



**MATERIAL SPECIFICATION**  
**CAST BASALT**

Basalt is a neovolcanic eruptive rock which melts at approximately 1250°C, and can be cast in a similar way to cast iron. Basalt gravel of special chemical and mineralogical structure is melted in a furnace similar to an open hearth furnace. The molten magma flows through a homogenizing drum and is cast by means of casting ladles - like cast iron - into sand molds or chill molds (static cast) or in rotating chill molds (dynamic or centrifugal casting). After a carefully controlled annealing process the resultant cast material, "Cast Basalt" which retaining the typical qualities has the following notable characteristics.

**Mineral Composition**

Pyroxen, Magnetite, Olivin, Glass

**Chemical Composition (TYPICAL)**

Silica	S <sub>1</sub> O <sub>2</sub>	45% approx.
Alumina	AL <sub>2</sub> O <sub>3</sub>	12% approx.
Calcium Oxide	CaO	11% approx.
Magnesium Oxide	MgO	10% approx.
Iron Oxide	FeO <sub>3</sub>	13% approx.
Sodium Oxide	Na <sub>2</sub> O	3% approx.
Titanium Oxide	TO	3% approx.
Potassium Oxide	K <sub>2</sub> O <sub>2</sub>	1.5% approx.
Phosphorus	P <sub>2</sub> O	1.5% approx.
Manganese Oxide	MnO <sub>5</sub>	.5% approx.

**Elementary Qualities of Cast Basalt**

Specific Gravity	2.90 - 3.0 g/cm <sup>3</sup>
Compressive Strength	approx. 300 - 450 MPa -min
Bending Strength	approx. 40 MPa -min
Tensile Strength	approx. 10 MPa -min
Thermal Conductivity	.7 K-Cal/m <sup>2</sup> /hg °C (1.7w/m <sup>-1</sup> K <sup>-1</sup> )
Specific Heat	0.2 BTU/lb.°C
Thermal Expansion	20-100° C (77 x 10 <sup>-7</sup> ) deg -1
Thermal Expansion	20-400° C (77 x 10 <sup>-7</sup> ) deg -1
Abrasion Resistance	3-3.5cm <sup>3</sup> /50 cm <sup>2</sup> - Din 52 108
Hardness	8.5 mohs scale

The greatest advantage of Cast Basalt products is their extraordinary abrasion resistance which in many cases surpasses that of alloy steel. Moreover, basalt castings have nearly unlimited durability and are resistant to most acids and lyes of every concentration.

There are however, qualities of Cast Basalt products which are inferior in comparison to metals eg. Mechanical and impact strength. Owing to the considerable hardness of Cast Basalt, its machinability, in comparison with metals, is not possible. However, Cast Basalt can be cut with a diamond saw.