

## Nomenclature:

### Example:

52100 steel wide inner ring set screws spherical	Pillow block cast iron	Normal duty 1-inch Bore	Nickel plated	With end cap: 1 closed cap and 1 open cap
<b>UC</b>	<b>P</b>	<b>205-16</b>	<b>NP</b>	<b>ECO</b>
Bearing inserts model code (Table 1)	Housings model code (Table 2)	Series/Bore size (Table 3)	Special housings code (Table 4)	Supplementary code (Table 5)

Table 1 Bearing inserts model code

Model Code	Model Code Details
UC	With set screws, Wide inner ring
UK	Tapered bore with adapter sleeve
HC	With eccentric locking collar, Wide inner ring
NC	With concentric locking collar, Wide inner ring
SER	With set screws, Cylindrical O.D, Wide inner ring, Snap ring
SB	With set screws, Narrow inner ring
SA	With eccentric locking collar, Narrow inner ring
CSB	With set screws, Cylindrical O.D, Narrow inner ring
CSA	With eccentric locking collar, Narrow inner ring
SUC	With set screws, Wide inner ring, Stainless steel series
SHC	With eccentric locking collar, Wide inner ring, Stainless steel series
SSB	With set screws, Narrow inner ring, Stainless steel series
SSA	With eccentric locking collar, Narrow inner ring, Stainless steel series
SSER	With set screws, Cylindrical O.D, Wide inner ring, Snap ring, Stainless steel series
ZUC	With set screws, Zinc chromate plated series
ZHC	With eccentric locking collar, Zinc chromate plated series
ZSB	With set screws, Narrow inner ring, Zinc chromate plated series
ZSA	With eccentric locking collar, Narrow inner ring, Zinc chromate plated series
ZSER	With set screws, Cylindrical O.D, Lubricating mechanism, Snap ring, Zinc chromate plated series
BUC	With set screws, Wide inner ring, Black oxide series
BHC	With eccentric locking collar, Wide inner ring, Black oxide series
BSER	With set screws, Cylindrical O.D, Wide inner ring, Snap ring, Black oxide series

Table 3 Series /Bore size

Code	Details
000	Extra light duty
200	Normal duty
X00	Medium duty
300	Heavy duty

Table 4 Special housings code

Code	Details
NP	Nickel plated housing
TP	Thermoplastic housing
H4	Ductile iron housing

Table 5 Supplementary code

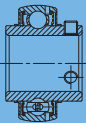
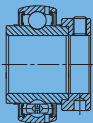

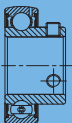
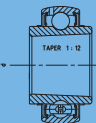
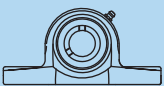


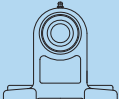
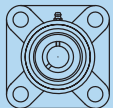





Item	Code	Details
Heat resistance and cold resistance	HT	Heat resistance
	CT	Cold resistance
Lubrication method	—	Non-relubricatable type
	D1	Relubricatable type
End cap	ECC	2 closed cap
	ECO	1 closed cap and 1 open cap

Table 2 Housings model code

Model Code	Model Code Details
P	Pillow Block, Cast iron
PE	Pillow Block, Enhancement type, Cast iron
PL	Pillow Block, Low shaft height, Cast iron
LP	Pillow Block, Cast iron, Light Duty
PH	Pillow Block, High shaft height, Cast iron
PX	Pillow Block, Medium duty, Cast iron
P300	Pillow Block, Heavy duty, Cast iron
PP	Pillow Block, Pressed steel
RPP	Pillow Block, Pressed steel, Rubber cushioned
PA	Tapped Base, Pillow Block, Cast iron
PW	Tapped Base, Pillow Block, Cast iron
PG	Tapped Base, Pillow Block, Cast iron
TB	Tapped Base, Pillow Block, Cast iron
F	4-Bolt Flange, Cast iron
FX	4-Bolt Flange, Medium duty, Cast iron
F300	4-Bolt Flange, Heavy duty, Cast iron
FS	4-Bolt Flange, Cast iron
FC	4-Bolt Flange, Cast iron
FCX	4-Bolt Flange, Medium duty, Cast iron
FL	2-Bolt Flange, Cast iron
FLX	2-Bolt Flange, Medium duty, Cast iron
FL300	2-Bolt Flange, Heavy duty, Cast iron
FLU	2-Bolt Flange, Cast iron
LF	2-Bolt Flange, Light duty, Cast iron
FD	2-Bolt Flange, Light duty, Cast iron
FW	2-Bolt Flange, Light duty, Cast iron
PFL	2-Bolt Flange, Pressed steel
FB	3-Bolt Flange, Bracket, Cast iron
FCT	3-Bolt Flange, Ductile iron
PF	3-Bolt Flange, Pressed steel
PFT	3-Bolt Flange, Pressed steel
C	Cartridge, Cast iron
CX	Cartridge, Medium duty, Cast iron
C300	Cartridge, Heavy duty, Cast iron
BR	Cartridge, Rubber
RCSM	Cartridge, Rubber
T	Take-Up, Cast iron
TX	Take-Up, Medium duty, Cast iron
HA	Hanger, Cast iron
SP	Pillow Block, Stainless steel
SF	4-Bolt Flange, Stainless steel
SFL	2-Bolt Flange, Stainless steel
ST	Take-Up, Stainless steel
SFB	3-Bolt Flange Bracket, Stainless steel
SHB	Hanger, Stainless steel

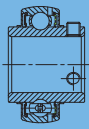
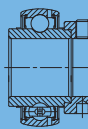


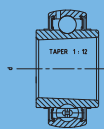




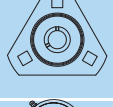
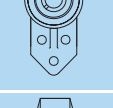

# Bearing Inserts and Housings Matching Table

Table 6

<div> <div>Bearing Inserts</div> <div>Housings</div> </div>						
		UC	HC	SA	SB	UK
	PE(P)200	UCPE(P)200	HCPE(P)200	SAPE(P)200	SBPE(P)200	UKPE(P)200
	P200	UCP200	HCP200	SAP200	SBP200	UKP200
	P300	UCP300	HCP300			UKP300
	PL200	UCPL200	HCPL200	SAPL200	SBPL200	UKPL200
	LP200			SALP200	SBLP200	
	PX00	UCPX00				UKPX00
	PP200			SAPP200	SBPP200	
	PA200	UCPA200				UKPA200
	PW200	UCPW200				UKPW200
	PG200	UCPG200				UKPG200
	PH200	UCPH200	HCPH200			UKPH200
	F200	UCF200	HCF200	SAF200	SBF200	UKF200
	F300	UCF300	HCF300			UKF300
	FX00	UCFX00				UKFX00
	FS200	UCFS200	HCFS200			UKFS200
	FS300	UCFS300	HCFS300			UKFS300
	FL(FT)200	UCFL(FT)200	HCFL(FT)200	SAFL(FT)200	SBFL(FT)200	UKFL(FT)200
	FLU200		HCFLU200			
	FLX00	UCFLX00				
	FL300	UCFL300	HCFL300			UKFL300
	LF200			SALF200	SBLF200	
	FD200			SAFD200	SBFD200	
	FW200			SAFW200	SBFW200	
	PFL200			SAPFL200	SBPFL200	
	LF200-H4			SALF200-H4	SBLF200-H4	

## Bearing Inserts and Housings Matching Table

Table 6

<div> <div>Bearing Inserts</div> <div>Housings</div> </div>						
		UC	HC	SA	SB	UK
	C200	UCC200	HCC200			UKC200
	C300	UCC300				UKC300
	CX00	UCCX00				UKCX00
	T200	UCT200	HCT200			UKT200
	T300	UCT300	HCT300			UKT300
	TX00	UCTX00				UKTX00
	FCT200			SAFCT200	SBFCT200	
	PF200			SAPF200	SBPF200	
	PFT200			SAPFT200	SBPFT200	
	FB200	UCFB200	HCFB200			UKFB200
	HA200	UCHA200				

Note:1) Stainless steel products available and design adjusted accordingly.

2) Please contact us for more models and information.

## Materials of Bearing Inserts

HI-SUN uses the highest quality steel approved by world famous bearing manufacturers.

As per the customer's application and design requirements, HI-SUN can offer products in chrome steel (ASTM 52100) / stainless steel (AISI440C).

Table 7

Material No.		Analysis (%)						
		C	Si	Mn	Cr	Mo	P	S
GB/T	GCr15	0.95-1.05	0.15-0.35	0.25-0.45	1.40-1.65	≤0.08	≤0.025	≤0.025
DIN	100Cr6	0.95-1.05	0.15-0.35	0.25-0.45	1.40-1.65		≤0.030	≤0.025
ASTM	52100	0.98-1.10	0.15-0.35	0.25-0.45	1.30-1.60	≤0.10	≤0.025	≤0.025
JIS	SUJ2	0.95-1.10	0.15-0.35	≤0.50	1.30-1.60		≤0.025	≤0.025

Table 8

Material No.		Analysis (%)						
		C	Si	Mn	Cr	Mo	P	S
AISI	440C	0.95-1.20	≤1.00	≤1.00	16.0-18.0	≤0.75	≤0.04	≤0.03
GB/T	9Cr18	0.90-1.00	≤0.80	≤0.80	17.0-19.0	≤0.75	≤0.035	≤0.030

## Materials of Housings

HI-SUN's housings are made of high strength Cast Iron(HT200) and Ductile Iron (QT500-7). Ductile Iron is approximately 2.0 times stronger (tensile) than gray Iron and also offers the benefit of reduced flex memory. Cast steel housings are generally the most effective solution for high impact applications.

For highly corrosion-resitant applications, please contact us.

Table 9 Materials comparison table

Cast Iron HT200	GB	ISO	AISI	JIS	DIN
	HT200	200	NO.30	FC200	GG20
Ductile Iron QT500-7	GB	ISO	AISI	JIS	DIN
	QT500-7	500-7	70-50-05	FCD500	GGG50
Stainless Steel 304	GB	ISO	AISI	JIS	DIN
	0Cr18Ni9	11	304	SUS304	X5CrNi189

Table 10 Chemical & Mechanical properties(Cast Iron)

Material No.	Reference Analysis (%)					
	C	Si	Mn	P	S	others
HT200	3.1-3.5	1.8-2.1	0.7-0.9	≤0.15	≤0.12	—
	Yield strength (Mpa)	Tensile strength (Mpa)	Extensibility (%)	—		
	—	200	—	—		

Table 11 Chemical & Mechanical properties(Ductile Iron)

Material No.	Reference Analysis (%)							
	C	Si	Mn	P	S	Mg	RE	others
500-7	3.6-3.8	2.5-2.9	<0.6	<0.08	<0.025	0.03-0.05	0.03-0.05	—
	Yield strength (Mpa)	Tensile strength (Mpa)	Extensibility (%)	—				
	320	500	7	—				



## Tolerances for Bearing Inserts

## 1. Tolerances for inner rings

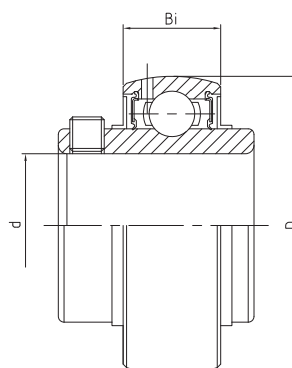


Table 12 Tolerances for inner rings of bearing inserts with cylindrical bores

Unit: 0.001mm (0.0001 in.)

Nominal Bore Diameter d				Cylindrical Bore					Radial Run-Out (max.)
				Bore Diameter			Width		
Over		Including		"d"	Deviations	"V"	Bi Deviations		
mm	in.	mm	in.	High	Low	Max	High	Low	
10	0.03937	18	0.7087	+15 (+6)	0	10 (4)	0	-120 (-47)	10 (4)
18	0.7087	31.75	1.25	+18 (+7)	0	12 (5)	0	-120 (-47)	13 (5)
31.75	1.25	50.8	2	+21 (+8)	0	14 (5.5)	0	-120 (-47)	15 (6)
50.8	2	80	3.1496	+24 (+9)	0	16 (6)	0	-150 (-59)	20 (8)
80	3.1496	120	4.7244	+28 (+11)	0	19 (7.5)	0	-200 (-79)	25 (10)

Note: 1) "d"= Single plane means bore diameter deviation

2) "V"= Bore diameter variation in a single radial plane

## 2. Tolerances for outer rings

Table 13 Tolerances for outer rings

Unit: 0.001mm (0.0001 in.)

Nominal Bore Diameter				D <sub>m</sub> Deviations		Radial Run-Out (max.)
Over		Including				
mm	in.	mm	in.	High	Low	
30	1.1811	50	1.9685	0	-10 (-4)	20 (8)
50	1.9685	80	3.1496	0	-13 (-5)	25 (10)
80	3.1496	120	4.7244	0	-15 (-6)	35 (14)
120	4.7244	150	5.9055	0	-18 (-7)	40 (16)
150	5.9055	180	7.0866	0	-25 (-10)	45 (18)
180	7.0866	250	9.8425	0	-30 (-12)	50 (20)
250	9.8425	315	12.402	0	-35 (-14)	60 (24)

Note: 1) D<sub>m</sub> is defined as arithmetical mean of the largest and smallest diameter obtained by two point measurements.2) The low deviation of outer diameter D<sub>m</sub> does not apply within the distance of 1/4 the width of outer ring from the side.

## Internal Clearances

The radial internal clearances for bearing inserts in accordance with ISO 5753:1991. The C3 clearance is generally as an industry standard; The radial internal clearances indicated in table 15.

For high temperature applications, C5 clearance recommended.

For the bearings inserts with tapered bores , the radial internal clearances indicated in table 15.

Table 14 The radial internal clearances for the bearings inserts with cylindrical bores Unit:  $\mu\text{m}$  / 0.0001in.

Bore Diameter				CN				Standard/C3				C4				C5			
Over		Including		min		max		min		max		min		max		min		max	
mm	in.	mm	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.
10	0.3937	18	0.7087	3	1	18	7	11	4	25	10	18	7	33	13	25	10	45	18
18	0.7087	24	0.9449	5	2	20	8	13	5	28	11	20	8	36	14	28	11	48	19
24	0.9449	30	1.1811	5	2	20	8	13	5	28	11	23	9	41	16	30	12	53	21
30	1.1811	40	1.5748	6	2	20	8	15	6	33	13	28	11	46	18	40	16	54	25
40	1.5748	50	1.9685	6	2	23	9	18	7	36	14	30	12	51	20	45	18	73	29
50	1.9685	65	2.5591	8	3	28	11	23	9	43	17	38	15	61	24	55	22	90	35
65	2.5591	80	3.1496	10	4	30	12	25	10	51	20	46	18	71	28	65	26	105	41
80	3.1496	100	3.9370	12	5	36	14	30	12	58	23	53	21	84	33	75	30	120	47
100	3.9370	120	4.7244	15	6	41	16	36	14	66	26	61	24	97	38	90	35	140	55
120	4.7244	140	5.5118	18	7	48	19	41	16	81	32	71	28	114	45	105	41	160	63

Table 15 The radial internal clearances for the bearings inserts with tapered bores Unit:  $\mu\text{m}$  / 0.0001in.

Bore Diameter				CN				C3				Standard/C4				C5			
Over		Including		min		max		min		max		min		max		min		max	
mm	in.	mm	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.	$\mu\text{m}$	in.
24	0.9449	30	1.1811	5	2	20	8	13	5	28	11	23	9	41	16	30	12	53	21
30	1.1811	40	1.5748	6	2	20	8	15	6	33	13	28	11	46	18	40	16	54	25
40	1.5748	50	1.9685	6	2	23	9	18	7	36	14	30	12	51	20	45	18	73	29
50	1.9685	65	2.5591	8	3	28	11	23	9	43	17	38	15	61	24	55	22	90	35
65	2.5591	80	3.1496	10	4	30	12	25	10	51	20	46	18	71	28	65	26	105	41
80	3.1496	100	3.9370	12	5	36	14	30	12	58	23	53	21	84	33	75	30	120	47
100	3.9370	120	4.7244	15	6	41	16	36	14	66	26	61	24	97	38	90	35	140	55
120	4.7244	140	5.5118	18	7	48	19	41	16	81	32	71	28	114	45	105	41	160	63

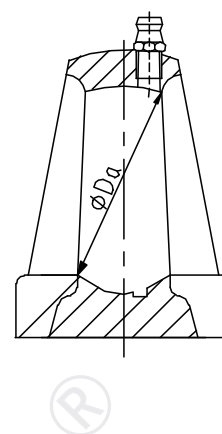
## Tolerances for Housings

### 1. Tolerances for spherical inner diameter of housings and resultant fits

Table 16

Unit = 0.001 mm (0.0001 in.)

Nominal Spherical Inner Diameter				H7		J7		K7	
Da				Dam		Dam		Dam	
Over		incl.		Deviations		Deviations		Deviations	
mm	in.	mm	in.	high	low	high	low	high	low
30	1.1811	50	1.9685	+25 (+10)	0	+14 (+6)	-11 (-4)	+7 (+3)	-18 (-7)
50	1.9685	80	3.1496	+30 (+12)	0	+18 (+7)	-12 (-5)	+9 (+4)	-21 (-8)
80	3.1496	120	4.7244	+35 (+14)	0	+22 (+9)	-13 (-5)	+10 (+4)	-25 (-10)
120	4.7244	150	5.9055	+40 (+16)	0	+26 (+10)	-14 (-6)	+12 (+5)	-28 (-11)
150	5.9055	180	7.0866	+40 (+16)	0	+26 (+10)	-14 (-6)	+12 (+5)	-28 (-11)
180	7.0866	250	9.8425	+46 (+18)	0	+30 (+12)	-16 (-6)	+13 (+5)	-33 (-13)
250	9.8425	315	12.4016	+52 (+20)	0	+36 (+14)	-16 (-6)	+16 (+6)	-36 (-14)



Note: 1) Dam = (Dam.max+Dam.min)/2.

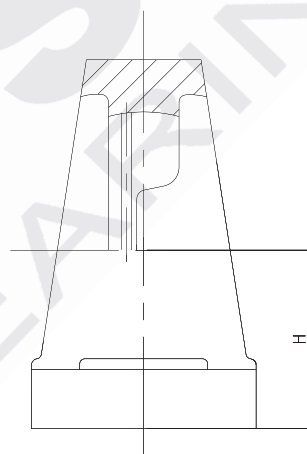
2) HI-SUN's standard clearance fit (J7). However, for special applications, HI-SUN can provide clearance fit (H7) or substantial interference fit (K7).

### 2. Tolerances for Pillow Block Housings

Table 17

Unit: inch(mm)

Housings No.		Tolerances of H
P,PL,LP,PE,PH PA,TB	PX00	
203	—	±0.0059 (±0.15)
204	—	
205	X05	
206	X06	
207	X07	
208	X08	
209	X09	
210	X10	
211	X11	±0.0079 (±0.20)
212	X12	
213	X13	
214	X14	
215	X15	
216	X16	
217	X17	
218	X18	
—	—	±0.0118 (±0.30)
—	X20	

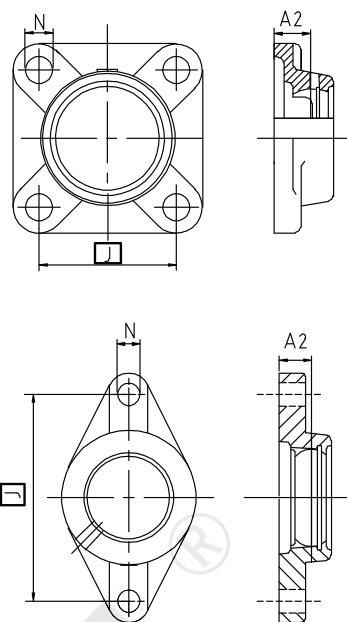


## 3. Tolerances for Flange Unit Housings

Table 18

Unit: inch(mm)

Housing Sizes	Casted Tolerance of J	Machined Tolerance of J
F,FL,FS,FLU,LF FD,FW,FLX.FCT		
203	±0.0236 (±0.6)	±0.0197 (±0.5)
204		
205		
206		
207		
208		
209		
210		
211	±0.0315 (±0.8)	
212		
213		
214		
215		
216		
217		
218		



## 4. Tolerances for Flange Cartridge Unit Housings

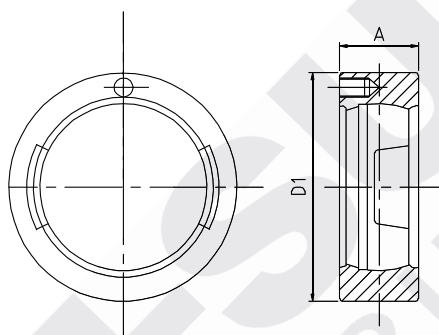


Table 19 Tolerances for Flange Cartridge Unit Housings

Unit: inch(mm)

Tolerance of D1						Radial Runout of Outside Surface	Tolerance of A
Housings No.		C200		CX00			
		high	low	high	low	max	—
C204	—	0	-0.0012 (-0.03)		—	0.0079 (0.2)	±0.0079 (±0.2)
C205	CX05	0		0	-0.0014 (-0.035)		
C206	CX06	0	0				
C207	CX07	0	0				
C208	CX08	0	0				
C209	CX09	0	0				
C210	CX10	0	0	-0.0016 (-0.040)	0.0118 (0.3)	±0.0118 (±0.3)	
C211	CX11	0	0				
C212	CX12	0	0				
C213	—	0		—	—		

## 5. Tolerances for machined back (piloted) Flange Unit Housings

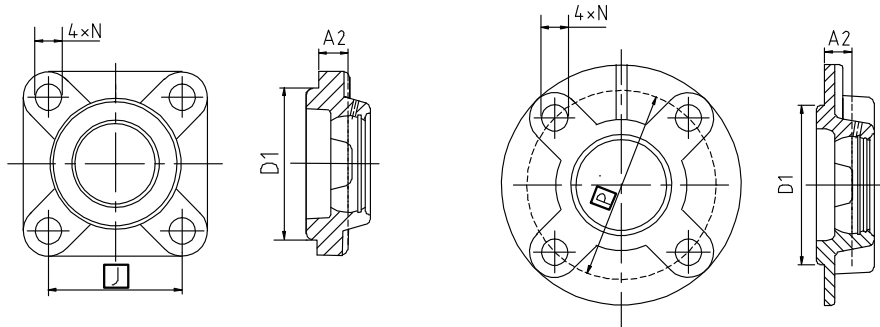


Table 20

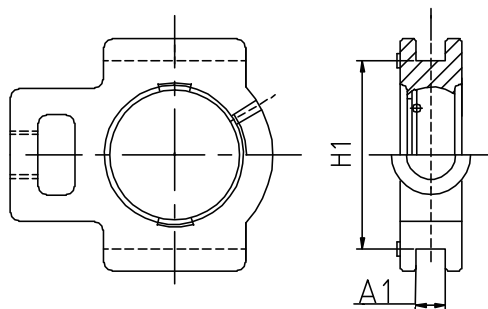
Unit: inch(mm)

Housings No.	Tolerance of A2	Tolerance of D1		Radial Runout of Spigot Joint	Tolerance of J
	—	high	low	max	max
FC203-FC206	±0.0196 (±0.5)	0	-0.0018 (-0.046)	0.0079 (0.2)	0.0280 (0.7)
FCX05-FCX06					
FS305					
FC207-FC210					
FCX07-FCX10					
FS306-FS308	±0.0315 (±0.8)	0	-0.0021 (-0.054)	0.0118 (0.3)	0.0394 (1.0)
FS309-FS310					
FC211-FC217					
FCX11-FCX17					
FS311-FS313					
FC218		0	-0.0025 (-0.063)	0.0160 (0.4)	
FCX18-FCX20					
FS314-FS318					
FS319					
FS320-FS322					
FS324-FS328		0	-0.0028 (-0.072)	-0.0031 (-0.081)	
	0	-0.0035 (-0.089)			

Note: 1) J = bolt holes centerline dimensions.

2) A2 = bearing centerline distance from mounting surface.

3) D1 = outside diameter of spigot joint.



## 6. Tolerances for Take-Up Housings

Table 21

Unit: inch(mm)

Housings No.	Tolerance of A1	Tolerance of H1	Tolerance of Parallelism Between Both Grooves(max)
T204	—		
T205	TX05		
T206	TX06	+0.0079 0 (+0.2) 0	0 -0.0197 (0) (-0.5)
T207	TX07		0.0157 (0.48)
T208	TX08		
T209	TX09		
T210	TX10		
T211	TX11		
T212	TX12		
T213	TX13	+0.0118 0 (+0.3) 0	0 -0.0315 (0) (-0.8)
T214	TX14		0.0236 (0.6)
T215	TX15		
T216	TX16		
T217	TX17		

## 7. Take-Up Housings slot widths - "A1" dimensions

Table 22

Unit: inch

Housings No.	HI-SUN Standard A1	A1		
		Option	Option	Option
T204	17/32	15/32	—	5/16
T205	17/32	15/32	—	5/16
T206	17/32	15/32	—	5/16
T207	17/32	15/32	—	5/16
T208	11/16	5/8	—	—
T209	11/16	5/8	—	—
T210	11/16	5/8	—	—
T211	0.866	17/16	11/16	—
T212	0.866	17/16	11/16	—
T213	17/16	—	—	—
T214	17/16	—	—	—
T215	17/16	—	—	—
T216	17/16	—	—	—
T217	17/16	—	—	—

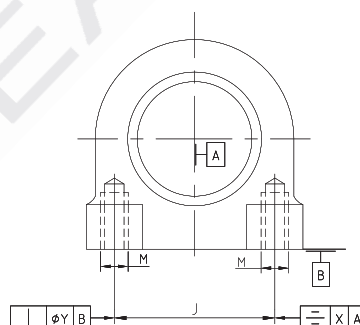
## 8. Tolerances for Tapped Base Housings

Inch thread shall comply with ISO 5864-1993. 2B tolerances

Table 23

Unit: inch(mm)

Housings No.	Tolerance of X	Tolerance of Y
PA, TB	max	max
203		
204		0.0060 (0.15)
205		
206	0.0197 (0.50)	
207		
208		0.0079 (0.75)
209		
210		
211	0.0295 (0.75)	
212		



## 9. Tolerances for standard castings

Table 24

Unit: inch(mm)

Normal Dimensions	Up to 3.4 inch	3.4 up to 7.87 inch	7.87 up to 15.65 inch	15.65 up to 31.50 inch
Tolerances	±0.039	±0.059	±0.098	±0.118
	(±1.0)	(±1.5)	(±2.5)	(±3.0)

Table 25 Tolerances for all machined dimensions other than specified in this catalog

Unit: inch(mm)

Normal Dimensions	Up to 0.197 inch	0.197 up to 0.394 inch	0.394 up to 0.787 inch	0.787 up to 1.181 inch	1.181 up to 1.575 inch
Tolerances	±0.039	±0.059	±0.079	±0.118	±0.157
	(±1.0)	(±1.5)	(±2.5)	(±3.0)	(±4.0)

Table 26 Machined tolerances for all machined tolerances not otherwise specified in this catalog

Unit: inch(mm)

Normal Dimensions		Dimension Tolerances
Over	Incl.	
0.1575	0.6299	±0.0118
(4)	(16)	(±0.3)
0.6299	2.4803	±0.0159
(16)	(63)	(±0.4)
2.4803	9.8425	±0.0197
(63)	(250)	(±0.5)

## 10. Tolerances for pressed steel units

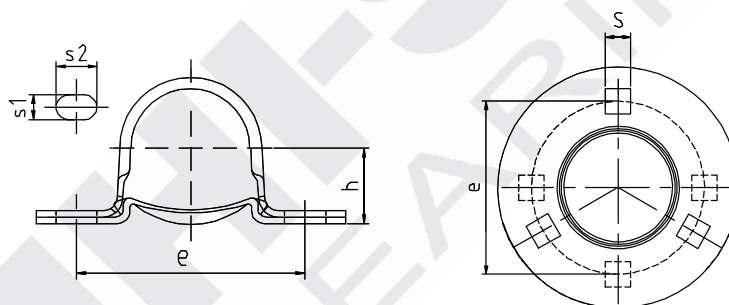


Table 27 Tolerances for pressed steel housings

Unit: inch(mm)

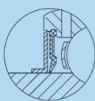






Housing No.	e	s	h
PP203-PP207	±0.0118 (±0.3)	±0.0079 (±0.2)	±0.010 (±0.026)
PF203-PF212			—
PFT203-PFT212			—
PFL203-PFL207			—



## Seal Designs

HI-SUN offers a variety of seal designs according to the end user's unique application and design requirements.

Table 28

Sealing Structure	Description
SL-seal 	The inside is NBR rubber sealed ring. The outside is the metal cover, which is fixed on the inner ring. The metal cover can protect the inner rubber sealed ring from the external mechanical damage.
R-seal 	This design enhances dustproofing based on the SL-seal design, it can be applied to most of the conditions.
ZZ-seal 	The double seal of inner and outer layers is made of a single metal plate, This design is used in high temperature applications.
L3-seal 	This design provides excellent dustproofing, and can be applied to the harshest conditions and slowest speeds.
KRR-seal 	This design allows the bearings more space to keep grease, and can effectively reduce the maintenance term.
RST-seal 	This design is made with a single metal plate, which is pasted by NBR rubber inside, and fixed on the outer ring. The metal plate protects the rubber from premature mechanical damage.
P-seal 	This design with inner and outer double carbon steel frames and NBR rubber inside, has better intensity which can prevent the seals from being damaged and extruded in grease filling.

Note:1) In addition, we enhance frame intensity and the structure intensity of seals to greatly improve dustproofing performance of our seals.

## HI-SUN's Bearing Inserts and Seal Features Selection Chart

Table 29


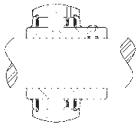
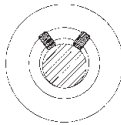

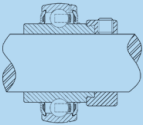
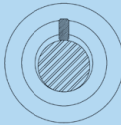

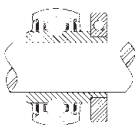
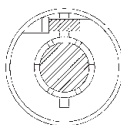
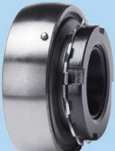
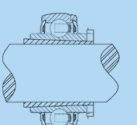
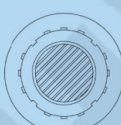
Bearing InsertsType	SL-seal	R-seal	ZZ-seal	L3-seal	KRR-seal	RST-seal	P-seal
UC200	•	•	•	•	•	—	—
UC300	•	•	•	•	•	—	—
UCX00	•	•	•	•	•	—	—
HC200	•	•	•	•	•	—	—
SER200	•	•	•	•	•	—	—
SB200	—	—	—	—	—	•	•
CSB200	—	—	—	—	—	•	•
SA200	—	—	—	—	—	•	•
CSA200	—	—	—	—	—	•	•

Note:1) Corrosion resistant bearing inserts are available, please contact us for more information.

## Shaft Locking Methods

HI-SUN provides four standard methods to lock bearing inserts to the shaft. Depending on the application requirements, one method may yield a better operating result than another. HI-SUN has the ability to deliver high quality solutions for any application.

Table 30

Locking Method	Description	Bearing Type
  	Set Screw Locking is one of the most popular and the least cost of the methods. This type is simple to install and two set screws tighten the bearing to the shaft.	UC
	The clearance fit of the bearing on the shaft, makes installation simple and quick. They are typically used for low to medium speed applications. It may be required that the set screws be re-tightened periodically.	SB
		CSB
		SER
  	The bearing inner ring has an eccentric groove and a mating groove is machined into the collar. Commonly a drift pin and hammer are used to tighten the collar against the mating eccentric of the inner ring, locking the bearing to the shaft. Generally the locking collar is tightened with the direction of shaft rotation. For reversing loads, it is best to use another locking method as torque reversals could loosen the collar.	HC
		SA
		CSA
  	The concentric locking method is a clearance fit of bearing inner ring to the shaft, therefore, easy to install and will not loosen after proper initial tightening. As the cap screw in the split locking collar is tightened, the collar compresses the spline zone of the inner ring to grip or squeeze the shaft. Loosening the concentric collar will loosen the unit and removal is easy.	NC
		NER
  	The adapter locking method provides the most concentric locking fit of the other types simulating the direct mounting of the bearing to the shaft. The adapter mounting allows the highest speed with the lower vibration.	UK

Note:1) Please contact us with requests for specific solutions.

## Bearing Inserts Mounting

When mounting, always clean the shafting and bearing bore. Then, having coated the shaft with a light oil, slide the bearing unit on the shaft to its correct position. It may be necessary to use a soft mallet and/or pipe, on the inner ring only, to reach the correct position. Never pound on, or apply pressure to, the outside ring. Once the bearing unit is in position, precise alignment can be achieved by first fixing the housing in place, then simultaneously rotating and tapping the shaft with a soft mallet. This should be accomplished before any locking collar or set screw is tightened.

When mounting a locking collar bearing, use a spanner wrench or punch to lock the collar in place, always in the direction of shaft rotation, then tighten the screw. Do not use locking collar bearings for bi-directional applications.

When mounting set screw locking bearing inserts, we recommend the torque settings in Table 31.

Table 31 Recommended locking torque of set screws locking and collar locking

Set Screw & Eccentric Locking Collar				Concentric Locking Collar	
Set Screw Size	Recommended Torque			Cap Screw Size	Recommended Torque (Max)
	Key Hex Across Flats	Standard Bearing Inserts (Max)	Stainless Steel (Max)		
( In.)	( In.)	( In.-lbs)	( In.-lbs)	( In.)	( In.-lbs)
1/4-28	1/8	80	60	8-32	60
5/16-24	5/32	156	117	10-24	80
3/8-24	3/16	275	206	1/4-20	160
7/16-20	7/32	428	321	5/16-18	360
1/2-20	1/4	615	—	3/8-16	550

Table 32 Recommended torque of adapter locking in normal load application

Bearing Inserts No.	Recommended Torque (Max)	Bearing Inserts No.	Recommended Torque (Max)	Bearing Inserts No.	Recommended Torque (Max)
	( In.-lbs)		( In.-lbs)		( In.-lbs)
UK205	22	UKX05	29	UK305	29
UK206	29	UKX06	51	UK306	43
UK207	43	UKX07	58	UK307	58
UK208	58	UKX08	72	UK308	80
UK209	58	UKX09	87	UK309	108
UK210	72	UKX10	116	UK310	145
UK211	100	UKX11	152	UK311	181
UK212	145	UKX12	174	UK312	224
UK213	158	UKX13	239	UK313	260
UK215	188	UKX15	282	UK315	369
UK216	230	UKX16	333	UK316	424
UK217	297	UKX17	405	UK317	521
UK218	354	UKX18	462	UK318	593
—	—	UKX20	665	UK319	694

## Grease Fittings

The grease fittings applied by HI-SUN bearing units are classified as A type(straight),B type(type 45°) and C type(type 90°) which are made of brass or steel.Grease fittings types,for HI-SUN standard bearing units are given in Table 33. Multiple grease fitting sizes are available, and are shown in Table 34.

Table 33 Grease fitting types for HI-SUN standard bearing units

Housing No.	Grease Fitting Type and Size
201~209	A Type, 1/4-28UNF
305~307	
X05~X08	
210~215	A Type, 1/8-27NPT
308~312	
X09~X14	
216~218	A Type, 1/8-27NPT
313~328	
X15~X20	

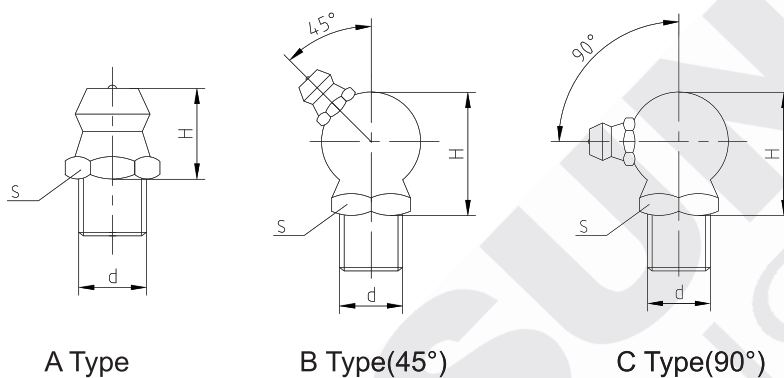


Table 34 Applicable grease fittings size and designations of bearing units

Grease Fitting type	d	H(mm)	S(mm)
A Type	M6×1	9	7
	M8×1	9	10
	M10×1	9.5	11
	1/4-28UNF	9	7
	1/8-27NPT	9.5	11
	G1/4-19	14	14
B Type(45°)	M6×1	15	10
	M8×1	15	10
	1/4-28UNF	15	10
	1/8-27NPT	15	10
C Type(90°)	M6×1	15	10
	M8×1	15	10
	1/4-28UNF	15	10
	1/8-27NPT	14.5	10


## Lubrication

HI-SUN's bearing inserts are filled with #2 Lithium grease during production. The grease has superior waterproofing, antirust, antioxidant, and lubricating properties. It can be used in both high and low temperature with good stability, and long life.

Physical and chemical characteristics are listed below:

Working temperature:  $-4^{\circ}\text{F} \sim +248^{\circ}\text{F}$

Table 35

Testing Items	Typical Data	Test Methods
	2	
Worked cone penetration 0.1mm	281	ASTM D217
Dropping point, $^{\circ}\text{F}$	392	ASTM D565
Oxidation bomb (99.100h.785kPa) pressure drop. kPa	30	ASTM D942
Solid foreign matters.entres/cm2	—	 JIS K2220.5.9
10 $\mu\text{m}$	200	
25 $\mu\text{m}$	100	
75 $\mu\text{m}$	0	
125 $\mu\text{m}$	0	
Low temperature( $-4^{\circ}\text{F}$ ) N.m	—	ASTM D1748
Starting torque	0.21	—
Running torque	0.03	—
Corrosion prevention (126 $^{\circ}\text{F}$ ,48h),grade	1	ASTM D1743

HI-SUN bearing inserts are pre-lubricated with standard grease suitable for a wide variety of applications, speeds, temperatures and environments.

Special grease is readily available. Shown in Table 36 is a small sampling of standard and special grease offered.

Table 36 Grease and operating temperature

Greases No.	Shell Alvania RL2	Shell Alvania RL3	Mobil Polyrex EM	Exxon Unirex N2	Mobil FM 222
Color	Amber	Amber	Blue	Green	White
Thickener	Lithium	Lithium	Polyurea	Lithium-complex	Aluminum-Complex
Base oil	Mineral	Mineral	Mineral	Mineral	Mineral
NLGI number	2	3	2	2	2
Viscosity	98	98	115	115	220
Recommended operating temperature range $^{\circ}\text{F}$	-20 to +250	-10 to +230	-10 to +320	-20 to +300	-10 to +250
Dropping point $^{\circ}\text{F}$	385	385	550	437	500

Note:1) Operating temperature, environment, RPM and load all play a role in selecting the appropriate grease for each application.

## Relubrication Intervals

Under normal operating conditions, the service life of the grease exceeds the service life of the sealed bearing inserts. Relubricatable bearing inserts must be periodically greased to assure long life. The greasing interval depends on the bearing inserts running speed, operating temperatures and ambient conditions. The standard relubrication Intervals recommended in Table 37.

Table 37

d·n Value	Cleanliness	Temperature		Greasing interval
		°C	°F	
≤ 40,000	Clean	-15~65 up to 65~100	+5~150 up to 150~210	2~6 month
> 40,000 ≤ 70,000	Clean	-15~65 up to 65~100	+5~150 up to 150~210	1 month
Any d·n Value	Dirty	up to 65 over 65	up to 150 over 150	1 wk. to 1 month 1 day to 2 wk
Any d·n Value	Very Dirty	Any temp.	Any temp.	1 day to 1 wk
Any d·n Value	Exposed to water splashes	Any temp.	Any temp.	Every day

## Load Ratings

The load ratings shown in Table 38 apply to all HI-SUN bearing inserts made of AISI52100 Steel steel. Load ratings for cylindrical bore UC, HC, SB, CSB, SA, CSA ,UCX and SER series bearing inserts are identical. The load ratings in Table 38 have been calculated per ABMA standard 9-1990 and conform to ISO standard 281.

Table 38 Load ratings

Unit: Lbf

Bearing Inserts No.						Basic Load Rating	
UC	HC	SA/CSA	SB/CSB	UCX	SER	Dynamic (Cr)	Static (Cor)
201S-203S	201S-203S	201-203	201-203	—	—	2160	1000
201-204	201-204	204	204	—	204	2900	1410
205	205	205	205	—	205	3150	1610
206	206	206	206	X05	206	4370	2320
207	207	207	207	X06	207	5770	3150
208	208	208	208	X07	208	7340	3650
209	209	209	209	X08	209	7350	4150
210	210	210	210	X09	210	7880	4650
211	211	211	211	X10	211	9740	5850
212	212	—	—	X11	212	11780	7250
213	213	—	—	X12	—	13980	8000
214	214	—	—	X13	—	14000	8800
215	215	—	—	X14	—	14830	9750
216	216	—	—	X15	—	16280	10500

Note:1) These dynamic load ratings (Cr) are based on an interference shaft fit. ABMA standard 9-1990 recommends that for slip or loose shaft fits, divide the basic dynamic load rating (Cr) by 1.3 to obtain the de-rated value.

## Load Capacities & Life Calculations

The L10 Life is the expected life of bearing inserts based on normal conditions. Factors involving temperatures and ambient conditions, i.e. chemical, moisture and maintenance intervals are not factored into the basic formula. However they must be considered or factored into your selection criteria. To determine the L10 hours of life for bearing inserts use the following:

$$L_{10h} = (C / P)^3 \times 16,667 / n$$

Where:

L10h = Life hours

C = Basic Load Rating (lbf)

P = Equivalent Radial Load (lbf)

n = Speed (RPM)

Simple life/load estimations can be derived from the radial load rating shown on Table 39.

HI-SUN always recommends very generous safety factors for maximum bearing inserts longevity. Additional adjustment may also be required if the bearing insert is directly exposed to heavy contaminants. The seal type will then influence the amount of this additional adjustment. It is assumed that the bearing inserts will be operated within the confines of its published temperature limits, and that it will be relubricated properly.

Note: Caution is advised if in the use of the L10 formula, extremely high or low hours are derived.

## Thrust load

The above calculations assume that there is no consequential thrust load present; therefore, the actual radial load equals the Equivalent Radial load. It is important to note, however, that thrust, or axial force can dramatically affect the life of a mounted ball bearing. It is also significant to note that, outside of ideal testing conditions, and without field experience, many thrust applications are difficult to realistically quantify. Therefore, as thrust exceeds approximately 25% of the basic load rating, or there exists a combination of thrust and speed, please contact us for technical assistance.



Table 39 Radial load ratings

Bearing Inserts No.						Basic Load Rating @33⅓RPM	Radial Load Rating in Pounds at Various RPM Based on 500 Hours Minimum Life										
Normal Duty			Light Duty		Medium Duty UCX												
UC	HC	SER	SA	SB			50	100	200	300	500	900	1200	1500	1800	2400	3600
—	—	—	201	201	—	2040	1780	1415	1120	980	830	680	620	575	540	490	425
—	—	—	201-8	201-8	—												
—	—	—	202	202	—												
—	—	—	202-10	202-10	—												
—	—	—	203	203	—												
201	201	201	—	—	—	2740	2390	1890	1510	1320	1110	910	835	770	725	655	575
201-8	201-8	201-8	—	—	—												
202	202	202	—	—	—												
202-10	202-10	202-10	204-12	204-12	—												
203	203	203	204	204	—												
204-12	204-12	204-12	—	—	—	3010	2625	2085	1650	1450	1210	1000	915	845	800	725	630
204	204	204	—	—	—												
205-14	205-14	205-14	205-14	205-14	—												
205-15	205-15	205-15	205-15	205-15	—												
205	205	205	205	205	—												
206-18	206-18	206-18	206-18	206-18	05-15	4200	3670	2910	2290	2010	1695	1390	1265	1170	1100	990	860
206	206	206	206	206	05												
206-19	206-19	206-19	206-19	206-19	05-16												
206-20	206-20	206-20	206-20	206-20	—												
207-20	207-20	207-20	207-20	207-20	06-18												
207-21	207-21	207-21	207-21	207-21	06-18	5535	4820	3850	3050	2680	2250	1850	1680	1560	1420	1325	1155
207-22	207-22	207-22	207-22	207-22	06-19												
207	207	207	207	207	06-20												
207-23	207-23	207-23	207-23	207-23	—												
208-24	208-24	208-24	208-24	208-24	07-22												
208-25	208-25	208-25	208-25	208-25	07	6375	5560	4410	3490	3040	2550	2100	1895	1755	1655	1505	—
208	208	208	208	208	07-23												
209-26	209-26	209-26	209-26	—	08-24	7110	6210	4915	3910	3400	2880	2355	2150	1990	1875	1700	—
209-27	209-27	209-27	209-27	—	08												
209-28	209-28	209-28	209-28	—	—												
209	209	209	209	—	—												
210-30	210-30	210-30	210-30	—	09-26												
210-31	210-31	210-31	210-31	—	09-27	7400	6465	5140	4075	3560	3000	2460	2240	2075	1970	1740	—
210	210	210	210	—	09-28												
210-32	210-32	210-32	210-32	—	09												
211-32	211-32	211-32	211-32	—	10-30												
211-34	211-34	211-34	211-34	—	10-31												
211-32	211-32	211-32	211-32	—	10	9490	8290	6575	5220	4560	3825	3140	2840	2635	2460	2240	—
211-35	211-35	211-35	211-35	—	10-32												
212-36	212-36	212-36	—	—	11-34												
212	212	212	—	—	11												
212-38	212-38	212-38	—	—	11-35												
212-39	212-39	212-39	—	—	11-36	11,500	10,050	7965	6335	5525	4655	3775	3450	3200	3000	—	—
213-40	213-40	—	—	—	12												
213-40	213-40	—	—	—	12-38												
—	—	—	—	—	12-39												
214-44	—	—	—	—	13-40												
214	—	—	—	—	13-40	13,530	11,820	9450	7480	6480	5520	4540	4110	3820	3510	—	—
215-47	215-47	215-47	—	—	14-44												
215	215	215	—	—	14												
215-48	215-48	215-48	—	—	—												
216	—	—	—	—	15-47												
—	—	—	—	—	15	15,970	13,950	11,070	8160	6470	5650	5150	4840	4490	4200	—	—
—	—	—	—	—	15-48												
218-56	—	—	—	—	17												
218	—	—	—	—	17-55												
—	—	—	—	—	17-56												
—	—	—	—	—	20	29,300	25,600	20,300	16100	14,100	11,900	9770	8870	—	—	—	—
—	—	—	—	—	20-63												
—	—	—	—	—	20-64												
—	—	—	—	—	—												
—	—	—	—	—	—												

## Permissible Speed of Rotation

The permissible speed of rotation of the bearing inserts is connected with the fit between shaft and bearing. It is recommended that, under normal operating conditions, the fit between the bearing and the shaft is h7, the relevant values of permissible speed of rotation are shown in Table 38. Loose fit allowing lower speed is recommended when lighter load is applied, while tighter fit allowing higher speed is recommended when heavier load is applied.

Table 40

Bearing Inserts No.	Limit Speed (r/min)	Bearing Inserts No.	Limit Speed (r/min)
UC HC SA SB UCX CSA CSB SER UK	Grease Lubrication	UC UK	Grease Lubrication
201	4500	305	2800
202	4500	306	2600
203	4500	307	2200
204	4000	308	2000
205	3400	309	1800
206	2800	310	1700
207	2400	311	1400
208	2200	312	1300
209	1900	313	1200
210	1800	314	1100
211	1600	315	1000
212	1500	316	1000
213	1400	317	950
214	1300	318	900
215	1200	319	850
216	1100	320	800
217	1000	—	—
218	950	—	—

## End Caps

Housings designed for snap-on end cap, contain a machined groove in the housing to accommodate a snap-on style polymer end cap. The end cap provides additional protection from the environment and creates a safer working environment for employees maintaining equipment. The snap-on style end cap incorporates an additional lip on the mounting surface for a more rigid fit within the housing and enhanced sealing. The design is more durable than a bolt-on style that uses the grease fitting to secure the cap in place and can be easily knocked off the bearing housings. Closed and open end caps are available.

HI-SUN end caps (see Table 39) :

- In sizes to accommodate from 3/4" (20mm) to 2" (50mm) shaft sizes
- Extended lip on the outer diameter of end cap provides a secure fit and positive sealing
- Polymer end cap, OSHA approved white
- Closed and open end caps available

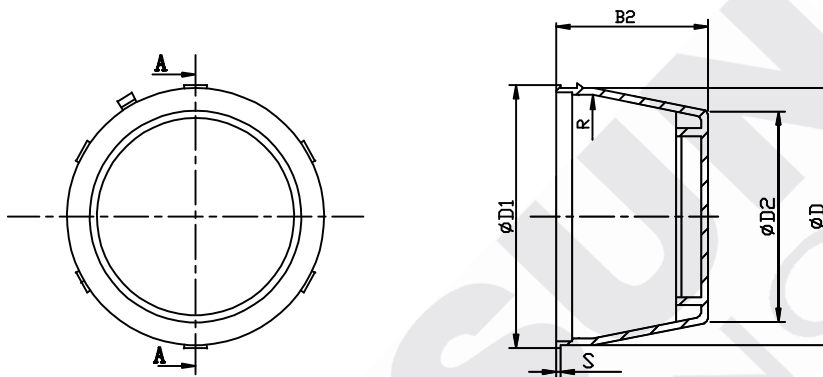


Table 39

Series	Closed End Cap No.	Open End Cap No.	Dimensions	
			in/(mm)	
			D	B2
204	CC-204-TP	OC-204-TP	2.047 (52.00)	1.339 (34.00)
205	CC-205-TP	OC-205-TP	2.362 (60.00)	1.378 (35.00)
206	CC-206-TP	OC-206-TP	2.717 (69.00)	1.378 (35.00)
207	CC-207-TP	OC-207-TP	2.992 (76.00)	1.575 (40.00)
208	CC-208-TP	OC-208-TP	3.385 (86.00)	1.575 (40.00)
209	CC-209-TP	OC-209-TP	3.622 (92.00)	1.575 (40.00)
210	CC-210-TP	OC-210-TP	3.780 (96.00)	1.575 (40.00)