



# MOLOCHITE™

## THE REFRACTORY MATERIAL SPECIFICALLY DESIGNED FOR THE BACK-UP OF INVESTMENT CASTING MOULDS

Molochite is an Alumino-Silicate specifically designed to be used as Flour and Stucco in the production of Investment Casting ceramic moulds.

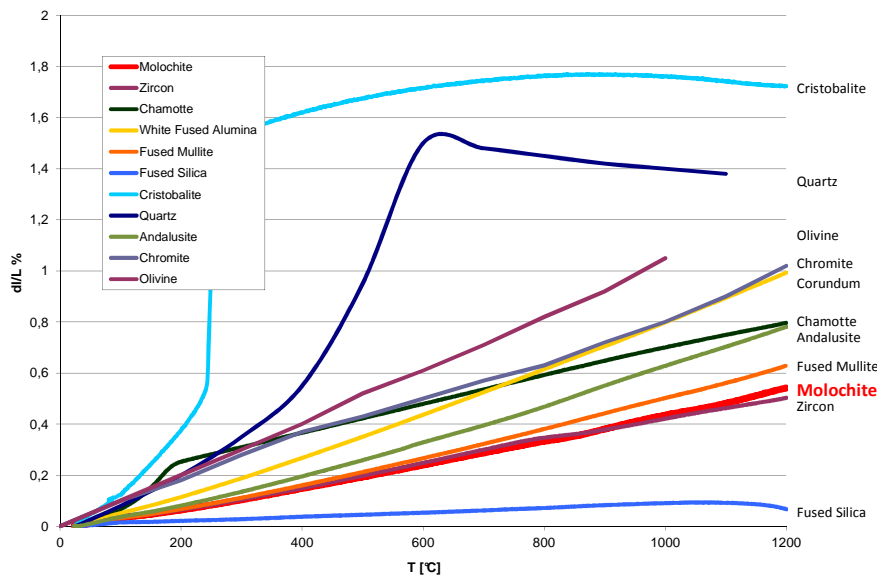
Molochite is obtained from specially selected kaolins from the **Cornwall area (UK)**, through a tunnel calcination process taking several days at temperatures reaching 1525°C. This produces an evenly calcined, consistent refractory with low Titanium and Iron Oxide content which are uniformly distributed.

Its structure is based on a composite network of mullite crystals, which are responsible for the hot resistance of the material, surrounded by a matrix of amorphous phase that contributes to minimize the thermal expansion.

The absence of any form of crystalline silica (Quartz, Cristobalite, Tridimite), avoids the expansion peaks associated to the allotropic transformations of silica and further enhances the Thermal Shock Resistance of the ceramic material based on Molochite.

### KEY PROPERTIES

#### Low Thermal Expansion and Hot Mechanical properties



The thermal expansion of Molochite is linear in the range 0-1200°C (2190°F), with a coefficient of  $4,4 \cdot 10^{-6} / ^\circ\text{K}$ . This is amongst the lowest coefficients achievable with Alumino-Silicates, almost identical to the one of **Zircon Silicate**. The low thermal expansion of Molochite provides the shell with enhanced thermo-mechanical properties:

- **High thermal shock resistance**, which reduces the risk of cracking during the Firing and De-waxing stages
  - **No risk of prime-coat delamination**, which would occur in case of thermal expansion mismatch between primary and back-up coats
  - **Enhanced dimensional accuracy** of the casting
- Furthermore, the hot mechanical behavior of Molochite makes this material particularly suitable to reduce the **Hot-Tearing defects**.





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## ACCURATE SIZING AND DE-DUSTING

Molochite is specifically produced to meet the requirements of the Investment Casting industry. The stucco grades are accurately **sieved and sized** in order to guarantee the consistency of the shell building process (shell thickness, weight, strength, etc.). Furthermore, all stucco grades are carefully **de-dusted (the dust index of each batch is controlled and is part of our specifications)**, which makes Molochite suitable for application with both Rainfall Sander or Fluidized Bed.

Molochite flours are milled with ceramic Grinding Media, in order to keep the material free from any metallic impurities which could be detrimental to the **stability of the slurries**. The Particle Size Distribution of the flours is designed to optimize the slurry rheology according to the requirements of the Investment Casting process.

## GRADES AND SHELL FORMULATION

This is a typical shell formulation recommended for Steel or Super-alloys casting. A wider selection of grade is available in case of particular requirements.

	PRIMARY COAT	INTERMEDIATE COATS	BACK-UPS
Flour	<b>White Fused Alumina Alodur WRG IC SF</b> (or Calcined Zircon flour)	<b>White Fused Alumina Alodur ZWSK F90</b> (or Calcined Zircon sand)	Colloidal Silica (28-30% SiO <sub>2</sub> )
Stucco	<b>Molochite -200</b> (or Molochite -120/200 blend)	<b>Molochite 30-80dd</b>	Colloidal Silica (24-26% SiO <sub>2</sub> )
Binder	<b>Molochite -200</b> (or Molochite -120/200 blend)	<b>Molochite 16-30dd</b>	Colloidal Silica (24-26% SiO <sub>2</sub> )

