

## Material Product Data Sheet

### Sintered Tungsten Carbide Electrodes with Nickel and Iron Additives

#### Welding Products: WokaDur S80-Ni-TIG

##### 1 Introduction

WokaDur™ S80-Ni-TIG is a sintered electrode comprised of a tungsten carbide with nickel and iron additives.

WokaDur S80-Ni-TIG is designed for application using the TIG welding process.

WokaDur S80-Ni-TIG can be applied to mild steels, low-alloy steels and high-alloy steels. It is appropriate for use on thin-walled components and can be used on thin edges.

WokaDur S80-Ni-TIG is designed for use where hard and wear resistant overlays are needed. It produces smooth, extremely hard and wear-resistant overlay deposits and is an excellent choice for surfaces exposed to sliding and abrasive mineral wear that are exposed to minimal impact stress.

##### 1.1 Typical Uses and Applications:

Typical applications for WokaDur S80-Ni-TIG include:

- Draw knives
- Roll mandrels
- Extrusion dies
- Debarring knives
- Pressure rolls
- Baffle plates
- Wire guides and capstans

#### Quick Facts

Classification	Electrode, tungsten carbide
Chemistry	7.7Fe 75W 10Ni 7.3C
Manufacture	Sintered and dip-coated
Deposit Hardness	60 HRC minimum
Weld Deposit Density	13.4 g/cm <sup>3</sup>
Service Temperature	≤ 500 °C (930 °F)
Purpose	Wear resistance
Process	Tungsten Inert Gas Welding (TIG)



WokaDur S80-Ni-TIG 5.0 mm sintered electrode.

## 2 Material Information

### 2.1 Chemical Composition

Product	Nominal Chemical Composition (wt.%)				Deposit Hardness (HRC)
	C <sub>TOTAL</sub>	W	Fe	Ni	
WokaDur S80-Ni-TIG	7.3	75	7.7	10	60 minimum

### 2.2 Primary Carbide Grain Size and Type, Available Lengths and Diameters

Product	Available Length	Available Diameters
WokaDur S80-Ni-TIG	300 mm (11.8 in)	3.0 mm (0.12 in) 4.0 mm (0.16 in) 5.0 mm (0.20 in)

### 2.3 Key Selection Criteria

Choose WokaDur S80-Ni-TIG for applications where:

- An extremely hard surface is required to resist abrasive minerals and/or sliding wear.
- Surfaces are exposed to minimal impact stress.
- Parts having thin walls and/or edges to be welded.
- Parts comprised of almost any type of steel.

### 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.
- Multilayer deposits are not recommended.
- Use straight polarity (electrode-negative; DC-), pulse arc mode is preferred.
- Use shield gas DIN EN ISO 17175:2008-I1 (100% Argon).

- TIG weld without preheating to avoid porosity in weld deposits.
- High heat input is required during welding, depending on the electrode diameter, to create a functional melt.
- Avoid excessive puddling during processing.
- Post-weld processing requires a slow cool down phase under moisture-free conditions.
- Deposits are not machinable or forgeable, but can be ground to dimension or finished with diamond tools.

### 3.2 Recommended Welding Parameters

Rod Diameter	Current Intensity	Shielding Gas Rate
3.0 mm	110 – 130 A	15 l/min (31.78 ft <sup>3</sup> /h)
4.0 mm	150 – 170 A	15 l/min (31.78 ft <sup>3</sup> /h)
5.0 mm	190 – 210 A	15 l/min (31.78 ft <sup>3</sup> /h)

Parameter reference: Mild steel with carbon content of 0.1%; thickness 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	Rod Length	Rod Diameter
WokaDur S80-Ni-TIG	1065242	5 kg (11 lb)	300 mm (11.8 in)	3.0 mm (0.12 in)
WokaDur S80-Ni-TIG	1067602	5 kg (11 lb)	300 mm (11.8 in)	4.0 mm (0.16 in)
WokaDur S80-Ni-TIG	1059739	5 kg (11 lb)	300 mm (11.8 in)	5.0 mm (0.20 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 50-1090 (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).