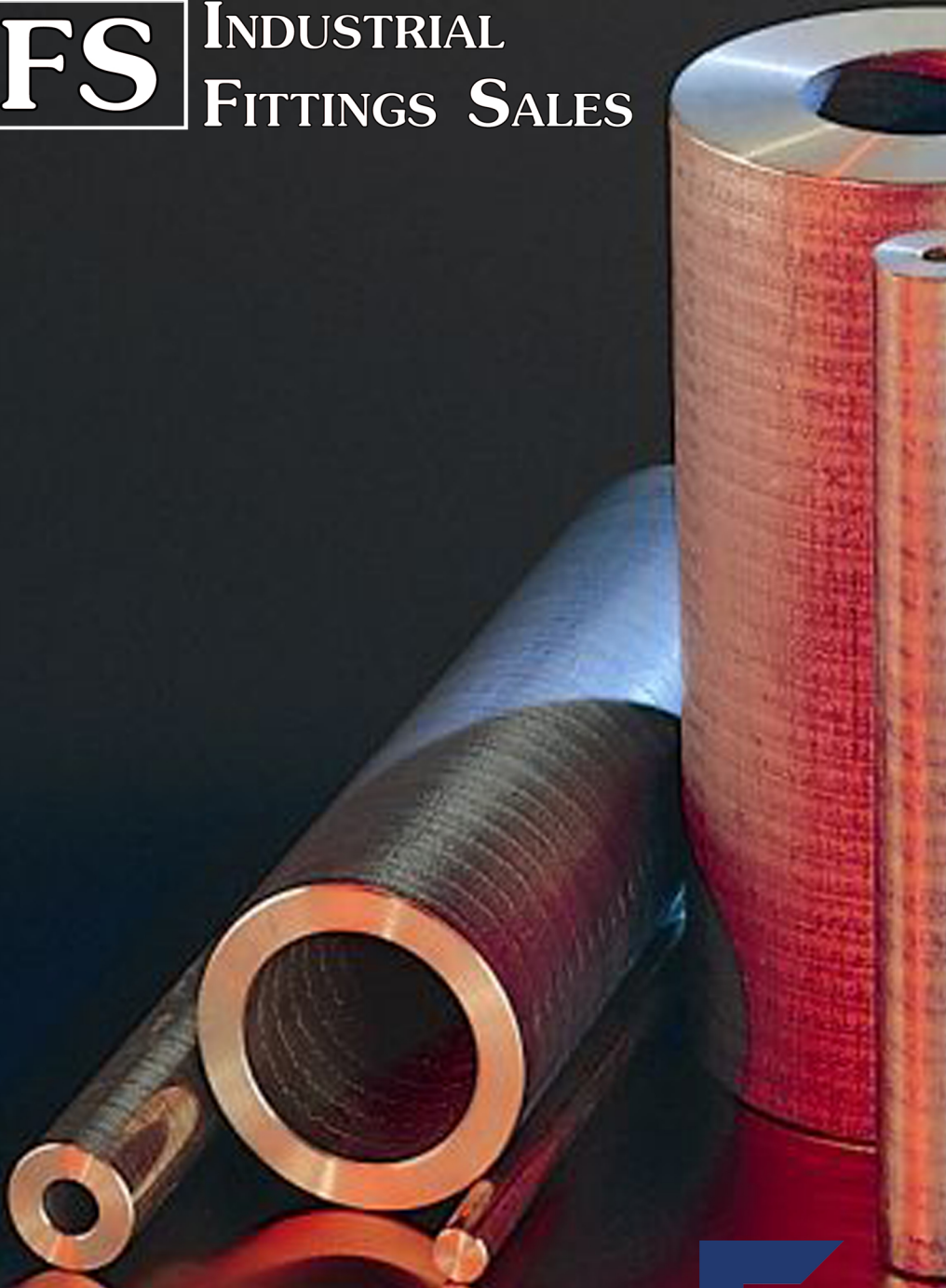


IFS INDUSTRIAL FITTINGS SALES



**Engineered Bushes, Continuous &
Spuncast Bronze Information Booklet**



In today's economic climate we understand the need to be aware of your options. We also know that you can't afford to wait for replacement parts or material. **so don't!**

Before you make your decision about where to buy your Continuous or Spuncast Bronze, speak to the team at IFS and discover why Fraser Bronze is THE leading Continuous or Spuncast Bronze.

A.W. Fraser is **the** leading supplier/manufacturer of Continuous Cast and Spuncast Bronze in the Pacific Rim region. We have reached this position because we do the little things better. For example;

- * *Immediate Technical Back up available.*
- * *On Time Delivery*
- * *Competitive Pricing*
- * *An extensive Product Range (LG2, Aluminium Bronze-954 and Phosphor Bronze-PB1 ex Stock)*
- * *A size range from 1/2" to 20" in both solid & hollows. Plus the range of Finished Machined Bushes.*
- * *Your requirements are manufactured under the strictest Quality Control to Australian and International Standards.*
- * *All materials manufactured and distributed under quality systems meeting ISO 9001:2008*

The above are not hopes or dreams, they are **facts**. We have built our reputation over many years of involvement in this market. Our involvement is due to our intention to support **all** of the market, by means of our distributors.

If the above is of interest to you, we would appreciate the opportunity to provide you with further details. Contact your local IFS branch Today!

Environmental awareness and focus are at the very heart of our business.

A W Fraser utilises recycling processes to produce all of our bronze and has in place programmes to conserve resources and recycle waste, whilst minimising energy consumption and carbon emissions. 70% of the electricity consumed is from renewable resources.

The factory has accreditation to the highest international Environmental Management Standard AS/NZ ISO 14001. All emissions are closely monitored both by A W Fraser and external regulating bodies to ensure compliance with New Zealand's stringent environmental requirements.



A.W. Fraser Alloy LG2 is a general purpose leaded gunmetal conforming to the requirements of B.S.1400 – 1985 alloy LG2. (BS EN 1982 CuSn5Zn5Pb5). See page 9 for stock list and weights.

LG2 has excellent machining properties, medium strength, good pressure tightness and is not subject to dezincification (Category I alloy), and has reasonable corrosion resistance to seawater and brine, making it suitable for pump and valve components.

LG2 is suitable for bearings having light loads and low to medium speeds with adequate lubrication, and for very light duty gears when loading is negligible.

The composition of A.W. Fraser alloy LG2 is strictly controlled as are the casting conditions. LG2 products are manufactured using the latest continuous and centrifugal casting technology.

ALLOY LG2 – LEADED GUNMETAL (85-5-5-5) SUMMARY OF PROPERTIES

Chemical Composition – percent

Element			Nominal
Tin	Sn	4.0 – 6.0	4.4
Lead	Pb	4.0 – 6.0	5.5
Zinc	Zn	4.0 – 6.0	5.5
Nickel	Ni	1.0 maximum	
Iron	Fe	0.30 maximum	
Aluminium	Al	0.005 maximum	
Antimony	Sb	0.25 maximum	
Copper	Cu	Balance	
Total Impurities:		0.80 maximum	

Mechanical Properties [Typical]

	Continuous Cast	Centrifugal Cast
Yield Strength	120 MPa (17,400 psi)	120 MPa (17,400 psi)
Ultimate Tensile Strength	300 MPa (43,500 psi)	270 MPa (39,000 psi)
Elongation	20%	20%
Typical Hardness	75 BHN	75 BHN
Compressive Strength 0.1% Permanent Set	100 MPa (15,000 psi)	
Specific Gravity	8.8	
Machinability Rating (Free Machining Brass=100)	84	
Max. Operating Temperature	230°C (450°F)	
Stress Relieving Temperature	260°C (500°F)	
Time at Temperature	1 hour per 25mm of section thickness	

Comparative Specifications

BS1400 – LG2; AS1565 83600; ASTM B505, B271 – 83600; SAE 40; JIS (Japan) H5111 – BC6; DIN (Germany) 1705 – RG5; ISO 1338 – CuPb5Sn5Zn5; BS EN 1982 CuSn5Zn5Pb5

A.W.Fraser Alloy 954 is a high strength aluminium bronze conforming to the requirements of ASTM B505 for Continuous Cast and ASTM B271 for Centrifugal Cast alloy 95400. See page 10 for stock list and weights.

Alloy 954 is very hard and abrasion resistant, having excellent strength and wear resistance with reasonable machining properties. These physical properties remain good at elevated temperatures. General corrosion resistance is good but under some circumstances may suffer dealuminification.

Alloy 954 is suitable for high strength bearings, and has good impact resistance, but poor anti seizure properties requiring reliable full film lubrication to prevent metal to metal contact and possible scoring.

The composition of A.W. Fraser alloy 954 is strictly controlled as are the casting conditions. Alloy 954 products are manufactured using the latest continuous and centrifugal casting technology.

ALLOY 954 – ALUMINIUM BRONZE SUMMARY OF PROPERTIES

Chemical Composition - percent

Element			Nominal
Aluminium	Al	10.0 – 11.5	10.5
Iron	Fe	3.0 – 5.0	4.0
Nickel	Ni	1.5 maximum	0.5 maximum
Manganese	Mn	0.5 maximum	
Copper	Cu	Balance	
Total Impurities:		0.5 maximum	

Mechanical Properties [Typical]

Yield Strength (minimum)
Ultimate Tensile Strength (minimum)
Elongation
Hardness (Typical)
Shear Strength (Typical)

Continuous Cast	Centrifugal Cast
221 MPa (32,000 psi).	205 MPa (29,500 psi)
586 MPa (84,500 psi).	515 MPa (74,500 psi)
12% mm.	12% min.
180 BHN	170 BHN
324 MPa (46,500 psi)	

Compressive Strength 0.1% Permanent Set (Typical)
Specific Gravity
Machinability Rating (Free Machining Brass=100)
Max. Operating Temperature
Stress Relieving Temperature
Time at Temperature

265 MPa (38,000 psi)
7.45
60
260°C (500°F)
316°C (600°F)
1 hour per 25mm of section thickness

Comparative Specifications

AS1565 95400; ASTM B505, B271 – C95400; SAE J461,J462; DIN 1714 – G-CuAl11Fe4;
UNI 5274 – CuAl11Fe4

We have a huge range of other alloys available for specific purposes. Generally speaking there is a 500 Kg minimum order quantity for these other alloys. This can be alleviated if you were to use our machine shop for manufacturing the part in question - we would simply re-melt any excess material and build this into the component price.

The list of alloys includes:

Alloy 274	Alloy 678	Alloy CuAl10Fe5Ni5
Alloy 352	Alloy 686	Alloy CuSn12
Alloy 360	Alloy 844	Alloy CuSn12Ni Micrograin®
Alloy 370	Alloy 857	Alloy CuSn12Ni
Alloy 385	Alloy 862	Alloy CuZn25Al5
Alloy SAE 430B	Alloy 863	Alloy CuZn34Al2
Alloy 464	Alloy 865	Alloy CZ132
Alloy 464LL	Alloy 867	Alloy EMS 210
Alloy 486	Alloy 905	Alloy G1
Alloy 630	Alloy 907	Alloy HTB2
Alloy 642	Alloy 938	Alloy LB2
Alloy 643	Alloy C94100 (EMS 403)	Alloy LB4
Alloy 660	Alloy 952	Alloy LG1
Alloy 668	Alloy 953	Alloy LG2
Alloy 673	Alloy 954	Alloy LG2 Low Lead
Alloy 673 Continuous Cast	Alloy 955	Alloy LG2M
Alloy 673 Extrusions 1.2	Alloy 959	Alloy LG4
Alloy 673 Extrusions Under 1	Alloy AB1	Alloy PB1
Alloy 673 Heat Treated	Alloy AB2	Alloy PB2
Alloy 674	Alloy CA 104	Alloy UNI 5275

Data sheets are available for all of the above alloys. There may be other alloys available as well, please feel free to inquire with our staff who will be only be to happy to answer your enquiry.

Machining allowance

All sizes have the following allowance for finish machining.

< 3-3/4"	OD	+	.040"
	ID	-	.060"
> 4" ≤ 5"	OD	+	.070"
	ID	-	.090"
> 5" ≤ 6"	OD	+	.094"
	ID	-	.108"
> 6" ≤ 20"	OD	+	.109"
	ID	-	.120"

(note: allowances are approximate)

Nominal chemical analysis %

Copper	85	Tin	5
Zinc	5	Lead	5

Mechanical properties

U.T.S.	17.5 – 22.0 tons/in ²	(270 – 340 MPa)
Proof Stress	0.2% 6.5 – 9 tons/in ²	(100 – 140 MPa)
Elongation	13 – 35%	
Hardness	75 – 90 BHN	

Material specification

B.S.	1400	LG2	Equivalent to:
U.S.A.	SAE 40	C83600	
Japan	JIS	H5111	BC6C
Germany	DIN	1705	RG5
Australia	AS	1565	Alloy C83600

Machining allowance

For alloys LG2, 660, PB1, PB2, CuSn12Ni, 844, LB2, 907, 922 927 Hollow and Solid Round Bars - Where tolerances are not specified by Customer or job sheet.

Nominal Outside Diameter	Outside Diameter Machining allowance + tolerance	Inside Diameter Machining allowance + tolerance
≤ 3 3/4" (102mm)	+0.030 / + 0.040" (+0.76 / 1.02mm)	-0.050 / -0.064" (-1.27 / -1.62mm)
> 4" (102mm) ≤ 5" (127mm)	+0.060 / + 0.071" (+1.52 / 1.80mm)	-0.080 / -0.090" (-2.03 / -2.29mm)
> 5" (127mm) ≤ 6" (153mm)	+0.080 / + 0.094" (+2.03 / 2.38mm)	-0.100 / -0.108" (-2.54 / -2.74mm)
> 6" (153mm) ≤ 8" (204mm)	+0.100 / + 0.140" (+2.54 / 2.89mm)	-0.110 / -0.120" (-2.81 / -3.04mm)
> 8" (204mm) ≤ 10" (255mm)	+0.157 / + 0.177" (+4.00 / 4.50mm)	-0.177 / -0.197" (-4.50 / -5.00mm)

For alloys 954, 864, 865, 955, 953, AB2, 857, 360, 352 Hollow and Solid Round Bars- Where tolerances are not specified by Customer or job sheet.

Nominal Outside Diameter	Outside Diameter Machining allowance + Tolerance	Inside Diameter Machining allowance + Tolerance
≤ 3" (76.2mm)	+0.067 / +0.077" (+1.70 / 1.97mm)	-0.115 / - 0.125" (-2.92 / -3.17mm)
> 3" (76.2mm) ≤ 4" (102mm)	+0.100 / +0.110" (+2.54 / 2.81mm)	-0.115 / - 0.125" (-2.92 / -3.17mm)
> 4" (102mm) ≤ 5 1/2" (140mm)	+0.120 / +0.130" (+3.04 / 3.30mm)	-0.125 / - 0.145" (-3.18 / -3.68mm)
> 5 1/2" (140mm) ≤ 6 1/2" (165mm)	+0.140 / +0.170" (+3.55 / 4.31mm)	-0.135 / - 0.155" (-3.43 / -3.93mm)
> 6 1/2" (165mm) ≤ 10" (255mm)	+0.180 / +0.210" (+4.57 / 5.33mm)	-0.190 / - 0.210" (-4.83 / -5.33mm)

Standard Bar Length: Where not specified by Customer or job sheet.

LG2, 660, C863, 864, C865	124" ±1" (3150mm ± 25mm)
C954	146.5" ± 0.5" (3721mm ± 13mm)
C955	145" ± 1" (3680mm ± 25mm)

FB Imperial size range progressive size list in inches (indexed by inside diameter)

inside d.	outside d.	length	part no.	inside d.	outside d.	length	part no.	inside d.	outside d.	length	part no.
5/16	7/16	1/2	FB1	5/8	3/4	1-3/4	FB308	13/16	15/16	2	FB603
5/16	7/16	3/4	FB3	5/8	3/4	2	FB309	13/16	1	1-1/2	FB605
5/16	7/16	1	FB4	5/8	3/4	2-1/4	FB310	13/16	1	2	FB606
5/16	7/16	1-1/2	FB2	5/8	3/4	2-1/2	FB311	13/16	1	2-1/2	FB607
3/8	1/2	3/4	FB10	5/8	3/4	3	FB312	13/16	1-1/16	2	FB608
3/8	1/2	1	FB11	5/8	13/16	1	FB313	13/16	1-1/16	2-1/2	FB610
3/8	1/2	1-1/2	FB13	5/8	13/16	1-1/2	FB315	13/16	1-1/16	3	FB612
3/8	1/2	2	FB12	5/8	13/16	2	FB317	7/8	1	1	FB700
7/16	9/16	3/4	FB19	5/8	13/16	2-1/2	FB319	7/8	1	1-1/4	FB702
7/16	9/16	1	FB20	5/8	7/8	3/4	FB321	7/8	1	1-1/2	FB703
7/16	9/16	1-1/2	FB22	5/8	7/8	1	FB322	7/8	1	2	FB705
7/16	9/16	2	FB25	5/8	7/8	1-1/4	FB324	7/8	1	2-1/2	FB707
7/16	5/8	1	FB36	5/8	7/8	1-1/2	FB325	7/8	1	3	FB708
7/16	5/8	1-1/2	FB27	5/8	7/8	1-3/4	FB326	7/8	1-1/16	1	FB709
7/16	5/8	2	FB29	5/8	7/8	2	FB328	7/8	1-1/16	1-1/2	FB711
7/16	11/16	1	FB39	5/8	7/8	2-1/4	FB329	7/8	1-1/16	2	FB713
7/16	11/16	1-1/2	FB30	5/8	7/8	2-1/2	FB330	7/8	1-1/16	2-1/2	FB715
7/16	11/16	2	FB32	5/8	7/8	3	FB331	7/8	1-1/8	1-1/4	FB717
1/2	9/16	1-1/2	FB100	5/8	1	1-1/4	FB334	7/8	1-1/8	1-1/2	FB718
1/2	5/8	3/4	FB101	5/8	1	2	FB335	7/8	1-1/8	2	FB720
1/2	5/8	1	FB102	5/8	1	2-1/2	FB337	7/8	1-1/8	2-1/4	FB721
1/2	5/8	1-1/4	FB103	11/16	13/16	1	FB400	7/8	1-1/8	2-1/2	FB722
1/2	5/8	1-1/2	FB104	11/16	13/16	1-1/2	FB401	7/8	1-1/8	3	FB723
1/2	5/8	2	FB106	11/16	13/16	2	FB403	7/8	1-1/4	1-1/2	FB725
1/2	11/16	1	FB107	11/16	7/8	1	FB406	7/8	1-1/4	2	FB726
1/2	11/16	1-1/2	FB110	11/16	7/8	2	FB409	7/8	1-1/4	2-1/2	FB728
1/2	11/16	2	FB112	11/16	15/16	1	FB412	7/8	1-1/4	3	FB729
1/2	3/4	3/4	FB99	11/16	15/16	1-1/2	FB413	7/8	1-3/8	3	FB730
1/2	3/4	1	FB113	11/16	15/16	2	FB415	15/16	1-1/16	1-1/2	FB731
1/2	3/4	1-1/2	FB115	11/16	1	2	FB418	15/16	1-1/16	2	FB732
1/2	3/4	1-3/4	FB116	3/4	13/16	1-1/2	FB500	15/16	1-1/16	2-1/2	FB733
1/2	3/4	2	FB117	3/4	7/8	3/4	FB501	15/16	1-1/8	1-1/4	FB734
1/2	3/4	2-1/2	FB119	3/4	7/8	1	FB502	15/16	1-1/8	2-1/4	FB735
1/2	7/8	1-1/2	FB120	3/4	7/8	1-1/4	FB504	15/16	1-1/8	3	FB736
1/2	7/8	2	FB121	3/4	7/8	1-1/2	FB505	15/16	1-3/16	2	FB738
1/2	1	2	FB122	3/4	7/8	2	FB507	1	1-1/16	1-1/2	FB800
9/16	11/16	1	FB200	3/4	7/8	2-1/2	FB510	1	1-1/8	1	FB801
9/16	11/16	1-1/2	FB203	3/4	15/16	1	FB511	1	1-1/8	1-1/4	FB802
9/16	11/16	1-3/4	FB206	3/4	15/16	1-1/2	FB515	1	1-1/8	1-1/2	FB803
9/16	11/16	2	FB207	3/4	15/16	2	FB518	1	1-1/8	2	FB805
9/16	3/4	1	FB210	3/4	15/16	2-1/4	FB519	1	1-1/8	2-1/2	FB806
9/16	3/4	1-1/2	FB214	3/4	15/16	2-1/2	FB520	1	1-1/8	3	FB807
9/16	3/4	1-3/4	FB216	3/4	1	3/4	FB490	1	1-3/16	1-1/2	FB808
9/16	3/4	2	FB217	3/4	1	1	FB522	1	1-3/16	2	FB809
9/16	3/4	2-1/4	FB219	3/4	1	1-1/4	FB523	1	1-3/16	2-1/2	FB810
9/16	3/4	2-1/2	FB220	3/4	1	1-1/2	FB524	1	1-1/4	1	FB811
9/16	13/16	1	FB236	3/4	1	1-3/4	FB525	1	1-1/4	1-1/8	FB812
9/16	13/16	1-1/2	FB222	3/4	1	2	FB526	1	1-1/4	1-1/4	FB813
9/16	13/16	2	FB224	3/4	1	2-1/4	FB528	1	1-1/4	1-1/2	FB814
9/16	7/8	1	FB237	3/4	1	2-1/2	FB529	1	1-1/4	1-3/4	FB815
9/16	7/8	1-1/2	FB227	3/4	1	3	FB530	1	1-1/4	2	FB816
9/16	7/8	2	FB228	3/4	1-1/16	2	FB531	1	1-1/4	2-1/2	FB818
9/16	1	1-1/2	FB231	3/4	1-1/16	2-1/2	FB532	1	1-1/4	3	FB820
9/16	1	2	FB232	3/4	1-1/8	1-1/2	FB533	1	1-1/4	3-1/2	FB821
5/8	11/16	1-1/2	FB301	3/4	1-1/8	2	FB534	1	1-1/4	4	FB822
5/8	11/16	2	FB302	3/4	1-1/8	2-1/2	FB536	1	1-3/8	1-1/2	FB827
5/8	3/4	3/4	FB303	3/4	1-1/8	3	FB537	1	1-3/8	2	FB823
5/8	3/4	1	FB304	3/4	1-1/4	2-1/2	FB538	1	1-3/8	2-1/2	FB824
5/8	3/4	1-1/4	FB305	13/16	15/16	1	FB600	1	1-3/8	3	FB825
5/8	3/4	1-1/2	FB307	13/16	15/16	1-1/2	FB602	1-1/8	1-1/4	1-1/2	FB900

FB metric size range (indexed by inside diameter)

inside d.	outside d.	length	part no.	inside d.	outside d.	length	inside d.	outside d.	length	inside d.	outside d.	length
1-1/8	1-1/4	2	FB901	08	10	10	20	24	30	35	40	40
1-1/8	1-1/4	2-1/2	FB902			20			40			50
1-1/8	1-1/4	3	FB903			30			30			60
1-1/8	1-3/8	2	FB904			40			60			80
1-1/8	1-3/8	3	FB906	08	12	10			80			100
1-1/8	1-3/8	3-1/2	FB907			20	20	30	30	35	45	40
1-1/8	1-3/8	4	FB908			30			40			50
1-1/8	1-1/2	3	FB909			40			50			60
1-1/4	1-3/8	1-1/2	FB1000	10	12	20			60			80
1-1/4	1-3/8	3	FB1001			30			80			100
1-1/4	1-1/2	1	FB912			40	25	30	30	40	45	40
1-1/4	1-1/2	1-1/2	FB914	10	16	20			40			50
1-1/4	1-1/2	1-3/4	FB1002			30			50			60
1-1/4	1-1/2	2	FB1003			40			60			80
1-1/4	1-1/2	2-1/2	FB1004			50			80			100
1-1/4	1-1/2	3	FB1005	12	16	20			100	40	50	40
1-1/4	1-1/2	3-1/2	FB1007			30	25	35	30			50
1-1/4	1-1/2	4	FB1008			40			40			60
1-1/4	1-5/8	1-3/4	FB1009			50			50			80
1-3/8	1-5/8	2	FB1010	12	20	20			60			100
1-3/8	1-5/8	3	FB1011			30			80	45	55	50
1-3/8	1-5/8	4	FB910			40			100			60
1-3/8	1-3/4	4	FB1012			50	30	35	30			80
1-1/2	1-5/8	2	FB1013	16	20	20			40			100
1-1/2	1-3/4	1-1/2	FB996			30			50	50	60	50
1-1/2	1-3/4	2	FB998			40			60			60
1-1/2	1-3/4	2-1/2	FB1014			50			80			80
1-1/2	1-3/4	3	FB1015			60			100			100
1-1/2	1-3/4	3-1/2	FB1016	16	24	30	30	40	30			
1-1/2	1-3/4	4	FB1017			40			40			
1-1/2	2	2-1/2	FB1020			50			50			
1-1/2	2	3	FB1021			60			60			
1-1/2	2	3-1/2	FB1022			80			80			
1-1/2	2	4	FB1023						100			
1-3/4	2	2-1/2	FB1030									
1-3/4	2	3	FB1031									
1-3/4	2	3-1/2	FB1032									
1-3/4	2	4	FB1033									
1-3/4	2-1/8	4	FB1018									
1-3/4	2-1/4	2-1/4	FB1036									
1-3/4	2-1/4	3	FB1037									
1-3/4	2-1/4	3-1/2	FB1038									
1-3/4	2-1/2	4	FB1039									
2	2-1/4	2-1/2	FB1040									
2	2-1/4	3	FB1041									
2	2-1/4	3-1/2	FB1019									
2	2-1/2	2-1/2	FB1050									
2	2-1/2	3	FB1051									
2	2-1/2	3-1/2	FB1052									
2	2-1/2	4	FB1053									
2-1/4	2-3/4	2-1/2	FB1060									
2-1/4	2-3/4	3	FB1061									
2-1/4	2-3/4	3-1/2	FB1062									
2-1/4	2-3/4	4	FB1063									
2-1/2	3	2-1/2	FB1070									
2-1/2	3	3	FB1071									
2-1/2	3	3-1/2	FB1072									
2-1/2	3	4	FB1073									

Specifications

Fraser bronze bearings are manufactured from continuously cast bronze conforming to A51565 grade C83600 (85 1400 LG2).

Mechanical properties

Max. operating temperature	230°C
Max unit pressure load	270 MPa
Tensile strength	270-230 MPa
Proof stress 0.2%	100-140 MPa
Elongation	13-30%
Hardness brinell	75-90 BHN
Coefficient of friction	0.14-0.8
Thermal coefficient of expansion	19.6*10 ⁻⁶ per °C

Tolerances

	Imp.	Metric
Inside dia.	-.0005	-0.01
	+.0015	+0.04
Outside dia.	+.002	+0.06
	+.004	+0.10
Length	+.010	+0.25
	-.010	-0.21

Stock sizes & weights imperial size (note: weights are approximate only)

solid	outside d.	kg/ft	kg/metre	hollow	outside d	inside d.	kg/ft	kg/metre	outside d	inside d.	kg/ft	kg/metre
	1/2	0.392	1.285		1	x 1/2	1.258	4.127	3-1/2	x 2	11.934	39.152
	5/8	0.596	1.956		1	x 5/8	1.090	3.577		2-1/4	10.519	34.510
	3/4	0.843	2.766		1	x 3/4	0.880	2.886		2-1/2	9.178	30.112
	7/8	1.133	3.718		1-1/8	x 3/4	1.260	4.134		2-3/4	7.431	24.381
	1	1.466	4.809		1-1/4	x 1/2	2.062	6.765		3	5.514	18.089
	1-1/8	1.841	6.041			5/8	1.894	6.214	3-3/4	x 1-1/2	16.754	54.968
	1-1/4	2.260	7.413			3/4	1.684	5.523		1-3/4	15.682	51.448
	1-3/8	2.720	8.925			1	1.134	3.721		2	14.438	47.367
	1-1/2	3.224	10.578		1-3/8	x 3/4	2.150	7.053		2-1/4	13.023	42.725
	1-5/8	3.771	12.371			1	1.600	5.250		2-1/2	11.437	37.522
	1-3/4	4.360	14.304		1-1/2	x 1/2	3.037	9.963		2-3/4	9.946	32.630
	2	5.667	18.592			3/4	2.659	8.722		3	8.028	26.338
	2-1/4	7.145	23.440			1	2.109	6.920	4	x 1	21.471	70.443
	2-1/2	8.794	28.850			1-1/4	1.389	4.556		1-1/4	20.760	68.109
	2-3/4	10.613	34.821		1-5/8	x 1	2.661	8.729		1-1/2	19.877	65.213
	3	12.604	41.353			1-1/4	1.940	6.366		1-3/4	18.823	61.756
	3-1/4	14.766	48.446		1-3/4	x 3/4	3.805	12.482		2	17.599	57.738
	3-1/2	17.100	56.100			1	3.255	10.679		2-1/4	16.203	53.159
	3-3/4	19.604	64.316			1-1/4	2.535	8.316		2-1/2	14.636	48.019
	4	22.617	74.202			1-1/2	1.643	5.391		2-3/4	12.898	42.317
	4-1/2	28.522	93.576		2	x 3/4	5.010	16.435		3	11.276	36.995
	5	35.112	115.194			1	4.572	15.000		3-1/4	9.206	30.204
	5-1/2	42.713	140.134			1-1/4	3.852	12.637	4-1/4	x 2	20.466	67.144
	6	50.701	166.338			1-1/2	2.960	9.712		2-1/2	17.503	57.425
	7	69.116	226.756		2-1/4	x 3/4	6.487	21.284	4-1/2	x 2	23.504	77.112
	8	89.935	295.057			1	5.928	19.448		2-1/2	20.541	67.393
						1-1/4	5.340	17.519		3	16.895	55.428
						1-1/2	4.448	14.594		3-1/2	12.891	42.294
						1-3/4	3.386	11.108		4	7.897	25.908
					2-1/2	x 3/4	8.136	26.694	4-3/4	x 3-1/2	15.773	51.748
						1	7.577	24.858	5	x 2	30.093	98.731
						1-1/4	6.846	22.460		2-1/2	27.131	89.011
						1-1/2	6.108	20.037		3	23.484	77.047
						1-3/4	5.045	16.552		3-1/2	19.153	62.838
						2	3.811	12.504		4	14.507	47.594
					2-3/4	x 1	9.397	30.828	5-1/2	x 2	37.794	123.995
						1-1/4	8.666	28.431		2-1/2	34.858	114.361
						1-1/2	7.764	25.473		3	31.237	102.482
						1-3/4	6.875	22.556		3-1/2	26.932	88.359
						2	5.642	18.509		4	21.943	71.990
						2-1/4	4.237	13.901		4-1/2	16.679	54.722
					3	x 1	11.388	37.360	6	x 2	45.781	150.200
						1-1/4	10.657	34.963		2-1/2	42.845	140.566
						1-1/2	9.755	32.005		3	39.224	128.687
						1-3/4	8.682	28.485		3-1/2	34.919	114.563
						2	7.643	25.075		4	29.930	98.195
						2-1/4	6.238	20.466		4-1/2	24.257	79.582
						2-1/2	4.663	15.297		5	18.350	60.204
					3-1/4	x 1	13.550	44.454	6-1/2	x 4	39.080	128.213
						1-1/4	12.819	42.056		5	27.079	88.841
						1-1/2	11.917	39.098	7	x 3	57.727	189.390
						1-3/4	10.844	35.578		4	48.463	158.997
						2	9.601	31.497		5	36.462	119.625
						2-1/4	8.410	27.593		5-1/2	29.435	96.572
						2-1/2	6.835	22.424		6	22.258	73.024
						2-3/4	5.088	16.693	7-1/2	x 6	31.792	104.303
					3-1/2	x 1	15.883	52.108	8	x 3	78.545	257.691
						1-1/4	15.152	49.711		4	69.281	227.298
						1-1/2	14.250	46.752		5	57.281	187.926
						1-3/4	13.177	43.233		6	42.543	139.576
										7	25.684	84.265

Standard lengths

≤4" dia. 10ft

≥4" ≤8" dia. 12ft

(some sizes 1 metre max)

>8" dia. 1 metre maximum

(bars may be cut to order)

solid

outside d.	inside d.	kg/ft	kg/metre
1		1.322	4.338
1 1/4		2.011	6.597
1 1/2		2.843	9.329
2		4.940	16.206
2 1/2		7.612	24.972
2 3/4		9.163	30.062
3		10.859	35.625
3 1/4		12.951	42.491
3 1/2		14.953	49.059
4		19.389	63.611
5		30.222	99.151
6		43.590	143.009
7		59.565	195.420

Hollow

1 1/2	x	1	1.952	6.405
1 3/4	x	1	2.929	9.608
		1 1/4	2.350	7.711
2		1	4.049	13.283
2 1/4	x	1 1/2	4.013	13.164
		1 3/4	3.147	10.324
2 1/2	x	1	6.720	22.049
		1 1/2	5.420	17.783
		2	3.545	11.630
2 3/4	x	2	5.096	16.720
3	x	1 1/2	8.667	28.436
		2	6.792	22.283
3 1/2	x	1 1/2	12.762	41.870
		2	10.887	35.717
		2 1/2	8.436	27.676
4	x	1	18.498	60.688
		2	15.322	50.269
		3	9.845	32.301
4 1/2	x	1 1/2	22.468	73.714
5	x	2	26.219	86.021
		3	20.777	68.165
6	x	2	39.631	130.020
		3	34.211	112.240
		4	26.491	86.910
7	x	5	33.055	108.446
9 1/8	x	2	96.217	315.668

Standard lengths

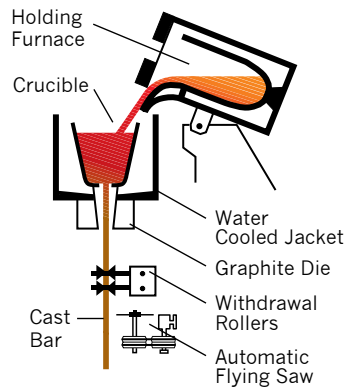
≤4" dia. 12ft

≥4" ≤8" dia. 12ft
(some sizes 1 metre max)

>8" dia. 1 metre maximum
(bars may be cut to order)

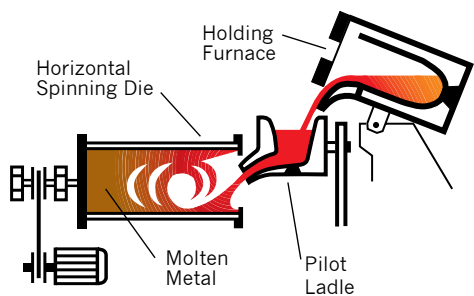


Molten bronze is poured from a furnace into a crucible which is cemented to the neck of a graphite die. The lower half of the die is water cooled, and the metal sets in this section, and is withdrawn through two sets of rollers. A flying saw mounted below the roller cuts the bar to the required length. Continuous cast rod has greatly improved physical properties as compared with normal sand-cast material. Because of the bottom pouring conditions and rapid cooling that the metal receives in the cooling zone, inclusions are completely eliminated, grain structure is tight and even, giving excellent pressure tightness qualities. Tensile strength and wearing qualities are increased by up to 35%.



Principle of centrifugal casting

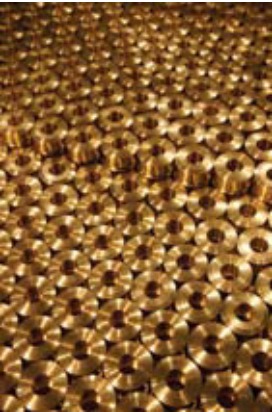
Molten bronze is poured from a furnace into a pilot ladle which directs the stream of metal into a horizontal spinning die. This die determines the O.D. of the casting produced, and the amount of molten bronze fed to the die determines the wall thickness. When the die is fully charged with the correct amount of metal it continues spinning for a predetermined period. On the completion of the spinning process, the die is removed, the casting withdrawn, proof machined and inspected.



As with continuous casting this method produces an improved close grained defect free material.



AW Fraser manufactures and exports machined bronze to Australia and around the globe. AW Fraser has a modern, well-equipped machine tool facility at its manufacturing location in in Christchurch, New Zealand. The key advantage to the client base is that foundry, extrusion mill and CNC machine shop are all located on the one site, eliminating waste and allowing excellent quality control at each stage of the process.



The experienced staff continue to develop efficiencies with the use of the latest machinery and manufacturing cells which allow skilled operators to run multiple machines or complete secondary tasks.

The latest acquisition in the machine shop is the magnificent Okuma LU45, the world's largest production twin turret lathe, which allows for fast accurate turning of bushes up to 26" in diameter.

The industries serviced by the machine shop include Mining, Rail / Heavy Diesel, Actuators / Gear Assemblies / Transmission Products, Marine, Hydraulic Components and any other industries requiring machined bronze components.



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