

Material Product Data Sheet

Nickel – Aluminum – Molybdenum Alloy Powder for Hydrogen Electrolyzer Applications

Powder Products: Diamalloy™ 4070, 4080

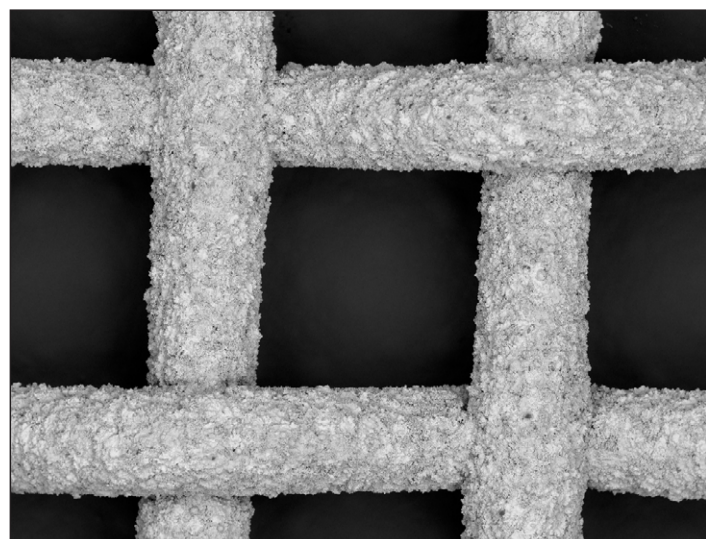
1 Introduction

Diamalloy 4070 and Diamalloy 4080 have been engineered for the coating of cathodes used in Alkaline Electrolyzers. The coating is activated using an alkaline leaching solution to form a nanostructured Nickel alloy. The nanostructured coating enhances the catalytic activity and thereby efficiency of ALK beyond an electroplated Nickel coating.

Diamalloy 4080 powder forms a composite coating structure of both highly active regions and regions of durable structural integrity. This composite structure enables combined durability and high catalytic activity. In comparative electrochemical testing Diamalloy 4080 shows equivalent performance to Diamalloy 4070, a NiAlMo Raney Nickel material. Diamalloy 4080, however, shows enhanced durability over Diamalloy 4070 as measured via tape and scratch testing after exposure to alkaline solutions.

1.1 Typical Uses and Applications

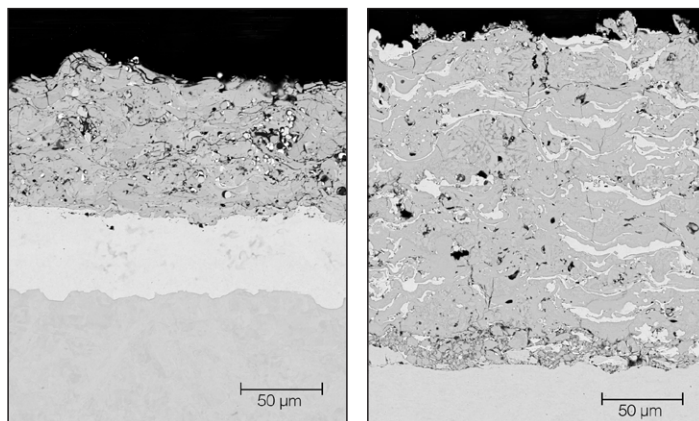
- Power Generation: Alkaline Electrolyzers (cathode)



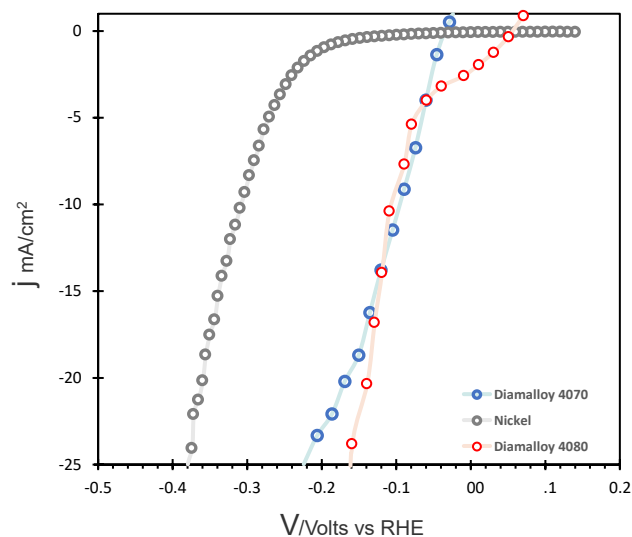
Diamalloy 4080 sprayed onto 24x25 mesh size opening size: 0,028"

Quick Facts

Classification	Nickel-based alloy
Chemical formula	Raney Nickel type
Manufacture	Gas atomization
Purpose	Catalyst
Morphology	Spheroidal
Process	Atmospheric Plasma Spray



Left: Diamalloy 4070 Right: Diamalloy 4080



Diamalloy 4070 and Diamalloy 4080 can be sprayed effectively onto plates and screens. For maximum coating throughput, using a Triplex plasma spray gun is recommended.

2 Material Information

2.1 Chemical Composition

Product	Chemical Composition (wt. %)		
	Ni	Al	Mo
Diamalloy 4070	Bal.	46	17
Diamalloy 4080	Raney Nickel Type - Proprietary.		

2.2 Particle Size Distribution

Product	Nominal Size Range μm	D90 μm	D50 μm	D10 μm
Diamalloy 4070	-45+15	48	33	21
Diamalloy 4080	-45+10	46	30	18

2.3 Key Selection Criteria

- Use material best suited for the specific application
- Chose plasma gun according to requirements

3 Coating Information

3.1 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 Atmospheric Plasma Spray Guns

SinplexPro™ series

TriplexPro™ series

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Availability	Distribution
Diamalloy 4070	1081847	10 lb	Stock	Global
Diamalloy 4080	2453300	5 kg (approx. 11 lb)	Stock	Global

4.2 Handling Recommendations

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

4.3 Safety Recommendations

See SDS 50-1626 (Diamalloy 4070) and SDS 50-2785 (Diamalloy 4080) in the localized version applicable 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).

Information is subject to change without prior notice.