



## INFORMATION SHEET

### **CAST BASALT**

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#### **1. INTRODUCTION**

In any Process Industry, where corrosive and abrasive materials are handled, the life of the plant shortens considerably due to wear by the high abrasive nature of the materials which gradually destroys the equipment leading to :

- Interruption in production
- Plant slow down or even standstill
- Costs on replacement/spares
- Expensive, time consuming repairs
- And thus high maintenance costs

The interruptions of down-time occur due to abrasion, wear or corrosion can now be overcome by using cast basalt lining of various shapes and sizes. Cast Basalt is ideally suitable for equipments handling suspended solids in fluids and all transfer chutes/points.

#### **2. WHAT IS CAST BASALT ?**

Basalt is a volcanic rock possessing ideal properties like inertness coupled with excellent resistance to corrosion and abrasion.

After selective quarrying the rock is melted at a temperature of around 1500 degree C and cast into moulds, bends or spun into pipes. The casting so produced are then subjected to heat treatment cycles in special kilns to produce re-crystallised basalt the product thus produced inherits inertness of parent materials. Its micro-crystalline, non-porous texture being denser and more homogenous than raw basalt, it acquires exceptionally high abrasion resistance.

Its high hardness, index (Minimum 7-8 as compared to 10 of diamond on Moh's scale) together with compressive strength of about 3500 kg/ Cm (minimum) makes it more suitable to use as the lining material.

#### **3. FEATURES AND PRACTICAL USEFULNESS**

Its main features are :

- a) Its extreme high resistance to sliding abrasion
- b) Its high resistance to most chemicals.
- c) The ease with which it can be cast into a wide range of shapes viz. Flat and Curved Tiles-Square, hexagonal, circular pipe liners and Special castings such as cones, squares, rounds etc.

#### **4. TECHNICAL DETAILS**

##### **a) *Friction Resistance***

As more material is passed over Cast Basalt it gets polished up thereby reducing friction further. Cast Basalt improves in service after getting polished. Wetting also improves its performance in practical applications.



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**b) Impact Resistance**

Direct Impact Resistance at 90 degree is low like all other ceramics, but it can be increased with proper installation by reducing the angle of impact. Cast Basalt is the best wherever sliding abrasion exists. Moreover, external impact strength of composite basalt pipe (enclosed in M.S. Shell) is always more than that of bare Ni-hard Pipe.

**c) Chemical Resistance**

Cast Basalt is almost absolutely acid/alkali resistant (except Hydrofluoric Acid) and hence corrosion resistant.

**d) Weight and Sizes**

Basalt Tiles are available in regular shape square of 200 x 200 x 30 mm thick, weighing approx. 90 kg/sq.m; whereas bends and pipes are made in various standard sizes.

**e) Temperature**

Cast Basalt withstands temperature up to 450 degree C and so in all high temp. applications Cast Basalt is used with cement grout. Wherever Basalt tiles or bends/pipes in sections are used with jointing resins, maximum temperature it can withstands is 100 deg. C.

**f) Explosion and Pressure**

With the building up of internal pressure causing pipe failure, basalt lined pipes will not fragment but will quietly split open ; the basalt remaining contained within the shell.

**g) Life**

Life of basalt lined pipe is estimated to be 7 to 10 times that of Cast Iron, and 3 to 4 times that of Ni-hard Steel.

#### 5. TYPICAL PROPERTIES

Specific Gravity	2.9 to 3.3 gm/cc
Compressive Strength	Minimum 3000 kg/ Cm <sup>2</sup>
Hardness	8 as compared to 10 of Diamond Moh's Scale.
Abrasion	: 0.4 mm material loss (Max.) OR 2 Cm <sup>3</sup> / Cm <sup>2</sup>

#### 6. APPLICATIONS

**a) Thermal Power Stations**

- Raw Coal Chutes/ Hoppers
- Ash Pits
- B. A. Disposal Slurry
- F.A. Trenches below Hopper and Pipelines
- Feed Bunker/Coal Bunker
- Crushers
- Dust Lines/ Bends, Pipeline/Bends
- Pulverised Coal Piping



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#### **b) Cement Plants**

- Dynamic Air Separators
- Drag Chain Conveyor
- Air Separator/ Cyclones
- Coal Hopper/ Chutes
- Slurry Lines/ Bends Lines/ Bends
- Lime/Silica Hoppers/Chutes
- Zub Separators
- Coal Ventury
- Raw Mill Ducts/ Chutes
- Grate Cooler Housing
- Coal Handling
- Cement Conveying
- Discharge Boxes / Bankers
- Redler Conveyor Housing
- Mixers/Nozzles

#### **c) Coal Mines/ Washeries**

- Coal Washing Plants
- Conveyor Chutes/Pipes
- Media Sumps
- Cyclones
- Coal Transportation
- Floatation Cells
- Centrifuges
- Sieves

#### **d) Paper and Pulp Mills**

- Pipe Work
- Decker & Stock Chest
- Hydro Pulpers
- Thickener Vats
- Couch Pit
- Blow Tanks
- Knotters
- Centri-cleaner
- Hydro Pulper Chests
- Mixers

#### **e) Fertilizer Plant**

- Pipe Work
- Conveyors
- Bunkers/Chutes/Flumes
- Separators

#### **f) Mineral Processing**

- Pipe Work
- Conveyors
- Separators
- Bunkers/Chutes
- Hoppers/Silos/Cyclones



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**g) Steel plants.**

- Cock sorting unit
- Lime bunkers
- Sinter plant cyclones
- Iron slurry line
- Air lift pipes
- Granulated slag
- Coal bunkers / sinter bunkers
- Coke breeze
- Sinter plant flow conveyors
- Thick slurry lines
- Telescopic pipes
- Hot mill flume

### 7. TYPICAL COMPARISON

Cost effectiveness is the main criteria for any piece of equipment and Cast Basalt proves to be simply that. A comparison of Cast Basalt with few other materials, under standard conditions indicates as follows : (basis 200 mm NB Bend for Ash Slurry application)

Material	Approx. Thickness mm	Approx. Life months
Mild Steel	10	4-6
Plain Cast Iron	18	6-8
Tiscral Lining	10	8-10
Ni-hard Dashcolite	20	12-14
Cast Basalt	20	30

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