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Material Product Data Sheet

Iron-Core, Flexible Welding Rod / Wire Coated with Chromium Carbide and Iron-Based Matrix

Welding Products:
WokaDur FeCr

1 Introduction

WokaDur FeCr, available as flexible welding rod or wire, consists of iron-based wire coated with chromium carbide (Cr_2C_3) in an iron-based matrix material.

WokaDur FeCr produces extremely wear resistant hardface deposits and was designed for application using the oxy-acetylene welding process on low carbon steels.

1.1 Typical Uses and Applications

WokaDur FeCr has been designed to produce hard overlay deposits on mild and low-alloy steels with a carbon content up to 0.5 %. The main applications are tools for mining, oil drilling, deep drilling, clay processing and brick manufacturing.
Typical applications where these products are used:

- Wear resistant surfaces for mining components
- Mixer blades used for processing concrete and minerals
- Breakers and hammers used for concrete and mineral processing
- Agricultural earth-moving and tilling equipment
- Brick manufacturing and clay processing equipment

Quick Facts	
Classification	Flexible rod/wire, chromium carbide coated
Chemistry	53.6Fe 38Cr 4.9C 2.5Mn 1.0Si
Manufacture	Extruded and coated
Deposit Hardness	60 – 65 HRC
Carbide Hardness	1600 – 1800 HV0.1
Weld Deposit Density	12.4 g/cm^3
Service Temperature	≤ 650 °C (1200 °F)
Purpose	Wear resistance
Process	Oxy-acetylene welding

Top: WokaDur FeCr rod (6 mm diameter).Bottom: WokaDur FeCr wire (6 mm diameter).

2 Material Information

2.1 Chemical Composition

Product	Nominal Chemical Composition (wt.%)					Carbide Hardness HV0.1	Hard Phase wt. %
	C_{TOTAL}	Fe	Cr	Mn	Si		
WokaDur FeCr	4.9	53.6	38.0	2.5	1.0	1900 – 2100	36 – 44

2.2 Primary Particle Size Distribution, Available Lengths and Diameters

Product	Primary Carbide Particle Size Distribution µm	Available Product Forms	Available Diameters
WokaDur FeCr	–106 +45	Rod: 500 mm (19.5 in) Spools: See Section 4.1	5.0 mm (0.20 in) 6.0 mm (0.24 in)

2.3 Key Selection Criteria

The main selection criteria for WokaDur FeCr are:

- Extremely wear resistant oxy-acetylene flexible iron welding wire consisting of chromium carbide mixed within an iron matrix
- Excellent flow and wetting characteristics with a deposition rate that is 20 % to 30 % better than with comparable oxy-acetylene welding tubular rods
- Easy to use and inexpert welders will have no difficulties making smooth deposits without cracks
- Designed for use as a hard overlay on low carbon steels (up to 0.5 % carbon content)
- Ideal for applications such as tooling for mining, oil drilling tooling, deep drilling tooling, brick manufacturing tooling and clay processing tooling

2.4 Related Products

Oerlikon Metco offers a wide variety of carbide-containing hardfacing welding products in a number of forms designed for convenient application. Products are available for oxy-acetylene welding, MIG / open arc welding and powders for PTA welding. These products are available with different carbide types and hardness, matrix materials and matrix materials so customers can choose a product that is suitable for both their budget and surface application. Please contact your Oerlikon Metco Account Representative for additional information.

3 Coating Information

3.1 Key Welding Recommendations

- The surface to be welded should be free from grease, oil, fats, lipids, rust and other foreign matter
- Use welding positions PA or PB (DIN EN ISO 6947)
- Multilayer welding is not recommended
- It is essential to slowly and uniformly preheat the substrate to a temperature of approximately 400 to 600 °C (750 to 1110 °F), depending on the type of base material
- Use a slightly excessive acetylene feather
- Apply the material uniformly using a dabbing technique within the torch flame to produce an even droplet pattern
- Avoid excessive puddling during processing
- Sweat the deposit to the base metal with minimum penetration
- Deposits are not machinable or forgeable, but can be ground to dimension or finished with diamond tools

3.2 Recommended Welding Parameters

Parameter	Recommended Setting	
Carrier Gas	Oxygen	
Carrier Gas Pressure	5 – 7 bar	70 – 100 psi.
Fuel Gas	Acetylene	
Fuel Gas Pressure	0.7 – 1.0 bar	10 – 14
Nozzle Size	6 – 9 mm	

Above parameters are for welding on a mild steel substrate with a carbon content of 0.1 % and a thickness of 15 mm (0.59 in).

3.3 Welding Parameter Development

For specific application needs, Oerlikon Metco can provide parameter advice and parameter development services may be available.

4 Commercial Information

4.1 Ordering Information and Availability

Product	Order No.	Package Size	Product Form	Diameter (mm)
WokaDur FeCr	1065232	5 kg (11 lb)	500 mm (19.5 in) rod	5.0 mm (0.20 in)
WokaDur FeCr	1065233	6.5 kg (14.3 lb)	Spool	5.0 mm (0.20 in)
WokaDur FeCr	1065235	6 kg (13.2 lb)	Spool	6.0 mm (0.24 in)

Please note: All materials are globally available on a Special Order basis. Please allow adequate lead time.

4.2 Handling Recommendations

- Store in the original, closed container in a dry location.
- Open containers should be stored in a drying oven to prevent moisture pickup.

4.3 Safety Recommendations

See SDS 50-1084 (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).

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