

# Repair & Maintenance

DATA SHEET

E-50

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## 350 HARDFACING

### Alloy type

Martensitic hardfacing alloy producing a deposit of nominally 350HV hardness.

### Materials to be welded

These consumables are used for surfacing not joining. They can be used for surfacing many materials including structural steels (BS 4360), general purpose cast steels (BS 3100) and rail steels (BS 11).

### Applications

These consumables deposit weld metal with a hardness in the range 380-410HV; actual hardness depends on base metal composition and number of layers deposited.

The deposit gives a wear resistant crack-free deposit suitable for conditions of moderate abrasion and friction coupled with resistance to heavy impact.

Items suitable for surfacing include **slideways**,

**trackwheels, rails, roller guides, couplings, brake drums and shoes, rope winches, caterpillar tracks, and clutch plates and cones.**

### Microstructure

In the as-deposited condition the microstructure consists of martensite with some carbides.

### Welding guidelines

Preheat is not normally required but 100-200°C may be required with thick and/or complex sections particularly with low alloy base materials or where there is a risk of hydrogen-induced cracking.

### Products available


Process	Product	Specification
MMA	<b>Methard 350</b>	(BS EN EFe1)
FCW	<b>Hardcore 350</b>	BS EN TFe1

## METHARD 350

350HV hardness MMA electrode for surfacing

<b>Product description</b>	MMA surfacing electrode with a rutile metal powder type flux made on low carbon core wire. Recovery is about 120% with respect to core wire, 65% with respect to whole electrode.					
<b>Specifications</b>	<b>DIN 8555</b>	E1-UM-400-GP				
	<b>BS EN 14700</b>	(E Fe1 nearest)				
<b>ASME IX Qualification</b>	<b>QW432</b> F-No --					
<b>Composition (weld metal wt %)</b>		C	Mn	Si	Cr	Mo
	typical	0.3	0.2	0.2	3	0.1
<b>All-weld mechanical properties</b>	Typical hardness as-welded assuming at least three layers on mild steel base plate:					
	Vickers	HV	380-410			
	Rockwell	HRC	39-42			
	Brinell	HB	360-390			
	Preheat and dilution will affect hardness in the first two layers but will have little effect in subsequent layers.					

## METHARD 350 (continued)

<b>Operating parameters</b>	DC +ve or AC (OCV: 70V min)									
	∅ mm	3.2	4.0	5.0						
	min A	80	100	140						
	max A	140	180	240						
<b>Packaging data</b>	∅ mm	3.2	4.0	5.0						
	length mm	450	450	450						
	kg/carton	18.6	18.9	18.0						
	pieces/carton	471	234	147						
<b>Storage</b>	<p><b>3 hermetically sealed ring-pull metal tins</b> per carton, with unlimited shelf life. Direct use from tin is satisfactory. For electrodes that have been exposed:</p> <p><b>Redry</b> 100 – 150°C/1-2h to restore to as-packed condition. Maximum 150° C, 3 cycles, 10h total.</p> <p><b>Storage:</b> Recommended ambient storage conditions for opened tins (using plastic lid): &lt; 60% RH, &gt; 18°C.</p>									
<b>Fume data</b>	Fume composition, wt % typical:									
		Fe	Mn	Cr	F	OES (mg/m <sup>3</sup> )				
		16	5	1	18	5				

## HARDCORE 350

Self-shielded flux cored wire for surfacing

<b>Product description</b>	<p>A self-shielded flux cored wire for surfacing applications in the flat and HV positions. The lime-fluorspar flux fill eliminates the need for an external shielding gas.</p> <p>Metal recovery about 90% with respect to wire.</p>							
<b>Specifications</b>	<b>DIN 8555</b>	MF1-GF-350-GP						
	<b>BS EN 14700</b>	T Fe1						
<b>ASME IX Qualification</b>	<b>QW432</b> F-No --							
<b>Composition (weld metal wt %)</b>		C	Mn	Si	Cr	Mo	Al	
	typ	0.25	2	0.1	1	0.2	1.7	
<b>All-weld mechanical properties</b>	Typical hardness as-welded assuming at least three layers on mild steel base plate:							
	Vickers	HV	300-400					
	Rockwell	HRC	30-36					
	Brinell	HB	280-400					
	Preheat and dilution will affect hardness in the first two layers but will have little effect in subsequent layers.							
<b>Operating parameters</b>	No shielding gas is required.							
	<b>Current:</b> DC+ve ranges as below:							
	∅ mm	amp-volt range				stickout		
	1.2	150-250A, 20-26V				40-50mm		
	1.6	200-300A, 24-30V				40-50mm		
2.8	300-500A, 27-35V				40-50mm			
<b>Packaging data</b>	Spools in cardboard carton: 13kg							
	Where possible, preferred storage conditions are 60% RH max, 18°C min.							
<b>Fume data</b>	Fume composition (wt %)							
		Fe	Mn	Ni	Cr	Cu	F	OES (mg/m <sup>3</sup> )
		18	8	<0.5	1	<1	8	5