una ridotta frizione e un movimento lineare anche a bassa pressione.

**DATI TECNICI**

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0,5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	oli idraulici minerali (vedi TABELLA I, pagg. 12-13)

**MATERIALI**

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set e buona resistenza all'abrasione.

Ha una durezza di 93 Sh A ± 2.

**Codice materiale: CO**

**MONTAGGIO**

Il montaggio è facilitato dall'alto modulo elastico del poliuretano.

E' consigliato ingrassare la guarnizione prima del montaggio, e togliere spigoli e bave che danneggerebbero la tenuta.

**ROD/PISTON SEAL type RPS**

**DESCRIPTION**

The **RPS** seal type combines in one solution two different installations and uses.

With two symmetrical lips, it can be used for both rod and piston sealing applications and for cylinders working with simple or double effect.

The profile with equal lips and the deep groove ensure low friction and a linear movement even at low pressure.

**TECHNICAL DATA**

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0,5 m/s
Temperature:	from - 35° C to + 100° C, with peaks till + 110° C
Fluids:	mineral hydraulic oils (see TABLE I, pages 12-13)

**MATERIAL**

The material proposed is polyurethane **CO**-type with a high modulus of elasticity, low compression set and good abrasion resistance.

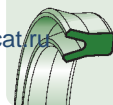
Its hardness is of 93 Sh A ± 2.

**Compound reference: CO**

**ASSEMBLY**

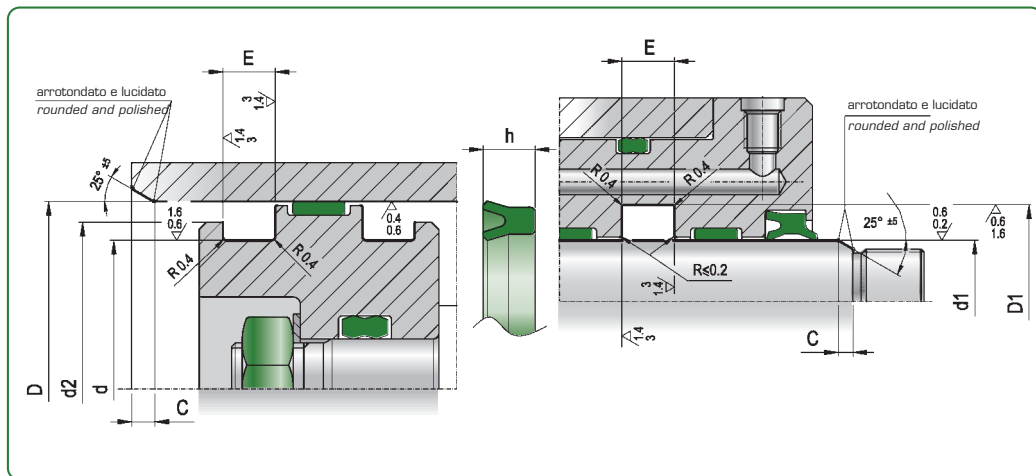
The installation is eased by the high modulus of elasticity of the polyurethane.

It is suggested to lubricate the seals before installation and to eliminate any edges or flash which would damage the seal.



disegno / DRAWING

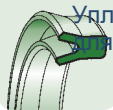
RPS



$d_{h11}$ $d_{1h9}$	$D_{H9}$ $D_{1H10}$	h	$E_{+0,2}$	$d_2^{**}$	C	ART / ITEM				
4,0	8,0	3,5	4,0	6,0	2,0	RPS	0040	0080	035	CO
4,0	10,0	4,0	4,5	7,0	3,0	RPS	0040	0100	040	CO
5,0	12,0	4,5	5,0	8,5	3,0	RPS	0050	0120	045	CO
5,0	12,0	5,0	5,5	8,5	3,0	RPS	0050	0120	050	CO
6,0	12,0	4,5	5,0	9,0	3,0	RPS	0060	0120	045	CO
6,0	12,0	5,5	6,0	9,0	3,0	RPS	0060	0120	055	CO
6,0	12,0	6,0	7,0	9,0	3,0	RPS	0060	0120	060	CO
7,0	14,0	3,5	4,0	10,5	4,0	RPS	0070	0140	035	CO
8,0	12,0	5,0	5,5	10,0	2,0	RPS	0080	0120	050	CO
8,0	14,0	5,5	6,0	11,0	3,0	RPS	0080	0140	055	CO
8,0	14,0	6,0	7,0	11,0	3,0	RPS	0080	0140	060	CO
8,0	15,0	5,7	6,3	11,0	4,0	RPS	0080	0150	057	CO
* 8,0	16,0	5,5	6,0	12,0	4,0	RPS	0080	0160	055	CO
8,0	16,0	5,7	6,3	12,0	3,5	RPS	0080	0160	057	CO
8,0	16,0	7,0	8,0	12,0	3,5	RPS	0080	0160	070	CO
9,0	19,0	6,0	7,0	14,0	4,0	RPS	0090	0190	060	CO
10,0	16,0	6,0	6,5	13,0	3,0	RPS	0100	0160	060	CO
10,0	18,0	5,5	6,0	14,0	3,5	RPS	0100	0180	055	CO
* 10,0	18,0	5,7	6,3	14,0	3,5	RPS	0100	0180	057	CO
10,0	18,0	6,0	7,0	14,0	3,5	RPS	0100	0180	060	CO
10,0	18,0	8,0	9,0	14,0	3,5	RPS	0100	0180	080	CO
* 10,0	19,0	3,2	3,5	14,5	4,0	RPS	0100	0190	032	CO
10,0	20,0	7,0	8,0	15,0	4,0	RPS	0100	0200	070	CO
10,0	20,0	8,0	9,0	15,0	4,0	RPS	0100	0200	080	CO
12,0	18,0	5,0	5,5	15,0	3,0	RPS	0120	0180	050	CO
12,0	18,0	6,0	7,0	15,0	3,0	RPS	0120	0180	060	CO
12,0	20,0	4,0	4,5	16,0	4,5	RPS	0120	0200	040	CO
12,0	20,0	7,0	8,0	16,0	3,5	RPS	0120	0200	070	CO
12,0	20,0	8,0	9,0	16,0	3,5	RPS	0120	0200	080	CO
12,0	22,0	5,0	6,0	17,0	4,0	RPS	0120	0220	050	CO
* 12,0	22,0	7,0	8,0	17,0	4,0	RPS	0120	0220	070	CO
12,0	22,0	8,0	9,0	17,0	4,0	RPS	0120	0220	080	CO
12,0	25,0	10,0	11,0	18,5	5,0	RPS	0120	0250	100	CO
* 14,0	20,0	4,8	5,3	17,0	3,0	RPS	0140	0200	048	CO
* 14,0	22,0	4,0	4,5	18,0	3,5	RPS	0140	0220	040	CO
* 14,0	22,0	6,0	7,0	18,0	3,5	RPS	0140	0220	060	CO
14,0	22,0	8,0	9,0	18,0	3,5	RPS	0140	0220	080	CO
14,0	22,0	11,0	12,0	18,0	3,5	RPS	0140	0220	110	CO
* 14,0	24,0	7,0	8,0	19,0	4,0	RPS	0140	0240	070	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

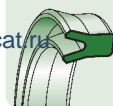
\*\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio – hook diameter wich could be modified accordingly to mounting demand



d <sub>h11</sub> d <sub>1H9</sub>	D <sub>H9</sub> D <sub>1H10</sub>	h	E <sub>+0,2</sub>	d <sub>2</sub> <sup>**</sup>	C	ART / ITEM				
14,0	24,0	8,0	9,0	19,0	4,0	RPS	0140	0240	080	CO
15,0	25,0	8,0	9,0	20,0	4,0	RPS	0150	0250	080	CO
15,0	25,0	10,0	11,0	20,0	4,0	RPS	0150	0250	100	CO
16,0	22,0	4,0	4,5	19,0	3,0	RPS	0160	0220	040	CO
16,0	22,0	5,0	5,5	19,0	3,0	RPS	0160	0220	050	CO
16,0	24,0	5,0	6,0	20,0	3,5	RPS	0160	0240	050	CO
* 16,0	24,0	5,7	6,3	20,0	3,5	RPS	0160	0240	057	CO
16,0	24,0	7,0	8,0	20,0	3,5	RPS	0160	0240	070	CO
16,0	26,0	5,0	6,0	21,0	4,0	RPS	0160	0260	050	CO
16,0	26,0	8,0	9,0	21,0	4,0	RPS	0160	0260	080	CO
16,0	28,0	6,0	7,0	22,0	5,0	RPS	0160	0280	060	CO
17,0	25,0	10,0	11,0	21,0	3,0	RPS	0170	0250	100	CO
* 18,0	25,0	5,0	5,5	21,5	3,5	RPS	0180	0250	050	CO
18,0	26,0	6,5	7,5	22,0	3,5	RPS	0180	0260	065	CO
18,0	28,0	6,0	7,0	23,0	4,0	RPS	0180	0280	060	CO
18,0	28,0	8,0	9,0	23,0	4,0	RPS	0180	0280	080	CO
18,0	30,0	8,0	9,0	24,0	5,0	RPS	0180	0300	080	CO
19,0	25,0	6,0	7,0	22,0	3,0	RPS	0190	0250	060	CO
* 20,0	28,0	4,0	5,0	24,0	3,5	RPS	0200	0280	040	CO
20,0	28,0	4,5	5,0	24,0	3,5	RPS	0200	0280	045	CO
* 20,0	30,0	8,0	9,0	25,0	4,0	RPS	0200	0300	080	CO
20,0	30,0	10,0	11,0	25,0	4,0	RPS	0200	0300	100	CO
20,0	32,0	7,5	8,5	26,0	5,0	RPS	0200	0320	075	CO
20,0	35,0	12,0	13,0	27,5	5,0	RPS	0200	0350	120	CO
20,0	40,0	10,0	11,0	30,0	7,0	RPS	0200	0400	100	CO
20,0	40,0	12,0	13,0	30,0	7,0	RPS	0200	0400	120	CO
22,0	28,0	8,0	9,0	25,0	3,0	RPS	0220	0280	080	CO
* 22,0	30,0	6,0	7,0	26,0	3,5	RPS	0220	0300	060	CO
22,0	30,0	10,0	11,0	26,0	3,5	RPS	0220	0300	100	CO
* 22,0	32,0	8,0	9,0	27,0	4,0	RPS	0220	0320	080	CO
22,0	32,0	10,0	11,0	27,0	4,0	RPS	0220	0320	100	CO
22,0	35,0	10,0	11,0	28,5	5,0	RPS	0220	0350	100	CO
22,0	40,0	10,0	11,0	31,0	6,0	RPS	0220	0400	100	CO
24,0	32,0	7,0	8,0	28,0	3,5	RPS	0240	0320	070	CO
25,0	35,0	5,0	5,5	30,0	4,0	RPS	0250	0350	050	CO
* 25,0	35,0	8,0	9,0	30,0	4,0	RPS	0250	0350	080	CO
25,0	35,0	10,0	11,0	30,0	4,0	RPS	0250	0350	100	CO
25,0	38,0	10,0	11,0	31,5	5,0	RPS	0250	0380	100	CO
25,0	40,0	10,0	11,0	32,5	5,0	RPS	0250	0400	100	CO
28,0	35,0	5,0	5,5	31,5	3,0	RPS	0280	0350	050	CO
* 28,0	36,0	5,7	6,3	33,0	4,0	RPS	0280	0360	057	CO
28,0	36,0	6,5	7,5	32,0	3,5	RPS	0280	0360	065	CO
28,0	38,0	5,7	6,3	33,0	4,0	RPS	0280	0380	057	CO
28,0	38,0	8,0	9,0	33,0	4,0	RPS	0280	0380	080	CO
28,0	40,0	10,0	11,0	34,0	5,0	RPS	0280	0400	100	CO
30,0	38,0	6,0	6,5	34,0	4,0	RPS	0300	0380	060	CO
30,0	40,0	5,0	5,5	35,0	5,0	RPS	0300	0400	050	CO
* 30,0	40,0	7,0	8,0	35,0	5,0	RPS	0300	0400	070	CO
30,0	40,0	10,0	11,0	35,0	5,0	RPS	0300	0400	100	CO
30,0	42,0	9,0	10,0	36,0	5,5	RPS	0300	0420	090	CO
30,0	42,0	10,0	11,0	36,0	5,5	RPS	0300	0420	100	CO
30,0	45,0	10,0	11,0	37,5	6,0	RPS	0300	0450	100	CO
30,0	50,0	10,0	11,0	40,0	7,0	RPS	0300	0500	100	CO
30,0	50,0	12,0	13,0	40,0	7,0	RPS	0300	0500	120	CO
* 32,0	40,0	5,5	6,0	36,0	4,0	RPS	0320	0400	055	CO
32,0	40,0	5,7	6,3	36,0	4,0	RPS	0320	0400	057	CO
32,0	40,0	8,0	9,0	36,0	4,0	RPS	0320	0400	080	CO
* 32,0	42,0	7,0	8,0	37,0	5,0	RPS	0320	0420	070	CO
32,0	42,0	10,0	11,0	37,0	5,0	RPS	0320	0420	100	CO
32,0	45,0	10,0	11,0	38,5	5,5	RPS	0320	0450	100	CO
32,0	50,0	12,0	13,0	41,0	6,5	RPS	0320	0500	120	CO
35,0	45,0	8,0	9,0	40,0	5,0	RPS	0350	0450	080	CO
35,0	45,0	10,0	11,0	40,0	5,0	RPS	0350	0450	100	CO
35,0	48,0	10,0	11,0	41,5	5,5	RPS	0350	0480	100	CO
35,0	50,0	10,0	11,0	42,5	6,0	RPS	0350	0500	100	CO
35,0	55,0	10,0	11,0	45,0	7,0	RPS	0350	0550	100	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

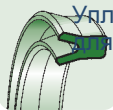
\*\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio – hook diameter wich could be modified accordingly to mounting demand



$d_{h11}$ $d_{1H9}$	$D_{H9}$ $D_{1H10}$	$h$	$E_{+0,2}$	$d_2^{**}$	$C$	ART / ITEM				
* 36,0 38,0 38,0	46,0 45,0 50,0	7,0 5,0 9,0	8,0 5,5 10,0	41,0 41,5 44,0	5,0 3,5 5,5	RPS RPS RPS	0360 0380 0380	0460 0450 0500	070 050 090	CO CO CO
* 38,0 40,0 40,0	55,0 50,0 50,0	10,0 6,0 6,5	11,0 7,0 7,5	46,5 45,0 45,0	6,5 5,0 5,0	RPS RPS RPS	0380 0400 0400	0550 0500 0500	100 060 065	CO CO CO
40,0 40,0 40,0	50,0 50,0 50,0	7,0 8,0 10,0	8,0 9,0 11,0	45,0 45,0 45,0	5,0 5,0 5,0	RPS RPS RPS	0400 0400 0400	0500 0500 0500	070 080 100	CO CO CO
40,0 40,0 40,0	55,0 56,0 60,0	10,0 10,0 10,0	11,0 11,0 11,0	47,5 48,0 50,0	6,0 6,0 7,0	RPS RPS RPS	0400 0400 0400	0550 0560 0600	100 100 100	CO CO CO
40,0 42,0 45,0	60,0 52,0 55,0	13,0 9,0 6,5	14,0 10,0 7,5	50,0 47,0 50,0	7,0 5,0 5,0	RPS RPS RSP	0400 0420 0450	0600 0520 0550	130 090 065	CO CO CO
45,0 45,0 45,0	55,0 60,0 63,0	10,0 10,0 10,0	11,0 11,0 11,0	50,0 52,5 54,0	5,0 6,0 6,5	RPS RPS RPS	0450 0450 0450	0550 0600 0630	100 100 100	CO CO CO
45,0 45,0 48,0	65,0 65,0 58,0	10,0 12,0 10,0	11,0 13,0 11,0	55,0 55,0 53,0	7,0 7,0 5,0	RPS RPS RPS	0450 0450 0480	0650 0650 0580	100 120 100	CO CO CO
50,0 50,0 50,0	60,0 60,0 63,0	10,0 11,0 6,0	11,0 12,0 7,0	55,0 55,0 56,5	5,0 5,0 5,5	RPS RPS RPS	0500 0500 0500	0600 0600 0630	100 110 060	CO CO CO
50,0 50,0 50,0	65,0 70,0 70,0	10,0 10,0 12,0	11,0 11,0 13,0	57,5 60,0 60,0	6,0 7,0 7,0	RPS RPS RPS	0500 0500 0500	0650 0700 0700	100 100 120	CO CO CO
* 53,0 55,0 55,0	63,0 65,0 65,0	6,5 10,0 12,0	7,5 11,0 13,0	58,0 60,0 60,0	5,0 5,0 5,0	RPS RPS RPS	0530 0550 0550	0630 0650 0650	065 100 120	CO CO CO
55,0 55,0 56,0	70,0 75,0 66,0	12,0 12,0 10,0	13,0 13,0 11,0	62,5 65,0 61,0	6,0 7,0 5,0	RPS RPS RPS	0550 0550 0560	0700 0750 0660	120 120 100	CO CO CO
56,0 60,0 60,0	71,0 70,0 70,0	10,0 8,0 10,0	11,0 9,0 11,0	63,5 65,0 65,0	6,0 5,0 5,0	RPS RPS RPS	0560 0600 0600	0710 9,00 0700	100 080 100	CO CO CO
60,0 60,0 60,0	70,0 75,0 75,0	12,0 10,0 12,0	13,0 11,0 13,0	65,0 67,5 67,5	5,0 6,0 6,0	RPS RPS RPS	0600 0600 0600	0700 0750 0750	120 100 120	CO CO CO
* 60,0 60,0 63,0	80,0 80,0 75,0	10,0 12,0 10,0	11,0 13,0 11,0	70,0 70,0 69,0	7,0 7,0 5,5	RPS RPS RPS	0600 0600 0630	0800 0800 0750	100 120 100	CO CO CO
63,0 63,0 65,0	78,0 80,0 75,0	10,0 10,0 12,0	11,0 11,0 13,0	70,5 71,5 70,0	6,0 6,5 5,0	RPS RPS RPS	0630 0630 0650	0780 0800 0750	100 100 120	CO CO CO
* 65,0 * 65,0	80,0 80,0	10,0 11,0 12,0	11,0 12,0 13,0	72,5 72,5 72,5	6,0 6,0 6,0	RPS RPS RPS	0650 0650 0650	0800 0800 0800	100 110 120	CO CO CO
65,0 65,0 66,0	85,0 85,0 76,0	10,0 12,0 8,0	11,0 13,0 9,0	75,0 75,0 71,0	7,0 7,0 5,0	RPS RPS RPS	0650 0650 0660	0850 0850 0760	100 120 080	CO CO CO
* 67,0 70,0 70,0	77,0 80,0 80,0	12,0 7,0 8,0	13,0 8,0 9,0	72,0 75,0 75,0	5,0 5,0 5,0	RPS RPS RPS	0670 0700 0700	0770 0800 0800	120 070 080	CO CO CO
70,0 70,0 70,0	80,0 80,0 85,0	10,0 12,0 10,0	11,0 13,0 11,0	75,0 75,0 77,5	5,0 5,0 6,0	RPS RPS RPS	0700 0700 0700	0800 0800 0850	100 120 100	CO CO CO
* 70,0 70,0 70,0	85,0 90,0 90,0	12,0 10,0 12,0	13,0 11,0 13,0	77,5 80,0 80,0	6,0 7,0 7,0	RPS RPS RPS	0700 0700 0700	0850 0900 0900	120 100 120	CO CO CO
75,0 75,0 75,0	85,0 85,0 90,0	10,0 12,0 10,0	11,0 13,0 11,0	80,0 80,0 82,5	5,0 5,0 6,0	RPS RPS RPS	0750 0750 0750	0850 0850 0900	100 120 100	CO CO CO
75,0 75,0 75,0	90,0 95,0 95,0	12,0 12,0 13,5	13,0 13,0 14,5	82,5 85,0 85,0	6,0 7,0 7,0	RPS RPS RPS	0750 0750 0750	0900 0950 0950	120 120 135	CO CO CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1

\*\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio - hook diameter wich could be modified accordingly to mounting demand



$d_{h11}$ $d_{1h9}$	$D_{H9}$ $D_{1H10}$	$h$	$E_{+0,2}$	$d_2^{**}$	$C$	ART / ITEM				
80,0	90,0	7,0	8,0	85,0	5,0	RPS	0800	0900	070	CO
80,0	90,0	10,0	11,0	85,0	5,0	RPS	0800	0900	100	CO
80,0	90,0	12,0	13,0	85,0	5,0	RPS	0800	0900	120	CO
* 80,0	95,0	12,0	13,0	87,5	6,0	RPS	0800	0950	120	CO
80,0	100,0	10,0	11,0	90,0	7,0	RPS	0800	1000	100	CO
* 80,0	100,0	12,0	13,0	90,0	7,0	RPS	0800	1000	120	CO
85,0	95,0	8,5	9,5	90,0	5,0	RPS	0850	0950	085	CO
85,0	95,0	12,0	13,0	90,0	5,0	RPS	0850	0950	120	CO
* 85,0	100,0	9,0	10,0	92,5	6,0	RPS	0850	1000	090	CO
* 85,0	100,0	12,0	13,0	92,5	6,0	RPS	0850	1000	120	CO
85,0	105,0	12,0	13,0	95,0	7,0	RPS	0850	1050	120	CO
* 90,0	100,0	7,0	8,0	95,0	5,0	RPS	0900	1000	070	CO
90,0	100,0	8,0	9,0	95,0	5,0	RPS	0900	1000	080	CO
90,0	100,0	10,5	11,5	95,0	5,0	RPS	0900	1000	105	CO
90,0	100,0	12,0	13,0	95,0	5,0	RPS	0900	1000	120	CO
* 90,0	105,0	12,0	13,0	97,5	6,0	RPS	0900	1050	120	CO
90,0	110,0	12,0	13,0	100,0	7,0	RPS	0900	1100	120	CO
90,0	110,0	18,0	19,0	100,0	7,0	RPS	0900	1100	180	CO
95,0	105,0	12,0	13,0	100,0	5,0	RPS	0950	1050	120	CO
95,0	110,0	12,0	13,0	102,5	6,0	RPS	0950	1100	120	CO
95,0	110,0	12,5	13,5	102,5	6,0	RPS	0950	1100	125	CO
95,0	110,0	15,0	16,0	102,5	6,0	RPS	0950	1100	150	CO
95,0	112,0	11,0	12,0	103,5	6,5	RPS	0950	1120	110	CO
95,0	115,0	12,0	13,0	105,0	7,0	RPS	0950	1150	120	CO
95,0	115,0	18,0	19,0	105,0	7,0	RPS	0950	1150	180	CO
100,0	115,0	12,0	13,0	107,5	6,0	RPS	1000	1150	120	CO
* 100,0	120,0	12,0	13,0	110,0	7,0	RPS	1000	1200	120	CO
* 100,0	125,0	15,0	16,0	112,5	8,0	RPS	1000	1250	150	CO
* 105,0	125,0	12,0	13,0	115,0	7,0	RPS	1050	1250	120	CO
* 105,0	125,0	15,0	16,0	115,0	7,0	RPS	1050	1250	150	CO
* 110,0	130,0	15,0	16,0	120,0	7,0	RPS	1100	1300	150	CO
125,0	140,0	15,0	16,0	132,5	6,0	RPS	1250	1400	150	CO
170,0	190,0	15,0	16,0	180,0	7,0	RPS	1700	1900	150	CO
200,0	220,0	12,0	13,0	210,0	7,0	RPS	2000	2200	120	CO

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

\*\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio – hook diameter which could be modified accordingly to mounting demand

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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SISTEMI DI TENUTA PER OLEODINAMICA  
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## GUARNIZIONI PISTONE

Le **guarnizioni per pistone**, allo stesso modo di quelle per stelo, devono essere realizzate con rigorosi criteri tecnici, atti ad eliminare effetti indesiderati che si possono così riassumere:

- perdita di pressione causata da perdite del fluido;
- attrito eccessivo;
- usura precoce della tenuta.

Esse debbono perciò possedere caratteristiche particolari quali:

- alto modulo elastico;
- elevata resistenza all'abrasione;
- basso coefficiente di attrito;
- buona resistenza ai fluidi in generale.

Non meno importante è l'aspetto economico che deve prevedere:

- sezioni radiali minime;
- sedi semplici e di facile accesso per semplificare la costruzione ed il montaggio.

In termini funzionali si possono distinguere in guarnizioni per semplice o doppio effetto, classificazione questa che influenza la forma costruttiva ed il relativo profilo.

Negli schemi di montaggio che seguono, alcuni esempi di tenute per pistone.

## PISTON SEALS

**Piston seals**, like rod seals, should be manufactured in compliance with strict technical requirements in order to avoid the following unwanted effects:

- loss of pressure due to leaks;
- excessive friction;
- premature seal wear.

They should have specific features:

- high modulus of elasticity;
- high resistance to abrasion;
- low friction factor;
- good resistance to fluids in general.

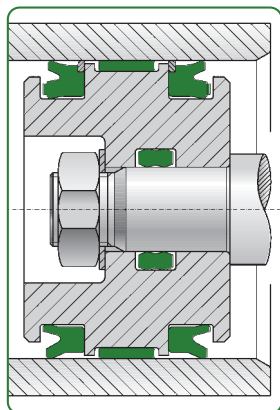
Since the financial side is just as important, the design should also take the following factors into account:

- limited radius;
- simple and accessible grooves, in order to facilitate manufacture and assembly.

From an operational point of view, we can distinguish between simple effect and double effect seals. This classification influences the profile shape of the seal.

Some examples of piston seals can be found in the following assembly diagrams.

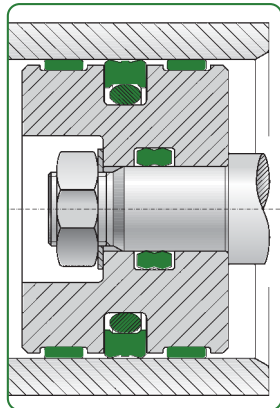
fig. 4



Due guarnizioni contrapposte tipo **PAE** con anello antiestrusione con interposto un anello di guida tipo **HES**. Entrambi i tipi di tenuta sono costruiti con tacche di sfogo sul dorso, dal lato esterno, necessarie affinché non si crei una pressione residua tra le due guarnizioni, di valore crescente che nel medio/lungo termine potrebbe espellerne una dalla sede.

*Two opposing **PAE**-type seals with anti-extrusion ring and an **HES** wear ring in between. Both seal types have blow holes on the external reverse side to prevent residual pressure from forming between the two seals. Pressure would keep rising and in the mid to long-term could cause seal extrusion.*

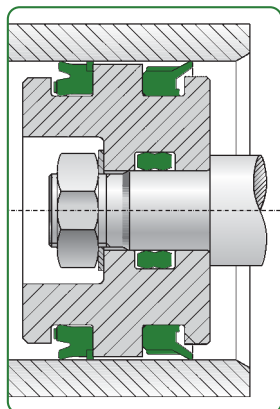
fig. 5



Montaggio semplice, ma molto efficace di una guarnizione tipo **PSO** con anello di tenuta in poliuretano in accoppiamento a due anelli di guida tipo **HES**. E' consigliato anche in presenza di pressioni molto basse.

*Easy but effective assembly of a **PSO** seal type, with polyurethane sealing ring coupled by two **HES** wear rings. It is recommended even for very low pressure conditions.*

fig. 6



Impiego di guarnizione tipo **PAE** provvista di anello antiestrusione ed anello raschiatore tipo **WEL**. Quest'ultimo è consigliato in tutti i cilindri a semplice effetto ove è facile che sul lato asciutto della canna si formi condensa o si depositino particelle metalliche di lavorazione entrambi agenti di deterioramento della tenuta.

*Use of **PAE** seals with antiextrusion ring and **WEL** type wiper ring. This last one is suggested for all simple effect cylinders where condensation can form or tooling metal particles can accumulate on the dry side of the tube, thus damaging the seal.*



## TENUTA PISTONE TIPO PSA

### DESCRIZIONE

La guarnizione tipo **PSA** è stata realizzata per impieghi su pistone e può essere utilizzata sia per il semplice che per il doppio effetto.

Ha labbri asimmetrici che assicurano sempre il contatto con la camicia anche con dei disallineamenti elevati. Il montaggio avviene in cava semiaperta per accavallamento, avendo il materiale un alto modulo elastico.

### DATI TECNICI

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	oli a base minerale (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, basso compression-set ed alta resistenza all'usura.

Ha una durezza di 93 Sh A ± 2.

**Codice materiale: CO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave sul pistone dove alloggia la guarnizione.

Eseguire uno smusso di invito sulla camicia per facilitare l'inserimento del pistone.

Lubrificare la tenuta prima del montaggio.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## PISTON SEAL TYPE PSA

### DESCRIPTION

The **PSA** seal type has been conceived to work on the piston and it can be used for simple or double effect. Its has asymmetrical lips which ensure a continuous contact with the bore, even in case of high misalignments. The installation is done in semi-open groove by overlap, since the material has a high modulus of elasticity.

### TECHNICAL DATA

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C, with peaks till 110° C
Fluids:	mineral-based oils and fuels (see TABLE I, pages 12-13)

### MATERIAL

The material used is a polyurethane with a high modulus of elasticity, low compression set and high wear resistance.

Its hardness is 93 Sh A ± 2.

**Compound reference: CO**

### ASSEMBLY

Remove any flash or cutting edges on the piston where the seal is housed.

Ensure a lead-in chamfer in the bore to facilitate the insertion of the piston.

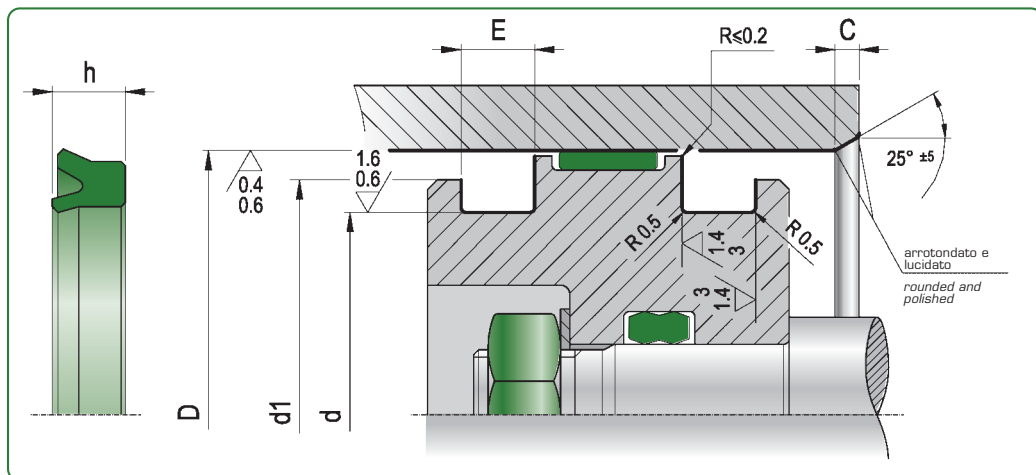
Lubricate the packing before installation.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

PSA



D <sub>H9</sub>	d <sub>H9</sub>	h	E <sub>+0,2</sub>	d <sub>1</sub> *	C	ART / ITEM				
20,0	12,0	6,5	7,5	15,0	4,0	PSA	0200	0120	065	CO
20,0	14,0	5,5	6,0	17,0	3,5	PSA	0200	0140	055	CO
22,0	12,0	8,0	9,0	16,0	5,0	PSA	0220	0120	080	CO
25,0	15,0	8,0	9,0	19,0	5,0	PSA	0250	0150	080	CO
30,0	20,0	8,0	9,0	24,0	5,0	PSA	0300	0200	080	CO
30,0	22,0	6,5	7,0	26,0	5,0	PSA	0300	0220	065	CO
32,0	22,0	10,0	11,0	26,0	5,0	PSA	0320	0220	100	CO
32,0	24,0	5,7	6,3	28,0	4,0	PSA	0320	0240	057	CO
32,0	26,0	5,0	6,0	28,0	3,5	PSA	0320	0260	050	CO
35,0	20,0	10,0	11,0	25,0	5,5	PSA	0350	0200	100	CO
35,0	25,0	8,0	9,0	29,0	5,0	PSA	0350	0250	080	CO
37,0	21,0	12,0	13,0	25,0	6,0	PSA	0370	0210	120	CO
40,0	25,0	10,0	11,0	30,0	6,0	PSA	0400	0250	100	CO
40,0	30,0	6,5	7,5	34,0	5,0	PSA	0400	0300	065	CO
40,0	30,0	10,0	11,0	34,0	5,0	PSA	0400	0300	100	CO
40,0	32,0	5,5	6,5	36,0	4,0	PSA	0400	0320	055	CO
40,0	32,0	8,0	9,0	36,0	4,0	PSA	0400	0320	080	CO
42,0	32,0	10,0	11,0	36,0	5,0	PSA	0420	0320	100	CO
45,0	30,0	10,0	11,0	35,0	6,0	PSA	0450	0300	100	CO
50,0	30,0	12,0	13,0	35,0	7,0	PSA	0500	0300	120	CO
50,0	32,0	10,0	11,0	37,0	6,5	PSA	0500	0320	100	CO
50,0	35,0	8,5	9,5	40,0	6,0	PSA	0500	0350	085	CO
50,0	35,0	10,0	11,0	40,0	6,0	PSA	0500	0350	100	CO
50,0	40,0	5,0	5,5	44,0	5,0	PSA	0500	0400	050	CO
50,0	40,0	10,0	11,0	44,0	5,0	PSA	0500	0400	100	CO
50,0	42,0	5,5	6,0	45,0	4,0	PSA	0500	0420	055	CO
50,0	42,0	8,0	9,0	45,0	4,0	PSA	0500	0420	080	CO
55,0	40,0	10,0	11,0	45,0	6,0	PSA	0550	0400	100	CO
60,0	40,0	12,0	13,0	45,0	7,0	PSA	0600	0400	120	CO
60,0	45,0	10,0	11,0	50,0	6,0	PSA	0600	0450	100	CO
60,0	50,0	7,0	8,0	54,0	5,0	PSA	0600	0500	070	CO
60,0	50,0	10,0	11,0	54,0	5,0	PSA	0600	0500	100	CO
63,0	43,0	12,0	13,0	47,0	7,0	PSA	0630	0430	120	CO
63,0	45,0	12,0	13,0	50,0	6,0	PSA	0630	0450	120	CO
63,0	48,0	6,5	7,5	53,0	6,5	PSA	0630	0480	065	CO
63,0	48,0	10,0	11,0	53,0	6,0	PSA	0630	0480	100	CO
63,0	48,0	12,0	13,0	53,0	6,0	PSA	0630	0480	120	CO
63,0	53,0	7,0	8,0	57,0	5,0	PSA	0630	0530	070	CO
63,0	53,0	12,0	13,0	57,0	5,0	PSA	0630	0530	120	CO

\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio  
recommended hook diameter wich could be modified accordingly to mounting demand



D <sub>H9</sub>	d <sub>H9</sub>	h	E <sub>+0,2</sub>	d <sub>1*</sub>	C	ART / ITEM				
65,0	45,0	12,0	13,0	50,0	7,0	PSA	0650	0450	120	CO
65,0	50,0	10,0	11,0	55,0	6,0	PSA	0650	0500	100	CO
70,0	50,0	12,0	13,0	55,0	7,0	PSA	0700	0500	120	CO
70,0	55,0	9,5	10,5	60,0	6,0	PSA	0700	0550	095	CO
70,0	55,0	12,0	13,0	60,0	6,0	PSA	0700	0550	120	CO
70,0	60,0	7,0	8,0	64,0	5,0	PSA	0700	0600	070	CO
70,0	60,0	12,0	13,0	64,0	5,0	PSA	0700	0600	120	CO
70,0	62,0	7,5	8,5	65,0	4,5	PSA	0700	0620	075	CO
75,0	55,0	13,5	14,5	60,0	7,0	PSA	0750	0550	135	CO
75,0	65,0	7,0	8,0	69,0	5,0	PSA	0750	0650	070	CO
75,0	65,0	10,0	11,0	69,0	5,0	PSA	0750	0650	100	CO
80,0	60,0	12,0	13,0	65,0	7,0	PSA	0800	0600	120	CO
80,0	65,0	12,0	13,0	70,0	6,0	PSA	0800	0650	120	CO
80,0	68,0	8,5	9,5	72,0	5,5	PSA	0800	0680	085	CO
80,0	70,0	7,0	8,0	74,0	5,0	PSA	0800	0700	070	CO
80,0	70,0	12,0	13,0	74,0	5,0	PSA	0800	0700	120	CO
85,0	65,0	12,0	13,0	70,0	7,0	PSA	0850	0650	120	CO
85,0	65,0	13,5	14,5	70,0	7,0	PSA	0850	0650	135	CO
85,0	70,0	12,0	13,0	75,0	6,0	PSA	0850	0700	120	CO
85,0	75,0	10,0	11,0	79,0	5,0	PSA	0850	0750	100	CO
90,0	70,0	12,0	13,0	75,0	7,0	PSA	0900	0700	120	CO
90,0	70,0	13,5	14,5	75,0	7,0	PSA	0900	0700	135	CO
90,0	75,0	12,0	13,0	80,0	6,0	PSA	0900	0750	120	CO
90,0	80,0	10,0	11,0	84,0	5,0	PSA	0900	0800	100	CO
95,0	80,0	12,0	13,0	85,0	6,0	PSA	0950	0800	120	CO
95,0	85,0	7,0	8,0	89,0	5,0	PSA	0950	0850	070	CO
100,0	80,0	10,0	11,0	85,0	7,0	PSA	1000	0800	100	CO
100,0	80,0	12,0	13,0	85,0	7,0	PSA	1000	0800	120	CO
100,0	85,0	12,0	13,0	90,0	6,0	PSA	1000	0850	120	CO
100,0	88,0	8,5	9,5	93,0	5,5	PSA	1000	0880	085	CO
100,0	90,0	7,0	8,0	94,0	5,0	PSA	1000	0900	070	CO
105,0	90,0	12,0	13,0	95,0	6,0	PSA	1050	0900	120	CO
110,0	90,0	12,0	13,0	95,0	7,0	PSA	1100	0900	120	CO
110,0	95,0	12,0	13,0	100,0	6,0	PSA	1100	0950	120	CO
115,0	95,0	15,0	16,0	105,0	7,0	PSA	1150	0950	150	CO
115,0	100,0	12,0	13,0	105,0	6,0	PSA	1150	1000	120	CO
120,0	100,0	12,0	13,0	105,0	7,0	PSA	1200	1000	120	CO
120,0	105,0	12,0	13,0	110,0	6,0	PSA	1200	1050	120	CO
125,0	100,0	15,0	16,0	105,0	8,0	PSA	1250	1000	150	CO
125,0	105,0	12,0	13,0	110,0	7,0	PSA	1250	1050	120	CO
125,0	105,0	15,0	16,0	110,0	7,0	PSA	1250	1050	150	CO
125,0	110,0	10,0	11,0	115,0	6,0	PSA	1250	1100	100	CO
130,0	110,0	15,0	16,0	115,0	7,0	PSA	1300	1100	150	CO
140,0	120,0	12,0	13,0	125,0	7,0	PSA	1400	1200	120	CO
150,0	130,0	15,0	16,0	135,0	7,0	PSA	1500	1300	150	CO
160,0	140,0	11,5	12,5	145,0	7,0	PSA	1600	1400	115	CO
160,0	140,0	15,0	16,0	145,0	7,0	PSA	1600	1400	150	CO
180,0	160,0	11,5	12,5	165,0	7,0	PSA	1800	1600	115	CO
180,0	160,0	15,0	16,0	165,0	7,0	PSA	1800	1600	150	CO
200,0	170,0	19,0	20,0	175,0	8,0	PSA	2000	1700	190	CO
250,0	220,0	19,0	20,0	225,0	8,0	PSA	2500	2200	190	CO

\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio  
recommended hook diameter wich could be modified accordingly to mounting demand

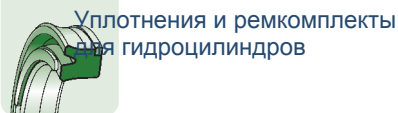
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## TENUTA PISTONE CON ANELLO ANTIESTRUSIONE TIPO PAE

### DESCRIZIONE

La guarnizione tipo **PAE** è stata realizzata specificatamente per operare in condizioni di esercizio molto gravose. Quando i giochi di accoppiamento tra camicia e pistone non possono essere ridotti e la pressione è molto elevata, superiore a 250 bar, la tenuta tipo PAE, grazie ad un robusto anello antiestrusione, risulta tra le più appropriate.

### DATI TECNICI

Pressione: < 400 bar a temperatura di 60° C

Velocità: < 0.5 m/s

Temperatura: da -35° C a +100° C con punte fino a 110° C

Fluidi: Oli a base minerale  
(vedi TABELLA I, pagg. 12-13)

### MATERIALE

I materiali utilizzati sono un poliuretano tipo **CO** a 93 Sh A ad alto modulo elastico per la guarnizione e una resina acetaltica tipo **RO** rinforzata con fibre di vetro con elevata resistenza al carico di rottura per l'anello antiestrusione.

**Codice materiale: CR**

### MONTAGGIO

Il montaggio di questa guarnizione avviene in cava semiaperta.

La sequenza prevede prima la tenuta e poi l'anello antiestrusione.

E' importante togliere le bave e gli spigoli vivi sul pistone per non danneggiare la guarnizione durante il montaggio nella fase di accavallamento.

## PISTON SEAL WITH ANTIEXTRUSION RING TYPE PAE

### DESCRIPTION

The **PAE** seal type is specially designed for heavy-duty applications.

When the coupling clearance between bore and piston cannot be reduced and the pressure is very high - above 250 bar - the PAE seal type, thanks to a strong anti-extrusion ring, is among the most appropriate of seal types.

### TECHNICAL DATA

Pressure: < 400 bar at a temperature of 60° C

Speed: < 0.5 m/s

Temperature: from -35° C till +100° C

Fluids: mineral oils  
(see TABLE I, pages 12-13)

### MATERIAL

The material used for the seal is polyurethane **CO**-type at 93 Sh A with high elasticity module. The anti-extrusion ring is made of acetylic resin **RO**-type reinforced with fibreglass and with high tensile strength.

**Compound reference: CR**

### ASSEMBLY

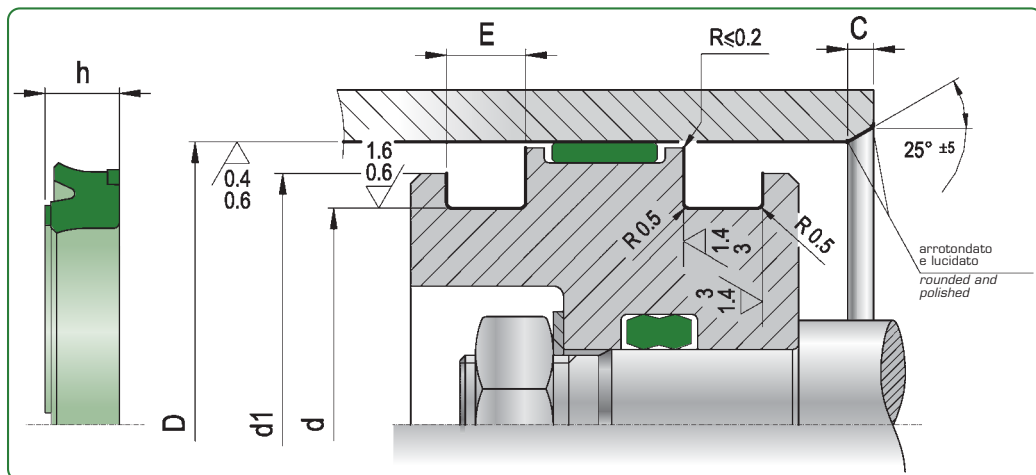
The assembly of this seal is done in semi-open groove.

The anti-extrusion ring should be installed after the seal. It is important to remove any flash or cutting edge on the piston not to damage the seal during the overlap phase.



disegno / DRAWING

PAE



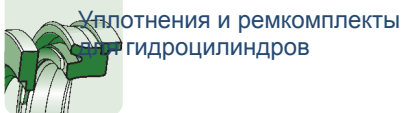
D <sub>H9</sub>	d <sub>H9</sub>	d <sub>1</sub> *	h	E <sub>+0,2</sub>	C	ART / ITEM				
40,0	25,0	35,0	9,3	9,5	4,0	PAE	0400	0250	093	CR
45,0	30,0	40,0	9,3	9,5	4,0	PAE	0450	0300	093	CR
50,0	35,0	45,0	9,3	9,5	4,0	PAE	0500	0350	093	CR
55,0	40,0	50,0	9,3	9,5	4,0	PAE	0550	0400	093	CR
60,0	45,0	55,0	9,3	9,5	4,0	PAE	0600	0450	093	CR
63,0	48,0	58,0	9,3	9,5	4,0	PAE	0630	0480	093	CR
65,0	50,0	60,0	9,3	9,5	4,0	PAE	0650	0500	093	CR
70,0	50,0	64,0	12,2	12,5	5,0	PAE	0700	0500	122	CR
75,0	55,0	69,0	12,2	12,5	5,0	PAE	0750	0550	122	CR
80,0	60,0	74,0	12,2	12,5	5,0	PAE	0800	0600	122	CR
85,0	70,0	80,0	9,3	9,5	4,0	PAE	0850	0700	093	CR
90,0	70,0	84,0	12,2	12,5	5,0	PAE	0900	0700	122	CR
100,0	80,0	94,0	12,2	12,5	5,0	PAE	1000	0800	122	CR
105,0	85,0	99,0	12,2	12,5	5,0	PAE	1050	0850	122	CR
110,0	90,0	104,0	12,2	12,5	5,0	PAE	1100	0900	122	CR
115,0	95,0	109,0	12,2	12,5	5,0	PAE	1150	0950	122	CR
125,0	100,0	117,0	15,2	16,2	6,5	PAE	1250	1000	152	CR
125,0	105,0	119,0	12,2	12,5	5,0	PAE	1250	1050	122	CR
130,0	110,0	124,0	12,2	12,5	5,0	PAE	1300	1100	122	CR
140,0	115,0	132,0	15,2	16,2	6,5	PAE	1400	1150	152	CR
140,0	120,0	134,0	12,2	12,5	5,0	PAE	1400	1200	122	CR

\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio  
recommended hook diameter which could be modified according to mounting demand

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





## TENUTA PISTONE CON ANELLO GUIDA E RITEGNO TIPO PSH + RR

### DESCRIZIONE

La guarnizione per pistone tipo **PSH** è simile al tipo **PSA**, ma è provvista di un anello di guida in resina acetalica che oltre ad attenuare eventuali disallineamenti funge anche da antiestrusione.

Un anello di ritegno tipo **RR** in resina termoplastica non consente l'espulsione della tenuta durante l'inversione del ciclo.

### DATI TECNICI

Pressione:	< 400 bar a temperatura di 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a +110° C
Fluidi:	fluidi e oli a base minerale (vedi TABELLA I, pagg 12-13)

### MATERIALE

Il materiale proposto è il poliuretano tipo **CO** ad alto modulo elastico, a basso compression-set ed elevata resistenza all'abrasione; l'anello di guida è in resina acetatica tipo **RO** rinforzata con fibre di vetro.

**Codice materiale PSH: CR**

L'anello di ritegno è costruito in resina termoplastica tipo **R2**.

**Codice materiale RR: R2**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave sul pistone dove alloggia la guarnizione.

Eseguire uno smusso di invito sulla camicia per facilitare l'inserimento del pistone.

Lubrificare la tenuta prima del montaggio.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## PISTON SEAL WITH WEAR RING AND RETAINING TYPE PSH + RR

### DESCRIPTION

The **PSH** piston seal type is similar to the **PSA** type, but it has an acetylic resin wear ring to mitigate possible misalignments and avoid extrusion.

A **RR** retaining ring made of thermoplastic resin prevents seal extrusion during the cycle inversion.

### TECHNICAL DATA

Pressure:	< 400 bar at a temperature of 60° C
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C with peaks till +110° C
Fluids:	mineral fluids and oils (see TABLE I, pages 12-13)

### MATERIAL

The proposed material is a **CO**-type polyurethane with high modulus of elasticity, low compression-set and high resistance to abrasion. The wear ring is made of a **RO**-type acetylic resin, and is reinforced with fibreglass.

**Compound reference PSH: CR**

The retaining seal is made of thermoplastic resin, **R2** type.

**Compound reference RR: R2**

### ASSEMBLY

Avoid all cutting edges and flash on the piston where the seal is housed.

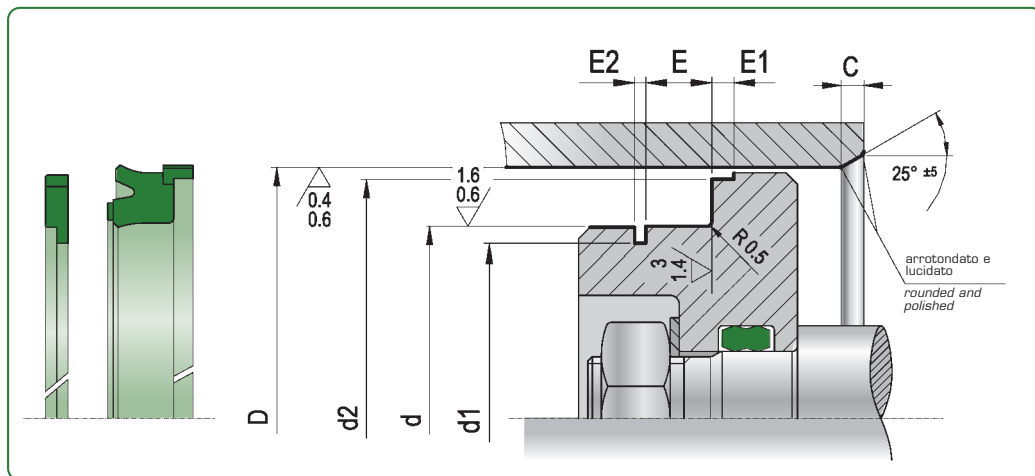
A lead-in chamfer in the groove will facilitate the insertion of the piston.

Lubricate the seal before installation.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING PSH + RR



$D_{H9}$	$d_{H9}$	E +0,2	$E_2$ +0,1 +0,2	$d_2$ 0/-0,05	$E_1$ ±0,1	C	$d_1$ ±0,1	ART / ITEM				ART / ITEM				
32,0	20,0	10,0	3,10	28,50	6,35	4,0	15,80	PSH	0320	0200	100	CR	RR	0320	0200	R2
35,0	22,0	10,0	3,10	31,40	6,35	4,0	17,80	PSH	0350	0220	100	CR	RR	0350	0220	R2
40,0	26,0	9,4	3,10	35,40	6,35	4,0	21,60	PSH	0400	0260	094	CR	RR	0400	0260	R2
45,0	30,0	9,5	3,10	40,40	6,35	4,0	25,80	PSH	0450	0300	095	CR	RR	0450	0300	R2
50,0	30,0	14,5	3,35	44,30	6,35	4,0	25,80	PSH	0500	0300	145	CR	RR	0500	0300	R2
55,0	40,0	11,0	3,10	50,36	6,35	4,0	35,80	PSH	0550	0400	110	CR	RR	0550	0400	R2
60,0	40,0	14,5	3,35	54,20	6,35	4,0	36,10	PSH	0600	0400	145	CR	RR	0600	0400	R2
63,0	45,0	10,5	3,10	58,40	6,35	4,0	40,84	PSH	0630	0450	105	CR	RR	0630	0450	R2
70,0	50,0	14,5	3,35	64,20	6,35	5,0	45,84	PSH	0700	0500	145	CR	RR	0700	0500	R2
75,0	55,0	14,5	3,35	69,20	6,35	5,0	51,10	PSH	0750	0550	145	CR	RR	0750	0550	R2
90,0	70,0	14,5	3,35	84,15	6,35	5,0	66,10	PSH	0900	0700	145	CR	RR	0900	0700	R2
95,0	75,0	14,5	3,35	89,15	6,35	5,0	71,10	PSH	0950	0750	145	CR	RR	0950	0750	R2

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## TENUTA PISTONE TIPO PSO

### DESCRIZIONE

La guarnizione tipo **PSO** ha un profilo con doppie punte sulla parte dinamica e un piano con due piccoli gradini di contenimento sulla parte statica dove trova alloggio l'o-ring.

La presenza dell'o-ring, che energizza la guarnizione, garantisce la perfetta tenuta sia a basse che ad alte pressioni.

Lo speciale profilo a doppie punte evita pressioni idrodinamiche sulla tenuta e di conseguenza l'effetto blow-by.

### DATI TECNICI

Pressione:	< 250 bar con materiale standard 93 Sh A a 60° C (CO)
Pressione:	< 400 bar con materiale alternativo 98 Sh A a 60° C (DO)
Pressione:	< 500 bar con materiale alternativo 55 Sh D a 60° C (EO)
Velocità:	< 0.5 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a 110° C
Fluidi:	fluidi a base minerale (vedi TABELLA I, pagg. 12-13)

### MATERIALE

I materiali utilizzati sono dei poliuretani con differenti durezza a seconda delle pressioni di esercizio (**CO** o **DO** o **EO**).

L'o-ring in NBR è di durezza 70 Sh A. (**NO**).

Codice materiale: **CN** (o in alternativa, **DN** o **EN**).

### MONTAGGIO

E' necessario eliminare spigoli taglienti e bave nella sede dove alloggia la guarnizione.

Eseguire smusso di invito sulla camicia per facilitare il montaggio del pistone.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## PISTON SEAL TYPE PSO

### DESCRIPTION

The **PSO** seal type shows a double-ended profile on the dynamic side and a surface with two small steps on the static side, where the o-ring is housed.

The presence of the o-ring, which energizes the seal, ensures a perfect seal performance at both low and high pressure.

The special double-ended profile avoids any hydrodynamic pressure on the sealing part and the consequent blow-by effect.

### TECHNICAL DATA

Pressure:	< 250 bar with standard material 93 Sh A at 60° C (CO)
Pressure:	< 400 bar with alternative material 98 Sh A at 60° C (DO)
Pressure:	< 500 bar with alternative material 55 Sh D at 60° C (EO)
Speed:	< 0.5 m/s
Temperature:	from - 35° C to + 100° C, with peaks at 110° C
Fluids:	mineral-based fluids (see TABLE I, pages 12-13)

### MATERIAL

The chosen material is polyurethane, whose hardness varies according to the working pressure (**CO** o **DO** o **EO**).

The o-ring is in NBR, its hardness is of 70 Sh A (**NO**).

Compound reference: **CN** (or, in alternative, **DN** or **EN**).

### ASSEMBLY

Remove any cutting edges and flash in the housing of the seal.

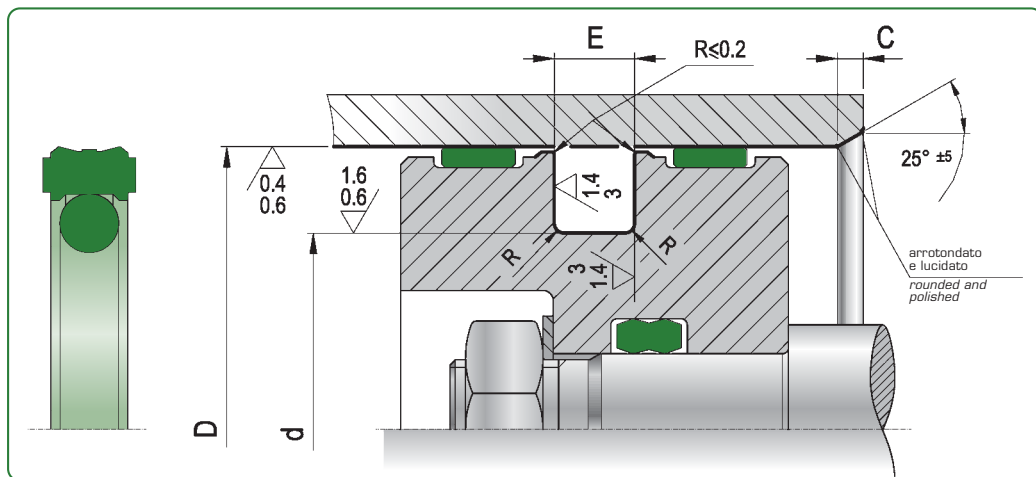
Ensure a lead-in chamfer in the bore to facilitate the piston installation.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

PSO



D <sub>H9</sub>	d <sub>h9</sub>	E <sub>+0,2</sub>	C	R	O-ring (no)	ART / ITEM				
12,00	7,1	2,2	2,0	0,2	OR 016	PSO	0120	0710	022	CN
* 20,00	12,50	3,2	3,0	0,2	OR 112	PSO	0200	0125	032	CN
22,00	14,50	3,2	3,0	0,2	OR 113	PSO	0220	0145	032	CN
24,00	16,50	3,2	3,0	0,2	OR 114	PSO	0240	0165	032	CN
* 25,00	14,00	4,2	4,0	0,4	OR 207	PSO	0250	0140	042	CN
* 25,00	17,50	3,2	3,0	0,2	OR 115	PSO	0250	0175	032	CN
28,00	20,50	3,2	3,0	0,4	OR 117	PSO	0280	0205	032	CN
30,00	22,50	3,2	3,0	0,4	OR 118	PSO	0300	0225	032	CN
32,00	21,00	4,2	4,0	0,4	OR 211	PSO	0320	0210	042	CN
* 32,00	24,50	3,2	3,0	0,4	OR 119	PSO	0320	0245	032	CN
35,00	24,00	4,2	4,0	0,4	OR 213	PSO	0350	0240	042	CN
35,00	27,50	3,2	3,0	0,4	OR 121	PSO	0350	0275	032	CN
36,00	25,00	4,2	4,0	0,4	OR 213	PSO	0360	0250	042	CN
36,00	28,50	3,2	3,0	0,4	OR 122	PSO	0360	0285	032	CN
38,00	30,50	3,2	3,0	0,4	OR 123	PSO	0380	0305	032	CN
40,00	24,50	6,3	5,0	0,5	OR 318	PSO	0400	0245	063	CN
* 40,00	29,00	4,2	4,0	0,4	OR 216	PSO	0400	0290	042	CN
42,00	31,00	4,2	4,0	0,5	OR 217	PSO	0420	0310	042	CN
45,00	29,50	6,3	5,0	0,5	OR 320	PSO	0450	0295	063	CN
45,00	34,00	4,2	4,0	0,5	OR 219	PSO	0450	0340	042	CN
48,00	37,00	4,2	4,0	0,5	OR 221	PSO	0480	0370	042	CN
49,00	38,00	4,2	4,0	0,5	OR 222	PSO	0490	0380	042	CN
50,00	34,50	6,3	5,0	0,5	OR 324	PSO	0500	0345	063	CN
* 50,00	39,00	4,2	4,0	0,5	OR 222	PSO	0500	0390	042	CN
50,80	39,80	4,2	4,0	0,5	OR 222	PSO	0508	0398	042	CN
52,00	36,50	6,3	5,0	0,5	OR 324	PSO	0520	0365	063	CN
55,00	39,50	6,3	5,0	0,5	OR 325	PSO	0550	0395	063	CN
55,00	44,00	4,2	4,0	0,5	OR 224	PSO	0550	0440	042	CN
57,00	46,00	4,2	4,0	0,5	OR 224	PSO	0570	0460	042	CN
60,00	44,50	6,3	5,0	0,5	OR 327	PSO	0600	0445	063	CN
60,00	49,00	4,2	4,0	0,5	OR 225	PSO	0600	0490	042	CN
* 63,00	47,50	6,3	5,0	0,5	OR 328	PSO	0630	0475	063	CN
* 63,00	52,00	4,2	4,0	0,5	OR 226	PSO	0630	0520	042	CN
63,50	52,50	4,2	4,0	0,5	OR 226	PSO	0635	0525	042	CN
65,00	49,50	6,3	5,0	0,5	OR 328	PSO	0650	0495	063	CN
65,00	54,00	4,2	4,0	0,5	OR 227	PSO	0650	0540	042	CN
70,00	54,50	6,3	5,0	0,5	OR 330	PSO	0700	0545	063	CN
70,00	59,00	4,2	4,0	0,5	OR 228	PSO	0700	0590	042	CN
72,00	61,00	4,2	4,0	0,5	OR 229	PSO	0720	0610	042	CN

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 - in accordance with norms ISO/DIN 5597 and ISO 5597/1



D <sub>H9</sub>	d <sub>H9</sub>	E <sub>-0,2</sub>	C	R	O-ring (no)	ART / ITEM				
75,00	59,50	6,3	5,0	0,5	OR 331	PSO	0750	0595	063	CN
75,00	64,00	4,2	4,0	0,5	OR 230	PSO	0750	0640	042	CN
* 80,00	64,50	6,3	5,0	0,5	OR 333	PSO	0800	0645	063	CN
* 80,00	69,00	4,2	4,0	0,5	OR 842	PSO	0800	0690	042	CN
85,00	69,50	6,3	5,0	0,5	OR 335	PSO	0850	0695	063	CN
* 88,90	73,40	6,3	5,0	0,5	OR 336	PSO	0889	0734	063	CN
90,00	74,50	6,3	5,0	0,5	OR 336	PSO	0900	0745	063	CN
95,00	79,50	6,3	5,0	0,5	OR 338	PSO	0950	0795	063	CN
* 100,00	84,50	6,3	5,0	0,5	OR 339	PSO	1000	0845	063	CN
105,00	89,50	6,3	5,0	0,5	OR 341	PSO	1050	0895	063	CN
110,00	94,50	6,3	5,0	0,5	OR 343	PSO	1100	0945	063	CN
115,00	94,00	8,1	6,0	0,5	OR 94X7	PSO	1150	0940	081	CN
115,00	99,50	6,3	5,0	0,5	OR 344	PSO	1150	0995	063	CN
118,00	102,50	6,3	5,0	0,5	OR 345	PSO	1180	1025	063	CN
120,00	104,50	6,3	5,0	0,5	OR 346	PSO	1200	1045	063	CN
* 125,00	104,00	8,1	6,0	0,5	OR 100X7	PSO	1250	1040	081	CN
* 125,00	109,50	6,3	5,0	0,5	OR 347	PSO	1250	1095	063	CN
130,00	109,00	8,1	6,0	0,6	OR 106X7	PSO	1300	1090	081	CN
130,00	114,50	6,3	5,0	0,6	OR 349	PSO	1300	1145	063	CN
135,00	114,00	8,1	6,0	0,6	OR 425	PSO	1350	1140	081	CN
135,00	119,50	6,3	5,0	0,6	OR 350	PSO	1350	1195	063	CN
140,00	119,00	8,1	6,0	0,6	OR 426	PSO	1400	1190	081	CN
145,00	124,00	8,1	6,0	0,6	OR 428	PSO	1450	1240	081	CN
150,00	129,00	8,1	6,0	0,6	OR 430	PSO	1500	1290	081	CN
* 160,00	139,00	8,1	6,0	0,6	OR 433	PSO	1600	1390	081	CN
170,00	149,00	8,1	6,0	0,6	OR 436	PSO	1700	1490	081	CN
177,80	156,80	8,1	6,0	0,6	OR 437	PSO	1778	1568	081	CN
180,00	159,00	8,1	6,0	0,6	OR 438	PSO	1800	1590	081	CN
185,00	164,00	8,1	6,0	0,6	OR 874	PSO	1850	1640	081	CN
190,00	169,00	8,1	6,0	0,6	OR 439	PSO	1900	1690	081	CN
* 200,00	179,00	8,1	6,0	0,6	OR 441	PSO	2000	1790	081	CN
210,00	189,00	8,1	6,0	0,6	OR 443	PSO	2100	1890	081	CN
220,00	199,00	8,1	6,0	0,6	OR 444	PSO	2200	1990	081	CN
230,00	209,00	8,1	6,0	0,6	OR 445	PSO	2300	2090	081	CN
240,00	219,00	8,1	6,0	0,6	OR 446	PSO	2400	2190	081	CN
* 250,00	229,00	8,1	6,0	0,6	OR 447	PSO	2500	2290	081	CN

\* in conformità alle norme ISO/DIN 5597 e ISO 5597/1 – in accordance with norms ISO/DIN 5597 and ISO 5597/1

Materiali alternativi: **DN** (98 Sh A); **EN** (55 Sh D)

Alternative compounds: **DN** (98 Sh A); **EN** (55 Sh D)

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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## TENUTA PISTONE TIPO PSQ

### DESCRIZIONE

La guarnizione **PSQ** ha un profilo con doppie punte al centro nella parte dinamica ed un piano con due piccoli gradini nella parte statica dove alloggia il G-ring.

La presenza del G-ring energizza la guarnizione e garantisce la perfetta tenuta sia a bassa che ad alta pressione.

La geometria del profilo a doppie punte centrali evita pressioni idrodinamiche sulla tenuta e di conseguenza l'effetto blow-by.

### DATI TECNICI

Pressione: < 250 Bar con materiale tipo CO  
a 93 Shore A a temperatura di 60° C.  
< 400 Bar con materiale tipo DO a 98  
Shore A a temperatura di 60° C.

Velocità: < 0,8 m/s

Temperatura: da - 35° C a + 100 ° C  
con punte fino a 110° C.

Fluidi: oli a base minerale  
(vedi TABELLA I, pagg.12-13)

### MATERIALE

I materiali della tenuta sono poliuretani di diverse durezza a seconda delle pressioni di esercizio.

**Codice materiale:** **CQ** (93 Shore A con G-ring ) o, in alternativa, **DQ** (98 Shore A con G-ring)

### MONTAGGIO

E' necessario eliminare gli spigoli taglienti e le bave nella sede dove alloggia la guarnizione.

Eseguire smusso d'invito sulla camicia per facilitare il montaggio del pistone.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag 27.

## PISTON SEAL TYPE PSQ

### DESCRIPTION

The **PSQ** seal has a double-ended profile in the middle, in the dynamic part, and two small steps in the static part where the G-ring is housed.

The G-ring energizes the seal and provides a perfect sealing performance both at low and high pressure.

The shape of the central double-ended profile prevents hydrodynamic pressures on the seal and the resulting blow-out effect.

### TECHNICAL DATA

Pressure: < 250 Bar with a CO-type material at 93  
Shore A, at a temperature of 60° C.  
< 400 Bar a DO-type material, at 98  
Shore A, at a temperature of 60° C.

Speed: < 0.8 m/s

Temperature: from - 35° C to + 100 ° C with peaks  
up to 110° C.

Fluids: mineral oils  
(see TABLE I on pages 12-13)

### MATERIAL

The sealing parts are in polyurethanes with different hardnesses, according to the specific operating pressures.

**Compound reference:** **CQ** (93 Shore A with G-ring ) or, alternatively, **DQ** (98 Shore A with G-ring)

### ASSEMBLY

Cutting edges or flash must be removed in the housing of the seal.

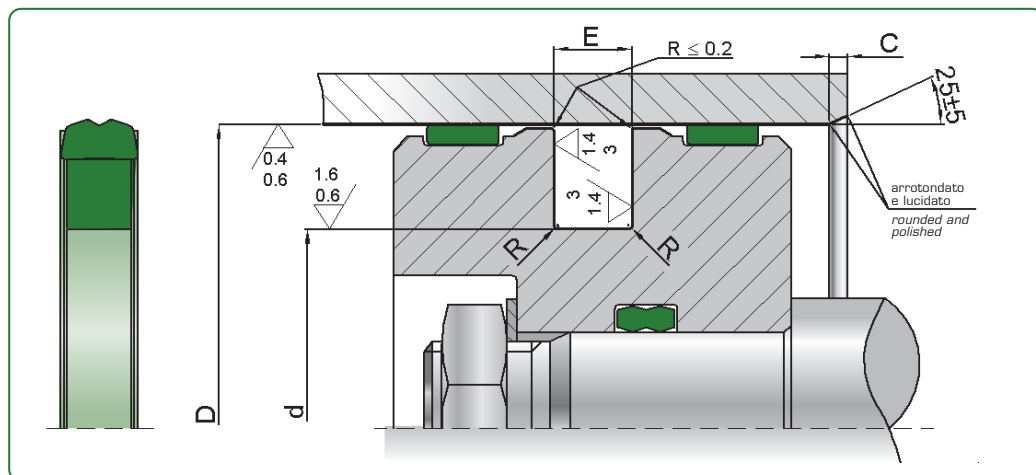
Ensure a lead-in chamfer in the bore to facilitate the installation of the piston.

For further information please refer to the assembly instructions on page 27.



disegno / DRAWING

PSQ



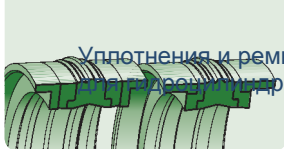
D <sub>H9</sub>	d <sub>h9</sub>	E <sub>+0,2</sub>	C	R	ART / ITEM				
* 40,0	24,5	6,3	5,0	0,4	PSQ	0400	0245	063	CN
40,0	29,0	4,2	4,0	0,3	PSQ	0400	0290	042	CN
45,0	34,0	4,2	4,0	0,3	PSQ	0450	0340	042	CN
* 50,0	34,5	6,3	5,0	0,4	PSQ	0500	0345	063	CN
* 50,0	39,0	4,2	4,0	0,3	PSQ	0500	0390	042	CN
55,0	39,5	6,3	5,0	0,4	PSQ	0550	0395	063	CN
60,0	44,5	6,3	5,0	0,4	PSQ	0600	0445	063	CN
* 60,0	49,0	4,2	4,0	0,3	PSQ	0600	0490	042	CN
* 63,0	47,5	6,3	5,0	0,4	PSQ	0630	0475	063	CN
* 63,0	52,0	4,2	5,0	0,3	PSQ	0630	0520	042	CN
65,0	49,5	6,3	4,0	0,4	PSQ	0650	0495	063	CN
70,0	54,5	6,3	5,0	0,4	PSQ	0700	0545	063	CN
70,0	59,0	4,2	4,0	0,3	PSQ	0700	0590	042	CN
75,0	59,5	6,3	5,0	0,4	PSQ	0750	0595	063	CN
80,0	59,0	8,1	6,0	0,4	PSQ	0800	0590	081	CN
* 80,0	64,5	6,3	5,0	0,4	PSQ	0800	0645	063	CN
85,0	69,5	6,3	5,0	0,4	PSQ	0850	0695	063	CN
90,0	69,0	8,1	6,0	0,4	PSQ	0900	0690	081	CN
90,0	74,5	6,3	5,0	0,4	PSQ	0900	0745	063	CN
95,0	79,5	6,3	5,0	0,4	PSQ	0950	0795	063	CN
100,0	79,0	8,1	6,0	0,4	PSQ	1000	0790	081	CN
* 100,0	84,5	6,3	5,0	0,4	PSQ	1000	0845	063	CN
105,0	89,5	6,3	5,0	0,4	PSQ	1050	0895	063	CN
110,0	89,0	8,1	6,0	0,4	PSQ	1100	0890	081	CN
110,0	94,5	6,3	5,0	0,4	PSQ	1100	0945	063	CN
115,0	94,0	8,1	6,0	0,4	PSQ	1150	0940	081	CN
120,0	99,0	8,1	6,0	0,4	PSQ	1200	0990	081	CN
* 125,0	104,0	8,1	6,0	0,4	PSQ	1250	1040	081	CN
* 125,0	109,5	6,3	5,0	0,4	PSQ	1250	1095	063	CN
130,0	109,0	8,1	6,0	0,4	PSQ	1300	1090	081	CN

\* ISO 7425

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





**TENUTA PISTONE COMPATTA TIPO  
KDSA + KDSB**

**DESCRIZIONE**

Per la guarnizione compatta esistono due profili: **KDSA** e **KDSB** (vedi tabella dimensionale qui di seguito). **KDSA** e **KDSB** sono costituite da un elemento centrale in gomma nitrilica che esercita la funzione di tenuta, da due supporti laterali all'elemento in gomma che agiscono da anelli antiestrusione e da due guide esterne che mantengono in guida il pistone nel cilindro.

**DATI TECNICI**

Pressione:	da 0 a 300 bar con punte fino a 400 bar a 60° C
Velocità:	< 0.5 m/s
Temperatura:	da - 30° C a +100° C
Fluidi:	Oli a base minerale (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

I materiali utilizzati per la costruzione di questo tipo di tenuta sono i seguenti:

- l'elemento centrale è in NBR con durezza 70 Sh A  $\pm 3$
- i supporti laterali sono in elastomero termoplastico (TPE)
- le guide esterne sono in resina poliacetalica (POM)

**Codice materiale: CX**

**MONTAGGIO**

Il montaggio di questa tenuta può essere eseguito sia in cava chiusa su pistone monoblocco, sia in cava aperta su pistone in due pezzi.

L'ordine di montaggio deve essere il seguente:

- 1 - elemento in gomma;
- 2 - supporti;
- 3 - guide.

E' necessario che il pistone non presenti bave di lavorazione meccanica che danneggerebbero l'elemento in gomma durante il montaggio.

**COMPACT PISTON SEAL TYPE  
KDSA + KDSB**

**DESCRIPTION**

In the compact seals two profiles are available: **KDSA** and **KDSB** (see the dimensions table).

**KDSA** and **KDSB** are composed of a central unit made of nitrilic rubber working as a seal, two side supports, working as anti-extrusion rings, and two external guide rings, keeping the piston position in the cylinder aligned.

**TECHNICAL DATA**

Pressure:	from 0 to 300 bar with peaks till 400 bar at 60° C
Speed:	< 0.5 m/s
Temperature:	from - 30° C to +100° C
Fluids:	Mineral oils (see TABLE I, pages 12-13)

**MATERIAL**

The compounds used to manufacture this seal type are the following:

- the central unit is made of NBR, the hardness is 70 Sh A  $\pm 3$
- the side supports are made of thermoplastic elastomer (TPE)
- the external wear rings are made of polyacetalic resin (POM)

**Compound reference: CX**

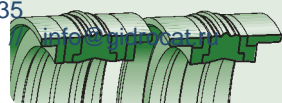
**ASSEMBLY**

The assembly of this seal can be carried out in either closed groove, on a monobloc piston, or in open groove, on a two-part piston.

The assembly order is as follows:

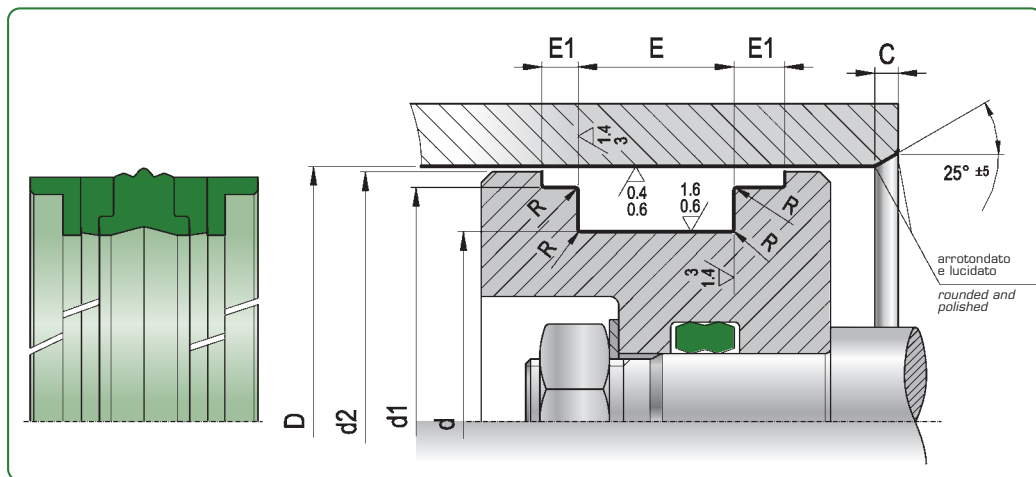
- 1 - rubber element;
- 2 - supports;
- 3 - wear rings.

The piston must not have machining scores which might damage the rubber unit during the installation.



disegno / DRAWING

KDSA



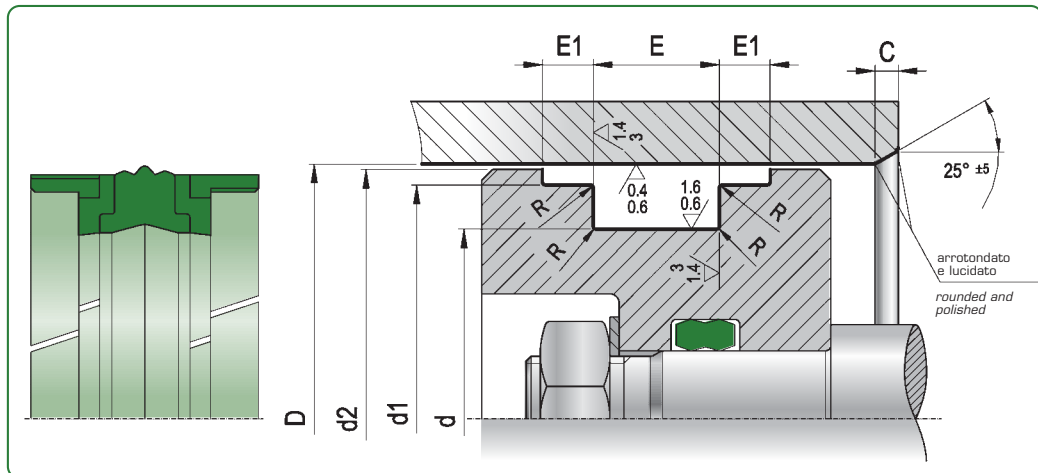
D <sub>H9</sub>	d <sub>H9</sub>	E <sub>+0,2</sub>	d <sub>1H9</sub>	d <sub>2-0,2</sub>	E <sub>1 0/+0,1</sub>	R	C	ART / ITEM			
32,0	24,0	15,5	28,0	31,4	3,2	0,4	3,5	KDSA 0320	0240	155	CX
40,0	32,0	15,5	36,0	39,4	3,2	0,4	4,0	KDSA 0400	0320	155	CX
50,0	38,0	20,5	46,0	49,4	4,2	0,4	4,0	KDSA 0500	0380	205	CX
60,0	48,0	20,5	56,0	59,4	4,2	0,4	4,5	KDSA 0600	0480	205	CX
63,0	51,0	20,5	59,0	62,4	4,2	0,4	4,5	KDSA 0630	0510	205	CX
70,0	58,0	20,5	66,0	69,4	4,2	0,4	4,5	KDSA 0700	0580	205	CX
80,0	66,0	22,5	76,0	79,4	5,2	0,4	4,5	KDSA 0800	0660	225	CX
90,0	76,0	22,5	86,0	89,4	5,2	0,4	4,5	KDSA 0900	0760	225	CX
100,0	86,0	22,5	96,0	99,4	5,2	0,4	5,0	KDSA 1000	0860	225	CX
110,0	96,0	22,5	106,0	109,4	5,2	0,4	5,0	KDSA 1100	0960	225	CX
120,0	106,0	22,5	116,0	119,4	5,2	0,8	5,0	KDSA 1200	1060	225	CX
125,0	108,0	26,5	121,0	124,4	7,2	0,8	5,0	KDSA 1250	1080	265	CX
130,0	113,0	26,5	126,0	129,4	7,2	0,8	5,0	KDSA 1300	1130	265	CX
140,0	123,0	26,5	136,0	139,4	7,2	0,8	5,0	KDSA 1400	1230	265	CX
150,0	133,0	26,5	146,0	149,4	7,2	0,8	5,0	KDSA 1500	1330	265	CX
160,0	143,0	26,5	156,0	159,4	7,2	0,8	5,0	KDSA 1600	1430	265	CX

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

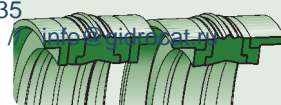
Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

disegno / DRAWING

KDSB



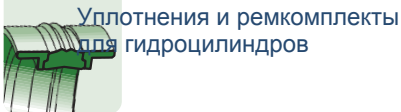
$D_{H9}$	$d_{H9}$	$E_{+0,2}$	$d_{1H9}$	$d_{2+0,2}$	$E_{1\ 0/+0,1}$	R	C	ART / ITEM				
20,0	11,0	13,5	17,00	19,0	2,10	0,4	3,5	KDSB	0200	0110	135	CX
22,0	13,0	13,5	19,00	21,0	2,10	0,4	3,5	KDSB	0220	0130	135	CX
25,0	15,0	12,0	21,00	23,0	4,00	0,4	3,5	KDSB	0250	0150	120	CX
25,0	15,0	12,5	22,00	24,0	4,00	0,4	3,5	KDSB	0250	0150	125	CX
25,0	15,0	16,4	21,45	23,5	6,35	0,4	3,5	KDSB	0250	0150	164	CX
25,0	16,0	13,5	22,00	24,0	2,10	0,4	3,5	KDSB	0250	0160	135	CX
28,0	19,0	13,5	25,00	27,0	2,10	0,4	3,5	KDSB	0280	0190	135	CX
30,0	21,0	13,5	27,00	29,0	2,10	0,4	3,5	KDSB	0300	0210	135	CX
32,0	22,0	15,5	28,00	31,0	2,60	0,4	3,5	KDSB	0320	0220	155	CX
32,0	22,0	16,4	28,50	30,5	6,35	0,4	3,5	KDSB	0320	0220	164	CX
35,0	25,0	15,5	31,00	34,0	2,60	0,4	3,5	KDSB	0350	0250	155	CX
35,0	25,0	16,4	31,40	33,5	6,35	0,4	3,5	KDSB	0350	0250	164	CX
40,0	24,0	18,4	35,40	38,5	6,35	0,4	4,0	KDSB	0400	0240	184	CX
40,0	26,0	15,5	36,00	39,0	2,60	0,4	4,0	KDSB	0400	0260	155	CX
40,0	30,0	12,5	36,00	38,0	4,00	0,4	4,0	KDSB	0400	0300	125	CX
40,0	30,0	16,4	35,40	38,5	6,35	0,4	4,0	KDSB	0400	0300	164	CX
42,0	28,0	15,5	38,00	41,0	2,60	0,4	4,0	KDSB	0420	0280	155	CX
45,0	29,0	18,4	40,40	43,5	6,35	0,4	4,0	KDSB	0450	0290	184	CX
45,0	31,0	15,5	41,00	44,0	2,60	0,4	4,0	KDSB	0450	0310	155	CX
45,0	35,0	16,4	40,40	43,5	6,35	0,4	4,0	KDSB	0450	0350	164	CX
50,0	34,0	18,4	45,40	48,5	6,35	0,4	4,0	KDSB	0500	0340	184	CX
50,0	34,0	20,5	46,00	49,0	3,10	0,4	4,0	KDSB	0500	0340	205	CX
55,0	39,0	18,4	50,36	53,5	6,35	0,4	4,0	KDSB	0550	0390	184	CX
55,0	39,0	20,5	51,00	54,0	3,10	0,4	4,0	KDSB	0550	0390	205	CX
56,0	40,0	20,5	52,00	55,0	3,10	0,4	4,0	KDSB	0560	0400	205	CX
60,0	44,0	18,4	55,40	58,5	6,35	0,4	4,5	KDSB	0600	0440	184	CX
60,0	44,0	20,5	56,00	59,0	3,10	0,4	4,5	KDSB	0600	0440	205	CX
63,0	47,0	18,4	58,40	61,5	6,35	0,4	4,5	KDSB	0630	0470	184	CX
63,0	47,0	19,4	58,40	61,5	6,35	0,4	4,5	KDSB	0630	0470	194	CX
63,0	47,0	20,5	59,00	62,0	3,10	0,4	4,5	KDSB	0630	0470	205	CX
65,0	49,0	20,5	61,00	64,0	3,10	0,4	4,5	KDSB	0650	0490	205	CX
65,0	50,0	18,4	60,40	63,5	6,35	0,4	4,5	KDSB	0650	0500	184	CX
70,0	50,0	22,4	64,20	68,3	6,35	0,4	4,5	KDSB	0700	0500	224	CX
70,0	54,0	20,5	66,00	69,0	3,10	0,4	4,5	KDSB	0700	0540	205	CX
75,0	55,0	22,4	69,20	73,3	6,35	0,4	4,5	KDSB	0750	0550	224	CX
75,0	59,0	20,5	71,00	74,0	3,10	0,4	4,5	KDSB	0750	0590	205	CX
80,0	60,0	22,4	74,15	78,3	6,35	0,4	4,5	KDSB	0800	0600	224	CX
80,0	62,0	22,5	76,00	79,0	3,60	0,4	4,5	KDSB	0800	0620	225	CX
85,0	65,0	22,4	79,15	83,3	6,35	0,4	4,5	KDSB	0850	0650	224	CX



D <sub>H9</sub>	d <sub>H9</sub>	E <sub>+0,2</sub>	d <sub>1H9</sub>	d <sub>2,0,2</sub>	E <sub>1 0/+0,1</sub>	R	C	ART / ITEM				
90,0	70,0	22,4	84,15	88,3	6,35	0,4	4,5	KDSB	0900	0700	224	CX
90,0	72,0	22,5	86,00	89,0	3,60	0,4	4,5	KDSB	0900	0720	225	CX
95,0	75,0	22,4	89,15	93,3	6,35	0,4	4,5	KDSB	0950	0750	224	CX
100,0	75,0	22,4	93,15	98,0	6,35	0,4	5,0	KDSB	1000	0750	224	CX
100,0	82,0	22,5	96,00	99,0	3,60	0,4	5,0	KDSB	1000	0820	225	CX
105,0	80,0	22,4	98,10	103,0	6,35	0,4	5,0	KDSB	1050	0800	224	CX
110,0	85,0	22,4	103,10	108,0	6,35	0,4	5,0	KDSB	1100	0850	224	CX
110,0	92,0	22,5	106,00	109,0	3,60	0,4	5,0	KDSB	1100	0920	225	CX
115,0	90,0	22,4	108,10	113,0	6,35	0,4	5,0	KDSB	1150	0900	224	CX
115,0	97,0	22,5	111,00	114,0	3,60	0,4	5,0	KDSB	1150	0970	225	CX
120,0	95,0	22,4	113,10	118,1	6,35	0,8	5,0	KDSB	1200	0950	224	CX
125,0	100,0	25,4	118,10	123,0	6,35	0,8	5,0	KDSB	1250	1000	254	CX
125,0	103,0	26,5	121,00	124,0	5,10	0,8	5,0	KDSB	1250	1030	265	CX
130,0	105,0	25,4	122,60	127,5	9,50	0,8	5,0	KDSB	1300	1050	254	CX
130,0	105,0	25,4	123,10	128,0	6,35	0,8	5,0	KDSB1	1300	1050	254	CX
135,0	110,0	25,4	127,60	132,5	9,50	0,8	5,0	KDSB	1350	1100	254	CX
135,0	110,0	25,4	128,10	133,0	6,35	0,8	5,0	KDSB1	1350	1100	254	CX
140,0	115,0	25,4	132,60	137,5	9,50	0,8	5,0	KDSB	1400	1150	254	CX
140,0	115,0	25,4	133,00	138,0	6,35	0,8	5,0	KDSB1	1400	1150	254	CX
140,0	118,0	26,5	136,00	139,0	5,10	0,8	5,0	KDSB	1400	1180	265	CX
145,0	120,0	25,4	137,60	142,5	9,50	0,8	5,0	KDSB	1450	1200	254	CX
145,0	120,0	25,4	138,30	143,0	6,35	0,8	5,0	KDSB1	1450	1200	254	CX
150,0	125,0	25,4	142,60	147,5	9,50	0,8	5,0	KDSB	1500	1250	254	CX
150,0	125,0	25,4	143,00	148,0	6,35	0,8	5,0	KDSB1	1500	1250	254	CX
150,0	128,0	26,5	146,00	149,0	5,10	0,8	5,0	KDSB	1500	1280	265	CX
155,0	130,0	25,4	147,60	152,5	9,50	0,8	5,0	KDSB	1550	1300	254	CX
155,0	130,0	25,4	148,00	153,0	6,35	0,8	5,0	KDSB1	1550	1300	254	CX
160,0	130,0	25,4	153,00	157,5	6,35	0,8	5,0	KDSB1	1600	1300	254	CX
160,0	130,0	25,4	152,60	157,5	9,50	0,8	5,0	KDSB	1600	1300	254	CX
160,0	135,0	25,4	152,60	157,5	9,50	0,8	5,0	KDSB	1600	1350	254	CX
160,0	138,0	26,5	156,00	159,0	5,10	0,8	5,0	KDSB	1600	1380	265	CX
165,0	140,0	25,4	157,60	162,5	9,50	0,8	5,0	KDSB	1650	1400	254	CX
170,0	145,0	25,4	161,70	167,1	12,70	0,8	5,0	KDSB	1700	1450	254	CX
170,0	148,0	26,5	166,00	169,0	5,10	0,8	5,0	KDSB	1700	1480	265	CX
175,0	150,0	25,4	166,70	172,1	12,70	0,8	5,0	KDSB	1750	1500	254	CX
180,0	150,0	35,4	172,95	177,9	6,35	0,8	5,0	KDSB	1800	1500	354	CX
180,0	155,0	25,4	171,70	177,1	12,70	0,8	5,0	KDSB	1800	1550	254	CX
185,0	160,0	25,4	176,70	182,1	12,70	0,8	5,0	KDSB	1850	1600	254	CX
190,0	165,0	25,4	181,70	187,0	12,70	0,8	5,0	KDSB	1900	1650	254	CX
195,0	170,0	25,4	186,70	192,0	12,70	0,8	5,0	KDSB	1950	1700	254	CX
200,0	175,0	25,4	191,60	197,0	12,70	0,8	6,0	KDSB	2000	1750	254	CX
210,0	185,0	25,4	201,60	207,0	12,70	0,8	6,0	KDSB	2100	1850	254	CX
220,0	190,0	35,4	212,70	217,9	6,35	0,8	6,0	KDSB	2200	1900	354	CX
220,0	195,0	25,4	211,60	217,0	12,70	0,8	6,0	KDSB	2200	1950	254	CX
230,0	205,0	25,4	221,60	227,0	12,70	0,8	6,0	KDSB	2300	2050	254	CX
240,0	215,0	25,4	231,60	237,0	12,70	0,8	6,0	KDSB	2400	2150	254	CX
250,0	220,0	35,4	242,90	247,9	6,35	0,8	6,0	KDSB	2500	2200	354	CX
250,0	225,0	25,4	241,60	247,0	12,70	0,8	6,0	KDSB	2500	2250	254	CX

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## TENUTA PISTONE COMPATTA TIPO KDSP

### DESCRIZIONE

La guarnizione **KDSP** nasce per tenuta pistone con sedi intercambiabili ISO 6547.

E' composta da soli tre elementi: quello centrale in poliuretano (che ha la funzione di tenuta) e due guide laterali in poliacetalica rinforzata vetro.

Questo sistema permette di eliminare i supporti antiestrusione, in quanto l'elemento centrale col suo alto modulo elastico ha una durezza superiore alla gomma nitrilica NBR.

L'attrito di primo distacco ed in esercizio si mantiene basso per la particolare geometria della guarnizione.

### DATI TECNICI

Pressione:	da 0 a 300 Bar con punte fino a 400 Bar a 60° C.
Velocità:	0,8 m/s
Temperatura:	da - 30° C a + 100 ° C
Fluidi:	oli a base minerale (vedi TABELLA I pagg. 12-13)

### MATERIALE

I materiali utilizzati per la costruzione di questo tipo di guarnizione sono i seguenti:

- l'elemento centrale in poliuretano di durezza 93 Sh A  
Codice materiale tipo CO
- gli elementi laterali in poliacetalica caricata vetro (POM)  
**Codice materiale: CX**

### MONTAGGIO

Il montaggio di questa tenuta può essere eseguito sia in cava chiusa su pistone monoblocco, sia in cava aperta su pistone in due pezzi.

E' necessario che il pistone non presenti bave di lavorazione meccanica che danneggerebbero l'elemento di tenuta durante il montaggio.

## COMPACT PISTON SEAL TYPE KDSP

### DESCRIPTION

The **KDSP** seal is designed to be a piston seal with interchangeable seats ISO 6547.

It consists of only three elements: a polyurethane seal at the centre and two side wiper rings in glass-filled polyacetal resin.

This system does away with anti-extrusion supports, given the high modulus of elasticity of the central element and the higher hardness when compared to nitrilic rubber.

Abrasion is also considerably reduced, thus facilitating the construction of the seat and bores and therefore extending the service life of the seal.

### TECHNICAL DATA

Pressure:	from 0 to 300 Bar with peaks up to 400 Bar at 60° C.
Speed:	0.8 m/s
Temperature:	from - 30° C to + 100 ° C
Fluids:	mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The materials used for the construction of this seal type are as follows:

- polyurethane for the central element, hardness 93 Sh A, compound reference CO
- glass-filled polyacetal resin (POM) for the side elements  
**Compound reference: CX**

### ASSEMBLY

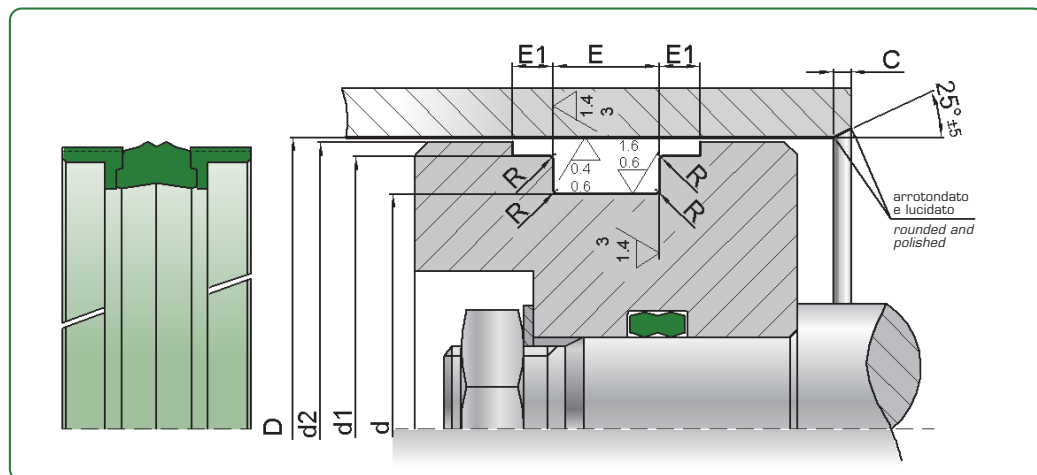
This seal can be assembled both in closed groove on a monobloc piston and in open groove on a two-part piston.

The piston must not have machining scores which might damage the sealing during the installation.



disegno / DRAWING

KDSP

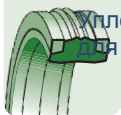


D <sub>H9</sub>	d <sub>H9</sub>	E <sub>+0,2</sub>	d <sub>1H9</sub>	d <sub>2±0,2</sub>	E <sub>1 0/+0,1</sub>	R	C	ART / ITEM				
* 25,0	15,0	12,5	22,0	24,0	4,0	0,4	5,0	KDSP	0250	0150	125	CX
* 25,0	17,0	10,0	22,0	24,0	4,0	0,4	5,0	KDSP	0250	0170	100	CX
* 32,0	22,0	12,5	29,0	31,0	4,0	0,4	5,0	KDSP	0320	0220	125	CX
* 32,0	24,0	10,0	29,0	31,0	4,0	0,4	5,0	KDSP	0320	0240	100	CX
* 40,0	30,0	12,5	36,0	38,0	4,0	0,4	5,0	KDSP	0400	0300	125	CX
* 40,0	32,0	10,0	37,0	39,0	4,0	0,4	5,0	KDSP	0400	0320	100	CX
* 50,0	35,0	20,0	46,0	48,5	5,0	0,4	5,0	KDSP	0500	0350	200	CX
* 50,0	40,0	12,5	47,0	49,0	4,0	0,4	5,0	KDSP	0500	0400	125	CX
* 55,0	45,0	12,5	52,0	54,0	4,0	0,4	5,0	KDSP	0550	0450	125	CX
* 63,0	48,0	20,0	59,0	62,0	5,0	0,4	5,0	KDSP	0630	0480	200	CX
* 63,0	53,0	12,5	60,0	62,0	4,0	0,4	5,0	KDSP	0630	0530	125	CX
* 70,0	55,0	20,0	66,0	68,5	5,0	0,4	5,0	KDSP	0700	0550	200	CX
* 70,0	60,0	12,5	67,0	69,0	4,0	0,4	5,0	KDSP	0700	0600	125	CX
* 80,0	65,0	20,0	76,0	78,5	5,0	0,4	5,0	KDSP	0800	0650	200	CX
* 80,0	70,0	12,5	77,0	79	4,0	0,4	5,0	KDSP	0800	0700	125	CX
* 90,0	75,0	20,0	86,0	88,5	5,0	0,4	5,0	KDSP	0900	0750	200	CX
* 90,0	80,0	12,5	86,0	88,5	5,0	0,4	5,0	KDSP	0900	0800	125	CX
* 100,0	85,0	20,0	96,0	98,5	5,0	0,4	5,0	KDSP	1000	0850	200	CX
100,0	90,0	12,5	96,0	98,5	5,0	0,4	5,0	KDSP	1000	0900	125	CX

\* ISO 7425

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## TENUTA PISTONE COMPATTA TIPO KDAE

### DESCRIZIONE

Sempre tra le tenute pistone compatte, la guarnizione **KDAE** nasce con un elemento centrale in poliuretano e due anelli antiestrusione ai lati.

L'assemblaggio combinato del poliuretano ad alto modulo elastico, con due anelli in elastomero con elevata durezza, rendono la tenuta molto stabile anche alle alte pressioni. Paragonata alla gomma, l'abrasione risulta molto inferiore con l'utilizzo del poliuretano aumentandone in questo caso la durata del pistone stesso.

L'attrito di primo distacco ed in esercizio, per lo speciale profilo geometrico della tenuta, è maggiormente performante rispetto alla guarnizione in NBR.

### DATI TECNICI

Pressione:	da 0 a 400 bar
Velocità:	< 0,8 m/s
Temperatura:	da - 30° C a + 100° C con punte fino a 110° C
Fluidi:	oli a base minerale (vedi TABELLA I pagg.12-13)

### MATERIALE

I materiali utilizzati per la costruzione di questo tipo di tenuta sono i seguenti :

- elemento centrale in poliuretano di durezza 93 Shore A Codice materiale tipo CO.
- gli anelli antiestrusione laterali in termoplastico di durezza 63 Shore D Codice materiale tipo L2

**Codice materiale: CR**

### MONTAGGIO

Il montaggio di questa tenuta può essere eseguito sia in cava chiusa su pistone monoblocco, sia in cava aperta su pistone in due pezzi.

E' importante che il pistone non presenti bave di lavorazione meccanica che andrebbero a danneggiare la tenuta durante il montaggio.

E' consigliato ingrassare il pistone per facilitare il montaggio.

## COMPACT PISTON SEAL TYPE KDAE

### DESCRIPTION

Amongst the compact piston seal series, the **KDAE** type is designed with a central polyurethane element and two side anti-extrusion rings.

The assembly between the polyurethane element with high elastic modulus and the two elastomer rings with high hardness enhances stability of the sealing even at heavy duty applications.

Compared to rubber, the abrasion is also reduced due to the use of polyurethane, therefore extending the service life of the seal in the system.

Abrasion is also considerably reduced, thus facilitating the construction of the seat and bores, due to the special geometry of the seal itself better performing than NBR.

### TECHNICAL DATA

Pressure:	from 0 to 400 bar
Speed:	< 0.8 m/s
Temperature:	from - 30° C to + 100° C with peaks up to + 110° C
Fluids:	mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The materials used for the construction of this seal type are as follows:

- polyurethane for the central element, hardness 93 Sh A (CO)
- the backup rings in TPE elastomer 63 Shore D (L2).

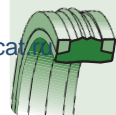
**Compound reference: CR**

### ASSEMBLY

This seal can be assembled both in closed groove on a monobloc piston and in open groove on a two-part piston.

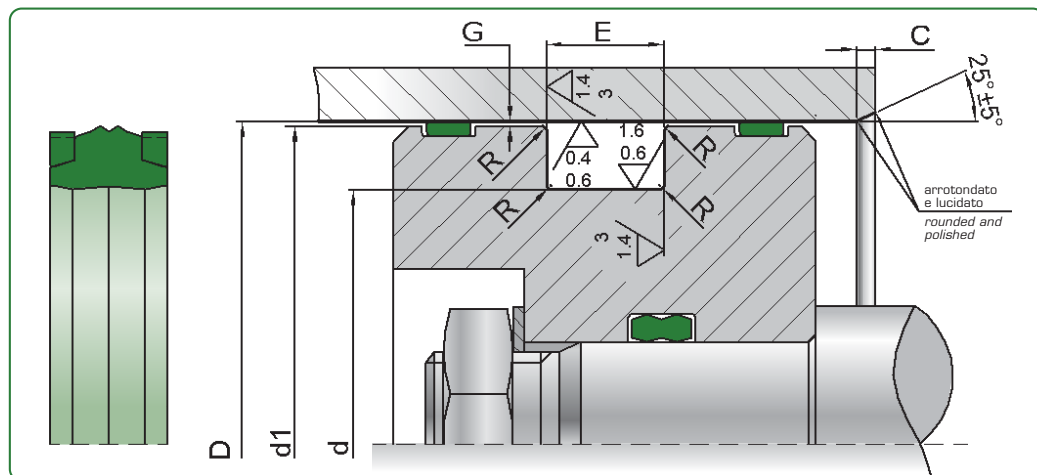
The piston must not have machining scores which might damage the sealing during the installation.

Recommended to grease the piston to facilitate mounting.



disegno / DRAWING

KDAE



D <sub>H9</sub>	d <sub>H9</sub>	E <sub>+0,2</sub>	C	ART / ITEM				
50,0	36,0	9,0	4,0	KDAE	0500	0360	090	CR
50,0	38,0	10,0	4,0	KDAE	0500	0380	100	CR
55,0	41,0	9,0	4,0	KDAE	0550	0410	090	CR
60,0	46,0	9,0	4,0	KDAE	0600	0460	090	CR
63,0	48,0	11,0	4,0	KDAE	0630	0480	110	CR
63,0	51,0	10,0	4,0	KDAE	0630	0510	100	CR
65,0	50,0	11,0	4,0	KDAE	0650	0500	110	CR
70,0	53,0	14,0	4,0	KDAE	0700	0530	140	CR
70,0	55,0	11,0	4,0	KDAE	0700	0550	110	CR
75,0	60,0	11,0	4,0	KDAE	0750	0600	110	CR
80,0	63,0	14,0	4,0	KDAE	0800	0630	140	CR
80,0	65,0	11,0	4,0	KDAE	0800	0650	110	CR
85,0	70,0	11,0	4,0	KDAE	0850	0700	110	CR
90,0	73,0	14,0	5,0	KDAE	0900	0730	140	CR
90,0	75,0	11,0	5,0	KDAE	0900	0750	110	CR
95,0	80,0	11,0	5,0	KDAE	0950	0800	110	CR
100,0	83,0	14,0	5,0	KDAE	1000	0830	140	CR
100,0	85,0	12,5	5,0	KDAE	1000	0850	125	CR
105,0	88,0	14,0	5,0	KDAE	1050	0880	140	CR
105,0	90,0	12,5	5,0	KDAE	1050	0900	125	CR
110,0	93,0	14,0	5,0	KDAE	1100	0930	140	CR
110,0	95,0	12,5	5,0	KDAE	1100	0950	125	CR
115,0	98,0	14,0	5,0	KDAE	1150	0980	140	CR
115,0	100,0	12,5	5,0	KDAE	1150	1000	125	CR
120,0	103,0	14,0	5,0	KDAE	1200	1030	140	CR
120,0	105,0	12,5	5,0	KDAE	1200	1050	125	CR
125,0	108,0	14,0	5,0	KDAE	1250	1080	140	CR

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





**ANELLI GUIDA INTERNO TIPO HIS**

**DESCRIZIONE**

I pattini di guida tipo **HIS**, hanno la funzione di mantenere in asse tutto il sistema cilindro (stelo con testata, pistone con camicia).

Svolgono una funzione importante aiutando la tenuta stelo, il raschiatore e la tenuta pistone a lavorare senza disallineamenti garantendo nello stesso momento il non contatto delle parti metalliche tra loro.

Il materiale con un coefficiente di attrito molto basso non crea perdite di carico (linearità).

Sopporta deformazioni sotto carico elevate avendo un punto di rammollimento vicino al punto di fusione (lavora in esercizio a 115° C).

Per facilitare la scelta della guida pistone o stelo consigliamo questa formula per conoscere l'altezza della guida da inserire nel sistema.

$$h = \frac{F \times Q}{D \times G} \text{ per pistone} \quad \text{e} \quad h = \frac{F \times Q}{d \times G} \text{ per stelo}$$

Dove:

h = altezza guida in mm.

F = forza radiale applicata

Q = forza radiale sopportata dal materiale

D = diametro camicia

d = diametro stelo

**DATI TECNICI**

Velocità:	< 0,8 m/s
Temperatura:	da - 40° C a + 115° C
Carico radiale Q:	35 N/mm <sup>2</sup> a temperatura di 60° C
Fluidi:	oli e fluidi a base minerale (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale è una resina poliacetaleica rinforzata con fibra di vetro.

Per temperature di esercizio superiori ai 115° C il materiale è una resina poliammidica rinforzata.

**Codice materiale per temp < 115° C: R0**

**Codice materiale per temp > 115° C: R1**

**MONTAGGIO**

Il montaggio si esegue facilmente essendo la guida tagliata ed avendo un'ottima elasticità.

La presenza sui due lati di smussi facilita l'inserimento dello stelo.

**INTERNAL WEAR RINGS TYPE HIS**

**DESCRIPTION**

The **HIS** wear rings are meant to keep all the parts of the cylinder aligned (the rod with the head, the piston with the bore).

They play an important role as they help the rod seal, the wiper and the piston seal in working without any misalignments and at the same time they prevent any contact between the metal parts.

The material, which has a very low friction factor, does not cause load losses (linearity).

It endures deformations under heavy loads, as the softening point is close to the fusion point (it works at 115° C).

To facilitate the choice of the piston or rod guide, we suggest the use of this formula to find the wear ring length.

$$h = \frac{F \times Q}{D \times G} \text{ for the piston} \quad \text{and} \quad h = \frac{F \times Q}{d \times G} \text{ for the rod}$$

Where:

h = wear ring length in mm.

F = radial force applied

Q = radial force endured by the material

D = bore diameter

d = rod diameter

**TECHNICAL DATA**

Speed:	< 0,8 m/s
Temperature:	from - 40° C to + 115° C
Radial load Q:	35 N/mm <sup>2</sup> at a temperature of 60° C
Fluids:	mineral oils and fluids (see TABLE I, pages 12-13)

**MATERIAL**

The material is a polyacetaleic resin reinforced with fibreglass.

For working temperatures higher than 115° C, the material is a reinforced polyamidic resin.

**Compound reference for temp < 115° C: R0**

**Compound reference for temp > 115° C: R1**

**ASSEMBLY**

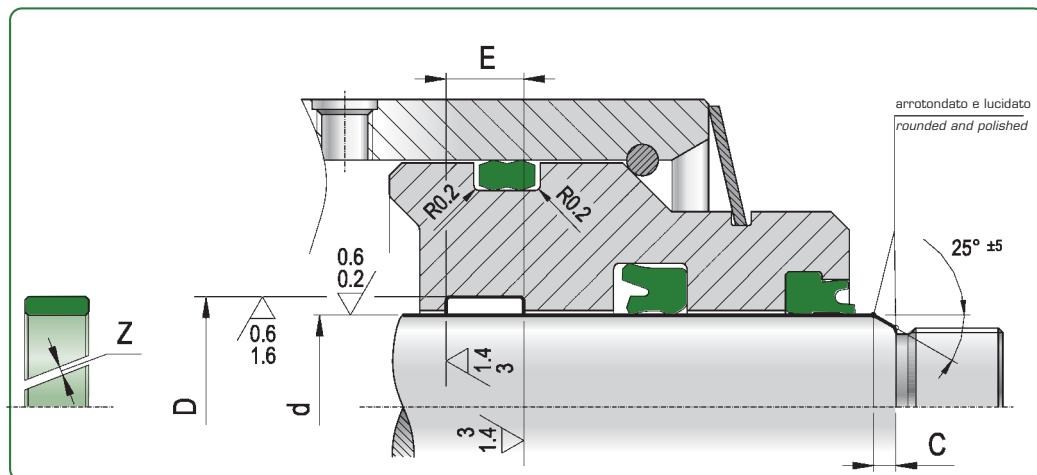
The assembly is done easily as the wear ring is cut and extremely elastic.

The presence of chamfers on both sides facilitates the insertion of the rod.



disegno / DRAWING

HIS



diametri diameters d-D	0 - 50	51 - 100	101 - 150	151 - 300
z. mm ≥	2,0	2,5	3,0	3,5

dh9	D <sub>-0</sub> +0,05	E +0,2	C	ART / ITEM				
12,0	16,0	9,6	> 3	HIS	0120	0160	096	RO
14,0	18,0	9,6	> 3	HIS	0140	0180	096	RO
16,0	20,0	9,6	> 3	HIS	0160	0200	096	RO
18,0	22,0	9,6	> 3	HIS	0180	0220	096	RO
20,0	24,0	9,6	> 3	HIS	0200	0240	096	RO
20,0	25,0	5,6	> 3	HIS	0200	0250	056	RO
20,0	25,0	9,7	> 3	HIS	0200	0250	097	RO
22,0	26,0	9,6	> 3	HIS	0220	0260	096	RO
22,0	27,0	5,6	> 3	HIS	0220	0270	056	RO
22,0	27,0	9,7	> 3	HIS	0220	0270	097	RO
25,0	29,0	9,6	> 3	HIS	0250	0290	096	RO
25,0	30,0	5,6	> 3	HIS	0250	0300	056	RO
25,0	30,0	9,7	> 3	HIS	0250	0300	097	RO
26,0	30,0	9,6	> 3	HIS	0260	0300	096	RO
27,0	32,0	5,6	> 3	HIS	0270	0320	056	RO
27,0	32,0	9,7	> 3	HIS	0270	0320	097	RO
28,0	32,0	9,6	> 3	HIS	0280	0320	096	RO
28,0	33,0	5,6	> 3	HIS	0280	0330	056	RO
28,0	33,0	9,7	> 3	HIS	0280	0330	097	RO
30,0	34,0	9,6	> 3	HIS	0300	0340	096	RO
30,0	35,0	5,6	> 3	HIS	0300	0350	056	RO
30,0	35,0	9,7	> 3	HIS	0300	0350	097	RO
32,0	36,0	9,6	> 3	HIS	0320	0360	096	RO
32,0	37,0	5,6	> 3	HIS	0320	0370	056	RO
32,0	37,0	9,7	> 3	HIS	0320	0370	097	RO
35,0	39,0	9,6	> 3	HIS	0350	0390	096	RO
35,0	40,0	5,6	> 3	HIS	0350	0400	056	RO
35,0	40,0	9,7	> 3	HIS	0350	0400	097	RO
36,0	40,0	9,6	> 3	HIS	0360	0400	096	RO
36,0	41,0	5,6	> 3	HIS	0360	0410	056	RO
36,0	41,0	9,7	> 3	HIS	0360	0410	097	RO
38,0	42,0	9,6	> 3	HIS	0380	0420	096	RO
40,0	44,0	9,6	> 3	HIS	0400	0440	096	RO



dh9	D <sub>-0,+0,05</sub>	E +0,2	C	ART / ITEM				
40,0	45,0	5,6	> 3	HIS	0400	0450	056	RO
40,0	45,0	9,7	> 3	HIS	0400	0450	097	RO
40,0	45,0	15,0	> 3	HIS	0400	0450	150	RO
42,0	46,0	9,6	> 3	HIS	0420	0460	096	RO
43,0	48,0	5,6	> 3	HIS	0430	0480	056	RO
45,0	50,0	5,6	> 3	HIS	0450	0500	056	RO
45,0	50,0	9,7	> 3	HIS	0450	0500	097	RO
45,0	50,0	15,0	> 3	HIS	0450	0500	150	RO
45,0	51,0	9,6	> 3	HIS	0450	0510	096	RO
46,0	52,0	9,6	> 3	HIS	0460	0520	096	RO
47,0	52,0	5,6	> 3	HIS	0470	0520	056	RO
47,0	52,0	9,7	> 3	HIS	0470	0520	097	RO
48,0	54,0	9,6	> 3	HIS	0480	0540	096	RO
50,0	55,0	5,6	> 3	HIS	0500	0550	056	RO
50,0	55,0	9,7	> 3	HIS	0500	0550	097	RO
50,0	55,0	15,0	> 3	HIS	0500	0550	150	RO
50,0	56,0	9,6	> 3	HIS	0500	0560	096	RO
55,0	60,0	5,6	> 3	HIS	0550	0600	056	RO
55,0	60,0	9,7	> 3	HIS	0550	0600	097	RO
55,0	60,0	15,0	> 3	HIS	0550	0600	150	RO
55,0	61,0	9,6	> 3	HIS	0550	0610	096	RO
56,0	61,0	5,6	> 3	HIS	0560	0610	056	RO
56,0	61,0	9,7	> 3	HIS	0560	0610	097	RO
56,0	62,0	12,8	> 3	HIS	0560	0620	128	RO
58,0	63,0	5,6	> 3	HIS	0580	0630	056	RO
58,0	63,0	9,7	> 3	HIS	0580	0630	097	RO
60,0	65,0	5,6	> 3	HIS	0600	0650	056	RO
60,0	65,0	9,7	> 3	HIS	0600	0650	097	RO
60,0	65,0	15,0	> 3	HIS	0600	0650	150	RO
60,0	66,0	12,8	> 3	HIS	0600	0660	128	RO
63,0	68,0	5,6	> 3	HIS	0630	0680	056	RO
63,0	68,0	9,7	> 3	HIS	0630	0680	097	RO
63,0	69,0	12,8	> 3	HIS	0630	0690	128	RO
65,0	70,0	5,6	> 3	HIS	0650	0700	056	RO
65,0	70,0	9,7	> 3	HIS	0650	0700	097	RO
65,0	70,0	15,0	> 3	HIS	0650	0700	150	RO
65,0	71,0	12,8	> 3	HIS	0650	0710	128	RO
67,0	72,0	5,6	> 3	HIS	0670	0720	056	RO
70,0	75,0	5,6	> 3	HIS	0700	0750	056	RO
70,0	75,0	9,7	> 3	HIS	0700	0750	097	RO
70,0	75,0	15,0	> 3	HIS	0700	0750	150	RO
70,0	76,0	12,8	> 3	HIS	0700	0760	128	RO
72,0	78,0	12,8	> 3	HIS	0720	0780	128	RO
75,0	80,0	5,6	> 4	HIS	0750	0800	056	RO
75,0	80,0	9,7	> 4	HIS	0750	0800	097	RO
75,0	80,0	15,0	> 4	HIS	0750	0800	150	RO
75,0	81,0	12,8	> 4	HIS	0750	0810	128	RO
76,0	82,0	12,8	> 4	HIS	0760	0820	128	RO
80,0	85,0	5,6	> 4	HIS	0800	0850	056	RO
80,0	85,0	9,7	> 4	HIS	0800	0850	097	RO
80,0	85,0	15,0	> 4	HIS	0800	0850	150	RO
80,0	86,0	12,8	> 4	HIS	0800	0860	128	RO
85,0	90,0	5,6	> 4	HIS	0850	0900	056	RO
85,0	90,0	9,7	> 4	HIS	0850	0900	097	RO
85,0	90,0	15,0	> 4	HIS	0850	0900	150	RO
85,0	91,0	12,8	> 4	HIS	0850	0910	128	RO
90,0	95,0	5,6	> 4	HIS	0900	0950	056	RO
90,0	95,0	9,7	> 4	HIS	0900	0950	097	RO
90,0	95,0	15,0	> 4	HIS	0900	0950	150	RO
90,0	96,0	12,8	> 4	HIS	0900	0960	128	RO
92,0	97,0	5,6	> 4	HIS	0920	0970	056	RO
95,0	100,0	5,6	> 4	HIS	0950	1000	056	RO
95,0	100,0	9,7	> 4	HIS	0950	1000	097	RO
95,0	100,0	15,0	> 4	HIS	0950	1000	150	RO
95,0	100,0	20,0	> 4	HIS	0950	1000	200	RO
95,0	100,0	25,0	> 4	HIS	0950	1000	250	RO



dh9	D <sub>-0</sub> +0,05	E +0,2	C	ART / ITEM				
95,0	101,0	12,8	> 4	HIS	0950	1010	128	RO
100,0	105,0	5,6	> 4	HIS	1000	1050	056	RO
100,0	105,0	9,7	> 4	HIS	1000	1050	097	RO
100,0	105,0	15,0	> 4	HIS	1000	1050	150	RO
100,0	105,0	20,0	> 4	HIS	1000	1050	200	RO
100,0	105,0	25,0	> 4	HIS	1000	1050	250	RO
100,0	106,0	12,8	> 4	HIS	1000	1060	128	RO
105,0	110,0	9,7	> 4	HIS	1050	1100	097	RO
105,0	110,0	15,0	> 4	HIS	1050	1100	150	RO
105,0	110,0	20,0	> 4	HIS	1050	1100	200	RO
105,0	110,0	25,0	> 4	HIS	1050	1100	250	RO
105,0	111,0	12,8	> 4	HIS	1050	1110	128	RO
110,0	115,0	9,7	> 4	HIS	1100	1150	097	RO
110,0	115,0	15,0	> 4	HIS	1100	1150	150	RO
110,0	115,0	20,0	> 4	HIS	1100	1150	200	RO
110,0	115,0	25,0	> 4	HIS	1100	1150	250	RO
110,0	116,0	12,8	> 4	HIS	1100	1160	128	RO
115,0	120,0	9,7	> 4	HIS	1150	1200	097	RO
115,0	120,0	15,0	> 4	HIS	1150	1200	150	RO
115,0	120,0	20,0	> 4	HIS	1150	1200	200	RO
115,0	120,0	25,0	> 4	HIS	1150	1200	250	RO
115,0	121,0	12,8	> 4	HIS	1150	1210	128	RO
120,0	125,0	9,7	> 4	HIS	1200	1250	097	RO
120,0	125,0	15,0	> 4	HIS	1200	1250	150	RO
120,0	125,0	20,0	> 4	HIS	1200	1250	200	RO
120,0	125,0	25,0	> 4	HIS	1200	1250	250	RO
120,0	126,0	12,8	> 4	HIS	1200	1260	128	RO
125,0	130,0	15,0	> 4	HIS	1250	1300	150	RO
125,0	130,0	20,0	> 4	HIS	1250	1300	200	RO
125,0	130,0	25,0	> 4	HIS	1250	1300	250	RO
125,0	131,0	12,8	> 4	HIS	1250	1310	128	RO
130,0	135,0	15,0	> 4	HIS	1300	1350	150	RO
130,0	135,0	20,0	> 4	HIS	1300	1350	200	RO
130,0	135,0	25,0	> 4	HIS	1300	1350	250	RO
130,0	136,0	12,8	> 4	HIS	1300	1360	128	RO
135,0	140,0	15,0	> 4	HIS	1350	1400	150	RO
135,0	140,0	20,0	> 4	HIS	1350	1400	200	RO
135,0	140,0	25,0	> 4	HIS	1350	1400	250	RO
135,0	141,0	12,8	> 4	HIS	1350	1410	128	RO
140,0	145,0	15,0	> 4	HIS	1400	1450	150	RO
140,0	145,0	20,0	> 4	HIS	1400	1450	200	RO
140,0	145,0	25,0	> 4	HIS	1400	1450	250	RO
140,0	146,0	12,8	> 4	HIS	1400	1460	128	RO
145,0	150,0	15,0	> 4	HIS	1450	1500	150	RO
145,0	150,0	20,0	> 4	HIS	1450	1500	200	RO
145,0	150,0	25,0	> 4	HIS	1450	1500	250	RO
145,0	151,0	12,8	> 4	HIS	1450	1510	128	RO
150,0	156,0	12,8	> 4	HIS	1500	1560	128	RO
155,0	161,0	19,2	> 4	HIS	1550	1610	192	RO
160,0	166,0	19,2	> 5	HIS	1600	1660	192	RO
165,0	171,0	19,2	> 5	HIS	1650	1710	192	RO
170,0	176,0	19,2	> 5	HIS	1700	1760	192	RO
175,0	181,0	19,2	> 5	HIS	1750	1810	192	RO
180,0	186,0	19,2	> 5	HIS	1800	1860	192	RO
185,0	191,0	19,2	> 5	HIS	1850	1910	192	RO
190,0	196,0	19,2	> 5	HIS	1900	1960	192	RO
195,0	201,0	19,2	> 5	HIS	1950	2100	192	RO
200,0	206,0	19,2	> 5	HIS	2000	2060	192	RO
205,0	211,0	19,2	> 5	HIS	2050	2110	192	RO
210,0	216,0	19,2	> 5	HIS	2100	2160	192	RO
215,0	221,0	19,2	> 5	HIS	2150	2210	192	RO
220,0	226,0	19,2	> 5	HIS	2200	2260	192	RO
225,0	231,0	19,2	> 5	HIS	2250	2310	192	RO
230,0	236,0	19,2	> 5	HIS	2300	2360	192	RO
235,0	241,0	19,2	> 5	HIS	2350	2410	192	RO
240,0	246,0	19,2	> 5	HIS	2400	2460	192	RO
245,0	251,0	19,2	> 5	HIS	2450	2510	192	RO



**ANELLI GUIDA ESTERNO TIPO HES**

**DESCRIZIONE**

I pattini di guida tipo **HES**, hanno la funzione di mantenere in asse tutto il sistema cilindro (stelo con testata, pistone con camicia).

Svolgono una funzione importante aiutando la tenuta stelo, il raschiatore e la tenuta pistone a lavorare senza disallineamenti garantendo nello stesso momento il non contatto delle parti metalliche tra loro.

Il materiale con un coefficiente di attrito molto basso non crea perdite di carico (linearità).

Sopporta deformazioni sotto carico elevate avendo un punto di rammollimento vicino al punto di fusione (lavora in esercizio a 115° C).

Per facilitare la scelta della guida pistone o stelo consigliamo questa formula per conoscere l'altezza della guida da inserire nel sistema.

$$h = \frac{F \times 2}{D \times Q} \text{ per pistone} \quad \text{e} \quad h = \frac{F \times 2}{d \times Q} \text{ per stelo}$$

Dove:

h = altezza guida in mm.

F = forza radiale applicata

Q = forza radiale sopportata dal materiale

D = diametro camicia

d = diametro stelo

**DATI TECNICI**

Velocità:	< 0,8 m/s
Temperatura:	da - 40° C a + 115° C
Carico radiale Q:	35 N/mm <sup>2</sup> a temperatura di 60° C
Fluidi:	oli e fluidi a base minerale (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale è una resina poliacetaleica rinforzata con fibra di vetro.

Per temperature di esercizio superiori ai 115° C il materiale è una resina poliammidica rinforzata.

**Codice materiale per temp < 115° C: R0**

**Codice materiale per temp > 115° C: R1**

**MONTAGGIO**

Il montaggio si esegue facilmente essendo la guida tagliata ed avendo un'ottima elasticità.

La presenza sui due lati di smussi facilita l'inserimento dello stelo.

**EXTERNAL WEAR RINGS TYPE HES**

**DESCRIPTION**

The **HES** wear rings are meant to keep all the parts of the cylinder aligned (the rod with the head, the piston with the bore).

They play an important role as they help the rod seal, the wiper and the piston seal in working without any misalignments and at the same time they prevent any contact between the metal parts.

The material, which has a very low friction factor, does not cause load losses (linearity).

It endures deformations under heavy loads, as the softening point is close to the fusion point ( it works at 115° C).

To facilitate the choice of the piston or rod guide, we suggest the use of this formula to find the wear ring length.

$$h = \frac{F \times 2}{D \times Q} \text{ for the piston} \quad \text{and} \quad h = \frac{F \times 2}{d \times Q} \text{ for the rod}$$

Where:

h = wear ring length in mm.

F = radial force applied

Q = radial force endured by the material

D = bore diameter

d = rod diameter

**TECHNICAL DATA**

Speed:	< 0,8 m/s
Temperature:	from - 40° C to + 115° C
Radial load Q:	35 N/mm <sup>2</sup> at a temperature of 60° C
Fluids:	mineral oils and fluids (see TABLE I, pages 12-13)

**MATERIAL**

The material is a polyacetaleic resin reinforced with fibreglass.

For working temperatures higher than 115° C, the material is a reinforced polyamidic resin.

**Compound reference for temp < 115° C: R0**

**Compound reference for temp > 115° C: R1**

**ASSEMBLY**

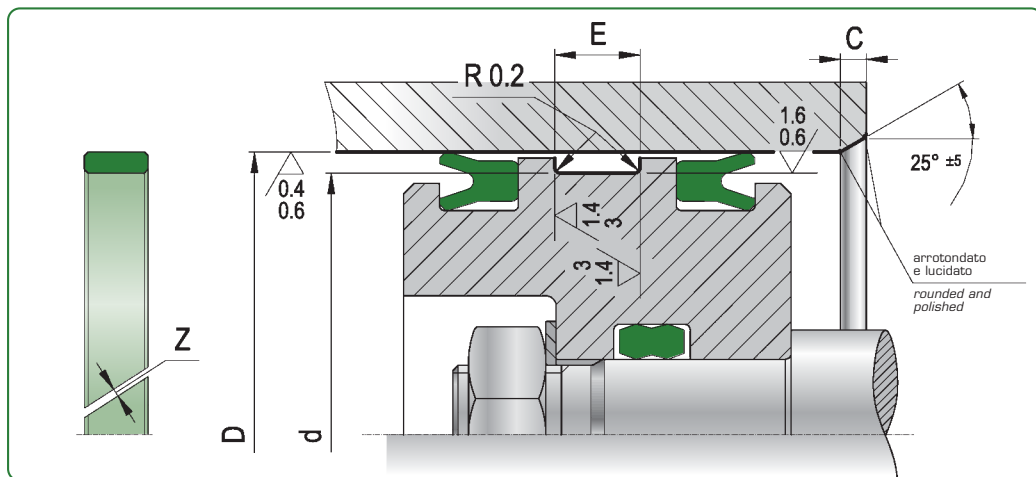
The assembly is done easily as the wear ring is cut and extremely elastic.

The presence of chamfers on both sides facilitates the insertion of the rod.



disegno / DRAWING

HES



diametri diameters D-d	0 - 50	51 - 100	101 - 150	151 - 300
z. mm ≥	2,0	2,5	3,0	3,5

D H9	d +0 -0,05	E +0,2	C	ART / ITEM				
16,0	12,0	9,6	> 3	HES	0160	0120	096	RO
18,0	14,0	9,6	> 3	HES	0180	0140	096	RO
20,0	16,0	9,6	> 3	HES	0200	0160	096	RO
22,0	18,0	9,6	> 3	HES	0220	0180	096	RO
24,0	20,0	9,6	> 3	HES	0240	0200	096	RO
25,0	20,0	5,6	> 3	HES	0250	0200	056	RO
25,0	20,0	9,7	> 3	HES	0250	0200	097	RO
25,0	21,0	9,6	> 3	HES	0250	0210	096	RO
27,0	22,0	5,6	> 3	HES	0270	0220	056	RO
27,0	22,0	9,7	> 3	HES	0270	0220	097	RO
28,0	24,0	9,6	> 3	HES	0280	0240	096	RO
30,0	25,0	5,6	> 3	HES	0300	0250	056	RO
30,0	25,0	9,7	> 3	HES	0300	0250	097	RO
30,0	26,0	9,6	> 3	HES	0300	0260	096	RO
32,0	27,0	5,6	> 3	HES	0320	0270	056	RO
32,0	27,0	9,7	> 3	HES	0320	0270	097	RO
32,0	28,0	9,6	> 3	HES	0320	0280	096	RO
33,0	28,0	5,6	> 3	HES	0330	0280	056	RO
33,0	28,0	9,7	> 3	HES	0330	0280	097	RO
34,0	30,0	9,6	> 3	HES	0340	0300	096	RO
35,0	30,0	5,6	> 3	HES	0350	0300	056	RO
35,0	30,0	9,7	> 3	HES	0350	0300	097	RO
35,0	31,0	9,6	> 3	HES	0350	0310	096	RO
36,0	32,0	9,6	> 3	HES	0360	0320	096	RO
37,0	32,0	5,6	> 3	HES	0370	0320	056	RO
37,0	32,0	9,7	> 3	HES	0370	0320	097	RO
40,0	35,0	5,6	> 3	HES	0400	0350	056	RO
40,0	35,0	9,7	> 3	HES	0400	0350	097	RO
40,0	36,0	9,6	> 3	HES	0400	0360	096	RO
41,0	36,0	5,6	> 3	HES	0410	0360	056	RO

SISTEMI DI TENUTA PER OLEODINAMICA  
HYDRAULIC SEALING SYSTEMS



D H9	d +0 -0,05	E +0,2	C	ART / ITEM				
41,0	36,0	9,7	> 3	HES	0410	0360	097	RO
45,0	40,0	5,6	> 3	HES	0450	0400	056	RO
45,0	40,0	9,7	> 3	HES	0450	0400	097	RO
45,0	40,0	15,0	> 3	HES	0450	0400	150	RO
45,0	41,0	9,6	> 3	HES	0450	0410	096	RO
48,0	43,0	5,6	> 3	HES	0480	0430	056	RO
50,0	44,0	9,6	> 3	HES	0500	0440	096	RO
50,0	45,0	5,6	> 3	HES	0500	0450	056	RO
50,0	45,0	9,7	> 3	HES	0500	0450	097	RO
50,0	45,0	15,0	> 3	HES	0500	0450	150	RO
52,0	47,0	5,6	> 3	HES	0520	0470	056	RO
52,0	47,0	9,7	> 3	HES	0520	0470	097	RO
55,0	49,0	12,8	> 3	HES	0550	0490	128	RO
55,0	50,0	5,6	> 3	HES	0550	0500	056	RO
55,0	50,0	9,7	> 3	HES	0550	0500	097	RO
55,0	50,0	15,0	> 3	HES	0550	0500	150	RO
60,0	54,0	12,8	> 3	HES	0600	0540	128	RO
60,0	55,0	5,6	> 3	HES	0600	0550	056	RO
60,0	55,0	9,7	> 3	HES	0600	0550	097	RO
60,0	55,0	15,0	> 3	HES	0600	0550	150	RO
61,0	56,0	5,6	> 3	HES	0610	0560	056	RO
61,0	56,0	9,7	> 3	HES	0610	0560	097	RO
63,0	57,0	12,8	> 3	HES	0630	0570	128	RO
63,0	58,0	5,6	> 3	HES	0630	0580	056	RO
63,0	58,0	9,7	> 3	HES	0630	0580	097	RO
65,0	59,0	12,8	> 3	HES	0650	0590	128	RO
65,0	60,0	5,6	> 3	HES	0650	0600	056	RO
65,0	60,0	9,7	> 3	HES	0650	0600	097	RO
65,0	60,0	15,0	> 3	HES	0650	0600	150	RO
68,0	63,0	5,6	> 3	HES	0680	0630	056	RO
68,0	63,0	9,7	> 3	HES	0680	0630	097	RO
70,0	64,0	12,8	> 3	HES	0700	0640	128	RO
70,0	65,0	5,6	> 3	HES	0700	0650	056	RO
70,0	65,0	9,7	> 3	HES	0700	0650	097	RO
70,0	65,0	15,0	> 3	HES	0700	0650	150	RO
72,0	67,0	5,6	> 3	HES	0720	0670	056	RO
75,0	69,0	12,8	> 3	HES	0750	0690	128	RO
75,0	70,0	5,6	> 3	HES	0750	0700	056	RO
75,0	70,0	9,7	> 3	HES	0750	0700	097	RO
75,0	70,0	15,0	> 3	HES	0750	0700	150	RO
80,0	74,0	12,8	> 4	HES	0800	0740	128	RO
80,0	75,0	5,6	> 4	HES	0800	0750	056	RO
80,0	75,0	9,7	> 4	HES	0800	0750	097	RO
80,0	75,0	15,0	> 4	HES	0800	0750	150	RO
85,0	79,0	12,8	> 4	HES	0850	0790	128	RO
85,0	80,0	5,6	> 4	HES	0850	0800	056	RO
85,0	80,0	9,7	> 4	HES	0850	0800	097	RO
85,0	80,0	15,0	> 4	HES	0850	0800	150	RO
90,0	84,0	12,8	> 4	HES	0900	0840	128	RO
90,0	85,0	5,6	> 4	HES	0900	0850	056	RO
90,0	85,0	9,7	> 4	HES	0900	0850	097	RO
90,0	85,0	15,0	> 4	HES	0900	0850	150	RO
95,0	89,0	12,8	> 4	HES	0950	0890	128	RO
95,0	90,0	5,6	> 4	HES	0950	0900	056	RO
95,0	90,0	9,7	> 4	HES	0950	0900	097	RO
95,0	90,0	15,0	> 4	HES	0950	0900	150	RO
97,0	92,0	5,6	> 4	HES	0970	0920	056	RO
100,0	94,0	12,8	> 4	HES	1000	0940	128	RO
100,0	95,0	5,6	> 4	HES	1000	0950	056	RO
100,0	95,0	9,7	> 4	HES	1000	0950	097	RO
100,0	95,0	15,0	> 4	HES	1000	0950	150	RO
100,0	95,0	20,0	> 4	HES	1000	0950	200	RO
100,0	95,0	25,0	> 4	HES	1000	0950	250	RO
105,0	99,0	12,8	> 4	HES	1050	0990	128	RO
105,0	100,0	5,6	> 4	HES	1050	1000	056	RO
105,0	100,0	9,7	> 4	HES	1050	1000	097	RO



D H9	d +0 -0,05	E +0,2	C	ART / ITEM				
105,0	100,0	15,0	> 4	HES	1050	1000	150	RO
105,0	100,0	20,0	> 4	HES	1050	1000	200	RO
105,0	100,0	25,0	> 4	HES	1050	1000	250	RO
110,0	104,0	12,8	> 4	HES	1100	1040	128	RO
110,0	105,0	9,7	> 4	HES	1100	1050	097	RO
110,0	105,0	15,0	> 4	HES	1100	1050	150	RO
110,0	105,0	20,0	> 4	HES	1100	1050	200	RO
110,0	105,0	25,0	> 4	HES	1100	1050	250	RO
115,0	109,0	12,8	> 4	HES	1150	1090	128	RO
115,0	110,0	9,7	> 4	HES	1150	1100	097	RO
115,0	110,0	15,0	> 4	HES	1150	1100	150	RO
115,0	110,0	20,0	> 4	HES	1150	1100	200	RO
115,0	110,0	25,0	> 4	HES	1150	1100	250	RO
120,0	114,0	12,8	> 4	HES	1200	1140	128	RO
120,0	115,0	9,7	> 4	HES	1200	1150	097	RO
120,0	115,0	15,0	> 4	HES	1200	1150	150	RO
120,0	115,0	20,0	> 4	HES	1200	1150	200	RO
120,0	115,0	25,0	> 4	HES	1200	1150	250	RO
125,0	119,0	12,8	> 4	HES	1250	1190	128	RO
125,0	120,0	9,7	> 4	HES	1250	1200	097	RO
125,0	120,0	15,0	> 4	HES	1250	1200	150	RO
125,0	120,0	20,0	> 4	HES	1250	1200	200	RO
125,0	120,0	25,0	> 4	HES	1250	1200	250	RO
130,0	124,0	12,8	> 4	HES	1300	1240	128	RO
130,0	125,0	15,0	> 4	HES	1300	1250	150	RO
130,0	125,0	20,0	> 4	HES	1300	1250	200	RO
130,0	125,0	25,0	> 4	HES	1300	1250	250	RO
135,0	129,0	12,8	> 4	HES	1350	1290	128	RO
135,0	130,0	15,0	> 4	HES	1350	1300	150	RO
135,0	130,0	20,0	> 4	HES	1350	1300	200	RO
135,0	130,0	25,0	> 4	HES	1350	1300	250	RO
140,0	134,0	12,8	> 4	HES	1400	1340	128	RO
140,0	135,0	15,0	> 4	HES	1400	1350	150	RO
140,0	135,0	20,0	> 4	HES	1400	1350	200	RO
140,0	135,0	25,0	> 4	HES	1400	1350	250	RO
145,0	139,0	12,8	> 4	HES	1450	1390	128	RO
145,0	140,0	15,0	> 4	HES	1450	1400	150	RO
145,0	140,0	20,0	> 4	HES	1450	1400	200	RO
145,0	140,0	25,0	> 4	HES	1450	1400	250	RO
150,0	144,0	12,8	> 4	HES	1500	1440	128	RO
150,0	145,0	15,0	> 4	HES	1500	1450	150	RO
150,0	145,0	20,0	> 4	HES	1500	1450	200	RO
150,0	145,0	25,0	> 4	HES	1500	1450	250	RO
155,0	149,0	19,2	> 4	HES	1550	1490	192	RO
160,0	154,0	19,2	> 5	HES	1600	1540	192	RO
165,0	159,0	19,2	> 5	HES	1650	1590	192	RO
170,0	164,0	19,2	> 5	HES	1700	1640	192	RO
175,0	169,0	19,2	> 5	HES	1750	1690	192	RO
180,0	174,0	19,2	> 5	HES	1800	1740	192	RO
185,0	179,0	19,2	> 5	HES	1850	1790	192	RO
190,0	184,0	19,2	> 5	HES	1900	1840	192	RO
195,0	189,0	19,2	> 5	HES	1950	1890	192	RO
200,0	194,0	19,2	> 5	HES	2000	1940	192	RO
210,0	204,0	19,2	> 5	HES	2100	2040	192	RO
220,0	214,0	19,2	> 5	HES	2200	2140	192	RO
230,0	224,0	19,2	> 5	HES	2300	2240	192	RO
240,0	234,0	19,2	> 5	HES	2400	2340	192	RO
250,0	244,0	19,2	> 5	HES	2500	2440	192	RO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





**ARTIC SEALS** è da tempo impegnata in attive collaborazioni con importanti Università ed Istituti di Ricerca per la materia plastica. Queste partnership consentono uno sviluppo costante delle nostre soluzioni innovative attraverso lo svolgimento di numerosi test, condotti sia sul polimero sia sul prodotto finito. Significativa è la collaborazione costante e qualificata con il **CPI Centro Polimeri Italia** ([www.centropolimeri.it](http://www.centropolimeri.it)) che da tempo collabora con le imprese del territorio ed offre un'ampia esperienza nel settore delle materie plastiche. Svariati sono i servizi rivolti alle imprese del settore: prove sui materiali e sui manufatti, consulenze tecnologiche, studi di fattibilità, failure-analysis, corsi di formazione ecc...

***ARTIC SEALS** actively cooperates with renowned University and Research Institutes focusing on study of plastic raw materials since a long time. These partnerships allow a constant improvement in innovative sealing solutions throughout several trial tests either on polymer or on finished products. Meaningful is the constant and qualified cooperation with **CPI Centro Polimeri Italia** ([www.centropolimeri.it](http://www.centropolimeri.it)). Since years CPI collaborates with local manufactory companies and it offers a wide experience in thermoplastic materials industry. Several are the services aimed on this field: trials on raw materials and finished products, technological consultancy, feasibility studies, failure-analysis, training, ecc...*



## ANELLI RASCHIATORI

Nel campo dei cilindri oleodinamici si è sempre data grande importanza alle guarnizioni cercando di adottare materiali e profili adatti a condizioni di esercizio sempre più gravose.

Queste indicazioni hanno creato la necessità di pensare anche all'importanza degli anelli raschiatori finanziando adeguatamente studi e ricerche sistematiche che ne valutassero il comportamento e le relative conseguenze. Dal lato stelo l'ingresso di polveri abrasive provoca infatti un deterioramento della tenuta e degli elementi di guida. Questo grave inconveniente ha portato gradualmente all'abbandono dei **raschiatori** in gomma sintetica in favore di quelli in **poliuretano** molto più resistenti all'usura in presenza di fanghi, sabbie ecc... e quindi di efficacia nel tempo molto più lunga.

L'accesso di queste particelle inquinanti, oltre che attraverso lo stelo, può avvenire anche dal lato statico del raschiatore. Diventa quindi necessario prevedere un profilo che tenga conto di questa evenienza e che preveda un vero e proprio spigolo di tenuta sul lato esterno. Infine, ogni raschiatore di ultima generazione è provvisto, lungo tutta la corona circolare interna, di una serie di rilievi che hanno una duplice funzione:

- compensare i disallineamenti dello stelo esercitando una funzione stabilizzatrice;
- evitare che si crei una pressione residua di valore crescente tra guarnizione e raschiatore che nel medio periodo tenderebbe ad espellere quest'ultimo dalla sede.

## WIPER RINGS

*Understandably, in the field of hydraulic cylinders, a great deal of attention has always been devoted to seals, and to trying to make use of the most suitable compounds and profiles to withstand increasingly demanding operating conditions.*

*This led us to reconsider the importance of wear rings and subsequently to provide considerable financing for studies and long-term research to assess their performance and its implications.*

*As for the rod, external abrasive dusts cause wear of the seal and of the wear rings.*

*This serious disadvantage has led to the gradual replacement of synthetic rubber **wipers** by **polyurethane** ones, which are much more resistant to wear in muddy or sandy environments and therefore offer more lasting performances.*

*Dirt particles can enter the system not only through the rod, but also through the static side of the wiper ring. The design of the profile should therefore take this possibility into account and should have a true sealing edge on the external side.*

*Lastly, each new generation wiper ring is embossed with a series of bumps with a double function along the whole inner circular crown:*

- to act as a stabilizer to compensate for rod misalignments;
- to prevent growing residual pressure between the seal and the wiper ring which would cause extrusion in the mid-term.



## RASCHIATORE STELO TIPO WSL

### DESCRIZIONE

Il raschiatore tipo **WSL** ha un labbro raschiante molto flessibile nella parte dinamica e un labbro sporgente, più corto e molto robusto nella parte statica. Questo profilo speciale, sia dal lato stelo sia dal lato esterno statico, impedisce alle impurità quali scorie acqua ed altro, di penetrare, cosa che andrebbe a danneggiare la guarnizione di tenuta ed a corrodere la parte interna del cilindro.

### DATI TECNICI

Velocità:	< 1 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a +110° C
Fluidi:	acqua a temperatura ambiente, oli minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

I materiali utilizzati sono dei poliuretani che resistono agli agenti atmosferici con alto modulo elastico e resistenti all'abrasione.

Il materiale standard è di durezza 93 Sh A ± 2.

In alternativa è possibile utilizzare poliuretani di durezza superiore quando esistono condizioni gravose in ambienti molto inquinanti. In questo caso consultare il nostro ufficio tecnico.

**Codice materiale: CO**

### MONTAGGIO

Non presenta particolari problemi essendo in sede semiaperta collocata nella parte più vicina all'esterno del cilindro.

Si raccomanda di eliminare gli spigoli taglienti, le bave per non incidere il raschiatore durante il montaggio.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## ROD WIPER TYPE WSL

### DESCRIPTION

The **WSL** wiper has a highly flexible wiping lip on the dynamic side and a strong, shorter, protruding lip on the static side.

This special profile keeps any impurity, waste or water off the rod and the static side where it is housed. Impurities would damage the seal and corrode the inner part of the cylinder.

### TECHNICAL DATA

Speed:	< 1 m/s
Temperature:	from - 35° C to + 100° C with peaks till +110° C
Fluids:	water at room temperature, mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The material used is a polyurethane with a high modulus of elasticity and with resistance to atmospheric factors and abrasion.

The hardness of the standard material is of 93 Sh A ± 2. In alternative it is possible to use harder polyurethane for highly polluted environments. In this case please contact our technical office.

**Compound reference: CO**

### ASSEMBLY

It is not very problematic as it is done in semi-open groove in one extremely of the cylinder:

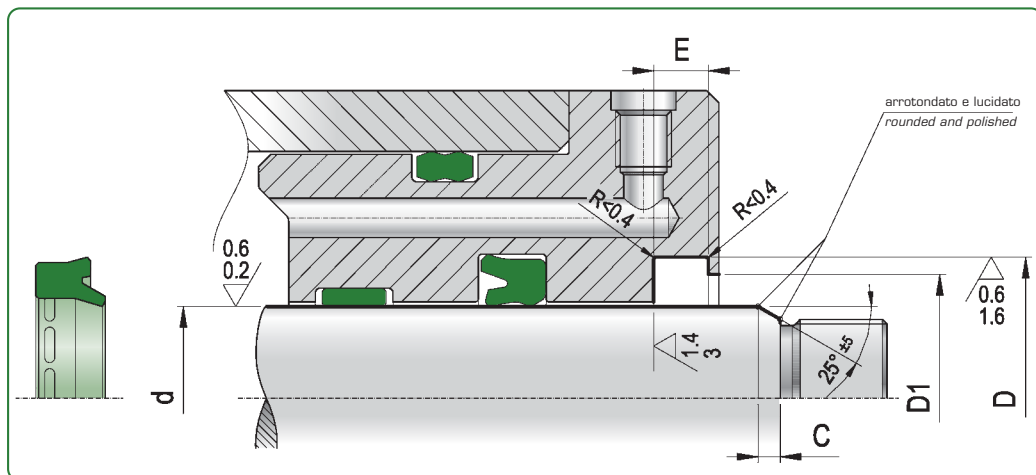
It is recommended to remove any cutting edges and flash not to scratch the wiper during the installation.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

WSL



$d_{h9}$	$D_{H10}$	$E_{+0,2}$	$D_1 \ 0/+0,2$	ART / ITEM				
5,0	12,0	2,8	8,0	WSL	0050	0120	028	CO
6,0	12,0	3,0	9,0	WSL	0060	0120	030	CO
8,0	14,6	3,8	11,0	WSL	0080	0146	038	CO
10,0	15,0	1,0	13,0	WSL	0100	0150	010	CO
10,0	16,6	3,8	13,0	WSL	0100	0166	038	CO
12,0	18,6	3,8	15,0	WSL	0120	0186	038	CO
13,0	19,6	3,8	16,0	WSL	0130	0196	038	CO
14,0	20,6	3,8	17,0	WSL	0140	0206	038	CO
15,0	21,6	3,8	18,0	WSL	0150	0216	038	CO
16,0	22,6	3,8	19,0	WSL	0160	0226	038	CO
18,0	24,6	3,8	21,0	WSL	0180	0246	038	CO
20,0	28,6	5,3	23,0	WSL	0200	0286	053	CO
22,0	30,6	5,3	25,0	WSL	0220	0306	053	CO
24,0	32,6	5,3	27,0	WSL	0240	0326	053	CO
25,0	33,6	5,3	28,0	WSL	0250	0336	053	CO
28,0	36,6	5,3	31,0	WSL	0280	0366	053	CO
30,0	38,0	5,3	33,0	WSL	0300	0380	053	CO
30,0	38,6	5,3	33,0	WSL	0300	0386	053	CO
32,0	40,6	5,3	35,0	WSL	0320	0406	053	CO
35,0	43,6	5,3	38,0	WSL	0350	0436	053	CO
36,0	44,6	5,3	39,0	WSL	0360	0446	053	CO
38,0	46,6	5,3	41,0	WSL	0380	0466	053	CO
40,0	48,6	5,3	43,0	WSL	0400	0486	053	CO
45,0	53,6	5,3	48,0	WSL	0450	0536	053	CO
46,0	54,6	5,3	49,0	WSL	0460	0546	053	CO
50,0	58,0	5,3	53,0	WSL	0500	0580	053	CO
50,0	58,6	5,3	53,0	WSL	0500	0586	053	CO
55,0	63,6	5,3	58,0	WSL	0550	0636	053	CO
55,0	65,6	5,3	58,0	WSL	0550	0656	053	CO
56,0	64,6	5,3	59,0	WSL	0560	0646	053	CO
60,0	68,0	5,3	63,0	WSL	0600	0680	053	CO
60,0	68,6	5,3	63,0	WSL	0600	0686	053	CO
60,0	70,0	5,0	63,0	WSL	0600	0700	050	CO
61,0	69,6	5,3	64,0	WSL	0610	0696	053	CO
63,0	71,6	5,3	66,0	WSL	0630	0716	053	CO
65,0	73,6	5,3	68,0	WSL	0650	0736	053	CO
70,0	78,6	5,3	73,0	WSL	0700	0786	053	CO
70,0	80,0	5,0	73,0	WSL	0700	0800	050	CO
70,0	82,2	7,1	76,0	WSL	0700	0822	071	CO



$d_{H9}$	$D_{H10}$	$E_{+0,2}$	$D_{10/+0,2}$	ART / ITEM				
70,0	82,6	7,1	76,0	WSL	0700	0826	071	CO
75,0	83,6	5,3	78,0	WSL	0750	0836	053	CO
75,0	87,2	7,1	81,0	WSL	0750	0872	071	CO
76,0	84,6	5,3	79,0	WSL	0760	0846	053	CO
80,0	88,6	5,3	83,0	WSL	0800	0886	053	CO
80,0	90,2	7,1	83,0	WSL	0800	0902	071	CO
80,0	92,6	7,1	83,0	WSL	0800	0926	071	CO
85,0	93,6	5,3	88,0	WSL	0850	0936	053	CO
85,0	97,2	7,1	91,0	WSL	0850	0972	071	CO
90,0	102,2	7,1	96,0	WSL	0900	1022	071	CO
91,0	99,6	5,3	94,0	WSL	0910	0996	053	CO
95,0	107,2	7,1	101,0	WSL	0950	1072	071	CO
100,0	108,6	5,3	103,0	WSL	1000	1086	053	CO
100,0	112,2	7,1	106,0	WSL	1000	1122	071	CO
105,0	113,6	5,3	108,0	WSL	1050	1136	053	CO
105,0	117,2	7,1	111,0	WSL	1050	1172	071	CO
107,0	115,6	5,3	110,0	WSL	1070	1156	053	CO
110,0	118,6	5,3	113,0	WSL	1100	1186	053	CO
110,0	122,2	7,1	116,0	WSL	1100	1222	071	CO
115,0	127,2	7,1	121,0	WSL	1150	1272	071	CO
120,0	132,2	7,1	126,0	WSL	1200	1322	071	CO
125,0	137,2	7,1	131,0	WSL	1250	1372	071	CO
126,0	134,6	5,3	129,0	WSL	1260	1346	053	CO
130,0	142,2	7,1	136,0	WSL	1300	1422	071	CO
135,0	147,2	7,1	141,0	WSL	1350	1472	071	CO
140,0	152,2	7,1	146,0	WSL	1400	1522	071	CO
140,0	155,0	9,0	146,5	WSL	1400	1550	090	CO
145,0	157,2	7,1	151,0	WSL	1450	1572	071	CO
150,0	162,2	7,1	156,0	WSL	1500	1622	071	CO
160,0	172,2	7,1	166,0	WSL	1600	1722	071	CO
160,0	175,2	10,1	168,0	WSL	1600	1752	101	CO
170,0	185,2	10,1	178,0	WSL	1700	1852	101	CO
180,0	195,2	10,1	188,0	WSL	1800	1952	101	CO
180,0	200,2	10,2	183,0	WSL	1800	2002	102	CO
190,0	205,2	10,1	198,0	WSL	1900	2052	101	CO
200,0	215,2	10,1	208,0	WSL	2000	2152	101	CO
210,0	225,2	10,1	218,0	WSL	2100	2252	101	CO
220,0	235,2	10,1	228,0	WSL	2200	2352	101	CO
230,0	245,2	10,1	238,0	WSL	2300	2452	101	CO
240,0	255,2	10,1	248,0	WSL	2400	2552	101	CO
250,0	265,2	10,1	258,0	WSL	2500	2652	101	CO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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## RASCHIATORE CON STEP TIPO WSG

### DESCRIZIONE

Il raschiatore tipo **WSG** ha la funzione di pulire lo stelo al suo rientro, mantenendo all'esterno le impurità. E' composto da un'anima metallica incollata ad un elemento in poliuretano.

La cava risulta aperta facilitando l'esecuzione della sede.

### DATI TECNICI

Velocità:	< 0,8 m/s
Temperatura:	da - 35° C a + 100 ° C con punte fino a 110° C.
Fluidi:	agenti atmosferici, acqua a temperatura inferiore a 60° C, oli a base minerale (vedi TABELLA I pagg. 12-13)

### MATERIALE

Il materiale del raschiatore è un poliuretano di durezza 93 Shore A e anima in acciaio.

Codice materiale: CA

### MONTAGGIO

Il montaggio avviene in cava aperta. Togliere gli spigoli vivi e le bave per facilitarne l'inserimento.

**Attenzione:** la cava dove alloggia il raschiatore deve essere in tolleranza di lavorazione come indicato nella colonna D. Il mancato rispetto della misura della tolleranza può causare la fuoriuscita del manufatto durante il movimento.

## WIPER WITH STEP TYPE WSG

### DESCRIPTION

The function of the **WSG** wiper is to clean the rod while returning to position, blocking any external impurities. It is made up of a metal core glued to a polyurethane element.

The groove is open and facilitates the design of the seat.

### TECHNICAL DATA

Speed:	< 0.8 m/s
Temperature:	from - 35° C to + 100 ° C with peaks till 110° C.
Fluids:	atmospheric factors, water at a temperature below 60° C, mineral oils (see TABLE I pages 12-13)

### MATERIAL

The material of the wiper is a polyurethane with a hardness of 93 Shore A and steel core.

Compound reference: CA

### ASSEMBLY

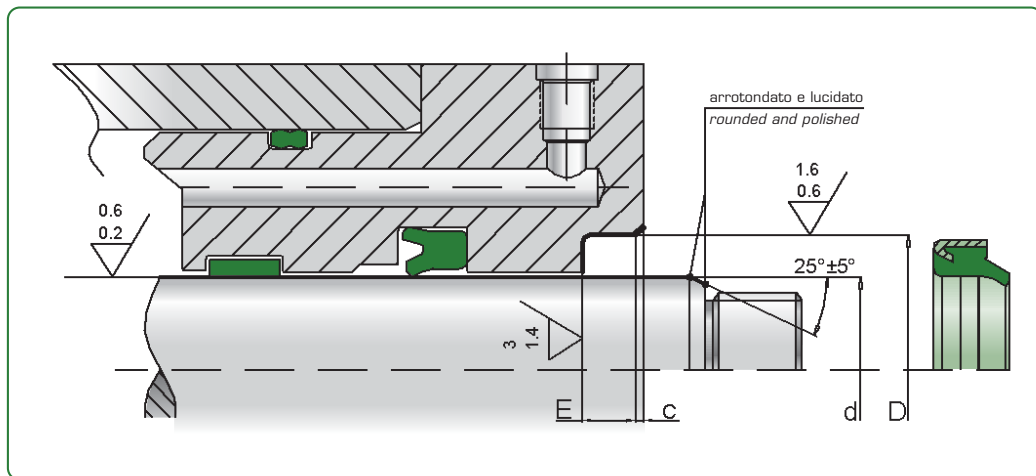
The assembly is done in open groove. Remove any flash and cutting edges to ease the insertion of the wiper.

**Warning:** The housing of the wiper must be within the machining tolerance as shown in column D. The non observance of the tolerance measures can trigger the extrusion of the product during operations.



disegno / DRAWING

WSG



$d_{H9}$	$D_{H10}$	Toll.	$E_{+0,2}$	C	ART / ITEM				
20,0	30,0	-0	4,0	0,8	WSG	0200	0300	040	CA
20,0	30,0	+0,033	5,0	1,0	WSG	0200	0300	050	CA
* 20,0	30,0		7,0	1,5	WSG	0200	0300	070	CA
22,0	30,0	-0	4,0	0,8	WSG	0220	0300	040	CA
22,0	32,0	+0,039	5,0	1,0	WSG	0220	0320	050	CA
* 22,0	32,0		7,0	1,5	WSG	0220	0320	070	CA
25,0	35,0	-0	5,0	1,5	WSG	0250	0350	050	CA
* 25,0	35,0	+0,039	7,0	1,5	WSG	0250	0350	070	CA
28,0	38,0		5,0	1,0	WSG	0280	0350	050	CA
28,0	38,0	-0	7,0	1,5	WSG	0280	0380	070	CA
30,0	40,0	+0,039	5,0	1,0	WSG	0300	0400	050	CA
30,0	40,0		7,0	1,5	WSG	0300	0400	070	CA
32,0	42,0	-0	5,0	1,0	WSG	0320	0420	050	CA
32,0	42,0	+0,039	7,0	1,5	WSG	0320	0420	070	CA
35,0	45,0		5,0	1,0	WSG	0350	0450	050	CA
* 35,0	45,0	-0	7,0	1,5	WSG	0350	0450	070	CA
36,0	46,0	+0,039	5,0	1,0	WSG	0360	0460	050	CA
38,0	48,0		7,0	1,0	WSG	0380	0480	070	CA
40,0	50,0	-0	5,0	1,0	WSG	0400	0500	050	CA
* 40,0	50,0	+0,046	7,0	1,5	WSG	0400	0500	070	CA
42,0	52,0		7,0	1,5	WSG	0420	0520	070	CA
45,0	55,0	-0	7,0	1,5	WSG	0450	0550	070	CA
* 50,0	60,0	+0,046	5,0	1,0	WSG	0500	0600	050	CA
50,0	60,0		7,0	1,5	WSG	0500	0600	070	CA
55,0	65,0	-0	7,0	1,5	WSG	0550	0650	070	CA
* 56,0	66,0	+0,046	7,0	1,5	WSG	0560	0660	070	CA
60,0	70,0		5,0	1,0	WSG	0600	0700	050	CA
60,0	70,0	-0	7,0	1,5	WSG	0600	0700	070	CA
* 65,0	75,0	0,046	7,0	1,5	WSG	0650	0750	070	CA
70,0	80,0		7,0	1,5	WSG	0700	0800	070	CA
75,0	85,0	-0	7,0	1,5	WSG	0750	0850	070	CA
* 80,0	90,0	+0,054	7,0	1,5	WSG	0800	0900	070	CA
85,0	95,0		7,0	1,5	WSG	0850	0950	070	CA
90,0	100,0	-0	7,0	1,5	WSG	0900	1000	070	CA
* 95,0	105,0	+0,054	7,0	1,5	WSG	0950	1050	070	CA
100,0	110,0		7,0	1,5	WSG	1000	1100	070	CA
110,0	120,0	-0	7,0	1,5	WSG	1100	1200	070	CA
120,0	130,0	+0,063	7,0	1,5	WSG	1200	1300	070	CA

\* in conformità alle norme ISO 3320 - in accordance with norms ISO 3320





## RASCHIATORE CON STEP TIPO WWS

### DESCRIZIONE

Il raschiatore tipo **WWS** a differenza di altri profili, presenta un gradino sul lato statico che serve per agganciarlo alla sede.

Questo facilita il montaggio in automatico del particolare e l'esecuzione meccanica della sede risulta molto semplice. Ha dei notches nella base interna che hanno la funzione di stabilizzatori e assicurano uno sfogo alla pressione che potrebbe crearsi a causa di perdite tra guarnizione e raschiatore con conseguente espulsione dalla sede di quest'ultimo.

### DATI TECNICI

Velocità: < 1 m/s

Temperatura: da -35° C a +100° C con punte fino a +110° C

Fluidi: acqua a temperatura ambiente, oli minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale utilizzato è un poliuretano molto flessibile anche a basse temperature con una alta resistenza all'abrasione.

Materiale standard poliuretano 90 Sh A (B0) fino al diametro 35mm.

Per diametri maggiori il poliuretano 93 Sh A (C0).

**Codice materiale per diam ≤ 35mm: B0**

**Codice materiale per diam > 36mm: C0**

### MONTAGGIO

Essendo in sede semiaperta il montaggio è molto facilitato. Eliminare le bave e spigoli taglienti nella sede.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## WIPER WITH STEP TYPE WWS

### DESCRIPTION

The **WWS** scraper, unlike other profiles, has a step in the static side which hooks it to the housing.

This facilitates an automated assembly and makes the mechanical construction of the groove extremely easy. It has notches in the wiper inner base which help it stabilize and ensure a good ventilation.

This avoids any extrusion.

### TECHNICAL DATA

Speed: < 1 m/s

Temperature: from -35° C to +100° C with peaks till +110° C

Fluids: water at room temperature, mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The material used is a very flexible polyurethane, even at low temperatures, with a high abrasion resistance. Standard polyurethane at 90 Sh A up to diameter 35 mm (B0).

For bigger dimensions employ standard polyurethane 93 Sh A (C0).

**Compound reference diam ≤ 35mm: B0**

**Compound reference diam > 36mm: C0**

### ASSEMBLY

The assembly is much easier as it is done in semi-open groove.

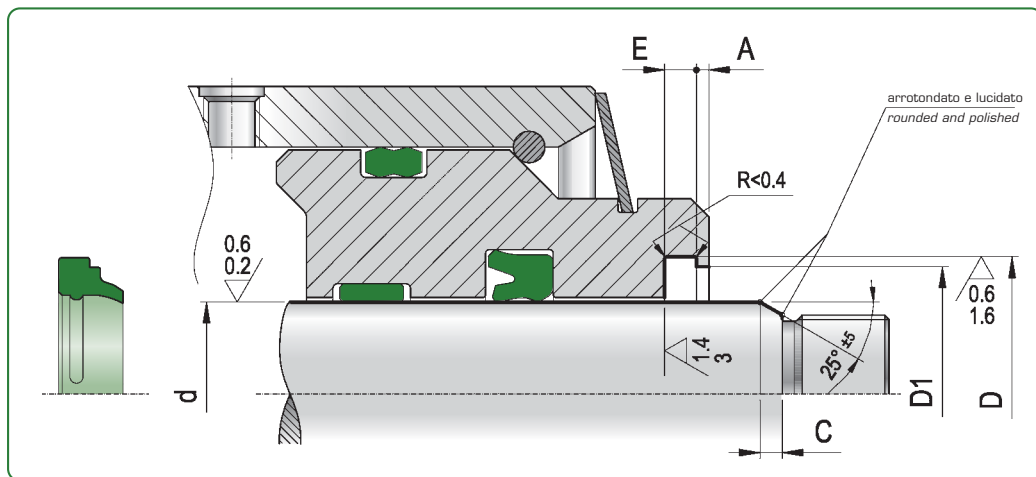
Remove any flash or cutting edges in the housing.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

WWS



$d_{H9}$	$D_{H10}$	$E_{+0,2}$	$D_1 H11$	$A_{min.}$	ART / ITEM				
* 6,0	10,0	2,0	9,0	1,0	WWS	0060	0100	020	BO
* 8,0	14,0	2,6	12,0	1,0	WWS	0080	0140	026	BO
* 10,0	16,0	2,6	14,0	1,0	WWS	0100	0160	026	BO
* 10,0	18,0	4,0	16,0	1,0	WWS	0100	0180	040	BO
* 12,0	18,0	2,6	16,0	1,0	WWS	0120	0180	026	BO
* 12,0	20,0	4,0	18,0	1,0	WWS	0120	0200	040	BO
* 14,0	20,0	2,6	18,0	1,0	WWS	0140	0200	026	BO
* 14,0	22,0	4,0	20,0	1,0	WWS	0140	0220	040	BO
* 15,0	23,0	4,0	21,0	1,0	WWS	0150	0230	040	BO
* 16,0	24,0	4,0	22,0	1,0	WWS	0160	0240	040	BO
* 18,0	26,0	4,0	24,0	1,0	WWS	0180	0260	040	BO
* 20,0	28,0	4,0	26,0	1,0	WWS	0200	0280	040	BO
* 22,0	30,0	4,0	28,0	1,0	WWS	0220	0300	040	BO
* 24,0	32,0	4,0	30,0	1,0	WWS	0240	0320	040	BO
* 25,0	33,0	4,0	31,0	1,0	WWS	0250	0330	040	BO
* 28,0	36,0	4,0	34,0	1,0	WWS	0280	0360	040	BO
* 30,0	38,0	4,0	36,0	1,0	WWS	0300	0380	040	BO
* 32,0	40,0	4,0	38,0	1,0	WWS	0320	0400	040	BO
* 34,0	42,0	4,0	40,0	1,0	WWS	0340	0420	040	BO
* 35,0	43,0	4,0	41,0	1,0	WWS	0350	0430	040	BO
* 36,0	44,0	4,0	42,0	1,0	WWS	0360	0440	040	CO
* 38,0	46,0	4,0	44,0	1,0	WWS	0380	0460	040	CO
* 40,0	48,0	4,0	46,0	1,0	WWS	0400	0480	040	CO
* 42,0	50,0	4,0	48,0	1,0	WWS	0420	0500	040	CO
* 45,0	53,0	4,0	51,0	1,0	WWS	0450	0530	040	CO
* 50,0	58,0	4,0	56,0	1,0	WWS	0500	0580	040	CO
* 52,0	60,0	4,0	58,0	1,0	WWS	0520	0600	040	CO
* 55,0	63,0	4,0	61,0	1,0	WWS	0550	0630	040	CO
* 56,0	64,0	4,0	62,0	1,0	WWS	0560	0640	040	CO
* 60,0	68,0	4,0	66,0	1,0	WWS	0600	0680	040	CO
* 63,0	71,0	4,0	69,0	1,0	WWS	0630	0710	040	CO
* 63,5	71,5	4,0	69,5	1,0	WWS	0635	0715	040	CO
* 65,0	73,0	4,0	71,0	1,0	WWS	0650	0730	040	CO
* 70,0	78,0	4,0	76,0	1,0	WWS	0700	0780	040	CO
* 75,0	83,0	4,0	81,0	1,0	WWS	0750	0830	040	CO
* 80,0	88,0	4,0	86,0	1,0	WWS	0800	0880	040	CO
* 85,0	93,0	4,0	91,0	1,0	WWS	0850	0930	040	CO
* 90,0	98,0	4,0	96,0	1,0	WWS	0900	0980	040	CO
* 100,0	108,0	4,0	106,0	1,0	WWS	1000	1080	040	CO

\* in conformità alle norme ISO 3320 - in accordance with norms ISO 3320



$d_{H9}$	$D_{H10}$	$E_{+0,2}$	$D_1 H11$	$A_{min.}$	ART / ITEM				
110,0	122,0	5,5	119,0	1,5	WWS	1100	1220	055	CO
120,0	132,0	5,5	129,0	1,5	WWS	1200	1320	055	CO
* 125,0	137,0	5,5	134,0	1,5	WWS	1250	1370	055	CO
* 140,0	152,0	5,5	149,0	1,5	WWS	1400	1520	055	CO
150,0	162,0	5,5	159,0	1,5	WWS	1500	1620	055	CO
* 160,0	172,0	5,5	169,0	1,5	WWS	1600	1720	055	CO
* 180,0	192,0	5,5	189,0	1,5	WWS	1800	1920	055	CO

\* in conformità alle norme ISO 3320 - in accordance with norms ISO 3320

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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HYDRAULIC SEALING SYSTEMS



## RASCHIATORE ANTI-RIBALTAMENTO TIPO WAT

### DESCRIZIONE

Il raschiatore tipo **WAT** ha, grazie allo speciale profilo, la possibilità di autoallinearsi quando lo stelo, durante l'esercizio, è soggetto a forti disallineamenti.

Presenta due labbri che lo fanno assomigliare a una tenuta: il labbro dinamico raschiante più lungo e molto flessibile, il labbro statico più corto, che evita, appoggiandosi sul gradino trattenitore, l'entrata dall'esterno delle impurità.

### DATI TECNICI

Velocità:	< 1 m/s
Temperatura:	da - 35° C a + 100° C con punte fino a +110° C
Fluidi:	acqua a temperatura ambiente, oli a base minerale (vedi TABELLA I, pagg. 12-13)

### MATERIALE

I materiali utilizzati sono dei poliuretani che resistono agli agenti atmosferici con alto modulo elastico e resistenti all'abrasione.

Il materiale standard è di durezza 93 Sh A  $\pm$  2.

In alternativa è possibile utilizzare poliuretani di durezza superiore quando esistono condizioni gravose in ambienti molto inquinati. In questo caso consultare il nostro ufficio tecnico.

**Codice materiale: CO**

### MONTAGGIO

Il montaggio risulta molto semplice essendo la sede semiaperta.

Eliminare gli spigoli taglienti e le bave nella sede.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## ANTI-TWISTING WIPER TYPE WAT

### DESCRIPTION

The **WAT** wiper; thanks to its special profile and design, can self-align in case of rod misalignment during operations.

It has two lips which make it look like a seal: the wiping lip is longer, very flexible and dynamic; the static lip is shorter and avoids, by resting on the blocking step, any impurity to come in from the outside.

### TECHNICAL DATA

Speed:	< 1 m/s
Temperature:	from - 35° C to + 100° C with peaks till +110° C
Fluids:	water at room temperature mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The material used is a polyurethane with a high modulus of elasticity and with resistance to atmospheric factors and abrasion.

The hardness of the standard material is of 93 Sh A  $\pm$  2. In alternative it is possible to use harder polyurethane for highly polluted environments. In this case please contact our technical office.

**Compound reference: CO**

### ASSEMBLY

The assembly is extremely easy thanks to the semi-open groove.

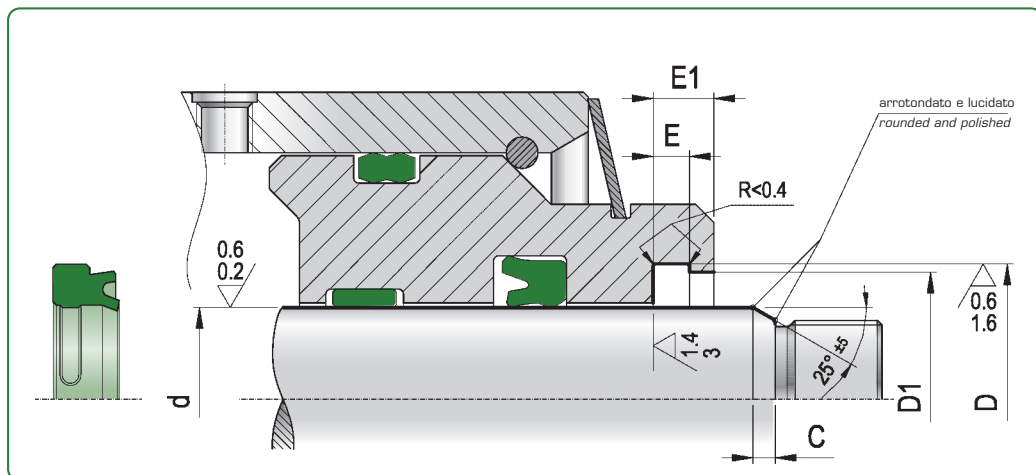
Eliminate any cutting edges and flash in the housing.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

WAT



$d_{H9}$	$D_{H10}$	$D_1 H11$	$E_{+0,2}$	$E_1_{+0,2}$	ART / ITEM				
16,0	24,0	21,5	5,0	7,0	WAT	0160	0240	050	CO
18,0	26,0	23,5	5,0	7,0	WAT	0180	0260	050	CO
20,0	28,0	25,5	5,0	7,0	WAT	0200	0280	050	CO
22,0	30,0	27,5	5,0	7,0	WAT	0220	0300	050	CO
25,0	33,0	30,5	5,0	7,0	WAT	0250	0330	050	CO
28,0	36,0	33,5	5,0	7,0	WAT	0280	0360	050	CO
32,0	40,0	37,5	5,0	7,0	WAT	0320	0400	050	CO
36,0	44,0	41,5	5,0	7,0	WAT	0360	0440	050	CO
40,0	48,0	45,5	5,0	7,0	WAT	0400	0480	050	CO
45,0	53,0	50,5	5,0	7,0	WAT	0450	0530	050	CO
50,0	58,0	55,5	5,0	7,0	WAT	0500	0580	050	CO
56,0	66,0	63,0	6,3	8,3	WAT	0560	0660	063	CO
60,0	68,0	65,5	5,0	7,0	WAT	0600	0680	050	CO
63,0	73,0	70,0	6,3	8,3	WAT	0630	0730	063	CO
70,0	80,0	77,0	6,3	8,3	WAT	0700	0800	063	CO
80,0	90,0	87,0	6,3	8,3	WAT	0800	0900	063	CO
90,0	100,0	97,0	6,3	8,3	WAT	0900	1000	063	CO
100,0	115,0	110,0	9,5	12,0	WAT	1000	1150	095	CO
110,0	122,0	119,0	5,5	7,0	WAT	1100	1220	055	CO
110,0	125,0	120,0	9,5	12,0	WAT	1100	1250	095	CO
115,0	127,0	124,0	5,5	7,0	WAT	1150	1270	055	CO
120,0	132,0	129,0	5,5	7,0	WAT	1200	1320	055	CO
125,0	137,0	134,0	5,5	7,0	WAT	1250	1370	055	CO
125,0	140,0	135,0	9,5	12,0	WAT	1250	1400	095	CO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## RASCHIATORE BIDIREZIONALE TIPO WED

### DESCRIZIONE

Il raschiatore bidirezionale tipo **WED** presenta il profilo combinato di un raschiatore e una guarnizione con un labbro raschiante nella parte esterna e un labbro di tenuta nella parte interna.

Ha le dimensioni intercambiabili con le sedi dei raschiatori più utilizzati.

Il labbro che agisce come raschiatore è molto flessibile e si adatta ai disallineamenti dello stelo. La parte di tenuta presenta un labbro più robusto ed allungato per garantire la tenuta e per aiutare il film d'olio che si crea sullo stelo a rientrare nel cilindro.

### DATI TECNICI

Pressione:	< 20 bar
Velocità:	1 m/s
Temperatura:	da - 35° C a +100° C con punte fino a +110° C
Fluidi:	acqua a temperatura ambiente e oli a base minerale (vedi TABELLA I, pagg. 12-13).

### MATERIALE

I materiali utilizzati sono dei poliuretani che resistono agli agenti atmosferici con alto modulo elastico e resistenti all'abrasione.

Il materiale standard è di durezza 93 Sh A.

In alternativa è possibile utilizzare poliuretani di durezza superiore quando esistono condizioni gravose in ambienti molto inquinati. In questo caso consultare il nostro ufficio tecnico.

**Codice materiale: CO**

### MONTAGGIO

Il montaggio, molto semplice, è in sede semiaperta.

Eliminare bave e spigoli taglienti nella sede per non danneggiare la tenuta.

Per ulteriori informazioni leggere le istruzioni di montaggio a pag. 27.

## DOUBLE ACTING WIPER TYPE WED

### DESCRIPTION

The **WED** bidirectional scraper has a combined scraper profile where the seal is provided with a scraping lip on the outer side and a sealing lip on the inner side. The dimensions are interchangeable with normal scraper housings.

The scraping lip is very flexible and it adapts to misalignments of the rod. The sealing side has a stronger and longer lip to ensure the sealing capacity and to help the oil film which forms on the rod to go back into the cylinder.

### TECHNICAL DATA

Pressure:	< 20 bar
Speed:	1 m/s
Temperature:	from - 35° C to +100° C with peaks till +110° C
Fluids:	water at room temperature and mineral oils (see TABLE I, pages 12-13)

### MATERIAL

The material used is a polyurethane with a high modulus of elasticity and with resistance to atmospheric factors and abrasion.

The hardness of the standard material is of 93 Sh A. In alternative it is possible to use harder polyurethane for highly polluted environments.

In this case please contact our technical office.

**Compound reference: CO**

### ASSEMBLY

The assembly is done in semi-open groove and is extremely easy.

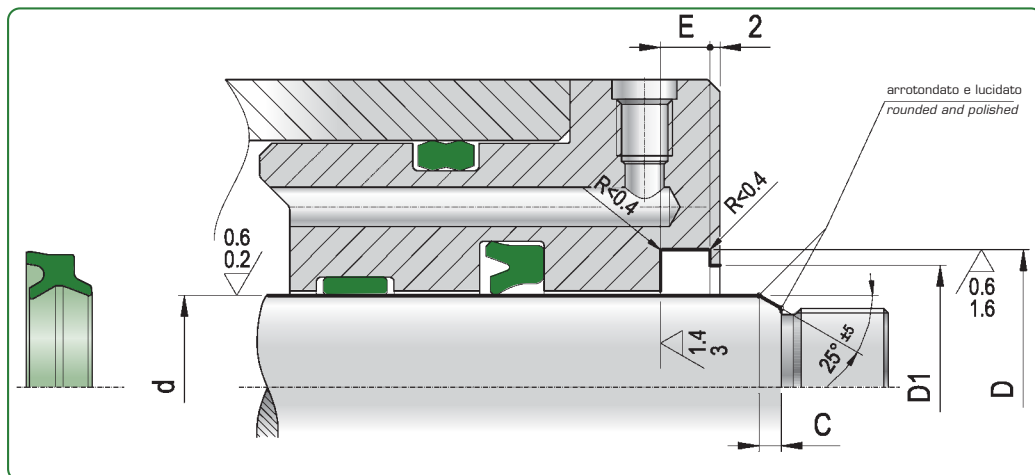
Remove any flash or cutting edges in the housing not to damage the seal.

For further information please refer to the installation instructions on page 27.



disegno / DRAWING

WED



$d_{H9}$	$D_{H10}$	$E_{+0,2}$	$D_1$	$D_{+0,2}$	$C$	ART / ITEM				
6,0	11,0	3,5	8,5		>3,5	WED	0060	0110	035	CO
8,0	13,0	3,5	10,5		>3,5	WED	0080	0130	035	CO
10,0	16,0	4,0	13,0		>3,5	WED	0100	0160	040	CO
* 12,0	18,0	4,0	14,5		> 3,5	WED	0120	0180	040	CO
12,0	18,6	3,8	15,0		> 3,5	WED	0120	0186	038	CO
* 14,0	20,0	4,0	16,5		> 3,5	WED	0140	0200	040	CO
14,0	20,6	3,8	17,0		> 3,5	WED	0140	0206	038	CO
16,0	22,0	4,0	18,5		> 3,5	WED	0160	0220	040	CO
* 18,0	24,0	4,0	20,5		> 3,5	WED	0180	0240	040	CO
18,0	24,6	3,8	21,0		> 3,5	WED	0180	0246	038	CO
20,0	26,0	4,0	22,5		> 3,5	WED	0200	0260	040	CO
20,0	28,6	5,3	23,0		> 3,5	WED	0200	0286	053	CO
* 22,0	28,0	4,0	24,5		> 3,5	WED	0220	0280	040	CO
22,0	30,6	5,3	25,0		> 3,5	WED	0220	0306	053	CO
24,0	32,6	5,3	27,0		> 3,5	WED	0240	0326	053	CO
25,0	31,0	4,0	27,5		> 3,5	WED	0250	0310	040	CO
25,0	33,6	5,3	28,0		> 3,5	WED	0250	0336	053	CO
* 28,0	36,0	5,0	31,0		> 3,5	WED	0280	0360	050	CO
28,0	36,6	5,3	31,0		> 3,5	WED	0280	0366	053	CO
30,0	38,0	5,0	33,0		> 3,5	WED	0300	0380	050	CO
30,0	38,6	5,3	33,0		> 3,5	WED	0300	0386	053	CO
32,0	40,0	5,0	35,0		> 3,5	WED	0320	0400	050	CO
32,0	40,6	5,3	35,0		> 3,5	WED	0320	0406	053	CO
35,0	43,0	5,0	38,0		> 3,5	WED	0350	0430	050	CO
35,0	43,6	5,3	38,0		> 3,5	WED	0350	0436	053	CO
35,0	45,0	5,0	38,0		> 4,0	WED	0350	0450	050	CO
* 36,0	44,0	5,0	39,0		> 3,5	WED	0360	0440	050	CO
36,0	44,6	5,3	39,0		> 3,5	WED	0360	0446	053	CO
38,0	46,0	5,0	41,0		> 3,5	WED	0380	0460	050	CO
40,0	48,0	5,0	43,0		> 4,0	WED	0400	0480	050	CO
40,0	48,6	5,3	43,0		> 4,0	WED	0400	0486	053	CO
42,0	50,0	5,0	45,0		> 3,5	WED	0420	0500	050	CO
42,0	50,0	6,0	45,0		> 3,5	WED	0420	0500	060	CO
* 45,0	53,0	5,0	48,0		> 4,0	WED	0450	0530	050	CO
45,0	53,6	5,3	48,0		> 4,0	WED	0450	0536	053	CO
50,0	58,0	5,0	53,0		> 4,0	WED	0500	0580	050	CO
50,0	58,6	5,3	53,0		> 4,0	WED	0500	0586	053	CO
50,0	60,0	6,0	53,0		> 4,0	WED	0500	0600	060	CO
55,0	63,6	5,3	58,0		> 4,0	WED	0550	0636	053	CO

\* in conformità alle norme ISO 6195 - in accordance with norms ISO 6195





d <sub>H9</sub>	D <sub>H10</sub>	E <sub>+0,2</sub>	D <sub>1 0/+0,2</sub>	C	ART / ITEM				
55,0	65,0	6,0	58,0	> 4,0	WED	0550	0650	060	CO
* 56,0	64,6	5,3	59,0	> 4,0	WED	0560	0646	053	CO
56,0	66,0	6,0	59,0	> 4,0	WED	0560	0660	060	CO
58,0	68,0	6,0	61,0	> 4,0	WED	0580	0680	060	CO
60,0	68,6	5,3	63,0	> 4,0	WED	0600	0686	053	CO
60,0	70,0	6,0	63,0	> 4,0	WED	0600	0700	060	CO
63,0	71,6	5,3	66,0	> 4,0	WED	0630	0716	053	CO
63,0	73,0	6,0	66,0	> 4,0	WED	0630	0730	060	CO
65,0	73,6	5,3	68,0	> 4,0	WED	0650	0736	053	CO
65,0	75,0	6,0	68,0	> 4,0	WED	0650	0750	060	CO
67,0	77,0	6,0	70,0	> 4,0	WED	0670	0770	060	CO
70,0	78,6	5,3	73,0	> 4,0	WED	0700	0786	053	CO
* 70,0	80,0	6,0	73,0	> 4,0	WED	0700	0800	060	CO
75,0	83,6	5,3	78,0	> 4,0	WED	0750	0836	053	CO
75,0	85,0	6,0	78,0	> 4,0	WED	0750	0850	060	CO
78,0	88,0	6,0	81,0	> 4,0	WED	0780	0880	060	CO
80,0	88,6	5,3	83,0	> 4,0	WED	0800	0886	053	CO
80,0	90,0	6,0	83,0	> 4,0	WED	0800	0900	060	CO
85,0	93,6	5,3	88,0	> 3,5	WED	0850	0936	053	CO
85,0	95,0	6,0	88,0	> 4,0	WED	0850	0950	060	CO
85,0	97,2	7,1	91,0	> 4,0	WED	0850	0972	071	CO
* 90,0	100,0	6,0	93,0	> 4,0	WED	0900	1000	060	CO
90,0	102,2	7,1	96,0	> 4,0	WED	0900	1022	071	CO
100,0	110,0	6,0	103,0	> 5,0	WED	1000	1100	060	CO
100,0	112,2	7,1	106,0	> 5,0	WED	1000	1122	071	CO
110,0	122,2	7,1	116,60	> 5,0	WED	1100	1222	071	CO
* 110,0	125,0	8,5	114,00	> 5,0	WED	1100	1250	085	CO
120,0	135,0	8,5	124,00	> 5,0	WED	1200	1350	085	CO
125,0	140,0	8,5	129,00	> 5,0	WED	1250	1400	085	CO
* 140,0	155,0	8,5	144,00	> 5,0	WED	1400	1550	085	CO
150,0	165,0	8,5	154,00	> 5,0	WED	1500	1650	085	CO
160,0	175,0	8,5	164,00	> 5,0	WED	1600	1750	085	CO
180,0	195,0	8,5	184,00	> 5,0	WED	1800	1950	085	CO

\* in conformità alle norme ISO 6195 – in accordance with norms ISO 6195

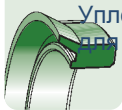
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Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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SISTEMI DI TENUTA PER OLEODINAMICA  
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## RASCHIATORE PER ESTERNO TIPO WEL

### DESCRIZIONE

Il raschiatore tipo **WEL** viene comunemente usato nei cilindri a semplice effetto aperti su di un lato. Per evitare che la camicia venga deteriorata da agenti atmosferici, condensa o altro nell'ambiente, si utilizza un raschiatore con profilo rovesciato che ha funzione di pulitore.

### DATI TECNICI

Pressione:	non esiste pressione ma può avvenire una leggera cavitazione.
Velocità:	< 1 m/s
Temperatura:	da - 35° C a + 100° C, con punte fino a + 110° C
Fluidi:	acqua, polvere o altro nell'atmosfera

### MATERIALE

Il materiale utilizzato è un poliuretano tipo **CO** ad alto modulo elastico ed a basso compression-set, con una elevata resistenza all'usura a 93 Sh A.

**Codice materiale: CO**

### MONTAGGIO

Il montaggio avviene per accavallamento in sede semiaperta con aggancio che ha la funzione di non permettere l'espulsione del raschiatore durante l'inversione del ciclo. E' importante togliere le bave e gli spigoli per evitarne il danneggiamento.

## EXTERNAL WIPER TYPE WEL

### DESCRIPTION

The **WEL** wiper type is commonly used in simple effect cylinders which are open on one side.

To prevent wear to the bore from atmospheric factors, condensation or any other environmental conditions, a reversed profile wiper is used because of its cleansing properties.

### TECHNICAL DATA

Pressure:	no pressure, but a slight cavitation might occur.
Speed:	< 1 m/s
Temperature:	from - 35° C to + 100° C, with peaks till + 110° C
Fluids:	water, dust or other atmospheric factors

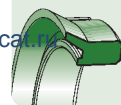
### MATERIAL

The used material is a **CO**-type polyurethane with high elasticity modulus, low compression-set, high wear resistance at 93 Sh A.

**Compound reference: CO**

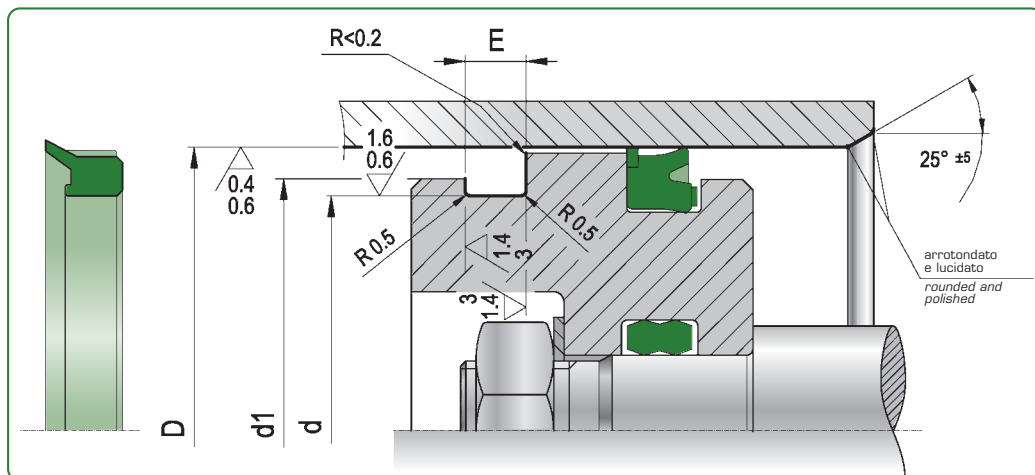
### ASSEMBLY

The assembly is done by overlap in semi-open groove with a chamfer preventing the wiper extrusion during the cycle inversion. It is important to remove any flash or cutting edges to avoid any damage.



disegno / DRAWING

WEL



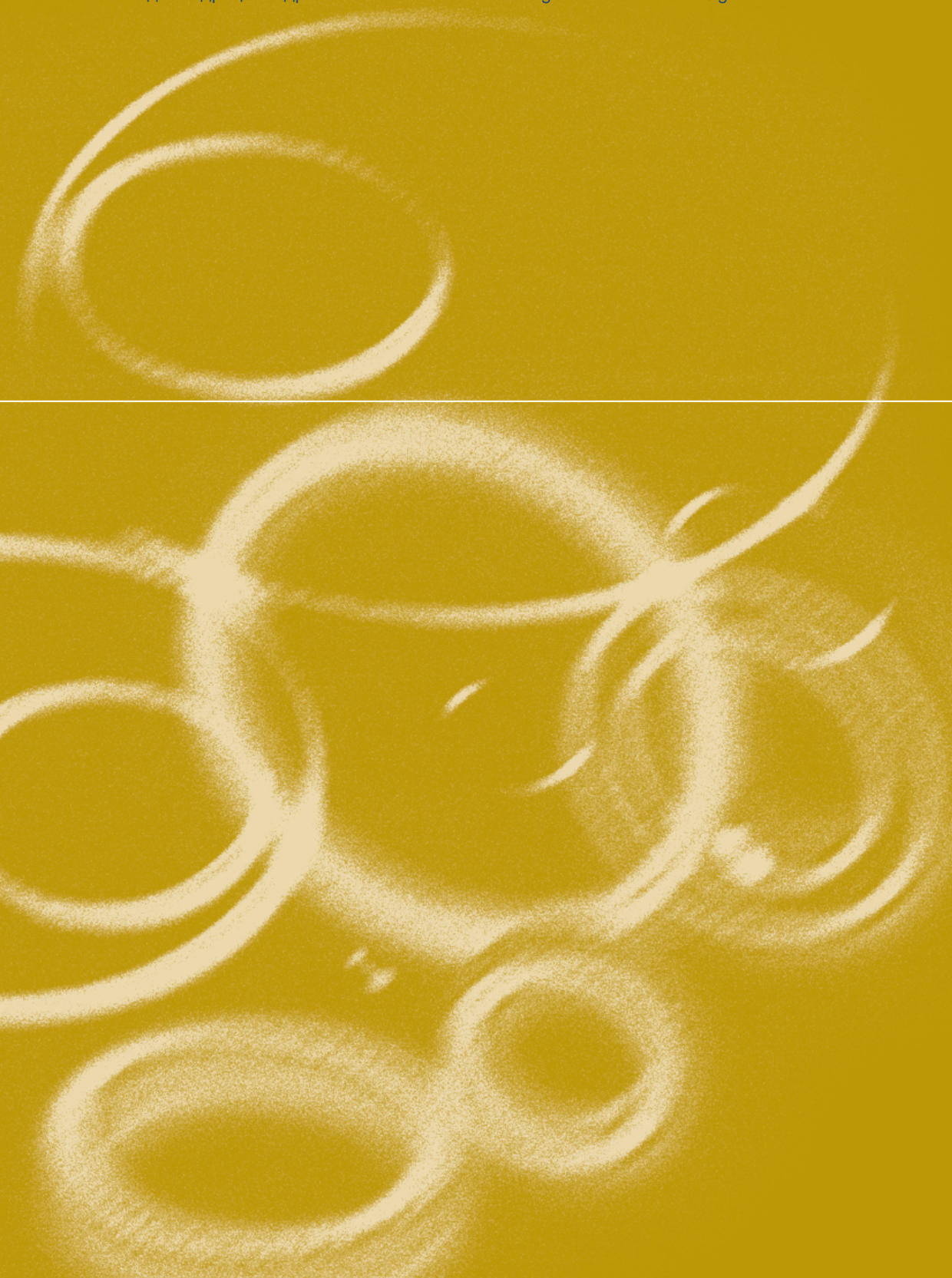
D <sub>H9</sub>	d <sub>H9</sub>	E <sub>+0,2</sub>	d <sub>1</sub>	ART / ITEM				
40,0	31,4	5,3	37,0	WEL	0400	0314	053	CO
45,0	36,4	5,3	42,0	WEL	0450	0364	053	CO
50,0	41,4	5,3	47,0	WEL	0500	0414	053	CO
60,0	51,4	5,3	57,0	WEL	0600	0514	053	CO
63,0	54,4	5,3	60,0	WEL	0630	0544	053	CO
70,0	61,4	5,3	67,0	WEL	0700	0614	053	CO
75,0	66,4	5,3	72,0	WEL	0750	0664	053	CO
80,0	71,4	5,3	77,0	WEL	0800	0714	053	CO
90,0	81,4	5,3	87,0	WEL	0900	0814	053	CO
95,0	86,4	5,3	92,0	WEL	0950	0864	053	CO
100,0	91,4	5,3	97,0	WEL	1000	0914	053	CO
110,0	101,4	5,3	107,0	WEL	1100	1014	053	CO
120,0	111,4	5,3	117,0	WEL	1200	1114	053	CO
140,0	131,4	5,3	137,0	WEL	1400	1314	053	CO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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TENUTE STATICHE  
*STATIC SEAL*



**ARTIC SEALS**

## TENUTE STATICHE

A completare il sistema di tenuta di un cilindro oleodinamico, oltre alle già descritte guarnizioni dinamiche per stelo e pistone, intervengono quelle che servono ad assicurare la tenuta tra organi reciprocamente fissi.

Le **guarnizioni statiche** neutralizzano le fughe di fluido attraverso la filettatura esterna della testata e quella necessaria ad avvitare lo stelo al pistone.

Esse sono normalmente realizzate con un o-ring in NBR spesso accoppiato con uno o due anelli antiestrusione necessari in presenza di pressioni elevate e giochi di accoppiamento eccessivi.

A parte le limitazioni poste dalle alte temperature o dalla compatibilità con il fluido sussiste spesso anche un problema di usura. In presenza di pressioni pulsanti che comprimono e rilasciano l'o-ring, si genera comunque un effetto che in presenza di superfici di contatto con rugosità non accurata, tende a "limare" l'elemento di tenuta, provocando perdite.

Sotto questo aspetto risulta estremamente vantaggioso l'impiego di una guarnizione tipo SSA in poliuretano che, oltre a risolvere il problema, presenta il vantaggio di utilizzare un solo elemento anzichè due (o-ring e antiestrusione) con maggiore facilità di montaggio.

## STATIC SEALS

*Together with the rod and the piston seals, another component of the sealing system of a hydraulic cylinder, are the seals to grant the sealing between reciprocating static organs. Leakages in the **static seal** are prevented by the head external screw-thread and the thread for tightening the rod to the piston.*




*The seals are usually composed of an NBR o-ring together with one or two anti-extrusion rings, which become necessary in cases of high pressure and excessive coupling clearance.*

*Besides the limitations resulting from high temperatures or fluid compatibility issues, wear is also a common problem. Pulsating pressures loading or unloading the o-ring, when the roughness of the contact surface does not comply with the specification range, cause "filing" of the sealing part which can leak as a result.*

*The use of a SSA polyurethane seal proves to be particularly appropriate in countering this effect. Not only does it solve this specific problem, it also has the advantage of using one element instead of two (o-ring and anti-extrusion ring), making the assembly much easier.*


### GUARNIZIONI STATICHE / STATIC SEALS

#### Condizioni massime non simultanee / Maximum non simultaneous conditions

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	SSA	- 35 + 100	< 400	-	TPU	120
	FSA	- 35 + 100	< 400	-	TPU	124
	VRA	- 35 + 100	-	-	TPU	126

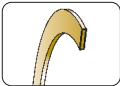
### O-RING / O-RING

#### Condizioni massime non simultanee / Maximum non simultaneous conditions

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	OR	vedi pag. 129 specifiche mescole o-ring see page 129 specifications of o-ring compounds				128

### ANELLI ANTIESTRUSIONE / BACK-UP RINGS

#### Condizioni massime non simultanee / Maximum non simultaneous conditions

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	RAE	- 30 + 120	-	< 0,8	TPE	130





## GUARNIZIONE STATICA TIPO SSA

### DESCRIZIONE

La guarnizione tipo **SSA** è stata studiata e collaudata da molti anni. E' utilizzata per impieghi statici e, in qualche applicazione, anche dinamici.

Viene utilizzata principalmente in sostituzione di un o-ring e di un anello antiestrusione.

L'utilizzo di un poliuretano ad alto modulo elastico e a basso compression-set fa sì che non si attorcigli durante il montaggio e che non si estruda in esercizio.

L'utilizzo di un solo pezzo e il profilo simmetrico rendono più facile all'operatore il montaggio in sede.

Inoltre la gestione dello stock di magazzino risulta dimezzata.

### LIMITI D'IMPIEGO

Pressione: < 400 bar a temperatura di 60° C

Temperatura: da - 35° C a + 100° C, con punte fino a + 110° C

Fluidi: olio e grassi minerali, gas non aggressivi ecc. (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Poliuretano standard a 93 Sh A ± 2.

Codice materiale: **CO**

### MONTAGGIO

E' importante eliminare gli spigoli vivi e le bave nella sede ed eseguire uno smusso di invito per facilitare il montaggio.

## STATIC SEAL TYPE SSA

### DESCRIPTION

The **SSA** seal type has been developed and tested for many years for static and sometimes dynamic sealing applications.

It is mainly used in replacement of an o-ring and of an anti-extrusion ring.

By using a high modulus polyurethane with a low compression-set it doesn't wind itself during assembly and doesn't extrude during work.

One single piece and the symmetric profile help the operator for the in housing installation.

It also halves the stock management.

### TECHNICAL DATA

Pressure: < 400 bar at a temperature of 60°C

Temperature: from - 35° C to + 100° C with peaks till + 110° C

Fluids: mineral oil and grease, non aggressive gas etc... (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane at 93 Sh A ± 2.

Compound reference: **CO**

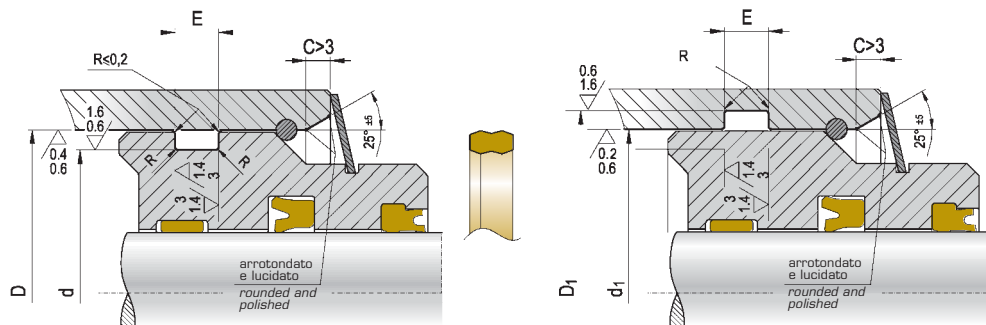
### ASSEMBLY

It is important to avoid any cutting edges and flash in the housing and to ensure a lead-in chamfer to facilitate assembly.

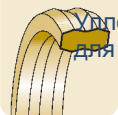


disegno / DRAWING

SSA



D <sub>H10</sub>	d <sub>h9</sub>	E <sub>+0,2</sub>	R	d <sub>1h9</sub>	D <sub>1H10</sub>	ART / ITEM				
10,00	7,40	3,8	0,2	8,0	10,6	SSA	0100	0074	038	CO
12,65	9,90	2,5	0,2			SSA	0126	0099	025	CO
12,00	9,40	3,8	0,2	10,0	12,6	SSA	0120	0094	038	CO
13,00	10,20	2,5	0,2			SSA	0130	0102	025	CO
14,00	11,90	2,5	0,2			SSA	0140	0112	025	CO
14,00	11,40	3,8	0,2	12,0	14,6	SSA	0140	0114	038	CO
14,22	11,47	2,5	0,2			SSA	0142	0114	025	CO
15,00	11,90	2,5	0,2			SSA	0150	0119	025	CO
15,00	11,90	4,0	0,2	11,0	14,1	SSA	0150	0119	040	CO
15,00	12,20	2,5	0,2			SSA	0150	0122	025	CO
15,00	12,40	3,8	0,2	13,0	15,6	SSA	0150	0124	038	CO
15,82	13,07	2,5	0,2			SSA	0158	0130	025	CO
15,87	13,00	3,5	0,2			SSA	0159	0130	035	CO
16,00	12,90	2,5	0,2			SSA	0160	0129	025	CO
16,00	13,40	3,8	0,2	14,0	16,6	SSA	0160	0134	038	CO
16,50	12,00	3,5	0,2			SSA	0165	0120	035	CO
17,00	14,20	2,5	0,2			SSA	0170	0142	025	CO
17,47	14,60	3,5	0,2			SSA	0175	0146	035	CO
18,00	14,90	2,5	0,2			SSA	0180	0149	025	CO
18,00	14,90	4,0	0,2	14,0	17,1	SSA	0180	0149	040	CO
18,00	15,20	2,5	0,2			SSA	0180	0152	025	CO
18,00	15,40	3,8	0,2	16,0	18,6	SSA	0180	0154	038	CO
19,00	15,90	2,5	0,2			SSA	0190	0159	025	CO
19,00	15,90	4,0	0,2	16,0	19,1	SSA	0190	0159	040	CO
19,00	16,20	2,5	0,2			SSA	0190	0162	025	CO
19,05	16,20	3,5	0,2			SSA	0190	0162	035	CO
20,00	17,40	3,4	0,2			SSA	0200	0174	034	CO
20,00	17,40	3,4	0,2	18,0	20,6	SSA	0200	0174	038	CO
20,62	17,80	3,5	0,2			SSA	0206	0178	035	CO
21,00	17,60	4,4	0,2			SSA	0210	0176	044	CO
22,00	19,40	3,8	0,2	20,0	22,6	SSA	0220	0194	038	CO
24,00	21,40	3,8	0,2	22,0	24,6	SSA	0240	0214	038	CO
25,00	20,50	3,5	0,2			SSA	0250	0205	035	CO
25,00	20,50	5,0	0,2	20,0	24,5	SSA	0250	0205	050	CO
25,00	22,40	3,8	0,2	23,0	25,6	SSA	0250	0224	038	CO
26,00	21,80	3,5	0,2			SSA	0260	0218	035	CO
26,00	22,00	5,0	0,2	22,0	26,0	SSA	0260	0220	050	CO
27,00	22,80	3,5	0,2			SSA	0270	0228	035	CO
28,00	23,00	5,3	0,2			SSA	0280	0230	053	CO



D <sub>H10</sub>	d <sub>h9</sub>	E <sub>-0,2</sub>	R	d <sub>1h9</sub>	D <sub>1H10</sub>	ART / ITEM				
28,00	23,80	3,5	0,2			SSA	0280	0238	035	CO
28,00	24,00	5,0	0,2	24,0	28,0	SSA	0280	0240	050	CO
29,00	24,50	3,5	0,2			SSA	0290	0245	035	CO
29,00	24,90	5,0	0,2	24,0	28,1	SSA	0290	0249	050	CO
30,00	26,00	5,0	0,2	26,0	30,0	SSA	0300	0260	050	CO
32,00	28,00	5,0	0,2	28,0	32,0	SSA	0320	0280	050	CO
34,00	30,00	5,0	0,2	30,0	34,0	SSA	0340	0300	050	CO
35,00	31,00	5,0	0,2	31,0	35,0	SSA	0350	0310	050	CO
36,00	30,40	4,5	0,2			SSA	0360	0304	045	CO
36,00	32,00	5,0	0,2	32,0	36,0	SSA	0360	0320	050	CO
37,00	30,80	4,5	0,2			SSA	0370	0308	045	CO
38,00	31,80	4,5	0,2			SSA	0380	0318	045	CO
38,00	32,40	4,5	0,2			SSA	0380	0324	045	CO
38,60	34,00	4,0	0,2			SSA	0386	0340	040	CO
39,00	33,40	5,3	0,2			SSA	0390	0334	053	CO
40,00	33,80	6,0	0,2			SSA	0400	0338	060	CO
40,00	34,40	4,8	0,2			SSA	0400	0344	048	CO
40,00	36,00	5,0	0,2	36,0	40,0	SSA	0400	0360	050	CO
42,00	36,40	4,8	0,2			SSA	0420	0364	048	CO
42,00	38,00	3,2	0,2			SSA	0420	0380	032	CO
42,00	38,00	5,0	0,2	38,0	42,0	SSA	0420	0380	050	CO
43,00	37,40	5,3	0,2			SSA	0430	0374	053	CO
44,45	38,45	5,3	0,2			SSA	0445	0385	053	CO
45,00	41,00	5,0	0,2	41,0	45,0	SSA	0450	0410	050	CO
45,00	40,00	5,4	0,2			SSA	0450	0400	054	CO
45,60	41,00	4,0	0,2			SSA	0456	0410	040	CO
47,00	42,00	5,4	0,2	42,0		SSA	0470	0420	054	CO
48,00	42,30	5,3	0,2			SSA	0480	0423	053	CO
48,00	42,60	6,2	0,2	43,0	48,4	SSA	0480	0426	062	CO
48,00	43,00	3,6	0,2			SSA	0480	0430	036	CO
50,00	43,80	6,0	0,2			SSA	0500	0438	060	CO
50,00	44,40	5,3	0,2			SSA	0500	0444	053	CO
50,00	44,60	6,2	0,2	45,0	50,4	SSA	0500	0446	062	CO
50,00	47,50	3,6	0,2			SSA	0500	0475	036	CO
52,00	46,60	6,2	0,3	47,0	52,4	SSA	0520	0466	062	CO
53,00	48,00	3,6	0,2			SSA	0530	0480	036	CO
53,00	48,00	5,4	0,3	48,0		SSA	0530	0480	054	CO
54,40	48,70	5,3	0,3			SSA	0544	0487	053	CO
55,00	49,60	6,2	0,3	50,0	55,4	SSA	0550	0496	062	CO
55,00	49,90	5,3	0,3			SSA	0550	0499	053	CO
55,00	51,00	3,5	0,3			SSA	0550	0510	035	CO
57,00	52,20	4,1	0,3			SSA	0570	0522	041	CO
57,15	51,15	5,3	0,3			SSA	0572	0512	053	CO
60,00	53,80	6,0	0,3			SSA	0600	0538	060	CO
60,00	54,30	5,8	0,3			SSA	0600	0543	058	CO
60,00	54,40	5,8	0,3			SSA	0600	0544	058	CO
60,00	54,60	6,2	0,3	55,0	60,4	SSA	0600	0546	062	CO
60,00	55,00	5,3	0,3			SSA	0600	0550	053	CO
60,00	55,90	4,4	0,3			SSA	0600	0559	044	CO
60,70	55,00	5,3	0,3			SSA	0607	0550	053	CO
61,50	56,00	2,8	0,3			SSA	0615	0560	028	CO
63,00	57,40	4,8	0,3			SSA	0630	0574	048	CO
63,50	57,50	5,3	0,3			SSA	0635	0575	053	CO
65,00	59,40	5,0	0,3			SSA	0650	0594	050	CO
65,00	59,60	6,2	0,3	60,0	65,4	SSA	0650	0596	062	CO
65,00	60,00	5,0	0,3			SSA	0650	0600	050	CO
66,00	60,40	5,1	0,3			SSA	0660	0604	051	CO
69,60	65,00	3,9	0,3			SSA	0696	0650	039	CO
70,00	63,80	6,0	0,3			SSA	0700	0638	060	CO
70,00	64,60	6,2	0,3	65,0	70,4	SSA	0700	0646	062	CO
70,00	65,00	5,0	0,3			SSA	0700	0650	050	CO
72,00	66,40	5,0	0,3			SSA	0720	0664	050	CO
72,60	68,00	3,8	0,3			SSA	0726	0680	038	CO
74,60	70,00	3,8	0,3			SSA	0746	0700	038	CO
75,00	69,40	5,3	0,3			SSA	0750	0694	053	CO
75,00	69,60	6,2	0,3	70,0	75,4	SSA	0750	0696	062	CO



D <sub>H10</sub>	d <sub>h9</sub>	E <sub>-0,2</sub>	R	d <sub>1h9</sub>	D <sub>1H10</sub>	ART / ITEM				
75,60	70,00	5,3	0,3			SSA	0756	0700	053	CO
76,20	70,20	5,3	0,3			SSA	0762	0702	053	CO
76,60	72,00	4,8	0,3			SSA	0766	0720	048	CO
80,00	73,60	6,4	0,3			SSA	0800	0736	064	CO
80,00	73,80	6,0	0,3			SSA	0800	0738	060	CO
80,00	74,40	5,3	0,3			SSA	0800	0744	053	CO
80,00	74,60	6,2	0,3	75,0	80,4	SSA	0800	0746	062	CO
80,60	76,00	6,4	0,3			SSA	0806	0760	064	CO
84,70	78,58	4,9	0,3			SSA	0847	0786	049	CO
85,00	78,50	6,4	0,3			SSA	0850	0785	064	CO
85,00	79,40	5,3	0,3			SSA	0850	0794	053	CO
85,00	79,60	6,2	0,3	80,0	85,4	SSA	0850	0796	062	CO
85,10	80,50	3,9	0,3			SSA	0851	0805	039	CO
88,00	82,40	7,0	0,3			SSA	0880	0824	070	CO
89,00	82,80	6,0	0,3			SSA	0890	0828	060	CO
90,00	80,60	9,0	0,3			SSA	0900	0806	090	CO
90,00	81,40	9,0	0,3	80,0	88,6	SSA	0900	0814	090	CO
90,00	83,00	6,5	0,3			SSA	0900	0830	065	CO
90,00	84,40	4,8	0,3			SSA	0900	0844	048	CO
92,00	86,50	4,8	0,3			SSA	0920	0865	048	CO
93,00	87,40	5,3	0,3			SSA	0930	0874	053	CO
94,00	89,50	3,8	0,3			SSA	0940	0895	038	CO
95,00	86,40	9,0	0,3	85,0	93,6	SSA	0950	0864	090	CO
99,00	92,80	6,0	0,3			SSA	0990	0928	060	CO
100,00	90,60	9,0	0,4			SSA	1000	0906	090	CO
100,00	91,40	9,0	0,4	90,0	98,6	SSA	1000	0914	090	CO
100,00	94,30	5,3	0,4			SSA	1000	0943	053	CO
102,50	96,60	5,5	0,4			SSA	1025	0966	055	CO
104,00	99,50	3,8	0,4			SSA	1040	0995	038	CO
105,00	96,40	9,0	0,4	95,0	103,6	SSA	1050	0964	090	CO
108,00	98,90	7,2	0,4			SSA	1080	0989	072	CO
110,00	101,40	9,0	0,4	100,0	108,6	SSA	1100	1014	090	CO
110,00	104,50	4,5	0,4			SSA	1100	1045	045	CO
113,00	107,40	5,3	0,4			SSA	1130	1074	053	CO
115,00	106,40	9,0	0,4	105,0	113,6	SSA	1150	1064	090	CO
115,00	108,00	4,6	0,4			SSA	1150	1080	046	CO
120,00	111,40	9,0	0,4	110,0	118,6	SSA	1200	1114	090	CO
125,00	116,40	9,0	0,4	115,0	123,6	SSA	1250	1164	090	CO
130,00	121,40	9,0	0,4	120,0	128,6	SSA	1300	1214	090	CO
135,00	126,40	9,0	0,4	125,0	133,6	SSA	1350	1264	090	CO
140,00	131,40	9,0	0,4	130,0	138,6	SSA	1400	1314	090	CO
150,00	138,40	12,4	0,4	140,0	151,6	SSA	1500	1384	124	CO
160,00	148,40	12,4	0,4	150,0	161,6	SSA	1600	1484	124	CO
170,00	158,40	12,4	0,4	160,0	171,6	SSA	1700	1584	124	CO
180,00	168,40	12,4	0,4	170,0	181,6	SSA	1800	1684	124	CO
190,00	178,40	12,4	0,4	180,0	191,6	SSA	1900	1784	124	CO
200,00	188,40	12,4	0,4	190,0	201,6	SSA	2000	1884	124	CO
225,00	213,40	12,4	0,4	215,0	226,6	SSA	2250	2134	124	CO
251,00	238,40	12,4	0,4	240,0	251,6	SSA	2510	2384	124	CO
270,00	258,40	12,4	0,4	260,0	271,6	SSA	2700	2584	124	CO
280,00	268,40	12,4	0,4	270,0	281,6	SSA	2800	2684	124	CO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## TENUTA PER FLANGE SAE TIPO FSA

### DESCRIZIONE

La guarnizione tipo **FSA (Flange SAE)** ha avuto in questi anni un notevole sviluppo in tutte quelle applicazioni statiche dove un normale o-ring in NBR non resiste a pressione e al gioco di accoppiamento elevati.

Lo speciale profilo, l'alto modulo elastico ed un ottimo compression-set eliminano il problema dell'estrusione e delle perdite nella flangiatura dei tubi.

### LIMITI D'IMPIEGO

Pressione: < 400 bar

Temperatura: da - 35° C a + 100° C, con punte fino a + 110° C

Fluidi: olio e grassi minerali, gas non aggressivi ecc. (vedi TABELLA I, a pagg. 12-13)

### MATERIALE

Poliuretano standard a 93 Sh A ± 2.

**Codice materiale: CO**

### VANTAGGI

Ottima resistenza all'abrasione e all'estrusione.

### MONTAGGIO

E' importante eliminare gli spigoli vivi e le bave nella sede ed eseguire uno smusso di invito per facilitare il montaggio.

Il montaggio in cava aperta risulta molto semplice.

## SAE FLANGE TYPE FSA

### DESCRIPTION

The **FSA seal type (SAE Flange)** has recently known a significant development in all static applications where a normal o-ring in NBR would not resist to pressure and to high coupling clearance.

The specific profile and the high modulus of elasticity, together with an excellent compression-set, avoid the problems of extrusion and of leaks in the tube flanges.

### TECHNICAL DATA

Pressure: < 400 bar

Temperature: from - 35° C to + 100° C with peaks till + 110° C

Fluids: oil and mineral grease, non-aggressive gases etc. (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane at 93 Sh A ± 2.

**Compound reference: CO**

### ADVANTAGES

Excellent abrasion resistance.

Excellent extrusion resistance.

### ASSEMBLY

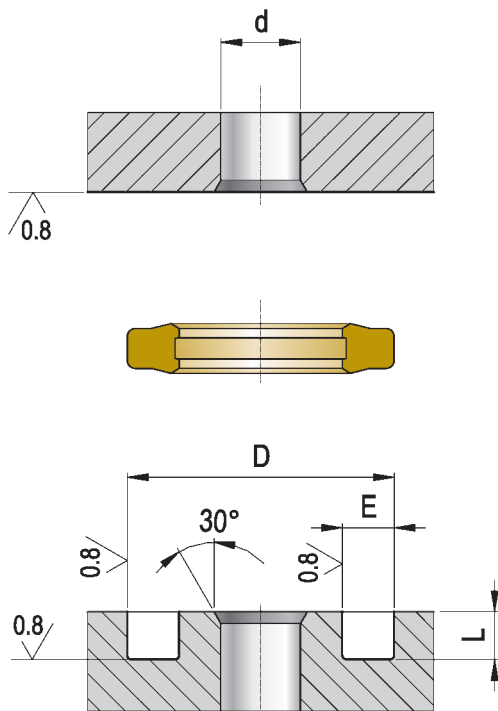
It is important to avoid any cutting edges and flash in the housing and to ensure a lead-in chamfer to facilitate mounting.

The installation in open housing is extremely simple.



disegno / DRAWING

FSA



TENUTE STATICHE  
STATIC SEALS

INCH DIM.	d	D	E		L	ART / ITEM		
			min	max				
1/2"	13,0	25,40 - 25,83	3,94	4,45	2,79 - 2,92	FSA	0500	00
3/4"	19,0	31,75 - 31,88	3,94	4,45	2,79 - 2,92	FSA	0750	00
1"	25,0	39,62 - 39,75	3,94	4,45	2,79 - 2,92	FSA	1000	00
1 1/4"	32,0	44,45 - 44,58	3,94	4,45	2,79 - 2,92	FSA	1250	00
1 1/2"	38,0	53,72 - 53,98	3,94	4,45	2,79 - 2,92	FSA	1500	00
2"	51,0	63,25 - 63,50	3,94	4,45	2,79 - 2,92	FSA	2000	00
2 1/2"	63,0	76,45 - 76,70	3,94	4,45	2,79 - 2,92	FSA	2500	00

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## GUARNIZIONE A V TIPO VRA

### DESCRIZIONE

La guarnizione tipo **VRA** è stata studiata per proteggere snodi, cuscinetti, bronzine, flange e tutte quelle parti meccaniche che lavorano in moto rotatorio o semi rotatorio.

Questo tipo di profilo realizzato in materiale **BO** a bassa deformazione permanente, impedisce ad acqua, fanghi e altre impurità di penetrare all'interno del componente. La vasta gamma di diametri facilita il costruttore nella scelta dimensionale.

### LIMITI D'IMPIEGO

Pressione: non essendo una guarnizione di tipo tradizionale, la pressione di esercizio è quella necessaria al mantenimento del grasso all'interno del sistema.

Temperatura: da - 35° C a + 90° C

Fluidi: olio e grassi minerali, gas non aggressivi ecc. (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Poliuretano standard a 90 Sh A.

**Codice materiale: BO**

### MONTAGGIO

E' sufficiente ingrassare le parti metalliche dove va alloggiata la guarnizione con grasso minerale.

Spigoli e bave che danneggerebbero la tenuta vanno eliminati.

## V-SEAL TYPE VRA

### DESCRIPTION

The **VRA** seal type has been conceived to protect joints, bearings, bronze bushes, flanges and all the mechanical parts in rotation or semi-rotation made in **BO** material, presenting a low compression-set, it prevents the penetration of water, mud and other impurities.

The wide range of diameters facilitates the constructor's choice.

### TECHNICAL DATA

Pressure: it is not a traditional seal, the working pressure is therefore the one resulting from keeping the grease within the system.

Temperature: from - 35° C to + 90° C

Fluid: mineral oil and grease, non-aggressive gas etc (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane at 90 Sh A.

**Compound reference: BO**

### ASSEMBLY

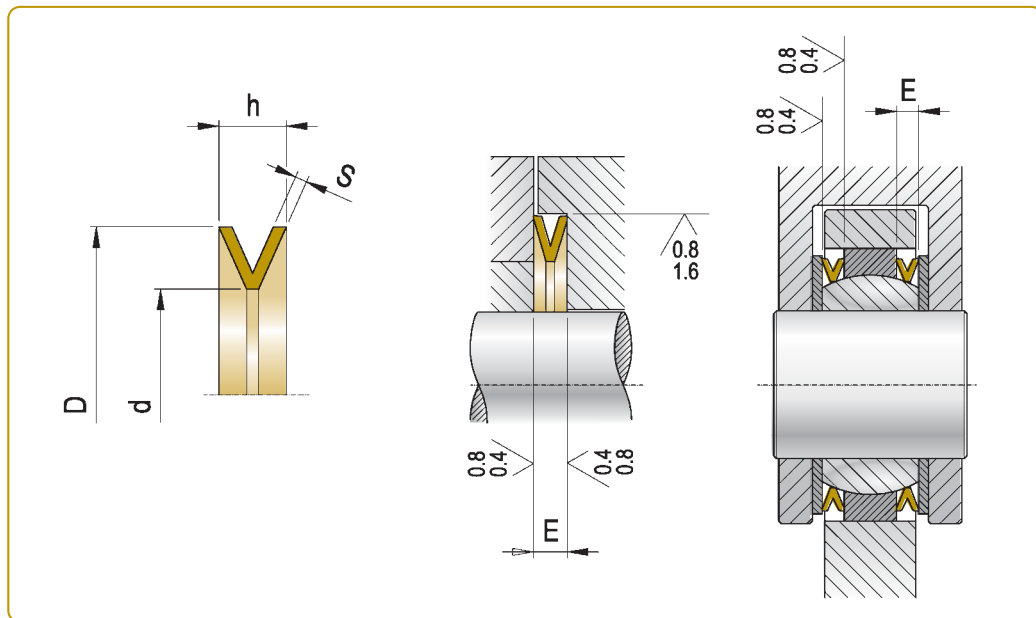
Just lubricate with mineral grease the metal parts where the seal is installed.

Edges and flash have to be avoided, they would otherwise damage the sealing capacity.



disegno / DRAWING

VRA



D	d	h	E <sub>+0,2</sub>	S	ART / ITEM				
27,5	22,5	4,0	2,0	0,75	VRA	0275	0225	040	80
38,5	31,0	4,5	2,0	0,75	VRA	0385	0310	045	80
43,0	36,0	5,0	2,0	0,75	VRA	0430	0360	050	80
51,0	42,0	6,0	2,5	0,80	VRA	0510	0420	060	80
57,5	47,5	7,0	3,0	1,00	VRA	0575	0475	070	80
59,0	50,5	5,0	2,5	1,00	VRA	0590	0505	050	80
64,0	54,0	7,0	3,5	1,00	VRA	0640	0540	070	80
71,0	59,0	7,0	3,5	1,00	VRA	0710	0590	070	80
80,0	65,0	7,0	3,5	1,00	VRA	0800	0650	070	80
86,0	70,0	9,0	4,0	1,00	VRA	0860	0700	090	80
86,0	71,0	9,0	4,0	1,00	VRA	0860	0710	090	80
88,8	70,0	8,0	3,5	1,20	VRA	0888	0700	080	80
95,0	85,0	6,0	2,5	1,00	VRA	0950	0850	060	80
100,0	82,0	9,0	4,5	1,25	VRA	1000	0820	090	80
105,0	90,0	9,0	4,5	1,25	VRA	1050	0900	090	80
112,0	96,0	10,0	5,0	1,50	VRA	1120	0960	100	80
121,0	103,0	12,0	5,0	1,50	VRA	1210	1030	120	80
186,0	160,0	16,0	7,5	2,00	VRA	1860	1600	160	80

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

TENUTE STATICHE  
STATIC SEALS



## O-RING

### DESCRIZIONE

L'o-ring, di forma toroidale, può essere utilizzato sia per applicazioni statiche che dinamiche.

Può essere fornito in varie mescole ed in varie durezza. La reperibilità di varie tipologie di materiali con differenti durezza, ha notevolmente ampliato il campo delle applicazioni.

Anche se la forma toroidale è stata sostituita da altre tecnicamente più efficaci, la facilità di montaggio, la semplicità di esecuzione della sede ed il costo contenuto, hanno fatto dell'o-ring la tenuta più utilizzata.

### DIMENSIONI, TOLLERANZE E QUALITA' DELLE SEDI

La sezione nominale dell'o-ring, il diametro interno e la sede sono indicate nelle tabelle dimensionali.

Le tolleranze di accoppiamento dipendono dalla pressione di esercizio, dalla temperatura del fluido e dalla durezza dell'elastomero.

Il grafico di fig. 7, indica orientativamente il gioco radiale in funzione della pressione e della durezza.

La qualità della sede deve rientrare entro valori che non permettano all'o-ring di usurarsi nel leggero movimento che può avere durante cambi di pressioni o durante inversioni di ciclo.

Nel disegno di fig. 8 sono elencate le rugosità consigliate delle sedi del pistone e dello stelo.

## O-RING

### DESCRIPTION

The o-ring has a toroidal shape and can be used for both static and dynamic applications.

It comes in different materials and hardness.

The availability on the market of various types of materials and hardness has widened the application range.

The toroidal shape has been replaced by more engineered shapes, still the facility in the assembly, in the groove construction and the limited cost remain the o-ring's strong points.

### GROOVES DIMENSIONS, TOLERANCE AND QUALITY

The o-ring's working section, diameter and groove are shown in the dimension tables. The coupling tolerances depend on the exerted pressure, on the fluid temperature and on the hardness of elastomers.

In fig. 7 the graph shows the approximate radial play according to the pressure and the hardness.

The groove's quality values must remain within certain limits to prevent the o-ring from wearing out during possible small movements, in case of pressure change or of cycle inversion.

In fig. 8 the drawing lists the suggested roughness rates in the piston and rod grooves.

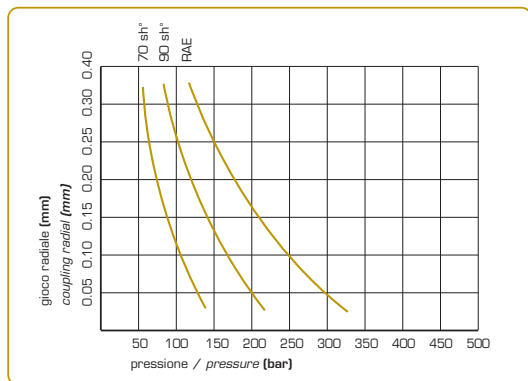


fig. 7

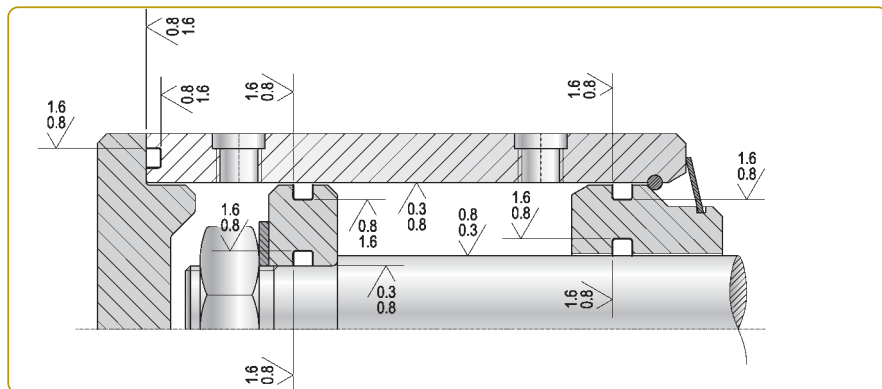


fig. 8



## MATERIALE

Esistono, come indicato nella descrizione, varie mescole e varie durezze per l'o-rings.

Qui di seguito ne elenchiamo alcuni tipi ed il relativo utilizzo:

### **Mescole in NBR di durezza 70 Shore A standard e 90 Shore A a richiesta:**

mescole di impiego generico sia in oleodinamica che in pneumatica.

Hanno una bassa deformazione permanente e resistono molto bene ai fluidi come olio minerale, olio vegetale, grassi e composti con acqua e glicole con temperatura inferiore a 60° C.

Il range di temperatura in esercizio è compreso tra -25° C e +100° C con punte per periodi brevi fino a 120° C.

### **Mescole in HNBR di durezza 70 Shore A standard e 75 Shore A a richiesta:**

mescole di base come l'NBR ma con doppio legame del componente butadiene.

E' una mescola idrogenata utilizzata per impieghi a temperatura di 140° C e per periodi brevi anche a 150° C, dove la comune gomma in NBR non resiste. E' compatibile con grassi, oli minerali e vegetali e si comporta molto bene all'ossidazione.

### **Mescole in EPDM di durezza 70 Shore A standard e 75 Shore A, a richiesta:**

sono mescole impiegate in presenza di acqua, acqua calda, fluido per freni, fluido antigelo, glicoli ed hanno un range di temperatura compreso tra -40° C e +150° C.

### **Mescole in FKM di durezza 70 Shore A standard e 90 Shore A a richiesta:**

mescole in elastomero fluorurato utilizzato in applicazioni con elevate temperature e dove si richiede una inerzia chimica straordinaria.

Impiegate a contatto con solventi aromatici, fluidi a base di esteri fosforici, lubrificanti sintetici e acidi concentrati. Possono essere utilizzate in un range di temperatura compreso tra i -20° C e +200° C.

### **Mescole in VMQ di durezza di 65/70 Shore A:**

mescole utilizzate nell'industria alimentare e nell'industria medicale. Hanno ottimi risultati in acqua calda, ossigeno ed ozono.

Il range di temperature molto ampio (da -60° C a +220° C) allarga il campo di applicazioni.

Tutte le compatibilità con queste mescole disponibili nella TABELLA I, pagine 12 e 13.

## MATERIAL

There are, as stated in the description, different compounds and hardness for o-rings.

Some of the materials and applications are listed hereafter.

### **NBR compounds, standard hardness 70 Shore A and 90 Shore A on demand:**

general use material, both for hydraulic and pneumatic applications.

They show little compression-set and they have a very good resistance to fluids like mineral oil, vegetal oil, greases and water-glycol compounds. It only requires not to exceed 60° C.

The operating temperature ranges from -25° C to +100° C, with short peaks up to 120° C.

### **HNBR compounds, standard hardness 70 Shore A and 75 Shore A on demand:**

basic compound as the NBR but with a double butadiene bond.

It is a hydrogenated material and it is used in cases where the normal rubber does not resist, for applications at temperatures of 140° C, even with peaks of 150° C. It is compatible with greases, mineral and vegetable oils and reacts very well to oxidation.

### **EPDM compounds, standard hardness 70 Shore A and 75 Shore A on demand:**

they are meant for use in water, hot water, brake fluid, antifreeze fluid, glycols and the temperature can range from -40° C to +150° C.

### **FKM compounds, standard hardness 70 Shore A and 90 Shore A on demand:**

compounds in fluorinated elastomer for high temperature applications and where huge chemical inertia is needed. They are used in the contact with aromatic solvents, ester-phosphoric based fluids, synthetic lubricants and concentrated acids.

It can be used in a temperature range from -20° C to +200° C.

### **VMQ compounds, hardness 65/70 Shore A:**

material used in the food and medical industry. They give excellent results in hot water, oxygen and ozone. The wide temperature range (from -60° C to +220° C) broadens the scope for application.

For all the compatibilities with these compounds see TABLE I, pages 12 and 13.

## ANELLO ANTIESTRUSIONE TIPO RAE

### DESCRIZIONE

Come descritto in precedenza, la tenuta con o-ring è la più semplice ed anche la più economica in condizioni di lavoro non gravose.

Quando si è in presenza di pressioni elevate il solo o-ring non è sufficiente. In questo specifico caso bisogna montare l'o-ring con uno o due anelli antiestrusione, per il semplice effetto o per il doppio effetto.

### DATI TECNICI

Pressione: vedi diagramma gioco-pressione a pag. 16

Velocità: < 0.8 m/s

Temperatura: da -30° C a +120° C

Fluidi: oli idraulici a base minerale tipo HL e HLP (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Il materiale è un elastomero termoplastico (TPE) di durezza 55 Sh D con un buon modulo elastico e un ottimo comportamento all'allungamento che facilita il rientro in sede in pochi secondi.

**Codice materiale: L1**

### MONTAGGIO

Il montaggio avviene in cava chiusa, in sequenza prima l'o-ring poi l'anello/i antiestrusione.

Le dimensioni della sede sono quelle riportate nella tabella sottostante.

## BACK UP RING TYPE RAE

### DESCRIPTION

As previously mentioned, the o-ring is the easiest and most economical sealing solution, given average working conditions.

In the case of high pressure though, the o-ring alone is not enough and should be combined with one or two anti-extrusion rings, for simple or double effect.

### TECHNICAL DATA

Pressure: see diagram for coupling clearance on page 16

Speed: < 0.8 m/s

Temperature: from -30° C to +120° C

Fluids: mineral-base hydraulic oils, HL and HLP type (see TABLE I, pages 12-13)

### MATERIAL


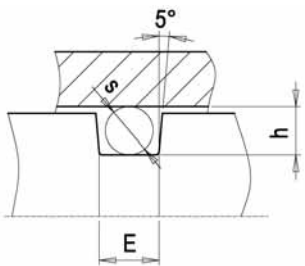
The compound used is a thermoplastic elastomer type (TPE), with a hardness factor of 55 Sh D, a good modulus of elasticity and excellent elongation response. This enables it to return to its original position in the housing in a matter of seconds.

**Compound reference: L1**

### ASSEMBLY

The assembly is done in closed groove, fitting the o-ring first, then the anti-extrusion ring/s.

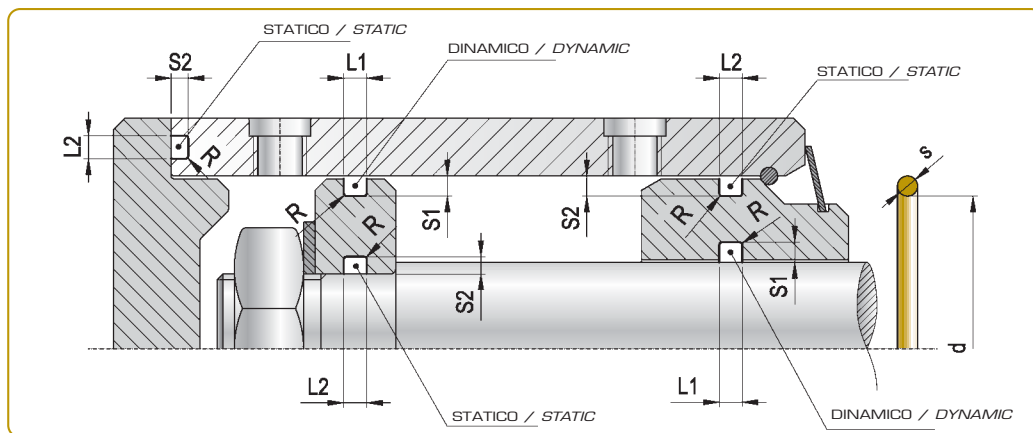
The groove's dimensions are given in the table below.

DIMENSIONI SEDE GROOVE DIMENSION				S	h	
	E	E1	E2			
	2,5	4,0	5,5	1,78	1,45	1,4
	3,5	5,0	6,5	2,62	2,25	1,4
	4,5	6,0	7,5	3,53	3,10	1,4
	7,0	9,0	10,5	5,34	4,70	1,7
	9,5	12,0	14,5	6,99	6,10	2,5



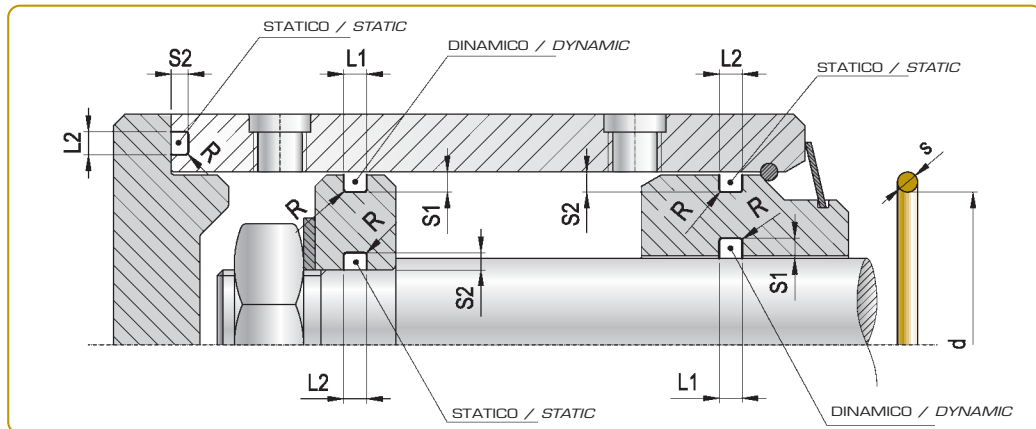
disegno / DRAWING

OR



S	S1	L1	S2	L2	R
sezione section	sezione dinamica dynamic section	sezione dinamica dynamic section	sezione statica static section	sezione statica static section	raggio radius
1,78 ± 0,08	1,45 ± 0,05	2,40 ± 0,20	1,30 ± 0,05	2,60 ± 0,20	0,30 ± 0,10
2,62 ± 0,09	2,25 ± 0,05	3,60 ± 0,20	2,00 ± 0,05	3,80 ± 0,20	0,40 ± 0,15
3,53 ± 0,10	3,10 ± 0,05	4,80 ± 0,20	2,70 ± 0,05	5,00 ± 0,20	0,50 ± 0,20
5,34 ± 0,15	4,70 ± 0,05	7,10 ± 0,20	4,30 ± 0,05	7,30 ± 0,20	0,60 ± 0,25
6,99 ± 0,15	6,10 ± 0,05	9,50 ± 0,20	5,80 ± 0,05	9,70 ± 0,20	1,00 ± 0,30

TENUTE STATICHE  
STATIC SEALS

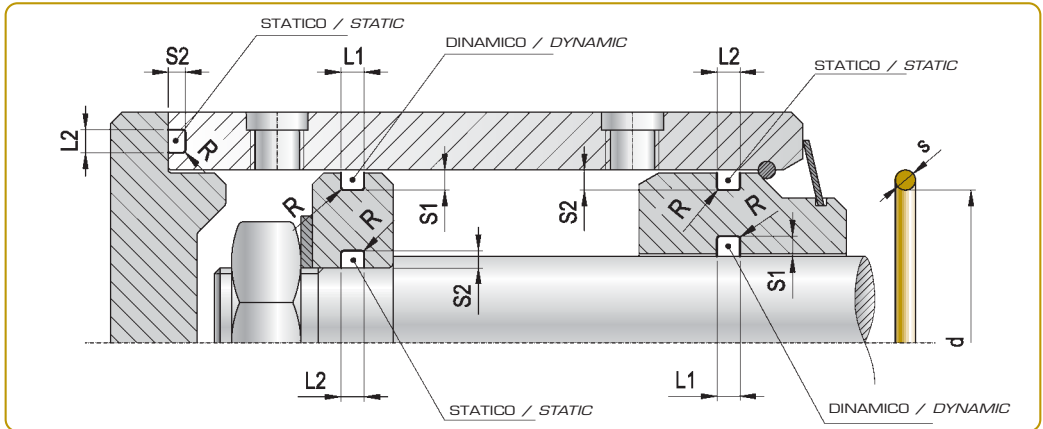


S	S1	L1	S2	L2	R
1,78 ± 0,08	1,45 ± 0,05	2,40 ± 0,20	1,30 ± 0,05	2,60 ± 0,20	0,30 ± 0,10

d	toll ±	ART / ITEM						
		o-ring	altro rif alternative ref.	RAE (x100)				
1,78	0,13	004	2007	RAE	00178	00178	L1	
2,57	0,14	005	2010	RAE	00257	00178	L1	
2,90	0,14	006	2012	RAE	00290	00178	L1	
3,68	0,14	007	2015	RAE	00368	00178	L1	
4,47	0,14	008	2018	RAE	00447	00178	L1	
5,28	0,15	009	20,19	RAE	00528	00178	L1	
6,07	0,15	010	2025	RAE	00607	00178	L1	
6,75	0,16	610	106	RAE	00675	00178	L1	
7,65	0,16	011	2031	RAE	00765	00178	L1	
8,73	0,17	611	108	RAE	00873	00178	L1	
9,25	0,17	012	2037	RAE	00925	00178	L1	
10,82	0,18	013	2043	RAE	01082	00178	L1	
11,11	0,18	806	114	RAE	01111	00178	L1	
12,42	0,19	014	2050	RAE	01242	00178	L1	
14,00	0,20	015	2056	RAE	01400	00178	L1	
15,60	0,20	016	2062	RAE	01560	00178	L1	
17,17	0,21	017	2068	RAE	01717	00178	L1	
18,77	0,22	018	2075	RAE	01877	00178	L1	
20,35	0,23	019	2081	RAE	02035	00178	L1	
21,95	0,24	020	2087	RAE	02195	00178	L1	
23,52	0,24	021	2093	RAE	02352	00178	L1	
25,12	0,26	022	2100	RAE	02512	00178	L1	
26,07	0,28	023	2106	RAE	02607	00178	L1	
28,30	0,29	024	2112	RAE	02830	00178	L1	
29,87	0,29	025	2118	RAE	02987	00178	L1	
31,47	0,31	026	2125	RAE	03147	00178	L1	
33,05	0,32	027	2131	RAE	03305	00178	L1	
34,65	0,33	028	2137	RAE	03465	00178	L1	
37,82	0,37	029	2150	RAE	03782	00178	L1	
41,00	0,39	030	2162	RAE	04100	00178	L1	
44,17	0,42	031	2175	RAE	04417	00178	L1	
47,35	0,44	032	2187	RAE	04735	00178	L1	
50,52	0,47	033	2200	RAE	05052	00178	L1	
53,70	0,50	034	2212	RAE	05370	00178	L1	
56,87	0,52	035	2225	RAE	05687	00178	L1	
60,05	0,55	036	2237	RAE	06005	00178	L1	



d	toll ±	ART / ITEM						
		o-ring	altro rif <i>alternative ref.</i>	RAE	RAE (x100)			
63,22	0,58	037	2250	RAE	06322	00178	L1	
66,40	0,59	038	2262	RAE	06640	00178	L1	
69,57	0,63	039	2275	RAE	06957	00178	L1	
72,75	0,64	040	2287	RAE	07275	00178	L1	
75,92	0,67	041	2300	RAE	07592	00178	L1	
82,27	0,71	042	2325	RAE	08227	00178	L1	
88,62	0,77	043	2350	RAE	08862	00178	L1	
94,97	0,81	044	2375	RAE	09497	00178	L1	
101,32	0,87	045	2400	RAE	10132	00178	L1	
107,67	0,91	046	2425	RAE	10767	00178	L1	
114,02	0,95	047	2450	RAE	11402	00178	L1	
120,37	1,00	048	2475	RAE	12037	00178	L1	



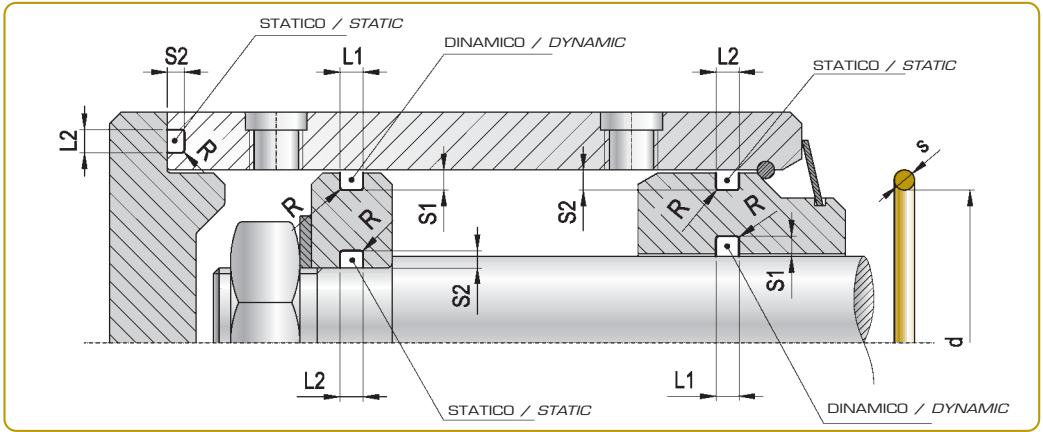
S	S1	L1	S2	L2	R
2,62 ± 0,09	2,25 ± 0,05	3,60 ± 0,2	2,00 ± 0,05	3,80 ± 0,2	0,4 ± 0,15

d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE (x100)			
9,13	0,17	109	-	RAE	00913	00262	L1
9,19	0,17	110	3037	RAE	00919	00262	L1
9,92	0,17	613	112	RAE	00992	00262	L1
10,77	0,18	111	3043	RAE	01077	00262	L1
11,91	0,19	614	115	RAE	01191	00262	L1
12,37	0,19	112	3050	RAE	01237	00262	L1
13,10	0,19	615	117	RAE	01310	00262	L1
13,94	0,19	113	3056	RAE	01394	00262	L1
15,08	0,20	616	119	RAE	01508	00262	L1
15,54	0,20	114	3062	RAE	01554	00262	L1
15,88	0,20	809	121	RAE	01588	00262	L1
17,21	0,21	115	3068	RAE	01721	00262	L1
17,86	0,21	617	123	RAE	01786	00262	L1
18,72	0,22	116	3075	RAE	01872	00262	L1
20,29	0,23	117	3081	RAE	02029	00262	L1
20,63	0,23	812	128	RAE	02063	00262	L1
21,89	0,23	118	3087	RAE	02189	00262	L1
22,22	0,24	813	130	RAE	02222	00262	L1
23,47	0,24	119	3093	RAE	02347	00262	L1
23,81	0,25	814	132	RAE	02381	00262	L1
25,07	0,26	120	3100	RAE	02507	00262	L1
26,64	0,28	121	3106	RAE	02664	00262	L1
28,24	0,29	122	3112	RAE	02824	00262	L1
29,82	0,29	123	3118	RAE	02982	00262	L1
31,42	0,31	124	3123	RAE	03142	00262	L1
32,99	0,32	125	3131	RAE	03299	00262	L1
34,60	0,33	126	3137	RAE	03460	00262	L1
36,14	0,35	127	3143	RAE	03614	00262	L1
37,77	0,37	128	3150	RAE	03777	00262	L1
39,34	0,38	129	3156	RAE	03934	00262	L1
40,95	0,39	130	3162	RAE	04095	00262	L1
42,52	0,40	131	3168	RAE	04252	00262	L1
44,12	0,42	132	3175	RAE	04412	00262	L1
45,69	0,43	133	3181	RAE	04569	00262	L1
47,30	0,44	134	3187	RAE	04730	00262	L1
48,90	0,46	135	3193	RAE	04890	00262	L1



d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE	RAE (x100)		
50,47	0,47	136	3200	RAE	05047	00262	L1
52,07	0,48	137	3206	RAE	05207	00262	L1
53,65	0,50	138	3212	RAE	05365	00262	L1
55,25	0,51	139	3218	RAE	05525	00262	L1
56,82	0,52	140	3225	RAE	05682	00262	L1
58,42	0,54	141	3231	RAE	05842	00262	L1
60,00	0,55	142	3237	RAE	06000	00262	L1
61,60	0,56	143	3243	RAE	06160	00262	L1
63,17	0,58	144	3250	RAE	06317	00262	L1
64,77	0,58	145	3256	RAE	06477	00262	L1
66,35	0,59	146	3262	RAE	06635	00262	L1
67,95	0,61	147	3268	RAE	06795	00262	L1
69,52	0,63	148	3275	RAE	06952	00262	L1
71,12	0,64	149	3281	RAE	07112	00262	L1
72,96	0,64	150	3287	RAE	07296	00262	L1
75,87	0,67	151	3300	RAE	07587	00262	L1
82,22	0,71	152	3325	RAE	08222	00262	L1
88,57	0,77	153	3350	RAE	08857	00262	L1
94,92	0,81	154	3375	RAE	09492	00262	L1
101,27	0,87	155	3400	RAE	10127	00262	L1
107,62	0,91	156	3425	RAE	10762	00262	L1
113,97	0,95	157	3450	RAE	11397	00262	L1
120,33	1,00	158	3475	RAE	12033	00262	L1
126,67	1,05	159	3500	RAE	12667	00262	L1
133,00	1,10	160	3525	RAE	13300	00262	L1
139,38	1,13	161	3550	RAE	13938	00262	L1
145,72	1,20	162	3575	RAE	14572	00262	L1
152,07	1,24	163	3600	RAE	15207	00262	L1
158,43	1,27	164	3625	RAE	15843	00262	L1
164,78	1,31	165	3650	RAE	16478	00262	L1
171,13	1,38	166	3675	RAE	17113	00262	L1
177,84	1,41	167	3700	RAE	17784	00262	L1
183,83	1,44	168	3725	RAE	18383	00262	L1
190,18	1,51	169	3750	RAE	19018	00262	L1
196,53	1,55	170	3775	RAE	19653	00262	L1
202,88	1,59	171	3800	RAE	20288	00262	L1
209,23	1,63	172	3825	RAE	20923	00262	L1
215,58	1,67	173	3850	RAE	21558	00262	L1
221,93	1,71	174	3875	RAE	22193	00262	L1
228,28	1,75	175	3900	RAE	22828	00262	L1



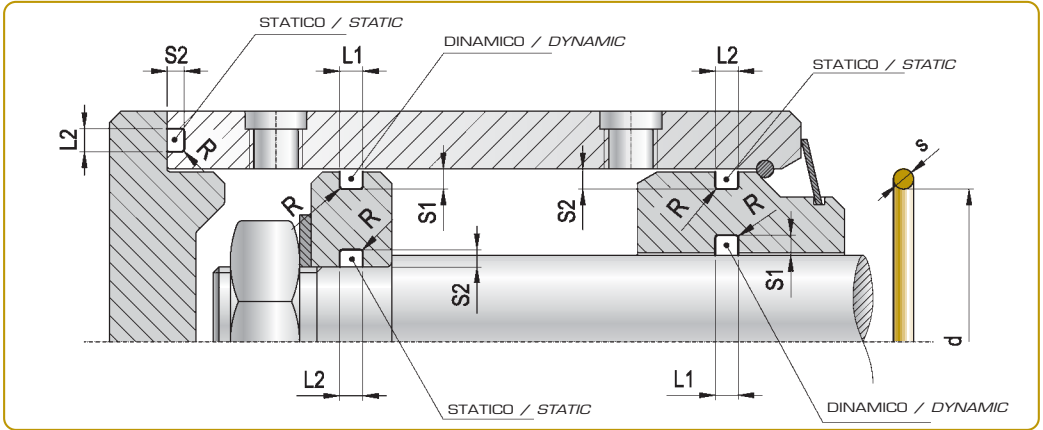


S	S1	L1	S2	L2	R
3,53 ± 0,1	3,10 ± 0,05	4,80 ± 0,2	2,70 ± 0,05	5,00 ± 0,2	0,5 ± 0,2

d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE (x100)			
18,64	0,22	210	4075	RAE	01864	00353	L1
20,22	0,23	211	4081	RAE	02022	00353	L1
21,82	0,24	212	4087	RAE	02182	00353	L1
23,40	0,24	213	4093	RAE	02340	00353	L1
24,99	0,25	214	4100	RAE	02499	00353	L1
25,80	0,26	618	134	RAE	02580	00353	L1
26,58	0,28	215	4106	RAE	02658	00353	L1
28,17	0,29	216	4112	RAE	02817	00353	L1
29,75	0,29	217	4118	RAE	02975	00353	L1
31,34	0,31	218	4125	RAE	03134	00353	L1
32,92	0,32	219	4131	RAE	03292	00353	L1
34,52	0,34	220	4137	RAE	03452	00353	L1
36,09	0,35	221	4143	RAE	03609	00353	L1
37,69	0,37	222	4150	RAE	03769	00353	L1
39,69	0,38	824	144	RAE	03969	00353	L1
40,87	0,39	223	4162	RAE	04087	00353	L1
41,28	0,40	825	146	RAE	04128	00353	L1
42,86	0,41	826	147	RAE	04286	00353	L1
44,04	0,42	224	4175	RAE	04404	00353	L1
44,45	0,42	827	149	RAE	04445	00353	L1
46,04	0,43	828	150	RAE	04604	00353	L1
47,22	0,44	225	4187	RAE	04722	00353	L1
47,63	0,45	829	152	RAE	04763	00353	L1
49,21	0,46	830	153	RAE	04921	00353	L1
50,39	0,47	226	4200	RAE	05039	00353	L1
50,80	0,47	831	155	RAE	05080	00353	L1
52,39	0,48	832	156	RAE	05239	00353	L1
53,57	0,50	227	4212	RAE	05357	00353	L1
53,98	0,50	833	158	RAE	05398	00353	L1
55,56	0,51	834	159	RAE	05556	00353	L1
56,74	0,52	228	4225	RAE	05674	00353	L1
57,15	0,54	835	161	RAE	05715	00353	L1
58,74	0,54	836	162	RAE	05874	00353	L1
59,92	0,54	229	4237	RAE	05992	00353	L1
60,33	0,55	837	164	RAE	06033	00353	L1
61,91	0,56	838	165	RAE	06191	00353	L1



d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE (x100)			
63,09	0,58	230	4250	RAE	06309	00353	L1
63,50	0,58	839	167	RAE	06350	00353	L1
65,09	0,59	840	168	RAE	06509	00353	L1
66,27	0,59	231	4262	RAE	06627	00353	L1
66,68	0,59	841	170	RAE	06668	00353	L1
68,26	0,61	842	171	RAE	06826	00353	L1
69,44	0,63	232	4275	RAE	06944	00353	L1
69,85	0,63	843	173	RAE	06985	00353	L1
71,44	0,64	844	174	RAE	07144	00353	L1
72,62	0,64	233	4287	RAE	07262	00353	L1
73,03	0,66	845	176	RAE	07303	00353	L1
74,61	0,66	846	177	RAE	07461	00353	L1
75,79	0,67	234	4300	RAE	07579	00353	L1
78,97	0,69	235	4312	RAE	07897	00353	L1
82,14	0,71	236	4325	RAE	08214	00353	L1
85,32	0,75	237	4337	RAE	08532	00353	L1
88,49	0,77	238	4350	RAE	08849	00353	L1
91,67	0,79	239	4362	RAE	09167	00353	L1
94,84	0,81	240	4375	RAE	09484	00353	L1
98,02	0,84	241	4387	RAE	09802	00353	L1
101,19	0,87	242	4400	RAE	10119	00353	L1
104,37	0,89	243	4412	RAE	10437	00353	L1
107,54	0,91	244	4425	RAE	10754	00353	L1
110,72	0,93	245	4437	RAE	11072	00353	L1
113,89	0,95	246	4450	RAE	11389	00353	L1
117,07	0,97	247	4462	RAE	11707	00353	L1
120,24	1,00	248	4475	RAE	12024	00353	L1
123,42	1,03	249	4487	RAE	12342	00353	L1
126,59	1,05	250	4500	RAE	12659	00353	L1
129,77	1,08	251	4512	RAE	12977	00353	L1
132,94	1,10	252	4525	RAE	13294	00353	L1
136,12	1,13	253	4537	RAE	13612	00353	L1
139,29	1,13	254	4550	RAE	13929	00353	L1
142,47	1,17	255	4562	RAE	14247	00353	L1
145,64	1,20	256	4575	RAE	14564	00353	L1
148,82	1,20	257	4587	RAE	14882	00353	L1
151,99	1,24	258	4600	RAE	15199	00353	L1
158,34	1,27	259	4625	RAE	15834	00353	L1
164,69	1,31	260	4650	RAE	16469	00353	L1
171,04	1,38	261	4675	RAE	17104	00353	L1
177,39	1,41	262	4700	RAE	17739	00353	L1
183,74	1,44	263	4725	RAE	18374	00353	L1
190,09	1,51	264	4750	RAE	19009	00353	L1
196,44	1,55	265	4775	RAE	19644	00353	L1
202,79	1,59	266	4800	RAE	20279	00353	L1
209,14	1,63	267	4825	RAE	20914	00353	L1
215,49	1,67	268	4850	RAE	21549	00353	L1
221,84	1,71	269	4875	RAE	22184	00353	L1
228,19	1,75	270	4900	RAE	22819	00353	L1
234,54	1,79	271	4925	RAE	23454	00353	L1
240,89	1,83	272	4950	RAE	24089	00353	L1
247,24	1,88	273	4975	RAE	24724	00353	L1
253,59	1,93	274	41000	RAE	25359	00353	L1
266,29	2,02	275	41050	RAE	26629	00353	L1
278,99	2,08	276	41100	RAE	27899	00353	L1
291,69	2,21	277	41150	RAE	29169	00353	L1
304,39	2,25	278	41200	RAE	30439	00353	L1
329,79	2,43	279	41300	RAE	32979	00353	L1
355,19	2,62	280	41400	RAE	35519	00353	L1
380,59	2,76	281	41500	RAE	38059	00353	L1

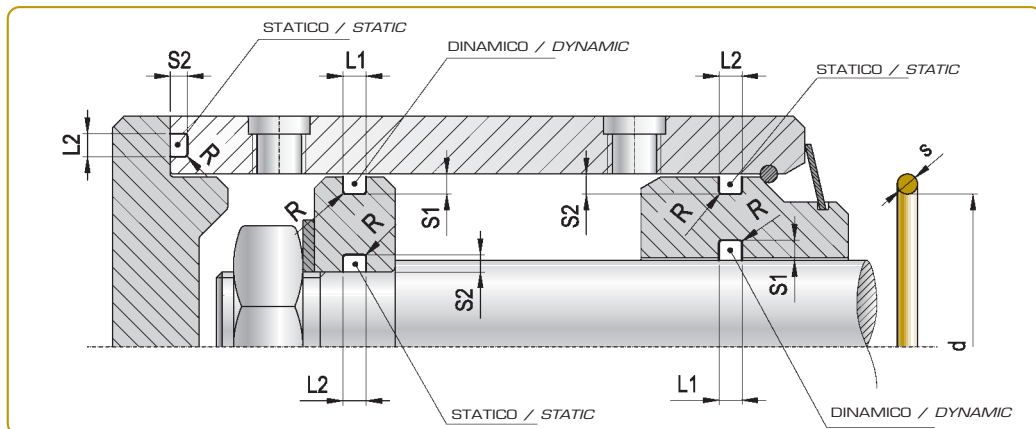


S	S1	L1	S2	L2	R
5,34 ± 0,15	4,70 ± 0,05	7,10 ± 0,2	4,30 ± 0,05	7,30 ± 0,2	0,6 ± 0,25

d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE	RAE (x100)		
37,47	0,36	325	6150	RAE	03747	00534	L1
40,65	0,39	326	6162	RAE	04065	00534	L1
43,82	0,42	327	6175	RAE	04382	00534	L1
47,00	0,44	328	6187	RAE	04700	00534	L1
50,16	0,47	329	6200	RAE	05016	00534	L1
53,34	0,50	330	6212	RAE	05334	00534	L1
56,52	0,52	331	6225	RAE	05652	00534	L1
59,69	0,54	332	6237	RAE	05969	00534	L1
62,87	0,56	333	6250	RAE	06287	00534	L1
66,04	0,59	334	6262	RAE	06604	00534	L1
69,22	0,63	335	6275	RAE	06922	00534	L1
72,39	0,64	336	6287	RAE	07239	00534	L1
74,63	0,66	619	178	RAE	07463	00534	L1
75,57	0,67	337	6300	RAE	07557	00534	L1
78,74	0,69	338	6312	RAE	07874	00534	L1
79,77	0,69	620	181	RAE	07977	00534	L1
81,92	0,71	339	6325	RAE	08192	00534	L1
85,09	0,75	340	6337	RAE	08509	00534	L1
88,27	0,77	341	6350	RAE	08827	00534	L1
89,69	0,77	621	185	RAE	08969	00534	L1
91,44	0,79	342	6362	RAE	09144	00534	L1
94,62	0,81	343	6375	RAE	09462	00534	L1
97,79	0,84	644	6387	RAE	09779	00534	L1
100,00	0,87	322	189	RAE	10000	00534	L1
100,97	0,87	345	6400	RAE	10097	00534	L1
104,14	0,89	346	6412	RAE	10414	00534	L1
107,32	0,91	347	6425	RAE	10732	00534	L1
109,50	0,93	623	193	RAE	10950	00534	L1
110,05	0,93	348	6437	RAE	11005	00534	L1
113,67	0,95	349	6450	RAE	11367	00534	L1
116,84	0,97	350		RAE	11684	00534	L1
117,50	0,97	860	199	RAE	11750	00534	L1
120,02	1,00	351		RAE	12002	00534	L1
120,07	1,00	861	201	RAE	12007	00534	L1
123,20	1,03	352		RAE	12320	00534	L1
123,80	1,03	862	203	RAE	12380	00534	L1



d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE (x100)			
126,37	1,05	353		RAE	12637	00534	L1
127,00	1,05	863	206	RAE	12700	00534	L1
129,54	1,08	354		RAE	12954	00534	L1
130,20	1,08	864	208	RAE	13020	00534	L1
132,72	1,10	355		RAE	13272	00534	L1
133,40	1,10	865	210	RAE	13340	00534	L1
135,90	1,10	356		RAE	13590	00534	L1
136,50	1,13	866	213	RAE	13650	00534	L1
139,07	1,13	357		RAE	13907	00534	L1
139,70	1,13	867	215	RAE	13970	00534	L1
142,24	1,17	358		RAE	14224	00534	L1
142,90	1,17	868	217	RAE	14290	00534	L1
145,42	1,20	359		RAE	14542	00534	L1
146,10	1,20	869	219	RAE	14610	00534	L1
148,60	1,20	360		RAE	14860	00534	L1
149,20	1,20	870	221	RAE	14920	00534	L1
151,77	1,24	361	6600	RAE	15177	00534	L1
158,12	1,27	362	6625	RAE	15812	00534	L1
164,47	1,31	363	6645	RAE	16447	00534	L1
170,82	1,38	364	6670	RAE	17082	00534	L1
177,17	1,41	365	6700	RAE	17717	00534	L1
183,52	1,44	366	6720	RAE	18352	00534	L1
189,87	1,48	367	6745	RAE	18987	00534	L1
196,22	1,55	368	6670	RAE	19622	00534	L1
202,57	1,59	369	6700	RAE	20257	00534	L1
208,92	1,63	370	6720	RAE	20892	00534	L1
215,27	1,67	371	6745	RAE	21527	00534	L1
221,62	1,71	372	6775	RAE	22162	00534	L1
227,97	1,75	373	6795	RAE	22797	00534	L1
234,32	1,79	374	6820	RAE	23432	00534	L1
240,67	1,83	375	6850	RAE	24067	00534	L1
247,02	1,88	376	6870	RAE	24702	00534	L1
253,37	1,93	377	6895	RAE	25337	00534	L1
266,07	2,02	378	6920	RAE	26607	00534	L1
278,77	2,08	379	6945	RAE	27877	00534	L1
291,47	2,21	380	6975	RAE	29147	00534	L1
304,17	2,25	381	6995	RAE	30417	00534	L1
329,57	2,43	382	61050	RAE	32957	00534	L1
354,97	2,56	383	61100	RAE	35497	00534	L1
380,37	2,76	384	61150	RAE	38037	00534	L1
405,26	2,91	385	61200	RAE	40526	00534	L1
430,66	3,07	386	61300	RAE	43066	00534	L1
456,06	3,22	387	61400	RAE	45606	00534	L1
481,40	3,37	388	61500	RAE	48140	00534	L1
506,80	3,54	389	61600	RAE	50680	00534	L1
532,20	3,72	390	61700	RAE	53220	00534	L1
557,60	3,81	391	61800	RAE	55760	00534	L1
582,68	4,05	392	61900	RAE	58268	00534	L1
608,08	4,13	393	62000	RAE	60808	00534	L1
633,48	4,34	394	62100	RAE	63348	00534	L1
658,88	4,46	395		RAE	65888	00534	L1



S	S1	L1	S2	L2	R
6,99 ± 0,2	6,1 ± 0,05	9,5 ± 0,2	5,80 ± 0,05	9,7 ± 0,2	1 ± 0,3

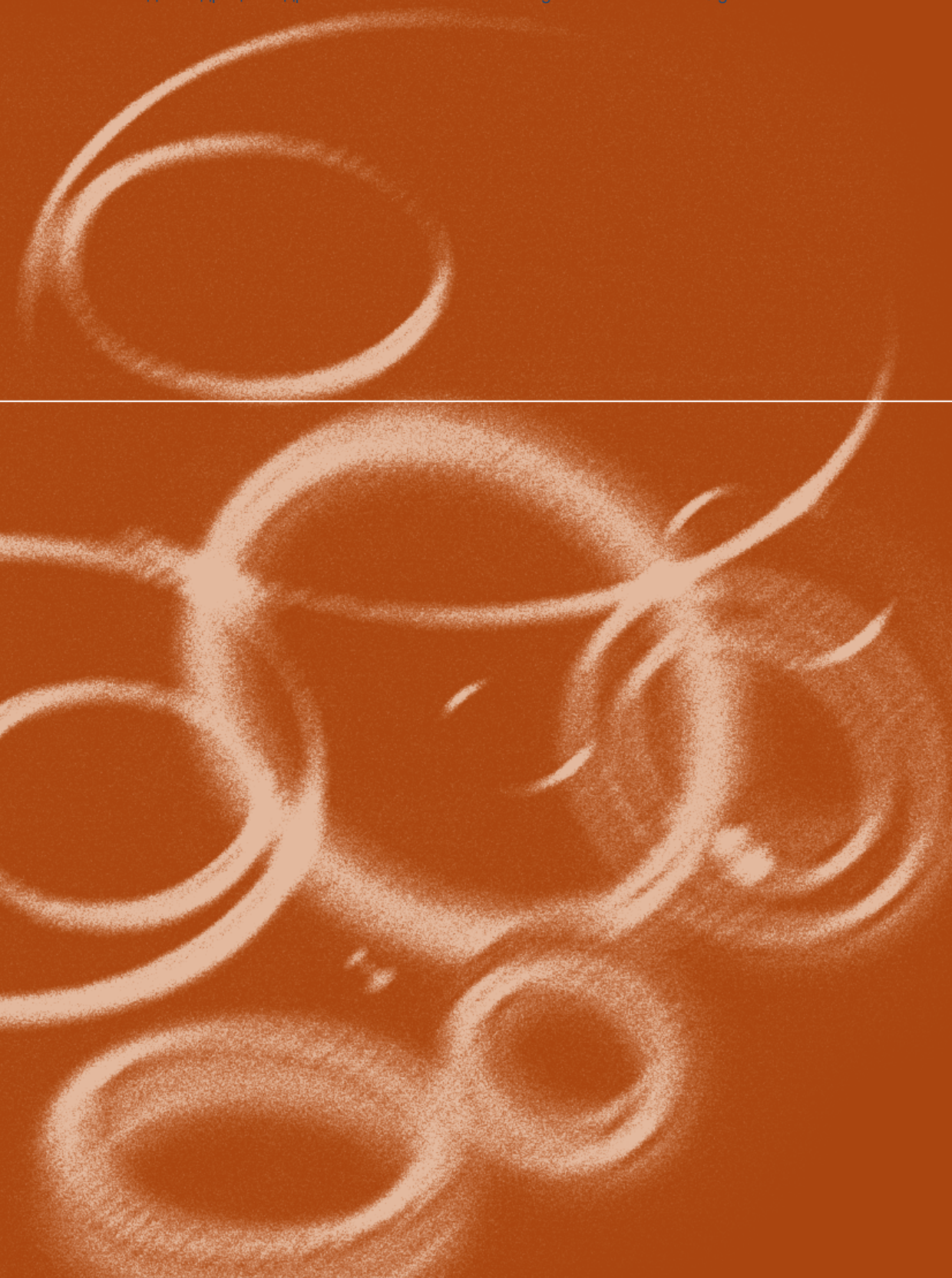
d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE	RAE (x100)		
113,67	0,95	425	4437	RAE	11376	00699	L1
114,70	0,95	624	197	RAE	11470	00699	L1
116,84	0,97	426	8462	RAE	11684	00699	L1
120,02	1,00	427	8475	RAE	12002	00699	L1
123,20	1,03	428	8487	RAE	12320	00699	L1
124,60	1,03	625	204	RAE	12460	00699	L1
126,37	1,05	429	8500	RAE	12637	00699	L1
129,54	1,08	430	8512	RAE	12954	00699	L1
132,72	1,10	431	8525	RAE	13272	00699	L1
134,50	1,10	626	211	RAE	13450	00699	L1
135,90	1,10	432	8537	RAE	13590	00699	L1
139,07	1,13	433	8550	RAE	13907	00699	L1
142,24	1,17	434	8562	RAE	14224	00699	L1
145,42	1,20	435	8575	RAE	14542	00699	L1
148,60	1,20	436	8587	RAE	14860	00699	L1
151,77	1,24	437	8600	RAE	15177	00699	L1
155,60	1,27	872	223	RAE	15560	00699	L1
158,12	1,27	438	8625	RAE	15812	00699	L1
159,50	1,27	627	225	RAE	15950	00699	L1
161,90	1,31	874	226	RAE	16190	00699	L1
164,47	1,31	439	8650	RAE	16447	00699	L1
166,70	1,34	628	228	RAE	16670	00699	L1
168,30	1,34	876	229	RAE	16830	00699	L1
170,82	1,38	440	8675	RAE	17082	00699	L1
174,60	1,38	878	231	RAE	17460	00699	L1
177,17	1,41	441	8700	RAE	17717	00699	L1
181,00	1,44	880	233	RAE	18100	00699	L1
183,52	1,44	442	8725	RAE	18352	00699	L1
187,30	1,48	882	235	RAE	18730	00699	L1
189,87	1,48	443	8750	RAE	18987	00699	L1
193,70	1,51	884	237	RAE	19370	00699	L1
196,22	1,55	444	8775	RAE	19622	00699	L1
200,00	1,55	886	239	RAE	20000	00699	L1
202,57	1,59	445	8800	RAE	20257	00699	L1
208,92	1,63	674	8825	RAE	20892	00699	L1
215,27	1,67	446	8850	RAE	21527	00699	L1



d	toll ±	ART / ITEM					
		o-ring	altro rif alternative ref.	RAE	RAE (x100)		
221,62	1,71	676	8875	RAE	22162	00699	L1
227,97	1,75	447	8900	RAE	22797	00699	L1
234,32	1,79	678	8925	RAE	23432	00699	L1
240,67	1,83	448	8950	RAE	24067	00699	L1
247,00	1,88	680	8975	RAE	24700	00699	L1
253,30	1,93	449	81000	RAE	25330	00699	L1
259,70	1,98	682	81025	RAE	25970	00699	L1
266,07	2,02	450	81050	RAE	26607	00699	L1
272,40	2,08	684	81075	RAE	27240	00699	L1
278,77	2,08	451	81100	RAE	27877	00699	L1
285,10	2,14	686	81125	RAE	28510	00699	L1
291,47	2,21	452	81150	RAE	29147	00699	L1
297,80	2,21	688	81175	RAE	29780	00699	L1
304,17	2,25	453	81200	RAE	30417	00699	L1
316,87	2,37	454	81250	RAE	31687	00699	L1
329,57	2,43	455	81300	RAE	32957	00699	L1
342,27	2,49	456	81350	RAE	34227	00699	L1
354,97	2,56	457	81400	RAE	35497	00699	L1
367,67	2,68	458	81450	RAE	36767	00699	L1
380,37	2,76	459	81500	RAE	38037	00699	L1
393,07	2,84	460	81550	RAE	39307	00699	L1
405,26	2,91	461	81600	RAE	40526	00699	L1
417,96	2,99	462	81650	RAE	41796	00699	L1
430,66	3,07	463	81700	RAE	43066	00699	L1
443,36	3,15	464	81750	RAE	44336	00699	L1
456,06	3,22	465	81800	RAE	45606	00699	L1
468,76	3,30	466	81850	RAE	46876	00699	L1
481,46	3,37	467	81900	RAE	48146	00699	L1
494,16	3,45	468	81950	RAE	49416	00699	L1
506,86	3,54	469	82000	RAE	50686	00699	L1
532,26	3,72	470	82100	RAE	53226	00699	L1
557,66	3,81	471	82200	RAE	55766	00699	L1

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**SISTEMI DI TENUTA PER PNEUMATICA**  
*PNEUMATIC SEALING SYSTEMS*

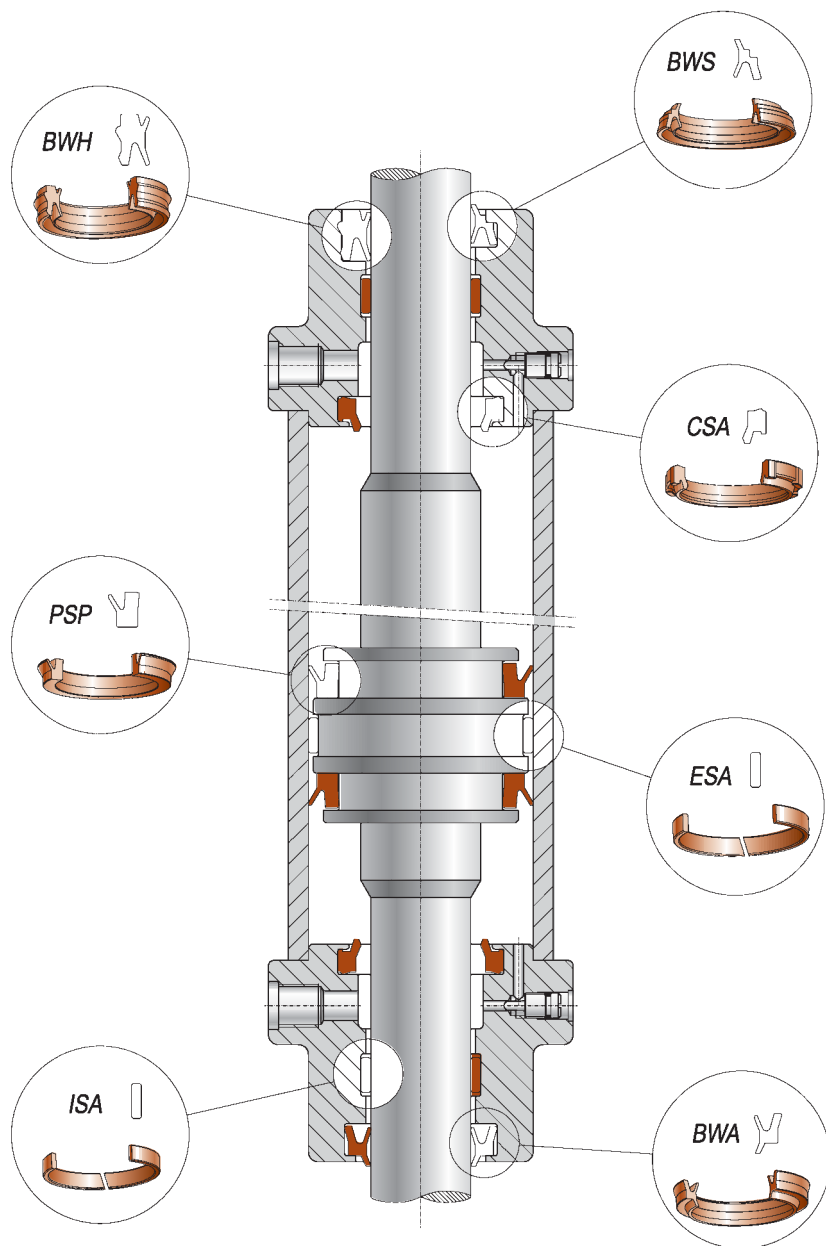
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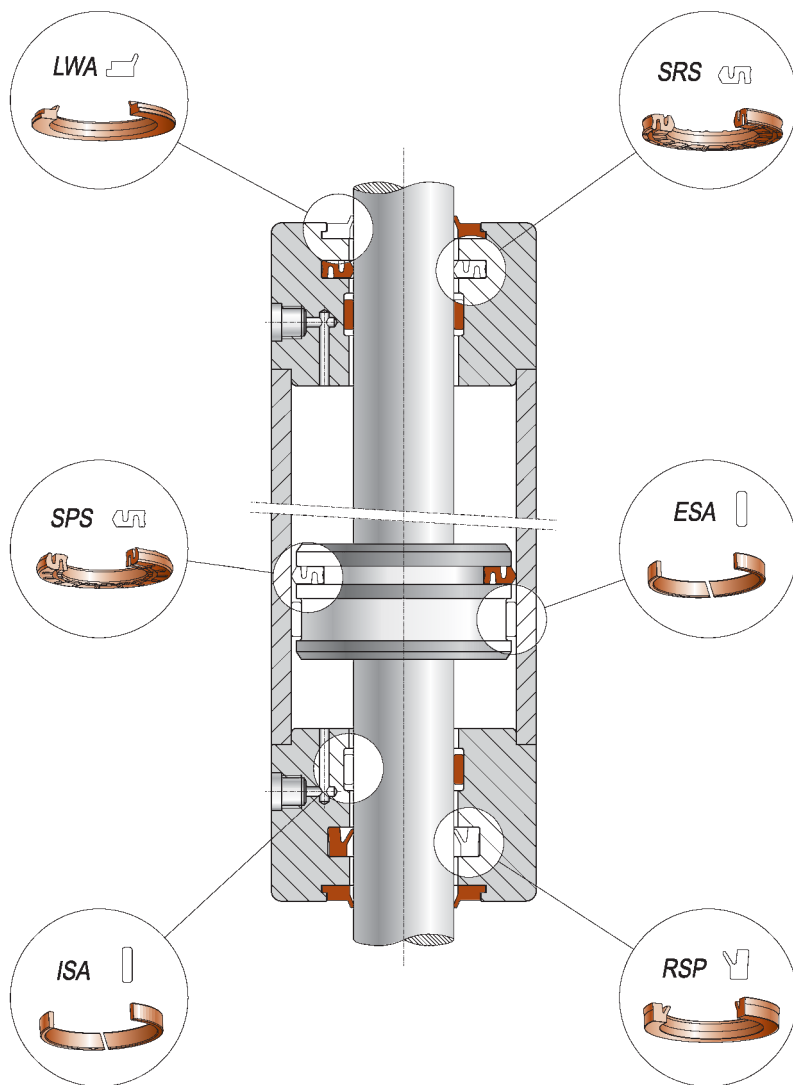
**ARTIC SEALS**



schema cil indro pneumatico A / pneumatic cylinder sketch A





schema cil indro pneumatico B / pneumatic cylinder sketch B



SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS


### GUARNIZIONI STELO / ROD SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	RSP	- 30 + 90	< 20	< 1	TPU	150
	SRS	- 30 + 90	< 20	< 1	TPU	154

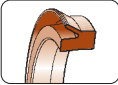


### GUARNIZIONI AMMORTIZZO / CUSHIONING SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	CSA	- 30 + 90	< 20	< 1	TPU	156

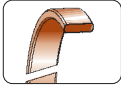

### GUARNIZIONI PISTONE / PISTON SEALS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo Profile	Ns Rif. Our Ref.	Temp. Temp. C°	Press Press Bar	Velocità Speed m/s	Materiale Material	pag
	PSP	- 30 + 90	< 20	< 1	TPU	158
	MPS	- 30 + 90	< 20	< 1	TPU	162
	SPS	- 30 + 90	< 20	< 1	TPU	166


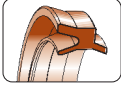


### ANELLI GUIDA / WEAR RINGS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	ISA	- 40 + 115	-	< 1	R3 POM modificato <i>modified</i>	168
	ESA	- 40 + 115	-	< 1	R3 POM modificato <i>modified</i>	170

### RASCHIATORI / WIPERS

Condizioni massime non simultanee / *Maximum non simultaneous conditions*

Profilo <i>Profile</i>	Ns Rif. <i>Our Ref.</i>	Temp. <i>Temp.</i> C°	Press <i>Press</i> Bar	Velocità <i>Speed</i> m/s	Materiale <i>Material</i>	pag
	LWA	- 30 + 90	< 20	< 1	TPU	174
	BWA	- 30 + 90	< 20	< 1	TPU	176
	BWS	- 30 + 90	< 20	< 1	TPU	180
	BWH	- 30 + 90	< 20	< 1	TPU	184

**AVVERTENZE E PRECAUZIONI DI  
MONTAGGIO NEI SISTEMI PNEUMATICI**

Per un ottimo funzionamento delle guarnizioni occorre che durante il montaggio non vengano tagliate o deformate in modo permanente.

Si raccomanda anche di rispettare le norme internazionali ISO sia per quanto riguarda le dimensioni degli alloggiamenti che per le tolleranze.

Le finiture delle superfici sono descritte nelle figure 9 e 10 sotto indicate e riportano i valori cui attenersi. La tabella di fig. 11 indica il valore in mm. per eseguire lo smusso d'invito.

**Le finiture di sola rettifica non sono mai consigliate ma si raccomanda un'ulteriore lavorazione di lucidatura prima del montaggio.**

**INSTRUCTIONS AND CARE FOR  
INSTALLATION IN PNEUMATIC  
SYSTEMS**

For the most suitable seals working condition it's necessary to avoid scratches or permanent deformation of the seals during assembly.

The respect of international ISO rules on housing dimensions as well as on tolerance is strongly recommended. Figures 9 and 10 describe the main criteria for surface finish. Table as per fig. 11 shows the value in mm to execute lead-in chamfer.

**Finish by grinding only is not suggested and an additional polishing work of the surface itself is recommended previous to mounting.**

fig. 9

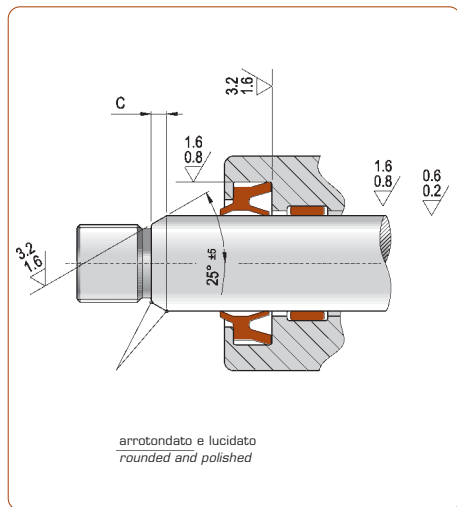


fig. 10

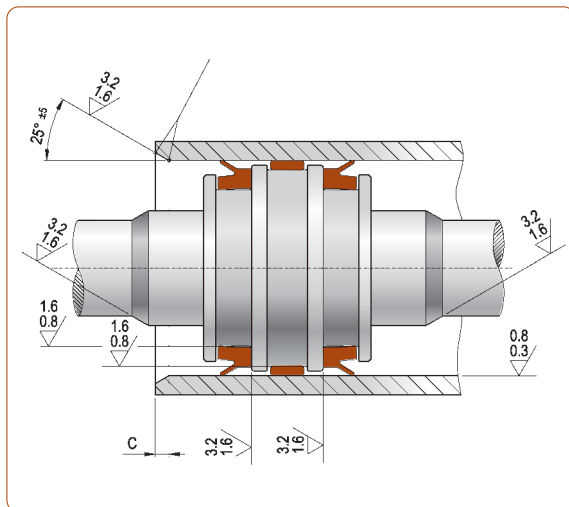


fig. 11

diametri diameters D-d	< 25	25 - 60	61 - 100	101 - 180	181 - 300	> 300
C mm	2,5	3,0	4,0	5,0	6,0	7,5



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### TENUTA STELO PER PNEUMATICA TIPO RSP

#### DESCRIZIONE

Alla tenuta stelo tipo **RSP**, rispetto a tipi similari, sono state apportate alcune modifiche sul profilo per renderla più scorrevole e più sensibile alle basse pressioni.

Il labbro dinamico è arrotondato per favorire la linearità del movimento.

La profondità della gola tra il labbro dinamico e il labbro statico è più marcata per aumentare la flessibilità e per un migliore adattamento agli eventuali disallineamenti del sistema.

#### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

#### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

#### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave nella sede per facilitare il montaggio e non danneggiare la guarnizione durante l'inserimento.

Lo stelo non deve presentare bave, e deve avere uno smusso d'invito (v. fig. 9, 10, 11 a pag. 148).

### ROD SEAL FOR PNEUMATIC TYPE RSP

#### DESCRIPTION

For the **RSP** rod seal slight changes have been made - if compared to the traditional rod seals profiles - in order to obtain the following advantages: better slide, lower abrasion resistance and better performance also at low pressures. A rounded dynamic lip facilitates a linear movement.

Deeper U-profile between the dynamic and the static lip to improve flexibility and to help winning non-linear system movements.

#### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

#### MATERIAL

Standard polyurethane 90 Sh A.

**Compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

#### ASSEMBLY

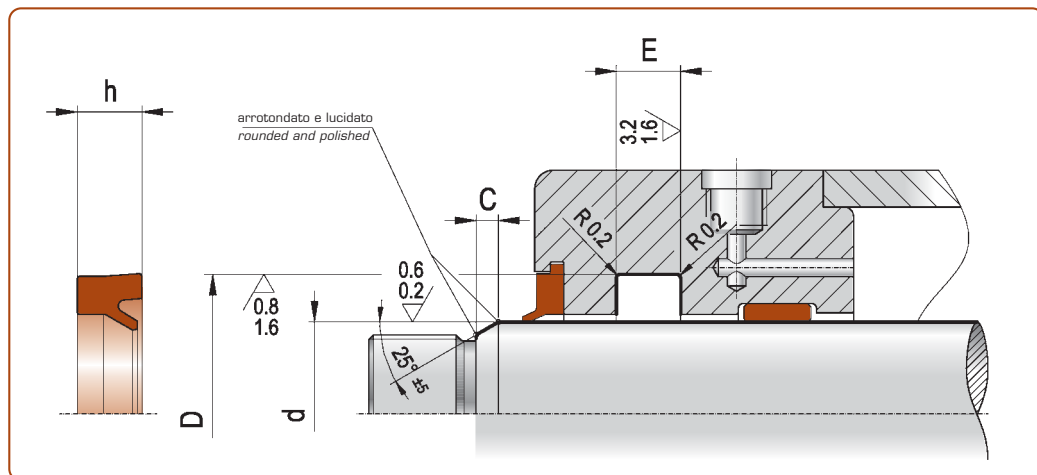
Eliminate any cutting edges and flash in the housing to permit assembly and prevent damage to the seals during mounting.

The same applies to the rod, a lead-in chamfer should be present instead [see fig. 9, 10, 11 page 148].



disegno / DRAWING

RSP



$d_{f9}$	$D_{H10}$	tol $H_{10}$	h	$E_{+0,2}$	ART / ITEM				
3,0	6,0	+0.058/0	2,5	3,0	RSP	0030	0060	025	80
4,0	8,0	+0.058/0	3,0	3,5	RSP	0040	0080	030	80
5,0	9,0	+0.058/0	2,5	3,0	RSP	0050	0090	025	80
6,0	10,0	+0.070/0	3,0	3,5	RSP	0060	0100	030	80
6,0	11,0	+0.070/0	3,0	3,5	RSP	0060	0110	030	80
6,0	12,0	+0.070/0	4,0	4,5	RSP	0060	0120	040	80
7,0	13,0	+0.070/0	4,0	4,5	RSP	0070	0130	040	80
7,0	14,0	+0.070/0	3,5	4,0	RSP	0070	0140	035	80
8,0	14,0	+0.070/0	4,0	4,5	RSP	0080	0140	040	80
8,0	14,0	+0.070/0	4,5	5,0	RSP	0080	0160	045	80
8,0	16,0	+0.070/0	4,5	5,0	RSP	0080	0160	045	80
10,0	16,0	+0.070/0	4,5	5,0	RSP	0100	0160	045	80
10,0	18,0	+0.070/0	5,5	6,0	RSP	0100	0180	055	80
11,0	19,0	+0.070/0	4,0	4,5	RSP	0110	0190	040	80
12,0	20,0	+0.084/0	5,5	6,0	RSP	0120	0200	055	80
12,0	24,0	+0.084/0	6,0	6,5	RSP	0120	0240	060	80
14,0	22,0	+0.084/0	5,5	6,0	RSP	0140	0220	055	80
16,0	22,0	+0.084/0	3,0	3,5	RSP	0160	0220	030	80
16,0	24,0	+0.084/0	5,5	6,0	RSP	0160	0240	055	80
18,0	26,0	+0.084/0	5,5	6,0	RSP	0180	0260	055	80
20,0	28,0	+0.084/0	5,5	6,0	RSP	0200	0280	055	80
22,0	28,0	+0.100/0	4,5	5,0	RSP	0220	0280	045	80
22,0	30,0	+0.100/0	5,5	6,0	RSP	0220	0300	055	80
25,0	33,0	+0.100/0	5,5	6,0	RSP	0250	0330	055	80
28,0	36,0	+0.100/0	5,5	6,0	RSP	0280	0360	055	80
28,0	38,0	+0.100/0	7,0	7,5	RSP	0280	0380	070	80
30,0	38,0	+0.100/0	5,5	5,5	RSP	0300	0380	055	80
30,0	40,0	+0.100/0	7,0	7,5	RSP	0300	0400	070	80
32,0	40,0	+0.100/0	5,5	6,0	RSP	0320	0400	055	80
35,0	43,0	+0.100/0	8,0	8,5	RSP	0350	0430	080	80
35,0	45,0	+0.100/0	7,0	7,5	RSP	0350	0450	070	80
35,0	45,0	+0.100/0	10,0	10,5	RSP	0350	0450	100	80
36,0	46,0	+0.100/0	7,0	7,5	RSP	0360	0460	070	80
40,0	48,0	+0.100/0	5,5	6,0	RSP	0400	0480	055	80
40,0	50,0	+0.100/0	7,0	7,5	RSP	0400	0500	070	80
45,0	55,0	+0.120/0	7,0	7,5	RSP	0450	0550	070	80
50,0	60,0	+0.120/0	7,0	7,5	RSP	0500	0600	070	80
55,0	65,0	+0.120/0	7,0	7,5	RSP	0550	0650	070	80
56,0	66,0	+0.120/0	7,0	7,5	RSP	0560	0660	070	80

SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS





$d_{f9}$	$D_{H10}$	тол $H_{10}$	$h$	$E_{\pm 0,2}$	ART / ITEM				
60,0	72,0	+0.120/0	8,5	9,5	RSP	0600	0720	085	80
63,0	73,0	+0.120/0	7,0	7,5	RSP	0630	0730	070	80
63,0	75,0	+0.120/0	8,5	9,5	RSP	0630	0750	085	80
65,0	77,0	+0.120/0	8,5	9,5	RSP	0650	0770	085	80
70,0	82,0	+0.120/0	8,5	9,5	RSP	0700	0820	085	80
75,0	87,0	+0.120/0	8,5	9,5	RSP	0750	0870	085	80
80,0	92,0	+0.120/0	8,5	9,5	RSP	0800	0920	085	80
85,0	97,0	+0.120/0	8,5	9,5	RSP	0850	0970	085	80
90,0	102,0	+0.120/0	8,5	9,5	RSP	0900	1020	085	80
95,0	107,0	+0.120/0	8,5	9,5	RSP	0950	1070	085	80
100,0	115,0	+0.120/0	10,0	11,0	RSP	1000	1150	100	80

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SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS



## TENUTA STELO A MOLLA TIPO SRS

### DESCRIZIONE

La guarnizione tipo **SRS** è progettata per la tenuta stelo di cilindri pneumatici.

Dove gli ingombri lo permettono, può essere utilizzata anche su valvole pneumatiche.

Le ridotte dimensioni delle sedi consentono un'esecuzione di lavorazione macchina semplice.

Ha un profilo arrotondato al centro sul labbro dinamico e due sporgenze sul labbro statico.

Il profilo simmetrico ne facilita il montaggio.

La particolare forma a molla rende il sistema molto scorrevole anche a bassa pressione.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave sullo stelo per evitare di compromettere la guarnizione.

## SPRING ROD SEAL TYPE SRS

### DESCRIPTION

The **SRS** rod seal has been designed for pneumatic cylinders applications.

Where the overall dimensions allow, the **SRS** can also be used for pneumatic valves.

In addition, the reduced overall dimensions result in a short machining time of the system.

Its profile is rounded in the middle of the dynamic lip and it has two projections on the static lip.

This symmetric shape makes installation easier. The special spring shaped profile ensures high flexibility in the system even at low pressure.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

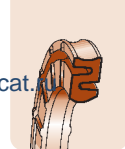
**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

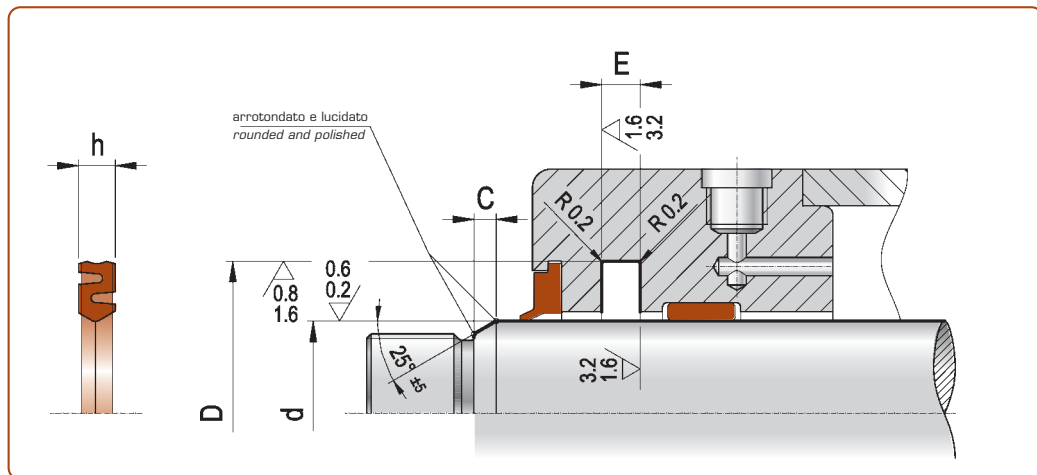
### ASSEMBLY

Eliminate any cutting edges and flash in the housing to permit assembly and prevent damage to seals during mounting.



disegno / DRAWING

SRS



SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS

$d_{f9}$	$D_{H10}$	tol $H_{10}$	$h$	$E_{+0,2}$	ART / ITEM				
6,0	13,0	+0,043/0	2,3	2,5	SRS	0060	0130	023	BO
8,0	15,0	+0,043/0	2,3	2,5	SRS	0080	0150	023	BO
10,0	17,0	+0,043/0	2,3	2,5	SRS	0100	0170	023	BO
12,0	19,0	+0,052/0	2,3	2,5	SRS	0120	0190	023	BO
14,0	21,0	+0,052/0	2,3	2,5	SRS	0140	0210	023	BO
15,0	22,0	+0,052/0	2,3	2,5	SRS	0150	0220	023	BO
16,0	25,0	+0,052/0	2,8	3,0	SRS	0160	0250	028	BO
20,0	29,0	+0,052/0	2,8	3,0	SRS	0200	0290	028	BO
25,0	34,0	+0,062/0	2,8	3,0	SRS	0250	0340	028	BO
30,0	39,0	+0,062/0	2,8	3,0	SRS	0300	0390	028	BO
40,0	49,0	+0,062/0	2,8	3,0	SRS	0400	0490	028	BO
42,0	51,0	+0,074/0	2,8	3,0	SRS	0420	0510	028	BO
50,0	59,0	+0,074/0	2,8	3,0	SRS	0500	0590	028	BO



**GUARNIZIONI AMMORTIZZO TIPO CSA**

**DESCRIZIONE**

L'elemento d'ammortizzo tipo **CSA** è studiato per la frenatura di fine corsa nei pistoni dei cilindri pneumatici. Diverse sono le caratteristiche che concorrono all'efficacia del sistema frenante della guarnizione **CSA**:

- il profilo raschiante con lo smusso d'invito che facilita l'inserimento dell'ogiva;
- le scanalature all'esterno che permettono l'allineamento;
- il bordo alla base dell'ammortizzo;
- l'utilizzo del poliuretano che grazie al suo alto modulo elastico e alla sua alta resistenza all'urto garantisce una lunga durata in esercizio.

**LIMITI D'IMPIEGO**

Pressione:	< 20 bar
Velocità:	< 1 m/s
Temperatura:	da - 30° C a + 90° C
Fluidi:	aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

**MATERIALE**

Il materiale standard è un poliuretano a basso compression-set con una buona flessibilità a freddo.

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 93 Sh A.

**Codice materiale alternativo: CO**

**MONTAGGIO**

Il montaggio avviene in sede semiaperta, pertanto si consiglia di eliminare tutti gli spigoli vivi e le bave per evitare di compromettere la guarnizione.

Lubrificare con grasso per assicurare una maggiore durata della guarnizione.

**CUSHIONING SEAL TYPE CSA**

**DESCRIPTION**

The **CSA** cushioning seal is designed for braking at the end-stroke of pneumatic cylinders.

Several elements contribute to the increased efficiency of the braking system of the **CSA** seal:

- the wiping profile with lead-in chamfer to facilitate the insertion of the ogive;
- the external packing groove to create auto-alignment;
- the edge at the bottom of the cushioning;
- the use of polyurethane which ensures a long service life thanks to the high modulus of elasticity and the very good resistance to leaks.

**TECHNICAL DATA**

Pressure:	< 20 bar
Speed:	< 1 m/s
Temperature:	from - 30° C up to + 90° C
Fluids:	air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

**MATERIAL**

The standard raw material is a low compression-set polyurethane with good flexibility at low temperature.

Standard polyurethane 90 Sh A.

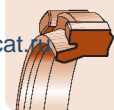
**Standard compound reference: BO**

Alternative polyurethane 93 Sh A.

**Alternative compound reference: CO**

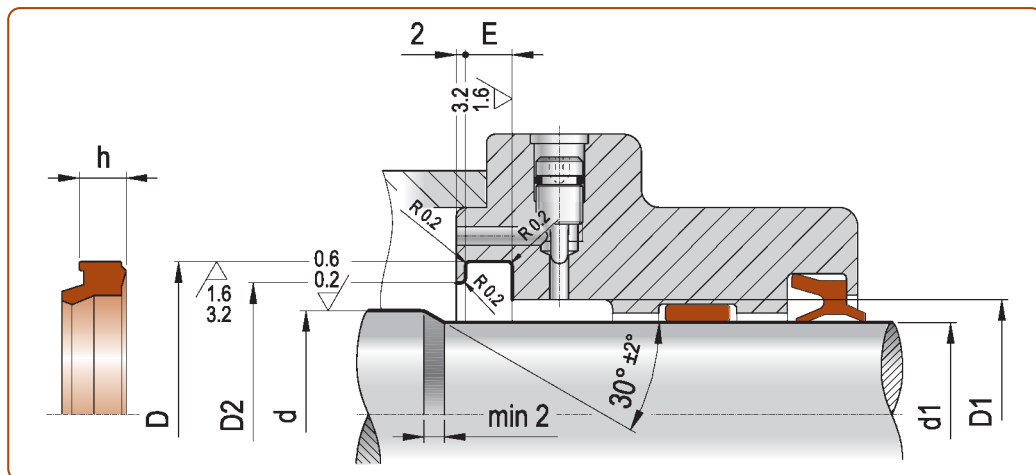
**ASSEMBLY**

The assembly is done in semi-open groove, therefore any cutting edges or flash should be eliminated not to affect seal operation. Lubricating with grease will ensure that the seal lasts longer.



disegno / DRAWING

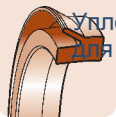
CSA



$d_{h10}$	tol $h_{10}$	$D_{H11}$	$D_1$	$D_2$	$d_1$	$h$	$E$	ART / ITEM				
6,0	0/-0.048	10,0	6,5	8,0	4,5	3,4	3,7	CSA	0060	0100	034	BO
8,0	0/-0.058	11,6	8,5	10,0	7,0	3,0	3,3	CSA	0080	0116	030	BO
9,5	0/-0.058	15,0	10,0	12,0	8,0	4,0	4,5	CSA	0095	0150	040	BO
10,0	0/-0.058	18,0	11,0	15,0	8,0	6,5	7,0	CSA	0100	0180	065	BO
12,0	0/-0.070	18,0	13,0	15,5	10,0	4,3	4,8	CSA	0120	0180	043	BO
12,0	0/-0.070	20,0	13,0	17,0	10,0	6,5	7,0	CSA	0120	0200	065	BO
14,0	0/-0.070	22,0	15,0	19,0	12,0	6,5	7,0	CSA	0140	0220	065	BO
16,0	0/-0.070	22,0	17,0	19,5	14,0	4,7	5,2	CSA	0160	0220	047	BO
16,0	0/-0.070	24,0	17,0	21,0	14,0	6,5	7,0	CSA	0160	0240	065	BO
18,0	0/-0.070	26,0	19,0	23,0	16,0	6,5	7,0	CSA	0180	0260	065	BO
20,0	0/-0.084	28,0	21,0	24,0	17,5	6,5	7,0	CSA	0200	0280	065	BO
22,0	0/-0.084	30,0	23,0	26,0	19,5	6,5	7,0	CSA	0220	0300	065	BO
25,0	0/-0.084	33,0	26,0	29,0	22,5	6,5	7,0	CSA	0250	0330	065	BO
28,0	0/-0.084	36,0	29,0	32,0	25,5	6,5	7,0	CSA	0280	0360	065	BO
30,0	0/-0.084	40,0	31,5	35,0	27,5	6,5	7,0	CSA	0300	0400	065	BO
32,0	0/-0.084	42,0	33,5	37,0	29,0	6,5	7,0	CSA	0320	0420	065	BO
36,0	0/-0.100	46,0	37,5	41,0	33,0	6,5	7,0	CSA	0360	0460	065	BO
40,0	0/-0.100	50,0	41,5	45,0	37,0	6,5	7,0	CSA	0400	0500	065	BO
50,0	0/-0.120	60,0	51,5	55,0	47,0	6,5	7,0	CSA	0500	0600	065	BO
57,0	0/-0.120	74,0	60,0	65,0	54,0	12,0	12,5	CSA	0570	0740	120	BO
70,0	0/-0.120	87,0	73,0	78,0	66,0	12,0	12,5	CSA	0700	0870	120	BO
78,0	0/-0.120	95,0	81,0	86,0	74,0	12,0	12,5	CSA	0780	0950	120	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## TENUTA PISTONE PER PNEUMATICA TIPO PSP

### DESCRIZIONE

La tenuta tipo **PSP** è progettata per la tenuta pistone di cilindri pneumatici a semplice e doppio effetto.

La gola molto marcata tra il labbro dinamico e quello statico unitamente alla raggatura dei due labbri di contatto aumentano la scorrevolezza della guarnizione anche in assenza di lubrificazione.

Le limitate dimensioni e l'alta flessibilità del materiale rendono semplice il montaggio anche in cava chiusa.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave nella sede del pistone per evitare di compromettere la guarnizione. Eseguire uno smusso sulla camicia del cilindro (v. fig. 9, 10, 11 a pag. 148) per facilitare il montaggio.

Si consiglia di lubrificare la guarnizione per rendere il sistema molto scorrevole.

## PISTON SEAL FOR PNEUMATICS TYPE PSP

### DESCRIPTION

The **PSP** piston seal has been designed for single and double action pneumatic cylinders.

The deep groove between the dynamic and the static lip, together with the radii of back-to-back lips, enhances seal sliding, even where there is a lack of environmental lubrication.

The reduced dimensions, together with the high flexibility of the material, also facilitate installation in closed grooves.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

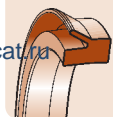
Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

### ASSEMBLY

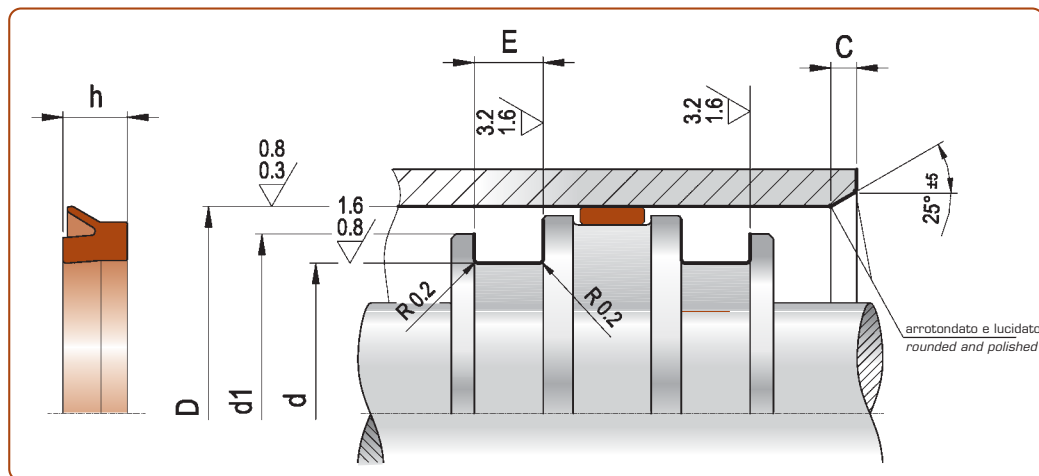
Eliminate any cutting edges and flash in the housing to permit assembly and prevent damage to seals during mounting.

The presence of a lead-in chamfer is suggested for easy installation of the piston seal (see fig 9, 10, 11 page 148).



disegno / DRAWING

PSP

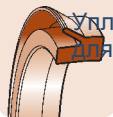


SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS

D <sub>H11</sub>	d <sub>h10</sub>	toll h <sub>10</sub>	d <sub>1</sub> *	h	E <sub>+0,2</sub>	ART / ITEM				
6,0	3,0	0/-0.048	5,0	2,00	2,50	PSP	0060	0030	020	BO
8,0	4,0	0/-0.048	7,0	2,55	3,00	PSP	0080	0040	025	BO
8,0	4,8	0/-0.048	7,0	2,30	2,70	PSP	0080	0048	023	BO
8,0	4,8	0/-0.048	7,0	2,55	3,00	PSP	0080	0048	025	BO
10,0	6,0	0/-0.048	9,0	2,55	3,00	PSP	0100	0060	025	BO
12,0	7,0	0/-0.058	11,0	2,55	3,00	PSP	0120	0070	025	BO
13,0	8,0	0/-0.058	12,0	2,55	3,00	PSP	0130	0080	025	BO
14,0	8,0	0/-0.058	13,0	2,55	3,00	PSP	0140	0080	025	BO
15,0	9,0	0/-0.058	14,0	2,55	3,00	PSP	0150	0090	025	BO
16,0	10,0	0/-0.058	15,0	2,55	3,00	PSP	0160	0100	025	BO
17,0	11,0	0/-0.070	16,0	2,55	3,00	PSP	0170	0110	025	BO
18,0	12,0	0/-0.070	17,0	2,55	3,00	PSP	0180	0120	025	BO
20,0	14,0	0/-0.070	19,0	2,55	3,00	PSP	0200	0140	025	BO
20,0	14,0	0/-0.070	19,0	4,00	4,50	PSP	0200	0140	040	BO
20,0	15,5	0/-0.070	19,0	4,00	4,50	PSP	0200	0155	040	BO
22,0	16,0	0/-0.070	21,0	2,55	3,00	PSP	0220	0160	025	BO
24,0	12,0	0/-0.070	23,0	6,50	7,50	PSP	0240	0120	065	BO
24,0	18,0	0/-0.070	23,0	2,55	3,00	PSP	0240	0180	025	BO
25,0	17,0	0/-0.070	24,0	5,50	6,00	PSP	0250	0170	055	BO
25,0	19,0	0/-0.084	24,0	3,25	3,50	PSP	0250	0190	032	BO
25,0	19,0	0/-0.084	24,0	4,00	4,50	PSP	0250	0190	040	BO
27,0	21,0	0/-0.084	26,0	3,25	4,00	PSP	0270	0210	032	BO
28,0	18,0	0/-0.084	27,0	7,00	7,50	PSP	0280	0180	070	BO
28,0	22,0	0/-0.084	27,0	3,25	3,50	PSP	0280	0220	032	BO
30,0	20,0	0/-0.084	29,0	5,00	6,00	PSP	0300	0200	050	BO
30,0	22,0	0/-0.084	29,0	3,25	3,50	PSP	0300	0220	032	BO
32,0	24,0	0/-0.084	31,0	3,25	3,50	PSP	0320	0240	032	BO
32,0	24,0	0/-0.084	31,0	5,50	6,00	PSP	0320	0240	055	BO
35,0	27,0	0/-0.084	34,0	3,25	3,50	PSP	0350	0270	032	BO
36,0	28,0	0/-0.084	35,0	3,25	3,50	PSP	0360	0280	032	BO
38,0	30,0	0/-0.084	37,0	3,25	3,50	PSP	0380	0300	032	BO
38,0	30,0	0/-0.084	37,0	5,50	6,00	PSP	0380	0300	055	BO
40,0	27,3	0/-0.084	39,0	6,40	7,50	PSP	0400	0273	064	BO
40,0	30,0	0/-0.084	39,0	7,00	7,50	PSP	0400	0300	070	BO
40,0	32,0	0/-0.100	39,0	3,25	3,50	PSP	0400	0320	032	BO
42,0	30,0	0/-0.100	41,0	6,00	6,50	PSP	0420	0300	060	BO
42,0	34,0	0/-0.100	41,0	3,25	3,50	PSP	0420	0340	032	BO
45,0	35,0	0/-0.100	44,0	10,00	11,00	PSP	0450	0350	100	BO
45,0	37,0	0/-0.100	44,0	3,25	3,50	PSP	0450	0370	032	BO

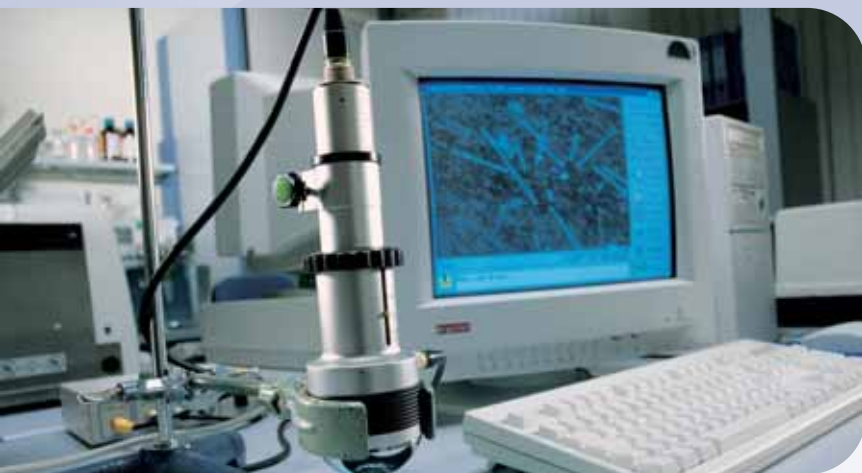
\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio  
recommended hook diameter wich could be modified accordingly to mounting demand





D <sub>H11</sub>	d <sub>h10</sub>	toll h10	d <sub>1</sub> *	h	E <sub>+0,2</sub>	ART / ITEM				
50,0	40,0	0/-0.100	49,0	5,00	6,00	PSP	0500	0400	050	BO
50,0	40,0	0/-0.100	49,0	7,00	7,50	PSP	0500	0400	070	BO
50,0	42,0	0/-0.100	49,0	3,25	3,50	PSP	0500	0420	032	BO
52,0	42,0	0/-0.100	51,0	4,25	4,50	PSP	0520	0420	042	BO
55,0	45,0	0/-0.100	54,0	7,00	7,50	PSP	0550	0450	070	BO
58,0	48,0	0/-0.100	57,0	4,25	4,50	PSP	0580	0480	042	BO
60,0	50,0	0/-0.120	59,0	5,00	5,70	PSP	0600	0500	050	BO
60,0	50,0	0/-0.120	59,0	7,00	7,50	PSP	0600	0500	070	BO
63,0	53,0	0/-0.120	62,0	4,25	4,50	PSP	0630	0530	042	BO
63,0	53,0	0/-0.120	62,0	7,00	7,50	PSP	0630	0530	070	BO
65,0	55,0	0/-0.120	64,0	5,00	6,00	PSP	0650	0550	050	BO
65,0	55,0	0/-0.120	64,0	7,00	7,50	PSP	0650	0550	070	BO
68,0	58,0	0/-0.120	67,0	4,70	5,50	PSP	0680	0580	047	BO
70,0	58,0	0/-0.120	69,0	8,50	9,50	PSP	0700	0580	085	BO
75,0	63,0	0/-0.120	74,0	8,50	9,50	PSP	0750	0630	085	BO
80,0	67,3	0/-0.120	79,0	6,35	7,00	PSP	0800	0673	063	BO
80,0	68,0	0/-0.120	79,0	8,50	9,50	PSP	0800	0680	085	BO
80,0	70,0	0/-0.120	79,0	4,25	4,50	PSP	0800	0700	042	BO
85,0	73,0	0/-0.120	84,0	8,50	9,50	PSP	0850	0730	085	BO
90,0	78,0	0/-0.120	89,0	8,50	9,50	PSP	0900	0780	085	BO
90,0	80,0	0/-0.120	89,0	4,25	4,50	PSP	0900	0800	042	BO
100,0	88,0	0/-0.140	99,0	8,50	9,50	PSP	1000	0880	085	BO
100,0	90,0	0/-0.140	99,0	4,25	4,50	PSP	1000	0900	042	BO
110,0	95,0	0/-0.140	109,0	10,00	11,00	PSP	1100	0950	100	BO
120,0	105,0	0/-0.140	119,0	10,00	11,00	PSP	1200	1050	100	BO
125,0	105,0	0/-0.140	124,0	8,25	8,50	PSP	1250	1050	082	BO
125,0	110,0	0/-0.140	124,0	10,00	11,00	PSP	1250	1100	100	BO
140,0	120,0	0/-0.140	139,0	8,25	8,50	PSP	1400	1200	082	BO
160,0	140,0	0/-0.160	159,0	8,25	8,50	PSP	1600	1400	082	BO
160,0	145,0	0/-0.160	159,0	10,00	11,00	PSP	1600	1450	100	BO
180,0	160,0	0/-0.160	179,0	14,00	15,00	PSP	1800	1600	140	BO
200,0	180,0	0/-0.160	199,0	8,25	8,50	PSP	2000	1800	082	BO
200,0	180,0	0/-0.160	199,0	14,00	15,00	PSP	2000	1800	140	BO
250,0	230,0	0/-0.185	249,0	14,00	15,00	PSP	2500	2300	140	BO

\* diametro di aggancio consigliato ma modificabile in funzione delle esigenze di montaggio  
recommended hook diameter wich could be modified accordingly to mounting demand



**ARTIC SEALS** è da tempo impegnata in attive collaborazioni con importanti Università ed Istituti di Ricerca per la materia plastica. Queste partnership consentono uno sviluppo costante delle nostre soluzioni innovative attraverso lo svolgimento di numerosi test, condotti sia sul polimero sia sul prodotto finito. Significativa è la collaborazione costante e qualificata con il **CPI Centro Polimeri Italia** ([www.centropolimeri.it](http://www.centropolimeri.it)) che da tempo collabora con le imprese del territorio ed offre un'ampia esperienza nel settore delle materie plastiche. Svariati sono i servizi rivolti alle imprese del settore: prove sui materiali e sui manufatti, consulenze tecnologiche, studi di fattibilità, failure-analysis, corsi di formazione ecc...

***ARTIC SEALS** actively cooperates with renowned University and Research Institutes focusing on study of plastic raw materials since a long time. These partnerships allow a constant improvement in innovative sealing solutions throughout several trial tests either on polymer or on finished products. Meaningful is the constant and qualified cooperation with **CPI Centro Polimeri Italia** ([www.centropolimeri.it](http://www.centropolimeri.it)). Since years CPI collaborates with local manufactory companies and it offers a wide experience in thermoplastic materials industry. Several are the services aimed on this field: trials on raw materials and finished products, technological consultancy, feasibility studies, failure-analysis, training, ecc...*





## TENUTA PISTONE MAGNETICO TIPO MPS

### DESCRIZIONE

La guarnizione tipo **MPS** è stata studiata sia per pistoni di cilindri pneumatici compatti a corsa breve sia per il semplice e doppio effetto.

L'elemento di guida è sulla guarnizione stessa. Appositi interstizi e notches creano spazi per trattenere grasso lubrificante mantenendo molto scorrevole il pistone nel tempo.

Tra le due garnizioni contrapposte alloggia all'interno il magnete.

Per problemi o soluzioni alternative, il nostro ufficio tecnico mette a disposizione specifiche progettuali personalizzate.

### LIMITI D'IMPIEGO

Pressione:	< 20 bar
Velocità:	< 1 m/s
Temperatura:	da - 30° C a + 90° C
Fluidi:	aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave nella sede del pistone per evitare di compromettere la guarnizione.

Il montaggio si effettua per accavallamento della guarnizione sul diametro del pistone.

**Importante:** il pistone deve essere sagomato esattamente come da disegno della tabella dimensionale **MPS**.

## MAGNETIC PISTON SEAL TYPE MPS

### DESCRIPTION

The **MPS** seal has been specifically built for pneumatic cylinders both for compact short stroke and single and double action stroke applications.

To ensure long cylinder service life, the MPS seal itself performs a sliding action, obtaining proper lubrication through specific notches which collect and store the grease.

The groove between two MPS seals is the right housing for the magnet.

For specific needs or problems, our technical office is at your complete disposal with tailor-made projects and solutions.

### TECHNICAL DATA

Pressure:	< 20 bar
Speed:	< 1 m/s
Temperature:	from -30° C up to +90° C
Fluids:	air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

### ASSEMBLY

Eliminate any cutting edges and flash in the housing to prevent damage to seals during mounting.

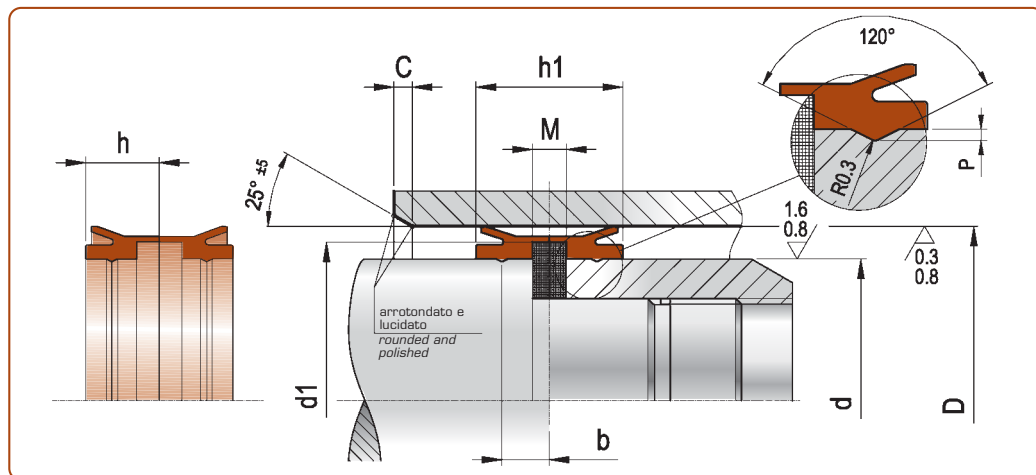
The installation is made by overlapping the seals and the piston diameter.

**Warning:** the piston must be shaped according to the drawing of the **MPS** dimensions table.

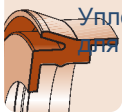


disegno / DRAWING

MPS



$D_{H11}$	$d_{h9}$	$\frac{tol}{h9}$	$h_1$	$h$	$d_1$	$M$	$P$	$b$	ART / ITEM					
8,0	4,0	0/-0.030	12,0	6,0	6,5	4,0	0,35	4,00	MPS	0080	0040	040	120	B0
10,0	4,0	0/-0.030	12,0	6,0	8,5	3,0	0,35	3,50	MPS	0100	0040	030	120	B0
12,0	6,0	0/-0.030	12,0	6,0	10,5	3,0	0,40	3,50	MPS	0120	0060	030	120	B0
16,0	8,0	0/-0.036	12,0	6,0	14,5	3,0	0,40	3,50	MPS	0160	0080	030	120	B0
20,0	10,0	0/-0.036	12,0	6,0	18,0	3,0	0,50	3,50	MPS	0200	0100	030	120	B0
25,0	10,0	0/-0.036	12,0	6,0	23,0	3,0	0,50	3,50	MPS	0250	0100	030	120	B0



## TENUTA PISTONE MAGNETICO TIPO MPS

### DESCRIZIONE

La guarnizione tipo **MPS** è stata studiata sia per pistoni di cilindri pneumatici compatti a corsa breve sia per il semplice e doppio effetto.

L'elemento di guida è sulla guarnizione stessa. Appositi interstizi e notches creano spazi per trattenere grasso lubrificante mantenendo molto scorrevole il pistone nel tempo.

Tra le due garnizioni contrapposte alloggia all'interno il magnete.

Per problemi o soluzioni alternative, il nostro ufficio tecnico mette a disposizione specifiche progettuali personalizzate.

### LIMITI D'IMPIEGO

Pressione:	< 20 bar
Velocità:	< 1 m/s
Temperatura:	da - 30° C a + 90° C
Fluidi:	aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave nella sede del pistone per evitare di compromettere la guarnizione.

Il montaggio si effettua per accavallamento della guarnizione sul diametro del pistone.

**Importante:** il pistone deve essere sagomato esattamente come da disegno della tabella dimensionale **MPS**.

## MAGNETIC PISTON SEAL TYPE MPS

### DESCRIPTION

The **MPS** seal has been specifically built for pneumatic cylinders both for compact short stroke and single and double action stroke applications.

To ensure long cylinder service life, the MPS seal itself performs a sliding action, obtaining proper lubrication through specific notches which collect and store the grease.

The groove between two MPS seals is the right housing for the magnet.

For specific needs or problems, our technical office is at your complete disposal with tailor-made projects and solutions.

### TECHNICAL DATA

Pressure:	< 20 bar
Speed:	< 1 m/s
Temperature:	from -30 °C up to +90 °C
Fluids:	air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

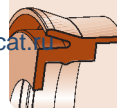
**Alternative compound reference: AO**

### ASSEMBLY

Eliminate any cutting edges and flash in the housing to prevent damage to seals during mounting.

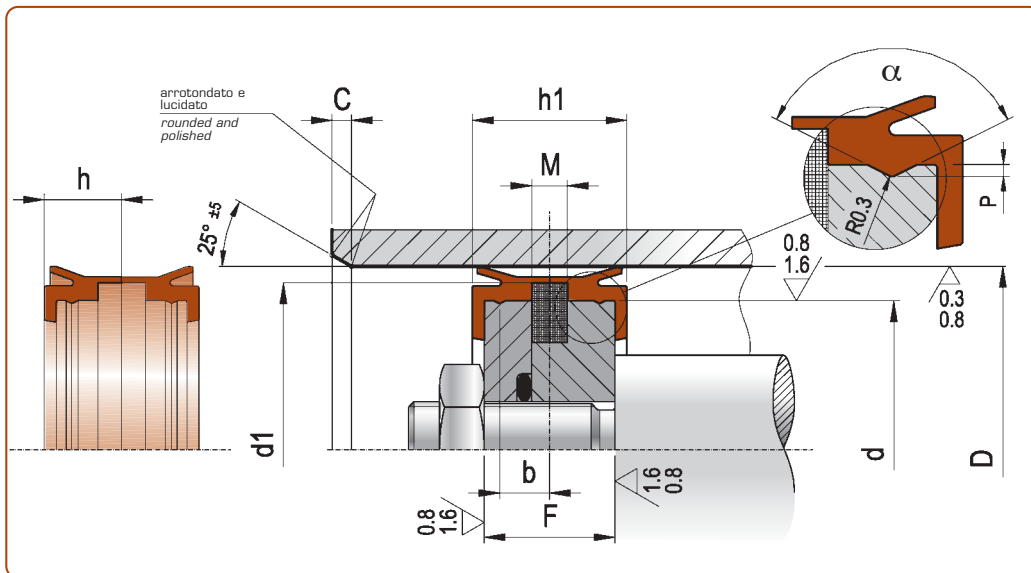
The installation is made by overlapping the seals and the piston diameter.

**Warning:** the piston must be shaped according to the drawing of the **MPS** dimensions table.



disegno / DRAWING

MPS



$D_{H11}$	$d_{h9}$	tol $h_9$	$h_1$	$h$	$d_1$	$M$	$P$	$b$	$F$	$\alpha$	ART / ITEM					
32,0	26,0	0/-0.052	14,0	7,00	29,5	3,0	0,50	4,00	11,00	120°	MPS	0320	0260	030	120	B0
32,0	26,0	0/-0.052	14,0	7,00	29,5	3,0	0,80	4,00	11,00	90°	MPS	0320	0260	030	090	B0
32,0	26,0	0/-0.052	14,0	7,00	29,5	5,0	0,50	4,00	11,00	120°	MPS	0320	0260	050	120	B0
32,0	26,0	0/-0.052	14,0	7,00	29,5	5,0	0,80	4,00	11,00	90°	MPS	0320	0260	050	090	B0
40,0	34,0	0/-0.062	14,5	7,25	37,5	5,0	0,50	4,25	12,00	120°	MPS	0400	0340	050	120	B0
40,0	34,0	0/-0.062	14,5	7,25	37,5	5,0	0,80	4,25	12,00	90°	MPS	0400	0340	050	090	B0
50,0	43,0	0/-0.062	14,5	7,25	46,5	5,0	0,60	4,25	12,00	120°	MPS	0500	0430	050	120	B0
50,0	43,0	0/-0.062	14,5	7,25	46,5	5,0	0,80	4,25	12,00	90°	MPS	0500	0430	050	090	B0
63,0	55,0	0/-0.074	20,0	10,00	59,5	5,0	0,80	6,00	17,00	120°	MPS	0630	0550	050	120	B0
80,0	72,0	0/-0.074	22,0	11,00	76,5	5,0	0,80	6,50	19,00	120°	MPS	0800	0720	050	120	B0
100,0	90,0	0/-0.087	26,0	13,00	96,5	5,0	0,80	7,50	22,00	120°	MPS	1000	0900	050	120	B0



## TENUTA PISTONE A MOLLA TIPO SPS

### DESCRIZIONE

La guarnizione tipo **SPS** è realizzata per la tenuta pistone di cilindri pneumatici.

Dove gli ingombri lo permettono, può essere utilizzata anche su valvole pneumatiche.

Le ridotte dimensioni delle sedi consentono un'esecuzione di lavorazione macchina semplice.

Ha un profilo con la tenuta arrotondata al centro sul labbro dinamico e due sporgenze sul labbro statico.

Il profilo simmetrico ne facilita il montaggio.

La particolare forma a molla rende il sistema molto scorrevole anche a bassa pressione.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave sulla camicia per evitare di compromettere la guarnizione.

## SPRING PISTON SEAL TYPE SPS

### DESCRIPTION

The **SPS** piston seal has been designed for pneumatic cylinders applications.

Where the overall dimensions allow, the SPS can also be used for pneumatic valves.

The reduced overall dimensions result in the a short machining time of the system.

Its profile is rounded in the middle on the dynamic lip and has two projections on the static lip.

This symmetrical shape facilitates installation.

The special spring shaped profile ensures a high flexibility in the system even at low pressure.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

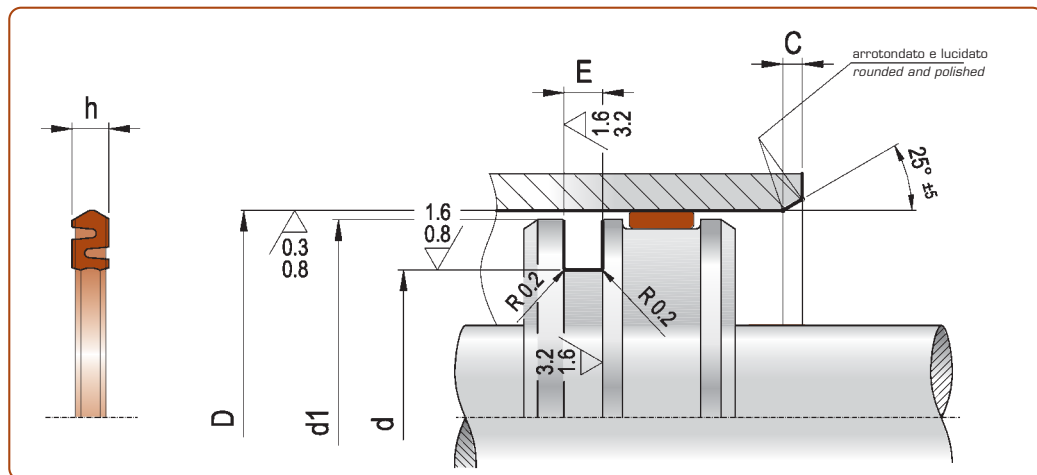
### ASSEMBLY

Eliminate any cutting edges and flash in the bore to permit assembly and prevent damage to seals during mounting.



disegno / DRAWING

SPS



D <sub>H11</sub>	d <sub>h10</sub>	toll h <sub>10</sub>	d <sub>1</sub>	h	E <sub>+0,2</sub>	ART / ITEM				
12,0	7,0	0/-0.058	11,5	2,2	2,5	SPS	0120	0070	022	BO
16,0	9,0	0/-0.058	15,5	2,4	2,5	SPS	0160	0090	024	BO
20,0	13,0	0/-0.070	19,5	2,4	2,5	SPS	0200	0130	024	BO
25,0	18,0	0/-0.070	24,5	2,4	2,5	SPS	0250	0180	024	BO
28,0	21,0	0/-0.084	27,5	2,4	2,5	SPS	0280	0210	024	BO
30,0	21,0	0/-0.084	29,5	2,9	3,0	SPS	0300	0210	029	BO
32,0	23,0	0/-0.084	31,5	2,9	3,0	SPS	0320	0230	029	BO
35,0	26,0	0/-0.084	34,5	2,9	3,0	SPS	0350	0260	029	BO
40,0	31,0	0/-0.100	39,5	2,9	3,0	SPS	0400	0310	029	BO
45,0	36,0	0/-0.100	44,5	2,9	3,0	SPS	0450	0360	029	BO
50,0	41,0	0/-0.100	49,5	2,9	3,0	SPS	0500	0410	029	BO
60,0	48,0	0/-0.100	59,5	3,9	4,0	SPS	0600	0480	039	BO
63,0	51,0	0/-0.120	62,5	3,9	4,0	SPS	0630	0510	039	BO
70,0	58,0	0/-0.120	69,5	3,9	4,0	SPS	0700	0580	039	BO
80,0	68,0	0/-0.120	79,5	3,9	4,0	SPS	0800	0680	039	BO

SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS





## FASCE DI GUIDA PER STELO TIPO ISA

### DESCRIZIONE

Per evitare il contatto diretto tra lo stelo e la testata del cilindro, e tra il pistone e la camicia, che nella maggior parte dei cilindri pneumatici è di alluminio, si inserisce una fascia di guida tipo **ISA** che serve per tenere guidato tutto il sistema.

Le fasce di guida sono stampate con un materiale auto-lubrificante, non abrasivo, studiato appositamente per favorire uno scorrimento lineare.

Il profilo della guida presenta smussi sia all'interno sia all'esterno che facilitano il montaggio dello stelo e del pistone.

### LIMITI D'IMPIEGO

Velocità: < 1 m/s

Temperatura: da - 40° C a + 115° C

Carico statico: fino a 36 N/mm<sup>2</sup>

### MATERIALE

Poliacetalica modificata.

Grazie all'aggiunta di particolari additivi si è realizzato un materiale molto scorrevole e non abrasivo.

**Codice materiale standard: R3**

### VANTAGGI

- Ottimo rapporto prezzo/prestazioni
- Basso effetto stick-slip
- Buona resistenza alla compressione

## ROD SLYDRINGS TYPE ISA

### DESCRIPTION

Given that most pneumatic cylinders are made of aluminium, a wear ring **ISA** is inserted between the piston and the bore in order to prevent the direct contact between the rod and the cylinder's head.

The function of the friction ring is to guide all the packing.

The wear rings are moulded in non-abrasive auto-lubricating material, which has been purpose designed to support linear sliding.

The wear ring profile has chamfers both inside and outside to facilitate the installation of the rod and the piston.

### TECHNICAL DATA

Speed: < 1 m/s

Temperature: from - 40° C up to + 115° C

Static Strength: up to 36 N/mm<sup>2</sup>

### MATERIAL

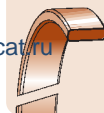
Polyacetalic resin.

Through the use of additional compounds a very slick, anti-friction material has been developed.

**Standard compound reference: R3**

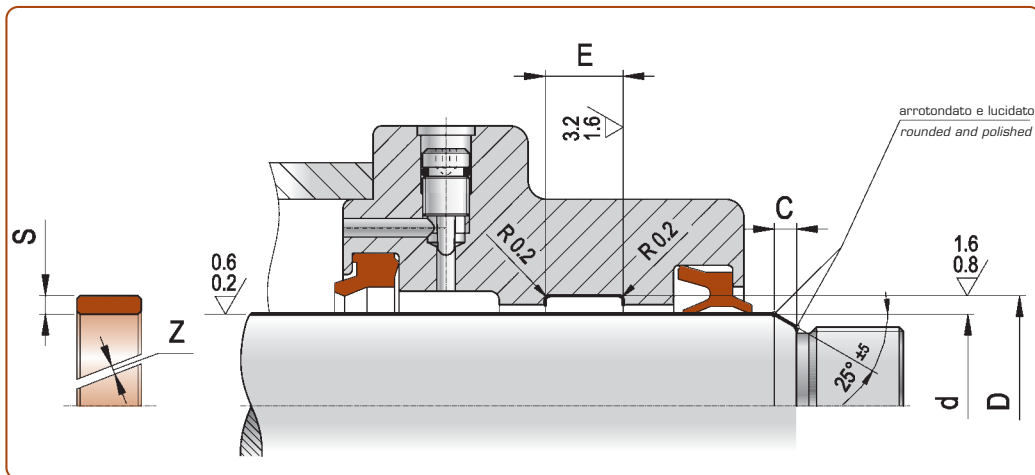
### ADVANTAGES

- Excellent price/performance ratio
- Low stick-slip effect
- Good compressive strength



disegno / DRAWING

ISA



diametri diameters d-D	0 - 50	51 - 100	101 - 150	151 - 300
z. mm $\geq$	2,0	2,5	3,0	3,5

d <sub>f9</sub>	D <sub>H7</sub>	toll H7	E <sub>+0,2</sub>	S <sub>-0,08</sub>	ART / ITEM				
8,0	11,1	+0.018/0	2,5	1,55	ISA	0080	0111	025	R3
10,0	13,1	+0.018/0	2,5	1,55	ISA	0100	0131	025	R3
10,0	13,1	+0.018/0	4,0	1,55	ISA	0100	0131	040	R3
12,0	15,1	+0.018/0	4,0	1,55	ISA	0120	0151	040	R3
12,0	16,0	+0.018/0	9,7	2,00	ISA	0120	0160	097	R3
14,0	17,1	+0.018/0	4,0	1,55	ISA	0140	0171	040	R3
14,0	18,0	+0.018/0	9,7	2,00	ISA	0140	0180	097	R3
15,0	18,1	+0.021/0	4,0	1,55	ISA	0150	0181	040	R3
16,0	19,1	+0.021/0	4,0	1,55	ISA	0160	0191	040	R3
16,0	20,0	+0.021/0	9,7	2,00	ISA	0160	0200	097	R3
18,0	22,0	+0.021/0	9,7	2,00	ISA	0180	0220	097	R3
20,0	23,1	+0.021/0	4,0	1,55	ISA	0200	0231	040	R3
22,0	25,1	+0.021/0	4,0	1,55	ISA	0220	0251	040	R3
25,0	28,1	+0.021/0	4,0	1,55	ISA	0250	0281	040	R3
28,0	31,1	+0.025/0	4,0	1,55	ISA	0280	0311	040	R3
30,0	33,1	+0.025/0	4,0	1,55	ISA	0300	0331	040	R3
32,0	35,1	+0.025/0	4,0	1,55	ISA	0320	0351	040	R3
35,0	38,1	+0.025/0	4,0	1,55	ISA	0350	0381	040	R3
36,0	39,1	+0.025/0	4,0	1,55	ISA	0360	0391	040	R3
40,0	43,1	+0.025/0	4,0	1,55	ISA	0400	0431	040	R3
50,0	53,1	+0.030/0	4,0	1,55	ISA	0500	0531	040	R3

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## FASCE DI GUIDA PER PISTONE TIPO ESA

### DESCRIZIONE

Per evitare il contatto diretto tra lo stelo e la testata del cilindro, e tra il pistone e la camicia, che nella maggior parte dei cilindri pneumatici è di alluminio, si inserisce una fascia di guida tipo **ESA** che serve per tenere guidato tutto il sistema.

Le fasce di guida sono stampate con un materiale auto-lubrificante, non abrasivo, studiato appositamente per favorire uno scorrimento lineare.

Il profilo della guida presenta smussi sia all'interno sia all'esterno che facilitano il montaggio dello stelo e del pistone.

### LIMITI D'IMPIEGO

Velocità: < 1 m/s

Temperatura: da - 40° C a + 115° C

Carico statico: fino a 36 N/mm<sup>2</sup>

### MATERIALE

Poliacetalica modificata.

Grazie all'aggiunta di particolari additivi si è realizzato un materiale molto scorrevole e non abrasivo.

**Codice materiale standard: R3**

### VANTAGGI

- Ottimo rapporto prezzo/prestazioni
- Basso effetto stick-slip
- Buona resistenza alla compressione

## PISTON SLYDRINGS TYPE ESA

### DESCRIPTION

Given that most pneumatic cylinders are made of aluminium, a wear ring **ESA** is inserted between the piston and the bore in order to prevent the direct contact between the rod and the cylinder's head.

The function of the friction ring is to guide all the packing. The wear rings are moulded in non-abrasive auto-lubricating material, which has been purpose designed to support linear sliding.

The wear ring profile has chamfers both inside and outside to facilitate the installation of the rod and the piston.

### TECHNICAL DATA

Speed: < 1 m/s

Temperature: from - 40° C up to + 115° C

Static Strength: up to 36 N/mm<sup>2</sup>

### MATERIAL

Polyacetalic resin.

Through the use of additional compounds a very slick, anti-friction material has been developed.

**Standard compound reference: R3**

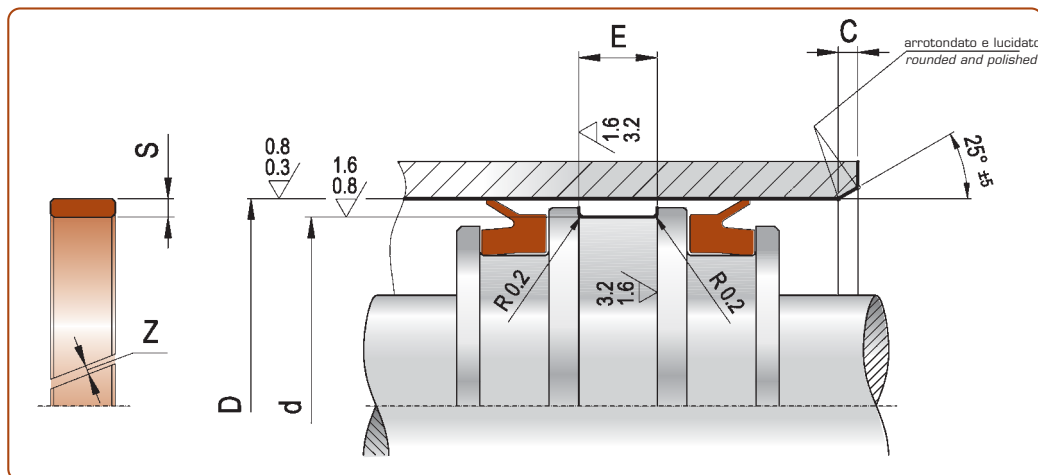
### ADVANTAGES

- Excellent price/performance ratio
- Low stick-slip effect
- Good compressive strength



disegno / DRAWING

ESA



SISTEMI DI TENUTA PER PNEUMATICA  
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diametri diameters D-d	0 - 50	51 - 100	101 - 150	151 - 300
z. mm ≥	2,0	2,5	3,0	3,5

D <sub>H11</sub>	d <sub>h7</sub>	toll h7	E <sub>+0,2</sub>	S <sub>0,08</sub>	ART / ITEM				
8,0	4,9	0/-0.012	2,5	1,55	ESA	0080	0049	025	R3
10,0	6,9	0/-0.015	2,5	1,55	ESA	0100	0069	025	R3
10,0	6,9	0/-0.015	4,0	1,55	ESA	0100	0069	040	R3
12,0	8,9	0/-0.015	4,0	1,55	ESA	0120	0089	040	R3
14,0	10,9	0/-0.018	4,0	1,55	ESA	0140	0109	040	R3
15,0	11,9	0/-0.018	4,0	1,55	ESA	0150	0119	040	R3
16,0	12,9	0/-0.018	4,0	1,55	ESA	0160	0129	040	R3
16,0	12,0	0/-0.018	9,7	2,00	ESA	0160	0120	097	R3
18,0	14,9	0/-0.018	4,0	1,55	ESA	0180	0149	040	R3
20,0	16,9	0/-0.018	4,0	1,55	ESA	0200	0169	040	R3
20,0	16,0	0/-0.018	8,2	2,00	ESA	0200	0160	082	R3
20,0	16,0	0/-0.018	9,7	2,00	ESA	0200	0160	097	R3
21,0	17,0	0/-0.018	8,2	2,00	ESA	0210	0170	082	R3
22,0	18,0	0/-0.018	9,7	2,00	ESA	0220	0180	097	R3
25,0	21,0	0/-0.021	8,2	2,00	ESA	0250	0210	082	R3
25,0	21,9	0/-0.021	4,0	1,55	ESA	0250	0219	040	R3
26,0	22,0	0/-0.021	8,2	2,00	ESA	0260	0220	082	R3
30,0	25,8	0/-0.021	5,0	2,10	ESA	0300	0258	050	R3
30,0	26,0	0/-0.021	5,0	2,00	ESA	0300	0260	050	R3
30,0	26,0	0/-0.021	8,2	2,00	ESA	0300	0260	082	R3
32,0	26,1	0/-0.021	5,0	2,95	ESA	0320	0261	050	R3
32,0	28,0	0/-0.021	5,0	2,00	ESA	0320	0280	050	R3
32,0	28,0	0/-0.021	8,2	2,00	ESA	0320	0280	082	R3
32,0	28,9	0/-0.021	4,0	1,55	ESA	0320	0289	040	R3
35,0	31,0	0/-0.025	8,2	2,00	ESA	0350	0310	082	R3
40,0	36,0	0/-0.025	5,0	2,00	ESA	0400	0360	050	R3
40,0	36,0	0/-0.025	8,2	2,00	ESA	0400	0360	082	R3
40,0	37,0	0/-0.025	12,0	1,50	ESA	0400	0370	120	R3
45,0	41,0	0/-0.025	10,2	2,00	ESA	0450	0410	102	R3
50,0	46,0	0/-0.025	5,2	2,00	ESA	0500	0460	052	R3
50,0	46,0	0/-0.025	10,2	2,00	ESA	0500	0460	102	R3
50,0	47,0	0/-0.025	12,0	1,50	ESA	0500	0470	120	R3
55,0	51,0	0/-0.030	10,2	2,00	ESA	0550	0510	102	R3



D <sub>H11</sub>	d <sub>h7</sub>	toll h7	E <sub>+0,2</sub>	S	ART / ITEM				
58,0	54,0	0/-0.030	10,2	2,00	ESA	0580	0540	102	R3
60,0	56,0	0/-0.030	10,2	2,00	ESA	0600	0560	102	R3
63,0	59,0	0/-0.030	10,2	2,00	ESA	0630	0590	102	R3
63,0	60,0	0/-0.030	12,0	1,50	ESA	0630	0600	120	R3
65,0	61,0	0/-0.030	10,2	2,00	ESA	0650	0610	102	R3
70,0	66,0	0/-0.030	10,2	2,00	ESA	0700	0660	102	R3
75,0	71,0	0/-0.030	15,2	2,00	ESA	0750	0710	152	R3
80,0	76,0	0/-0.030	10,2	2,00	ESA	0800	0760	102	R3
80,0	76,0	0/-0.030	15,2	2,00	ESA	0800	0760	152	R3
80,0	77,0	0/-0.030	12,0	1,50	ESA	0800	0770	120	R3
85,0	81,0	0/-0.035	15,2	2,00	ESA	0850	0810	152	R3
90,0	86,0	0/-0.035	15,2	2,00	ESA	0900	0860	152	R3
95,0	91,0	0/-0.035	15,2	2,00	ESA	0950	0910	152	R3
100,0	96,0	0/-0.035	10,2	2,00	ESA	1000	0960	102	R3
100,0	96,0	0/-0.035	15,2	2,00	ESA	1000	0960	152	R3
105,0	101,0	0/-0.035	20,3	2,00	ESA	1050	1010	203	R3
110,0	106,0	0/-0.035	20,3	2,00	ESA	1100	1060	203	R3
115,0	111,0	0/-0.035	20,3	2,00	ESA	1150	1110	203	R3
120,0	116,0	0/-0.035	20,3	2,00	ESA	1200	1160	203	R3
125,0	121,0	0/-0.040	15,2	2,00	ESA	1250	1210	152	R3
125,0	121,0	0/-0.040	20,3	2,00	ESA	1250	1210	203	R3
130,0	126,0	0/-0.040	20,3	2,00	ESA	1300	1260	203	R3
135,0	131,0	0/-0.040	20,3	2,00	ESA	1350	1310	203	R3
140,0	136,0	0/-0.040	20,3	2,00	ESA	1400	1360	203	R3
150,0	146,0	0/-0.040	25,4	2,00	ESA	1500	1460	254	R3
160,0	155,0	0/-0.040	15,0	2,50	ESA	1600	1550	150	R3
160,0	156,0	0/-0.040	15,2	2,00	ESA	1600	1560	152	R3
180,0	176,0	0/-0.040	25,4	2,00	ESA	1800	1760	254	R3
200,0	195,0	0/-0.046	15,0	2,50	ESA	2000	1950	150	R3
200,0	196,0	0/-0.046	20,3	2,00	ESA	2000	1960	203	R3
200,0	196,0	0/-0.046	25,4	2,00	ESA	2000	1960	254	R3
220,0	216,0	0/-0.046	30,5	2,00	ESA	2200	2160	305	R3
250,0	245,0	0/-0.046	20,0	2,50	ESA	2500	2450	200	R3
250,0	246,0	0/-0.046	20,3	2,00	ESA	2500	2460	203	R3
250,0	246,0	0/-0.046	30,5	2,00	ESA	2500	2460	305	R3

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.

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SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS



## RASCHIATORE LEGGERO TIPO LWA

### DESCRIZIONE

Il raschiatore leggero tipo **LWA** è studiato per tenere pulite le bussole a sfera nelle unità di guida.

Questo raschiatore è a contatto con alberi cementati o rettificati nella parte interna.

Alloggia nella parte esterna sul diametro della bussola e l'aggancio viene garantito da una gola (tipo quella di un seeger per esterno) dove viene inserito il gradino del raschiatore.

La lavorazione meccanica di facile esecuzione ed il minimo ingombro del raschiatore ha ampliato il campo di applicazioni anche in quello dei cilindri pneumatici.

Il labbro molto flessibile del raschiatore non pregiudica la scorrevolezza dell'unità di guida.

### LIMITI D'IMPIEGO

Velocità: < 4 m/s

Temperatura: da - 30° C a + 90° C

### MATERIALE

Il materiale utilizzato è un poliuretano che resiste molto bene all'usura e benissimo alle basse temperature mantenendosi sempre flessibile.

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

### MONTAGGIO

Eliminare tutti gli spigoli vivi e le bave nell'alloggiamento del raschiatore.

Si consiglia di ingrassare il sistema.

## LIGHT WIPER TYPE LWA

### DESCRIPTION

The light wiper type **LWA** is designed for the fast wearing of ball-bushings in the guide systems.

This wiper runs inside carburized or ground shafts. It is installed outside the diameter of the bushing and the chamfer is ensured by a groove (similar to the Seeger's for external use) where the wiper step is inserted.

A very simple mechanical execution and reduced overall dimensions widen the range of applications for pneumatic cylinders.

The highly flexible wiper lip does not interfere with the sliding of the guide system.

### TECHNICAL DATA

Speed: < 4 m/s

Temperature: from - 30° C up to + 90° C

### MATERIAL

Our polyurethane is very resistant to wear and is excellent at low temperature due to its high flexibility.

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

### ASSEMBLY

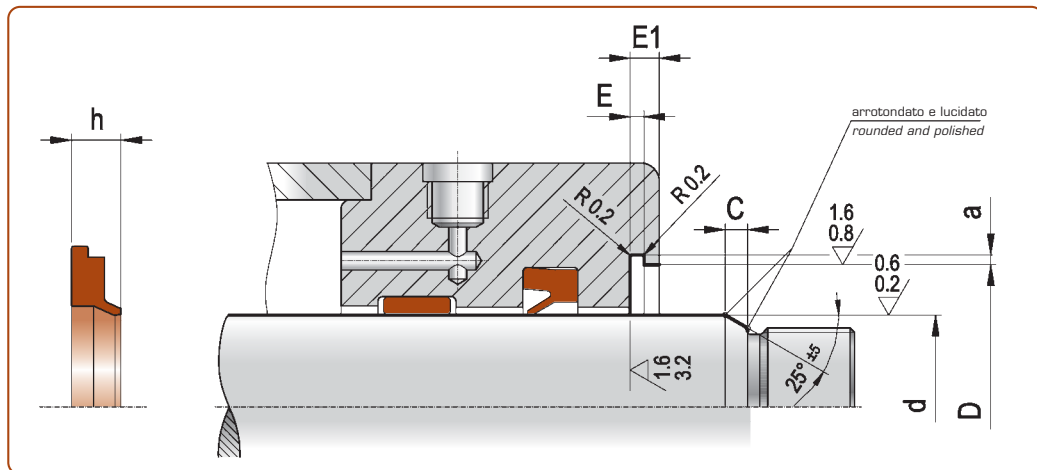
Eliminate any cutting edges and flash in the scraper housing.

We suggest greasing the system.



disegno / DRAWING

LWA



SISTEMI DI TENUTA PER PNEUMATICA  
PNEUMATIC SEALING SYSTEMS

$d_{f9}$	$D_{H11}$	tol $H_{11}$	h	$E_1$	a	E	ART / ITEM				
6,0	12,0	+0.110/-0	4,5	3,0	1,3	1,6	LWA	0060	0120	045	BO
8,0	15,0	+0.110/-0	4,5	3,0	1,3	1,6	LWA	0080	0150	045	BO
10,0	17,0	+0.110/-0	4,5	3,0	1,3	1,6	LWA	0100	0170	045	BO
12,0	19,0	+0.130/-0	4,5	3,0	1,3	1,6	LWA	0120	0190	045	BO
14,0	21,0	+0.130/-0	4,5	3,0	1,3	1,6	LWA	0140	0210	045	BO
16,0	24,0	+0.130/-0	4,5	3,0	1,3	1,6	LWA	0160	0240	045	BO
20,0	28,0	+0.130/-0	4,5	3,0	1,3	1,6	LWA	0200	0280	045	BO
25,0	35,0	+0.160/-0	4,5	3,0	1,5	1,6	LWA	0250	0350	045	BO
30,0	40,0	+0.160/-0	4,5	3,0	2,0	1,6	LWA	0300	0400	045	BO
40,0	52,0	+0.190/-0	4,5	3,0	2,0	1,6	LWA	0400	0520	045	BO
50,0	62,0	+0.190/-0	4,5	3,0	2,0	1,6	LWA	0500	0620	045	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





## RASCHIATORE BIDIREZIONALE TIPO BWA

### DESCRIZIONE

L'elemento di tenuta tipo **BWA** ha il profilo di una guarnizione a labbri asimmetrici combinato con un raschiatore.

Alloggiato in un'unica sede, presenta numerosi vantaggi:

- ingombri ridotti;
- minor tempo di esecuzione della sede.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

La sede dove va alloggiato il raschiatore non deve presentare spigoli vivi o bave che compromettano in esercizio la durata dello stesso.

## BI-DIRECTIONAL WIPER TYPE BWA

### DESCRIPTION

The **BWA** sealing part combines an asymmetric lip seal profile with a wiper.

Since it is installed in a single groove, the BWA seal has several advantages:

- reduced overall dimensions;
- faster construction of the groove.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

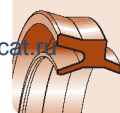
**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

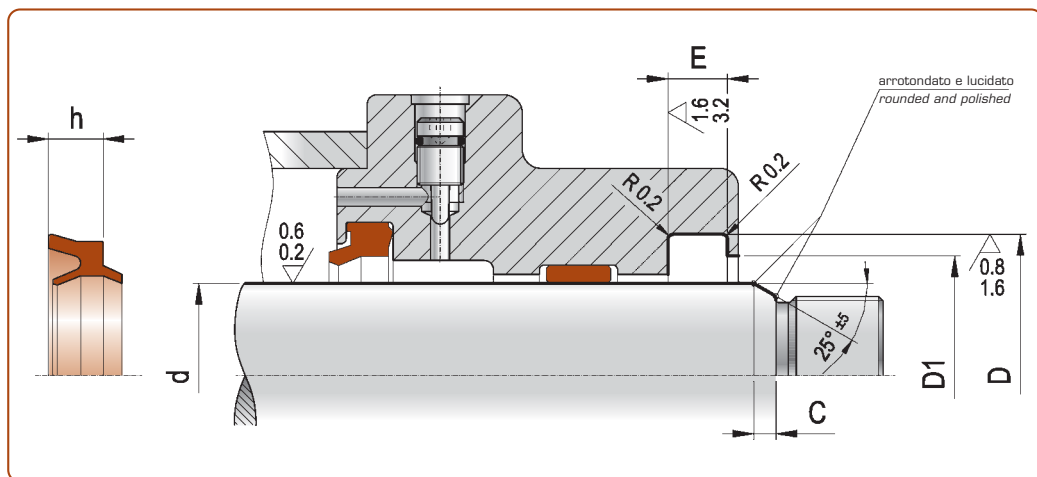
### ASSEMBLY

The housing where the wiper is to be installed should not have any cutting edges or flash in order to minimise seal wear during operation.



disegno / DRAWING

BWA



SISTEMI DI TENUTA PER PNEUMATICA  
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$d_{f9}$	$D_{H10}$	tol $H_{10}$	$D_1$	$h$	$E_{+0,2}$	ART / ITEM				
3,0	8,8	+0.058/0	5,0	4,0	4,5	BWA	0030	0088	040	BO
4,0	7,0	+0.058/0	6,0	2,2	2,7	BWA	0040	0070	022	BO
4,0	8,8	+0.058/0	5,4	4,0	4,5	BWA	0040	0088	040	BO
5,0	8,0	+0.058/0	6,2	2,2	2,7	BWA	0050	0080	022	BO
6,0	9,0	+0.070/0	7,2	2,2	2,7	BWA	0060	0090	022	BO
6,0	10,8	+0.070/0	8,0	4,0	4,5	BWA	0060	0108	040	BO
8,0	11,5	+0.070/0	9,2	2,5	3,0	BWA	0080	0115	025	BO
8,0	12,8	+0.070/0	10,0	4,0	4,5	BWA	0080	0128	040	BO
8,0	14,0	+0.070/0	11,0	4,0	4,5	BWA	0080	0140	040	BO
10,0	14,0	+0.070/0	11,4	2,8	3,2	BWA	0100	0140	028	BO
10,0	16,0	+0.070/0	12,5	3,6	4,0	BWA	0100	0160	036	BO
10,0	16,8	+0.070/0	13,0	4,0	4,5	BWA	0100	0168	040	BO
10,0	18,0	+0.070/0	14,0	4,5	5,0	BWA	0100	0180	045	BO
12,0	16,5	+0.070/0	13,7	3,2	3,7	BWA	0120	0165	032	BO
12,0	18,0	+0.070/0	14,5	3,6	4,0	BWA	0120	0180	036	BO
12,0	20,0	+0.084/0	16,0	3,2	3,7	BWA	0120	0200	032	BO
12,0	20,0	+0.084/0	16,0	4,5	5,0	BWA	0120	0200	045	BO
12,0	20,0	+0.084/0	16,0	5,0	5,5	BWA	0120	0200	050	BO
12,0	22,0	+0.084/0	16,0	5,0	6,0	BWA	0120	0220	050	BO
14,0	18,5	+0.084/0	15,7	3,2	3,7	BWA	0140	0185	032	BO
14,0	20,0	+0.084/0	16,5	3,6	4,0	BWA	0140	0200	036	BO
14,0	22,0	+0.084/0	18,0	4,5	5,0	BWA	0140	0220	045	BO
14,0	24,0	+0.084/0	18,0	5,0	6,0	BWA	0140	0240	050	BO
16,0	20,5	+0.084/0	17,7	3,2	3,7	BWA	0160	0205	032	BO
16,0	22,0	+0.084/0	18,5	3,6	4,0	BWA	0160	0220	036	BO
16,0	24,0	+0.084/0	18,5	4,5	5,0	BWA	0160	0240	045	BO
16,0	26,0	+0.084/0	20,0	5,0	6,0	BWA	0160	0260	050	BO
18,0	22,5	+0.084/0	19,7	3,2	3,7	BWA	0180	0225	032	BO
18,0	24,0	+0.084/0	20,5	3,6	4,0	BWA	0180	0240	036	BO
18,0	26,0	+0.084/0	21,0	4,5	5,0	BWA	0180	0260	045	BO
18,0	28,0	+0.084/0	22,0	5,0	6,0	BWA	0180	0280	050	BO
20,0	25,0	+0.084/0	21,9	3,6	4,0	BWA	0200	0250	036	BO
20,0	26,0	+0.084/0	22,5	3,6	4,0	BWA	0200	0260	036	BO
20,0	30,0	+0.084/0	24,0	6,0	7,0	BWA	0200	0300	060	BO
22,0	27,0	+0.084/0	23,9	3,6	4,0	BWA	0220	0270	036	BO
22,0	28,0	+0.084/0	24,5	3,6	4,0	BWA	0220	0280	036	BO
22,0	32,0	+0.084/0	26,0	6,0	7,0	BWA	0220	0320	060	BO
25,0	30,0	+0.084/0	26,9	3,6	4,0	BWA	0250	0300	036	BO
25,0	31,0	+0.100/0	27,5	3,6	4,0	BWA	0250	0310	036	BO



$d_{f9}$	$D_{H10}$	$\frac{tol}{H10}$	$D_1$	$h$	$E_{+0,2}$	ART / ITEM				
25,0	35,0	+0.100/0	29,0	6,0	7,0	BWA	0250	0350	060	BO
28,0	38,0	+0.100/0	32,0	6,0	7,0	BWA	0280	0380	060	BO
30,0	35,5	+0.100/0	32,1	3,9	4,5	BWA	0300	0355	039	BO
30,0	38,0	+0.100/0	33,0	4,5	5,0	BWA	0300	0380	045	BO
30,0	40,0	+0.100/0	34,0	6,0	7,0	BWA	0300	0400	060	BO
32,0	37,5	+0.100/0	34,1	3,9	4,5	BWA	0320	0375	039	BO
32,0	40,0	+0.100/0	35,0	4,5	5,0	BWA	0320	0400	045	BO
32,0	42,0	+0.100/0	36,0	6,0	7,0	BWA	0320	0420	060	BO
35,0	45,0	+0.100/0	39,0	6,0	7,0	BWA	0350	0450	060	BO
36,0	44,0	+0.100/0	39,0	4,5	5,0	BWA	0360	0440	045	BO
36,0	46,0	+0.100/0	40,0	6,0	7,0	BWA	0360	0460	060	BO
40,0	46,0	+0.100/0	43,0	4,3	4,8	BWA	0400	0460	043	BO
40,0	50,0	+0.100/0	44,0	6,0	7,0	BWA	0400	0500	060	BO
45,0	53,0	+0.120/0	48,0	4,5	5,0	BWA	0450	0530	045	BO
45,0	55,0	+0.120/0	49,0	6,0	7,0	BWA	0450	0550	060	BO
50,0	62,0	+0.120/0	55,0	7,5	8,5	BWA	0500	0620	075	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

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## RASCHIATORE BIDIREZIONALE CON GRADINO TIPO BWS

### DESCRIZIONE

Il raschiatore tipo **BWS** è ottenuto dalla combinazione di una guarnizione a labbri asimmetrici ed un raschiatore. Presenta sul labbro di tenuta una raggiatura che lo rende molto scorrevole ed ha sul lato statico un gradino ridotto che ne facilita il montaggio soprattutto per diametri piccoli.

La parte raschiante ha un labbro molto sottile per non influenzare il primo distacco nel movimento del cilindro.

### LIMITI D'IMPIEGO

Pressione:	< 20 bar
Velocità:	< 1 m/s
Temperatura:	da - 30° C a + 90° C
Fluidi:	aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

La sede dove va alloggiato il raschiatore non deve presentare spigoli vivi o bave che compromettano in esercizio la durata dello stesso.

**Attenzione:** per impieghi gravosi dove sono presenti disallineamenti o fuori centro, con diametri di stelo superiori a  $\varnothing$  16 mm è consigliato un montaggio in sede non più agganciato con il solo gradino ma con tutta la base del raschiatore (v. dis. dell'applicazione qui di seguito)

## BI-DIRECTIONAL WIPER WITH STEP TYPE BWS

### DESCRIPTION

The **BWS** wiper combines an asymmetric lip seal profile with a wiper.

On the sealing lip the BWS has a radius allowing greater smoothness and on the static side the reduced size step facilitates installation, especially for small diameters.

The scraping part has a very thin lip so as not to affect the stick-slip effect in the cylinder movement.

### TECHNICAL DATA

Pressure:	< 20 bar
Speed:	< 1 m/s
Temperature:	from - 30° C up to + 90° C
Fluids:	air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

### ASSEMBLY

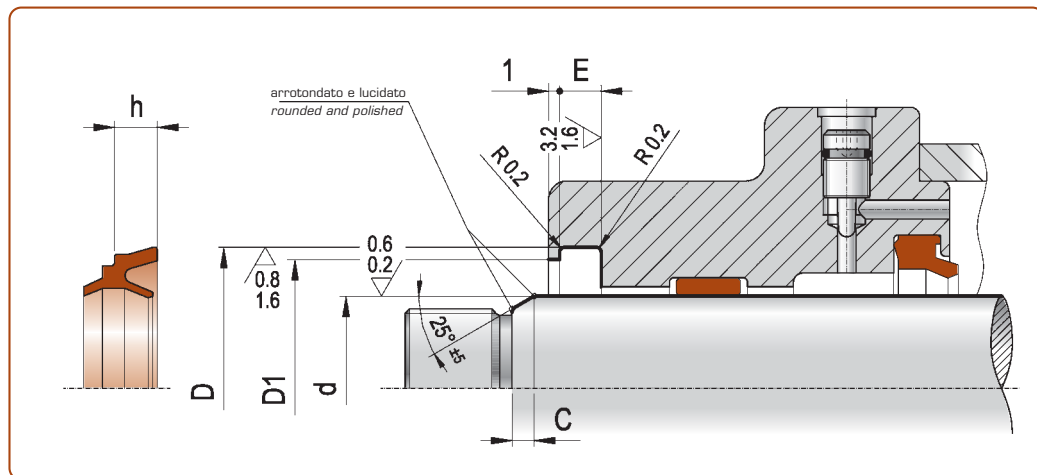
The housing where the wiper is to be installed should not have any cutting edges or flash so as to minimise the seal wear during operation.

**Warning:** for heavy duty applications showing misalignments or imbalance and with all diameters above  $\varnothing$  16 mm, during installation all the back of the wiper base should be hooked to the housing and not just to the step. (see following application drawings)



disegno / DRAWING

BWS



$d_{f9}$	$D_{H10}$	$\text{tol}_{H10}$	$D_1$	$h$	$E$	ART / ITEM				
4,0	8,1	+0.058/0	6,70	2,8	3,0	BWS	0040	0081	028	BO
6,0	11,1	+0.070/0	9,10	3,3	3,6	BWS	0060	0111	033	BO
8,0	14,1	+0.070/0	12,10	3,3	3,6	BWS	0080	0141	033	BO
10,0	16,1	+0.070/0	14,10	3,8	4,2	BWS	0100	0161	038	BO
12,0	18,1	+0.084/0	15,10	3,8	4,2	BWS	0120	0181	038	BO
12,0	20,0	+0.084/0	18,00	3,6	4,0	BWS	0120	0200	036	BO
14,0	22,0	+0.084/0	20,00	3,6	4,0	BWS	0140	0220	036	BO
16,0	24,0	+0.084/0	22,00	3,6	4,0	BWS	0160	0240	036	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.



## RASCHIATORE BIDIREZIONALE CON GRADINO TIPO BWS

### DESCRIZIONE

Il raschiatore tipo **BWS** è ottenuto dalla combinazione di una guarnizione a labbri asimmetrici ed un raschiatore. Presenta sul labbro di tenuta una raggatura che lo rende molto scorrevole ed ha sul lato statico un gradino ridotto che ne facilita il montaggio soprattutto per diametri piccoli.

La parte raschiante ha un labbro molto sottile per non influenzare il primo distacco nel movimento del cilindro.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 85 Sh A.

**Codice materiale alternativo: AO**

### MONTAGGIO

La sede dove va alloggiato il raschiatore non deve presentare spigoli vivi o bave che compromettano in esercizio la durata dello stesso.

**Attenzione:** per impieghi gravosi dove sono presenti disallineamenti o fuori centro, con diametri di stelo superiori a  $\varnothing$  16 mm è consigliato un montaggio in sede non più agganciato con il solo gradino ma con tutta la base del raschiatore (v. dis. dell'applicazione qui di seguito)

## BI-DIRECTIONAL WIPER WITH STEP TYPE BWS

### DESCRIPTION

The **BWS** wiper combines an asymmetric lip seal profile with a wiper.

On the sealing lip the BWS has a radius allowing greater smoothness and on the static side the reduced size step facilitates installation, especially for small diameters.

The scraping part has a very thin lip so as not to affect the stick-slip effect in the cylinder movement.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 85 Sh A.

**Alternative compound reference: AO**

### ASSEMBLY

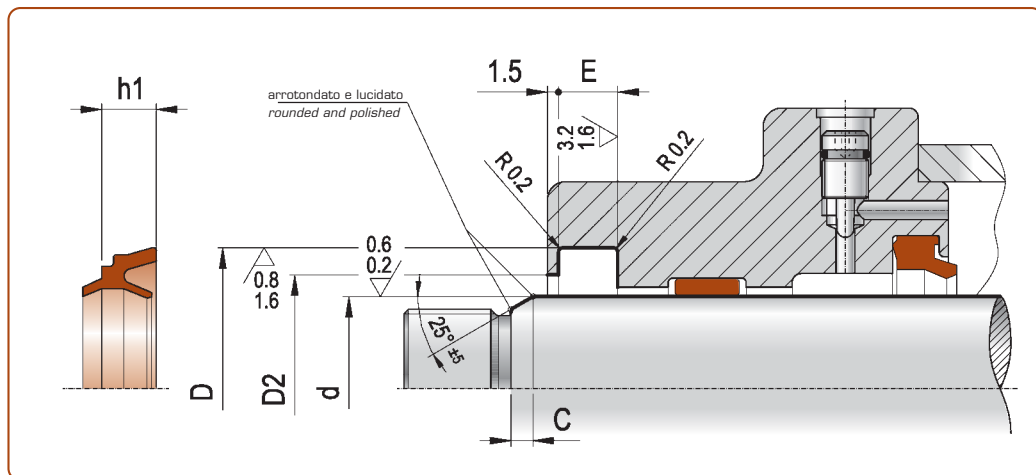
The housing where the wiper is to be installed should not have any cutting edges or flash so as to minimise the seal wear during operation.

**Warning:** for heavy duty applications showing misalignments or imbalance and with all diameters above  $\varnothing$  16 mm, during installation all the back of the wiper base should be hooked to the housing and not just to the step. (see following application drawings)



disegno / DRAWING

BWS



$d_{f9}$	$D_{H10}$	tol $H_{10}$	$D_2$	$h_1$	$E$	ART / ITEM				
18	26	+0,084/0	21,5	5,6	6,0	BWS	0180	0260	056	BO
20	28	+0,084/0	23,5	5,6	6,0	BWS	0200	0280	056	BO
22	30	+0,084/0	25,5	5,6	6,0	BWS	0220	0300	056	BO
25	33	+0,100/0	28,5	5,6	6,0	BWS	0250	0330	056	BO
28	36	+0,100/0	31,5	5,6	6,0	BWS	0280	0360	056	BO
30	38	+0,100/0	33,5	5,6	6,0	BWS	0300	0380	056	BO
32	40	+0,100/0	35,5	5,6	6,0	BWS	0320	0400	056	BO
35	43	+0,100/0	38,5	5,6	6,0	BWS	0350	0430	056	BO
36	44	+0,100/0	39,5	5,6	6,0	BWS	0360	0440	056	BO
40	46	+0,100/0	43,0	4,3	4,8	BWS	0400	0460	043	BO
40	48	+0,100/0	43,5	5,6	6,0	BWS	0400	0480	056	BO
42	50	+0,100/0	45,5	5,6	6,0	BWS	0420	0500	056	BO
45	53	+0,120/0	48,5	5,6	6,0	BWS	0450	0530	056	BO
50	58	+0,120/0	53,5	5,6	6,0	BWS	0500	0580	056	BO
55	63	+0,120/0	58,5	5,6	6,0	BWS	0550	0630	056	BO
56	64	+0,120/0	59,5	5,6	6,0	BWS	0560	0640	056	BO
60	68	+0,120/0	63,5	5,6	6,0	BWS	0600	0680	056	BO
100	108	+0,120/0	103,5	5,6	6,0	BWS	1000	1080	056	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

Remark: other dimensions not mentioned on catalogue on demand. Please contact our technical dept.





## RASCHIATORE BIDIREZIONALE CON GANCIO TIPO BWH

### DESCRIZIONE

La particolare forma e profilo del raschiatore con aggancio tipo **BWH** e la sede completamente aperta, ne consentono un rapido montaggio sia in automatico che in manuale.

La sede completamente aperta con una fresatura sulla parte laterale consente di sostituire il raschiatore molto facilmente.

Lo speciale profilo, che combina la tenuta e il raschiatore è molto robusto e consente allo stelo anche significativi disallineamenti senza il pericolo di espulsione dalla sede. Inoltre, la forma dei labbri statici impedisce alle impurità di penetrare nel cilindro.

### LIMITI D'IMPIEGO

Pressione: < 20 bar

Velocità: < 1 m/s

Temperatura: da - 30° C a + 90° C

Fluidi: aria con o senza lubrificazione, oli e grassi minerali (vedi TABELLA I, pagg. 12-13)

### MATERIALE

Materiale standard poliuretano a 90 Sh A.

**Codice materiale standard: BO**

Materiale alternativo poliuretano a 93 Sh A.

**Codice materiale alternativo: CO**

### MONTAGGIO

E' consigliato durante il montaggio lubrificare la parte interna del raschiatore, mentre occorre evitare di lubrificare la parte esterna e la cava per il pericolo di espulsione dalla sede.

Eliminare tutti gli spigoli vivi e le bave nella sede per facilitare il montaggio e non danneggiare la guarnizione durante l'inserimento.

## BI-DIRECTIONAL WIPER WITH HOOK TYPE BWH

### DESCRIPTION

The main characteristic of the hooked profile of the **BWH** wiper is to enable easy and fast installation into a complete open housing both automatically and manually. The groove is completely open with a lateral milling, which allows the wiper to be replaced easily.

The special profile combining a seal and a wiper has fast wear resistance and also allows significant deviations without the risk of extrusion from the open groove. Moreover, the static lips profile keeps dirt out of the cylinder.

### TECHNICAL DATA

Pressure: < 20 bar

Speed: < 1 m/s

Temperature: from - 30° C up to + 90° C

Fluids: air with or without lubrication, mineral oils or grease (see TABLE I, pages 12-13)

### MATERIAL

Standard polyurethane 90 Sh A.

**Standard compound reference: BO**

Alternative polyurethane 93 Sh A.

**Alternative compound reference: CO**

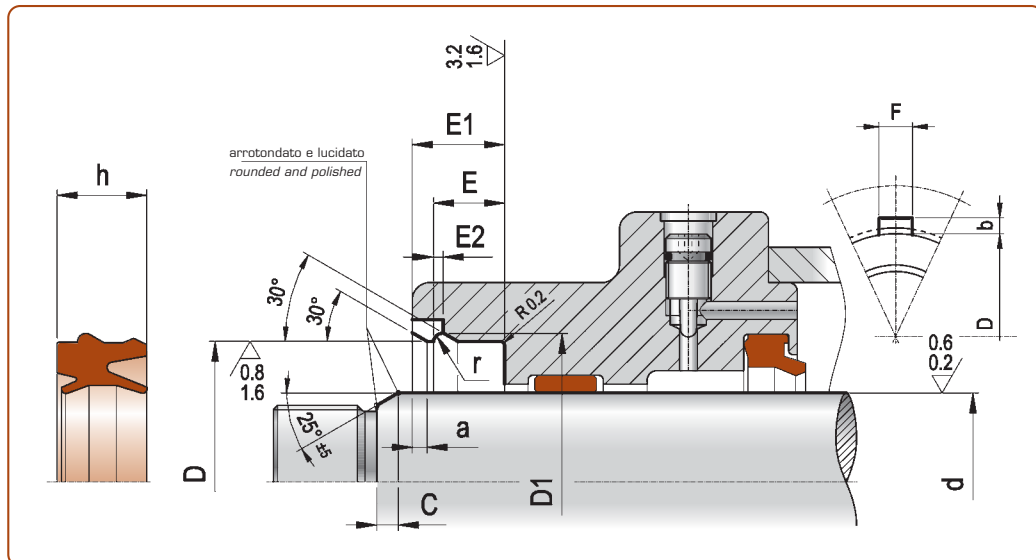
### ASSEMBLY

The wiper should be lubricated internally during installation. However an external lubrication of the wiper and housing is not recommended due to the risk of extrusion of the wiper itself. It is important to eliminate any cutting edges and flash in the housing to prevent damage to seals during mounting.



disegno / DRAWING

BWH



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$d_{f9}$	$D_{H10}$	tol $H_{10}$	$D_1$	$h$	$E_1$	$E$	$E_2$	$r$	$a$	$b$	$F$	ART / ITEM				
12,0	20,0	+0,084/0	22,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	4,0	BWH	0120	0200	107	BO
12,0	22,0	+0,084/0	24,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	4,0	BWH	0120	0220	107	BO
16,0	26,0	+0,084/0	28,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	5,0	BWH	0160	0260	107	BO
18,0	26,0	+0,084/0	28,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	5,0	BWH	0180	0260	107	BO
18,0	28,0	+0,084/0	30,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	5,0	BWH	0180	0280	107	BO
20,0	30,0	+0,084/0	32,0	10,7	13,0	8,8	2,5	1,1	1,5	1,8	5,0	BWH	0200	0300	107	BO
22,0	32,0	+0,100/0	34,5	11,2	14,0	9,4	3,0	1,4	2,0	2,0	7,5	BWH	0220	0320	112	BO
25,0	35,0	+0,100/0	37,5	11,2	14,0	9,4	3,0	1,4	2,0	2,0	7,5	BWH	0250	0350	112	BO
30,0	40,0	+0,100/0	42,5	11,2	14,0	9,4	3,0	1,4	2,0	2,0	7,5	BWH	0300	0400	112	BO
32,0	42,0	+0,100/0	44,5	11,2	14,0	9,4	3,0	1,4	2,0	2,0	7,5	BWH	0320	0420	112	BO
40,0	50,0	+0,100/0	52,5	11,2	14,0	9,4	3,0	1,4	2,0	2,0	7,5	BWH	0400	0500	112	BO
45,0	55,0	+0,120/0	58,2	12,2	15,0	10,4	4,0	1,8	2,0	2,5	10,0	BWH	0450	0550	122	BO
50,0	60,0	+0,120/0	63,2	12,2	15,0	10,4	4,0	1,8	2,0	2,5	10,0	BWH	0500	0600	122	BO
63,0	75,0	+0,120/0	78,2	13,0	16,0	11,4	4,0	1,8	2,0	2,5	10,0	BWH	0630	0750	130	BO

Nota: altre dimensioni non a catalogo a richiesta. Consultare il nostro ufficio tecnico.

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