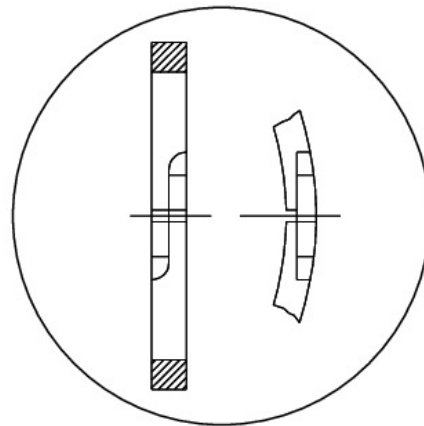




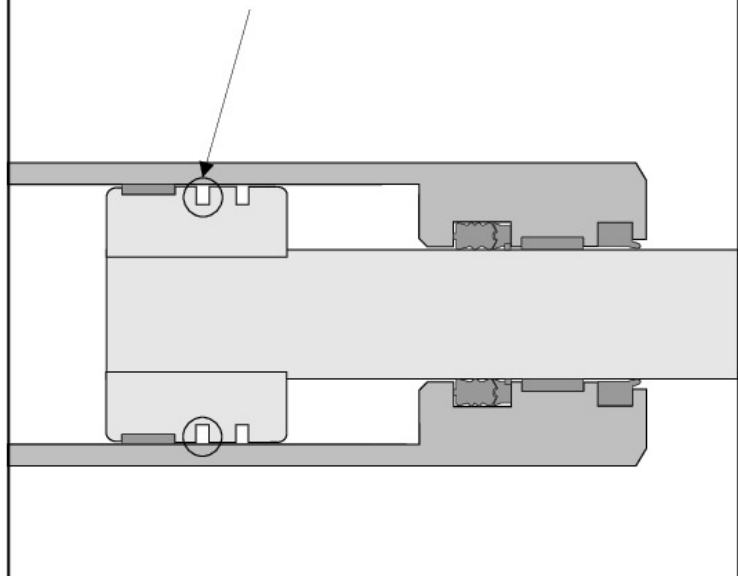
Piston rings from specially cast materials with joints impervious to medium find use in exceptionally demanding appliances in temperature and velocity. However, in contrast to other elastomer applications, they are not sensitive to impact pressures.

Special Features::

- Single part construction, with slit
- Good dynamic and static sealing through patented joint
- Good abrasion resistance, long life
- Extreme temperature range of application
- Overtravelling of cylinder bores possible without damage
- In combination with elastomer seals, this can be put to protective use against impact pressure and diesel effects



Material	: special cast material
Operating pressure	: up to 200 MPa (2000 bar)
Velocity	: reciprocating to 40 m/s



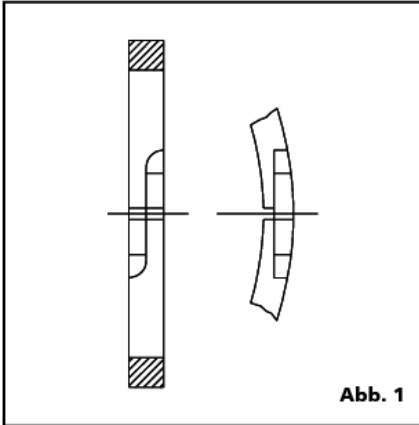


Abb. 1

Areas of Application:

Since complete static sealing is not achievable with metallic piston rings, such rings find use in cylinders where piston positions are defined using other external mechanical set up for long time. Examples of applications where even small amounts of friction and impact-free running with very slow movement assume significance are automotive engines, drives and servomechanisms. Cylinders on vehicles with container elevators and those for waste materials transport are often provided with metallic piston rings. In specific cases, these cylinders are designed as double-action telescopic cylinders. Metallic piston rings are meant moreover for cylinders of hydraulic presses that operate on intermittent compressive forces at high operational pressures. Pistons in hydro pumps and motors are normally sealed with metallic piston rings. Metallic piston rings can also serve to augment elastomer seals. In this case, they (metallic) are applied external to elastomer seals and thus serve to protect them against pressure surges, diesel effect and foreign bodies.

Method of Operation:

Metallic piston rings are a sealing element that is manufactured with high precision of dimension and form. The carefully machined outer diameter is vertically adjusted to the parallel flat finish faces to a close tolerance. Edge width is normally lower than the axial transverse dimension, so that the form is rectangular and the longer side is in contact with the cylinder area.

Piston ring is meant for use in piston groove. Normal width 25 to 200 micrometer (depending on piston size) is larger than the maximal piston ring width (see fig. 2). If axial play is too small, choking hinders advancement of oil pressure to inner diameter of piston ring. Sealing pressure against sides of the groove thus becomes very small, leading to leakage loss.

With too large a play, rapid pressure variations bring about lateral displacement of piston ring and pressure fluid is let through.

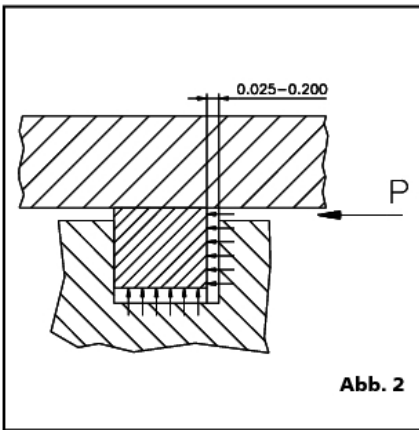


Abb. 2

HK 174 as Protection against Pressure Surge:

For use of HK 174 to protect elastomer seals against pressure surges and diesel effect (see fig. 3), piston ring must have small axial grooves, so as to avoid pressure build-up between elastomer seal and piston ring.

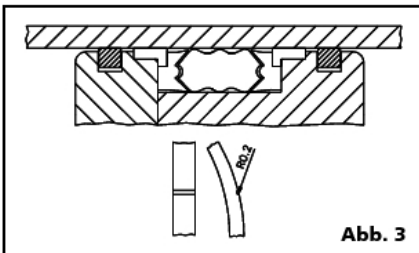


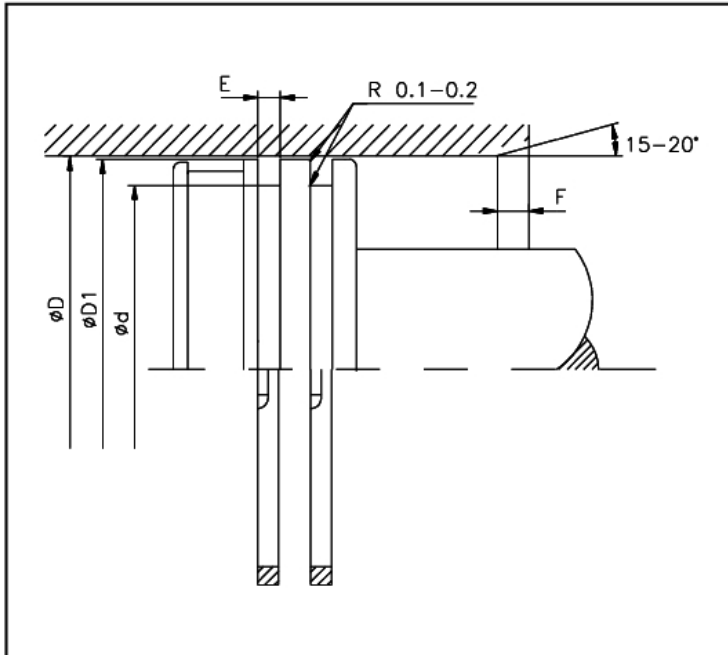
Abb. 3

Number of Piston Rings per Piston:

When two piston rings are used instead of one, leakage reduces by 15%, and the incorporation of a third one causes further reduction by 10-15%.

The most important reason why a three-ring combination is most useful in case of HK 174 is, that the two outer rings protect the inner one from foreign bodies. During use of HK 174 normally used with one ring, optimal sealing capacity is achieved with two seals (two grooves).

For details on factors about leakage and transport of oil as well as surface finish, please write to us for our special brochure HK 174.



Limitations on Use	
Operating pressure	: up to 200 MPa (2000 bar)
Velocity	: reciprocating to 40 m/s

Media for Use	
Mineral oil based pressure fluids, flame resistant fluids (HFA, HFB, HFC), Bio Oils, water, air and other materials as per O-ring materials.	

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	10,0 µm	6,3 µm	1,6 µm

Slide in Bevels	
Nominal Diameter	Length of Bevel
D [mm]	F [mm]
- 60	4
61 - 120	5
121 - 250	6
181 - 250	8
251 - 400	10

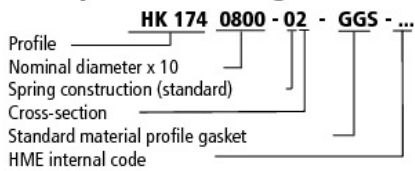
D H9/H8	d -0,5	E +0,13	D1 k11	Part N°.
40,00	35,00	3,20	39,50	HK174 0400-01-GGS
45,00	39,00	3,20	44,50	HK174 0450-01-GGS
50,00	44,00	3,20	49,50	HK174 0500-01-GGS
55,00	49,00	4,80	54,00	HK174 0550-01-GGS
60,00	53,00	4,80	59,00	HK174 0600-01-GGS
63,00	56,00	4,80	62,00	HK174 0630-01-GGS
65,00	58,00	4,80	64,00	HK174 0650-01-GGS
70,00	62,00	4,80	68,50	HK174 0700-01-GGS
75,00	67,00	4,80	73,50	HK174 0750-01-GGS
75,00	66,00	5,04	73,50	HK174 0750-02-GGS
80,00	72,00	4,80	78,50	HK174 0800-01-GGS
80,00	72,00	6,40	78,50	HK174 0800-02-GGS
85,00	77,00	4,80	83,50	HK174 0850-01-GGS
90,00	81,00	4,80	88,50	HK174 0900-01-GGS
90,00	80,00	3,54	88,50	HK174 0900-02-GGS
95,00	86,00	4,80	93,50	HK174 0950-01-GGS
100,00	90,00	6,40	98,50	HK174 1000-01-GGS
100,00	90,00	4,15	98,50	HK174 1000-02-GGS
105,00	95,00	6,40	103,00	HK174 1050-01-GGS
110,00	99,00	6,40	108,00	HK174 1100-01-GGS
110,00	99,00	4,15	108,00	HK174 1100-02-GGS
114,00	103,00	6,40	112,00	HK174 1140-01-GGS
115,00	104,00	6,40	113,00	HK174 1150-01-GGS
115,00	104,00	3,20	113,00	HK174 1150-02-GGS
120,00	109,00	6,40	118,00	HK174 1200-01-GGS
120,00	108,00	3,54	118,00	HK174 1200-02-GGS
125,00	113,00	6,40	123,00	HK174 1250-01-GGS
130,00	118,00	6,40	128,00	HK174 1300-01-GGS
130,00	118,00	5,05	128,00	HK174 1300-02-GGS
135,00	122,00	6,40	132,50	HK174 1350-01-GGS

D H9/H8	d -0,5	E +0,13	D1 k11	Part N°.
140,00	127,00	6,40	137,50	HK174 1400-01-GGS
145,00	132,00	6,40	142,50	HK174 1450-01-GGS
150,00	137,00	6,40	147,50	HK174 1500-01-GGS
150,00	136,00	5,04	147,50	HK174 1500-02-GGS
155,00	141,00	7,95	152,00	HK174 1550-01-GGS
160,00	146,00	7,95	157,00	HK174 1600-01-GGS
165,00	151,00	7,95	162,00	HK174 1650-01-GGS
170,00	155,00	7,95	167,00	HK174 1700-01-GGS
175,00	160,00	7,95	172,00	HK174 1750-01-GGS
180,00	164,00	7,95	177,00	HK174 1800-01-GGS
180,00	164,00	6,08	177,00	HK174 1800-02-GGS
185,00	169,00	7,95	182,00	HK174 1850-01-GGS
190,00	174,00	7,95	187,00	HK174 1900-01-GGS
195,00	178,00	7,95	192,00	HK174 1950-01-GGS
200,00	183,00	7,95	196,00	HK174 2000-01-GGS
200,00	183,00	9,55	196,00	HK174 2000-02-GGS
210,00	192,00	9,60	206,00	HK174 2100-01-GGS
220,00	202,00	9,60	216,00	HK174 2200-01-GGS
230,00	211,00	9,60	226,00	HK174 2300-01-GGS
240,00	221,00	9,60	236,00	HK174 2400-01-GGS
250,00	230,00	9,60	246,00	HK174 2500-01-GGS
260,00	240,00	9,60	256,00	HK174 2600-01-GGS
270,00	249,00	9,60	266,00	HK174 2700-01-GGS
280,00	258,00	9,60	275,00	HK174 2800-01-GGS
300,00	277,00	9,60	295,00	HK174 3000-01-GGS
320,00	296,00	12,80	315,00	HK174 3200-01-GGS
330,00	306,00	12,80	325,00	HK174 3300-01-GGS
350,00	324,00	12,80	344,00	HK174 3500-01-GGS
360,00	333,00	12,80	354,00	HK174 3600-01-GGS
400,00	372,00	12,80	394,00	HK174 4000-01-GGS

Extensive range of inch measurement diagrams available on request.



Example for ordering Piston Seal:



Issue

01	05
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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.