

Material Product Data Sheet Metcolite Grits

Thermal Spray Products: Metcolite 14, Metcolite C, Metcolite F, Metcolite F36, Metcolite VF

1 Introduction

Relatively coarse, sharp clean abrasives are required for to prepare substrate surfaces for thermal spray applications. Metcolite™ grits are formulations of various grades of fused aluminum oxides, and contain titanium dioxide as a toughener. They have been especially developed for optimum hardness and durability.

When using Metcolite™ aluminum oxide grits, the resulting surface profile is determined by the size of the grit, which should be appropriately chosen for the application. For very thin or very smooth coatings, a very fine grit is recommended to avoid that the surface profile is affected by grit inclusion. For very thick coatings, a rough blasted surface is important to maximize surface area.

For self-fluxing coatings, surface preparation with steel grit is recommended. Metcolite is not the preparation media of choice for these coatings.

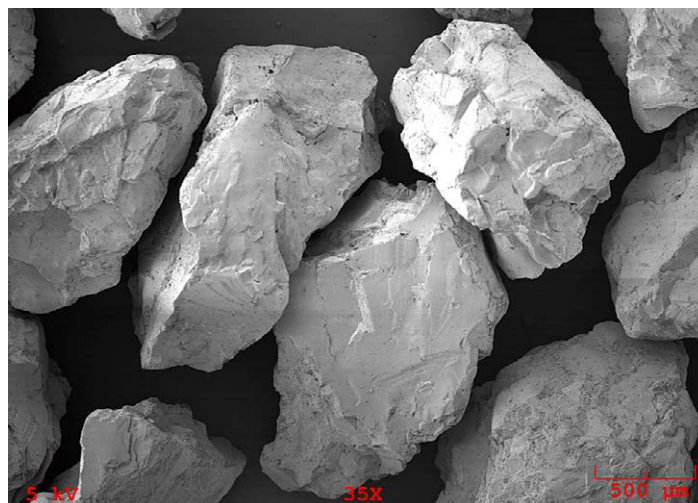
Grit blasted surfaces should be properly cleaned prior to coating to insure proper bonding of the coating. When blasting with Metcolite, follow the recommendations for pre-blast and post-blast cleaning of the surface. An improperly blasted surface may hold an excessive aggregate of imbedded particles which will interfere with the bonding of the thermal sprayed coating. Excessive grit is almost as bad as oil and grease contamination. Surfaces must be properly degreased prior to blasting to avoid bonding failure of the coating.

1.1 Typical Uses and Applications

- Metcolite grit can be used for surface roughening of a component prior to the application of a thermal spray coating to ensure good bonding of the coating to the substrate.

Quick Facts

Classification	Auxiliary, Grit
Formulation	Fused Al ₂ O ₃ ; TiO ₂
Morphology	Blocky and sharp edged
Purpose	Grit blasting; surface roughening
Apparent Density ⁽¹⁾	> 1.74 g/cm ³
Hardness	Knoop ≥ 2.09 x 10 ⁴ MPa (3.03 x 10 ⁶ psi) Mohs 9
Process	All thermal spray processes



SEM Photomicrograph of Metcolite C, showing blocky, sharp-edged particle morphology.

2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)		
	Al ₂ O ₃	TiO ₂	Total Others
All Metcolite Products	94	3.5	2.5

2.2 Particle Size and Apparent Density

Product	Nominal Range			Minimum Apparent Density g/cm ²
	mm ^a	ASTM Mesh ^a	Grit Size ^b	
Metcolite 14	-2.36 +1.00	-8 +18	14	1.83
Metcolite C	-2.00 +0.60	-10 +30	20	1.92
Metcolite F	-1.41 +0.42	-14 +40	24	1.90
Metcolite F36	-0.85 +0.35	-20 +45	36	1.74
Metcolite VF	-0.60 +0.17	-30 +80	54	1.75

^a Sieve analysis in accordance with ASTM B214

^b U.S. Commercial Standard CS 271-65

2.3 Key Selection Criteria

- When applicable, follow the recommendations for pre-coating grit blasting and surface roughness per the customer specification and/or drawings.
- Metcolite 14: Use on hard (HRC 50 – 65) and thick surfaces to get maximum roughness.
- Metcolite C: Use where the coating thickness will be greater than 0.25 mm (0.010 in), and where the roughest blasted surface is required.
- Metcolite F: Use where the coating thickness will be less than 0.25 mm (0.010 in), and where a very rough surface is not required or cannot be tolerated.
- Metcolite F36: Use when coatings are thin and fine and when the substrate surface does not require heavy roughening and the substrate hardness is in the range of HRC 40 – 50.
- Metcolite VF: Use to prepare substrates for thin coatings that will be used as-sprayed or lightly finished, such as by brushing or glass-beaded.

2.4 Customer Specifications

Product	Customer Specification
Metcolite C	Rolls-Royce Corporation EMS 29005 * Rolls-Royce Corporation PMI 1160-1

* Only applies to product sourced from Oerlikon Metco (US) Inc.

3 Key Processing Information

- Metcolite grits can be used with either suction or pressure blasting equipment; however, pressure blasters are generally recommended because of the higher grit particle velocities obtained.
- Ensure that the substrate is free of oil and grease prior to blasting.
- In all cases, parts should be coated as soon as possible after grit blasting to prevent oxidation of the blasted surface or contamination by atmospheric-borne media.
- Clean parts with clean, dry compressed air after grit blasting to remove any grit or dust from the substrate prior to coating.
- Change the Metcolite grit in the blaster if the grit is broken down, dull or contaminated by grease or oils. Even slight contamination of the substrate can cause poor coating bonding.
- With self-fluxing coatings, fusing temperatures will cause trace contaminants to out gas and form bubbles on the coating surface. In addition, entrained grit on the substrate may cause voids in the coating.
- Adjust the blast pressure when blasting softer substrates to prevent excessive grit entrapment.
- Be sure to blast the substrate to be coated evenly and sufficiently to create the desired surface roughness for a good coating bond. Depending on the blast pressure, the substrate material hardness and other factors, the ideal blasting angle is between 60° – 90°.
- If a satisfactory surface profile cannot be obtained using Metcolite grits on surfaces harder than 54 HRC, then use of a SiC grit is an option.
- Metcolite grits are not recommended for use to prepare surfaces for coatings using self-fluxing alloys. A better choice for these applications is chilled iron grit.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
Metcolite 14	1002886	25 kg (approx. 55 lb)	Special Order	Europe
Metcolite C	1036437	400 lb (approx. 181 kg)	Special Order	Global
	1002887	25 kg (approx. 55 lb)	Special Order	Europe
Metcolite F	1030423	50 lb (approx. 22.7 kg)	Special Order	Global
	1002888	25 kg (approx. 55 lb)	Special Order	Europe
Metcolite F36	1002889	25 kg (approx. 55 lb)	Special Order	Europe
Metcolite VF	1031422	50 lb (approx. 22.7kg)	Special Order	Global
	1002890	25 kg (approx. 55 lb)	Special Order	Europe

4.2 Handling Recommendations

- Store in the original container in a dry location.
- Seal previously opened containers tightly to prevent moisture pickup.

4.3 Safety Recommendations

See the SDS 50-134 (Safety Data Sheet) localized for 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).