

# Material Product Data Sheet

## Iron-Based, Flux-Cored Wire with Macrocrystalline Tungsten Carbide

### Welding Products: WokaDur OAM

#### 1 Introduction

WokaDur™ OAM is an iron-based, flux-cored welding wire filled with macrocrystalline tungsten carbide (MTC) in a specially formulated hard matrix. It is designed for application using the MIG welding process. It is a new self-shielding wire that is designed to produce extremely wear-resistant overlay deposits.

The wire is easy to use and produces very little spatter or smoke during welding. It develops its hardness in the first welding pass and should be applied using the lowest amperage and voltage possible.

WokaDur OAM is designed to produce hardface overlay deposits that protect against very harsh abrasive wear conditions, especially mineral-induced sliding wear, in applications where impact resistance is not required.

#### 1.1 Typical Uses and Applications:

Typical applications where these products are used:

- Concrete processing tooling
- Ceramic processing
- Agricultural implements and equipment
- Brick manufacturing and clay processing equipment
- Conveyor screws for transport of mineral-bearing materials
- Mixer and scraper blades
- Augers

#### Quick Facts

Classification	Wire, iron-based
Chemistry	52.5Fe 43W 2.9C 1.6Mn
Manufacture	Cored wire
Deposit Hardness	60 – 67 HRC
Carbide Hardness	1600 – 2100 HV0.1
Weld Deposit Density	11.5 g/cm <sup>3</sup>
Service Temperature	≤ 500 °C (930 °F)
Purpose	Wear resistance
Process	MIG or open-arc welding



WokaDur OAM 1.6 mm (14 ga AWG) Welding Wire.

## 2 Material Information

### 2.1 Chemical Composition

Product	Nominal Chemical Composition (wt.%)				Carbide Hardness HV0.1	Hard Phase wt. %
	C <sub>TOTAL</sub>	Fe	W	Mn		
WokaDur OAM	2.9	52.5	43	1.6	1600 – 2100	48 – 52 (Ø 1.6 mm) 52 – 58 (Ø 2.4 mm)

### 2.2 Primary Particle Size Distribution, Available Lengths and Diameters

Product	Primary Carbide Particle Size Distribution µm	Available Product Forms	Available Diameters
WokaDur OAM	-180 +75	Spools	1.6 mm (14 AWG) 2.4 mm (0.094 in)

Other particle size distributions are available on request

### 2.3 Key Selection Criteria

The main selection criteria for WokaDur OAM are:

- Choose for applications where extreme resistance to sliding or abrasive wear is needed such as when processing mineral-bearing media or slurries
- Do not choose when impact resistance is required
- WokaDur OAM meets DIN EN 14700: T Fe20

### 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 Overlay Characteristics

- The surface to be welded should be free from grease, oil, fats, lipids, rust and other foreign matter
- Use welding positions PA, PB or PC (DIN EN ISO 6947)
- Multilayer deposits are possible (standard is 1 pass)
- Shield Gas: DIN EN ISO 14175:2008 M12 (2.5% CO<sub>2</sub> and 97.5% Ar), or DIN EN ISO 14175:2008 M21 (5% – 15% CO<sub>2</sub>, balance Ar), if required
- Use reverse polarity (electrode-positive; DC+), pulse arc mode is preferred
- Preheating of the substrate to a minimum temperature of 100 °C (212 °F) is necessary; some substrates may require higher preheat temperatures
- Use a “push” technique for down-hand positioning during processing. Testing of the welding technique for coverage and uniformity using the same welding parameters and wire on scrap metal is recommended.
- Use a short arc to avoid melting the tungsten carbide particles, thereby minimizing dissolution
- Avoid excessive puddling during processing
- Deposits are not machinable or forgeable, but can be ground to dimension or finish with diamond tools

## 3.2 Recommended Welding Parameters

Parameter	Recommended Setting	
Rod Diameter	1.6 mm	14 gauge
Voltage	17 – 19 V	
Current Intensity	170 – 200 A	
Feed Rate	7 – 8 m/min	23.0 – 26.2 ft/min
Shield Gas Flow Rate	15 – 20 l/min	32 – 42 ft <sup>3</sup> /h

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 OAM	1065238	15 kg (33 lb)	spool	1.6 mm (14 AWG)
WokaDur OAM	1065239	7.5 kg (16.5 lb)	spool	1.6 mm (14 AWG)
WokaDur OAM	1065573	15 kg (33 lb)	spool	2.4 mm (0.094 in)

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

### 4.2 Handling Recommendations

- Powder-filled composite wires may be prone to moisture pickup and must be stored in a dry environment.
  - Avoid temperature fluctuations of greater than 5 °C (9 °F).
  - Maintain storage at a humidity level of ≤ 60 % at 15 to 25 ° (59 to 77 °F) or ≤ 50 % at 25 to 35 °C (77 to 95 °F).
  - Do not store for more than 5 years. Older wire should be redried.
  - If slightly affected by moisture, the wire may be redried at a temperature of 150 °C (300 °F) for 6 hours. Longer drying times of up to 12 hours at temperatures up to 200 °C (390 °F) can be employed if necessary. Redry no more than 6 times.
  - Wires exposed to severe water contamination, exposed to the atmosphere for long periods and/or exhibit oxidation or corrosion cannot be redried and should be scrapped.

### 4.3 Safety Recommendations

See SDS 50-1086 (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](http://www.oerlikon.com/metco) (Resources – Safety Data Sheets).

Information is subject to change without prior notice.