

## Higher Productivity from Higher Performance Materials.

### **CERAMICS :**

After pioneering the production of Abrasives, Refractories, Electro minerals and Ceramic Fibre, CERAMIC now offers 'CERANINE' High Alumina Wear Resistant Tiles, Bricks and shapes for material handling systems – particularly for high-wear industrial applications such as in Mining, Minerals Processing, Coal fired Power Generation, cement, Steel Making and Grain Handling.

### **CERANINE :**

'CERANINES' is a product brought to India by CERAMIC using world class technology from America's largest ceramics manufacturer **Ceramics Company**. The unique Spray Dryer Method to manufacture the ceramic powder ensures excellent particle size control and uniform density during compacting operations. The choice of High Alumina raw material ensures excellent wear and corrosion properties. CERAMIC now offers from their modern manufacturing plant, compressive support to customers on the use of high performance Ceramics, through the network of Sales Engineering, Fabrication and Field Services.

Like CERANINE offers products designed to meet exacting requirements in a cost effective manner. Ceramic Components ranging from simple Wear Resistant Tiles to Moralized Ceramics with exacting surface finishes and close tolerance limits will from the product range available from CERANINE. The commitment to careful selection and preparation of materials and the modern Grinding, Pressing, Firing, Finishing and Moralizing facilities at CERANINE's plant.

**HARDNESS:** The simple characteristic makes a big difference in how wear resistant materials perform, and the return on investment.

**CERANINE** wear Resistance Alumina is extremely hard. It can the punishment of high volume raw material handling and keeps on long after most alternative materials have failed.

With **CERANINE** maintenance and downtime are minimized, productivity and performance are maximized.

In addition, CERANINE maintains its extraordinary abrasion resistance at high temperature – where other materials and composites typically weaken.

**CERANINE** is also inert providing high corrosion resistance to most chemicals except hydraulics acid, even at extreme temperatures. Many industries will choose **CERANINE** as the preferred material for material handling systems – particularly in the high stress world of Mining, Steel Making, Mineral Processing, and Coal fired Power Generation, cement Production and Grain Handling.

**CERANINE** is cost effective in the long-run in applications such as PF Bends, Chute Linings, Feeders, Pulverizers, Classifiers, Centrifuges, Elbows and Fan Housing.

### **PRODUCT RANGE AND APPLICATIONS :**

**CERANINE** is available in different formulations to meet a wide range of application needs.

GRADE	NOMINAL Al <sub>2</sub> O <sub>3</sub>	GENERAL APPLICATION PROPERTIES
WR - 90	90%	All purposes abrasion, small particle impingement, corrosion and temperature resistance such as in sliding action, impact load etc.
WR - 85	85%	An alternate to WR-90 grade. Recommended for large size wear parts which are generally made to order.
WR - 96	96%	Excellent Thermal Properties – Good Impact and Abrasion resistance.
WR-99.5	99.5%	Excellent Corrosion resistance, Chemical Stability and High Temperature Capability. Smooth Finish.

CERANINE is available in three different grades for installation :

- Pastable
- Weldable
- Boltable

Thickness Indicator Bricks are usually supplied with each lot. This brick is designed with a 45° V' shaped groove cut into its side. S the bricks wear, the groove becomes smaller. The distance between grooved points is the thickness of the Brick remaining. This unique patented (by CERANINE) brick actually allows the wear rate to be measured at any point of time.

**INSTALLATION OF ‘CERANINE’**

CERANINE is easily installed by plant maintenance people. It is available in standard brick and tile shapes as well as in special shapes to fit irregular contours.

Fastening the Ceramic to metal or other backing material is accomplished by using cements, by mechanical means, or by a combination of cementing and mechanical attachment. The type of installation will determine which of the above methods to use.

**INSTALLATION METHODS :  
ATTACHMENTS MADE WITH CEMENTS :  
PORTLAND CEMENTS :**

Portland cement may be used to install ceramic brick in cylindrical shells or in confined areas, such as chutes. Installation should be designed to utilize the high compressive values of cement since its adhesive qualities decrease with age. White Portland Cement is used only when colour contamination is objectionable. Acid-resistant cement should be used where acids or other materials may weaken Portland Cement. Fast-setting cement is desirable.

**EPOXY RESIN CEMENTS :**

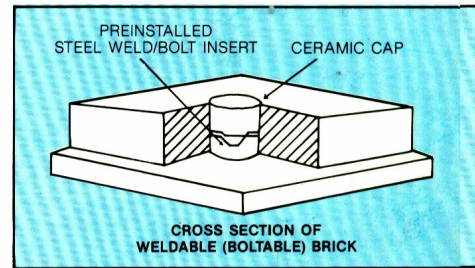
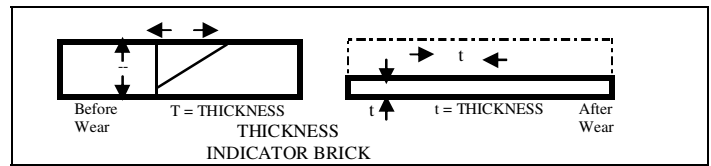
Epoxy resin cement is recommended if lasting adhesive strength is required. Cementing to a backing surface is similar to any other cementing operation. The epoxy cement selected must withstand maximum operating temperature expected and must not be affected by ant liquids that might be encountered. Special high-temperature heat-cure epoxies capable of withstanding temperature should be used if higher temperatures are anticipated.

**SILICONE RUBBER CEMENTS :**

Several brands of silicon rubber cements are capable to withstanding temperature upto 300<sup>0</sup>C; however, these have a lower shear strength than epoxy resin cements. For many applications this is not a disadvantage. Silicon rubber cements retain a slight resiliency which is an advantage if Ceramic is subjected to impact. Application is similar to epoxy resin cements.

**ACID RESISTANT CEMENTS :**

Some installations may be exposed to acids that weaken cement bond strength. Cements are available which will withstand acid conditions. Users should follow the manufacturer’s recommendations in selecting the type of acid-resisting cement to employ for a specific application.



**ATTACHMENT MADE BY WELDING OR BOLTING**

Under certain conditions it may be desirable to weld or bolt the ceramic in place when it is possible that the maximum temperature rating of an adhesive may be exceeded or if simplicity of welding is preferred. Standard brick in 12mm to 50mm thickness have holes with a steel insert. To attach, the insert is plug welded or bolted in place. Normal inserts are cold rolled steel, however, stainless steel 304 or 316 may be specially ordered. A ceramic cap is provided to protect the weld.

**HARDNESS COMPARISON**

MATERIAL	MOH HARDNESS
DIAMOND	15
BORON CARBIDE	14
SILICON CARBIDE	13
ALUMINA	12
FUSED ZIRCONIA	11
GARNET	10
TOPAZ	9
QUARTZ	8
TOOL STEEL	7
SILICA GLASS	6
CARBON STEEL	5
LIMESTONE	4
COPPER METAL	3
GYPSUM	2
TALC	1