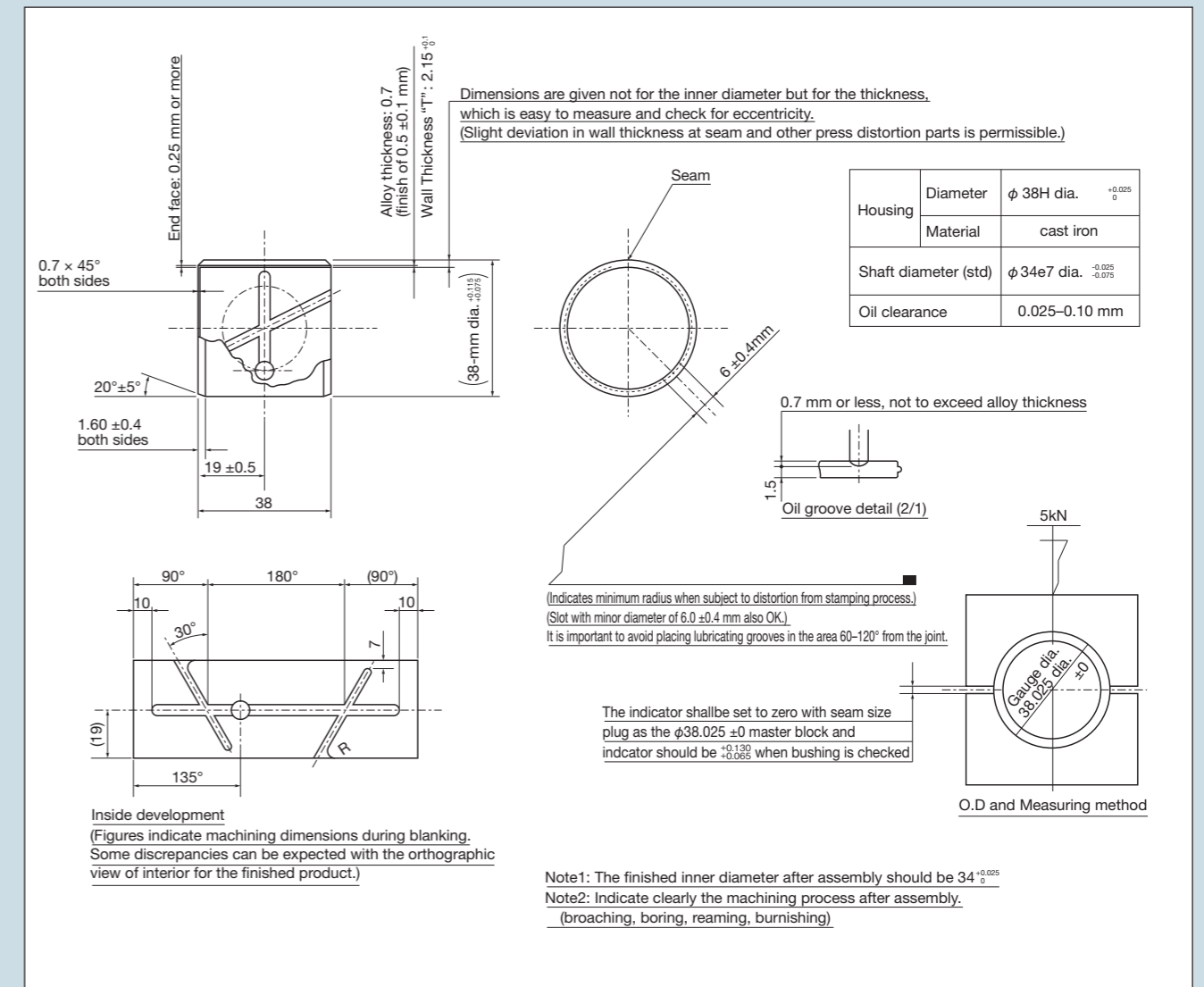# Metal bushing
(lubricated metal)

The use of bimetal or trimetal linings made of bearing alloys on a steel backing provides these lubricated metal bearings with good mechanical strength and makes them suitable for high-speed, high-load applications with proper lubrication.
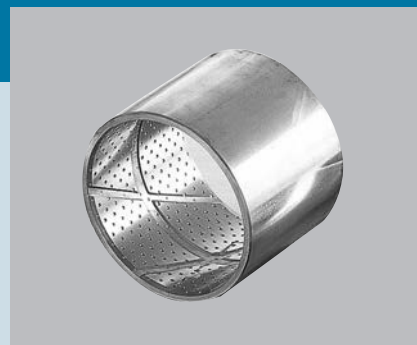
Material properties

Bearing material	Product No.	Equivalent SAE No.	Chemical composition (%)								Characteristics
			Cu	Sn	Pb	Sb	Al	Ni	Si	Graphite	
White metal	W90	11	4	Residual		6					Excellent resistance to seizing, emebeddability, and conformability
Copper alloy	B11	—	Residual	11							Sintered bronze withstands heavy loads.
	LG21X	—	Residual	3	21						Solid lubricant embedded in bronze for excellent boundary lubrication
	L10	792 797	Residual	10	10			<1			Superior impact load characteristics. Excellent wear resistance and corrosion resistance when using hardened axles.
	L23	794 799	Residual	3	23			<1			Suitable for use at high speeds, with more lead than L10 and excellent tribological properties.
	B05BS		Residual	6						Other Bi:0.5	Lead-free bearing materials with excellent resistance to both wear and seizing.
	NB6X		Residual	6						Other Ni:3	Excellent resistance to both corrosion and wear, especially in high heat at heavy surface pressures.
	CX4		Residual	10						Other Bi:0.5	Excellent resistance to fatigue
Aluminum alloy	A20	—	1	20			Residual				Excellent load bearing characteristics
	A17X	—	0.7	12	1.7	0.3	Residual		2.5	Other	Excellent performance non-seizing properties in heavy-duty, high-speed engines
	A66T	—	1	6			Residual		6	Other	Lead-free bearing materials with excellent resistance to both wear and seizing.
	A22E		1	12			Residual				

Typical design

Dimensions are given not for the inner diameter but for the thickness, which is easy to measure and check for eccentricity.
(Slight deviation in wall thickness at seam and other press distortion parts is permissible.)

Seam

Housing	Diameter	ϕ 38H dia.	$^{+0.025}_{0}$
	Material	cast iron	
Shaft diameter (std)		ϕ 34e7 dia.	$^{-0.025}_{-0.075}$
Oil clearance		0.025–0.10 mm	

0.7 mm or less, not to exceed alloy thickness

Oil groove detail (2/1)

Inside development
(Figures indicate machining dimensions during blanking. Some discrepancies can be expected with the orthographic view of interior for the finished product.)

(Indicates minimum radius when subject to distortion from stamping process.)
(Slot with minor diameter of 6.0 ±0.4 mm also OK.)
It is important to avoid placing lubricating grooves in the area 60–120° from the joint.

The indicator shallbe set to zero with seam size plug as the ϕ38.025 ±0 master block and indcator should be $^{+0.130}_{-0.000}$ when bushing is checked

O.D and Measuring method

5kN

Gauge dia. 38.025 dia. ±0

Note1: The finished inner diameter after assembly should be 34 $^{+0.025}_{0}$
Note2: Indicate clearly the machining process after assembly.
 (broaching, boring, reaming, burnishing)

Standard dimensions for metal bushings

Nominal dimensions		Finished dimensions					
Bushing inner diameter	Housing inner diameter	Housing inner diameter H7	Axle diameter f7, e7	Housing inner diameter H7 after assembly	Bushing outer diameter	Bushing length	Thickness (alloy thickness 0.3 mm)
10	**12**	$12^{+0.018}_{0}$	$10_{f7}{}^{-0.013}_{-0.028}$	$10^{+0.015}_{0}$	$12^{+0.068}_{+0.043}$	5. 10. 15	$1.0^{0}_{-0.015}$
12	**14**	$14^{+0.018}_{0}$	$12_{f7}{}^{-0.016}_{-0.034}$	$12^{+0.018}_{0}$	$14^{+0.068}_{+0.043}$	5. 15. 20	
15	**17**	$17^{+0.018}_{0}$	$15^{-0.016}_{-0.034}$	$15^{+0.018}_{0}$	$17^{+0.068}_{+0.043}$	10. 15. 20	
18	**20**	$20^{+0.021}_{0}$	$18^{-0.016}_{-0.034}$	$18^{+0.018}_{0}$	$20^{+0.086}_{+0.056}$	10. 20. 30	
20	**23**	$23^{+0.021}_{0}$	$20_{f7}{}^{-0.020}_{-0.041}$	$20^{+0.021}_{0}$	$23^{+0.086}_{+0.056}$	10. 20. 30	$1.5^{0}_{-0.015}$
22	**25**	$25^{+0.021}_{0}$	$22^{-0.020}_{-0.041}$	$22^{+0.021}_{0}$	$25^{+0.086}_{+0.056}$	15. 25. 40	
25	**28**	$28^{+0.021}_{0}$	$25^{-0.020}_{-0.041}$	$25^{+0.021}_{0}$	$28^{+0.086}_{+0.056}$	15. 30. 40	
28	**32**	$32^{+0.025}_{0}$	$28^{-0.020}_{-0.041}$	$28^{+0.021}_{0}$	$32^{+0.115}_{+0.075}$	15. 30. 50	$2.0^{0}_{-0.02}$
30	**34**	$34^{+0.025}_{0}$	$30^{-0.020}_{-0.041}$	$30^{+0.021}_{0}$	$34^{+0.115}_{+0.075}$	15. 30. 50	
32	**36**	$36^{+0.025}_{0}$	$32_{f7}{}^{-0.025}_{-0.050}$	$32^{+0.025}_{0}$	$36^{+0.115}_{+0.075}$	20. 40. 50	
35	**39**	$39^{+0.025}_{0}$	$35^{-0.025}_{-0.050}$	$35^{+0.025}_{0}$	$39^{+0.115}_{+0.075}$	20. 40. 60	
38	**42**	$42^{+0.025}_{0}$	$38^{-0.025}_{-0.050}$	$38^{+0.025}_{0}$	$42^{+0.115}_{+0.075}$	20. 40. 60	
40	**44**	$44^{+0.025}_{0}$	$40^{-0.025}_{-0.050}$	$40^{+0.025}_{0}$	$44^{+0.115}_{+0.075}$	20. 40. 60	
42	**46**	$46^{+0.025}_{0}$	$42^{-0.025}_{-0.050}$	$42^{+0.025}_{0}$	$46^{+0.115}_{+0.075}$	20. 40. 60	
45	**50**	$50^{+0.025}_{0}$	$45^{-0.025}_{-0.050}$	$45^{+0.025}_{0}$	$50^{+0.115}_{+0.075}$	30. 50. 80	$2.5^{0}_{-0.025}$
48	**53**	$53^{+0.030}_{0}$	$48^{-0.025}_{-0.050}$	$48^{+0.025}_{0}$	$53^{+0.145}_{+0.095}$	30. 50. 80	
50	**55**	$55^{+0.030}_{0}$	$50^{-0.025}_{-0.050}$	$50^{+0.025}_{0}$	$55^{+0.145}_{+0.095}$	30. 50. 80	
52	**57**	$57^{+0.030}_{0}$	$52_{e7}{}^{-0.060}_{-0.090}$	$52^{+0.030}_{0}$	$57^{+0.145}_{+0.095}$	30. 60. 80	
55	**60**	$60^{+0.030}_{0}$	$55^{-0.060}_{-0.090}$	$55^{+0.030}_{0}$	$60^{+0.145}_{+0.095}$	30. 60. 90	
60	**65**	$65^{+0.030}_{0}$	$60^{-0.060}_{-0.090}$	$60^{+0.030}_{0}$	$65^{+0.145}_{+0.095}$	30. 60. 90	
65	**70**	$70^{+0.030}_{0}$	$65^{-0.060}_{-0.090}$	$65^{+0.030}_{0}$	$70^{+0.145}_{+0.095}$	30. 70. 100	
70	**76**	$76^{+0.030}_{0}$	$70^{-0.060}_{-0.090}$	$70^{+0.030}_{0}$	$76^{+0.160}_{+0.095}$	40. 70. 100	$3.0^{0}_{-0.03}$
75	**81**	$81^{+0.035}_{0}$	$75^{-0.060}_{-0.090}$	$75^{+0.030}_{0}$	$81^{+0.165}_{+0.100}$	40. 80. 100	
80	**86**	$86^{+0.035}_{0}$	$80^{-0.060}_{-0.090}$	$80^{+0.030}_{0}$	$86^{+0.165}_{+0.100}$	40. 80. 100	
85	**91**	$91^{+0.035}_{0}$	$85_{e7}{}^{-0.072}_{-0.107}$	$85^{+0.035}_{0}$	$91^{+0.165}_{+0.100}$	40. 90. 100	
90	**96**	$96^{+0.035}_{0}$	$90^{-0.072}_{-0.107}$	$90^{+0.035}_{0}$	$96^{+0.165}_{+0.100}$	50. 100	
100	**106**	$106^{+0.035}_{0}$	$100^{-0.072}_{-0.107}$	$100^{+0.035}_{0}$	$106^{+0.180}_{+0.115}$	50. 100	
110	**117**	$117^{+0.035}_{0}$	$110^{-0.072}_{-0.107}$	$110^{+0.035}_{0}$	$117^{+0.180}_{+0.115}$	60. 100	$3.5^{0}_{-0.035}$
120	**127**	$127^{+0.040}_{0}$	$120^{-0.072}_{-0.107}$	$120^{+0.035}_{0}$	$127^{+0.185}_{+0.120}$	60. 100	

This is a made-to-order product, for which we maintain no inventory. Depending upon actual usage conditions, additional design work for oil grooves and lubrication channels might be necessary.
NB1: We make every effort to ensure that the dimensions and geometry of oil grooves and lubrication channels are optimally designed.
NB2: When inner diameter finishing is performed after assembly, we manufacture a semi-product with sufficient finishing allowance built into the upper surface thickness.

When requesting design work, please attach your drawings to the Bearing Specification Sheet for Lubricated Bearings found at the end of this catalog and send both to Daido Metal.