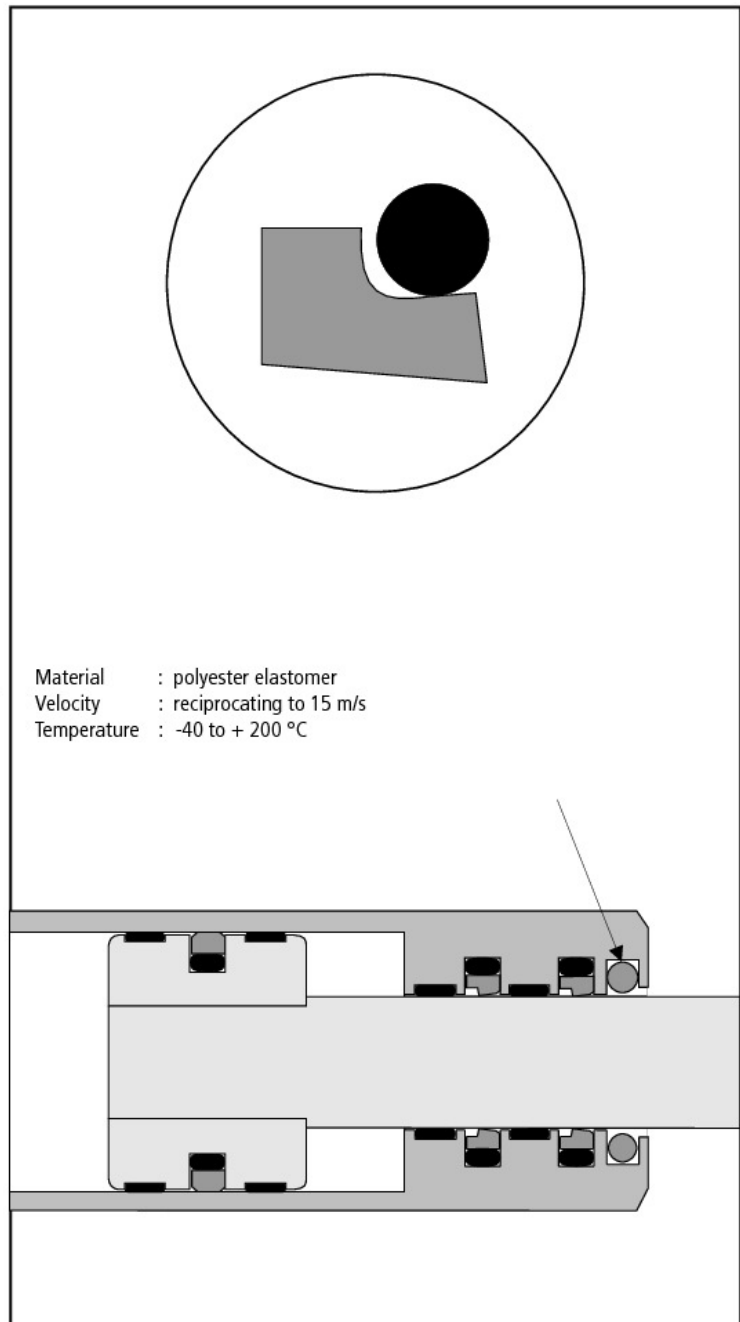


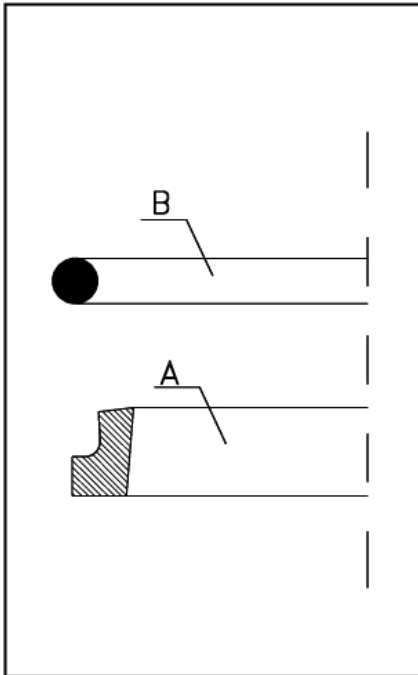
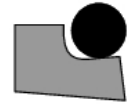
The wiper HA 350 is used in hydraulic cylinders to wipe the incoming piston rod clean of dirt. Various material combinations ensure high functional security and service life over the entire velocity range at low friction, various temperatures and media.

Special Features:

- Two part composition comprising of wiper ring and O-ring
- Very good wiper action against external and quickly adhering dirt
- Outstanding shear characteristics, no stick slip effect
- High abrasion resistance, long life
- Wide temperature range and high chemical resistance depending on O-ring material
- Available for every rod diameter up to approx. 2500 mm.



Material : polyester elastomer
 Velocity : reciprocating to 15 m/s
 Temperature : -40 to + 200 °C



Wiper Ring (Part A)

The wiper possesses a sturdy profile with a wiper lip protruding on one side. There exists a recess on the outermost circumference in order to be able to incorporate O-ring.

Wiper rings are manufactured from specially modified PTFE materials. Compound 55 (PTFE bronze) is the standard material of construction (MOC) that is used in hydraulics applications. This material is particularly superior in respect of very high abrasion resistance, inherent stability, very good shearing characteristics and very good thermal and chemical resistance.

O-Ring (Part B)

O-rings are standard sealing elements with circular cross section. Those used in the present application conform to the series of dimensions as per AS 568A (American norm).

Standard MOC for hydraulics is NBR (acrylonitrile butadiene rubber) with 70 Shore A, which guarantees particularly good resistance to hydraulic fluids.

Materials Overview: Wiper Ring

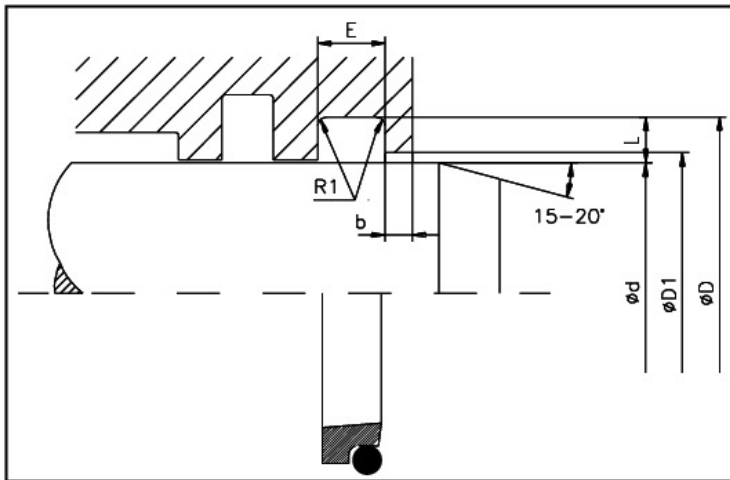
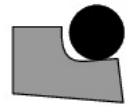
- 01:** Pure PTFE - Outstanding chemical resistance - Used in chemical, foodstuffs and pharmaceutical industry with mechanical stress.
- 12:** Modified PTFE - Very good chemical resistance, outstanding shear characteristics - Used for special purpose and intermediate stress applications.
- 25:** Modified PTFE + glass fiber - High abrasion resistance and inherent stability, good chemical resistance - Used in various areas of industry and intermediate-stress hydraulic applications.
- 30:** Modified PTFE + carbon - Good abrasion resistance and inherent stability, good chemical resistance - Used in water and water-oil emulsions with intermediate stress. Also designed for dry runs.
- 55:** Modified PTFE + bronze - High abrasion resistance and inherent stability, very good shear characteristics, good chemical resistance - Used in intermediate to high stress hydraulics application.
- 67:** Modified PTFE - Very high abrasion resistance and inherent stability - Used in hydraulics and abrasive pressure fluids.
- 83:** Modified polyurethane - Very high abrasion resistance and inherent stability - Used primarily in intermediate-stress hydraulics applications.

Materials Overview: O-Ring

- N:** Acrylonitrile butadiene rubber - Used in general machine construction, hydraulics, pneumatics. Resistant to mineral oil based pressure fluids, HFA, HFB and HFC fluids and water.
- F:** Fluorine containing rubbers - Used at high temperatures and aggressive surrounding media, resistant to mineral based and synthetic pressure fluids, aliphatic, aromatic and chlorated hydrocarbons, phosphate-ester based poorly inflammable fluids.
- E:** Ethylene propylene diene rubbers - Used in armature and pump industry. Resistant to hot water, steam, phosphate-ester based poorly inflammable fluids but is not resistant to mineral oils!
- S:** Silicon rubbers.
- C:** Chloroprene rubbers.

The wiper series HA 350 has been used for many years in hydraulic cylinders. It is meant for particularly robust applications like civil engineering and construction machinery, where high degree of dust attack is encountered.

The wiper can be used in divided and undivided grooves (rod diameter over 30 mm for undivided grooves). For use in an undivided groove, the profile ring must be carefully bent to a kidney shape. The ring is then further prised apart through the chamfered piston rod.



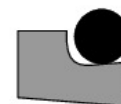
Limitations on Use	
Velocity	: reciprocating to 15 m/s
Temperature	: -40 to +200 °C (depending on O-ring material)

Media for Use	
Mineral oil based pressure fluids, flame resistant fluids (HFA, HFB, HFC), non-polluting pressure fluids (Bio Oils), water, air and other media (depending O-ring material).	

Surface Finish			
Surfaces	Rmax	Rz	Ra
Faces	2,5 µm	1,6 µm	0,4 µm
Groove root	10,0 µm	6,3 µm	1,6 µm
Groove flanks	16,0 µm	10,0 µm	3,2 µm

Recommended Sizes for Installation						
Section	O-Ring Cord-ø mm	Recommended Diameter Standard D mm	Groove Width E mm	Groove Depth L mm	Radius R1 max. mm	Bar Width b mm
01	1,78	6 - 11,9	3,7	2,4	0,2	2,0
02	2,62	12 - 64,9	5,0	3,4	0,2	2,0
03	3,53	65 - 250,9	6,0	4,4	0,2	3,0
04	5,33	251 - 420,9	8,4	6,1	0,2	4,0
05	7,00	421 - 650,9	11,0	8,0	0,2	5,0

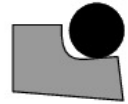
d f8/h9	D H10	E +0,2	D1 +0,2	O-Ring	Part N°.
6,00	10,80	3,70	8,70	011	HA350 0060-01-55N
8,00	12,80	3,70	10,70	012	HA350 0080-01-55N
10,00	14,80	3,70	12,70	013	HA350 0100-01-55N
12,00	18,80	5,00	15,50	113	HA350 0120-02-55N
14,00	20,80	5,00	17,50	115	HA350 0140-02-55N
15,00	21,80	5,00	18,50	115	HA350 0150-02-55N
16,00	22,80	5,00	19,50	116	HA350 0160-02-55N
18,00	24,80	5,00	21,50	117	HA350 0180-02-55N
20,00	26,80	5,00	23,50	118	HA350 0200-02-55N
22,00	28,80	5,00	25,50	120	HA350 0220-02-55N
25,00	31,80	5,00	28,50	121	HA350 0250-02-55N
26,00	32,80	5,00	29,50	122	HA350 0260-02-55N
28,00	34,80	5,00	31,50	123	HA350 0280-02-55N
30,00	36,80	5,00	33,50	125	HA350 0300-02-55N
32,00	38,80	5,00	35,50	126	HA350 0320-02-55N
35,00	41,80	5,00	38,50	127	HA350 0350-02-55N
36,00	42,80	5,00	39,50	129	HA350 0360-02-55N
37,00	43,80	5,00	40,50	129	HA350 0370-02-55N
38,00	44,80	5,00	41,50	130	HA350 0380-02-55N
40,00	46,80	5,00	43,50	131	HA350 0400-02-55N
42,00	48,80	5,00	45,50	132	HA350 0420-02-55N
45,00	51,80	5,00	48,50	134	HA350 0450-02-55N
48,00	54,80	5,00	51,50	136	HA350 0480-02-55N
50,00	56,80	5,00	53,50	137	HA350 0500-02-55N
52,00	58,80	5,00	55,50	138	HA350 0520-02-55N
55,00	61,80	5,00	58,50	140	HA350 0550-02-55N
56,00	62,80	5,00	59,50	141	HA350 0560-02-55N
58,00	64,80	5,00	61,50	142	HA350 0580-02-55N



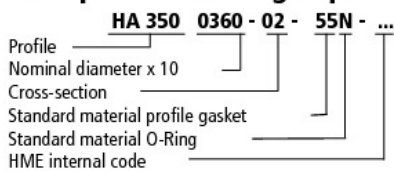
d f8/h9	D H10	E +0,2	D1 +0,2	O-Ring	Part N°.
60,00	66,80	5,00	63,50	143	HA350 0600-02-55N
63,00	69,80	5,00	66,50	145	HA350 0630-02-55N
65,00	73,80	6,00	69,00	231	HA350 0650-03-55N
70,00	78,80	6,00	74,00	233	HA350 0700-03-55N
75,00	83,80	6,00	79,00	235	HA350 0750-03-55N
80,00	88,80	6,00	84,00	236	HA350 0800-03-55N
85,00	93,80	6,00	89,00	238	HA350 0850-03-55N
90,00	98,80	6,00	94,00	239	HA350 0900-03-55N
95,00	103,80	6,00	99,00	241	HA350 0950-03-55N
100,00	108,80	6,00	104,00	243	HA350 1000-03-55N
105,00	113,80	6,00	109,00	244	HA350 1050-03-55N
110,00	118,80	6,00	114,00	246	HA350 1100-03-55N
115,00	123,80	6,00	119,00	247	HA350 1150-03-55N
120,00	128,80	6,00	124,00	249	HA350 1200-03-55N
125,00	133,80	6,00	129,00	250	HA350 1250-03-55N
130,00	138,80	6,00	134,00	252	HA350 1300-03-55N
135,00	143,80	6,00	139,00	253	HA350 1350-03-55N
140,00	148,80	6,00	144,00	255	HA350 1400-03-55N
150,00	158,80	6,00	154,00	258	HA350 1500-03-55N
155,00	163,80	6,00	159,00	259	HA350 1550-03-55N
160,00	168,80	6,00	164,00	260	HA350 1600-03-55N
170,00	178,80	6,00	174,00	261	HA350 1700-03-55N
175,00	183,80	6,00	179,00	262	HA350 1750-03-55N
180,00	188,80	6,00	184,00	263	HA350 1800-03-55N
185,00	193,80	6,00	189,00	263	HA350 1850-03-55N
190,00	198,80	6,00	194,00	264	HA350 1900-03-55N
195,00	203,80	6,00	199,00	265	HA350 1950-03-55N
200,00	208,80	6,00	204,00	266	HA350 2000-03-55N
210,00	218,80	6,00	214,00	267	HA350 2100-03-55N
220,00	228,80	6,00	224,00	269	HA350 2200-03-55N
225,00	233,80	6,00	229,00	270	HA350 2250-03-55N
230,00	238,80	6,00	234,00	271	HA350 2300-03-55N
240,00	248,80	6,00	244,00	272	HA350 2400-03-55N
250,00	258,80	6,00	254,00	274	HA350 2500-03-55N
260,00	272,20	8,40	264,50	377	HA350 2600-04-55N
270,00	282,20	8,40	274,50	378	HA350 2700-04-55N
280,00	292,20	8,40	284,50	379	HA350 2800-04-55N
290,00	302,20	8,40	294,50	380	HA350 2900-04-55N
300,00	312,20	8,40	304,50	381	HA350 3000-04-55N
310,00	322,20	8,40	314,50	381	HA350 3100-04-55N
320,00	332,20	8,40	324,50	382	HA350 3200-04-55N
330,00	342,20	8,40	334,50	382	HA350 3300-04-55N
340,00	352,20	8,40	344,50	382	HA350 3400-04-55N
350,00	362,20	8,40	354,50	383	HA350 3500-04-55N
360,00	372,20	8,40	364,50	383	HA350 3600-04-55N
370,00	382,20	8,40	374,50	383	HA350 3700-04-55N
380,00	392,20	8,40	384,50	384	HA350 3800-04-55N
390,00	402,20	8,40	394,50	384	HA350 3900-04-55N
400,00	412,20	8,40	404,50	385	HA350 4000-04-55N
410,00	422,20	8,40	414,50	385	HA350 4100-04-55N
420,00	432,20	8,40	424,50	386	HA350 4200-04-55N
430,00	446,00	11,00	435,20	463	HA350 4300-05-55N
440,00	456,00	11,00	445,20	464	HA350 4400-05-55N
450,00	466,00	11,00	455,20	465	HA350 4500-05-55N
460,00	476,00	11,00	465,20	466	HA350 4600-05-55N
470,00	486,00	11,00	475,20	466	HA350 4700-05-55N
480,00	496,00	11,00	485,20	467	HA350 4800-05-55N
490,00	506,00	11,00	495,20	468	HA350 4900-05-55N
500,00	516,00	11,00	505,20	469	HA350 5000-05-55N

Further sizes up to Ø 2500 mm available on request.

Sizes in bold correspond to rod diameter as per DIN ISO 3320.



Example for ordering Wipers:



Material Key:

Wiper Ring

- 01 - pure PTFE
- 12 - modified PTFE
- 25 - PTFE glass fiber
- 30 - PTFE carbon
- 55 - PTFE bronze
- 67 - modified PTFE
- 83 - modified PU

O-Ring

- N -NBR
- F - FPM
- E - EPDM
- S - Silicon
- C - Chloropren

WARNING: Limits of application stated herein are standard values. They could be individually transgressed with due consideration to respective service conditions. In the event of a large duty cycle, pulsating operation and other complex operational conditions, simultaneous transgression of these values is not recommended. Due to a large variety of service conditions that may arise in course of actual use, the company does not take responsibility of or guarantee the functional accuracy of the individual components. Rights for changes are reserved.

Issue

01	05
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