

# Durabrade 1615

## Aluminum Silicon Polyester Thermal Spray Powder

### 1 Introduction

Durabrade™ 1615 is an Aluminum Silicon – Polyester powder designed to produce abradable coatings for Low Pressure Compressor / Booster clearance control applications where the rotating component may come into contact with the coating as a result of design intent or operational surges.

Coatings of Durabrade 1615 will minimize detrimental effects to the entire seal system, thereby maximizing gas path efficiency. Durabrade 1615 is applied using the atmospheric plasma spray process and customers are advised to perform suitable coating development work and performance tests to meet coating specifications before implementing this product in the engine.

#### 1.1 Typical uses and applications:

Applications include lightweight clearance control coatings for:

- Aerospace turbine engine low pressure compressor

Abradable coatings can be used against untipped titanium alloy, nickel alloy and steel blades at service temperatures up to 325 °C (615 °F).



#### Quick Facts

Classification	Abradable, aluminum based
Chemistry	AlSi-Polyester
Manufacture	Blended
Morphology	Irregular, rounded
Apparent Density	~ 0.9 g/cm <sup>3</sup>
Service Temperature	≤ 325 °C (615 °F)
Melting Point (Al 12Si)	577 °C (1070 °F)
Purpose	Clearance control coatings
Process	Atmospheric Plasma Spray

## 2 Material information

### 2.1 Chemical composition, size distribution and manufacturing method

Product	Weight Percent (nominal)			Nominal Size Distribution $\mu\text{m}$	Manufacturing Method
	Al	Si	Polyester		
Durabrade 1615	Balance	7	40	-125 +11	Blended

Upper particle size analysis using sieve in accordance with ASTM B214; lower size analysis using laser diffraction (Microtrac)

### 2.2 Key Selection Criteria

Choose Durabrade 1615 when a high-quality abrasable material is required for clearance control applications at service temperature of 325 °C (615 °F) or lower.

### 2.3 Customer Specifications

Product	Customer Specifications
Durabrade 1615	DMR33-087 Issue C B50TF222 Class A Issue S3 CP6010 Issue Nov-07

## 3 Coating information

### 3.1 Key Thermal Spray coating information

Characteristic	Typical Data – Durabrade 1615
Recommended Process	Atmospheric Plasma Spray
Macrohardness HR15Y	70
Bond Strength (nominal)	9.7 MPa (1400 psi)
Coating Density	1.55 g/cm <sup>3</sup>
Post Finishing Technique	Use a sharply pointed, high-speed steel bit, light feeds, fast work speed & traverse rate
Deposition Efficiency *	≤ 65%
Maximum Service Temperature	325 °C (615 °F)
Thermal Conductivity	0.53 W/m·K
Thermal Expansion	20 – 30 x 10 <sup>-6</sup> /K

\* Significantly higher deposit efficiencies can be expected using Oerlikon Metco's TriplexPro™ series plasma spray guns.

## 3.2 Application notes

### 3.2.1 Conventional Plasma Spray Guns

Durabrade 1615 can be sprayed using conventional plasma spray guns such as the 9MB series or F4MB-XL series.

### 3.2.2 Cascading Arc Plasma Guns

For fast and efficient deposition of Durabrade 1615 coatings at a reduced cost, a cascading arc plasma spray gun can be used. Cascading arc plasma spray gun choices are:

**TriplexPro series:** Recommended for new spray system installations, this gun will provide the highest throughput with significantly higher powder feed rates that significantly reduce processing time and provide the greatest process cost reduction.

## 3.3 Available coating parameter sheets

Coating parameters for F4MB, 9MB and TriplexPro series spray guns are available to Oerlikon Metco customers. Please contact your local Oerlikon Metco Account Representative.

Support for specific application requirements are available through Oerlikon Metco Coating Solutions Centers.

## 3.4 Abradability testing

Oerlikon Metco offers abradability testing services using our in-house test bed. Our equipment can be run at a wide range of rotational speeds, incursion rates and operating temperatures using dummy components (blades) of almost any required composition. Deliverables for this service include analysis of the rub mechanisms and sophisticated wear-mapping.

## 4 Commercial information

### 4.1 Ordering information and availability

Product	Order No.	Package Size	Availability	Distribution
Durabrade 1615	1079954	5 lb (approx. 2.25 kg)	Stock	Global

### 4.2 Handling recommendations

- Store in the original container in a dry location.
- Tumble contents prior to use to prevent segregation.
- Remove desiccant bag prior to use, where applicable.
- Open containers should be stored in a drying oven at temperatures below 38 °C (100 °F) to prevent moisture pickup.

### 4.3 Safety recommendations

See SDS (Safety Data Sheet) 50-948 localized for the country where the material will be used. SDS are available from the Oerlikon web site at [www.oerlikon.com/metco](http://www.oerlikon.com/metco) (Resources – Online Tools).

## Interested?

For More Information about Durabrade 1615, Please Contact Your Oerlikon Metco Account Representative.

Information is subject to change without prior notice.