



Wollastonite: A Value-added Functional Mineral



A Specialty Mineral That Gives Improved Corrosion Protection and Durability

- AUXILIARY PIGMENT EXTENDER
- STABLE – PREVENTS DOWNWARD pH DRIFT
- IMPROVED WEATHERABILITY
- PREVENTS CRACKING AND IMPROVES SAG CONTROL
- REDUCES GLOSS

PAINT & COATINGS



WOLLASTOCOAT® Auxiliary Pigments

These high tech materials, known as WOLLASTOCOAT® pigments, have come a long way from simple extender applications. These calcium metasilicate products are easier to disperse and offer reduced oil absorption allowing significant elevation of the Critical Pigment Volume Concentration (CPVC), and allow substantially increased loadings without accompanying elevations in viscosity.

The use of chemically modified WOLLASTOCOAT® in metal primers has produced marked improvement in corrosion resistance and has decreased the tendency to blister. Even in non-inhibitive systems, inclusion of the WOLLASTOCOAT® family of products has improved performance by offering barrier properties.

WOLLASTOCOAT® pigments offer cost-effective, safe and successful solutions to a wide range of complex formulation problems.

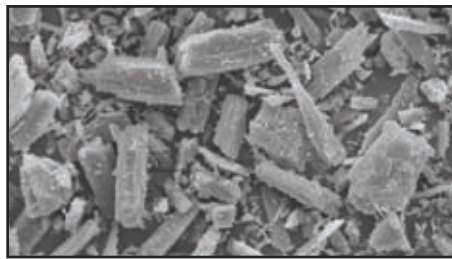
WOLLASTOCOAT®	ES	AS	WC
LONG OIL ALKYD	✓	✓✓	✓
MEDIUM AND SHORT OIL ALKYD	x	✓✓	✓
VINYL LATEX	✓✓	✓✓	✓
EPOXY AMINE AND AMIDE	✓✓	✓✓	x
COAL TAR/ASPHALTICS	✓	✓	✓✓
URETHANE/ACRYLIC & URETHANE POLYESTER	✓✓	✓	x
WATER-BASED ACRYLIC/URETHANE	✓✓	✓	N/A
VINYL CHLORIDE/ACETATE	✓✓	✓✓	✓
ACRYLIC LATEX	✓✓	✓✓	✓✓
WATER DISPERSIBLE ALKYD	x	✓	N/A
WATER EMULSIFIED ALKYD	x	✓✓	✓
WATER DISPERSIBLE EPOXY	✓✓	✓✓	N/A
ALUMINUM EPOXY MASTIC	✓✓	✓✓	N/A
UNSATURATED POLYESTER	✓	✓✓	✓✓
SATURATED POLYESTER	x	✓✓	x

✓✓ = Highly recommended ✓ = Specific System dependant x = Not recommended

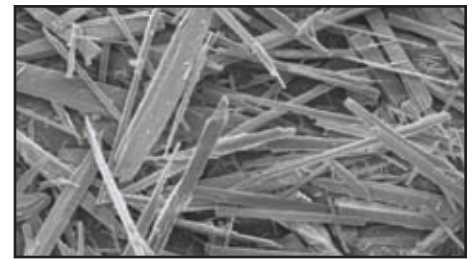
10 WOLLASTOCOAT® (750X)



NYAD® M400 (500X)



NYAD G® (100X)



WILLSBORO PRODUCTS/ TYPICAL PROPERTIES	10 WOLLASTOCOAT®	NYAD® 1250	NYAD® 400	NYAD® 325	NYAD G®
G.E. BRIGHTNESS	93	93	92	90	82
BULK DENSITY (lbs./cu.ft.) (g/cc)					
LOOSE	(41) (0.65)	(30) (0.48)	(44) (0.70)	(47) (0.75)	(25) (0.40)
TAPPED	(53) (0.85)	(50) (0.80)	(69) (1.10)	(75) (1.20)	(50) (0.80)
OIL ABSORPTION (lbs./100 lbs.)	25	27	22	21	35
HEGMAN GRIND	>6	>6	4	3	N/A
MICROTRAC D ₅₀ (µm)	4	4	8	14	55
ASPECT RATIO (L/D)	3:1	3:1	3:1	4:1	15:1

WOLLASTONITE... ONE MINERAL,



Applications

Industrial Coatings

- Reinforce film cohesion and improves mechanical properties
- Synergism with anti-corrosion inhibitors
- Improves durability and corrosion resistance
- Chemical treatment improves homogeneity and engineered reactivity
- Reduces cracking and checking
- Enhances resistance to brittle failure
- Improves resistance to physical degradation resulting from UV radiation
- Prolongs service life of coating; especially HAR grades

Roof Coatings, Coal Tar Coatings and Cements

- Safe alternative to asbestos and other fibers
- Partial to full replacement to cellulose fiber
- Improved film reinforcement and sag control
- High G.E. Brightness, especially beneficial for lighter or aluminum coatings
- Reduced susceptibility to UV related and mud cracking
- Improved durability and ease of application
- Improved flame and fire resistance

Powder Coatings

- Gloss reduction
- Crack and chip resistance
- Enhanced color-fastness and moisture/corrosion resistance
- Superior reinforcing performance and "tooth" in powder primers
- Lower specific gravity than competing materials
- Heat stable, resistant to ultra-violet degradation and chemical attack
- Lower film transmission properties

PRODUCT FAMILY	PRODUCT GRADES	APPLICATION USAGE
HIGH ASPECT RATIO	NYAD G, NYAD MG, NYGLOS 12, NYGLOS M15, ASPECT 3000, NYGLOS 4W	Asbestos and cellulose replacement in roof coatings/cements • Driveway sealers • Foundation coatings • Textured coatings, • Mastics • Floor coatings • Sealers • High heat resistance powder coatings • Aliphatic polyurethane coatings
POWDER	NYAD 325, NYAD M325, NYAD MD325, NYAD 400, NYAD M400, NYAD MD400	Architectural latex paints • Trade sale coatings • Block fillers • Traffic paint • Powder coatings
FINE PARTICLE SIZE	NYAD 1250, NYAD M1250, NYAD MD1250, NYAD 5000	Metal primers • Powder coatings • Industrial coatings • Automotive finishes • Wood stains
CHEMICALLY TREATED	400 WOLLASTOCOAT, M400 WOLLASTOCOAT, MD 400 WOLLASTOCOAT, 10 WOLLASTOCOAT, M1250 WOLLASTOCOAT, MD 1250 WOLLASTOCOAT	High performance anti-corrosive coatings • Heavy duty maintenance finishes • Marine and bridge paint • Powder coatings • Aerospace

MINERA PRODUCTS/ TYPICAL PROPERTIES	M1250/MD 1250 WOLLASTOCOAT®	NYAD® M400/MD400	NYAD® M325/MD325	NYGLOS® M15	NYAD® MG
G.E. BRIGHTNESS	89	87	87	82	82
BULK DENSITY (lbs./cu.ft.) (g/cc) LOOSE TAPPED	(45) (0.72) (57) (0.91)	(41) (0.65) (62) (1.0)	(47) (0.75) (69) (1.10)	(28) (0.45) (56) (0.90)	(34) (0.55) (59) (0.95)
OIL ABSORPTION (lbs./100 lbs.)	25	24	22	30	35
HEGMAN GRIND	>6	4	3	N/A	N/A
MICROTRAC D ₅₀ (µm)	4	9	12	18	23
ASPECT RATIO (L/D)	3:1	3:1	4:1	8:1	9:1

A WORLD OF APPLICATIONS



One Mineral, A World Of Applications

- State-of-the-art processing operations
- World-class chemical modification technology
- Industry leader
- World-wide distribution network
- Customer-focused global technical support
- Premium quality wollastonite

Wollastonite is a naturally occurring mineral, is non-hazardous, and is not regulated by shipping agencies. Based upon toxicological studies, there is no evidence of any significant health risks to workers.

NORTH AMERICAN OPERATION

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ISO 9001/14001 CERTIFIED

LATIN AMERICAN OPERATION

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ISO 9001/14001 CERTIFIED

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Purity and Acicularity

The deposits mined by NYCO in Willsboro, New York and in Mexico's Sonoran desert are unique for their purity and acicularity.

Wollastonite is the only pure white extender that is acicular in shape with aspect ratios ranging from 3:1 to 20:1. This high acicularity is of considerable value in the cohesive reinforcement of coating films. This, in turn, has led to coatings with better mechanical strength and weathering for improved resistance to cracking and checking.

Added Alkalinity

Wollastonite's pH of 9.9 along with its property of maintaining an alkaline pH in long-term storage make it a logical choice for use in paints to ensure better stability and maintenance of viscosity.

Wollastonite, due to its unique chemistry in combination with its particle shape, has a synergistic effect with anticorrosion inhibitors in industrial coatings. In architectural coatings, wollastonite-based formulations have better initial brightness and color than paints made with other extenders, as well as reduced sheen with better burnish resistance.

TYPICAL PROPERTIES	VALUE
APPEARANCE	WHITE
MORPHOLOGY	ACICULAR
MOLECULAR WEIGHT	116
SPECIFIC GRAVITY	2.9
REFRACTIVE INDEX	1.63
pH (10% SLURRY)	9.9
WATER SOLUBILITY (g/100cc)	0.0095
DENSITY (lbs./cu.ft.)	181
BULKING VALUE (gal./lbs.)	0.0413
MOHS HARDNESS	4.5
COEFFICIENT OF EXPANSION (mm/mm/°C)	6.5×10^{-6}
MELTING POINT (°C) - theoretical	1540
MELTING POINT (°C) - by ASTM D1857	1410

CHEMICAL COMPOSITION: CaSiO ₃			
COMPONENT	MEXICO (MD) TYPICAL VALUE (%)	MEXICO (M) TYPICAL VALUE (%)	NEW YORK TYPICAL VALUE (%)
CaO	45.72	44.94	46.36
SiO ₂	46.52	52.94	51.60
Fe ₂ O ₃	0.25	0.28	0.77
Al ₂ O ₃	0.25	0.30	0.40
MnO	0.02	0.04	0.15
MgO	0.71	0.75	0.15
TiO ₂	0.05	0.05	0.05
K ₂ O	0.20	0.23	0.02
Wt. Loss (1000°C)	6.30	0.47	0.50