

HUNTSMAN

Enriching lives through innovation



An exciting new addition to
the ALTIRIS[®] pigment range

Huntsman Corporation

Five business divisions 15,000 associates,
approx. \$10bn revenues

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Advanced Materials

Synthetic and formulated polymer systems



Performance Products

Intermediate chemistries and technologies



Pigments and Additives

TiO₂ pigments, color pigments, functional additives and timber and water treatment



Polyurethanes

MDI-based polyurethanes



Textile Effects

Chemical & dye products

Huntsman Pigments and Additives

Well Positioned to Understand Customer Needs

Unique “Horizontal” integration strategy differentiates the business

- ▶ One of the most diversified producers of pigments and additives
- ▶ Gaining deep insights into the needs of customers
- ▶ Ability to innovate across a wide range of products and applications



White pigments

Leading global supplier of specialty TiO₂ pigments



Functional Additives

A leading supplier of barium sulfate and zinc sulfide functional additives



Color pigments

A leading global supplier of ultramarine blue pigments
Number 2 globally for iron oxide pigments



Timber¹ treatment chemicals

Leading supplier of timber treatment chemicals



Eco Products and Water treatment chemicals

Major European supplier of water treatment chemicals
Leading producer of iron salts

Our main locations

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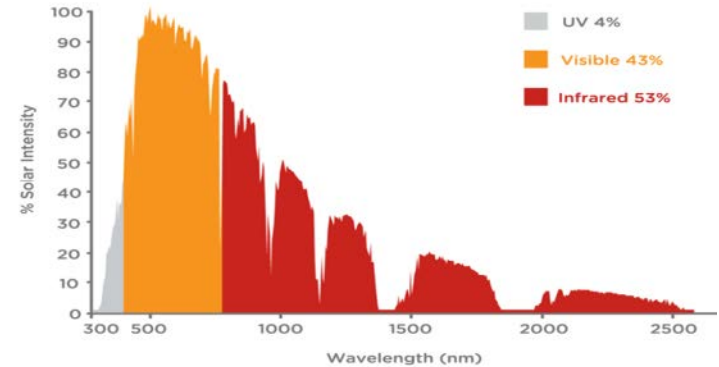


An established footprint with global reach

Solar spectrum and durability

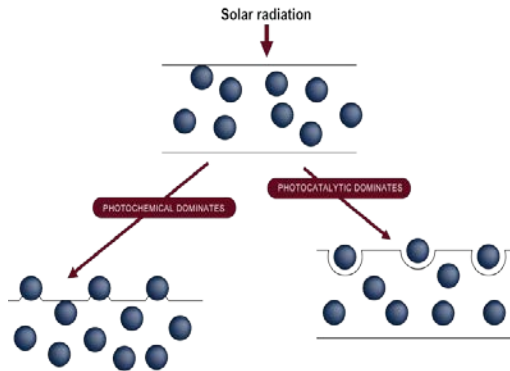
Managing reflectance to improve product durability

- ▶ UV makes up the smallest part of the spectrum
- ▶ Less than 50% is the visible part we see
- ▶ Over half the sun's power is in the infrared
- ▶ **Together they influence durability**
 - ▶ Energy absorbed from the sun's causes:



1) Photo degradation

Direct and indirect effect of free radicals destroying organic materials



2) Thermal degradation

Temperature affecting the physical and chemical structure of a material

- Depolymerization • Reduce mechanical integrity
- Migration of species • Embrittlement
- Stress cycles • Micro cracking

ALTIRIS[®] technology

Understanding the features & benefits

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ALTIRIS[®] technology – Key Features & Component Benefits

Key features

- Improved solar reflectance, heat management and weatherability in exterior applications
- Solutions for white and colored surfaces
- Meets new ASTM D476 class VIII type for TiO₂
- Proprietary patented technology

Macro sulfate titanium dioxide core

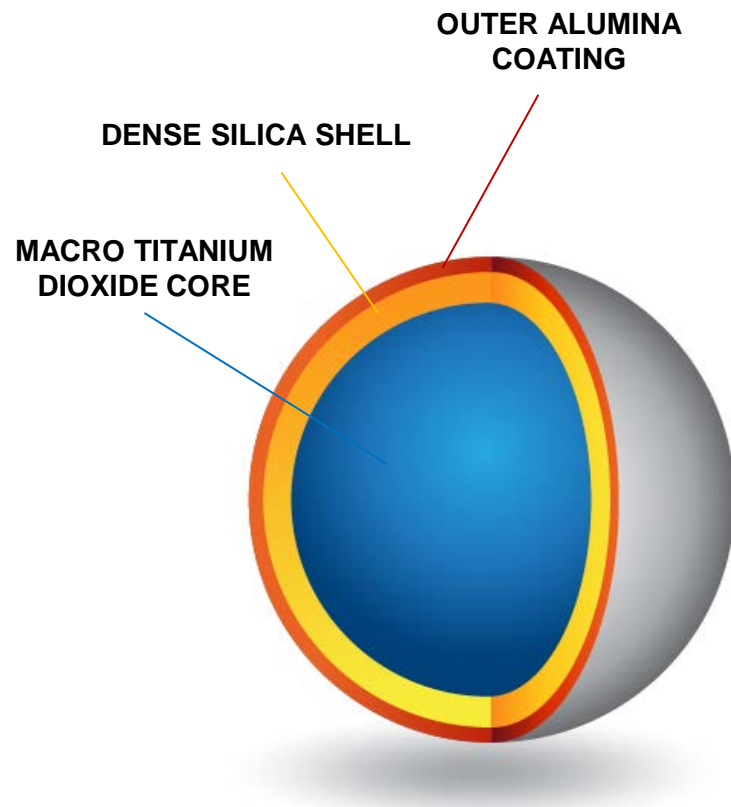
- Optimized sizes to maximise solar & near infrared reflection across the color spectrum

Dense silica shell

- Reduces free radical escape
- Low photocatalytic activity improving durability
- Delivers UV attenuation protecting organic pigments and reducing resin degradation in certain systems

Outer alumina coating

- Excellent dispersion and dispersibility



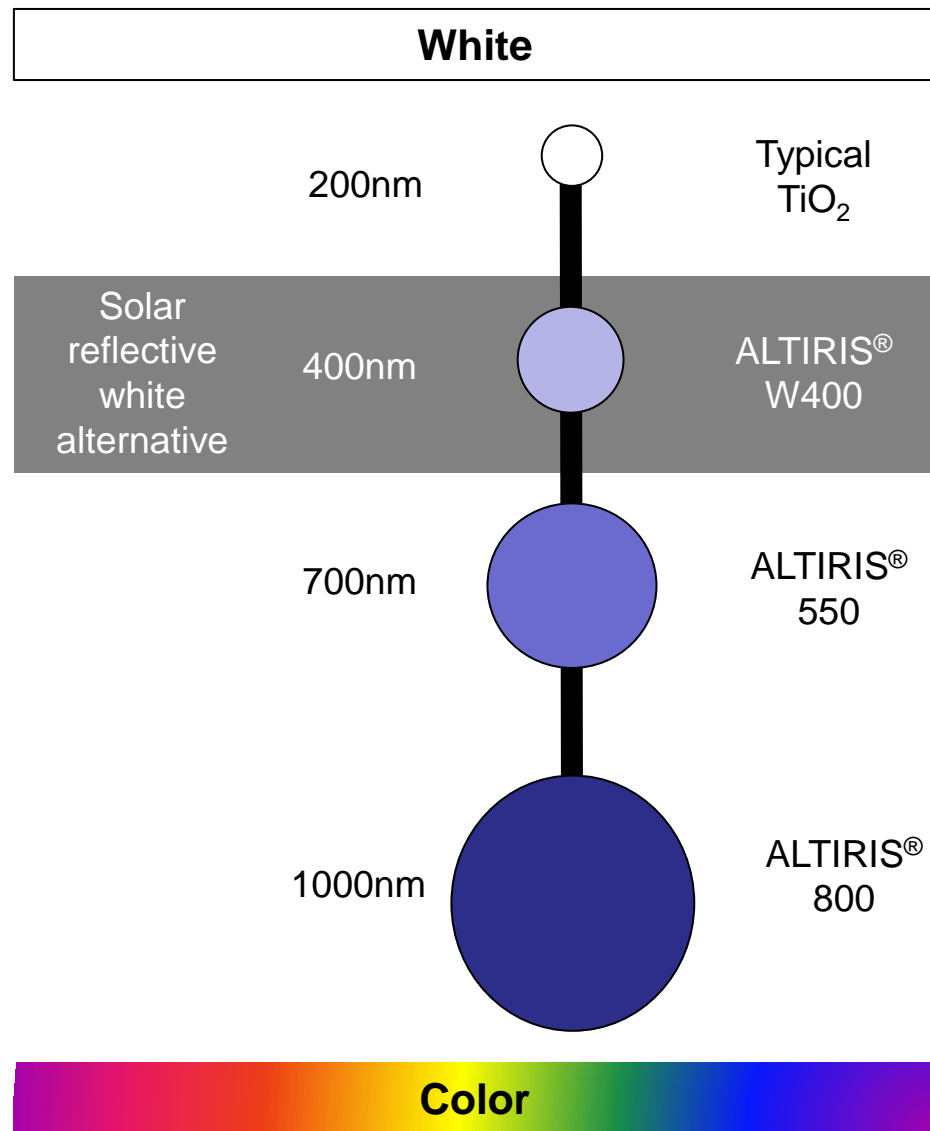
Meeting the new ASTM D476 TiO₂ standard

Feature	Class VIII	ASTM Standard
Crystal type	Rutile	D3720
Chalking resistance relative	Very High	
Typical end use application(s)	Exterior colored coatings & polymers requiring infra-red reflectance with excellent durability	
Titanium dioxide content, min%	92	D1394
Specific resistance, min Ohm	3000	D2448
Moisture content as packed, max %	1	D280
Specific gravity	3.6-4.3	D153

The latest addition to the ALTIRIS® range

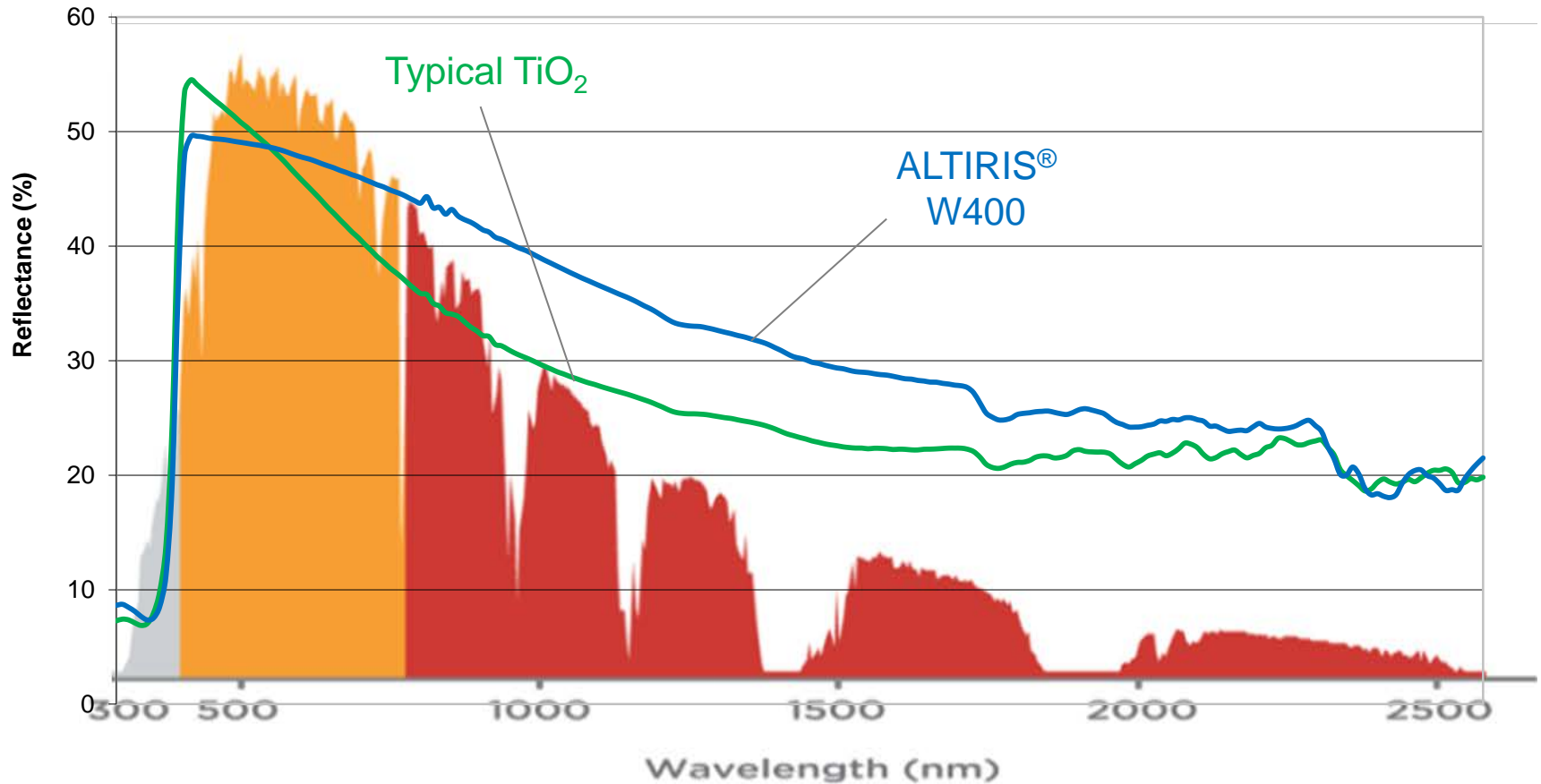
NEW ALTIRIS® W400 pigment

- ▶ For premium white and bright colored exterior surfaces
- ▶ Designed to maximize total solar reflectance
- ▶ Excellent tint strength
- ▶ Enhanced heat management
- ▶ Improved durability
- ▶ Low medium demand
- ▶ Blue color transmittance



ALTIRIS® W400

Comparing to a typical pigment grade



ALTIRIS® W400 IR reflective pigment

- ▶ Cutting edge patented technology
- ▶ Part of the ALTIRIS® IR pigment family
- ▶ Delivers improved total solar reflectance
- ▶ Can deliver improved durability over existing solutions
- ▶ 400nm primary particle size to maximize spectral reflectance for white and bright colors
- ▶ Dense silica coating to reduce photocatalytic effect improving durability
- ▶ Alumina coated to aid dispersibility

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Thank you

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