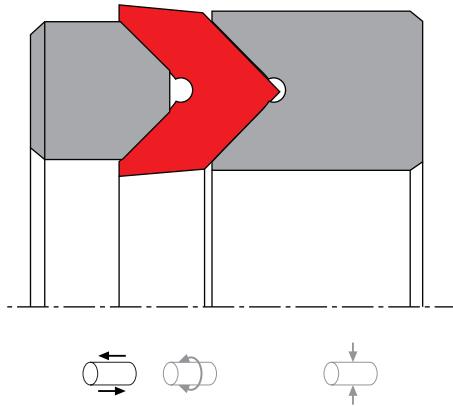


# SEAL SPEC K1012-M



## description

chevron sealing set, machined surface design. in back-to-back arrangement with one intermediate chevron for double sided pressure activation, in single acting applications with more intermediate chevrons possible. for heavy industry hydraulics.

- + symmetric single-acting piston sealing set consisting mainly of one chevrons, combined with pressure ring and support ring to form a set.
- + various materials are available for different purposes.
- + good sealing in all pressure ranges, particularly in the low pressure range.
- + for pressures up to 500 bar as a seal between pressurised spaces.
- + excellent static and dynamic sealing.
- + suitable for short and long travel.
- + very sturdy and wear-resistant.
- + insensitive to thermal damage caused by air in the oil.
- + open mounting space required (see mode of installation).
- + by combining various materials, the packing can be adjusted to the operating conditions.
- + by varying the number of packings, friction as well as leakage behaviour can be influenced.
- + the pressure and the support ring can be split for easier installation, the chevron snaps in the groove uncut (see mode of installation).

## category of profile

machined or molded/standard/trade product.

## single acting

the K1012-M seal is designed for use as a piston seal - either single or double acting where two seals are used 'back to back'

## area of application; hydraulics

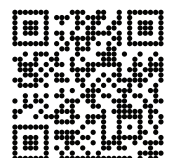
- reciprocating pistons in hydraulic cylinders; small swivelling motion also permissible.
- especially for heavy hydraulic applications or heavy-duty operating conditions.
- for repairs of heavy machinery and for normal wear, when re-tightening is possible

## note

- expensive and complex design.
- high degree of friction and thus little mechanical efficiency.
- for large numbers. for small amounts, the K1012-T profile is preferred.
- too many chevrons or too high clamping torque at installation can lead to increased friction, and wear (for standard applications use maximum 1 chevrons).

## function

K1012-M profiles are single-acting chevron seal sets designed to seal pressurised space against the atmosphere or - in case of back to back arrangement with intermediate guiding - to seal between two pressurised spaces, mainly for reciprocating movements. the design is based on application in standard hydraulic systems with conventional hydraulic oils. the operating parameters are as defined in the sealing data sheet and material data. requirements deviating from these parameters can be met to a certain degree by changing the geometry in the software program.



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## operating parameter & material

sealing element K11-M	material		temperature	max surface speed	max pressure <sup>1</sup>	hydrolysis	dry running	wear resistance
	header ring K10-A	back-up ring K12-M						
PU	POM / PA <sup>2</sup>	POM / PA <sup>2</sup>	-30 °C ... +100 °C	0,5 m/s	500 bar (50 MPa)	-	+	+
HPU	POM / PA <sup>2</sup>	POM / PA <sup>2</sup>	-20 °C ... +100 °C	0,5 m/s	500 bar (50 MPa)	+	+	+
LTPU	POM / PA <sup>2</sup>	POM / PA <sup>2</sup>	-40 °C ... +100 °C	0,5 m/s	500 bar (50 MPa)	-	+	+
SPU	POM / PA <sup>2</sup>	POM / PA <sup>2</sup>	-20 °C ... +100 °C	0,7 m/s	500 bar (50 MPa)	+	+	+
GPU	POM / PA <sup>2</sup>	POM / PA <sup>2</sup>	-30 °C ... +100 °C	0,5 m/s	500 bar (50 MPa)	+	+	+
NBR	PTFE glass	PTFE glass	-30 °C ... +100 °C	0,5 m/s	250 bar (25 MPa)	-	-	o
FKM	PTFE glass	PTFE glass	-20 °C ... +200 °C	0,5 m/s	250 bar (25 MPa)	-	-	o
EPDM	PTFE glass	PTFE glass	-50 °C ... +150 °C	0,5 m/s	250 bar (25 MPa)	++	-	o
HNBR	PTFE glass	PTFE glass	-25 °C ... +150 °C	0,5 m/s	250 bar (25 MPa)	+	o	+

<sup>1</sup> pressure ratings are dependent on the size of the extrusion gap.

++ particularly suitable

+ suitable

o conditional suitable

- not suitable

<sup>2</sup> POM up to ø260 mm, PA above ø260 mm

for detailed information regarding chemical resistance please refer to our „list of resistance“. for increased chemical and thermal resistance rubber materials are to be preferred, polyurethane materials increase wear resistance. for higher gliding speeds another sealing system should be used (e.g. PTFE materials).

## gap dimension

when using a pressure ring, the extrusion gap is already integrated in the seal. the gap between piston and housing should not exceed  $c_s \cdot 0.05$ .

## surface quality

surface roughness	Rtmax (µm)	Ra (µm)
sliding surface	≤2,5	≤0,1-0,5
bottom of groove	≤6,3	≤1,6
groove face	≤15	≤3

## tolerance recommendation

seal housing tolerance	
Ød	f8
ØD	H9

## mode of installation

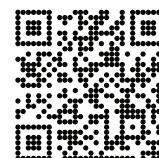
open housing are required. in case of already existing closed grooves the pressure and the support ring can be split for installation (pressure ring with cutting gap 0). the chevron has to be slipped in uncut. the support ring should be made of two parts (like ST08+K10) for easier installation into closed grooves.

## insertion chamfer

in order to avoid damage to the piston seal during installation, the piston and the housing is to be chamfered and rounded as shown in the "recommended mounting space" drawing. the size of chamfer depends on the seal type and profile width.

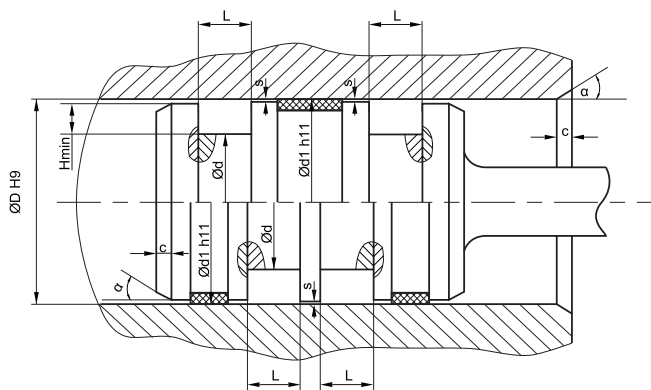
c <sub>s</sub> (mm)	c (mm)	
	α = 15° ... 20°	α = 20° ... 30°
4	3,5	2
5	4	2,5
6	4,5	3
7,5	5	4
10	6	5
12,5	8,5	6,5
15	10	7,5
20	13	10

instead of a chamfer, the piston can also be designed with a radius. recommended size of the radius is equal to size of chamfer (R=c).



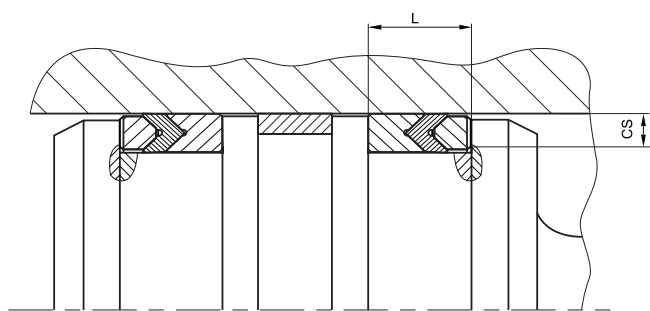
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## recommended mounting space



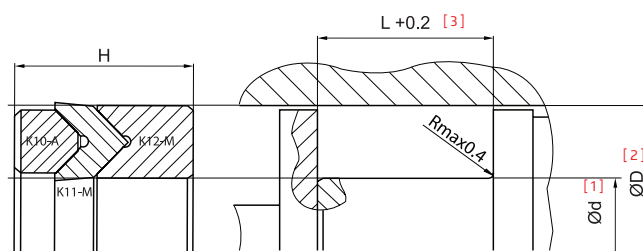
plastic guiderings (wearbands) have to feature a adequate cutting gap (recommendation: 2-5% of D). if metallic guides are used, spiral grooves shall be provided. in order to avoid drag pressure built up in case of back-to-back arrangement, the distance between the seals should be as small as possible.

## fitted



## seal & housing recommendations

please note that we are able to produce those profiles to your specific need or any non standard housing. for detail measurements, please see seal-mart catalog...

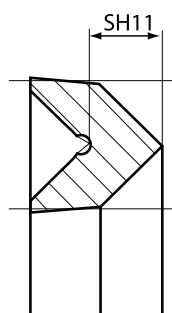


ØD [mm] [2]	L [mm] [3]	cs = (ØD - Ød)/2 [mm]
< 40	15	5
40 ~ 74,9	25	7,5
75 ~ 149,9	32	10
150 ~ 199,9	40	12,5
200 ~ 299,9	50	15
> 299,9	63	20

the ratio between nominal width and seal height should be in accordance with following recommendations (see also manufacturing notes)

## manufacturing notes

the following nominal widths are preferred. the theoretical packing height SH11 should be designed in accordance with the recommended values:



cs	SH11
(4)	2,2
5	2,5
(6)	3
7,5	3,5
10	5
12,5	6
15	7,5
20	10
(25)	12,5
(30)	15

in order to be able to maintain the required height irrespective of the accumulated packing height 'h', the pressure ring is individually adjusted during the production of the V-packing set.

