



# **NEP** Nap Engineering Works

Our company is a renowned manufacturers & exporters of all kind of Bronze Casting and Aluminium Gravity Die Casting products since last 27 years.

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# Company Profile

## About Us

Our company is a renowned manufacturers & exporters of all kind of Bronze Casting and Aluminium Gravity Die Casting products since last 27 years. Several rigorous quality testing parameters are also adopted to maintain flawlessness in our entire casting process and make error free supply range at our client end. Besides, our products are acknowledged for their unmatched characteristics and have found usage across the globe. We take pride that our products are being globally accepted for their quality and competitive pricing.

## Our Team

In our company, we have a team of expert professionals. They are fully experienced and in-depth knowledge regarding the requisite processes and activities. In our team we have Raw material procuring agents, Skilled Labours & Technicians, Inspecting Engineers & Quality Analysts, Sales and Marketing professionals. We consider our competent employees as an asset of our company and their effective performance will help our company to achieve outstanding result.

## Our Infrastructure

For smooth and streamlined execution of all trade activities, we have established a state-of-the-art facility of infrastructure within our premises. It covers a wide landmass and properly segmented into several departments which includes Manufacturing / Casting unit, Machining unit, Designing, Quality control etc. All departments are handled efficiently by our specialized professionals.

## Our Manufacturing Facilities

We have our own manufacturing unit with the following capacity installed :

- Bronze Casting Capacity > 8 Ton per Month.
- Aluminium Gravity Die Casting Capacity > 15 Ton per Month.
- Furnace Type > Electric Arc Furnace. (EAR)
- Crucible used > Graphite Crucible.
- Crucible capacity > 300 kgs., 500 kgs. & 700 kgs.
- Raw Material Used > Pure Copper, Tin, Phosphorus, Aluminium, Lead, Zinc, Silicon etc.
- Machinery Used > CNC Lathe, VMC Milling, Radial Drill, Shaping etc.
- Packaging Material Used > Bubble Plastic, Brown Paper, Lubricant, Silica Gel, Wooden Box etc.

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## Bronze Casting Definition

Bronze is a copper base alloy where copper is the principal element. It is an alloy of copper and other metals like Tin, Lead, Aluminium, Phosphor and Silicon as an alloying elements to define Bronze Casting grades. There are mainly four grades of Bronze Casting as follows :

### **Aluminium Bronze Casting**

Aluminium Bronzes are Copper and Aluminium alloys which normally contain iron, nickel & manganese. These alloys are characterized by good ductility, casting and weldability. These alloys are also retain a useful proportion of their strength elevated temperatures. These alloys have higher strength and corrosion resistance power than other bronzes especially in marine environment.

### **Phosphor Bronze Casting**

Phosphor Bronzes are Copper, Tin and Phosphorus alloys which may sometimes also contain Lead for improve machinability. These alloys are characterized by high hardness, good wear resistance, toughness and corrosion resistance.

### **Silicon Bronze Casting**

Silicon Bronzes are Copper and Silicon alloys which are characterized by high strength, very good atmospheric corrosion resistance and excellent weldability.

### **Aluminium Bronze Casting**

Leaded Tin Bronzes are Copper, Tin and Lead alloys which may additionally contain Zinc. These alloys are used for bearing applications where a combination of wear resistance and good anti-friction properties are desired. These alloys have also good corrosion resistance, machinability and pressure tightness.

## Bronze Casting Process

We use sand casting and die casting method in our Bronze Casting Process. We use high grade raw materials like Copper, Tin, Lead, Aluminium, Phosphor and Silicon for alloying in our Bronze Casting Process. We also use custom bronze casting composition by mixing copper and other alloying elements separately & percentage wise. Therefore we can offer our customers to choose a wide range of customized bronze casting grades as per their requirements.

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# OUR PRODUCTS

## Aluminium Bronze Casting

We are the premium quality Aluminium Bronze Casting Manufacturers & Exporters of our domestic and overseas buyers.



### There are three main Aluminium Bronze Casting Alloys :

- For higher strength, nickel Aluminium Bronze Casting which is by far the most popular sand cast alloy. (BS:1400 AB2).
- For lower strength, low Nickel Aluminium Bronze Casting used mostly in die casting. (BS:1400 AB1)
- For low magnetic permeability, Aluminium Silicon Bronze Castings are used.

### Aluminium Bronze Casting Process:

We manufacture Aluminium Bronze Casting products by Sand Casting, Permanent Mold / Die Casting process. We use high quality raw materials for alloying in our Aluminium Bronze Casting Process. Aluminium Bronze melting point is 1027-1038° C and we maintain it properly in our Aluminium Bronze Casting Process. Aluminium Bronze Casting Defects will appear if aluminium bronze pouring temperature not maintained properly and our products are always defect free as we know how to make Aluminium Bronze Casting products.

### Aluminium Bronze Specifications :

We strictly maintain Aluminium Bronze Chemical Composition as per their specification. We hold expertise in customizing the Aluminium Bronze Casting range as per the specification provided by our customers. Therefore we can offer our customers to choose a wide range of customized Aluminium Bronze Casting Alloys as per their needs.

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# Aluminium Bronze Casting Grades with Chemical Composition

Aluminium Bronze Casting Specification	CU	SN	PB	ZN	FE	NI	AI	MN	SI	Impurities
Standard : BS 1400, AB-1	Rem.	0.1	0.05	0.5	1.5 - 3.5	1.0	8.5 - 10.5	1.0	0.25	0.30
Standard : BS 1400, AB-2	Rem.	0.1	0.05	0.5	4 - 5.5	4 - 5.5	8.8 - 10	1.5	0.1	0.30
Standard : JIS, ALBC - 1	85 - 90	0.1	0.1	0.5	1 - 3	0.1 - 1	8 - 10	0.1 - 1	-	--
Standard : JIS, ALBC - 2	80 - 88	0.1	0.1	0.5	2.5 - 5	1 - 3	8 - 10.5	0.1 - 1.5	-	--
Standard : JIS, ALBC - 3	78 - 85	0.1	0.1	0.5	3 - 6	3 - 6	8.5 - 10.5	0.1 - 1.5	-	--
Standard : JIS, ALBC - 4	71 - 84	0.1	0.1	0.5	2 - 5	1 - 4	6 - 9	7 - 15	-	--
Standard : ASTM, C95400	83 Min.	0.1	0.03	0.1	3 - 5	1.5	10 - 11.5	0.5	-	--
Standard : ASTM, C95500	78 Min.	0.1	0.03	0.1	3 - 5	3 - 5.5	10 - 11.5	3.5	-	--
Standard : ASTM, C95800	78 Min.	0.1	0.03	0.1	3.5 - 4.5	4 - 5	8.5 - 9.5	0.8 - 1.5	0.1	--
Standard : DIN, G-CuAl10Fe	83 - 89	0.2	0.1	0.4	2 - 3.8	2.7	8.7 - 10.7	0.8	0.1	1.00
Standard : DIN, G-CuAl9Ni	82 - 86.5	0.2	0.1	0.2	1 - 2.8	1.5 - 3.8	8.7 - 9.8	2.3	0.07	0.80
Standard : DIN, G-CuAl10Ni	76 - 80.5	0.1	0.03	0.2	3.5 - 5.3	4.5 - 6.3	9 - 10.6	2.3	0.07	0.80
Standard : DIN, G-CuAl11Ni	72 - 77	0.1	0.03	0.2	4.3 - 5.8	5.3 - 6.8	9.3 - 11.3	2.3	0.07	0.80

## Aluminium Bronze Casting Mechanical Properties

Aluminium Bronze Casting Specification	Tensile Strength (Min.)	Elongation % (Min.)	Brinell Hardness (Min.)
Standard : BS 1400, AB - 1	550 Mpa.	18%	130 BHN.
Standard : BS 1400, AB - 2	650 Mpa.	12%	150 BHN.
Standard : JIS, ALBC - 1	470 Mpa.	15%	100 BHN.
Standard : JIS, ALBC - 2	490 Mpa.	20%	120 BHN.
Standard : JIS, ALBC - 3	590 Mpa.	15%	150 BHN.
Standard : JIS, ALBC - 4	620 Mpa.	15%	180 BHN.
Standard : ASTM, C95400	515 Mpa.	12%	150 BHN.
Standard : ASTM, C95500	620 Mpa.	6%	190 BHN.
Standard : ASTM, C95800	585 Mpa.	15%	180 BHN.
Standard : DIN, G-CuAl10Fe	550 Mpa.	18%	130 BHN.
Standard : DIN, G-CuAl9Ni	550 Mpa.	20%	120 BHN.
Standard : DIN, G-CuAl10Ni	650 Mpa.	12%	150 BHN.
Standard : DIN, G-CuAl11Ni	750 Mpa.	5%	185 BHN.

## Aluminium Bronze Casting Physical Properties :

Aluminium Bronze Density = 7.45 gm/cm<sup>3</sup> at 20° C.

Melting Point - Liquidus = 1038° C.

Melting Point - Solidus = 1027° C.

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# Phosphor Bronze Casting

We are the superior quality Phosphor Bronze Casting Manufacturers and Exporters of Phosphor Bronze Casting engineering products. It is an alloy of copper containing Tin (0.5% – 13%) and Phosphorus (0.1% – 0.5%). Tin increases their corrosion resistance and tensile strength; phosphorous increases wear resistance and stiffness. Phosphor Bronze Casting products has superb spring qualities, high fatigue resistance, excellent formability and high corrosion resistance.

Our Phosphor Bronze Casting products are very much appreciated by our clients for its features like toughness, strength, low coefficient of friction, rust proof and highly machinability.

Our Phosphor Bronze Casting products are used in diesel locomotives, railway coaches / bogies, rolling mill's machineries, submersible pump and steel plant's machineries.



## Phosphor Bronze Casting Process :

We manufacture Phosphor Bronze Casting products by Sand Casting, Chill Casting, Permanent Mold / Die Casting process. We use 99% pure Copper with other alloying elements in our Phosphor Bronze Casting Process. We also manufacture customized Phosphor Bronze Casting composition by mixing Copper, Tin, Phosphorus separately & percentage wise. Therefore we can offer our customers to choose a wide range of customized Phosphor Bronze Casting grades as per their requirements.

## Phosphor Bronze Casting Grades :

We manufacture Phosphor Bronze Casting products by maintaining all common phosphor bronze specification like BS: 1400 Grade PB1, PB2, PB4 and also IS: 28 Grade 1,2,3,4,5 etc. We strictly maintain the Phosphor Bronze Casting Grades in our Phosphor Bronze Casting products. Therefore we earn a great customer satisfaction from our valuable clients by supplying premium quality Phosphor Bronze Casting products.

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## Phosphor Bronze Casting Chemical Composition

Copper Alloys	CU	SN	PB	ZN	FE	NI	P	AL	SI	SB	Impurities
Standard BS: 1400, Grade PB 1	Rem.	10 Min	0.25	0.05	0.10	0.10	0.5 Min	0.01	0.02	-	0.60
Standard BS: 1400, Grade PB 2	Rem.	11 - 13	0.50	0.30	0.15	0.50	0.15 Min	0.01	0.02	-	0.20
Standard BS: 1400, Grade PB 4	Rem.	9.5 Min	0.75	0.50	-	0.50	0.4 Min	-	-	-	0.50
Standard IS: 28-1985, Grade 1	Rem.	6 - 8	0.25	0.50	0.30	0.70	0.3 - 0.5	0.01	0.02	0.10	1.20
Standard IS: 28-1985, Grade 2	Rem.	10 Min	0.25	0.05	0.10	0.10	0.5 Min	0.01	0.02	-	0.60
Standard IS: 28-1985, Grade 3	Rem.	6.5 - 8.5	2 - 5	2.0	-	1.0	0.3 Min	-	-	-	0.50
Standard IS: 28-1985, Grade 4	Rem.	9 - 11	0.25	0.05	-	0.25	0.15	-	-	-	0.80
Standard IS: 28-1985, Grade 5	Rem.	11 - 13.1	0.50	0.30	0.15	0.50	0.15 Min	0.01	0.20	-	0.20

## Phosphor Bronze Casting Mechanical Properties

Copper Alloys	Tensile Strength (Min.)	Elongation % (Min.)	Brinell Hardness (Min.)
Standard BS: 1400, Grade – PB 1	220 Mpa.	3%	70 BHN.
Standard BS: 1400, Grade – PB 2	220 Mpa.	5%	90 BHN.
Standard BS: 1400, Grade – PB 4	230 Mpa.	6%	80 BHN.
Standard IS: 28-1985, Grade - 1	190 Mpa.	3%	60 BHN.
Standard IS: 28-1985, Grade – 2	220 Mpa.	3%	70 BHN.
Standard IS: 28-1985, Grade – 3	190 Mpa.	3%	60 BHN.
Standard IS: 28-1985, Grade – 4	230 Mpa.	6%	80 BHN.
Standard IS: 28-1985, Grade – 5	220 Mpa.	5%	90 BHN.

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## Leaded Tin Bronze Casting

We are the leading Leaded Tin Bronze Casting Manufacturers and Exporters in India. This Tin Bronze Alloys are Copper, Tin & Lead alloys that additionally contain Zinc. Leaded Tin Bronze Casting has good machinability, excellent corrosion resistance and superb pressure tightness. This Tin Bronze alloys also known as High Leaded Tin Bronze.



### Leaded Bronze Properties

We maintain all Lead Bronze Properties / grades as per BS: 1400, IS: 318, ASTM, DIN, JIS etc for manufacturing Leaded Tin Bronze Casting products. Our Leaded Tin Bronze Casting products must confirm their chemical & mechanical properties as we use premium quality alloying elements in our casting process. So we earn a great customer satisfaction from our valuable clients by supplying Leaded Tin Bronze Casting products.

### Leaded Bronze Uses :

Our Leaded Tin Bronze Casting products are used in diesel locomotives, railway coaches / bogies, valve, bearing, submersible pump, rolling mill's and steel plant's machineries, pump & valve parts, bushes of medium strength, engine components, tractor parts etc.

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## Leaded Tin Bronze Casting Chemical Composition

We use the following Leaded Tin Bronze Chemical Composition in our casting process.

Copper Alloy Standards	CU	SN	PB	ZN	FE	NI	P	AL	SI	SB	Impurities
BS: 1400, Grade LG – 1	Rem.	2 - 3.5	3 - 6	7 - 9.5	-	2.0	0.05	-	-	-	-
BS: 1400, Grade LG – 2	Rem.	4 - 6	4 - 6	4 - 6	-	2.0	0.1	-	-	-	-
BS: 1400, Grade LG – 4	Rem.	6 - 8	2.5 - 3.5	1.5 - 3.5	-	2.0	0.1	-	-	-	-
BS: 1400, Grade LB – 1	Rem.	6 - 8	13 - 17	2.0	-	0.5 - 2	0.10	-	-	-	-
BS: 1400, Grade LB – 2	Rem.	9 - 11	8 - 11	2.0	-	2.0	0.10	-	-	-	-
BS: 1400, Grade LB – 4	Rem.	4 - 6	8 - 10	2.0	-	2.0	0.10	-	-	-	-
BS: 1400, Grade LB – 5	Rem.	4 - 6	18 - 23	2.0	-	0.5 - 2	0.10	-	-	-	-
IS: 318-1981, Grade LTB – 1	Rem.	6 - 8	2.5 - 3.5	1.5 - 3	0.30	2.0	-	0.01	0.01	0.30	0.70
IS: 318-1981, Grade LTB – 2	Rem.	4 - 6	4 - 6	4 - 6	0.35	2.0	-	0.01	0.02	0.40	0.80
IS: 318-1981, Grade LTB – 3	Rem.	6 - 8	9 - 11	0.75	0.35	2.0	-	0.01	0.02	0.50	0.80
IS: 318-1981, Grade LTB – 4	Rem.	6 - 8	14 - 16	0.75	0.35	2.0	-	-	0.02	0.50	0.80
IS: 318-1981, Grade LTB – 5	Rem.	9 - 11	8.5 - 11	1.0	0.35	2.0	-	0.01	0.02	0.50	0.80
IS: 318-1981, Grade LTB – 6	Rem.	4 - 6	18 - 23	1.0	0.35	2.0	-	-	0.01	0.50	0.80

## Leaded Tin Bronze Casting Mechanical Properties

The mechanical properties of leaded tin bronze are given in the following table.

Copper Alloy Standards	Tensile Strength (Min.)	Elongation % (Min.)	Brinell Hardness (Min.)
BS: 1400, Grade LG – 1	220 Mpa.	12%	70 BHN.
BS: 1400, Grade LG – 2	230 Mpa.	10%	65 BHN.
BS: 1400, Grade LG – 4	240 Mpa.	12%	70 BHN.
BS: 1400, Grade LB – 1	200 Mpa.	8%	65 BHN.
BS: 1400, Grade LB – 2	220 Mpa.	5%	65 BHN.
BS: 1400, Grade LB – 4	200 Mpa.	6%	60 BHN.
BS: 1400, Grade LB – 5	175 Mpa.	6%	50 BHN.
IS: 318-1981, Grade LTB – 1	250 Mpa.	16%	70 BHN.
IS: 318-1981, Grade LTB – 2	190 Mpa.	13%	65 BHN.
IS: 318-1981, Grade LTB – 3	175 Mpa.	4%	60 BHN.
IS: 318-1981, Grade LTB – 4	160 Mpa.	4%	65 BHN.
IS: 318-1981, Grade LTB – 5	190 Mpa.	5%	65 BHN.
IS: 318-1981, Grade LTB – 6	140 Mpa.	5%	40 BHN.

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## Silicon Bronze Casting

We are the superior quality Silicon Bronze Casting Manufacturers and Exporters. Silicon Bronze is an alloy of copper containing Silicon (3% – 5%). Our Silicon Bronze Casting products have a good combination of strength, ductility, corrosion resistance and weldability.

Our Silicon Bronze Casting products are widely used in diesel locomotives, railway coaches / bogies, marine hardware & fasteners, rolling mill's machineries, submersible pump and steel plant's machineries.



### Silicon Bronze Casting Alloy :

We manufacture all Silicon Bronze Casting Alloy mentioned in standards like ASTM, IS, BS etc. for manufacturing Silicon Bronze Casting products. We use pure Copper and Silicon for alloying in our sand casting process. We strictly maintain the chemical & mechanical properties of our Silicon Bronze Casting products. Therefore we earn a great customer satisfaction from our valuable clients and also known as a renowned Silicon Bronze Casting manufacturers, suppliers and exporters.

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## Silicon Bronze Casting Chemical Composition

The silicon bronze chemical composition is given in the following table.

Copper Alloys	CU	SN	PB	ZN	FE	NI	MN	AL	SI
Standard ASTM : C63400	Rem.	0.2	0.05	0.5	0.15	0.15	-	2.6 - 3.2	0.25 - 0.45
Standard ASTM : C63600	Rem.	0.2	0.05	0.5	0.15	0.15	-	3 - 4	0.7 - 1.3
Standard ASTM : C63800	Rem.	-	0.05	0.8	0.2	0.2	0.1	2.5 - 3.1	1.5 - 2.1
Standard ASTM : C64200	Rem.	0.2	0.05	0.5	0.3	0.25	0.1	6.3 - 7.6	1.5 - 2.2
Standard ASTM : C64210	Rem.	0.2	0.05	0.5	0.3	0.25	0.1	6.3 - 7.0	1.5 - 2.0
Standard ASTM : C87300	94 Min.	-	0.2	0.25	0.2	-	0.8 - 1.5	-	3.5 - 5.0
Standard ASTM : C87600	88 Min.	-	0.5	4.0 - 7.0	-	-	-	-	3.5 - 5.5
Standard ASTM : C87610	90 Min.	-	0.2	3.0 - 5.0	-	-	-	-	3.0 - 5.0
Standard ASTM : C95600	88 Min.	-	-	-	-	0.25	-	6 - 8	1.8 - 3.2
Standard IS : 1028-1987	89 Min.	1.0	0.5	5.0	2.5	-	1.5	1.5	1 - 5

## Silicon Bronze Casting Mechanical Properties

The silicon bronze mechanical properties are given in the following table.

Copper Alloys	Tensile Strength (Min.) (MPa)	Elongation % on 5.65√S <sub>0</sub> (Min.)
Standard ASTM : C63400	550	30
Standard ASTM : C63600	530	64
Standard ASTM : C63800	565	33
Standard ASTM : C64200	700	32
Standard ASTM : C64210	620	30
Standard ASTM : C87300	310	20
Standard ASTM : C87600	414	16
Standard ASTM : C87610	310	20
Standard ASTM : C95600	515	18
Standard IS : 1028-1987	310	20

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# Aluminium Gravity Die Casting

We are the renowned Aluminium Gravity Die Casting Manufacturers and exporters of mechanical products that are used in general engineering purpose around the world.

Our manufactured Aluminium Gravity Die Casting products are very much appreciated by our clients for its features like strength, high machinability and blowholes/porosity free.

Our Aluminium Gravity Die Casting items are used in Diesel Locomotives, Railway Coaches / Bogies of Indian Railways, Govt. of Defence, Submersible Pump and Electric power supply industries.



## Aluminium Gravity Die Casting Process :

We manufacture Aluminium Gravity Die Casting products by using Gravity Die Casting Process. The mold /die that is used in our Aluminium Gravity Die Casting Process are generally made of high alloy iron or steel. In this process molten metal is poured directly by gravity into a mold / die that is made in two halves.

The metal mold aids in quicker solidification of the casting material, which results in highly desirable fine-grained structures that have high strength and soundness. We use 99% pure aluminium ingots along with other alloying elements like silicon, magnesium, copper and manganese in our Aluminium Gravity Die Casting Process. Therefore our Aluminium Gravity Die Casting products are free from any surface defects & porosity.

## Product Specification :

We manufacture Aluminium Gravity Die Casting products by maintaining all common specifications like BS: 1490, IS: 617 etc. We strictly maintain the chemical & mechanical properties of our Aluminium Gravity Die Casting Items. Therefore we earn a great customer satisfaction from our valuable clients by supplying different types of Aluminium Gravity Die Casting engineering products.

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# Aluminium Gravity Die Casting Chemical Composition

Aluminium Alloys	Al	Cu	Mg	Si	Fe	Mn	Ni	Zn	Pb	Sn	Ti
BS: 1490, Designation - LM 2	Rem.	0.7 - 2.5	0.30	9.0 - 11.5	1.0	0.5	0.5	2.0	0.3	0.2	0.2
BS: 1490, Designation - LM 4	Rem.	2.0 - 4.0	0.2	4.0 - 6.0	0.8	0.2 - 0.6	0.3	0.5	0.1	0.1	0.2
BS: 1490, Designation - LM 6	Rem.	0.1	0.1	10.0 - 13.0	0.6	0.5	0.1	0.1	0.1	0.05	0.2
BS: 1490, Designation - LM 9	Rem.	0.2	0.2 - 0.6	10.0 - 13.0	0.6	0.3 - 0.7	0.1	0.1	0.1	0.05	0.2
BS: 1490, Designation - LM 13	Rem.	0.7 - 1.5	0.8 - 1.5	10.0 - 13.0	1.0	0.5	1.5	0.5	0.1	0.1	0.2
BS: 1490, Designation - LM 16	Rem.	1.0 - 1.5	0.4 - 0.6	4.5 - 5.5	0.6	0.5	0.25	0.1	0.1	0.05	0.2
BS: 1490, Designation - LM 20	Rem.	0.4	0.2	10.0 - 13.0	1.0	0.5	0.1	0.2	0.1	0.1	0.2
BS: 1490, Designation - LM 21	Rem.	3.0 - 5.0	0.1 - 0.3	5.0 - 7.0	1.0	0.2 - 0.6	0.3	2.0	0.2	0.1	0.2
BS: 1490, Designation - LM 22	Rem.	2.8 - 3.8	0.05	4.0 - 6.0	0.6	0.2 - 0.6	0.15	0.15	0.1	0.05	0.2
BS: 1490, Designation - LM 24	Rem.	3.0 - 4.0	0.3	7.5 - 9.5	1.3	0.5	0.5	3.0	0.3	0.2	0.2
BS: 1490, Designation - LM 25	Rem.	0.2	0.2 - 0.6	6.5 - 7.5	0.5	0.3	0.1	0.1	0.1	0.05	0.2
BS: 1490, Designation - LM 26	Rem.	2.0 - 4.0	0.5 - 1.5	8.5 - 10.5	1.2	0.5	1.0	1.0	0.2	0.1	0.2
BS: 1490, Designation - LM 27	Rem.	1.5 - 2.5	0.35	6.0 - 8.0	0.8	0.2 - 0.6	0.3	1.0	0.2	0.1	0.2
BS: 1490, Designation - LM 28	Rem.	1.3 - 1.8	0.8 - 1.5	17.0 - 20.0	0.7	0.6	0.8 - 1.5	0.2	0.1	0.1	0.2
BS: 1490, Designation - LM 30	Rem.	4.0 - 5.0	0.4 - 0.7	16 - 18	1.1	0.3	0.1	0.2	0.1	0.1	0.2
IS: 617-1994, Designation - 4223	Rem.	2.0 - 4.0	0.15	4.0 - 6.0	0.8	0.2 - 0.6	0.3	0.5	0.1	0.1	0.2
IS: 617-1994, Designation - 4225	Rem.	1.0 - 1.5	0.3 - 6.0	4.5 - 6.0	0.8	0.5	0.3	0.5	0.2	0.1	0.2
IS: 617-1994, Designation - 4300	Rem.	0.1	0.1	4.5 - 6.0	0.6	0.5	0.1	0.1	0.1	0.05	0.2
IS: 617-1994, Designation - 4323	Rem.	3.0 - 5.0	0.1 - 0.3	5.0 - 7.0	1.0	0.2 - 0.6	0.3	2.0	0.2	0.1	0.2
IS: 617-1994, Designation - 4420	Rem.	3.0 - 4.0	0.3	7.5 - 9.5	1.3	0.5	0.5	3.0	0.3	0.2	0.2
IS: 617-1994, Designation - 4423	Rem.	1.5 - 2.5	0.3	6.0 - 8.0	0.8	0.2 - 0.6	0.3	1.0	0.2	0.1	0.2
IS: 617-1994, Designation - 4450	Rem.	0.1	0.20 - 0.45	6.5 - 7.5	0.5	0.3	0.1	0.1	0.1	0.05	0.2
IS: 617-1994, Designation - 4520	Rem.	0.7 - 2.5	0.30	9.0 - 11.5	1.0	0.5	0.5	2.0	0.3	0.2	0.2
IS: 617-1994, Designation - 4525	Rem.	2.0 - 4.0	0.5 - 1.5	8.5 - 10.5	1.2	0.5	1.0	1.0	0.2	0.1	0.2
IS: 617-1994, Designation - 4528	Rem.	1.75 - 2.5	0.15	8.5 - 9.5	0.4 - 0.6	0.8	0.8	0.5	0.1	0.1	0.2
IS: 617-1994, Designation - 4635	Rem.	0.1	0.2 - 0.6	10.0 - 13.0	0.6	0.3 - 0.7	0.1	0.1	0.1	0.05	0.2
IS: 617-1994, Designation - 4652	Rem.	0.7 - 1.5	0.8 - 1.5	10.0 - 12.0	1.0	0.5	0.7 - 1.5	0.5	0.1	0.1	0.2

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## Aluminium Gravity Die Casting Mechanical Properties:

Aluminium Alloys	Condition	Tensile Strength (Min.) N/mm <sup>2</sup>	Elongation % on 5.65√S <sub>0</sub> (Min.)
BS: 1490, Designation - LM 2	M	150	-
BS: 1490, Designation - LM 4	M	160	2
BS: 1490, Designation - LM 6	M	190	7
BS: 1490, Designation - LM 9	M	190	3
BS: 1490, Designation - LM 13	TE	210	-
BS: 1490, Designation - LM 20	M	190	5
BS: 1490, Designation - LM 21	M	170	1
BS: 1490, Designation - LM 24	M	180	1.5
BS: 1490, Designation - LM 25	M	160	3
BS: 1490, Designation - LM 26	TE	210	-
BS: 1490, Designation - LM 27	M	160	2
BS: 1490, Designation - LM 28	TE	170	-
BS: 1490, Designation - LM 30	M	150	-
IS: 617-1994, Designation – 4223	M	160	2
IS: 617-1994, Designation – 4225	T4	230	3
IS: 617-1994, Designation – 4300	M	140	4
IS: 617-1994, Designation – 4323	M	175	1
IS: 617-1994, Designation – 4420	M	180	1.5
IS: 617-1994, Designation – 4423	M	160	2
IS: 617-1994, Designation – 4450	M	160	3
IS: 617-1994, Designation – 4520	M	150	2
IS: 617-1994, Designation – 4525	T5	210	2
IS: 617-1994, Designation – 4528	M	220	1.5
IS: 617-1994, Designation – 4600	M	190	7
IS: 617-1994, Designation – 4628	M	270	1.5
IS: 617-1994, Designation – 4635	M	190	3
IS: 617-1994, Designation – 4652	T5	210	1.5

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