An exciting new addition to the ALTIRIS® pigment range
Huntsman Corporation
Five business divisions 15,000 associates, approx. $10bn revenues

- **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

1. Marketed through Viance, a Huntsman/Dow JV

**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

**Timber 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

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
    - Solar radiation
    - Photodegradation
    - **Photochemical degradation**

  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

Maximising solar reflectance is key to enhanced performance in both white and colored exterior systems.
### 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 TiO$_2$
- 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

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

Higher Solar reflectance with excellent tint strength
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
Disclaimer

Thank you

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