APPLIED MINERALS

DRAGONITE™

Halloysite Clay Additive for Advanced Ceramics

Introduction

A Versatile Additive

Halloysite clay is a translucent alumino-silicate 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.

Key Performance Benefits

Improved Green Strength

DRAGONITE's high surface area of 65 m^2/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

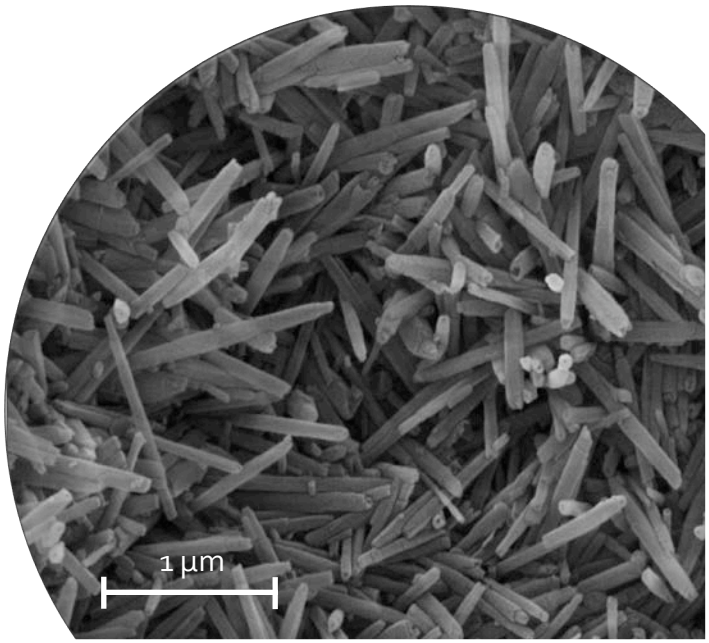
DRAGONITE's non-swelling nature yet high surface area helps to improve casting rates, which leads to productivity increases, reduction in scrap, and an ability to reduce the weight of cast parts.

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



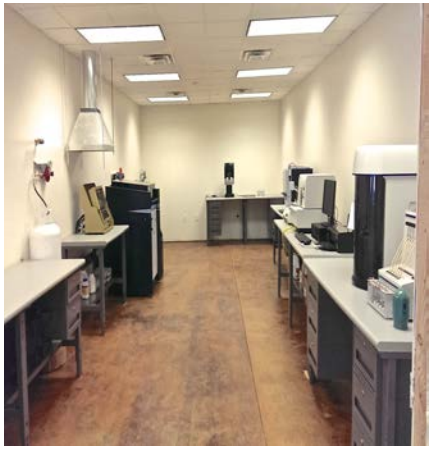
Contact: : 1 (800) 356.6463 info@appliedminerals.com www.appliedminerals.com

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

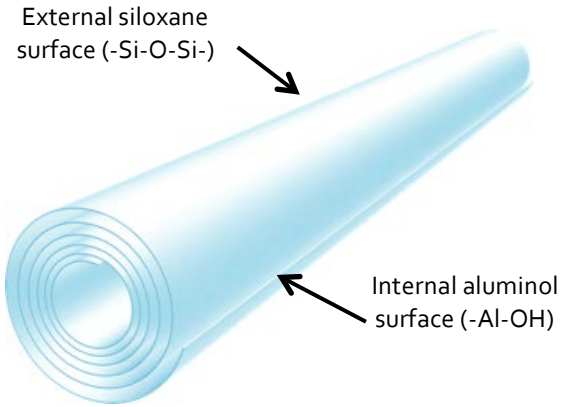
Dragonite-PureWhite is available in super sacks, fiber drums, and 25 kg paper bags



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

Key Properties of Dragonite-PureWhite

Chemistry and Physical Properties



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_2O_3	SiO_2	Na_2O	CaO	TiO_2	Fe_2O_3	LOI
38.2	46.3	<0.01	0.16	<0.05	0.25	15.5

Chemical formula	$Al_2Si_2O_5(OH)_4 . 2H_2O$
True specific gravity	2.53
Index of refraction	1.54
Bulk density	15.6 lbs/ft^3
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^2/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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