

# *Omega 2*

## **An Essential Refractory Coating**



# $\Omega 2$ - *The Ceramic 'Armour'*

## Introduction

**Omega 2 - *The Ceramic 'Armour'*** was developed due to the need for an effective protective coating for refractories suffering oxidation, alkali and excessive mechanical attacks.

### Omega 2

**Omega 2** is a scientifically formulated coating that is applied to the surfaces of high temperature kiln, furnace and silicon carbide crucible linings to prevent the effects of corrosion and erosion caused by chemical (mostly alkali attacks) and mechanical attacks.

**Omega 2** is capable of forming ceramic bonds with a variety of substrates, creating an impervious, and non-wetting surface. With medium temperature curing, it can be used for the protection of substrates at medium temperatures. With high temperature curing, it creates ceramic bonds directly with the surface of the substrate.

At this point it is a highly stable, extremely high purity alumina coating with virtually zero porosity, which then protects its substrates from chemical vapour attacks.

### The Secret of Omega 2

The secret of Omega 2 is the fact that it has virtually zero porosity at very high temperatures, yet is porous at ambient temperatures. It can do this only because its unique structure allows it to expand into itself at high temperatures and shrink back into itself at low temperatures. This allows the coating to withstand numerous heating and cooling cycles from ambient temperatures up to 1,800°C, thereby adapting to the thermal co-efficient of the substrate.

The special qualities of this product enable the life cycle of the refractory linings to be greatly extended thus creating substantial cost savings from much less frequent replacement of worn refractories and the related loss of production from such shutdowns.

For example, in the case of cement rotary kilns, when coated with Omega 2, the cycle life of the refractory lining is at least doubled simply because the combined mechanical and alkali attacks on the kiln lining are dramatically reduced.

Its use in heat vessels employing ceramic fibre installation results in the added benefit of having the fibre thoroughly sealed and thus dramatically reducing airborne dust.

Since early 1994, Omega 2 has been applied in many varied and hostile environments around the world, most often with extraordinary results.

Omega 2 - *The Ceramic 'Armour'* delivers the ultimate in protection to its substrates.

For further information, or assistance in determining the suitability of this product for your substrates, contact **Soren Kierkegaard** via: [soren@industrialevolutionsnz.com](mailto:soren@industrialevolutionsnz.com)

# Technical Specification Sheet

## Omega 2 - *The Ceramic 'Armour'*

Mineralogy - Al<sub>2</sub>O<sub>3</sub>

### IDENTIFICATION

Omega 2 is supplied in wet form, and is a **white, odourless, rock/aggregate, paint-like material**, with a wet density of **2,100 kg/m<sup>3</sup>**

### PACKAGING

It is packaged in tamper-proof airtight plastic pails of **4 & 10 litres** each. Unopened, it has a shelf life of **one year**.

### RECOMMENDED USES:

1. **Mechanical Protection of Ceramic Fibre**, resulting in:
  - \* Dramatic reduction of airborne ceramic *dust*
  - \* Protection against *erosion* of the ceramic fibre
2. **Chemically Stable Refractory Barrier** - Omega 2 can withstand *alkali attacks* and most *reducing atmospheres*. The coating is thus essentially inert and physically stable, thereby providing a long-term shield for the more chemically vulnerable substrates, especially ceramic fibre and insulating firebricks.
3. **Protection Against Chemical Vapour Attack** - seals against penetration of aggressive chemical vapours for a variety of refractory substrates, thus *minimizing thermal shock* and increasing their *longevity*.

These refractories include Recrystallized Silicon Carbide (RSiC), Nitride Bonded Silicon Carbide, Ceramic Fibre and various High Alumina and High Carbon based compound refractories. Applications would include RSiC elements, rollers and kiln furniture, insulating firebricks, and heat vessel ceilings and walls.

### APPLICATION

The material is applied using a proprietary method with an **airless sprayer**.

### TEMPERATURES

Maximum service temperature = 1,800°C

Minimum curing temperature for ceramic bonding = 1,100°C

### FIRED CHEMICAL ANALYSIS

Al<sub>2</sub>O<sub>3</sub> - 81%                      SiO<sub>2</sub> - < 0.1%                      P<sub>2</sub>O<sub>5</sub> - 18%

Less than 0.5% of the particles are above 325-mesh ASTM grain size.

(When fired above 1,500°C: Al<sub>2</sub>O<sub>3</sub> - > 99.95%)

### STORAGE CONDITIONS

1. **ALWAYS** store **between 3°C & 15°C** (ideally between **5°C & 10°C**). **NEVER freeze**.
2. After use, **ALWAYS** reseal the remaining material in an airtight plastic container with a maximum ratio of **one part air to nine parts material**.
3. **NEVER mix different pails or batches together**.