



APPLIED MINERALS

# DRAGONITE™

## Halloysite Clay Additive for Advanced Ceramics

### Introduction

#### A Versatile Additive

Halloysite clay is a translucent aluminosilicate used globally to produce the highest quality advanced ceramics.

Sold under the Dragonite-PureWhite tradename, Applied Minerals offers its customers the purest halloysite in the world, combining low iron and titania content with a fineness of particle size to provide unsurpassed strength, plasticity, and whiteness in advanced ceramic formulations. The product contains no organic modifications.

Contact: : 1 (800) 356.6463 [info@appliedminerals.com](mailto:info@appliedminerals.com) [www.appliedminerals.com](http://www.appliedminerals.com)

### Key Performance Benefits

#### Improved Green Strength

DRAGONITE's high surface area of 65 m<sup>2</sup>/g helps to improve green strength to enable a body to withstand handling, mold ejection, and machining before it is completely cured or hardened.

#### Improved Casting Rates

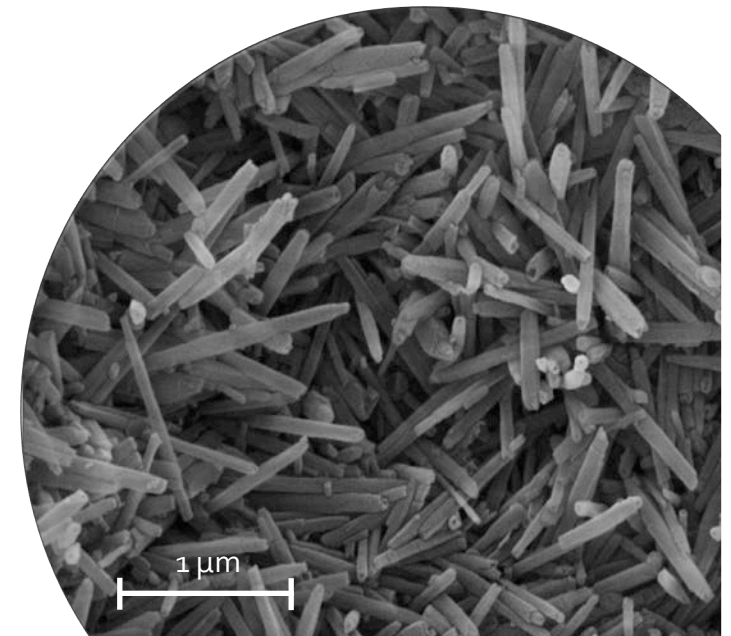
DRAGONITE's non-swelling nature yet high surface area helps to improve casting rates, which leads to productivity increases, reduction in scrap, and an ability to reduce the weight of cast parts.

#### Replace Higher Priced Plasticizers

DRAGONITE is employed in bodies as a thixotropic plasticizing agent and in glazes as a suspending agent and viscosity stabilizer. It can be used as a majority replacement of higher priced plasticizers such as Vee Gum and Hectorite, however with a higher fired whiteness and translucency

#### Additional Benefits

- High translucency
- Brilliant whiteness
- Highly porous
- Thermally stable
- High MOR
- Low clumping
- Highly refractive



# About Applied Minerals

Applied Minerals, Inc. is the leading global producer of Dragonite™ halloysite clay and AMIRON™ advanced natural iron oxides. Vertically integrated from mine to market, our products are produced from our wholly-owned Dragon Mine in Utah, USA.



Dragonite-PureWhite produced by Applied Minerals from its Dragon Mine located domestically in Utah



Dragonite-PureWhite is available in super sacks, fiber drums, and 25 kg paper bags

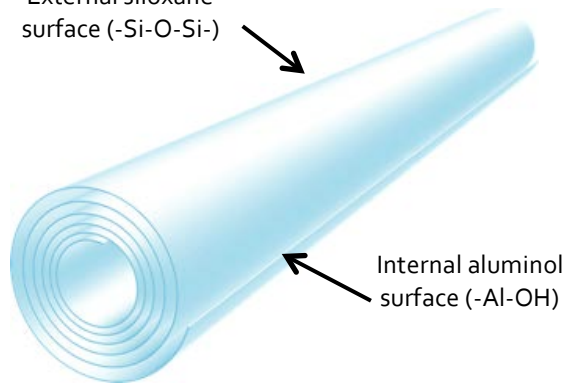


Production is supported by an onsite, state-of-the-art quality control lab

## Key Properties of Dragonite-PureWhite

### Chemistry and Physical Properties

External siloxane surface (-Si-O-Si-)



Dragonite possesses a hollow tubular morphology with negatively-charged silica on the outside and positively charged alumina on the inside. As seen below, Dragonite chemistry is identical to the widely-adopted kaolin clay.

#### Chemistry (XRF)

Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Na <sub>2</sub> O	CaO	TiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	LOI
38.2	46.3	<0.01	0.16	<0.05	0.25	15.5

Chemical formula	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub> · 2H <sub>2</sub> O
True specific gravity	2.53
Index of refraction	1.54
Bulk density	15.6 lbs/ft <sup>3</sup>
Pore volume	20-25%
Loss of tubular structure	900°C
Initial pH of raw clay	4.0 - 6.0
Oil absorption (Linseed)	40 lbs./100 lbs. Halloysite
% fired absorption (24 hour soak)	2.8
Surface area (BET)	65-120 m <sup>2</sup> /g
Fired Brightness (cone 10)	
L*	95.0%
a*	-0.08
b*	2.08
MBI (Methylene Blue Index)	8.81 Milliequivalents/100g
MOR (Modulus of Rupture)	733 – 1,100 psi

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