

## MATERIAL

### AST-650 Cast Bronze Bearings with Graphite



### Structure

AST-650 material is made of strong cast bronze base metal embedded with special solid lubricants. The base metal withstands high loads and the solid lubricants provide self-lubrication. The bearing shows excellent performance, without pre-lubrication, under conditions of extreme high and low temperature and low speed. This material provides a maintenance-free bearing solution, particularly for high load, intermittent or oscillating motion.

### Features

1. May work without any oil for long period
2. Extremely high load capacity, low wear and friction
3. Particularly appropriate for low speed and high load
4. Suitable for reciprocating, oscillation or intermittent motion where it is difficult to form an oil film
5. Good chemical resistance and anti-corrosion characteristics
6. Good for a wide range of temperatures (-40°C to +300°C)

### Typical Applications

These bearings can be used dry in applications with high temperature, high pressure, corrosive media, water or other chemical environments when no lubricant can be used. It is widely used in automotive products, water engineering, dam gates, plastics industries, successive casting machines, rollers in steel mills, ships, turbo generators, hydraulic turbines and injection molding machines.



# TECHNICAL INFORMATION



## AST-650 Cast Bronze Bearings with Graphite

<b>Main Metal Type</b>						
Grade	650	650S1	650S2	650S3	650S5	650HP
Material	CuZn25Al5Mn4Fe3	CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12	CuZn25Al5Mn4Fe3	CuZn32Al5Ni3
Density	8	8.9	7.8	8.9	8	8
HB hardness	>210	>70	>150	>95	>250	>280
Tensile strength N/mm <sup>2</sup>	>750	>200	>600	>260	>800	>540
Yield strength N/mm <sup>2</sup>	>450	>90	>260	>150	>450	>450
Elongation %	>12	>15	>10	>8	>8	>0.3
Coefficient of linear expansion	1.9x10 <sup>-5</sup> /°C	1.8x10 <sup>-5</sup> /°C	1.6x10 <sup>-5</sup> /°C	1.8x10 <sup>-5</sup> /°C	1.9x10 <sup>-5</sup> /°C	1.8x10 <sup>-5</sup> /°C
Max. Temp.	-40~+300°C	-40~+400°C	-40~+400°C	-40~+400°C	-40~+150°C	-40~+150°C
Max. load N/mm <sup>2</sup>	100	60	50	70	120	150
Max. speed (Dry) m/min	15	10	20	10	15	15
Max. PV N/mm <sup>2</sup> *m/min (Lubrication)	200	60	60	80	200	200
Compression deformation 300N/mm <sup>2</sup>	<0.01mm	<0.05mm	<0.04mm	<0.05mm	<0.005mm	<0.005mm

<b>Solid Lubricants</b>		
Lubricant	Features	Typical application
SL1 Graphite+add	Excellent resistance against chemical attacks and low friction. Temp limit 400°C	Suite for general machines and under atmosphere
SL4 PTFE+MOS <sub>2</sub> +add	Lower in friction and good for water lubrication, Temp. limit 300°C	Suite for water/sea lubrication, like ship, hydraulic turbine, gas turbine etc.