

Material Product Data Sheet

Aluminum Oxide 40 % Titanium Dioxide Powders

Thermal Spray Powder Products:
Amdry™ 6244, Amdry 6250, Amdry 6257,
Metco™ 131VF

1 Introduction

Powders consisting of alumina and 40 % titania (nominal) are used to produce coatings for applications that require moderate hardness and grindability, but higher fracture toughness compared to coatings produced from pure alumina, alumina 3 % titania or alumina 13 % titania.

Coatings of these materials are recommended for applications that require hard bearing surfaces, resistance to abrasive grains, fretting and particle erosion at operating temperatures up to 540 °C (1000 °F).

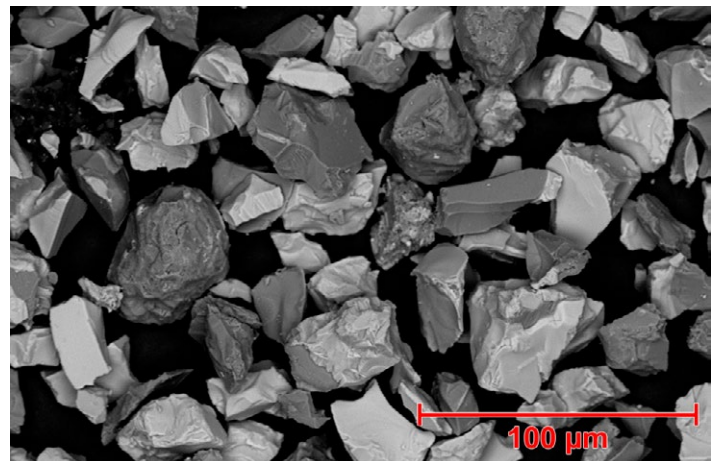
When polished, the coatings have low wettability, which makes them suitable for applications in the chemical processing industry to resistant weak acidic environments.

1.1 Typical Uses and Applications

- Chemical processing industry to resist weak acidic environments
- Textile manufacturing equipment and tooling
- Pump components, shaft sleeves and mechanical seals used in a variety of industries

Quick Facts

Classification	Oxide ceramic, alumina based
Chemistry	Al ₂ O ₃ 40TiO ₂
Manufacture	Various (see Section 2.2)
Morphology	Angular and blocky or spheroidal
Purpose	Wear and chemical resistance
Service Temperature	≤ 540 °C (1000 °F)
Melting Point	approx. 1840 °C (3340 °F)
Process	Atmospheric plasma spray or combustion powder Thermospray™



SEM photomicrograph of Amdry 6257, a fused and crushed product showing the angular and blocky morphology.

2 Material Information

2.1 Chemical Composition (nominal wt. %)

Product	Chemical Composition (nominal wt. %)							
	Al ₂ O ₃	TiO ₂	SiO ₂ (max)	Fe ₂ O ₃ (max)	MgO (max)	CaO (max)	Organic Solids (max)	Other (max)
Amdry 6244	Balance	38.5 – 41.5	0.5	0.3	0.2	0.1	–	–
Amdry 6250	Balance	38.5 – 41.5	0.5	0.3	0.2	0.1	–	–
Amdry 6257	Balance	38.5 – 41.5	0.5	0.3	0.2	0.1	–	–
Metco 131VF	Balance	35.0 – 41.0	–	–	–	–	2.0	1.0

2.2 Particle Size Distribution and Other Characteristics

Product	Nominal Particle Size Distribution (µm)	Color	Morphology	Manufacturing Method
Amdry 6244	–45 +5	Brown	Angular / Blocky	Fused, Crushed and Blended
Amdry 6250	–35 +5	Dark Grey / Black	Angular / Blocky	Fused and Crushed
Amdry 6257	–45+15	Dark Grey / Black	Angular / Blocky	Fused and Crushed
Metco 131VF	–45 +5	White	Spheroidal	Agglomerated

2.3 Key Selection Criteria

- Amdry 6250 because of its fine size range, produce denser coatings compared to those sprayed with coarser powders. Amdry 6250 is likely to produce more chemically homogeneous coatings.
 - Amdry 6257 has the same overall chemical composition as Amdry 6244 and Amdry 6250. This powder is likely to have better flow characteristics because of its coarser and narrow size distribution relative to the other powders.
 - Metco 131VF has a chemical composition that is very similar to the other materials with a particle size distribution similar to Amdry 6244. However, Metco 131VF powder is unique in terms of its spheroidal morphology that generally improves flowability of the powder. This material was developed for application using combustion powder Thermospray to produce thin, wear-resistant coatings capable of being finished easily to any of a number of surface textures and smoothness.
- required, then pure alumina-based powders such as Metco 105SFP, Metco 6100, Amdry 6060 or Amdry 6062 should be used. High purity alumina powders (Metco 105SFP and Metco 6100) are also the most suitable candidates for electrical and biomedical applications. However, coatings of these compositions do not have a fracture toughness as high as coatings of alumina 40 % titania.
- Alumina 3 % titania products such as Metco 101 series, Amdry 187 or Amdry 620X series produce coatings having a higher fracture toughness compared to pure alumina, but are still inferior to coatings of alumina 40 % titania.
 - If coatings with extreme hardness, wear and corrosion resistance are required, then chromium oxide based products, such as Amdry 64XX series, Metco 106 series or Metco 136 series should be used. These materials do not have the fracture toughness of alumina 40 % titania coatings.

2.4 Related Products

Oerlikon Metco offers a number of related compositions, that can be used in a range of applications:

- If superior hardness, wear and chemical resistance is

3 Coating Information

3.1 Key Thermal Spray Coating Information

Specification	Typical Data
Recommended Spray Process	Atmospheric Plasma Spray or Combustion Powder Thermospray™
Maximum Service Temperature	540 °C 1000 °F
Finishing Method	Brush or Wet grind (diamond wheels) using standard speeds and feeds for grinding ceramics

3.2 Coating Parameters

Please contact your Oerlikon Metco Account Representative for parameter availability. For specific coating application requirements, the services of Oerlikon Metco's Coating Solution Centers are available.

Recommended Spray Guns

Atmospheric Plasma	Combustion Powder
--------------------	-------------------

Metco 9MB series	Metco 6P-II series
------------------	--------------------

Metco F4 series	
-----------------	--

TriplexPro series	
-------------------	--

SimplexPro series	
-------------------	--

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
Amdry 6244	1002828	10 kg (approx. 22 lb)	Special Order	Europe
Amdry 6250	1002829	10 kg (approx. 22 lb)	Special Order	Europe
Amdry 6257	1002831	10 kg (approx. 22 lb)	Special Order	Europe
Metco 131VF	1000241	5 lb (approx. 2.25 kg)	Stock	Global

4.2 Handling Recommendations

- Store in the original container in a dry location.
- Tumble contents gently prior to use to prevent segregation.
- Open containers should be stored in a drying oven to prevent moisture pickup.

4.3 Safety Recommendations

See SDS 50-143 (Safety Data Sheet) in the localized version applicable to the country where the material will be used. SDS are available from the Oerlikon web site at www.oerlikon.com/metco (Resources – Safety Data Sheets).