oerlikon
metco

Material Product Data Sheet
Pure Copper Thermal Spray Powders

Thermal Spray Powder Products:
Diamalloy 1007, Metco 55

1 Introduction

Diamalloy™ 1007 and Metco™ 55 are essentially pure, inert gas atomized copper powders that are known for their excellent electrical and thermal conductivities.

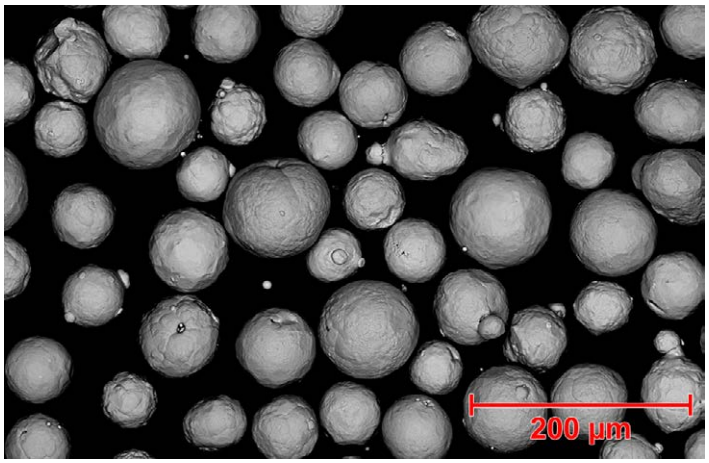
Diamalloy 1007 and Metco 55 are designed to produce thermal sprayed coatings suitable for restoration, particularly on copper-alloy substrates, electrical applications where a coating with very good conductivity is needed, or for EMI/RFI shielding applications.

Gas atomization ensures excellent chemical homogeneity and high purity for consistent processing results. The spheroidal shape of the powder particles ensures good powder feeding during thermal spray processing.

1.1 Typical Uses and Applications

- Restoration of worn non-ferrous components
- Applications that require thermal management or electrical conductivity
- Paper and printing industry to resist corrosive inks
- Excellent choice for electromagnetic / radio frequency (EMI/RFI) shielding
- Electrical contacts and ground connectors
- Self lubricating bearings
- Friction components, such as alternator brushes etc.

Quick Facts	
Classification	Pure metal, copper base
Chemical formula	Cu 99.0+
Manufacture	Gas atomized
Morphology	Spheroidal
Apparent density	3.0 – 4.0 g/cm^3
Melting point	1083 °C (1981 °F)
Purpose	Restoration, thermal and electrical conductivity
Process	HVOF, Atmospheric plasma spray or combustion powder Thermospray™



SEM photomicrograph of Metco 55 showing the gas atomized morphology of this material.

2 Material Information

2.1 Chemical Composition

Product	Weight Percent (nominal)	
	Cu (min)	Total Others (max)
Diamalloy 1007	99.0	0.7
Metco 55	99.0	0.7

2.2 Particle Size Distribution and Other Physical Properties

Product	Nominal Particle Size Distribution µm	Morphology	Manufacturing Method
Diamalloy 1007	-75 +31	Spheroidal	Gas Atomized
Metco 55	-90 +38	Spheroidal	Gas Atomized

Particle sizes equal to or above 45 µm determined by sieve analysis per ASTM B214; sizes below 45 µm determined by laser diffraction (Microtrac) analysis per ASTM C 1070.

2.3 Key Selection Criteria

- Choose the product that meets the required customer material specification.
- Diamalloy 1007 is recommended for application using HVOF spray processes.
- Metco 55 is designed for application using atmospheric plasma spray or combustion powder Thermospray™.
- Diamalloy 1007 produces coatings that are generally denser than those of Metco 55.

2.4 Related Products

- Aluminum bronze powders, such as Diamalloy 1004, Metco 51NS, Metco 51F-NS, and Mecto 445, can be used when better corrosion resistance is needed as a result of to the presence of aluminum in these bronze powders
- Other copper based products like Metco 58NS, Amdry 500C and Amdry 500F are recommended to combat fretting, adhesion, galling and cavitation.
- The above copper-nickel-indium materials exhibit better machinability and higher bond strength. Presence of indium helps in improving anti-galling, lubricity and bearing characteristics of the coatings.
- Metco 57NS (copper-nickel) has a slightly higher melting temperature than either the pure copper or the above indium-containing powders and is recommended when higher service temperatures are needed

2.5 Customer Specifications

Product	Customer Specifications
Metco 55	Rolls-Royce Corporation PMI 1173

3 Coating Information

3.1 Key Thermal Spray Coating Information

Specification	Diamalloy 1007	Metco 55
Recommended Spray Process	HVOF	Atmospheric Plasma Spray or Combustion Powder Thermospray™
Machining	High speed steel or carbide tools	High speed steel or carbide tools

3.2 Available Coating Parameter Sheets

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**	**HVOF**
Metco 9MB series	Metco 5P-II	DiamondJet series
Metco F4 series	Metco 6P-II series	
TriplexPro series		
SimplexPro series		

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
Diamalloy 1007	1000786	5 lb (approx. 2.25 kg)	Stock	Global
Metco 55	1000056	5 lb (approx. 2.25 kg)	Stock	Global
	1076327	25 lb (approx. 11.3 kg)	Stock	Global

4.2 Handling Recommendations

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

4.3 Safety Recommendations

See SDS 50-119 (Safety Data Sheet) in the version 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).

www.oerlikon.com/metco
info.metco@oerlikon.com