

**KALMETALL-WFD and -WE Welding Consumables ...**

## **Wear Resistant Linings with Flux Cored Wires and Stick Electrodes**



*Hard-facing of plant components  
with flux cored wires or stick electrodes*



*Surfacing of pipes: long service life at reduced weight*

Kalenborn offers a complete array of solutions for hard overlay welding under the name KALMETALL-W. These include standard plates of different steel and welding qualities, finished structures made up of surfaced plates as well as a comprehensive welding service.

A high quality series of welding consumables is also offered. It includes both flux cored wires and stick electrodes. The welding alloys available provide solutions to most problems of wear.

### **Advantages**

- 80 years of practical experience in solving wear problems
- excellent knowledge in welding techniques
- comprehensive range of weld engineering solutions
- delivery of the correct welding consumables for the specific application
- combination with other wear resistant materials of Kalenborn

# KALMETALL-W reliably solves many Wear Problems

## Hard Overlay Welding with Primary Chromium Carbides

Hard overlay welding is the wear resistant layer. It consists of a C-Cr-Fe system with primary chromium carbides.

Different alloys are offered. The choice is made with due regard to abrasion, impact, temperature, corrosion as well as the chemical composition of the base material.

### Criteria on the Choice of Alloy for Hard Overlay Welds

<b>Chemical composition of the base material</b>
<b>Field of application</b> wear · toughness · temperature · corrosion
<b>Surface quality</b> As-welded condition · machined · ground
<b>Thickness of overlay – number of layers</b>
<b>Technical requirements</b> Design · economic efficiency · service cycle

### Criteria on the Choice of Welding Process for Hard Overlay Welds

<b>Dimension and geometry of the part to be lined</b>
<b>Difficulty of weld</b>
<b>Welding requirements</b> at the premises · in situ
<b>Welding equipment required</b>

## Scope of Welding Consumables

The scope of welding consumables supplied by Kalenborn covers the following products:

### ■ KALMETALL-WFD flux cored wires as defined in DIN EN 14700

#### Wire diameter

1.6 mm · 2.0 mm · 2.4 mm · 2.8 mm

#### Package size

Coil BS 300	DIN EN ISO 544 of approx.	15 kg
Coil BS 435	DIN EN ISO 544 of approx.	25 kg
Coil S 760	DIN EN ISO 544 of approx.	250 kg
Drum	of approx.	250 kg

### ■ KALMETALL-WE stick electrodes as defined in DIN EN 14700

#### Electrode diameter

2.5 mm · 3.2 mm · 4.0 mm · 5.0 mm



*KALMETALL-WFD flux cored wires and KALMETALL-WE stick electrodes*

**Technical Data of KALMETALL-WFD flux cored wired (reference values)**

KALMETALL	Chemical composition of the welding consumables %						Max. hardness VH	Max. appl. temp. °C/°F	Resistant against		
	C	Cr	Mo	Nb	B	Fe			Abrasion	Impact	Temp.
W 100 FD	5	28	-	-	-	60	700	350/662	XX	X	X
W 143 FD	5	22	-	7	-	60	740	350/662	XXX	X	X
W 145 FD	5	21	7	7	-	60	800	750/1382	XXX	X	XXX
W 150 FD	4	22	-	-	1	66	820	350/662	XXXX	-	X
W 151 FD	5	30	3	-	-	57	820	550/1022	XXXX	X	XX

Flux cored wires KALMETALL	Description	Application
W 100 FD	The austenitic weld deposit of the C-, Cr-alloyed flux cored electrode is suited for surfacing of parts subject to heavy wear originating from mineral substances.	Universal welding consumables material for most applications in almost any industrial branch.
W 143 FD	High C-, Cr-, Nb-alloyed flux cored electrode for surfacing of parts exposed to extreme wear at temperatures up to 350 °C/662°F. The weld deposit consists of very hard Cr- and Nb-carbides.	Fields of application are, for example, cement and concrete pumps, grinding rolls and wear plates.
W 145 FD	High C-, Cr-, Mo-, Nb-, V-, W-alloyed flux cored electrode forming extremely hard carbides. Due to the large portion of the alloy element, the electrode is suited for hard linings as protection against extremely heavy wear. The high wear resistance is maintained even at higher application temperatures.	Typical fields of application are blast furnace bells, grates and toothed crushers.
W 150 FD	C-, Cr-, B-, W- V-alloyed flux cored electrode forming an alloy of very hard, martensitic-carbide structure. The weld deposit offers high resistance against heavy abrasion up to 350 °C/662 °F.	These electrodes are used by the brick making industry as well as for transport screws handling sand and clay.
W 151 FD	The austenitic weld deposit of the C-, Cr-, Mo-alloyed flux-cored electrode is suited for surfacing of parts subject to heavy wear. Due to the Mo-content this alloy features higher temperature stability than W 100 FD.	Typical uses are pump parts, mixer blades, screw conveyors, etc.
W 1-- FD	Further alloys are offered for special applications.	

## KALMETALL-W Hard Overlay Welding:

# Program for Complete Components, Standard Plates and Comprehensive Service



*Screw conveyor lined with KALMETALL-W*



*Hard overlay welded standard plates*



*Kalenborn welding service:  
regeneration of a grinding roll*

### KALMETALL-W

- depending on the alloy of the hard overlay welding high abrasion resistance, high impact strength and/or high temperature resistance
- wide range of applications and adaptation to the specific use

### Hard Overlay Welded Plates

- steel plates of various qualities, thickness and dimensions; cost-effective for large surfaces
- specially fabricated components that are produced to the specific customer requirements
- low weight and high economic efficiency if the component is a self-supporting structure

### Welding Service

- individual weld surfacing of most structures and components
- work done either at the customer or at the Kalenborn premises
- Kalenborn has specialized in the regeneration of grinding systems, including grinding rolls and grinding tables of vertical mills

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