



**BMW**  
*Steels Ltd*

## Cast Basalt Division

BASALT450<sup>TM</sup>



An ISO 9001-2008 Company



# Company Profile

BMW Steels Ltd was formed in 1962 as a one stop shop for wear and erosion solutions. The Company started as a casting unit but with the passage of time, new products like Alumina Ceramic & Cast Basalt were added to the product range.

BMW uses its core strengths of custom engineering, materials expertise, operational excellence, and rapid execution, to help customers develop amazing solutions to their toughest technical challenges. BMW products

have been proved second to none in the industry.

Effectiveness of our material for wear resistance has been tested in actual use, at various power plants and other industries including NTPC, BHEL, Alstom, Doosan, Vedanta, Tata Power and many more. Our wear protection capabilities have been evaluated and successfully established for wear and erosion resistance in laboratories like CSIR, CPRI Labs too.

## Our Products

With the support of excellent manufacturing infrastructure, experienced engineers, technicians and staff, BMW has to its credit developed many proprietary equipment like Variable Orifices, Coal Rope Breaker system for coal piping and many more...



### Wear Resistant Lining

- Alumina Ceramic Liner and Grinding Media (ALUMINA92™)
- Cast Basalt Cylinders and Tiles (BASALT450™)
- Chemically Bonded Lining (Wear Seal CBC™)
- Alumina Based Wear Seal™ Series of Mortar, Putty & Liners
  - Wear Seal™ Diamond
  - Wear Seal™ CBC
  - Wear Seal™ Mortar
- Fabrication for Lined Equipment

### Wear Resistant Iron Castings

- Ni-Hard
- Hi-Chrome
- Manganese Steel

### Pipe Connection Coupling System

- Grooved Coupling
- Slip on Type Coupling
- Quick Release Coupling
- Flexible Coupling

### Production Capacity...

BMW Steels Ltd. has a daily capacity to produce 7 MT Alumina Ceramic, 25 MT Cast Basalt, 10 MT CBC Linings & 10 MT Castings. Lining/Coating can be in any quantity/shape for wear resistance.

### Industries we serve...

Power Plants	Ceramic Industry
Cement Plants	Fertilizer Industry
Mining Industry	Mineral Processing Units
Paper Pulp Industry	Construction Industry





## Basalt



Basalt is a common "igneous volcanic rock" formed from the rapid cooling of Basaltic Lava that is low in silica content and comparatively rich in iron and magnesium. Basalt is usually Grey/Black in colour.

## Cast Basalt

Cast Basalt is formed by "Melting and Recrystallizing" naturally occurring basalt rock. The controlled cooling of the molten Basalt Rock forms finely crystallized black glass ceramic of extreme hardness 8 on the moh scale.

## Applications

Basalt is ideally suited to protect equipment where abrasive materials are conveyed, and cause sliding abrasion, such as pipes and bends for pneumatic or hydraulic systems, cyclones and separators, in flumes and chain conveyors, in hoppers and silos, mixers, tanks, pulpers, etc.

## Advantages

- Resistant to friction-induced abrasion.
- Heat resistant up to approx. 350°C.
- Resistant to chemicals and acids.
- Perfectly resistant to oxidation.
- Extremely smooth on the surface, and therefore has good sliding properties.

## Properties of Basalt 450™

Density	2.8 - 3.1 gm/cc
Surface hardness, Mohs scale	approx. 8 (Diamond is 10)
Compressive resistance	2,500-4,500 kg/cm <sup>2</sup>
Bending strength	250-450 kg/cm <sup>2</sup>
Application temperature range up to	approx. 620 K (approx. 350°C)
Chemical strength	Resistant to many acids and lyes
Water absorption	0.5% (maximum)
Color	Lustrous Black

# Product Range

BMW's Cast Basalt liners are manufactured under brand name BASALT 450™.

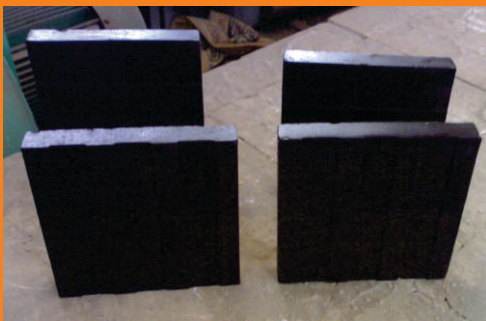
BMW manufactures Cast Basalt liners in various shapes and sizes, as per the client's requirement.

## Cast Basalt Liners

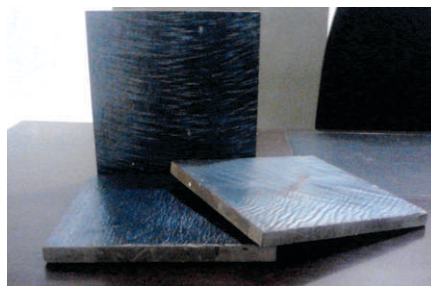
Pipes Cylinders



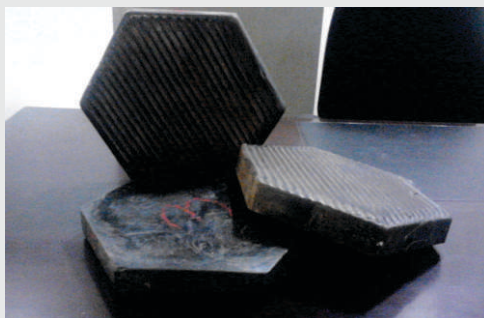
200 mm X 200 mm X 40 mm



130 X 50/47 X 20 mm



Hexagonal Liners



Trench Liners





## Skid Pan Tiles

The Automotive Research Association of England made a trial area of Cast Basalt Skid Pan tiles at their test track in 1979. Testing over six years proved that the Cast Basalt Skid Pan tile surface met all their requirements for automotive safety testing.

Now the Automotive industry worldwide utilizes specially designed water channeling "Skid pan basalt tiles" for their Low Friction test facilities are now being installed with Cast Basalt Tile in multiple countries around the world including India.

BMW – Cast Basalt tiles have gained the industry acceptance for this application.

BMW - Skid Pan Tiles are available in Polished or Unpolished stages. Cast Basalt has high wear resistance capacity so it maintains its surface smoothness.

Standard Dimension of BMW - Skid Pan Tiles are 200 x 200mm with thickness from 25mm to 40mm for straight section of track.

For Circular Part of track, BMW Tiles are designed to suit the curvature.





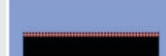



## Cast Basalt Lined Equipment

With our innovative approaches, we have established ourselves as a reliable manufacturer of Cast Basalt in Ash Pipeline Bends. These bends find wide usage in various areas such as pipelines for hydraulic, chemicals, electric power, mining, metallurgy, coal, and many more. Cast Basalt Liners have outstanding corrosion and abrasive resistance; as a result, they easily withstand high working pressures. Enclosed with cement mortar inside metal pipes, the liners prevent inner wall of the pipes from early wearing. Moreover, flexible Joints of our Ash Pipeline facilitate quick fitting & connection and smoothness in performance.



# Desirable Cast Basalt Properties for Achieving Optimum Wear Life

## Technical Details

Guidelines by BMW Steels Ltd. for Wear Resistance									
Basalt	 SLIDING	 FRICTION	 ABRASION	 IMPACT**	 HEAT	 CHEMICAL			
Cast Basalt	High	Low coefficient	10-15 times*	Low**	350°C	-			
*In Comparison with Mild Steel: 1 time									
**ANGLE OF INCIDENCE - maximum recommendable - depending on particle size of product being worn									
Guidelines by BMW Steels Ltd. for WEAR RESISTANCE for guidance only, having been produced - after selection of the product most appropriate to ORIGIN OF WEAR: Abrasion, Impact, Heat, Chemical, etc.- from data obtained on visits to Factories.									
	ANALYSIS (%) (Min)								
HARDNESS	Al2O3	SiO2	Fe2O3/FeO	CaO	MgO	K2O	Na2O	TiO2	DENSITY
8 MOH	10	50	12	10	10	3	3	2	2.8 to 3.1 gm/cm³

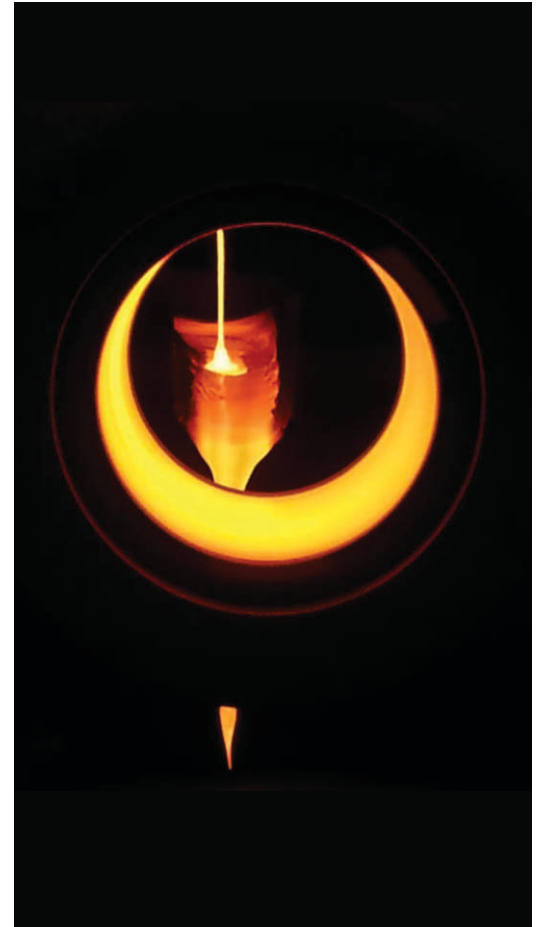
## Comparison of Basic Operating Properties of Basalt with Some Other Materials (Mean Values)

Property	Basalt Tiles	Ceramic Tiling Elements	Concrete Tiles
Abrasion resistance [cm <sup>3</sup> /50 cm <sup>2</sup> ]	5	6 - 10	19 - 24
[mm <sup>3</sup> ]	110	140 - 200	440 - 580
Bending strength [MPa]	45	30 - 60	5 - 7
Compression strength [MPa]	250 - 450	110 - 190	20 - 40
Chemical resistance	High	High	Low
Frost resistance	Frost proof	Frost proof	Frost proof

The values of Vickers hardness considerably exceed hardness of wear resistant cast irons and steels and they are comparable with high-grade, hardened and tempered steels with Tensile Strength in the range of about 2,300-2,600 MPa.

# Technology

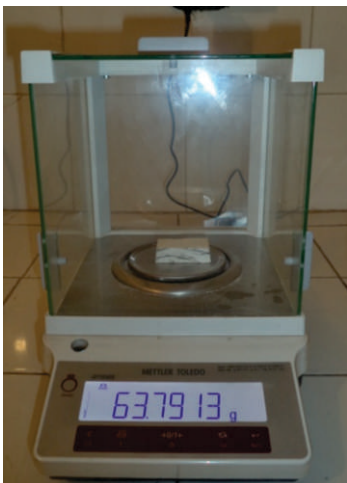
Spun Casted



Annealed in Furnace

Melted at 1450°C

## Testing Equipment



Density Testing Apparatus



Hardness Testing Machine



Water Absorption Test



Compressive Strength Test

# Our Prestigious Clients

## Power Plants



## Steel Plants



## EPC



## Cement Plants



## Mineral Processing Unit



## Fertilizer



## Aluminium Plants



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