



MWA
Product Guide
2nd Edition



HARD FACING

CONTENTS

MAC HARD E301	4
MAC HARD E304	5
MAC HARD E306	6
MAC HARD E307	7
MAC HARD E308	8
MAC HARD E335 T	9
MAC HARD E30618	10
MAC TUNGSTEN E375	11

MAC HARD E301

Hard facing electrode designed for applications where high resistance to impact is the main requirement. The electrode is all positional and has a metal recovery rate of 120%. Welds can be softened by heat treatment at 720-750°C, machined and subsequently re-hardened by oil or water quenching. Used for the hard facing of crusher jaws, dredger tumbler plates, punches, shears, guillotine blades, tractor idler wheels, roller and track links. Also suitable for depositing buffer layers and for building up multi-layer deposits on badly worn components.

Typical All Weld Metal Chemical Analysis (%)

C	Cr	Mn	Si
0.08	4.0	0.8	0.5

Typical All Weld Deposit Hardness

37-40	Rockwell C
350-380	Brinell
365-400	Vickers

Sizes Available & Recommended Amperages

2.5mm	3.2mm	4.0mm	5.0mm	6.0mm
80-100	90-110	110-170	180-220	260-300

Current:
AC/DC (+)

Storage:

If allowed to become damp, the electrodes should be re-dried for two hours at 150°C before use.

MAC HARD E304

The electrode is designed to deposit wear resistant overlays on all ferrous metals where high resistance to impact and abrasion is required. The electrode is all positional with a metal recovery rate of 110%. The welds are non-machinable in the as welded state but can be softened by heat treatment at temperatures of 720 – 750°C. After machining the welds can be rehardened by oil or water quenching.

Typical All Weld Metal Chemical Analysis (%)

C	Cr	Mn	Mo
0.5	6.5	1.5	1.5

Typical All Weld Deposit Hardness

57-59	Rockwell C
570-605	Brinell
660-725	Vickers

Sizes Available & Recommended Amperages

2.5mm	3.2mm	4.0mm	5.0mm	6.0mm
80-100	90-120	120-170	160-220	260-300

Current:
AC/DC (+)

Storage:

If allowed to become damp, the electrodes should be re-dried for two hours at 180°C before use.

MAC HARD E306

Hard facing electrode designed for applications on ferrous metals involving friction and severe abrasion, also where certain heat and corrosive conditions apply. The electrode is of the rutile chromium carbide all positional type and has a metal recovery rate of 150%. Ideal for foundry sand mill blades, impeller worms, screws, etc., also bucket edges and digger teeth in conjunction with Mac Trode E630 being used as a buttering layer.

Typical All Weld Metal Chemical Analysis (%)

C	Cr	Mn	Mo	Ni	Si
4.40	43.2	0.77	0.04	<0.01	0.30

Typical All Weld Deposit Hardness

62-65	Rockwell C
800-900	Vickers

Sizes Available & Recommended Amperages

2.5mm	3.2mm	4.0mm	5.0mm
80-100	90-110	110-170	160-220

Current:

AC/DC (+) (AC minimum 70 volts open circuit)

Storage:

If allowed to become damp, the electrodes should be re-dried for two hours at 150°C before use.

MAC HARD E307

Mac Hard E307 is a high chromium hard facing electrode made on a mild steel core wire. The chemically basic flux also contains other significant carbide formers than chromium, e.g. tungsten, niobium, molybdenum and vanadium. This ensures a microstructure of complex carbides capable of withstanding not only severe abrasion but also resistance to oxidation and stress at elevated temperatures. Typical applications occur in the earth moving and cement industries also in the iron and steel industries on furnace parts – fire grate bars etc.

Typical All Weld Metal Chemical Analysis (%)

C	Cr	Mn	Mo	Nb	Si	V	W
4.8	24	0.4	5.0	4.0	1.0	1.5	4.0

Typical All Weld Deposit Hardness

Hardness of the first layer will depend on base material but will be in the region HRC 59-62 RC.

Hardness achieved in 2nd and 3rd layers will be HRC 63-66 RC.

Sizes Available & Recommended Amperages

3.2mm	4.0mm	5.0mm
110-150	140-200	190-250

Current:

DC (+) or AC (OCV 80)

Storage:

If allowed to become damp, the electrodes should be re-dried for two hours at 150°C before use.

MAC HARD E308

Hard facing electrode designed specifically for applications on ferrous metals where rapid deposition is required – especially where dot formation is required with little or no deslagging involved. The electrode is designed to produce spatter type deposition in the vertical welding position but will also give conventional bead deposit in the downhand welding position. Designed purposefully for the sugar cane industry for hard facing sugar cane crushing rolls welding in the vertical position whilst the rolls are being slowly revolved. The deposit is in the form of a spray spatter and results in even dot formation of a highly abrasive resistant coating. Also ideal for many wear applications in quarrying and earth moving where severe abrasion is encountered.

Typical All Weld Metal Chemical Analysis (%)

C	Cr
4-4.5	30-35

Typical All Weld Deposit Hardness

66	Rockwell C on Cast Iron
61-62	Rockwell C on Steel

Sizes Available & Recommended Amperages

3.2mm	4.0mm	5.0mm
100-130	130-170	170-250

Current:

AC/DC (+) (AC minimum 70 volts open circuit)

Storage:

If allowed to become damp, the electrodes should be re-dried for two hours at 150°C before use.

MAC HARD E335 T

Superior highly alloyed all positional tubular flux coated electrode for hard facing where extreme abrasion is involved. Alloy content 40% minimum. Moisture resistant. Smooth easy to use electrode with high deposition rate at low amps (employing higher amps than necessary will result in greater burn off and dilution of the alloy content, and poorer wear life). Low slag formation allows multi-layer welding without need to de-slag between runs – 4kg/hr. Surface cracking in certain instances may occur, but in practice will assist in the wear performance. The surface cracking has no detriment whatsoever. The highly abrasive resistant deposits find numerous applications on quarrying and mining machinery and equipment, in brickworks and extensive applications on crushing equipment and on earth moving and agricultural machinery.

Typical All Weld Metal Chemical Analysis (%)

B	C	Cr	Mn	Mo	V
0.5	4.0	27.0	4.0	4.0	1.0

Typical All Weld Deposit Hardness

50-60 (Single Layer)	Rockwell C
59-62 (Multi Layer)	Rockwell C

Sizes Available & Recommended Amperages

6.0mm	8.0mm	11.0mm
80-130	140-190	190-260

Current:

AC/DC (+)

MAC HARD E30618

Manufactured using a high purity, low silicon core wire with a chemically basic, alloy bearing flux. Smooth arc with a low spatter, easy strike and re-strike. May be used in all positions except vertically down, strong stable arc. Fillet welds are convex, weld metal is of bright appearance. Very low levels of hydrogen. Used to best advantage for critical repairs to die blocks which allows the deposit to be machined while still resulting in a tough, impact resistant deposit of around Rockwell C 40 hardness.

Typical All Weld Metal Chemical Analysis (%)

C	Cr	Mn	Mo	Ni	Si
0.122	1.90	1.33	1.46	3.06	0.38

Physical Properties after PWHT at 600°C max

Hardness 38-43 RC

Sizes Available & Recommended Amperages

2.5mm	3.2mm	4.0mm	5.0mm	6.0mm
70-90	90-140	150-190	200-250	250-300

Related Specification:

AWS E16018-G

Current:

DC (+) OR AC (80 Min OCV)

Storage:

Re-drying electrodes at 180°C for two hours.

MAC TUNGSTEN E375

A tubular flux coated electrode designed to give maximum abrasion resistance, depositing tungsten carbide particles held in a tough steel matrix. Operates at low amperage with little spatter and produces smooth porosity free welds. By using a weaving technique, large areas of smooth weld overlay can be achieved. Recommended current range should not be exceeded otherwise the wear resisting properties will be destroyed. The welds are non-machinable. Recommended where severe abrasion coupled with low impact occurs. Ideal for foundry sand mill blades and slingers, pan scrapers, rock drills, pug mill knives, cement blades, conveyor screws, dredger teeth, gravel pumps and numerous other similar applications.

Carbide Hardness

72 Rockwell C

1800 VPN in Steel Matrix

Sizes Available & Recommended Amperages

6.0mm
90-145

Current:

AC/DC (+) (AC minimum 70 volts open circuit)