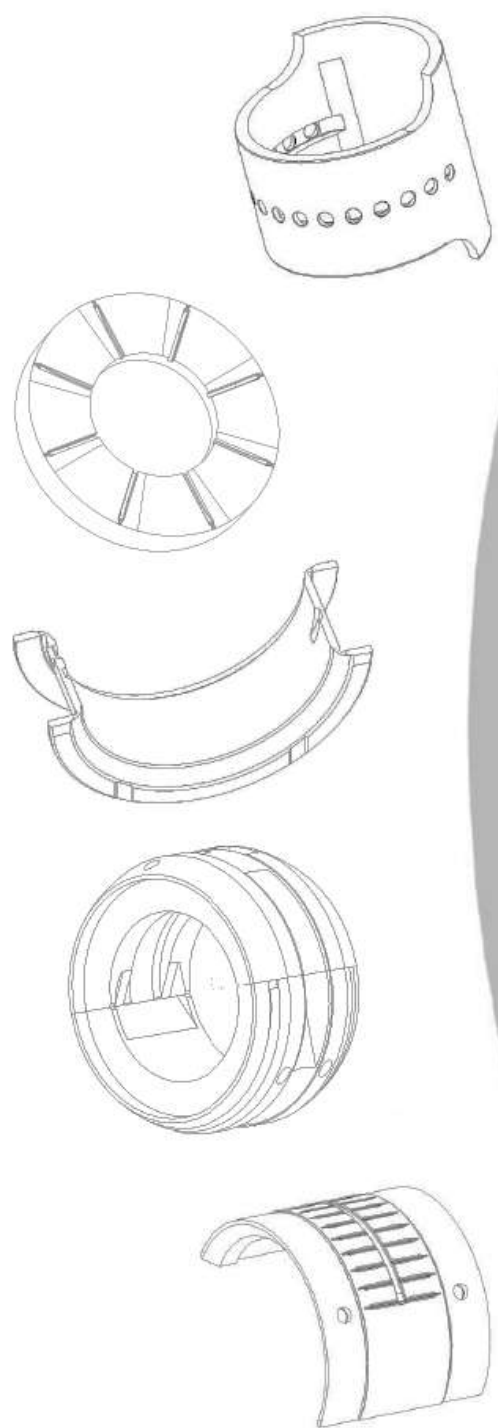




PBW Bearings Pvt. Ltd.

THE COMPANY



1948

Established

25,000

Total Area in Sq. Mtrs.

526

Employees

PBW's HISTORY



40's

- Established in 1948 as a small foundry

50's

- Leader in house-hold brass articles

60's

- Started manufacturing bimetal bearings

70's

- Gained OEM approvals

80's

- Set-up state of the art centrifugal casting facility
- Import substituted for various applications

90's

- Added sintered thin wall bearings in portfolio
- Certified by ISO

Millenium

- Achieved "Most Responsive Supplier" award
- Certified by AAR (Association of American Railroads)

**21st
Century**

- Moved to Larger Premises covering total Area of 25,000 Sq. Metres
- Added Lead – Free Lining and Lead – Free Overlay Plating Materials

GLOBAL PARTNERS



SEGMENTS & APPLICATIONS



Engines
Marine & Power Generations



Locomotive Engines
Railroad



Compressors
Industrial, Marine, Railroad
and Oil & Gas



Pumps
Fracturing & Centrifugal



Turbochargers
Large Bore Engines &
Compressors



**Reciprocating / Rotating
Machinery**
Steel Mills, Milling & Forging
Machines



Homogenizers
Food Processing, Dairy &
Pharmaceuticals



Light & Heavy Engines
Automotive & Earthmovers



Gearboxes
Wind, Steam & Solar Turbines,
Industrial



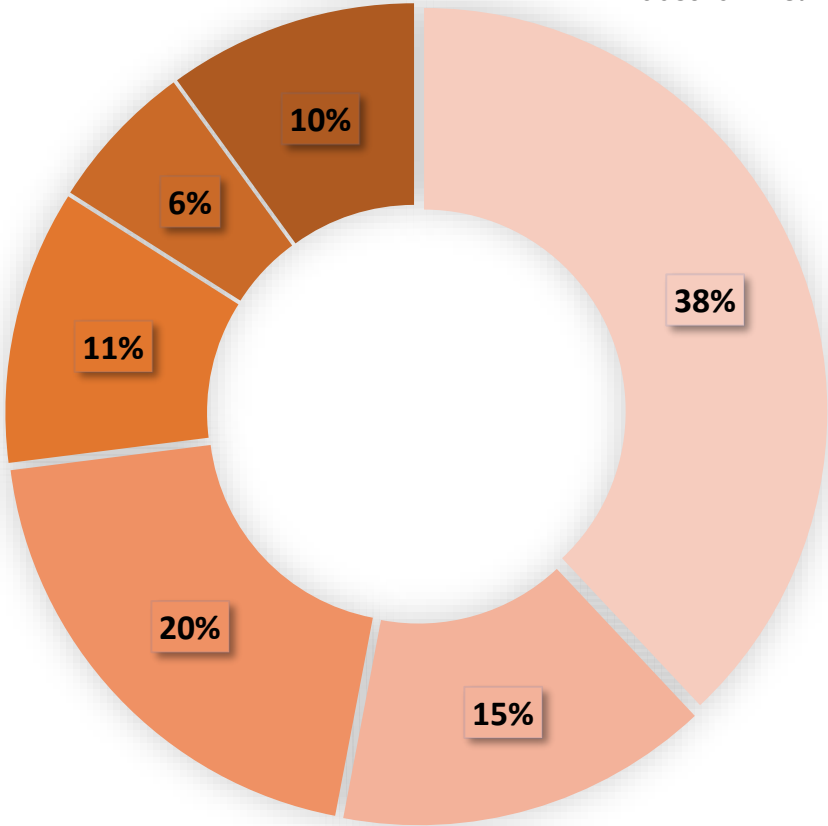
Aeronautics

REVENUE BREAK-UP FY 2023-24



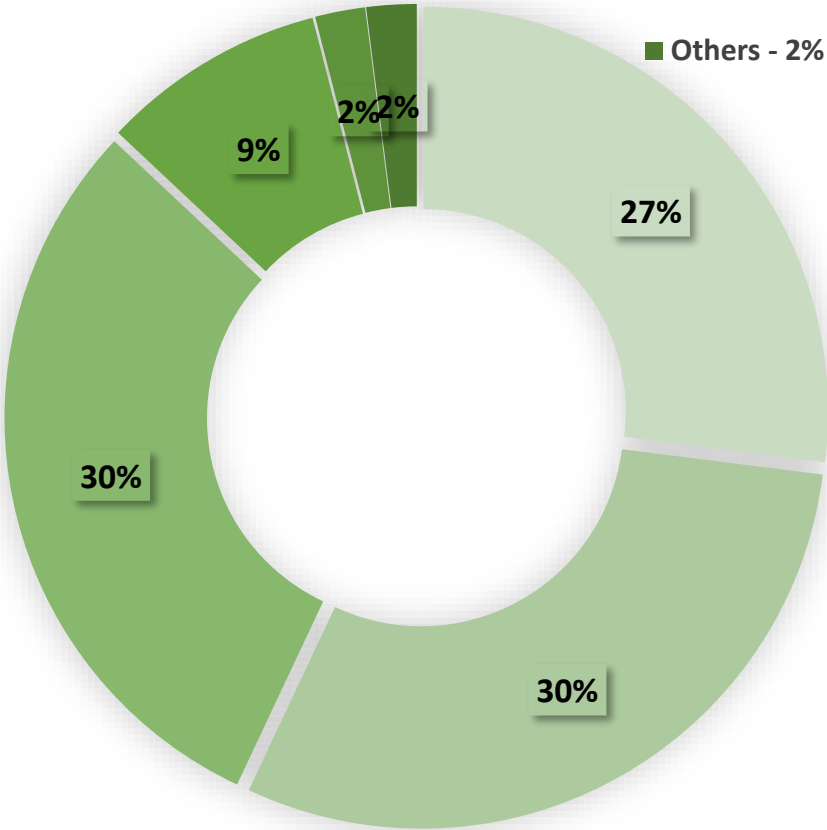
MARKET SEGMENT

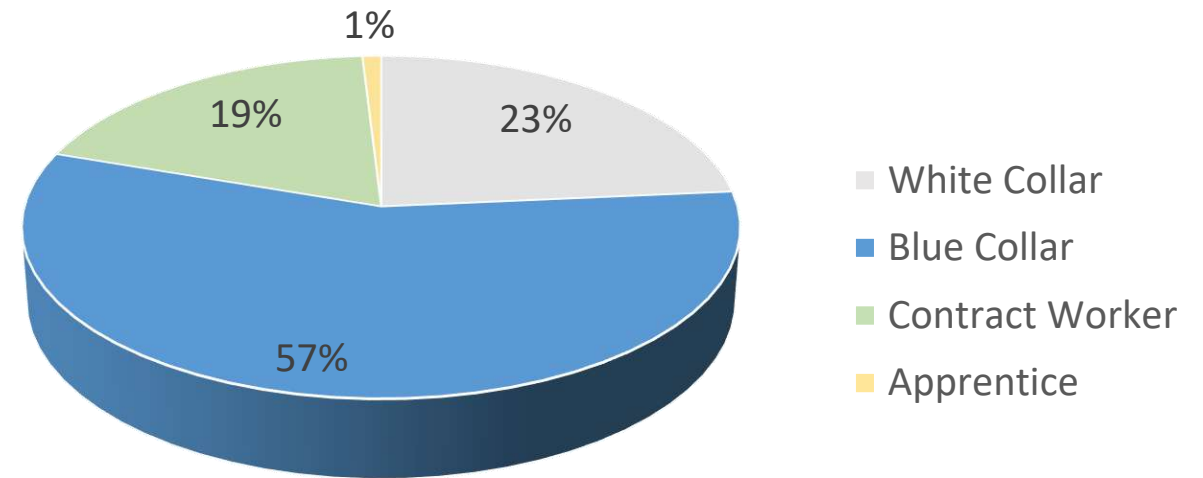
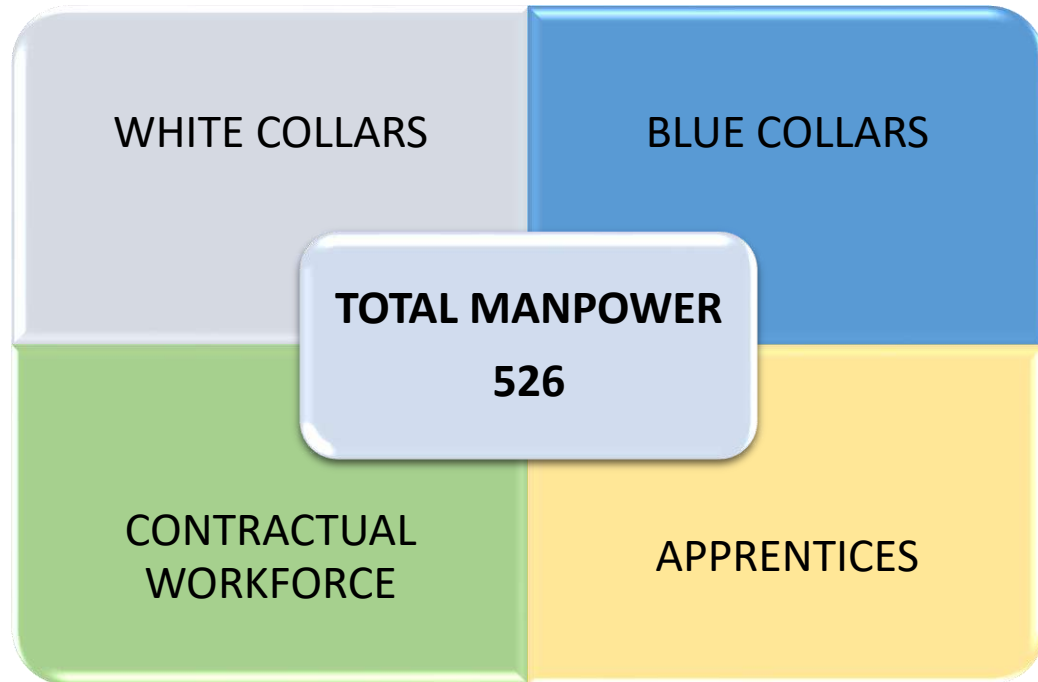
- Railways - 38%
- Pumps - 15%
- Engines - 20%
- Bearing Manufacturers - 11%
- Compressors - 6%
- Industrial - 10%



REGIONS

- Americas - 27%
- Europe - 30%
- India - 30%
- Middle East - 9%
- China - 2%
- Others - 2%





We believe & understand that each employee has unique abilities & carry wide experience to demonstrate for achievement of organizational goals. We have vivid manpower who work in team & collaborative approach to deliver the good quality product with highest customer satisfaction.

CORE TECHNOLOGY & TESTING FACILITIES



Alloy Powder Plant



**Centrifugal Casting
for Copper & Babbitt
Alloy**



Static Casting



**Jigs, Fixtures & Tooling
Manufacturing Facility**



**Complete Machining
Facility**



**Robotic
Process Automation**



Press Shop



**Electro Plating Plant
Automatic & Manual**



Calibration LAB



STD LAB

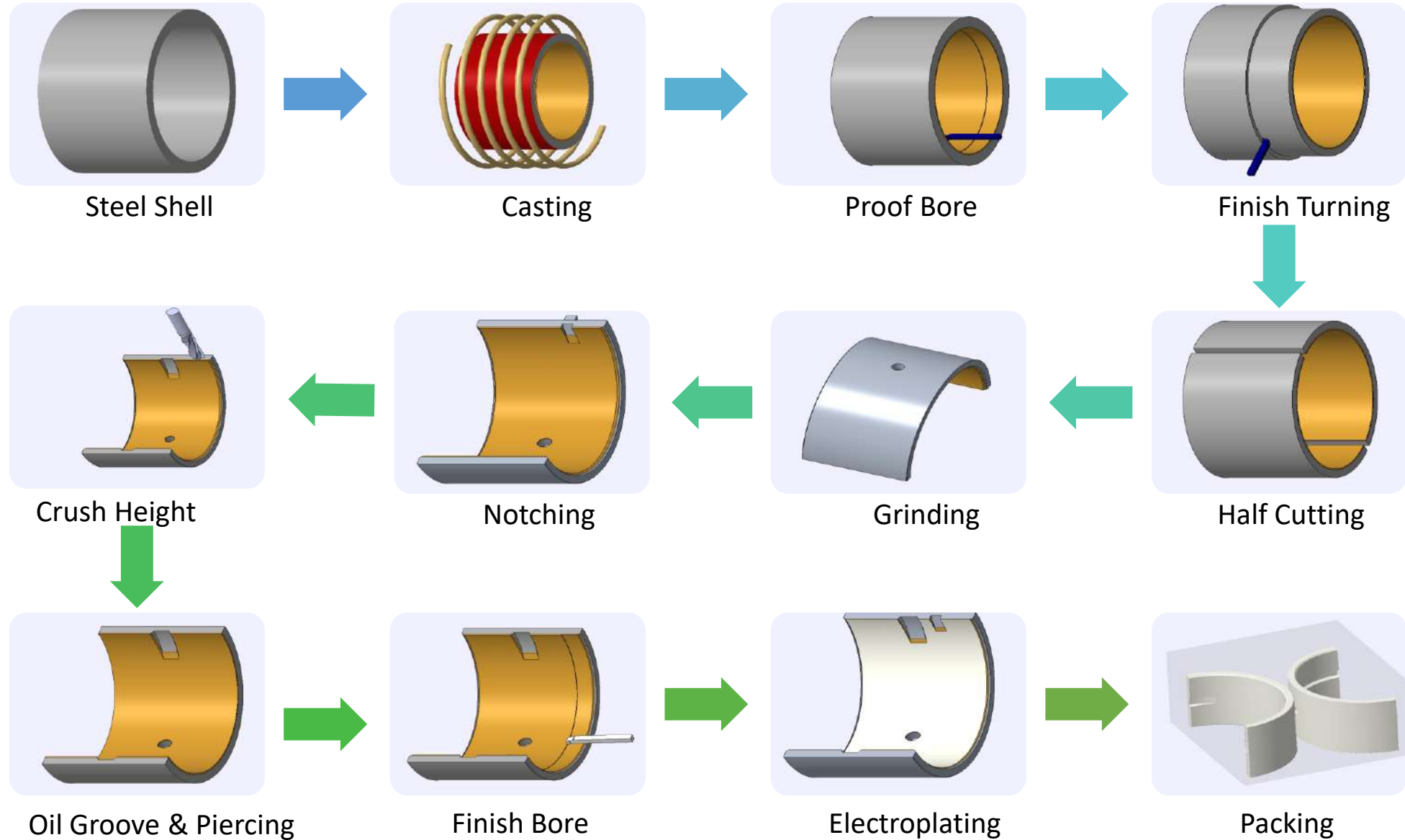


ETP & STP

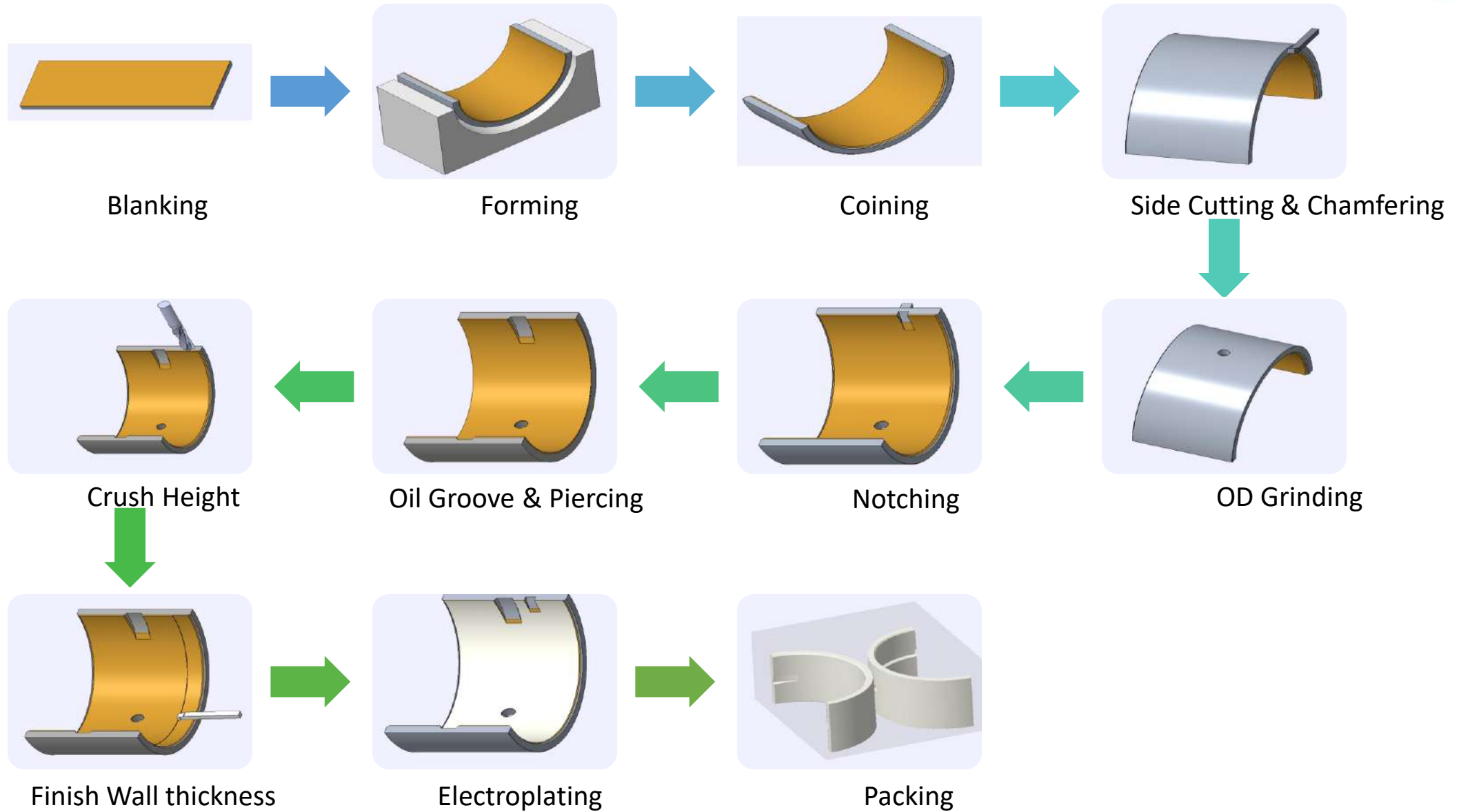
SIZE LIMITATIONS (FUTURE ROADMAP UP TO 1000MM)



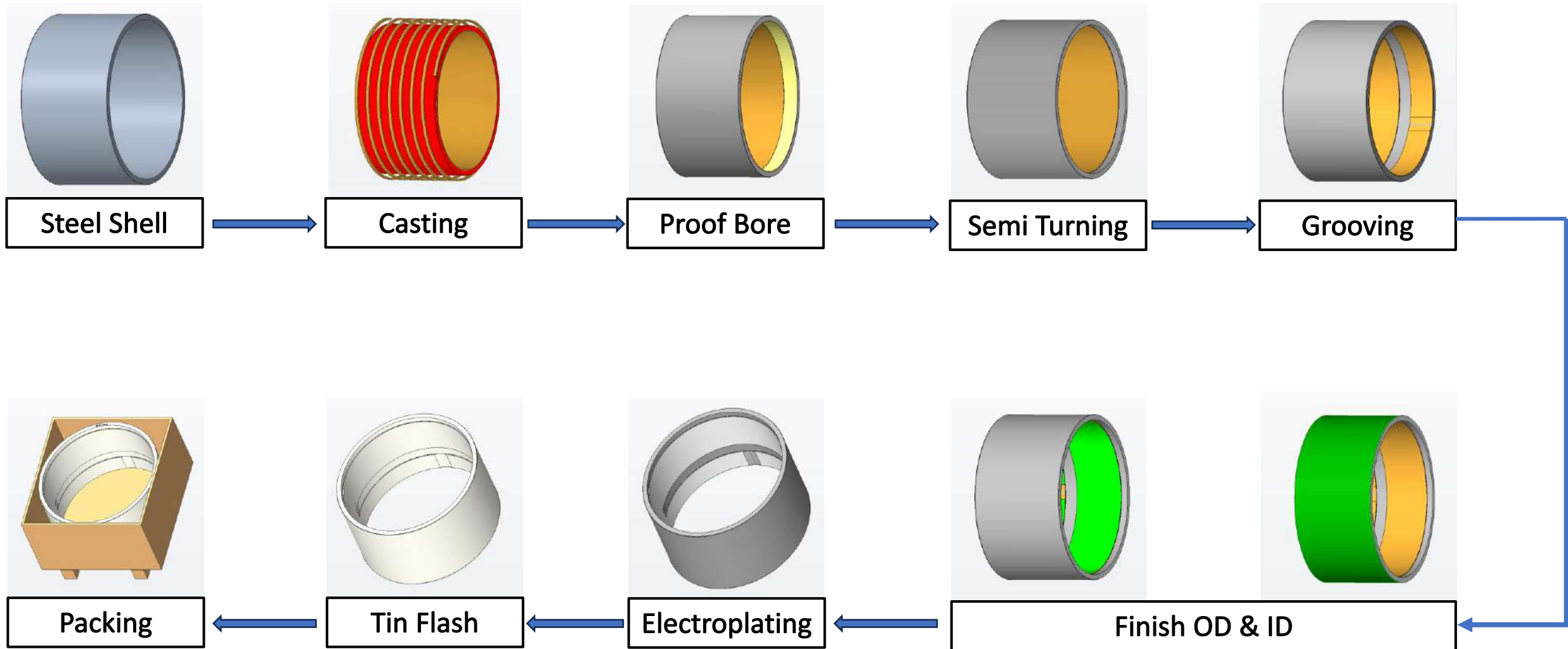
DESCRIPTION	BUSHING		HALF BEARING		THRUST WASHER	
	CURRENT	FUTURE	CURRENT	FUTURE	CURRENT	FUTURE
CASTING PROCESS						
HOUSING DIAMETER OR OUTER DIAMETER	100 to 700 mm	100 to 1000 mm	100 to 400 mm	100 to 1000 mm	40.0 to 300.0 mm	40.0 to 450.0 mm
INNER DIAMETER	50 to 650 mm	25 to 950 mm	N.A.	N.A.	As per requirements	As per requirements
TOTAL LENGTH	17 to 350 mm	17 to 600 mm	17 to 350 mm	17 to 600 mm	As per requirements	As per requirements
WALL THICKNESS	1.5 to 25 mm	1.5 to 25 mm	1.5 to 25 mm	1.5 to 25 mm	N.A.	N.A.
SINTER / SLAB PROCESS						
OUTER DIAMETER OR HOUSING DIAMETER	28 to 125 mm	28 to 125 mm	33 to 360 mm	33 to 1000 mm	40 to 300 mm	40 to 500 mm
TOTAL LENGTH	19 to 100 mm	19 to 100 mm	16 to 300 mm	16 to 300 mm	As per requirements	As per requirements
WALL THICKNESS	2 to 5 mm	2 to 5 mm	1.5 to 20 mm	1.5 to 20 mm	N.A.	N.A.



MANUFACTURING TECHNOLOGY : SINTERING



LARGE BUSHING - PROCESS SEQUENCE



Bearings range - PBW



CERTIFICATIONS



ISO 9001:2015



ISO 14001:2015



ISO 45001:2018

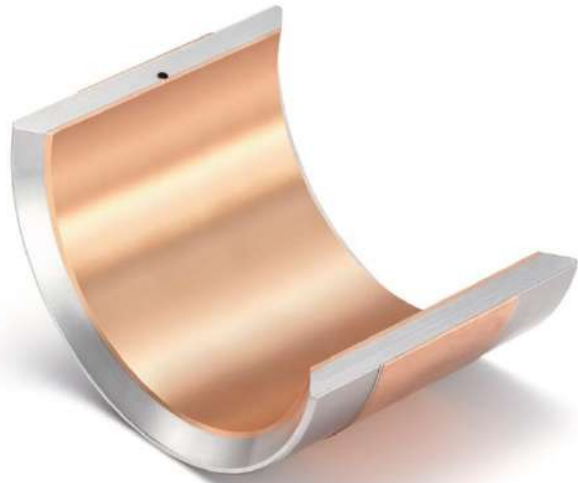


ISO/IES 17025:2017 CALIBRATION



ASSOCIATION OF AMERICAN RAILROADS

OD LINING BEARING



HALF SHELLS



STRIP (STEEL + BRONZE)



250MM-350MM



CENTRIFUGAL CASTED



BABBITT LINING BEARINGS



AXIAL BEARINGS



LEAD FREE BEARINGS



STEEL

PBW REFERENCE	COMPARABLE REFERENCE	C % (CARBON)	Mn % (MANGANESE)	P % (PHOSPHORUS)	S % (SULPHUR)	Si % (SILICON)	Cr % (CHROMIUM)	Ni % (NICKEL)	Mo % (MOLYBDENUM)
PB-1008	SAE 1008	0.10 Max.	0.30-0.60	0.04 Max.	0.05 Max.				
PB-1010	SAE 1010	0.08-0.13	0.30-0.60	0.04 Max.	0.05 Max.				
PB-1012	SAE 1012	0.10-0.15	0.30-0.60	0.04 Max.	0.05 Max.	0.15-0.35			
PB-1015	SAE 1015	0.13-0.18	0.30-0.60	0.04 Max.	0.05 Max.	0.15-0.35			
PB-1018	SAE 1018	0.15-0.20	0.60-0.90	0.04 Max.	0.05 Max.	0.15-0.35			
PB-1020	SAE 1020	0.18-0.23	0.30-0.60	0.04 Max.	0.05 Max.	0.15-0.35			
PB-1513	SAE 1513	0.10-0.16	1.10-1.40	0.05 Max.	0.04 Max.	0.10-0.35			
PB-8620	SAE 8620	0.18-0.23	0.70-0.90	0.035 Max.	0.04 Max.	0.15-0.30	0.40-0.60	0.40-0.70	0.15-0.25
PB-4140	SAE 4140	0.38-0.43	0.75-1.00	0.035 Max.	0.04 Max.	0.15-0.30	0.80-1.10	-	0.15-0.25
PB-4140-A	EN 19A	0.35-0.45	0.50-0.80	0.05 Max.	0.05 Max.	0.10-0.35	0.90-1.20	-	0.20-0.35
PB-1524	EN 14A	0.15-0.25	1.30-1.70	0.06 Max.	0.06 Max.	0.10-0.35	0.25 Max.	0.40 Max.	-
PB-1026	SAE - 1026	0.22-0.280	0.60-0.90	0.040 Max	0.050 Max				

LINING METALS										
PBW REFERENCE	COMPARABLE REFERENCES	Pb % (LEAD)	Sn % (TIN)	Cu % (COPPER)	Sb % (ANTIMONY)	Ni % (NICKEL)	Zn % (ZINC)	Fe % (IRON)	Si % (SILICON)	Others %
PB-9	SAE-792, ISO CuPb10Sn10	9.00-11.00	9.00-11.00	BALANCE	0.50 Max.	0.50 Max.	0.50 Max.	0.70 Max.	-	0.50 Max.
PB-13	ISO CuPb15Sn7	13.00-17.00	6.00-8.00	BALANCE	0.50 Max.	0.50 – 2.00	2.00 Max.	0.25 Max.	-	-
PB-18	ISO CuPb24Sn	18.00-24.00	1.50-3.00	BALANCE	0.50 Max.	0.50 Max.	0.50 Max.	0.70 Max.	-	0.50 Max.
PB-23	SAE-794 ISO CuPb24Sn4	23.00-27.00	2.00-4.00	BALANCE	0.50 Max.	0.50 Max.	0.50 Max.	0.70 Max.	-	0.50 Max.
PB-21	SAE-49, ISO CuPb24Sn	21.00-27.00	1.75-2.75	BALANCE	0.50 Max.	0.50 Max.	0.50 Max.	0.70 Max.	-	0.50 Max.
PB-104	CuNi2Si (Lead Free)	0.10 Max.	-	BALANCE	-	1.50 - 2.50	-	0.70 Max	0.40 - 0.80	0.50 Max.

BABBITT / WHITE METALS											
PBW REFERENCE	COMPARABLE REFERENCES	Pb % (LEAD)	Sn % (TIN)	Cu % (COPPER)	Sb % (ANTIMONY)	Al % (ALUMINIUM)	Bi % (Bismuth)	Cd % (CADMIUM)	Zn % (ZINC)	Fe % (IRON)	Others %
PB-14	SAE-14, ISO PbSb15Sn10	BALANCE	9.00-11.00	0.7 Max..	14.00-16.00	0.005 Max..	0.10 Max..	0.05 Max..	0.005 Max..	0.10 Max..	0.20 Max..
PB-90	SAE-12, ISO SnSb8Cu4	0.50 Max.	BALANCE	2.50-3.50	6.50-7.50	0.005 Max.	0.08 Max.	-	0.005 Max.	0.10 Max.	0.20 Max.

SOLID BRONZE

PBW REFERENCE	P % (Phosphors)	Sn % (TIN)	Cu % (COPPER)	Sb % (ANTIMONY)	Ni % (NICKEL)	Al % (ALUMINIUM)	Si % (SILICON)	Pb% (Lead)	Mn % (Manganese)	Zn % (ZINC)	Fe % (IRON)	Others %
CuSn8P	0.20 - 0.40	7.50 - 8.50	Balance	-	0.300 Max.	10.50-12.50	-	0.050 Max.	1.50 Max.	-	0.100 Max.	0.20 Max.
CuAl11Fe6Ni6	-	0.10 Max	Balance	-	5.0-7.0	-	0.20 Max	0.050 Max.	-	0.50 Max	5.0-7.0	0.20 Max.
CuAl10Fe4F64	-	-	Balance	-	4.0-6.0	8.50-11.0	-	0.050 Max.	1.50 Max.	0.50 Max	2.0-5.0	0.30 Max.
CuAl11Fe5Ni5	-	0.10 Max	Balance	-	4.0-6.0	8.5-10.5	0.20 Max	0.030 Max.	3.00 Max.	0.50 Max	4.0-5.5	0.20 Max.
C93200	1.5 % max.	6.30 - 7.50 %	Balance	0.35 % max.	1.00 % max	-	0.005 % max.	6.00-8.00 %	-	2.00 - 4.00 %	0.20 % max.	-

CLAD ALUMINUM

PBW REFERENCE	COMPARABLE REFERENCES	Sn % (TIN)	Cu % (COPPER)	Ni % (NICKEL)	Al % (ALUMINIUM)	Fe % (IRON)	Others %
PBAL-20	AlSn20,SAE 783	17.5-22.50	0.70-1.30	0.10 Max.	BALANCE	0.70 Max.	0.50 Max.

CAST ALUMINIUM (SOLID)

PBW REFERENCE	COMPARABLE REFERENCES	Sn % (TIN)	Cu % (COPPER)	Ni % (NICKEL)	Al % (ALUMINIUM)	Si % (SILICON)	Fe % (IRON)	Others %
PBAL-6	SAE-770, ISO AlSn6Cu	5.50-7.00	0.70-1.30	0.70-1.30	BALANCE	0.70 Max.	0.70 Max.	0.30 Max.

ELECTROPLATED OVERLAYS

PBW REFERENCE	COMPARABLE REFERENCES	Pb % (LEAD)	Sn % (TIN)	Cu % (COPPER)	Others %
PB-01	SAE-191, ISO PbSn10	BALANCE	8.00-12.00		
PB-02	SAE-192, ISO PbSn10Cu2	BALANCE	8.00-12.00	2.00-3.00	
PB-08	SnCu6 (Lead free)		BALANCE	5.00-8.00	0.50 Max.

BEARING CONSTRUCTION



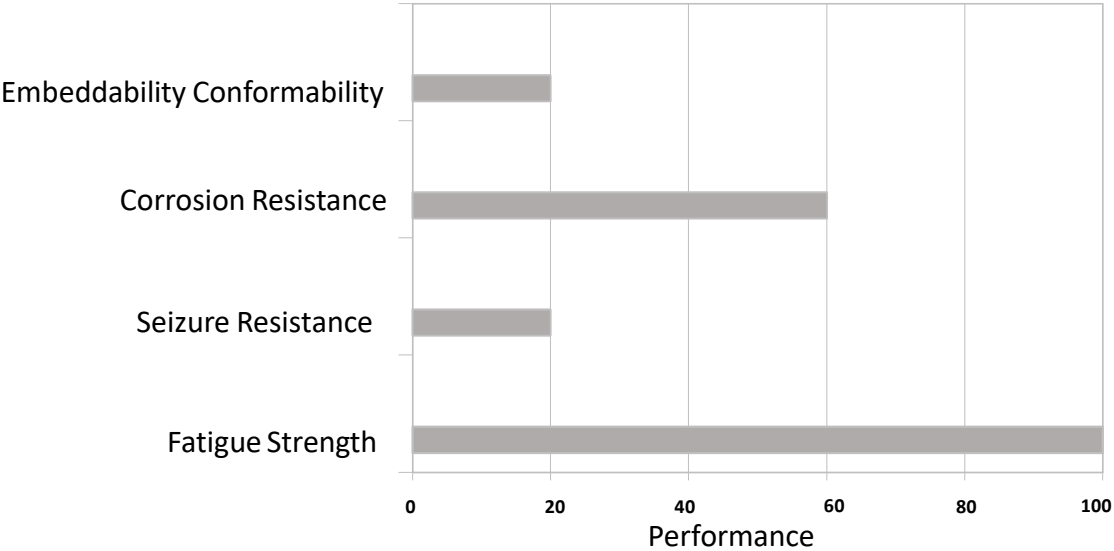
STEEL + PB 9 + PB 02

Coating : PB 02 ISO PbSn10Cu2 & Ni Intermédiate layar

Alloy : PB 9 ISO CuPb10Sn10

Category : Leaded Bronze, Cast on steel

Hardness: PB 9 (85 HV) & PB 02 (14HV)



PB 9 alloy is centrifugally cast material and is best suited for bushings and washers subjected to high impact and vibratory loads. In most Cases, it operators best with hardened shaft. Basically used with lead based overlay in bearings and bushes applicable in compressor and diesel engine segment

BEARING CONSTRUCTION



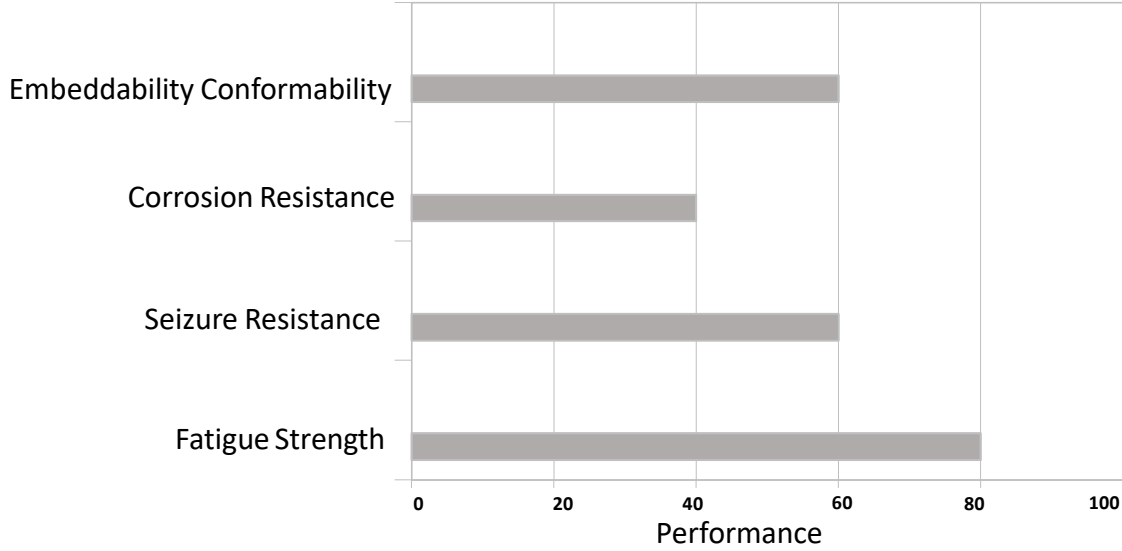
STEEL + PB 18 + PB 02

Coating : PB 02 ISO PbSn10Cu2 & Ni Intermédiate layar

Alloy : PB 18 ISO CuPb24Sn

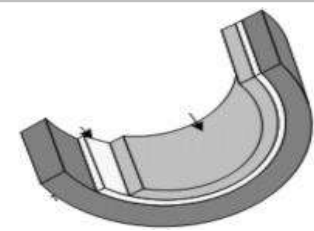
Category : Leaded Bronze, Cast on steel

Hardness: PB 18 (60 HV) & PB 02 (14HV)



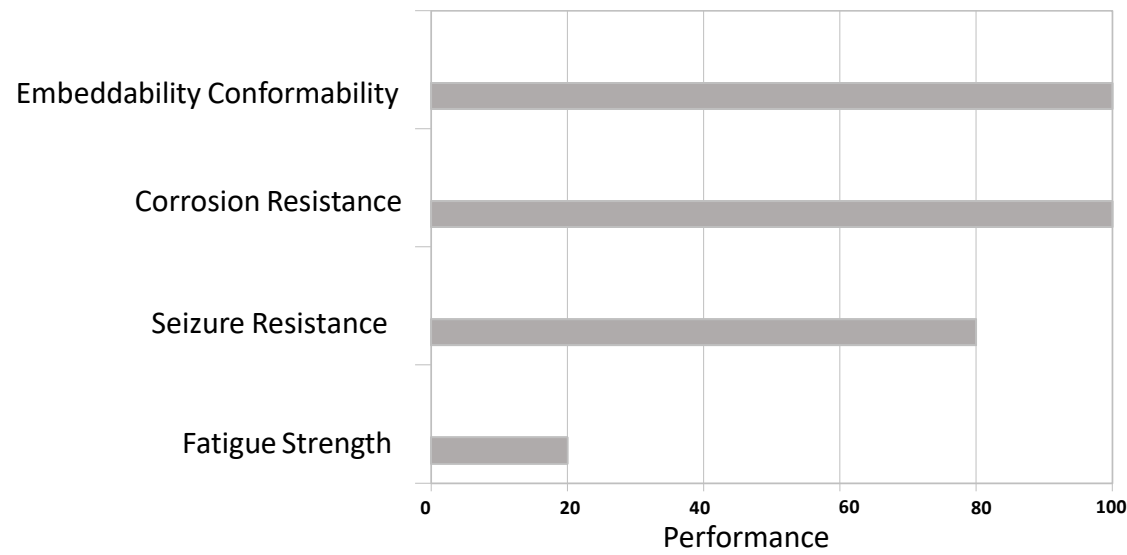
PB 18 alloy is centrifugally cast material with High fatigue strength, normally plated with an overlay when used in bearing application and in this form may be operated with hard or soft shafts, susceptible to corrosion by degraded oil when not overlay plated. Mainly used in Con Rod big end Bearings, Main Bearings Main Bushings and Thrust Washers.

BEARING CONSTRUCTION



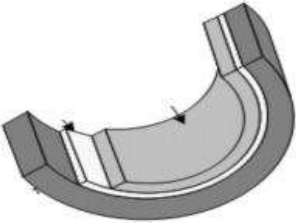
STEEL + PB 14

Alloy : PB 14 ISO PbSb15Sn10
Category : Lead Babbitt, Cast on steel
Hardness: PB 14 (20 HV)



This lead base Babbitt is soft, excellent embeddability for relative application, minimum lubrication, good resistance, low fatigue resistance and has been used for lower load application.

BEARING CONSTRUCTION

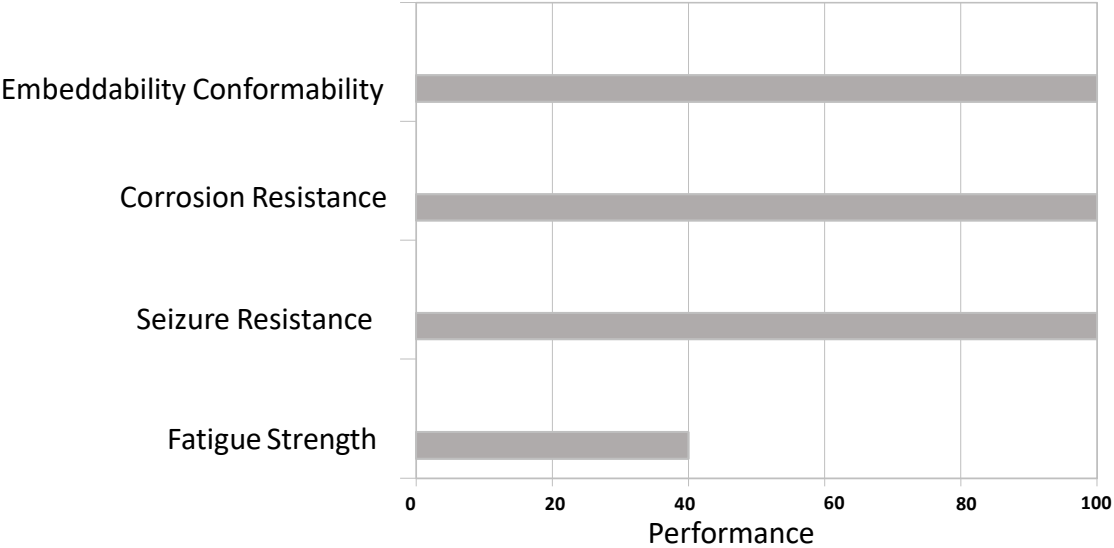


STEEL + PB 90

Alloy : PB 90 ISO SnSb8Cu4

Category : Tin Babbitt, Cast on steel

Hardness: PB 90 (32 HV)



PB 90 Bearings alloys has good sliding properties, conformability and high toughness, good embeddability suitable for high sliding velocities in the hydrodynamic range, mean load, impact stress at low frequency insensitive to reversed bending stress.

INCOMING RAW MATERIAL

Materials	Elements	Testing Parameter	Test Method
Steel	C, Mn, Si, P & S	Chemical Analysis, Microstructure, Hardness Test	Spectro Analysis, Metallurgical Microscope, Digital Vickers Hardness Machine
Virgin Metal	Copper, Lead, Tin, Nickel, Antimony	Chemical Analysis	Spectro Analysis,
Plating Chemical & Solution	Copper Flouborate, Lead Flouborate, Tin Flu borate, Nickel Chloride, Sodium Stannate	As per TC Parameters	Wet Analysis

CENTRIFUGAL CASTING STAGE

Stagewise Verification	Process	Testing Parameter	Test Method
Alloy Making	(Induction F/C)	Chemical Analysis,	Spectro Analysis
Granule Chemistry	Water Atomization Process	Chemical Analysis,	(ICP-OES) Inductive Coupled Plasma Optical Emission Spectroscopy
Casting Samples	Centrifugal Casting Process	Chemical Analysis, Microstructure, Hardness , Dye Penetrant Test, Ultrasonic test, Adhesion (Bond) test	Spectro Analysis, Metallurgical Microscope, Digital Vickers Hardness Machine, DP Test Method, Ultrasonic Test Machine, Chisel

IN-PROCESS INSPECTION

Parameters	Specification	Testing Parameter	Test Method
Surface Roughness	As per Customer Drawing	Surface Roughness	Surface Roughness Tester
Dimensional & GD&T Measurement,	As per Customer Drawing.	Roundness, Cylindricity Profile, Groove Width, Groove Angle, Radius, Depth OD Roundness, GD&T Parameters	Roundness Tester, Form tracer, CMM

ELECTROPLATING

- | |
|--|
| ➤ Nickel Layer (Galvano Tester) |
| ➤ Plating Layer Thickness (Galvano Tester) |
| ➤ Plating Layer Chemistry (ICP-OES) |
| ➤ Tin Flash Layer (Galvano Tester) |
| ➤ Adherence Test (Tape Test) |

TEST BEARING EXPERIENCE



Hardness



Microstructure



Contour Measurement Machine



Spark Spectrometer



ICP-OES



Ultrasonic Test



Coordinate Measuring Machine



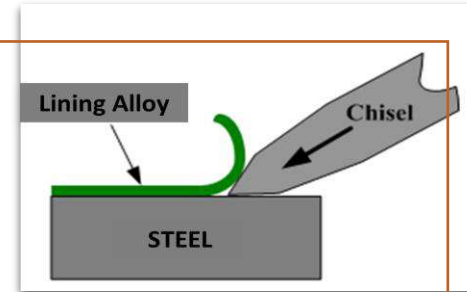
Roundness Measuring Machine



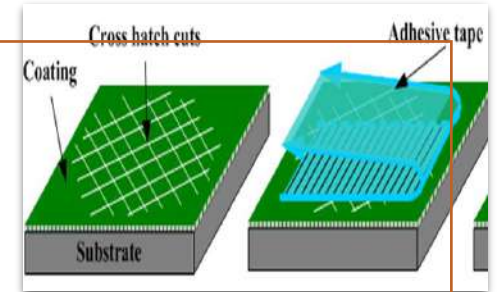
Surface Roughness Measuring machine



GalvanoTestCoulometric coating thickness gauge



chisel adhesion test



Adhesion test (Overlay)

RECOGNITION & DEVELOPMENT



Kaizen drive



Exposure to business seminar



Training & development capability program



Employee Birthday celebration

AMENITIES

Medical Facilities



Education Aid



Canteen



Household Utilities



WINDMILL



FIRE EXTINGUISHER
TRAINING



FIRE HYDRANT SYSTEM
TRAINING



NATIONAL SAFETY
DAY EVENT



ROUTINE EMPLOYEE HEALTH
CHECK-UP



FIRST AID
TRAINING



WORLD
ENVIRONMENT
DAY

Activities

- Ambient Air Monitoring
- Noise Monitoring
- Drinking Water Monitoring
- Lux Monitoring
- ETP & STP plant
- Monthly Safety Committee Meeting
- E-Waste & Hazardous Waste Disposal

AWARDS



Awarded
Most Responsive Supplier
by
GE Transportation



Winner – SME in
'EXCELLENCE IN QUALITY'
award by
The Machinist Super Shop Floor



Awarded
Emerging Company of the
Year
by
World Manufacturing India



Awarded
Most Sustainable Partner
by
Burckhardt Compression

**2.1 MW Windmill
Covers Current
Plant Requirement**



INITIATION TOWARDS GREEN EARTH

We will be implementing solar rooftop energy projects (1 MW) for meeting our increasing plant demand.



A top-down photograph showing a circle of approximately ten hands of various skin tones. Each hand is cupped, holding a small amount of dark brown soil. Some hands also hold tiny green seedlings with roots visible. The hands are arranged in a ring, creating a sense of unity and shared purpose. The background is a mix of green grass and grey mulch.

IN PURSUIT OF EXCELLENCE