

Typical Applications

All rotating machines for sealing gases and liquids. Centrifugal, screw and volumetric pumps, agitators, mixers, boosters, compressors, fans.

Performance Capabilities

- Temperature: -60° to 260°C/-75° to +500°F
- Pressure: Seal size ≤100mm
Up to 20 barg/290 psig (R33)
Up to 65 barg/940 psig (R34)
Seal size >100mm
Up to 15 barg/220 psig (R33)
Up to 28 barg/400 psig (R34)
- Speed: Up to 20 m.s⁻¹/4,000 fpm

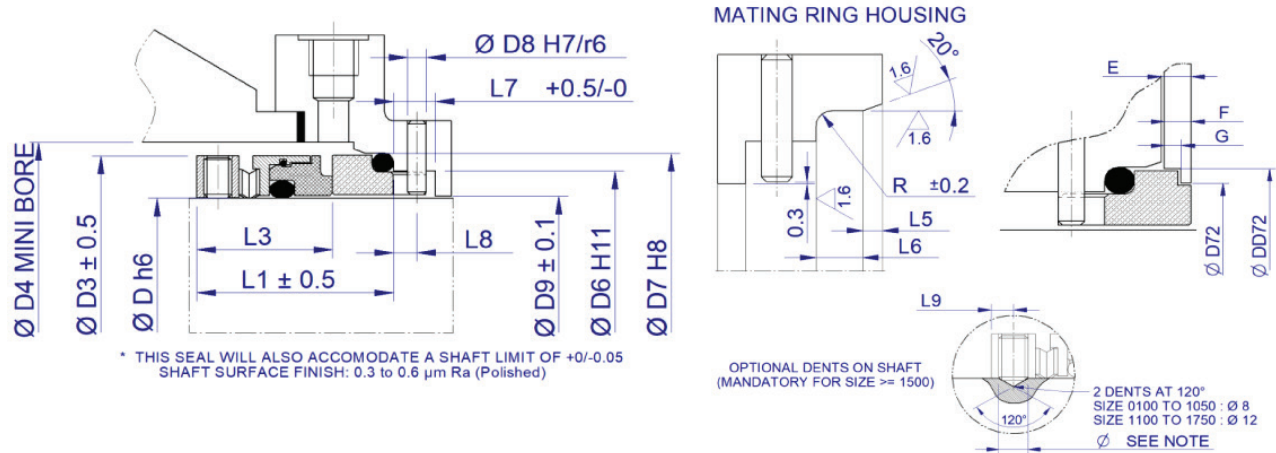
Design Features

- **Size:** For diameters from 10 to 100 mm, this seal complies with DIN 24960, NF E 29991, EN 12756 and ISO 3069 norms with the benefits to be shorter than L1K.
- **Monobloc type seal:** With its removable and clamped face this seal is easy to fit.
- **Drive:** The same driving device complies both type R33 and R34. Indifferent to rotational direction.
- **Wave Spring:** Wave spring with ample axial movement to maintain seal face contact regardless of wear, with the following advantages:
 - minimal space required
 - important deflection
 - indifferent to rotation direction
 - standard material stainless steel AISI 316, complies with the API specification
- **Wide range of O-rings:** Seal equipped with choice of O-rings in elastomers or PTFE

TYPE R33 AND R34

O-RING SEAL

R33 Typical Arrangement



Type R33 Dimensional Data (mm) - Sizes 0100 to 1000 comply with the standards EN 12756, DIN 24960 AND ISO 3069

SEAL SIZE	D	D3	D4	D6	D7	D8	D9	D72	DD72	E	F	G	L1	L1K	L3	L5	L6	L7	L8	L9	R
0100	10.0	20.0	22.0	17.0	21.0	3.0	10.5	19.3	21.0	3.0	2.5	1.5	28.0	32.5	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0120	12.0	22.0	24.0	19.0	23.0	3.0	12.5	21.3	23.0	3.0	2.5	1.5	28.0	32.5	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0140	14.0	24.0	26.0	21.0	25.0	3.0	14.5	23.3	25.0	3.0	2.5	1.5	28.0	35.0	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0160	16.0	26.0	28.0	23.0	27.0	3.0	16.5	25.3	27.0	3.0	2.5	1.5	28.0	35.0	19.5	1.5	4.0	8.5	5.0	3.75	1.0
0180	18.0	29.0	34.0	27.0	33.0	3.0	18.5	29.6	33.0	3.0	2.5	1.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0200	20.0	31.0	36.0	29.0	35.0	3.0	20.5	31.6	35.0	3.0	2.5	1.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0220	22.0	33.0	38.0	31.0	37.0	3.0	22.5	33.6	37.0	3.0	2.5	1.5	30.5	37.5	20.5	2.0	5.0	9.0	5.0	3.75	1.5
0240	24.0	36.0	40.0	33.0	39.0	3.0	24.5	35.6	39.0	3.0	2.5	1.5	32.5	40.0	22.5	2.0	5.0	9.0	5.0	4.0	1.5
0250	25.0	39.0	41.0	34.0	40.0	3.0	25.8	36.6	40.0	3.0	2.5	1.5	33.5	40.0	23.5	2.0	5.0	9.0	5.0	4.0	1.5
0280	28.0	42.0	44.0	37.0	43.0	3.0	28.8	39.6	43.0	3.0	2.5	1.5	33.5	42.5	23.5	2.0	5.0	9.0	5.0	4.0	1.5
0300	30.0	44.0	46.0	39.0	45.0	3.0	30.8	41.5	45.0	3.0	2.5	1.5	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0320	32.0	46.0	48.0	42.0	48.0	3.0	32.8	43.6	48.0	3.0	2.5	1.5	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0330	33.0	47.0	49.0	42.0	48.0	3.0	33.8	44.6	48.0	3.0	2.5	1.5	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0350	35.0	49.0	51.0	44.0	50.0	3.0	35.8	46.6	50.0	3.0	2.5	1.5	34.5	42.5	24.5	2.0	5.0	9.0	5.0	4.0	1.5
0380	38.0	53.0	58.0	49.0	56.0	4.0	38.8	52.1	56.0	3.0	2.5	1.0	38.0	45.0	27.0	2.0	6.0	9.0	5.0	4.0	1.5
0400	40.0	55.0	60.0	51.0	58.0	4.0	40.8	54.2	58.0	3.0	2.5	1.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0430	43.0	58.0	63.0	54.0	61.0	4.0	43.8	57.2	61.0	3.0	2.5	1.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0450	45.0	60.0	65.0	56.0	63.0	4.0	45.8	59.2	63.0	3.0	2.5	1.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0480	48.0	63.0	68.0	59.0	66.0	4.0	48.8	62.2	66.0	3.0	2.5	1.0	39.0	45.0	28.0	2.0	6.0	9.0	5.0	4.0	1.5
0500	50.0	66.0	70.0	62.0	70.0	4.0	50.8	64.8	70.0	4.5	4.0	2.5	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0530	53.0	69.0	73.0	65.0	73.0	4.0	53.8	67.7	73.0	4.5	4.0	2.5	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0550	55.0	71.0	75.0	67.0	75.0	4.0	55.8	69.8	75.0	4.5	4.0	2.5	40.0	47.5	27.0	2.5	6.0	9.0	5.0	4.0	2.0
0580	58.0	77.0	83.0	70.0	78.0	4.0	58.8	72.8	78.0	4.5	4.0	2.5	42.0	52.5	29.0	2.5	6.0	9.0	5.0	4.5	2.0
0600	60.0	79.0	85.0	72.0	80.0	4.0	60.8	75.3	80.0	4.5	4.0	2.5	42.0	52.5	29.0	2.5	6.0	9.0	5.0	4.5	2.0
0630	63.0	82.0	88.0	75.0	83.0	4.0	63.8	78.3	83.0	4.5	4.0	2.5	45.0	52.5	32.0	2.5	6.0	9.0	5.0	4.5	2.0
0650	65.0	84.0	90.0	77.0	85.0	4.0	65.8	80.3	85.0	4.5	4.0	2.5	45.0	52.5	32.0	2.5	6.0	9.0	5.0	4.5	2.0
0680	68.0	87.0	93.0	81.0	90.0	4.0	68.8	83.3	90.0	4.0	3.5	2.0	47.0	52.5	33.5	2.5	7.0	9.0	5.0	4.5	2.0
0700	70.0	89.0	95.0	83.0	92.0	4.0	70.8	85.9	92.0	5.5	5.0	3.5	47.0	60.0	32.0	2.5	7.0	9.0	5.0	4.5	2.0
0750	75.0	94.0	104.0	88.0	97.0	4.0	75.8	90.9	97.0	5.5	5.0	3.5	47.0	60.0	32.0	2.5	7.0	9.0	5.0	4.5	2.0
0800	80.0	100.0	109.0	95.0	105.0	4.0	80.8	98.0	105.0	5.5	5.0	3.5	48.0	60.0	32.5	3.0	7.0	9.0	5.0	4.5	2.5
0850	85.0	105.0	114.0	100.0	110.0	4.0	85.8	103.0	110.0	5.5	5.0	3.5	48.0	60.0	32.5	3.0	7.0	9.0	5.0	4.5	2.5
0900	90.0	112.0	119.0	105.0	115.0	4.0	90.8	110.0	115.0	5.5	5.0	3.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	117.0	124.0	110.0	120.0	4.0	95.8	115.0	120.0	5.5	5.0	3.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	122.0	129.0	115.0	125.0	4.0	100.8	120.0	125.0	5.5	5.0	3.0	54.0	65.0	38.5	3.0	7.0	9.0	5.0	6.0	2.5

TYPE R33 AND R34

O-RING SEAL

Technical Specification

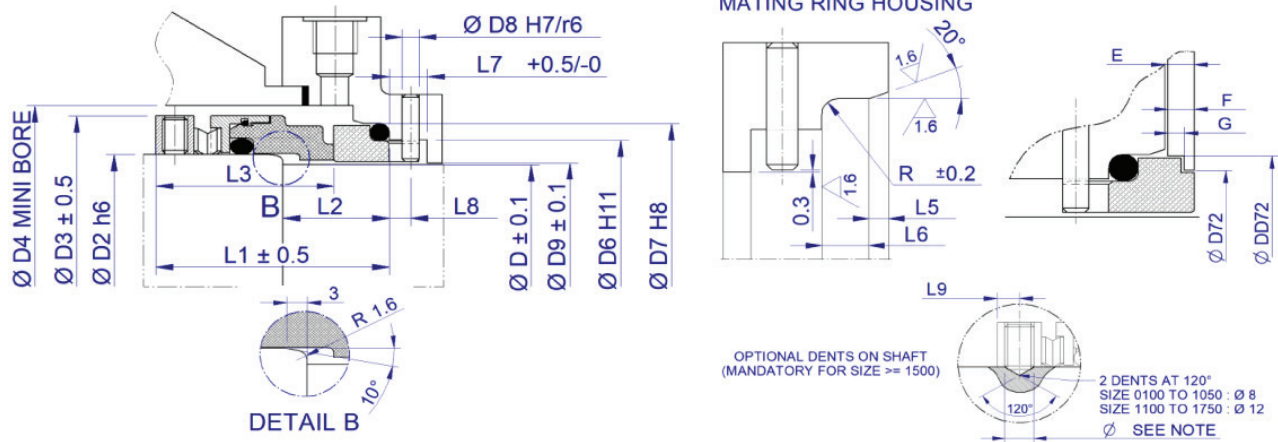
Type R33 Dimensional Data (mm)

SEAL SIZE	D	D3	D4	D6	D7	D8	D9	D72	DD72	E	F	G	L1	L1K	L3	L5	L6	L7	L8	L9	R
1050	105.0	127.0	134.0	122.0	131.0	5.0	105.8	125.0	131.0	7.0	6.5	1.7	64.0	—	42.0	3.0	9.0	10.0	6.0	6.0	2.5
1100	110.0	137.0	150.0	127.0	136.0	5.0	110.8	130.0	136.0	7.0	6.5	1.7	68.0	—	46.0	3.0	9.0	10.0	6.0	7.5	2.5
1150	115.0	142.0	155.0	132.0	141.0	5.0	115.8	135.0	141.0	7.0	6.5	1.7	68.0	—	46.0	3.0	9.0	10.0	6.0	7.5	2.5
1200	120.0	152.0	160.0	137.0	146.0	5.0	120.8	140.0	146.0	7.0	6.5	1.7	72.0	—	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1250	125.0	157.0	165.0	142.0	151.0	5.0	125.8	145.0	151.0	7.0	6.5	1.7	72.0	—	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1300	130.0	162.0	170.0	147.0	156.0	5.0	130.8	150.0	156.0	7.0	6.5	1.7	72.0	—	50.0	3.0	9.0	10.0	6.0	7.5	2.5
1350	135.0	167.0	175.0	157.0	166.0	8.0	135.8	160.0	166.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1400	140.0	172.0	180.0	162.0	171.0	8.0	140.8	165.0	171.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1450	145.0	177.0	185.0	167.0	176.0	8.0	145.8	170.0	176.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1500	150.0	182.0	190.0	172.0	181.0	8.0	150.8	175.0	181.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1550	155.0	187.0	200.0	177.0	186.0	8.0	155.8	180.0	186.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1600	160.0	192.0	205.0	182.0	191.0	8.0	160.8	185.0	191.0	8.5	8.0	3.2	82.0	—	57.0	3.0	9.0	13.0	7.0	7.5	2.5
1650	165.0	202.0	215.0	192.0	201.0	8.0	165.8	195.0	201.0	11.5	11.0	4.0	93.0	—	65.0	3.0	10.0	14.0	7.0	9.0	2.5
1700	170.0	207.0	220.0	197.0	206.0	8.0	170.8	200.0	206.0	11.5	11.0	4.0	93.0	—	65.0	3.0	10.0	14.0	7.0	9.0	2.5
1750	175.0	212.0	225.0	202.0	211.0	8.0	175.8	205.0	211.0	11.5	11.0	4.0	93.0	—	65.0	3.0	10.0	14.0	7.0	9.0	2.5

TYPE R33 AND R34

O-RING SEAL

R34 Typical Arrangement



Type R34 Dimensional Data (mm) - Sizes 0100 to 1000 comply with the standards EN 12756, DIN 24960 AND ISO 3069

SEAL SIZE	D	D2	D3	D4	D6	D7	D8	D9	D72	DD72	E	F	G	L1	L1K	L2	L3	L5	L6	L7	L8	L9	R
0100	10.0	14.0	24.0	26.0	17.0	21.0	3.0	10.5	19.3	21.0	3.0	2.5	1.5	37.0	40.0	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0120	12.0	16.0	26.0	28.0	19.0	23.0	3.0	12.5	21.3	23.0	3.0	2.5	1.5	37.0	40.0	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0140	14.0	18.0	29.0	34.0	21.0	25.0	3.0	14.5	23.3	25.0	3.0	2.5	1.5	37.0	42.5	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0160	16.0	20.0	31.0	36.0	23.0	27.0	3.0	16.5	25.3	27.0	3.0	2.5	1.5	37.0	42.5	18.0	28.5	1.5	4.0	8.5	5.0	3.75	1.0
0180	18.0	22.0	33.0	38.0	27.0	33.0	3.0	18.5	29.6	33.0	3.0	2.5	1.5	38.5	45.0	20.0	28.5	2.0	5.0	9.0	5.0	3.75	1.5
0200	20.0	24.0	36.0	40.0	29.0	35.0	3.0	20.5	31.6	35.0	3.0	2.5	1.5	41.5	45.0	20.0	31.5	2.0	5.0	9.0	5.0	4.0	1.5
0220	22.0	26.0	40.0	42.0	31.0	37.0	3.0	22.5	33.6	37.0	3.0	2.5	1.5	42.5	45.0	20.0	32.5	2.0	5.0	9.0	5.0	4.0	1.5
0240	24.0	28.0	42.0	44.0	33.0	39.0	3.0	24.5	35.6	39.0	3.0	2.5	1.5	42.5	47.5	20.0	32.5	2.0	5.0	9.0	5.0	4.0	1.5
0250	25.0	30.0	44.0	46.0	34.0	40.0	3.0	25.8	36.6	40.0	3.0	2.5	1.5	43.5	47.5	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0280	28.0	33.0	47.0	49.0	37.0	43.0	3.0	28.8	39.6	43.0	3.0	2.5	1.5	43.5	50.0	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0300	30.0	35.0	49.0	51.0	39.0	45.0	3.0	30.8	41.5	45.0	3.0	2.5	1.5	43.5	50.0	20.0	33.5	2.0	5.0	9.0	5.0	4.0	1.5
0330	33.0	38.0	53.0	58.0	42.0	48.0	3.0	33.8	44.6	48.0	3.0	2.5	1.5	44.5	50.0	20.0	34.5	2.0	5.0	9.0	5.0	4.0	1.5
0350	35.0	40.0	55.0	60.0	44.0	50.0	3.0	35.8	46.6	50.0	3.0	2.5	1.5	45.5	50.0	20.0	35.5	2.0	5.0	9.0	5.0	4.0	1.5
0380	38.0	43.0	58.0	63.0	49.0	56.0	4.0	38.8	52.1	56.0	3.0	2.5	1.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0400	40.0	45.0	60.0	65.0	51.0	58.0	4.0	40.8	54.2	58.0	3.0	2.5	1.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0430	43.0	48.0	63.0	68.0	54.0	61.0	4.0	43.8	57.2	61.0	3.0	2.5	1.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0450	45.0	50.0	66.0	70.0	56.0	63.0	4.0	45.8	59.2	63.0	3.0	2.5	1.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0480	48.0	53.0	69.0	73.0	59.0	66.0	4.0	48.8	62.2	66.0	3.0	2.5	1.0	49.0	52.5	23.0	38.0	2.0	6.0	9.0	5.0	4.0	1.5
0500	50.0	55.0	71.0	75.0	62.0	70.0	4.0	50.8	64.8	70.0	4.5	4.0	2.5	51.0	57.5	25.0	38.0	2.5	6.0	9.0	5.0	4.0	2.0
0530	53.0	58.0	77.0	83.0	65.0	73.0	4.0	53.8	67.7	73.0	4.5	4.0	2.5	52.0	57.5	25.0	39.0	2.5	6.0	9.0	5.0	4.5	2.0
0550	55.0	60.0	79.0	85.0	67.0	75.0	4.0	55.8	69.8	75.0	4.5	4.0	2.5	52.0	57.5	25.0	39.0	2.5	6.0	9.0	5.0	4.5	2.0
0580	58.0	63.0	82.0	88.0	70.0	78.0	4.0	58.8	72.8	78.0	4.5	4.0	2.5	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0600	60.0	65.0	84.0	90.0	72.0	80.0	4.0	60.8	75.3	80.0	4.5	4.0	2.5	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0630	63.0	68.0	87.0	93.0	75.0	83.0	4.0	63.8	78.3	83.0	4.5	4.0	2.5	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0650	65.0	70.0	89.0	95.0	77.0	85.0	4.0	65.8	80.3	85.0	4.5	4.0	2.5	55.0	62.5	25.0	42.0	2.5	6.0	9.0	5.0	4.5	2.0
0700	70.0	75.0	94.0	104.0	83.0	92.0	4.0	70.8	85.9	92.0	5.5	5.0	3.5	58.0	70.0	28.0	43.0	2.5	7.0	9.0	5.0	4.5	2.0
0750	75.0	80.0	100.0	109.0	88.0	97.0	4.0	75.8	90.9	97.0	5.5	5.0	3.5	59.0	70.0	28.0	44.0	2.5	7.0	9.0	5.0	4.5	2.0
0800	80.0	85.0	105.0	114.0	95.0	105.0	4.0	80.8	98.0	105.0	5.5	5.0	3.5	59.0	70.0	28.0	43.5	3.0	7.0	9.0	5.0	4.5	2.5
0850	85.0	90.0	112.0	119.0	100.0	110.0	4.0	85.8	103.0	110.0	5.5	5.0	3.5	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0900	90.0	95.0	117.0	124.0	105.0	115.0	4.0	90.8	110.0	115.0	5.5	5.0	3.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	100.0	122.0	129.0	110.0	120.0	4.0	95.8	115.0	120.0	5.5	5.0	3.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	105.0	127.0	135.0	115.0	125.0	4.0	100.8	120.0	125.0	5.5	5.0	3.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
0950	95.0	100.0	122.0	129.0	110.0	120.0	4.0	95.8	115.0	120.0	5.5	5.0	3.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5
1000	100.0	105.0	127.0	135.0	115.0	125.0	4.0	100.8	120.0	125.0	5.5	5.0	3.0	66.0	75.0	28.0	50.5	3.0	7.0	9.0	5.0	6.0	2.5

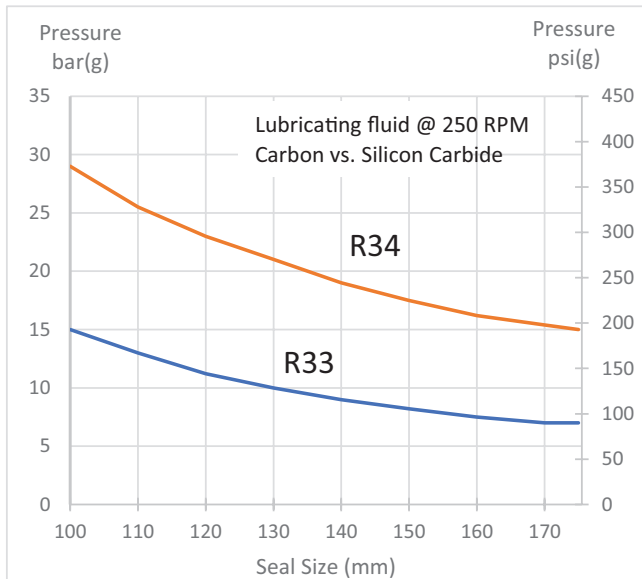
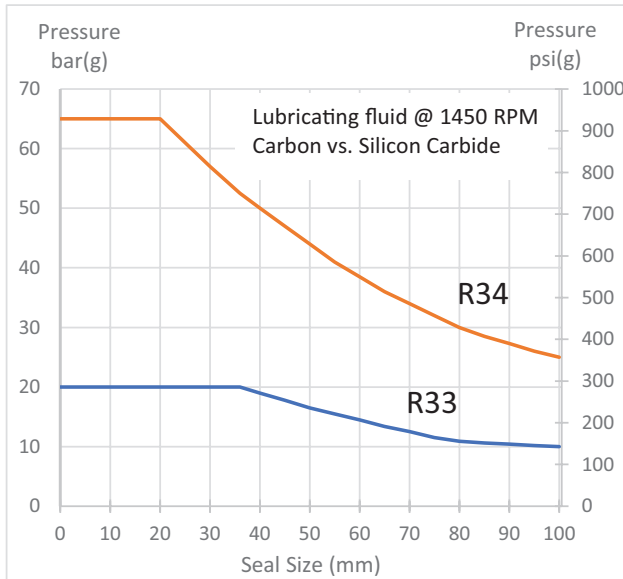
TYPE R33 AND R34

O-RING SEAL

Type R34 Dimensional Data (mm)

SEAL SIZE	D	D2	D3	D4	D6	D7	D8	D9	D72	DD72	E	F	G	L1	L1K	L2	L3	L5	L6	L7	L8	L9	R
1050	105.0	110.0	137.0	150.0	122.0	131.0	5.0	105.8	125.0	131.0	7.0	6.5	1.7	83.0	—	42.0	61.0	3.0	9.0	10.0	6.0	7.5	2.5
1100	110.0	115.0	142.0	155.0	127.0	136.0	5.0	110.8	130.0	136.0	7.0	6.5	1.7	83.0	—	42.0	61.0	3.0	9.0	10.0	6.0	7.5	2.5
1150	115.0	120.0	152.0	160.0	132.0	141.0	5.0	115.8	135.0	141.0	7.0	6.5	1.7	87.0	—	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1200	120.0	125.0	157.0	165.0	137.0	146.0	5.0	120.8	140.0	146.0	7.0	6.5	1.7	87.0	—	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1250	125.0	130.0	162.0	170.0	142.0	151.0	5.0	125.8	145.0	151.0	7.0	6.5	1.7	87.0	—	42.0	65.0	3.0	9.0	10.0	6.0	7.5	2.5
1300	130.0	135.0	167.0	175.0	147.0	156.0	5.0	130.8	150.0	156.0	7.0	6.5	1.7	92.0	—	42.0	70.0	3.0	9.0	10.0	6.0	7.5	2.5
1350	135.0	140.0	172.0	180.0	157.0	166.0	8.0	135.8	160.0	166.0	8.5	8.0	3.2	97.0	—	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1400	140.0	145.0	177.0	185.0	162.0	171.0	8.0	140.8	165.0	171.0	8.5	8.0	3.2	97.0	—	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1450	145.0	150.0	182.0	190.0	167.0	176.0	8.0	145.8	170.0	176.0	8.5	8.0	3.2	97.0	—	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1500	150.0	155.0	187.0	200.0	172.0	181.0	8.0	150.8	175.0	181.0	8.5	8.0	3.2	97.0	—	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1550	155.0	160.0	192.0	205.0	177.0	186.0	8.0	155.8	180.0	186.0	8.5	8.0	3.2	97.0	—	47.0	72.0	3.0	9.0	13.0	7.0	7.5	2.5
1600	160.0	165.0	202.0	215.0	182.0	191.0	8.0	160.8	185.0	191.0	8.5	8.0	3.2	103.0	—	47.0	78.0	3.0	9.0	13.0	7.0	9.0	2.5
1650	165.0	170.0	207.0	220.0	192.0	201.0	8.0	165.8	195.0	201.0	11.5	11.0	4.0	108.0	—	52.0	80.0	3.0	10.0	14.0	7.0	9.0	2.5
1700	170.0	175.0	212.0	225.0	197.0	206.0	8.0	170.8	200.0	206.0	11.5	11.0	4.0	108.0	—	52.0	80.0	3.0	10.0	14.0	7.0	9.0	2.5

Pressure Rating Limits



To determine the maximum pressure for the size of Type R33 or R34 seal required: multiply the pressure obtained from the Pressure Rating Limits chart above by the appropriate Multiplier Factors in chart on next page.

TYPE R33 AND R34

O-RING SEAL

Multiplier Factors

	Selection Considerations	Multiplier Factor
Sealed fluid lubricity	Petrol/Gasoline, kerosene or better	x 1.00
	Water and aqueous solutions Lighter hydrocarbons (s.g. < 0.65), etc.	x 0.75
Face and seat materials	Carbon vs. silicon carbide	x 1.00
	Silicon carbide vs. silicon carbide	x 0.60
Sealed fluid temperature	Up to 80°C/175°F	x 1.00
	Above 80 to 120°C/ 175 to 250°F	x 0.90
	Above 120 to 180°C/ 250 to 355°F	x 0.80
	Above 180°C/355°F	x 0.65
Speed	Seal sizes ≤ 100 mm/4.0 in Up to 1,800 rpm	x 1.00
	Seal sizes ≤ 100 mm/4.0 in Above 1,800 to 3,600 rpm	x 0.85
	Seal sizes > 100 mm/4.0 in Up to 500 rpm	x 1.00
	Seal sizes > 100 mm/4.0 in Above 500 to 1,800 rpm	x 0.65
	Seal sizes > 100 mm/4.0 in Above 1,800 to 3,000 rpm	x 0.50

Example of determining PV limits:

Seal: 33 mm diameter Type R33
 Product: Petrol/Gasoline
 Face materials: Carbon vs. silicon carbide
 Operating temperature: 35°C/95°F
 Operating speed: 2,950 rpm

Using the Pressure Rating Limits graphs on previous page, the maximum pressure would be 20 barg/290 psig.

From the Multiplier Factors table on the left, apply the multipliers for the specific service requirements.

$$20 \text{ barg/290 psig} \times 1.00 \times 1.00 \times 1.00 \times 0.85 = 17 \text{ barg/246 psig}$$

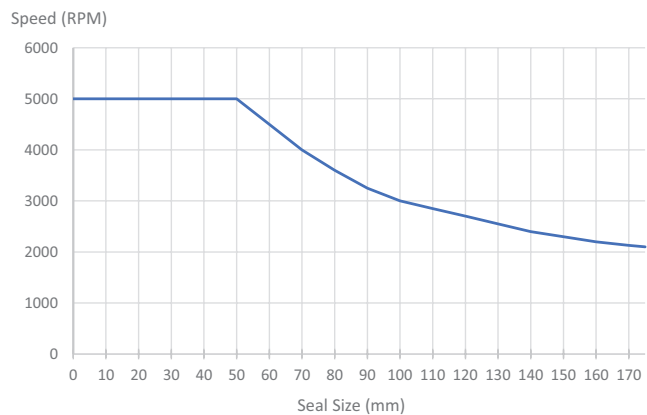
Therefore, for the example given, the maximum operating pressure is 17 barg/246 psig.

The operating parameters shown can be exceeded for certain applications. If the required operating pressure is greater than the calculated PV limit, please consult your John Crane Sales/Service Engineer.

Temperature Limit for O-rings

Compound	Temperature
Ethylene propylene	-40°C to 150°C/-40°F to 300°F
Medium nitrile	-40°C to 120°C/-40°F to 250°F
Fluorocarbon	-30°C to 205°C/-22°F to 400°F
Perfluoroelastomer	-20°C to 260°C/-4°F to 500°F
Pure PTFE	-60°C to 250°C/-80°F to 485°F

Speed Limits



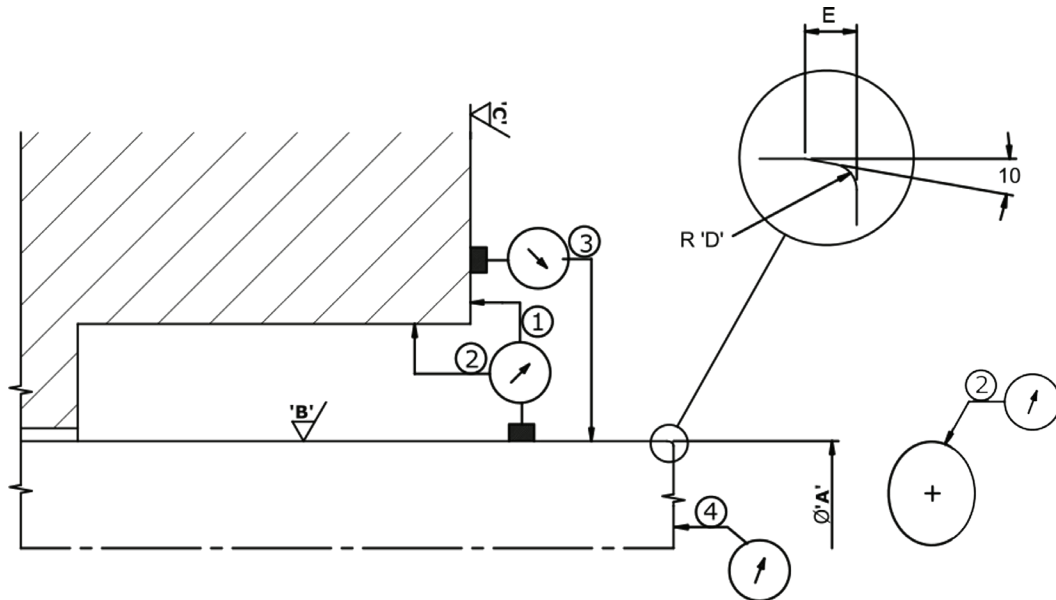
TYPE R33 AND R34

O-RING SEAL

Materials of Construction				
SEAL COMPONENTS	MATERIALS			
Description	Standard	DIN Code	Options	DIN Code
Face/Primary ring	Resin impregnated carbon	B	Antimony carbon	A2
	Reaction bonded silicon carbide	Q2	—	—
Seat/Mating ring	Alpha sintered silicon carbide	Q1	Tungsten carbide	U
Face carrier	316 stainless steel	G	Consult John Crane Engineering	—
Spring				
Set screw	904L stainless steel	G3	Consult John Crane Engineering	—
Driving carrier				
Clip ring	904L stainless steel	G3	PTFE	T2
O-ring	Fluoroelastomer	V	Several	—
	Perfluoroelastomer	K		
	Ethylene propylene	E		
	Medium nitrite	P		

Checking the Machine

- A – Seal size
- B – 0.3-0.6 μm Ra
12-24 μinch Ra
- C – 1.6-3.2 μm Ra
63-125 μinch Ra
- D – 1.5 mm/0.060 inch
- E – 3.0 mm/0.120 inch



1	2	3	4
Squareness of shaft to seal chamber face	Concentricity seal chamber bore to shaft	Shaft runout	Shaft end play
< 0.08 mm FIM, speed \leq 1800 RPM < 0.05 mm FIM, speed >1800 RPM < 0.003 inch FIM, speed \leq 1800 RPM < 0.002 inch FIM, speed >1800 RPM	<0.006 inch FIM <0.15 mm FIM	< 0.08 mm FIM, speed \leq 1800 RPM < 0.05 mm FIM, speed >1800 RPM < 0.003 inch FIM, speed \leq 1800 RPM < 0.002 inch FIM, speed >1800 RPM	<0.003 inch FIM <0.08 mm FIM



TYPE R33 AND R34

O-RING SEAL

Technical Specification



North America United States of America Tel: 1-847-967-2400	Europe United Kingdom Tel: 44-1753-224000	Latin America Brazil Tel: 55-11-3371-2500	Middle East & Africa United Arab Emirates Tel: 971-481-27800	Asia Pacific Singapore Tel: 65-6518-1800
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If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.