SELF LUBRICATING
BEARINGS

Release Date
30TH June 2006

LLOYD'S REGISTER QUALITY ASSURANCE ISO9001

SHORLUBE

Economical, self-lubricating, all-metal bearings for almost every purpose.

Uses for Shorlube Bearings

You can specify shorlube bearings for almost any type of machinery.

Australia-wide, you'll find shorlube at work in:

- Agricultural machinery
- Aircraft
- Business machines
- Cars
- Conveyors
- Cranes
- Domestic appliances
- Elevated platforms
- Generators
- Heaters
- Hydraulics
- Machine tools
- Packaging machinery
- Starters
- Textile machinery
- Trucks
- White goods

Lifetime lubrication

The oil is part of the bearing

Vital lubricating oil is part of every pore of a Shorlube bearing, instantly released when your machines start operating and re-absorbed between uses.

Under most conditions, this is all the lubrication you'll need for the life of your Shorlube Bearing. For especially arduous duty however, talk to Shorlube about simple methods of supplementary lubrication.

The oil you need

Standard Shorlube bearings are impregnated with a turbine quality, paraffin base oil with a viscosity of 61-68cSt at 40˚C. (approx SAE 20.)

Continuous operating temperature up to 85˚C. Intermittent maximum operating temperature up to 95˚C.

For extreme operating conditions, talk to Shorlube about custom-impregnation with the right oil for your needs.

Shorlube Industries

The bearings you need, when you need them.

With half a century of experience behind us, we've developed a range to suit practically every situation.

Our wide range of stock allows you, the customer, a ready source of supply to meet your needs.

If you need non-standard sizes in small quantity, order solid or hollow bar stock, ready to machine to your requirements.

For longer runs, ask us for a highly competitive quote.

Standards and Tolerances

Shorlube bearings are manufactured to A.S. 1654.1-1995. You will find full specifications in the technical section of this brochure. For standard tolerances, see page 15.

Sintered bar and Hollow bar - ready to machine to your requirements

After machining, for best results return to Shorlube for oil-impregnation free of charge. Or do-it-yourself; immerse in oil at 80˚C for 30 minutes and allow to cool in the bath or plunge cool in the same oil at room temperature.

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BEARINGS

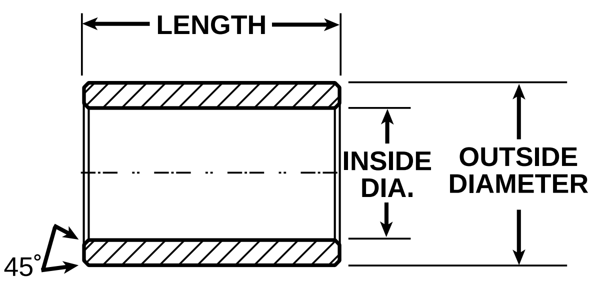
SHORLUBE

Imperial Plain Cylindrical
Self Lubricating Bronze Bearings

AVAILABILITY
S = Stock Orders
P = Subject to Production quantities

Always check. Other sizes may be available.

INSIDE DIAMETER Nom.	INSIDE DIAMETER Act.	OUTSIDE DIAMETER Nom.	OUTSIDE DIAMETER Act.	Length	Part Number	AVAIL.
1/16"	0.0635"	3/16"	0.1895"	3/16"	C0206-1	*P*
3/32"	0.0955"	3/16"	0.2205"	1/8"	C0307-1	*S*
1/8"	0.126"	3/16"	0.189"	3/16"	C0406-1	*S*
1/8"	0.126"	3/16"	0.189"	1/4"	C0406-2	*S*
1/8"	0.126"	3/16"	0.189"	3/8"	C0406-3	*P*
1/8"	0.1265"	7/32"	0.2227"	5/32"	C0407-1	*S*
1/8"	0.1270"	5/16"	0.3140"	3/16"	C0410-1	*S*
5/32"	0.1565"	1/4"	0.2515"	1/4"	C0508-1	*S*
5/32"	0.1565"	1/4"	0.2515"	1/2"	C0508-2	*S*
3/16"	0.1895"	1/4"	0.252"	3/16"	C0608-2	*P*
3/16"	0.1895"	1/4"	0.252"	3/8"	C0608-1	*S*
3/16"	0.1895"	1/4"	0.252"	1/2"	C0608-3	*S*
3/16"	0.1895"	5/16"	0.3145"	3/16"	C0610-1	*S*
3/16"	0.1895"	5/16"	0.3145"	1/4"	C0610-5	*S*
3/16"	0.1895"	5/16"	0.3145"	3/8"	C0610-2	*S*
3/16"	0.1895"	5/16"	0.3145"	1/2"	C0610-3	*S*
3/16"	0.1895"	5/16"	0.3145"	5/8"	S1200-40	*P*
3/16"	0.1895"	5/16"	0.3145"	3/4"	C0610-4	*S*
7/32"	0.2197"	13/32	0.4082"	7/16"	C0713-1	*S*
1/4"	0.256"	5/16"	0.3145"	5/16"	C0810-3	*S*
1/4"	0.252"	5/16"	0.3145"	7/16"	C0810-1	*S*
1/4"	0.256"	5/16"	0.3145"	9/16"	C0810-4	*P*
1/4"	0.252"	5/16"	0.3145"	5/8"	C0810-2	*S*
1/4"	0.252"	3/8"	0.3775"	1/4"	C0812-1	*S*
1/4"	0.252"	3/8"	0.3775"	3/8"	C0812-2	*S*
1/4"	0.252"	3/8"	0.3775"	1/2"	C0812-3	*P*
1/4"	0.252"	3/8"	0.3775"	5/8"	C0812-4	*S*
1/4"	0.252"	3/8"	0.3775"	3/4"	C0812-5	*S*
1/4"	0.252"	3/8"	0.3775"	1"	C0812-6	*S*
1/4"	0.252"	3/8"	0.3775"	5/16"	C0812-7	*S*
1/4"	0.252"	7/16"	0.440"	1/2"	C0814-1	*S*
1/4"	0.244"	7/16"	0.440"	5/8"	C0814-2	*S*
1/4"	0.252"	1/2"	0.502"	1/2"	C0816-2	*S*
9/32"	0.278"	7/16"	0.4395"	19/32"	C0914-1	*P*
5/16"	0.315"	3/8"	0.378"	5/8"	C1012-1	*S*
5/16"	0.3145"	7/16"	0.440"	1/4"	C1014-8	*S*
5/16"	0.3145"	7/16"	0.440"	5/16"	C1014-1	*S*
5/16"	0.3145"	7/16"	0.440"	3/8"	C1014-2	*S*
5/16"	0.3145"	7/16"	0.440"	7/16"	C1014-3	*S*
5/16"	0.3145"	7/16"	0.440"	1/2"	C1014-4	*S*
5/16"	0.3145"	7/16"	0.440"	5/8"	C1014-5	*S*
5/16"	0.3145"	7/16"	0.440"	3/4"	C1014-6	*P*
5/16"	0.3145"	7/16"	0.440"	1"	C1014-7	*P*
5/16"	0.3145"	1/2"	0.503"	1/2"	C1016-1	*P*
5/16"	0.3145"	1/2"	0.503"	3/4"	C1016-3	*S*
5/16"	0.3145"	1/2"	0.503"	1-1/4"	C1016-5	*P*
5/16"	0.3125"	9/16"	0.565"	7/8"	C1018-1	*P*
3/8"	0.377"	1/2"	0.5025"	3/8"	C1216-1	*S*
3/8"	0.377"	1/2"	0.5025"	1/2"	C1216-2	*S*
3/8"	0.377"	1/2"	0.5025"	5/8"	C1216-3	*S*
3/8"	0.377"	1/2"	0.5025"	3/4"	C1216-4	*S*
3/8"	0.377"	1/2"	0.5025"	7/8"	C1216-5	*S*
3/8"	0.377"	1/2"	0.5025"	1"	C1216-6	*S*
3/8"	0.377"	1/2"	0.5025"	1-1/8"	C1216-7	*P*
3/8"	0.377"	1/2"	0.5025"	1-1/4"	C1216-8	*P*
3/8"	0.377"	9/16"	0.565"	1/2"	C1218-1	*S*
3/8"	0.377"	9/16"	0.565"	3/4"	C1218-2	*S*
3/8"	0.377"	5/8"	0.628"	3/8"	C1220-1	*S*
3/8"	0.377"	5/8"	0.628"	1/2"	C1220-2	*S*
3/8"	0.377"	5/8"	0.628"	5/8"	C1220-3	*P*
3/8"	0.377"	5/8"	0.628"	3/4"	C1220-4	*S*
3/8"	0.377"	5/8"	0.628"	7/8"	C1220-5	*P*
3/8"	0.377"	5/8"	0.628"	1"	C1220-6	*P*
3/8"	0.377"	5/8"	0.628"	1-1/4"	C1220-7	*P*
3/8"	0.377"	5/8"	0.628"	1-1/2"	S2402-96	*P*
3/8"	0.377"	3/4"	0.753"	1-3/16"	C1224-2	*S*
3/8"	0.377"	3/4"	0.753"	3/4"	C1224-3	*S*
7/16"	0.440"	9/16"	0.565"	1/2"	C1418-1	*S*
7/16"	0.440"	9/16"	0.565"	5/8"	C1418-2	*S*
7/16"	0.440"	9/16"	0.565"	3/4"	C1418-3	*S*
7/16"	0.440"	9/16"	0.565"	1"	C1418-4	*S*
7/16"	0.4395"	5/8"	0.627"	1-1/4"	C1420-1	*P*
1/2"	0.499"	9/16"	0.565"	19/32"	C1618-1	*P*
1/2"	0.499"	9/16"	0.565"	11/16"	C1618-2	*P*
1/2"	0.502"	5/8"	0.628"	3/8"	C1620-1	*S*
1/2"	0.502"	5/8"	0.628"	1/2"	C1620-2	*S*
1/2"	0.502"	5/8"	0.628"	5/8"	C1620-3	*S*
1/2"	0.502"	5/8"	0.628"	11/16	C1620-4	*S*
1/2"	0.502"	5/8"	0.628"	3/4"	C1620-5	*S*
1/2"	0.502"	5/8"	0.628"	7/8"	C1620-6	*P*
1/2"	0.502"	5/8"	0.628"	15/16"	C1620-7	*S*
1/2"	0.502"	5/8"	0.628"	1"	C1620-8	*S*
1/2"	0.502"	5/8"	0.628"	1-1/4"	C1620-11	*P*
1/2"	0.502"	5/8"	0.628"	1-1/2"	C1620-12	*P*
1/2"	0.502"	11/16"	0.690"	1/2"	C1622-1	*P*
1/2"	0.502"	11/16"	0.690"	5/8"	C1622-2	*P*
1/2"	0.502"	11/16"	0.690"	3/4"	C1622-3	*P*
1/2"	0.502"	11/16"	0.690"	1"	C1622-5	*P*
1/2"	0.502"	11/16"	0.690"	1-1/4"	C1622-6	*P*
1/2"	0.502"	3/4"	0.753"	1/2"	C1624-1	*S*
1/2"	0.502"	3/4"	0.753"	5/8"	C1624-2	*S*
1/2"	0.502"	3/4"	0.753"	3/4"	C1624-3	*S*
1/2"	0.502"	3/4"	0.753"	7/8"	C1624-4	*S*
1/2"	0.502"	3/4"	0.753"	1"	C1624-5	*S*
1/2"	0.502"	3/4"	0.753"	1-1/4"	C1624-6	*S*
1/2"	0.502"	3/4"	0.753"	1-3/8"	C1624-7	*S*
1/2"	0.502"	3/4"	0.753"	1-1/2"	C1624-8	*S*
9/16"	0.565"	11/16"	0.690"	3/4"	C1822-1	*P*
9/16"	0.565"	11/16"	0.690"	1"	C1822-3	*P*
9/16"	0.565"	11/16"	0.690"	1-1/4"	C1822-4	*S*
9/16"	0.565"	3/4"	0.7525"	3/4"	C1824-1	*P*
9/16"	0.565"	3/4"	0.7525"	1"	C1824-2	*P*
9/16"	0.565"	3/4"	0.7525"	1-1/2"	C1824-3	*P*
9/16"	0.565"	13/16"	0.815"	3/4"	C1826-1	*P*
9/16"	0.565"	13/16"	0.815"	1"	C1826-2	*P*
5/8"	0.629"	11/16"	0.693"	3/8"	C2022-2	*S*
5/8"	0.629"	11/16"	0.693"	5/8"	C2022-3	*S*
5/8"	0.629"	11/16"	0.693"	3/4"	C2022-1	*S*
5/8"	0.628"	3/4"	0.7525"	3/8"	C2024-11	*S*
5/8"	0.628"	3/4"	0.7525"	1/2"	C2024-2	*S*
5/8"	0.628"	3/4"	0.7525"	5/8"	C2024-3	*S*
5/8"	0.628"	3/4"	0.7525"	3/4"	C2024-4	*S*
5/8"	0.628"	3/4"	0.7525"	7/8	C2024-5	*S*
5/8"	0.628"	3/4"	0.7525"	1"	C2024-6	*S*
5/8"	0.628"	3/4"	0.7525"	1-1/4"	C2024-7	*S*
5/8"	0.628"	3/4"	0.7525"	1-3/8"	C2024-8	*P*
5/8"	0.628"	3/4"	0.7525"	1-1/2"	C2024-9	*S*
5/8"	0.628"	13/16"	0.815"	1/2"	C2026-2	*S*
5/8"	0.628"	13/16"	0.815"	3/4"	C2026-3	*S*
5/8"	0.628"	13/16"	0.815"	1"	C2026-4	*S*
5/8"	0.628"	13/16"	0.815"	1-1/4"	C2026-5	*S*
5/8"	0.628"	13/16"	0.815"	2"	C2026-8	*P*



w/– 0.005" Flat

All dimensions in inches

SHORLUBE

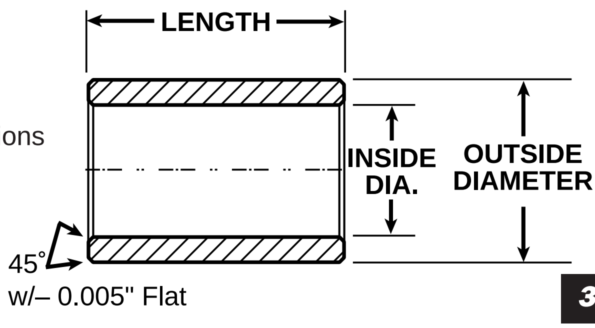
AVAILABILITY
S = Stock Orders
P = Subject to Production quantities

Always check. Other sizes may be available.

INSIDE DIAMETER Nom.	INSIDE DIAMETER Act.	OUTSIDE DIAMETER Nom.	OUTSIDE DIAMETER Act.	Length	Part Number	AVAIL.
5/8"	0.628"	7/8"	0.878"	1/2"	C2028-1	*P*
5/8"	0.628"	7/8"	0.878"	5/8"	C2028-2	*S*
5/8"	0.628"	7/8"	0.878"	3/4"	C2028-3	*P*
5/8"	0.628"	7/8"	0.878"	7/8"	C2028-4	*S*
5/8"	0.628"	7/8"	0.878"	1"	C2028-5	*S*
5/8"	0.628"	7/8"	0.878"	1-1/4"	C2028-7	*P*
5/8"	0.628"	7/8"	0.878"	1-1/2"	C2028-8	*P*
5/8"	0.627"	7/8"	0.878"	2"	S4002-128	*P*
5/8"	0.628"	1"	1.003"	1/1-4"	S4013-80	*P*
11/16"	0.690"	13/16"	0.815"	5/8"	C2226-1	*P*
11/16"	0.690"	13/16"	0.815"	1"	C2226-2	*P*
11/16"	0.6905"	15/16"	0.940"	1-1/4"	C2230-1	*P*
3/4"	0.753"	7/8"	0.878"	1/2"	C2428-2	*S*
3/4"	0.753"	7/8"	0.878"	5/8"	C2428-3	*P*
3/4"	0.753"	7/8"	0.878"	3/4"	C2428-4	*S*
3/4"	0.753"	7/8"	0.878"	7/8"	C2428-5	*P*
3/4"	0.753"	7/8"	0.878"	1"	C2428-6	*S*
3/4"	0.753"	7/8"	0.878"	1-1/8"	C2428-7	*P*
3/4"	0.753"	7/8"	0.878"	1-1/4"	C2428-8	*P*
3/4"	0.753"	7/8"	0.878"	1-1/2"	C2428-9	*S*
3/4"	0.753"	15/16"	0.940"	1"	C2430-2	*P*
3/4"	0.753"	15/16"	0.940"	1-1/2"	C2430-4	*S*
3/4"	0.753"	1"	1.003"	1/2"	C2432-16	*S*
3/4"	0.753"	1"	1.003"	5/8"	C2432-17	*S*
3/4"	0.753"	1"	1.003"	3/4"	C2432-5	*S*
3/4"	0.753"	1"	1.003"	13/16"	C2432-6	*P*
3/4"	0.753"	1"	1.003"	7/8"	C2432-7	*S*
3/4"	0.753"	1"	1.003"	1"	C2432-8	*S*
3/4"	0.753"	1"	1.003"	1-1/8"	C2432-9	*P*
3/4"	0.753"	1"	1.003"	1-1/4"	C2432-10	*P*
3/4"	0.753"	1"	1.003"	1-3/8"	C2432-11	*P*
3/4"	0.753"	1"	1.003"	1-7/16"	C2432-12	*P*
3/4"	0.753"	1"	1.003"	1-1/2"	C2432-13	*S*
3/4"	0.753"	1"	1.003"	1-3/4"	C2432-15	*P*
3/4"	0.753"	1"	1.003"	2"	C2432-14	*S*
3/4"	0.753"	1-1/16"	1.065"	3/4"	C2434-1	*P*
3/4"	0.7535"	1-1/8"	1.1275"	1"	C2436-1	*S*
7/8"	0.878"	1"	1.003"	1"	C2832-1	*S*
7/8"	0.878"	1"	1.003"	1-1/4"	C2832-2	*S*
7/8"	0.878"	1"	1.003"	1-1/2"	C2832-4	*S*
7/8"	0.878"	1-1/8"	1.128"	7/8"	C2836-1	*S*
7/8"	0.878"	1-1/8"	1.128"	1"	C2836-2	*S*
7/8"	0.878"	1-1/8"	1.128"	1-1/4"	C2836-3	*P*
7/8"	0.878"	1-1/8"	1.128"	1-3/8"	C2836-7	*P*
7/8"	0.878"	1-1/8"	1.128"	1-1/2"	C2836-4	*P*
7/8"	0.878"	1-1/8"	1.128"	2"	C2836-6	*P*
7/8"	0.878"	1-3/16"	1.189"	3/4"	C2838-1	*S*
15/16"	0.939"	1-1/8"	1.128"	1-1/16"	C3036-1	*P*
1"	1.002"	1-1/8"	1.128"	5/8"	C3236-2	*S*
1"	1.002"	1-1/8"	1.128"	7/8"	C3236-3	*S*
1"	1.002"	1-1/8"	1.128"	1"	C3236-4	*S*
1"	1.002"	1-1/8"	1.128"	1-1/4"	C3236-5	*S*
1"	1.002"	1-1/8"	1.128"	1-1/2"	C3236-6	*S*
1"	1.002"	1-1/8"	1.128"	2"	C3236-7	*S*

INSIDE DIAMETER Nom.	INSIDE DIAMETER Act.	OUTSIDE DIAMETER Nom.	OUTSIDE DIAMETER Act.	Length	PART NUMBER	AVAIL.
1"	1.003"	1-1/4"	1.253"	1/2	C3240-3	*S*
1"	1.003"	1-1/4"	1.253"	3/4"	C3240-4	*S*
1"	1.003"	1-1/4"	1.253"	1"	C3240-5	*S*
1"	1.003"	1-1/4"	1.253"	1-1/4"	C3240-6	*S*
1"	1.003"	1-1/4"	1.253"	1-1/2"	C3240-8	*S*
1"	1.003"	1-1/4"	1.253"	2"	C3240-9	*S*
1"	1.003"	1-3/8"	1.378"	1"	C3244-2	*S*
1-1/8"	1.128"	1-1/4"	1.253"	3/4"	C3640-1	*S*
1-1/8"	1.128"	1-1/4"	1.253"	1-1/2"	C3640-2	*S*
1-1/8"	1.128"	1-3/8"	1.378"	3/4"	C3644-4	*S*
1-1/8"	1.128"	1-3/8"	1.378"	1"	C3644-1	*S*
1-1/8"	1.128"	1-3/8"	1.378"	1-1/4"	C3644-2	*S*
1-1/8"	1.129"	1-3/8"	1.378"	1-1/2"	C3644-3	*S*
1-1/8"	1.129"	1-3/8"	1.378"	2"	C3644-6	*S*
1-1/4"	1.253"	1-1/2"	1.503"	3/4"	C4048-1	*S*
1-1/4"	1.253"	1-1/2"	1.503"	1"	C4048-2	*S*
1-1/4"	1.253"	1-1/2"	1.503"	1-1/4"	C4048-3	*S*
1-1/4"	1.253"	1-1/2"	1.503"	1-1/2"	C4048-4	*S*
1-1/4"	1.253"	1-1/2"	1.503"	1-3/4"	C4048-6	*P*
1-1/4"	1.253"	1-1/2"	1.503"	2"	C4048-5	*S*
1-9/32”	1.281”	1-1/2”	1.503”	15/16”	C4148-1	*P*
1-3/8”	1.378”	1-5/8”	1.628”	1”	C4452-3	*S*
1-3/8”	1.378”	1-5/8”	1.628”	1-1/4”	C4452-1	*S*
1-3/8”	1.378”	1-5/8”	1.628”	1-1/2”	C4452-2	*S*
1-1/2”	1.503”	1-3/4”	1.754”	1”	C4856-5	*P*
1-1/2”	1.503”	1-3/4”	1.754”	1-1/8”	C4856-3	*S*
1-1/2”	1.503”	1-3/4”	1.754”	1-1/4”	S9600-80	*S*
1-1/2”	1.503”	1-3/4”	1.754”	1-1/2”	C4856-4	*S*
1-1/2”	1.503”	1-3/4”	1.754”	1-3/4”	C4856-1	*S*
1-1/2”	1.503”	1-3/4”	1.754”	2”	C4856-2	*S*
1-1/2”	1.503”	1-3/4”	1.754”	3”	C4856-6	*P*
1-1/2”	1.503”	2”	2.004”	2”	C4864-1	*S*
1-1/2”	1.503”	2”	2.004”	3”	C4864-2	*P*
1-3/4”	1.7535”	2	2.004”	1”	C5664-1	*S*
1-3/4”	1.7535”	2	2.004”	1-1/2”	C5664-2	*S*
1-3/4”	1.7535”	2	2.004”	2”	C5664-3	*S*
1-3/4”	1.7525”	2-1/4”	2.253”	2”	C5672-1	*S*
2”	2.004”	2-1/4”	2.254”	1”	C6472-2	*S*
2”	2.004”	2-1/4”	2.254”	2”	C6472-1	*S*
2”	2.004”	2-1/4”	2.254”	2-1/4”	C6472-3	*P*
2”	2.004”	2-3/8”	2.379”	2-1/2”	C6476-1	*P*
2”	2.004”	2-1/2”	2.505”	2”	C6480-2	*P*
2”	2.004”	2-1/2”	2.505”	2-1/2”	C6480-1	*S*
2-1/4”	2.253”	2-3/4”	2.756”	2-5/8”	C7288-1	*S*
2-1/2”	2.504”	2-7/8”	2.879”	2-1/4”	C80112-1	*S*

All dimensions in inches



SHORLUBE

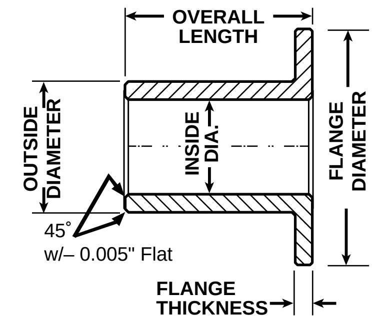
Imperial Flanged

Self Lubricating Bronze Bearings

AVAILABILITY
S = Stock Orders
P = Subject to Production quantities

Always check. Other sizes may be available.

INSIDE DIAMETER Nom.	INSIDE DIAMETER Act.	OUTSIDE DIAMETER Nom.	OUTSIDE DIAMETER Act.	Overall Length Nom.	Flange Diam.	Flange Thick-ness	Part Number	AVAIL.
5/32"	0.157"	5/16"	0.314"	3/8"	7/16"	1/16"	F0510-1	*S*
3/16"	0.189"	5/16"	0.314"	5/16"	1/2"	1/16"	F0610-1	*S*
3/16"	0.189"	5/16"	0.314"	3/8"	7/16"	1/16"	F0610-2	*S*
1/4"	0.252"	3/8"	0.377"	27/64"	9/16"	1/16"	F0812-1	*P*
1/4"	0.252"	3/8"	0.377"	7/16"	9/16"	1/16"	F0812-2	*S*
5/16"	0.314"	7/16"	0.440"	3/8"	5/8"	1/16"	F1014-1	*S*
5/16"	0.314"	7/16"	0.440"	1/2"	5/8"	1/8"	F1014-2	*S*
5/16"	0.314"	7/16"	0.440"	3/4"	5/8"	1/16"	F1014-5	*S*
5/16"	0.314"	1/2"	0.5035"	13/16"	5/8"	1/8"	F1016-2	*P*
5/16"	0.3145"	1/2"	0.5025"	7/8"	5/8"	1/8"	F1016-3	*P*
5/16"	0.314"	1/2"	0.5035"	3/4"	3/4"	1/8"	F1016-5	*S*
3/8"	0.377"	7/16"	0.440"	3/8"	11/16"	11/16"	F1214-1	*P*
3/8"	0.377"	1/2"	0.503"	7/16"	11/16"	1/8"	F1216-2	*P*
3/8"	0.377"	1/2"	0.503"	1/2"	11/16"	1/8"	F1216-1	*S*
3/8"	0.3775"	5/8"	0.6275"	11/16"	3/4"	3/32"	F1220-1	*P*
3/8"	0.3775"	5/8"	0.6275"	15/16"	3/4"	3/32"	F1220-2	*S*
3/8"	0.3775"	5/8"	0.6275"	1/2"	3/4"	3/32"	F1220-3	*S*
1/2"	0.502"	5/8"	0.628"	5/8"	7/8"	1/16"	F1620-2	*S*
1/2"	0.502"	5/8"	0.628"	3/4"	7/8"	3/32"	F1620-1	*S*
1/2"	0.502"	5/8"	0.628"	1"	7/8"	3/32"	F1620-5	*S*
1/2"	0.502"	5/8"	0.628"	13/16"	25/32"	1/16"	F1620-3	*S*
1/2"	0.502"	5/8"	0.628"	1.0"	1.0"	3/32"	F1620-4	*S*
1/2"	0.502"	11/16"	.690"	1/2"	1.0"	1/16"	F1622-1	*P*
1/2"	0.502"	3/4"	0.752"	3/4"	1.0"	1/8"	F1624-1	*S*
1/2"	0.502"	3/4"	0.752"	1.0"	1.0"	1/8"	F1624-2	*S*
5/8"	0.628"	3/4"	0.753"	3/4"	1.0"	1/8"	F2024-2	*S*
5/8"	0.628"	3/4"	0.753"	1.0"	1.0"	1/8"	F2024-1	*S*
5/8"	0.625"	13/16"	0.815"	1 3/8"	1-11/32"	3/16	F2026-1	*P*
5/8"	0.628"	7/8"	0.878"	15/16"	1-1/16"	1/8"	F2028-1	*P*
5/8"	0.628"	7/8"	0.878"	1 1/4"	1-1/16"	1/8"	F2028-2	*S*
3/4"	0.7552"	7/8"	0.8765"	7/8"	11/16"	1/16"	F2428-1	*S*
3/4"	0.752"	15/16"	0.940"	1 3/8"	1 1/4"	1/8"	F2430-1	*S*
3/4"	0.7535"	1"	1.000"	3/4"	1 3/4"	7/32"	F4809-48	*P*
3/4"	0.752"	1"	1.002"	3/4"	1 1/4"	1/8"	F2432-1	*S*
3/4"	0.752"	1"	1.002"	1.0"	1 1/4"	1/8"	F2432-3	*S*
3/4"	0.752"	1"	1.002"	1 1/4"	1 1/4"	1/8"	F2432-5	*P*
3/4"	0.746"	1"	1.0035"	1 1/2"	1 3/8"	1/8"	F2432-6	*P*
3/4"	0.752"	1"	1.002"	1 1/8"	1 3/16"	1/8"	F2432-7	*P*
3/4"	0.7535"	1 1/8"	1.1275"	1 1/8"	1 1/4"	5/32"	F2436-1	*P*
7/8"	0.880"	1 1/16"	1.066"	1/2"	1 3/16"	1/8"	F2834-1	*P*
7/8"	0.878"	1 1/8"	1.128"	1 7/16"	1 3/8"	1/8"	F2836-1	*S*
15/16"	0.9395"	1 3/16"	1.1895"	1.0"	1 3/8"	1/8"	F3038-1	*S*
1"	0.996"	1 1/4"	1.254"	1 1/2"	1 1/2"	1/8"	F3240-1	*P*
1"	1.003"	1 1/4"	1.254"	1 1/2"	1 1/2"	1/8"	F3240-2	*S*
1"	1.003"	1 1/4"	1.254"	1 1/4"	1 1/2"	1/8"	F3240-3	*S*
1 1/4"	1.254"	1 1/2"	1.504"	1 1/4"	1 11/16"	3/32"	F4048-1	*S*



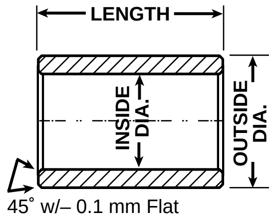
All dimensions in inches

Metric Plain Cylindrical & Flanged

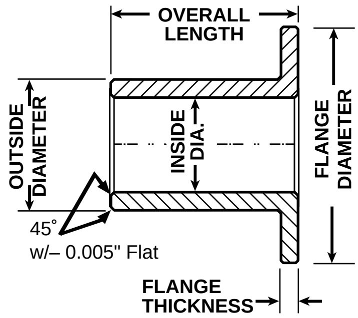
Self Lubricating Bronze Bearings

INSIDE DIAM. Nom	INSIDE DIAM. Act	OUTSIDE DIAM. Nom	OUTSIDE DIAM. Act	Overall Length	Cylindrical Part Number	AVAIL.	Flange Diam	Thickn's	Flanged Part Number	AVAIL.
4	4.032	8	8.034	4	SMC 040804	*S*	12	2	SMF 1204	*P*
	4.020		8.019	6	SMC 040806	*S*	12	2	SMF 1206	*P*
6	6.032	10	10.034	6	SMC 061006	*S*	14	2	SMF 1406	*S*
	6.020		10.019	10	SMC 061010	*S*	14	2	SMF 1410	*S*
8	8.040	12	12.041	6	SMC 081206	*P*	16	2	SMF 1606	*P*
	8.025		12.023	8	SMC 081208	*P*	16	2	SMF 1608	*S*
				12	SMC 081212	*S*	16	2	SMF 1612	*S*
10	10.040	16	16.041	8	SMC 101608	*S*	22	3	SMF 2208	*P*
	10.025		16.023	10	SMC 101610	*S*	22	3	SMF 2210	*S*
				16	SMC 101616	*S*	22	3	SMF 2216	*S*
				25	SMC 101625	*S*	22	3	SMF 2225	*P*
12	12.050	16	16.041	16	SMC 121616	*S*				
	12.032		16.023							
	12.050	18	18.041	8	SMC 121808	*P*	24	3	SMF 2408	*S*
	12.032		18.023	12	SMC 121812	*S*	24	3	SMF 2412	*S*
				16	SMC 121816	*S*	24	3	SMF 2416	*S*
				20	SMC 121820	*S*	24	3	SMF 2420	*S*
				25	SMC 121825	*S*	24	3	SMF 2425	*P*
14	14.050	20	20.049	10	SMC 142010	*P*	26	3	SMF 2610	*P*
	14.032		20.028	14	SMC 142014	*S*	26	3	SMF 2614	*S*
				20	SMC 142020	*S*	26	3	SMF 2620	*S*
				30	SMC 142030	*P*	26	3	SMF 2630	*P*
16	16.050	22	22.049	12	SMC 162212	*S*	28	3	SMF 2812	*P*
	16.032		22.028	16	SMC 162216	*S*	28	3	SMF 2816	*S*
				20	SMC 162220	*S*	28	3	SMF 2820	*S*
				25	SMC 162225	*S*	28	3	SMF 2825	*S*
				30	SMC 162230	*S*	28	3	SMF 2830	*P*
18	18.050	24	24.049	12	SMC 182412	*P*	30	3	SMF 3012	*P*
	18.032		24.028	18	SMC 182418	*P*	30	3	SMF 3018	*P*
				30	SMC 182430	*S*	30	3	SMF 3030	*S*
20	20.060	26	26.049	15	SMC 202615	*P*	32	3	SMF 3215	*S*
	20.032		26.028	20	SMC 202620	*S*	32	3	SMF 3220	*S*
				25	SMC 202625	*S*	32	3	SMF 3225	*S*
				30	SMC 202630	*S*	32	3	SMF 3230	*S*
22	22.061	28	28.049	15	SMC 222815	*P*	34	3	SMF 3415	*S*
	22.040		28.028	20	SMC 222820	*P*	34	3	SMF 3420	*S*
				25	SMC 222825	*P*	34	3	SMF 3425	*S*
				30	SMC 222830	*P*	34	3	SMF 3430	*S*
25	25.061	32	32.049	20	SMC 253220	*S*	39	3.5	SMF 3920	*S*
	25.040		32.034	25	SMC 253225	*S*	39	3.5	SMF 3925	*S*
				30	SMC 253230	*S*	39	3.5	SMF 3430	*S*
				35	SMC 253235	*S*	39	3.5	SMF 3435	*S*
27	27.061	35	35.049	20	SMC 273520	*S*	43	4	SMF 4320	*S*
	27.040		35.034	25	SMC 273525	*P*	43	4	SMF 4325	*P*
				30	SMC 273530	*S*	43	4	SMF 4330	*P*
				35	SMC 273535	*P*	43	4	SMF 4335	*S*
30	30.061	38	38.049	20	SMC 303820	*S*	46	4	SMF 4620	*P*
	30.040		38.034	25	SMC 303825	*S*	46	4	SMF 4625	*S*
				30	SMC 303830	*S*	46	4	SMF 4630	*P*
				35	SMC 303835	*S*	46	4	SMF 4635	*S*
33	33.075	41	41.059	20	SMC 334120	*S*	49	4	SMF 4920	*P*
	33.050		41.034	25	SMC 334125	*P*	49	4	SMF 4925	*P*
				30	SMC 334130	*P*	49	4	SMF 4930	*P*
				35	SMC 334135	*P*	49	4	SMF 4935	*S*
35	35.075	45	45.059	25	SMC 354525	*S*	55	5	SMF 5525	*S*
	35.050		45.034	35	SMC 354535	*S*	55	5	SMF 5535	*P*
				40	SMC 354540	*S*	55	5	SMF 5540	*S*
39	39.075	49	49.059	25	SMC 394925	*S*	59	5	SMF 5925	*S*
	39.050		49.034	35	SMC 394935	*P*	59	5	SMF 5935	*P*
				40	SMC 394940	*S*	59	5	SMF 5940	*S*
45	45.075	55	55.071	35	SMC 455535	*S*	65	5	SMF 6535	*P*
	45.050		55.041	50	SMC 455550	*S*	65	5	SMF 6550	*P*
				55	SMC 455555	*S*	65	5	SMF 6555	*S*
50	50.075	60	60.071	35	SMC 506035	*S*	70	5	SMF 7035	*P*
	50.050		60.041	50	SMC 506050	*S*	70	5	SMF 7050	*S*
				70	SMC 506070	*S*	70	5	SMF 7070	*P*

Plain Cylindrical Bearings



Flanged Bearings



All dimensions in mm

AVAILABILITY
S = Stock Orders
P = Subject to Production quantities

Always check. Other sizes may be available.

All dimensions in mm

SHORLUBE

Imperial Thrust Washers
Self Lubricating Bronze

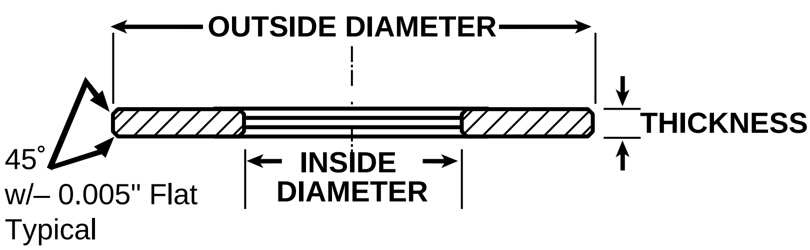
INSIDE DIAM. Nom	Act Max Min	OUTSIDE DIAM. Nom	Act Max Min	Thick-ness	Part Number	AVAIL
1/4"	0.255" 0.251"	1/2"	0.505" 0.501"	3/32"	W0816-1	*S*
3/8"	0.377" 0.736"	1 -1/8"	1.127" 1.126"	1/8"	W1236-1	*S*
1/2"	0.505" 0.503"	1"	1.005" 0.995"	3/64"	W1632-1	*S*
1/2"	0.502" 0.501"	1 -1/8"	1.130" 1.125"	1/8"	W1636-1	*S*
5/8"	0.630" 0.626"	1 - 18"	1.130" 1.127"	1/16"	W2036-1	*P*
5/8"	0.628" 0.627"	1 - 1/4"	1.265" 1.235"	1/8"	W2040-1	*S*
3/4"	0.747" 0.743"	1 - 1/2"	1.515" 1.535"	1/8"	W2448-1	*S*
3/4"	0.747" 0.743"	1 - 3/4"	1.765" 1.735"	1/8"	W2456-1	*S*
7/8"	0.879" 0.878"	1 - 3/4"	1.754" 1.753"	1/8"	W2856-1	*P*
1"	1.005" 1.002"	1 - 3/4"	1.758" 1.753"	1/8"	W3256-1	*S*
1 -1/8"	1.133" 1.128"	2 - 5/16"	2.317" 2.312"	1/8"	W3674-1	*P*
1 - 5/8"	1.628" 1.627"	2"	2.003" 2.002"	1/8"	W5264-1	*S*

AVAILABILITY
Current stock *S* **and/or minimum production** *P* **quantities.**

Always check with Shorlube prior to finalising designs.

Always check with Shorlube as tooling may be available to produce volume size you need.

All dimensions in inches



SHORLUBE

Imperial Self-Aligning

Self Lubricating Bronze Bearings

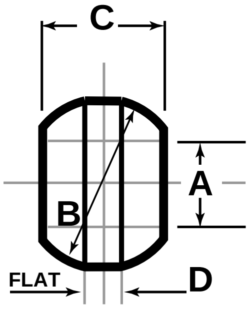
A INSIDE DIAM. DIAM. +.0000 -.0007	B SPHERICAL DIAM. +.0025 -.0025	C LENGTH +.005 -.005	D FLAT LENGTH NORMAL +.005 -.005	E CYLINDRICAL DIAMETER NORMAL	F CYLINDRICAL LENGTH	PART NUMBER
.1869"	.375	.250"	.109"	-	-	SA-27
.188"	.375"	.290"	.172"	-	-	SA-1
.2503"	.500"	.344"	.125"	-	-	SA-18
.2198"	.3745"	.250"	.109"	-	-	SA-25
.3115"	.625"	.500"	.281"	-	-	SA-3
.3755"	.812"	.625"	.125"	-	-	SA-30
.1256"	.468"	.355"	.100"	.343"	.031"	SB-6
.222"	.468"	.355"	.100"	.343"	.031"	SB-17
.3125"	.625"	.500"	-	.4375"	.062"	SB-9
.375"	.750"	.800"	-	-	.250"	SB-22
.2507"	.562"	.500"	-	.375"	.260"	SC-11
.3125"	.750"	.700"	-	.502"	.420"	SC-12

AVAILABILITY

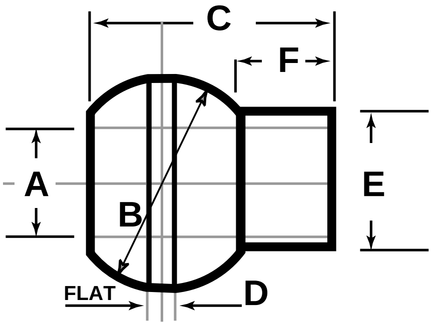
Subject to Current stock and/or minimum production quantities.

Please check with Shorlube prior to finalising design application.

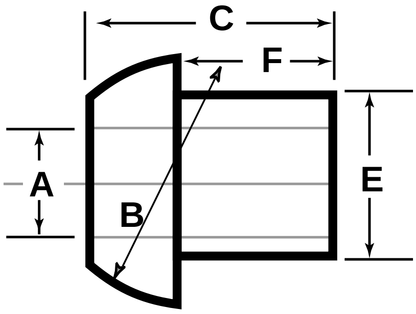
All dimensions in inches



Type A

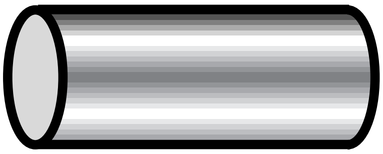


Type B



Type C

Sintered Bronze **Bar**

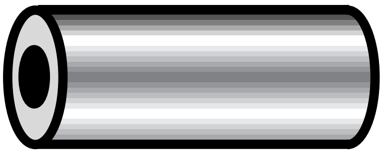


DIAMETER	LENGTH	PART NUMBER
13 mm	38 mm	SMSB1338
19 mm	38 mm	SMSB1938
19 mm	70 mm	SMSB1970
25 mm	38 mm	SMSB2538
25 mm	70 mm	SMSB2570
28 mm	63 mm	SMSB2863
31 mm	70 mm	SMSB3170
38 mm	63 mm	SMSB3863
50 mm	76 mm	SMSB5076
63 mm	70 mm	SMSB6370
76 mm	70 mm	SMSB7670
80 mm	45 mm	SMSB8045

SHORLUBE offer a wide range of sintered bronze bars as described at left. The range of bars provides a simple solution to countless bearing problems requiring 'off standard' sizes

The material used for the manufacture of sintered bronze bar is 90/10 Bronze - comprising a composition of 90% copper, 10% tin of high purity and conforms to ASTM B 438 Grade 1 Type 1
M.P.I.F. CTG-1001-K17

Sintered Bronze **Hollow Bar**



I.D.	O.D.	LENGTH	PART NUMBER
20mm	44 mm	70 mm	SMHB204470
31mm	67 mm	65 mm	SMHB316765
38mm	76 mm	63 mm	SMHB387663
47mm	103 mm	75 mm	SMHB4710375
52mm	82 mm	50 mm	SMHB528250
70mm	103 mm	75 mm	SMHB7010375
70mm	114 mm	63 mm	SMHB7011463
99mm	130 mm	65 mm	SMHB9913065

Also available from Shorlube is a range of hollow bars to provide for those larger sized 'off-standard' requirements.

SPECIAL SIZES
If your require, Shorlube can usually deliver special products to meet your exact requirements. Discuss your finished size specifications with us and we'll do everything possible to fulfil your needs.

Shorlube bronze bar & hollow bronze bar

MACHINING
Refer to the section "Machining of Sintered Bronze,' page 14, for recommended methods.

OIL IMPREGNATION
If required, Shorlube will pre-impregnate these products for you. However, it may still be necessary to re-impregnate after machining is completed.

For best results, return to Shorlube for oil-impregnation free of charge. Or do-it-yourself by immersing in oil at 80˚C for 30 minutes and allow to cool in the bath or plunge cool in the same oil at room temperature.

Standard Shorlube bearings are impregnated with a turbine quality, paraffin base oil with a viscosity of 61-68 cSt at 40˚C. (Approx SAE 20)

Continuous operating temperature up to 85˚C. intermittent maximum operating temperature up to 95˚C.

For extreme operating conditions, talk to Shorlube about custom-impregnation with the right oil for your needs.

SHORLUBE

Properties of Shorlube Bronze Bearings

SHORLUBE self lubricating bronze bearings are manufactured from bronze powder of a nominal 90/10 copper/tin composition with a small percentage of carbon. The pores are formed in the structure by the unique process of POWDER METALLURGY (P/M) and being interconnected serve as a reservoir for lubricant providing a passage for flow to the bearing surface. The oil content is an average 22% by volume and is normally sufficient for the life of the bearing.

The principle of self-lubrication

The flow of oil to the bearing surface from the storage, or reservoir in the pores of the bearing, results from the slight increase in temperature, and the application of load when the shaft commences rotating. With this rise in temperature, oil is forced out of the pores, as the volumetric expansion of the oil is much greater than that of the metal. The constant flow of oil set up is maintained automatically in direct relationship to the combined effects of the temperature, load, and speed. When rotation of the shaft stops, the oil is re-absorbed in the porous reservoir.

Due to this manner of operation, the quantity of oil used is infinitesimal, and it is thus that the oil contained in SHORLUBE bearings is sufficient to give good lubrication over a period of many years.

CHEMICAL COMPOSITION:

Copper	87.5% minimum.
Tin	9.5 - 10.5%
Carbon	0.5 - 1.5%
Iron	Balance
Total of other elements	0.5%

PHYSICAL PROPERTIES:

Density	6.0 - 6.4 gms/cc.
Porosity	22% by volume.

MECHANICAL PROPERTIES:

U.T.S	76 MPa (11,000 PSI.)
Elongation	1%
"K-Strength" Constant	117 MPa (17,000 P.S.I.)

COMPARABLE SPECIFICATIONS:

A.S.T.M	B438 Grade 1 Type 1
S.A.E.	840
M.P.I.F	CTG - 1001 - K17

Other Alloys

As noted above the material used for our standard range of bearings is 90/10 bronze. In instances where other materials are preferred it may be that existing tooling will provide a bearing of the desired dimensions, Each case must be reviewed for feasibility and in all such cases volume production is a mandatory aspect.

SHORLUBE

Installation & Sizing

When calculating the SHORLUBE bearing sizes required, the “close-in” of the bearing during assembly must be taken into consideration. This “close-in” depends mainly on the material of the housing and also on the wall thickness of the bearing. Soft housing materials, such as aluminium, produce less “close-in” than cast iron or steel. The “close-in” in a rigid housing that is not liable to give almost approximates the press fit. Average Press Fit and Running Clearance are shown in Figure 1.

It is customary to provide a chamfer in the housing bore to serve as a lead for the bearing. An unchamfered edge is undesirable as it might shear metal from the bearing O.D. thereby seriously reducing the press fit.

SHORLUBE bearings are manufactured to comply with Australian Standards and recommended for fitting into housings made to H7 limits. Providing the housing is rigid and complies with H7 limits, and that a fitting pin to s5 similar to Fig 3 Page 11 is used, the resulting fitted bearing bore will be F7.

The bearing dimensions ultimately selected will be influenced by the method of installation chosen, further, the bore size may be controlled by the method of installation selected.

The several methods commonly employed are:-

(i) No Tool Contacting Bore:

This method allows the Bore to close-in without restraint. The approximate amount of close-in may be determined in advance from Figure 2.

(ii) Combination Insertion & Sizing Plug:

The amount of close-in may be controlled by use of a combination insertion and sizing tool. The plug diameter should be approximately 0.008mm (.0003 in.) greater than the desired final bearing I.D. Bearing must be such that the plug fits freely in the bearing I.D. before installation. When the bearing is pressed into the housing, its I.D. will close-in on the plug. SHORLUBE bearings generate their own oil film so there is no difficulty in extracting the plug. Upon its withdrawal, the bearing I.D. will spring back approximately 0.008mm (.0003 in.) in most cases but the exact amount must be determined by trial. See Figure 3.

(iii) Reaming

SHORLUBE bearings may be reamed without destroying porosity provided a dead sharp cutting tool is used. It Is not recommended for volume production, however, since a dull tool will smear the bearing surface closing some of the pores and reducing the self lubricating qualities of the bearing.

(iv) Burnishing

For volume production, accuracy under 0.025mm (.001 in.), a burnishing tool is recommended, like that shown below see figure 4. Another method of accurate sizing, particularly for self aligner types of bearings is to use a steel ball pushed through the bore; slight variation can be made to the diameters of standard steel balls by an acid etching process.

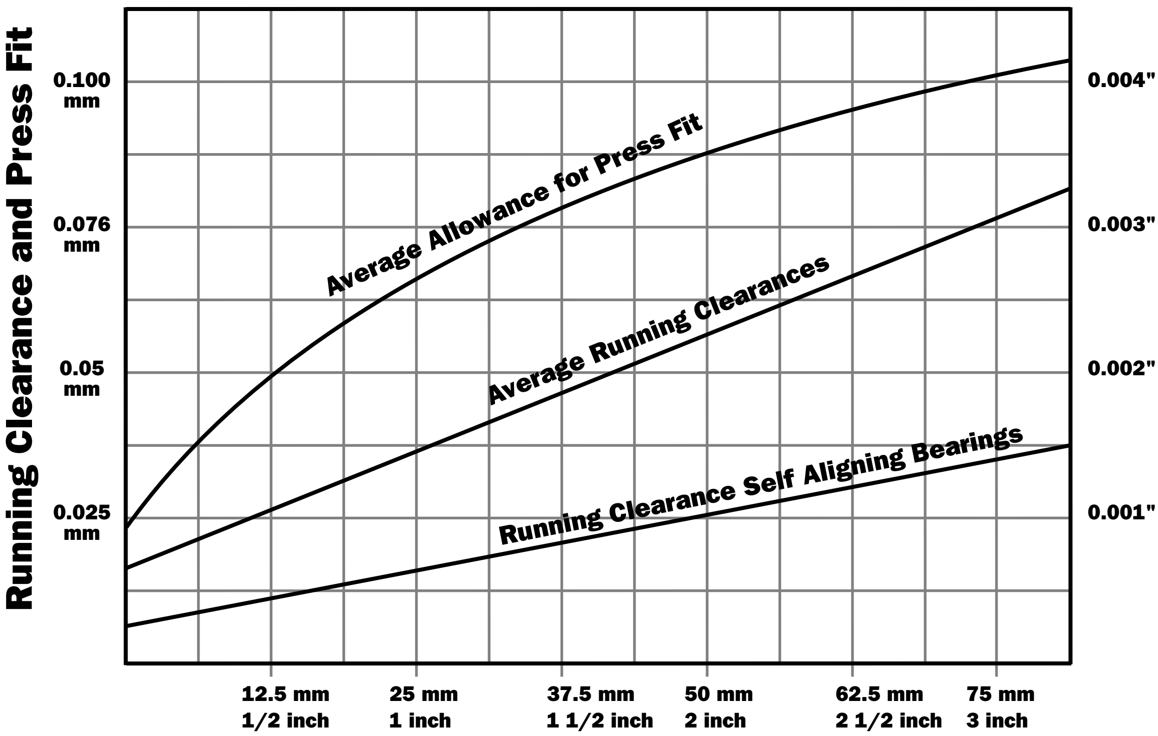


FIG 1 Shaft Diameter

Bore close-in as related to wall thickness (approximate values) for simple press fit.

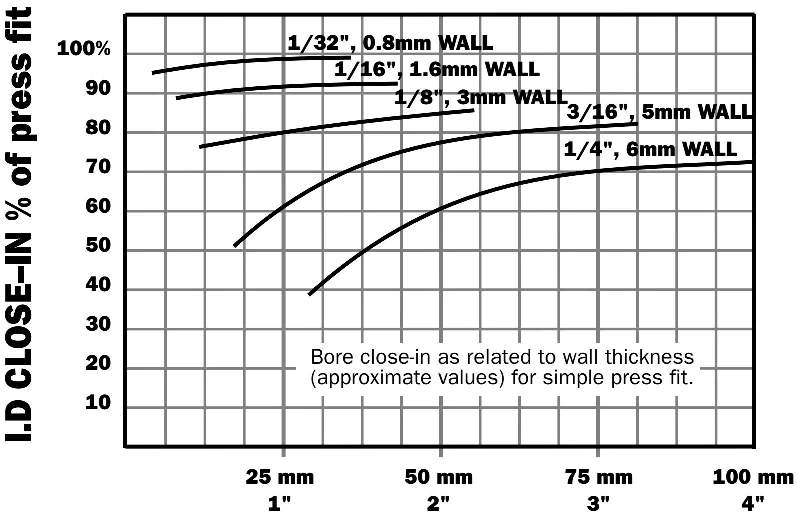
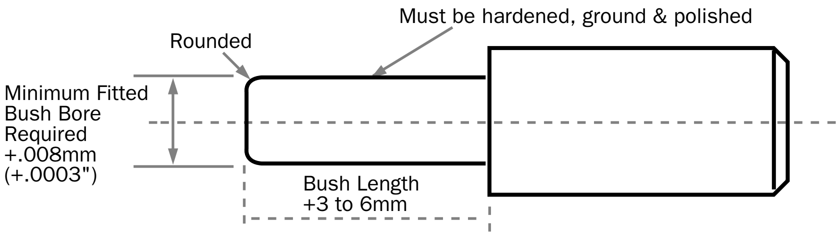
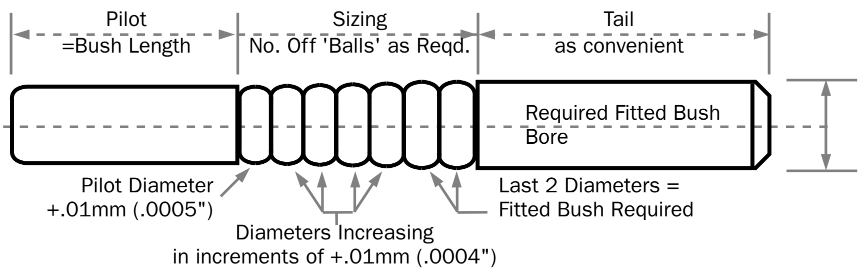


FIG 2 Bore Close-In



Combination Insertion and Sizing Plug
FIG 3



Burnishing Tool
FIG 4

The normal load carrying capacity of SHORLUBE bearings is expressed as PV factor (pressure x surface velocity) where-

P the load in p.s.i. on the projected bearing area (bearing I.D. x length).

V = surface velocity of the shaft in feet per minute.

SHORLUBE bronze has a permissible PV factor of 50,000. (Imperial dimensions only)

Shaft Velocity		**Permissible Loads**			
Metres/min	Feet/min	Bronze		Iron	
		MPa	(P.S.I.)	MPa	(P.S.I.)
Slow and Intermittent		28	4000	56	8000
>8	>25	14	2000	21	3000
15 - 30	50-100	3.5	500	5.0	700
30 - 45	100 - 150	2.3	325	2.8	400
45 - 60	150 - 200	1.8	250	2.1	300
*60	*200	Refer to Load/Speed Chart, Fig 5.			

* For shaft velocities over 200 feet per minute refer to the load speed chart Figure 5.

FACTOR OF SAFETY

The load speed chart is based on normal usage where lubrication is supplied by the bearing itself. The chart provides for a limited factor of safety.

Where adverse operating conditions exist, however, the Safety Factor required may be as high as 4. A generous Factor of Safety should, of course, be provided where continual operation is essential.

CONDITIONS WHICH INCREASE PERMISSIBLE PV

i.e. permit a greater load or higher velocity in the order of importance, 1 to 4.

1. Shaft Hardness and Finish.

A hardened or chrome plated shaft ground to a finish of 0.3 micron or better, will allow much closer bearing clearances, decrease wear on both bearing and shaft, and ensure trouble free operation over long periods.

2. Additional Lubrication.

Pressure lubrication or extra oil supplied from a reservoir or pump will allow a much higher PV.

3. Cooling.

Forced air, oil circulation or other means of cooling the bearing increase the permissible PV factor.

4. Instantaneous Loads

or loads of short duration (shock loads excepted) increase the permissible PV factor.

CONDITIONS WHICH REDUCE PERMISSIBLE PV

i.e. reduce the load carrying capacity or permissible velocity.

These same conditions adversely affect all bearings, regardless of type or make, and are here enumerated as a reminder of normal bearing practice.

1.General Conditions

Poor shaft finish, out of round or soft material, dust, grit, moisture and corrosive fumes adversely affect PV.

2. Low speeds, continual start-stop operation, oscillatory or reciprocating motion.

While SHORLUBE is less affected than solid materials, the foregoing conditions reduce the permissible pv factor.

3. High Speeds.

Continuous operation at high surface velocities reduce permissible PV. Moderately increasing bearing clearances may offset this loss in PV.

4. Shock Loading.

May reduce permissible PV by as much as 50%.

5. Extreme Temperature.

Abnormally high or low operating temperatures affect both the actual shaft clearance and the physical properties of the lubricant.

6. Extreme Bearing Clearance.

Excessively close bearing clearances (as might occur in precision tools) or extremely loose bearing clearances (as might occur where alignment is a consideration) adversely affect permissible PV

7. Shaft Runout, Deflection or Misalignment.

These conditions impose an unequal load on a bearing surface and reduce permissible PV. However, increasing the bearing clearance or using a self aligning spherical bearing will frequently eliminate excessively high localized loadings and help to maintain permissible PV at normal values.

8. Revolving Bearing.

If a bearing revolves at high speed on a stationary shaft, centrifugal force will result in a loss of oil on the bearing surface and reduce permissible PV.

THRUST BEARINGS

The permissible PV factor for thrust bearings is normally of the order of 10,000. Immersion in oil, intermittent loading and, especially, forced circulation of oil permit higher values.

SHORLUBE sintered bronze bearings load chart (PV=50,000)

Approximate load on projected bearing area permissible with given speed and shaft diameter.

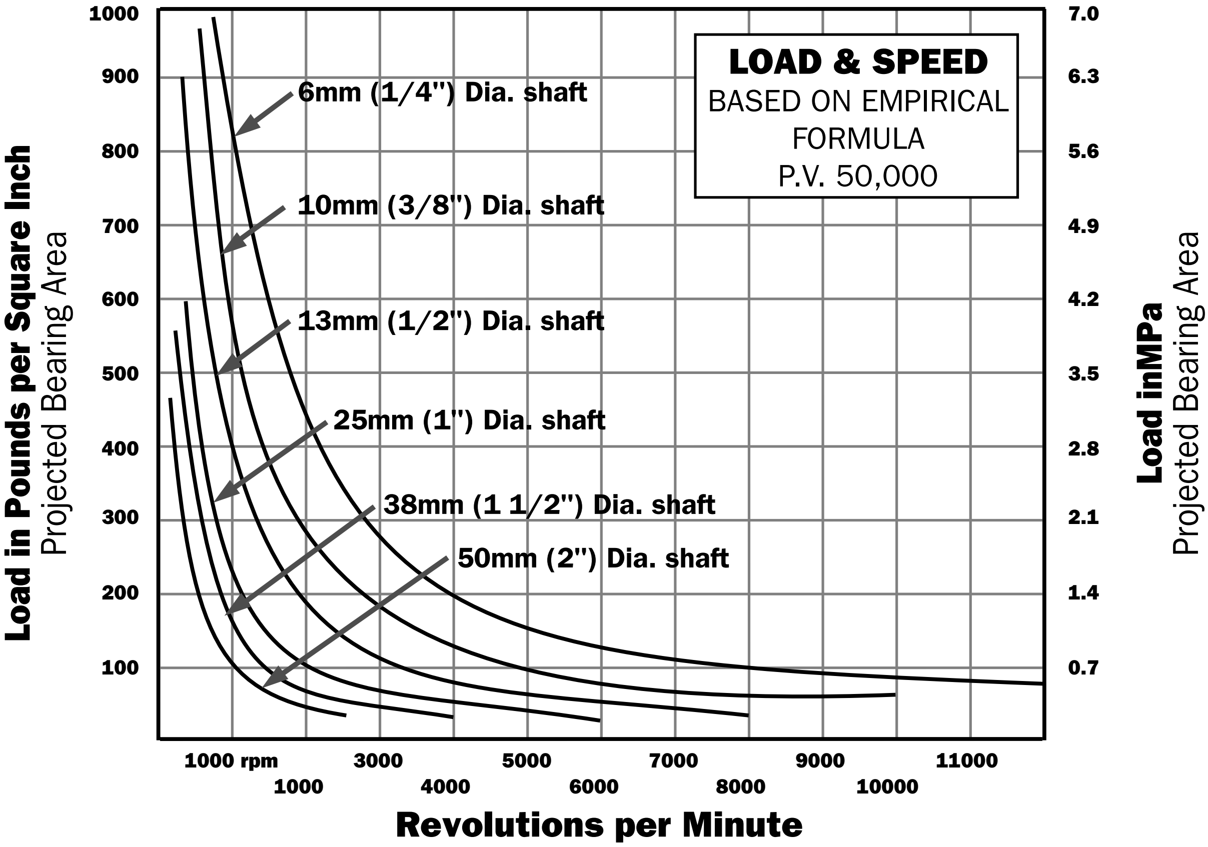


FIG 5

Machining of Sintered Bronze

THE AIM and objective of the powder metallurgy industry is to eliminate machining wherever possible, and to produce the various components to the finished shapes; unfortunately occasions do arise when this is not possible, because of side holes, tapped holes, undercuts, re-entrant angles, or when quantities such as sample lots for pilot production do not warrant expensive tooling, and these parts must be produced from blanks.

Unfortunately one of the most important features of Sintered Metal, its inherent porosity, causes some machining difficulty by presenting a discontinuous surface to the edge of the cutting tool, thereby causing the cutting edge to be subjected to a series of impacts as it leaves a pore area and re-enters the metal. These impacts cause the tool to become dulled resulting in poor finishes, and in the case of oil impregnated bearings, smearing over of the interconnecting pores so preventing the flow of oil from the inner pores.

The answer to this problem is to use dead sharp cutting tools preferably of the harder grade of Tungsten Carbide, high speeds and fine feeds.

TURNING: For turning we recommend cutting speeds of 100 metres per minute (350SFPM) and feeds of 0.025mm to 0.1 mm per revolution (0.001" - 0.005") with tool profiles as shown in Figure 6. When rough machining is necessary and surface porosity is not a requirement, surface speeds of 150 metres per minute (500SFPM) may easily be achieved.

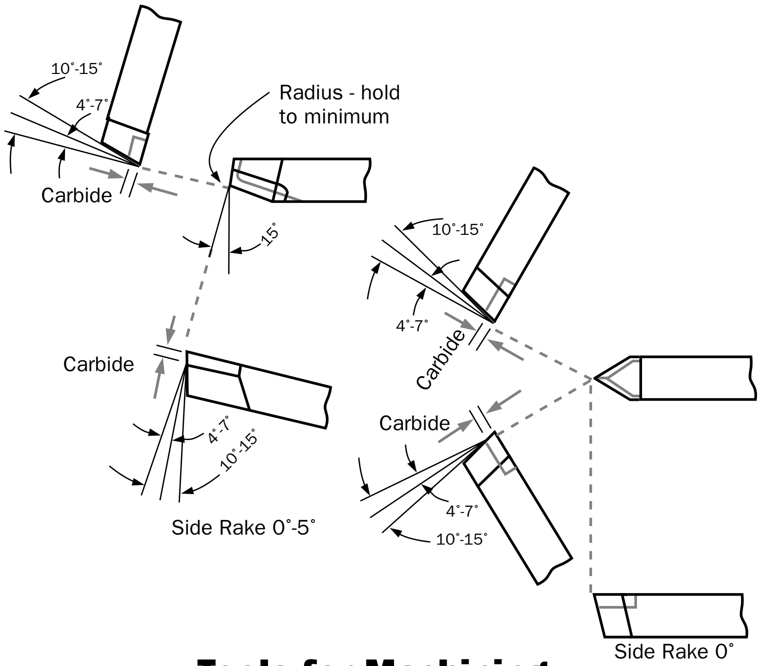
DRILLING: Drilling can be carried out at speeds of 20 metres per minute (70 SFPM) and more, using HSS drills; compressed air is recommended for cooling and swarf clearance.

TAPPING: Tapping is readily accomplished and once again compressed air is used for cooling and swarf removal. In this particular operation we would strongly recommend special tapping oils be used. Excellent results have been achieved with these commercially available products.

COOLANTS: It will be noticed that we have not recommended any coolants other than compressed air as contamination of the impregnant oil is undesirable. In any case, re-impregnation of all components is recommended after machining operations, to overcome any possible loss of lubricant.

Where possible, Collets, expanding mandrels and similar fixtures should be used for chucking these materials, particularly the bronzes, as chuck jaws not only mar the component, but do not hold the parts very efficiently.

In conclusion we would stress that Sintered Metals are not really difficult to machine if you abide by the rules, particularly in regard to the sharpness of the cutting edges. A dull tool which will still do a good job on a cast or wrought metal is not necessarily sharp enough for a sintered material.



Tools for Machining
FIG 6

Moulding in Place

Shorlube bearings, due to their porosity, can be readily moulded into rubber, die castings & plastics. When required for this purpose please order DRY bearings. Impregnation is obtained by submerging the entire part in oil heated to approximately 80°C for 30 minutes. The bearings being porous, readily absorb the oil.

Removing the Oil

To remove all the oil from Shorlube Bearings, simply immerse it in an active oil solvent, such as clean lead free petrol or trichlorethylene. Two or three hours should be allowed and the solvent should be changed two or three times, as needed during this period. Allow to dry by evaporation. Necessary ventilation precaution should be observed.

Storage

Shorlube oil-impregnated bearings can be stored indefinitely in suitable containers. Wood, ordinary paper and cardboard are not suitable since they absorb oil from the bearing. Properly stored in metal or plastic containers and protected against dust, oil-impregnated units retain their oil supply indefinitely.

Standard Manufacturing Tolerances

Plain & Flange Bearings

Imperial Sizes

I.D. & O.D.	TOLERANCE
Up to 1½"	+ .000 - .001"
1½" to 2"	+ .000 - .0015"
2" to 3½"	+ .000 - .002"

LENGTH

UP to 1½"	±.005"
1½" to 3"	±.0075"

FLANGE DIAMETER

ALL SIZES	±.005"

FLANGE THICKNESS

ALL SIZES	±.0025"

BODY TO FLANGE RADIUS:

BODY O.D.	RADIUS
UP to ½"	.012"
1½" to 1 3/16"	.024"
1 3/16" UP	.032"

CONCENTRICITY I.D. To O.D.

Maximum Total Indicator Reading T.I.R.

Up to 1½" I.D.	.003" T.I.R.
Over 1½" I.D.	.004" T.I.R.

Metric Sizes

Manufactured to: A.S. 1654.1–1995
ISO 286-1 : 1998

TO PROVIDE FITS FOR:

I.D. E7 as listed A.S. 1654.2-1995
O.D.r7 as listed A.S. 1654.2-1995

LENGTH	TOLERANCE
As listed:	A.S.1654.2-1995 Js l3

FLANGE DIAMETER

All sizes as listed A.S. 1654.2-1995
Js 13

FLANGE THICKNESS

All sizes as listed A.S. 1654.2-1995
Js 13

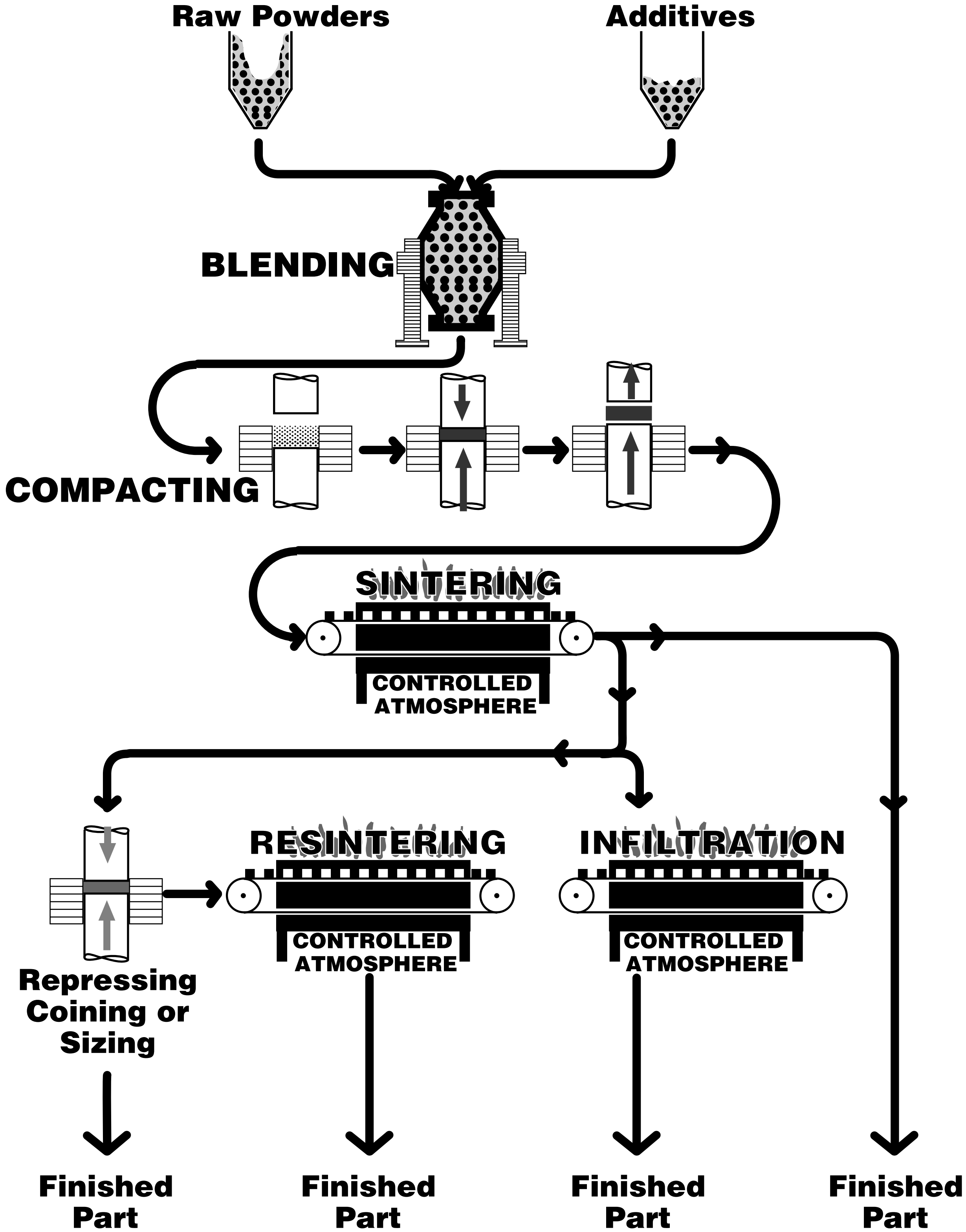
CONCENTRICITY I.D. to O.D.

Up to	l2mm I.D.	.05mm T.I.R
l2mm to	35mm I.D.	.08mm T.I.R
Over	35mm I.D.	.10mm T.I.R

Thrust Washers

Actual dimensions and tolerances per catalogue listing.

The Powder Metallurgy Process



IN ADDITION: Powder metallurgy parts may be heat-treated, tumbled, machined, oil impregnated or given a variety of other subsequent finishing operations.

Sintered metal filters & silencers

Being all metal, Shorlube filters have great intrinsic strength, so they can be used with a much wider pressure differential than most other filter materials.

The accuracy of the P/M process means you can specify particle extraction from 10 to 50 microns.

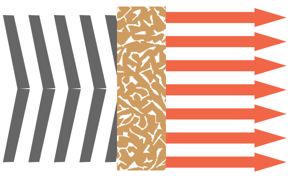
P/M filters can generally be cleaned simply by backwashing or ultrasonic cleaning.

Bronze is standard. Cupro-nickel and stainless steel optional.

Uses of P/M filters

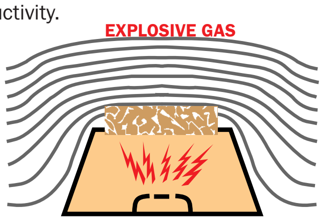
SILENCING
controlling noise emission from air exhausts.

DIFFUSION
Gases and/or liquids.



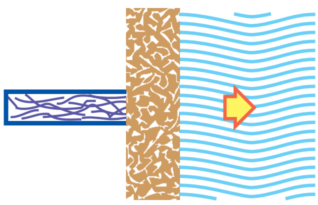
VENTING
pressures equalized while dust is excluded.

FLAME ARRESTING
P/M bronze filters are make excellent flame arrestors with their relatively high heat conductivity.



FILTRATION
water, fuel and gas lines.

DAMPENING
pressure or vacuum devices may be protected by Shorlube filters used as snubbers.



Shorlube Components

(continued from back cover)

P/M components, hard at work in:

Appliances	Office machinery	Sporting Goods	Farm equipment
Door locks	Electrical switches	Exhaust Gaskets	Garden equipment
Automotive	Power tools	Transmissions	

The alloy of your choice, 'moulded' to fit your design

Often, we can make your parts complete, ready to assemble, reducing your costs significantly.

P/M is a mass production process so the reduction in costs can be startling - especially compared to manual or CNC machining in-house. Even when complex parts require secondary operations such as drilling or tapping, Shorlube components will give you a highly productive head start.

Indeed, many manufacturers find that P/M has the strength of wrought metal with the price and versatility of plastics.

If your processes employ cast or machined parts, consider the P/M alternative.

Compacting & Sintering

How powder develops the strength you need.

Metal powders are compacted in precision tooling and fed into the sintering furnace. As the metal nears melting point it is bonded resulting in ready-formed components without the expense and waste of machining or milling.

- Brass
- Bronze
- Carbon Steel
- Stainless Steel
- Copper Steel
- Nickel Steel
- Iron
- Iron Copper

Choose your metal

P/M parts can be sized, coined or repressed to exacting tolerances - as close as 0.012 mm (0.0005”) on diameters and 0.15 mm (0.006”) on lengths.

Parts can be smaller than a shirt button, up to a component of 150 mm diameter or more. Tensile strengths, for example, for a heat treated Nickel/Steel component may exceed 770 MPa (112,000 p.s.i.).

You may choose to specify a porosity that allows impregnation with oil or wax. P/M components can even be infiltrated with copper to aid final machining, plating or to render them impervious for specific applications, such as in fluids.

SHORLUBE

Components

on short lead times ...

Quality Control

Shorlube Industries is a quality certified company.

Every step of the manufacturing process is sampled and monitored for precision and consistency.

Proudly manufactured in Australia

With half a century of leadership in powder metallurgy, Shorlube's design, engineering and manufacturing skills are all right here in Australia - where and when you need them

Manufacturers

Cut your machining and finishing costs with Shorlube components. Accurate, strong and economical.

You'll find Shorlube components hard at work in an amazing variety of applications such as cars, door locks, appliances, farm equipment and power tools.

Using metal powders as raw materials, accurate shapes are compacted, sintered and worked in medium to high volumes at surprisingly low unit cost.

Different blends of metal powder produce the desired qualities of strength, hardness, corrosion resistance or surface appearance. By bonding two separate shapes, parts of surprising complexity can be made, adapting the metals to the needs of the designer. A high degree of accuracy and repeatability is maintained.

Strong? Even con-rods are made in sintered metal.

You'll find more information on Shorlube Components on the inside back page.

- Bearings
- Brackets
- Bolts
- Cams
- Flanges
- Gaskets
- Impellers
- Levers
- Special parts
- Sprockets

SHORLUBE