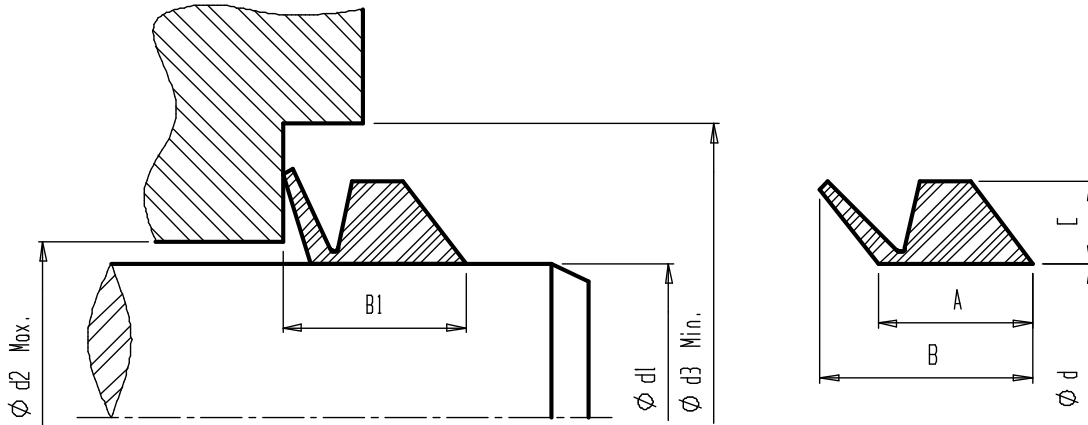


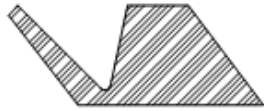
V - Seal



Dimension Table – Type VS



V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d_1	d	C	A	B	d_2	d_3	B_1
VS-005	4.5 ~ 5.5	4	2	3.9	5.2	d_1+1	d_1+6	4.5+/-0.4
VS-006	5.5~6.5	5	2	3.9	5.2	d_1+1	d_1+6	4.5+/-0.4
VS-007	6.5~8	6	2	3.9	5.2	d_1+1	d_1+6	4.5+/-0.4
VS-008	8~9.5	7	2	3.9	5.2	d_1+1	d_1+6	4.5+/-0.4
VS-010	9.5~11.5	9	3	5.6	7.7	d_1+1	d_1+9	6.7+/-0.6
VS-012	11.5~13.5	10.5	3	5.6	7.7	d_1+1	d_1+9	6.7+/-0.6
VS-014	13.5~15.5	12.5	3	5.6	7.7	d_1+1	d_1+9	6.7+/-0.6
VS-016	15.5~17.5	14	3	5.6	7.7	d_1+1	d_1+9	6.7+/-0.6
VS-018	17.5~19	16	3	5.6	7.7	d_1+1	d_1+9	6.7+/-0.6
VS-020	19~21	18	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-022	21~24	20	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-025	24~27	22	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-028	27~29	25	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-030	29~31	27	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-032	31~33	29	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-035	33~36	31	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-038	36~38	34	4	7.9	10.5	d_1+2	d_1+12	9.0+/-0.8
VS-040	38~43	36	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0
VS-045	43~48	40	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0



V - Seal



Dimension Table – Type VS

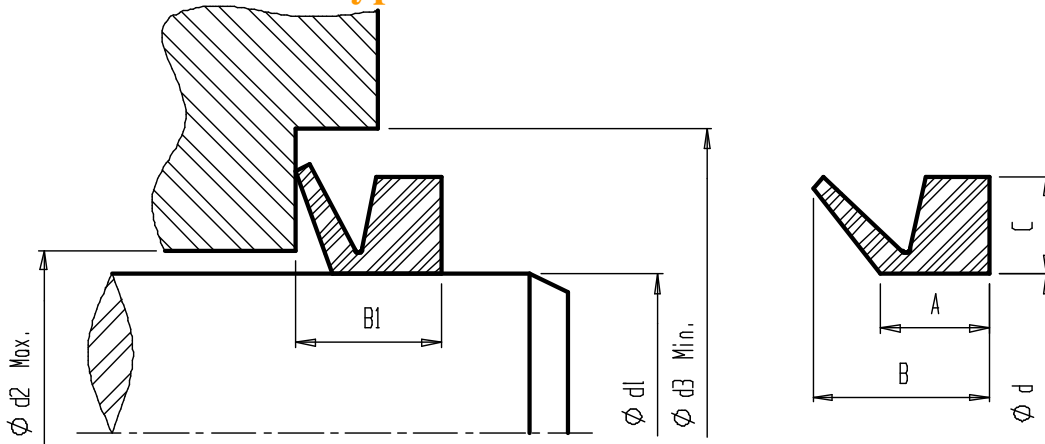
V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d_1	d	C	A	B	d_2	d_3	B_1
VS-050	48~53	45	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0
VS-055	53~58	49	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0
VS-060	58~63	54	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0
VS-065	63~68	58	5	9.5	13	d_1+2	d_1+15	11.0+/-1.0
VS-070	68~73	63	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-075	73~78	67	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-080	78~83	72	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-085	83~88	76	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-090	88~93	81	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-095	93~98	85	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-100	98~105	90	6	11.3	15.5	d_1+3	d_1+18	13.5+/-1.2
VS-110	105~115	99	7	13.1	18	d_1+4	d_1+21	15.5+/-1.5
VS-120	115~125	108	7	13.1	18	d_1+4	d_1+21	15.5+/-1.5
VS-130	125~135	117	7	13.1	18	d_1+4	d_1+21	15.5+/-1.5
VS-140	135~145	126	7	13.1	18	d_1+4	d_1+21	15.5+/-1.5
VS-150	145~155	135	7	13.1	18	d_1+4	d_1+21	15.5+/-1.5
VS-160	155~165	144	8	15.0	20	d_1+4	d_1+24	18.0+/-1.8
VS-170	165~175	153	8	15.0	20	d_1+4	d_1+24	18.0+/-1.8
VS-180	175~185	162	8	15.0	20	d_1+4	d_1+24	18.0+/-1.8
VS-190	185~195	171	8	15.0	20	d_1+4	d_1+24	18.0+/-1.8
VS-199	195~210	180	8	15.0	20	d_1+4	d_1+24	18.0+/-1.8



V - Seal



Dimension Table – Type VA



V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d_1	d	C	A	B	d_2	d_3	B_1
VA-003	2.7 ~ 3.5	2.5	1.5	2.1	3.0	d_1+1	d_1+4	2.5+/-0.3
VA-004	3.5~4.5	3.2	2	2.4	3.7	d_1+1	d_1+6	3.0+/-0.4
VA-005	4.5~5.5	4	2	2.4	3.7	d_1+1	d_1+6	3.0+/-0.4
VA-006	5.5~6.5	5	2	2.4	3.7	d_1+1	d_1+6	3.0+/-0.4
VA-007	6.5~8	6	2	2.4	3.7	d_1+1	d_1+6	3.0+/-0.4
VA-008	8~9.5	7	2	2.4	3.7	d_1+1	d_1+6	3.0+/-0.4
VA-010	9.5~11.5	9	3	3.4	5.5	d_1+1	d_1+9	4.5+/-0.6
VA-012	11.5~12.5	10.5	3	3.4	5.5	d_1+1	d_1+9	4.5+/-0.6
VA-014	13.5~15.5	12.50	3	3.4	5.5	d_1+1	d_1+9	4.5+/-0.6
VA-016	15.5~17.5	14	3	3.4	5.5	d_1+1	d_1+9	4.5+/-0.6
VA-018	17.5~19	16	3	3.4	5.5	d_1+1	d_1+9	4.5+/-0.6
VA-020	19~21	18	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-022	21~24	20	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-025	24~27	22	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-028	27~29	25	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-030	29~31	27	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-032	31~33	29	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-035	33~36	31	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8
VA-038	36~38	34	4	4.7	7.5	d_1+2	d_1+12	6.0+/-0.8



V - Seal



Dimension Table – Type VA

V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d ₁	d	C	A	B	d ₂	d ₃	B ₁
VA-040	38~43	36	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-045	43~48	40	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-050	48~53	45	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-055	53~58	49	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-060	58~63	54	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-065	63~68	58	5	5.5	9.0	d ₁ +2	d ₁ +15	7.0+/-1.0
VA-070	68~73	63	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-075	73~78	67	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-080	78~83	72	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-085	83~88	76	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-090	88~93	81	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-095	93~98	85	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-100	98~105	90	6	6.8	11.0	d ₁ +3	d ₁ +18	9.0+/-1.2
VA-110	105 ~115	99	7	7.9	12.8	d ₁ +4	d ₁ +21	10.5+/-1.5
VA-120	115~125	108	7	7.9	12.8	d ₁ +4	d ₁ +21	10.5+/-1.5
VA-130	125 ~135	117	7	7.9	12.8	d ₁ +4	d ₁ +21	10.5+/-1.5
VA-140	135~145	126	7	7.9	12.8	d ₁ +4	d ₁ +21	10.5+/-1.5
VA-150	145~155	135	7	7.9	12.8	d ₁ +4	d ₁ +21	10.5+/-1.5
VA-160	155~165	144	8	9	14.5	d ₁ +4	d ₁ +24	12+/-1.8
VA-170	165~175	153	8	9	14.5	d ₁ +4	d ₁ +24	12+/-1.8
VA-180	175~185	162	8	9	14.5	d ₁ +4	d ₁ +24	12+/-1.8
VA-190	185~195	171	8	9	14.5	d ₁ +4	d ₁ +24	12+/-1.8
VA-199	195~210	180	8	9	14.5	d ₁ +4	d ₁ +24	12+/-1.8
VA-200	190~210	180	15	14.3	25	d ₁ +10	d ₁ +45	20+/-4.0
VA-220	210~235	198	15	14.3	25	d ₁ +10	d ₁ +45	20+/-4.0
VA-250	235~265	225	15	14.3	25	d ₁ +10	d ₁ +45	20+/-4.0
VA-275	265~290	247	15	14.3	25	d ₁ +10	d ₁ +45	20+/-4.0
VA-300	290~310	270	15	14.3	25	d ₁ +10	d ₁ +45	20+/-4.0



V - Seal



Dimension Table – Type VA

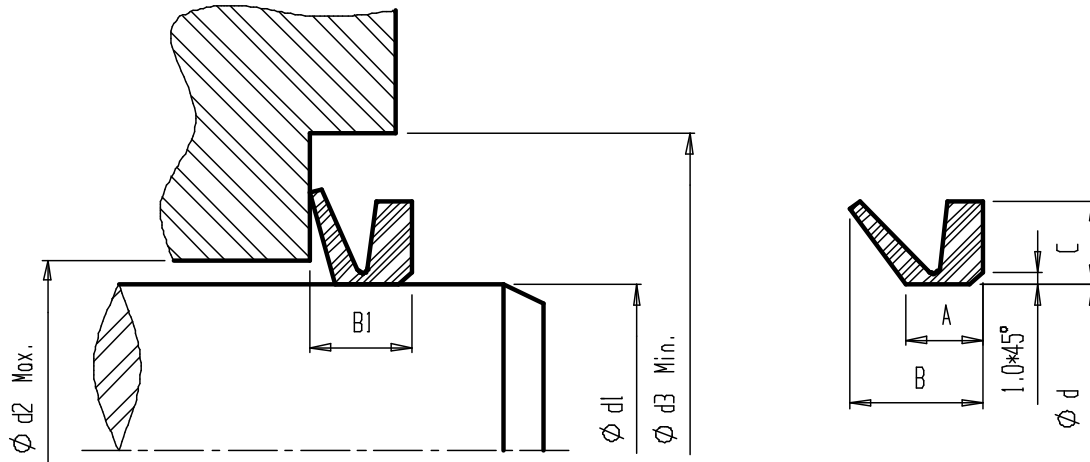
V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d_1	d	C	A	B	d_2	d_3	B_1
VA-325	310~335	292	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-350	335~365	315	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-375	365~390	337	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-400	390~430	360	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-450	430~480	405	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-500	480~530	450	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-550	530~580	495	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-600	580~630	540	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-650	630~665	600	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-700	665~705	630	15	14.3	25	d_1+10	d_1+45	20+/-4.0
VA-725	705~745	670	15	14.3	25	d_1+10	d_1+45	20+/-4.0



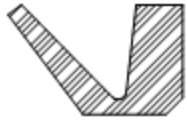
V - Seal



Dimension Table – Type VL



V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d ₁	d	C	A	B	d ₂	d ₃	B ₁
VL-110	105~115	99	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-120	115~125	108	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-130	125~135	117	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-140	135~145	126	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-150	145~155	135	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-160	155~165	144	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-170	165~175	153	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-180	175~185	162	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-190	185~195	171	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-200	195~210	182	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-220	210~233	198	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-250	233~260	225	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-275	260~285	247	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-300	285~310	270	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-325	310~335	292	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-350	335~365	315	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-375	365~385	337	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5
VL-400	385~410	360	6.5	6	10.5	d ₁ +5	d ₁ +20	8+/-1.5

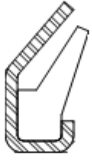


V - Seal



Dimension Table – Type VL

V-SEAL	For Shaft Diameter	Inside Diameter	Height of cross Section	Dimension	Free Width	Max.	Min.	Fitted Width
NO.	d_1	d	C	A	B	d_2	d_3	B_1
VL-425	410~440	382	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$
VL-450	440~475	405	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$
VL-500	475~510	450	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$
VL-525	510~540	472	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$
VL-550	540~575	495	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$
VL-600	575~625	540	6.5	6	10.5	d_1+5	d_1+20	$8+/-1.5$

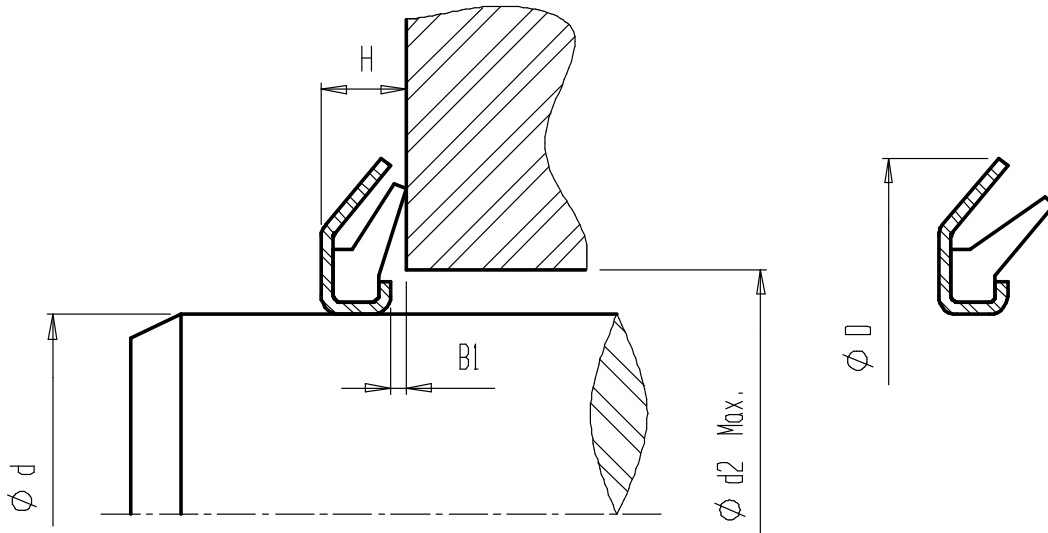


RE Seal

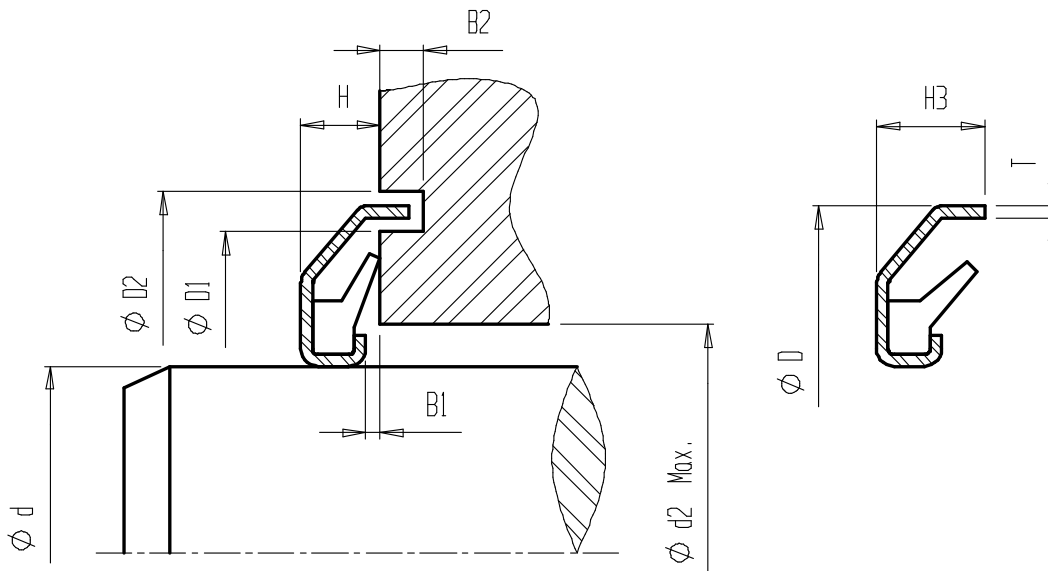


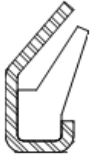
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Dimension Table - RE



Dimension Table – RE1



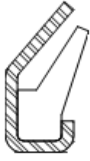


RE Seal



Dimension Table – RE & RE1

Number		For shaft Diameter	Outside Diameter (ϕD)		Fitted Width	Clearance	Case Thickness	MAX.
RE	RE1	ϕd	RE	RE1	H	B1	T	$\phi d 2$
RE-10	RE1-10	10	24	26	3.5	1.0	0.5	15
RE-11	RE1-11	11	26	28	3.5	1.0	0.5	17
RE-12	RE1-12	12	26	28	3.5	1.0	0.5	17
RE-14	RE1-14	14	30	32	4.0	1.0	0.5	21
RE-15	RE1-15	15	30	32	4.0	1.0	0.5	21
RE-16	RE1-16	16	32	34	4.0	1.0	0.5	23
RE-17	RE1-17	17	32	34	4.0	1.0	0.5	23
RE-18	RE1-18	18	33	35	4.0	1.0	0.5	24
RE-20	RE1-20	20	35	37	4.0	1.0	0.5	26
RE-22	RE1-22	22	40	42	4.0	1.0	0.5	31
RE-24	RE1-24	24	40	42	4.0	1.0	0.5	31
RE-25	RE1-25	25	40	42	4.0	1.0	0.5	31
RE-26	RE1-26	26	40	42	4.0	1.0	0.5	31
RE-28	RE1-28	28	43	45	4.0	1.0	0.5	34
RE-30	RE1-30	30	47	48	4.5	1.0	0.5	37
RE-32	RE1-32	32	49	50	4.5	1.0	0.5	39
RE-35	RE1-35	35	52	53	4.5	1.0	0.5	42
RE-38	RE1-38	38	55	56	4.5	1.0	0.5	45
RE-40	RE1-40	40	57	58	4.5	1.0	0.5	47
RE-41	RE1-41	41	57	59	4.5	1.0	0.5	48
RE-42	RE1-42	42	59	61	4.5	1.0	0.5	49
RE-45	RE1-45	45	62	63	4.5	1.0	0.5	52
RE-48	RE1-48	48	65	67	4.5	1.0	0.5	55
RE-50	RE1-50	50	70	72	5.5	1.0	0.8	58
RE-52	RE1-52	52	72	74	5.5	1.0	0.8	60
RE-55	RE1-55	55	75	77	5.5	1.0	0.8	63
RE-58	RE1-58	58	78	80	5.5	1.0	0.8	66



RE Seal



Dimension Table – RE & RE1

Number		For shaft Diameter	Outside Diameter (ϕD)		Fitted Width	Clearance	Case Thickness	MAX.
RE	RE1	ϕd	RE	RE1	H	B1	T	$\phi d 2$
RE-60	RE1-60	60	80	82	5.5	1.0	0.8	68
RE-62	RE1-62	62	82	84	5.5	1.0	0.8	70
RE-65	RE1-65	65	85	87	5.5	1.0	0.8	73
RE-68	RE1-68	68	88	90	5.5	1.0	0.8	76
RE-70	RE1-70	70	90	92	5.5	1.0	0.8	78
RE-72	RE1-72	72	92	93	5.5	1.0	0.8	80
RE-75	RE1-75	75	95	97	5.5	1.0	0.8	83
RE-78	RE1-78	78	98	100	5.5	1.0	0.8	86
RE-80	RE1-80	80	100	102	5.5	1.0	0.8	88
RE-85	RE1-85	85	105	107	5.5	1.0	0.8	93
RE-90	RE1-90	90	110	112	5.5	1.0	0.8	98
RE-95	RE1-95	95	115	117	5.5	1.0	0.8	103
RE-100	RE1-100	100	120	122	5.5	1.0	0.8	108
RE-105	RE1-105	105	125	127	5.5	1.0	0.8	113
RE-135	RE1-135	135	159	161	6.5	1.0	0.8	145
RE-225	RE1-225	225	250	252	7.5	1.0	1.0	235



Shaft & Bore of Condition



Bore to recommended surface finish(V-rings, RE, RE1):

Surface roughness ($\mu\text{m Ra}$)	Speed (m/s)	Media
0.40 ~ 0.80	> 10	Oil, Water, Scale, Fiber
0.80 ~ 1.60	5 ~ 10	Oil splash, Grease, Water splash
1.60 ~ 2.00	1 ~ 5	Grease, Dust, Water splash, Scale
2.00 ~ 2.50	< 1	Grease, Dust

The surface roughness shall not be smaller than $0.05 \mu\text{m Ra}$.

Shaft (V-rings):

Surface roughness:

We recommend the shaft surface roughness not greater than $6.3 \mu\text{m Ra}$. For sealing fluids and fine particle, we recommend shaft surface roughness not greater than $3.2 \mu\text{m Ra}$.

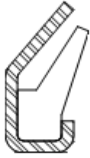
Shaft (RE, RE1):

Surface roughness:

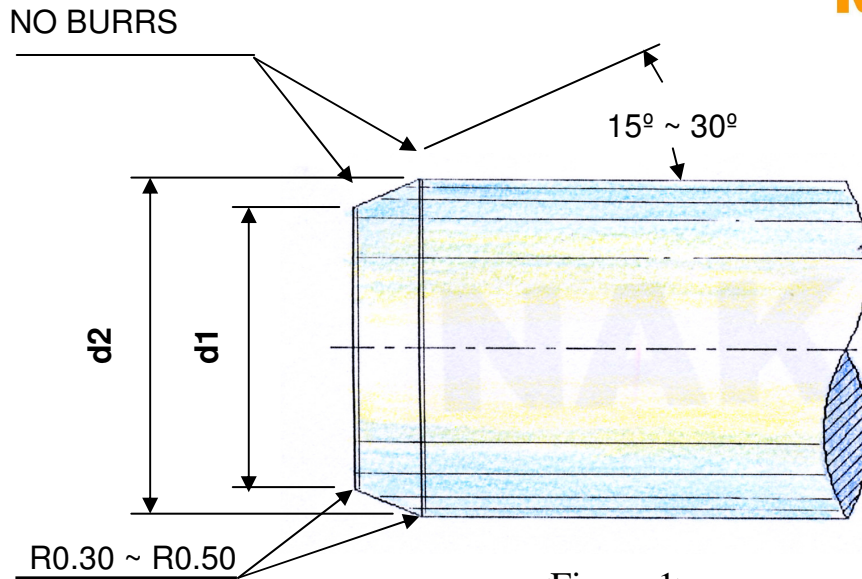
We recommend the shaft surface roughness not greater than $4.0 \mu\text{m Ra}$. In the area of the contact surface, any rifling marks are not permitted.

Chamfer:

Chamfer design can guide seal lip to be installed on the proper position. We recommend the chamfer angle is 15° to 30° (Figure 1). Burrs on the chamfer is not allowed. The recommended size for chamfer is shown as Table 1.



Shaft & Bore of Condition



<Figure 1>

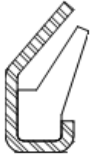
Unit: mm

Dimension	d2-d1	Dimension	d2-d1
≤ 10.00	1.5	50.01 ~ 70.00	4.0
10.01 ~ 20.00	2.0	70.01 ~ 95.00	4.5
20.01 ~ 30.00	2.5	95.01 ~ 130.00	5.5
30.01 ~ 40.00	3.0	130.01 ~ 240.00	7.0
40.01 ~ 50.00	3.5	240.01 ~ 500.00	11.0

<Table 1> Recommended size for chamfer

1. Tolerance:

Shafts shall have a diameter tolerance not greater than h9.



Installation

