

Standard

EN 14700

E Fe9

DIN 8555

E 7 UM 200 KP

AWS A 5.13

E FeMn - A

Application

Basic coated manganese hard steel electrode for wear resistant overlays. The weld metal obtains its high hardness by work hardening. It is therefore particularly suitable for parts exposed mainly to high shock and impact stress. The workpieces should not become too hot during welding, if necessary stop for them to cool down. With large workpieces of austenitic manganese steel such as crusher jaws it is advisable to weld them in a water bath. High amperages and wide oscillation should be avoided. With several layers an intermediate layer with the EI 307 is recommended. When joint welding austenitic manganese steels the EI 307 is likewise to be used. Suitable for overlay and repair welding of wearing parts of austenitic manganese steel such as crusher jaws, crusher cones, rollers and similar.

Chemical composition (typical values in %)

C	Mn	Ni	Fe				
0.70	12.00	3.00	Residue				

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HB)						
aw/u (as welded/untreated) work-hardened	200 400-450						

Type of current/polarity/welding positions

PA; PB; PC



Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0 mm				
70-100	100-130	140-180	200-250				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton		
2.50	350	239	5.00	3	15.00		
3.20	350	139	5.00	3	15.00		
4.00	450	95	6.50	3	19.50		
5.00	450	60	6.50	3	19.50		

EH 330

Thickly basic coated electrode for overlays of medium hardness

Standard

EN 14700

E Fe1

DIN 8555

E 1 UM 300

Application

Thickly basic coated bar electrode for overlays with medium hardness. Particularly suitable for components with fretting, high shock and impact stress. The weld metal is crack-proof and free from pores and can be machined by cutting. Suitable for reconditioning tracks, switches, sprockets and wearing parts such as rope pulleys, bucket rollers, rollers, rollers of caterpillar vehicles, bolts, studs etc.

Chemical composition (typical values in %)

C	Si	Mn	Cr	Fe			
0.10	0.70	0.90	3.00	Residue			

Mechanical properties of the pure weld metal (typical values)

Heat treatment aw/u (as welded/ untreated)	Hardness (HB)						
	300						

Type of current/polarity/welding positions

PA, PB, PC, PD, PE, PF



Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0 mm				
80-120	120-140	140-190	190-240				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/package	kg/package	Packet/ carton	kg/carton		
2.50	350	256	5.00	3	15.00		
3.20	350	159	5.00	3	15.00		
4.00	450	108	6.50	3	19.50		
5.00	450	87	6.50	3	19.50		



Standard

EN 14700
DIN 8555

E Fe3
E 1 UM 400

Application

Thickly basic coated bar electrode for overlays of high wear resistance. Particularly suitable for components with fretting, high shock and impact stress. The weld metal can only be machine cut with sintered hard metals. A tough buffer layer with the ESB 48 or EI 307 is only necessary with base materials very susceptible to cracks. Multiple layer welding gives a crack-proof weld metal even without intermediate layers. Suitable for the rehabilitation of tracks, point rails and switches, wearing parts such as dredger parts, polygon corners, tapping tools, wheel rims, bottom dies, stamps etc.

Chemical composition (typical values in %)

C	Si	Mn	Cr	Ni	Mo	Fe
0.20	0.90	0.40	2.70	0.10	0.40	Residue

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRc)				
aw/u (as welded/ untreated)	42				

Type of current/polarity/welding positions

PA, PB, PC, PD, PE, PF



Amperage [A]

3.2 mm	4.0 mm	5.0 mm				
105-135	120-180	170-210				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton
3.20	350	142	5.00	3	15.00
4.00	450	95	6.50	3	19.50
5.00	450	60	6.50	3	19.50

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EH 360B

Thickly basic coated electrode for tough and abrasion resistant overlays on components that are subject to heavy wear

Standard

EN 14700
DIN 8555

E Fe8
E 6 UM 60 (65W) T

Application

Thickly basic coated bar electrode for tough and abrasion resistant overlays on components with high stress. The weld metal is resistant to shock and impact stress, crack-proof and free from pores and can only be machined by grinding. With base materials very susceptible to cracks a tough buffer layer with ESB 48 or EI 307 is necessary. Multiple layer welding gives a crack-free weld metal even without buffer layers. Suitable for the rehabilitation of dredger parts, front edges of the dredger scoop, bucket teeth, drill inserts, coal planes, screw conveyors, polygon corners, crusher jaws, crusher cones etc.

Chemical composition (typical values in %)

C	Si	Mn	Cr	V	Fe		
0.40	0.50	0.30	7.00	0.50	Residue		

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRc)						
aw/u (as welded/ untreated)	59						

Type of current/polarity/welding positions

PA, PB, PC, PD, PE, PF



Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0 mm				
80-100	100-140	140-180	180-230				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton		
2.50	350	244	5.00	3	15.00		
3.20	350	141	5.00	3	15.00		
4.00	450	99	6.50	3	19.50		
5.00	450	63	6.50	3	19.50		

EH 360R

Thickly rutile-coated electrode for abrasion resistant and tough hardfacings.

Standard

EN 14700
DIN 8555

E Fe8
E 6 UM 60 (65W) T

Application

Thickly rutile-coated bar electrode for tough and abrasion resistant overlays. The weld metal has sufficient heat hardness up to 600°C. It is only machinable by grinding. With base materials very susceptible to cracks a tough buffer layer with ESB 48 or EI 307 is necessary, after every 3 layers EH 360 R a further one. The hardness as welded of 59 HRC can be increased by tempering once or twice to 60-65 HRC. Suitable for hardfacings that have to be wear resistant at higher temperatures, e.g. tools for hot working such as shear blades, dies, die-casting moulds, rollers, crushers.

Chemical composition (typical values in %)

C	Si	Mn	Cr	V	Fe		
0.40	0.50	0.30	7.00	0.50	Residue		

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRC)						
aw/u (as welded/ untreated)	59						

Type of current/polarity/welding positions

PA, PB, PC, PD, PE, PF



Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0 mm				
60-90	100-140	140-180	180-210				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton		
2.50	350	266	5.00	3	15.00		
3.20	350	151	5.00	3	15.00		
4.00	450	99	6.50	3	19.50		
5.00	450	67	6.50	3	19.50		

EH 515

Thickly rutile-coated high recovery electrode for extremely wear resistant stainless hard armourings.

Standard

EN 14700	E Fe14
DIN 8555	E 10 UM 60 GR

Application

Thickly rutile-coated bar electrode with approx. 160% metal recovery for extremely wear resistant stainless overlays in the abrasive area without impact stress. The weld metal has a ledeburitic structure and is only machinable by grinding. The transverse cracks occurring with this hard weld metal are not a disadvantage with friction wear. With base materials very susceptible to cracks a tough buffer layer with EI 307 is necessary. Smooth and finely rippled weld beads. Suitable for hardfacings on components subject to heavy mineral wear such as screw conveyors, mixer blades, sludge pumps, stirrers, crusher parts, front edges of dredger scoops and components in coking plants exposed to corrosion and increased temperature.

Chemical composition (typical values in %)

C	Si	Cr	Fe				
2.90	0.30	35.00	Residue				

Mechanical properties of the pure weld metal (typical values)

Heat treatment aw/u (as welded/ untreated)	Hardness (HRc) 60						
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Type of current/polarity/welding positions

PA; PB; PC 

Amperage [A]

2.5 mm	3.2 mm	4.0 mm					
80-100	100-120	140-170					

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/package	kg/package	Packet/ carton	kg/carton		
2.50	350	186	5.00	3	15.00		
3.20	350	110	5.00	3	15.00		
4.00	350	72	5.00	3	15.00		
5.00	350	51	5.00	3	15.00		

Thickly basic-coated high recovery electrode for extremely wear resistant stainless hard armourings.

Standard

EN 14700	E Fe15	
DIN 8555	E 10 UM 55 GR	

Application

Thickly basic-coated bar electrode with approx. 180% metal recovery for extremely wear resistant stainless overlays in the highly abrasive area with light impact stress. The weld metal has a ledeburitic structure with Cr and Nb carbides and is only machinable by grinding. The transverse cracks occurring with this hard weld metal are not a disadvantage with friction wear. The wear factor of a 3-layer overlay against SiO₂ is 1%. With base materials very susceptible to cracks a tough buffer layer with EI 307 is necessary. Suitable for hardfacings of wear plates in crusher plants, cone crushers, crushers in the cement and ore industries, oil mills, bucket teeth and front edges of dredger scoops.

Chemical composition (typical values in %)

C	Si	Nb	Fe			
4.0	20.00	6.50	Residue			

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRC)				
aw/u (as welded/ untreated)	55				

Type of current/polarity/welding positions

PA, PB 

Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0 mm			
80-110	115-150	150-200	190-240			

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton	
2.50	350	160	5.00	3	15.00	
3.20	350	95	5.00	3	15.00	
4.00	350	59	5.00	3	15.00	
5.00	350	40	5.00	3	15.00	

EH 528

Thickly basic-coated high recovery electrode for extremely wear resistant stainless hard armourings.

Standard

EN 14700	E Fe16
DIN 8555	E 10 UM 65 GR

Application

Thickly basic-coated bar electrode with approx. 180% metal recovery for extremely wear resistant stainless overlays in the highly abrasive area with light impact stress. The weld metal has a ledeburitic structure with Cr and Nb carbides and is only machinable by grinding. The transverse cracks occurring with this hard weld metal are not a disadvantage with friction wear. The wear factor of a 3-layer overlay against SiO₂ is 0.5%. With base materials very susceptible to cracks a tough buffer layer with EI 307 is necessary. Suitable for cement crushers, cement presses and stone screw conveyors, mixer blades, bucket teeth and front edges of dredger scoops. Can be used for operating temperatures up to 450°C.

Chemical composition (typical values in %)

C	Si	Nb	Fe				
7.00	24.00	7.00	Residue				

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRc)						
aw/u (as welded/ untreated)	62 (1st layer) 63 (2nd layer) 64 (3rd layer)						

Type of current/polarity/welding positions

PA, PB 

Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0				
90-115	115-150	150-200	190-240				

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton		
2.50	350	160	5.00	3	15.00		
3.20	350	95	5.00	3	15.00		
4.00	350	59	5.00	3	15.00		
5.00	350	40	5.00	3	15.00		

Thickly coated high recovery electrode for extremely wear resistant stainless hard armourings.



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Standard

EN 14700
DIN 8555

E ZFe16
E 10 UM 65 GR

Application

Thickly basic-coated bar electrode with approx. 235% metal recovery for extremely wear resistant stainless overlays in the highly abrasive area without impact stress. The weld metal has a ledeburitic structure with Cr and B carbides and is only machinable by grinding. The transverse cracks occurring with this hard weld metal are not a disadvantage with friction wear. With base materials very susceptible to cracks a tough buffer layer with EI 307 is necessary. Smooth and finely rippled weld beads. The required hardness and wear resistance can already be achieved in the 1st layer on a low alloyed steel. Suitable for bucket teeth, and front edges of dredger scoops, mixer blades, pumps, screw conveyors and transport belts in the gravel industry.

Chemical composition (typical values in %)

C	Si	Mn	Cr	B	Fe
4.20	1.30	0.30	31.00	1.20	Residue

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRc)
aw/u (as welded/ untreated)	63

Type of current/polarity/welding positions

PA, PB 

Amperage [A]

3.2 mm	4.0 mm	5.0 mm
130-160	140-190	180-230

Rebaking

2h/100°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/packet	kg/packet	Packet/ carton	kg/carton
3.20	350	96	5.00	3	15.00
4.00	350	59	5.00	3	15.00
5.00	350	41	5.00	3	15.00

EH 540

Thickly basic-coated high recovery electrode for maximum wear resistant stainless hard armourings.

Standard

EN 14700
DIN 8555

E ZFe16
E 10 UM 65 GR

Application

Thickly basic-coated bar electrode with approx. 240% metal recovery for maximum wear resistant stainless overlays in the highly abrasive area without impact stress. Operating temperature up to max. 600 °C. The weld metal has a ledeburitic structure with Cr, Nb-, Mo-, W- und V carbides and is only workable by grinding. The transverse cracks occurring with this hard weld metal are not a disadvantage with friction wear. With base materials very susceptible to cracks a tough buffer layer with EI 307 is necessary. The wear factor of a 3-layer overlay against SiO₂ is 0.3%. Suitable for hardfacings on crushing and screening plants, sintering plants, cement kilns, feed systems for furnaces, front edges of dredger scoops, and bucket teeth.

Chemical composition (typical values in %)

C	Si	Cr	Mo	V	W	Nb	Fe
6.00	1.00	22.00	6.00	1.00	2.00	6.00	Residue

Mechanical properties of the pure weld metal (typical values)

Heat treatment	Hardness (HRc)					
aw/u (as welded/ untreated)	62 (1st layer) 64 (2nd layer) 65 (3rd layer) 66 (4th layer)					

Type of current/polarity/welding positions

PA, PB



Amperage [A]

2.5 mm	3.2 mm	4.0 mm	5.0			
80-115	115-150	150-200	190-240			

Rebaking

2h/350°C, if necessary

Approvals

Packaging units

Ø mm	Length (mm)	Items/package	kg/package	Packet/ carton	kg/carton		
2.50	350	160	5.00	3	15.00		
3.20	350	78	5.00	3	15.00		
4.00	350	50	5.00	3	15.00		
5.00	350	32	5.00	3	15.00		



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Standard

DIN 1732

Material no.

AWS A5.3

EL-AISI5

3.2245

E4043

Application

AX-EAISI5 is a bar electrode for welds on aluminium forging alloys and casting alloys with silicon. The welding area is to be thoroughly cleaned, the weld zones must be metallic plain. The weldability and slag removal of the electrode is good. To obtain a tight non-porous seam the electrode must be welded in horizontal position (PA) with short electric arc. For larger workpieces (> 6 mm) preheat to approx.100-250°C.

Special hints

As the coating of aluminium electrodes is hygroscopic, it is essential to ensure dry, cool storage. Electrodes that have become damp must be rebaked before welding. The rebaking temperature is 120°C / 1h.

Typical analysis in %

Al	Si	Mn	Fe	Zn			
Basis	5	0.2	0.4	0.1			

Important base materials /most important areas of application

Aluminium-silicon alloys such as:

EN AW-6061 (AlMgSi1), EN AW-6063 (AlMgSi0.7), EN AW-6082 (AlMgMnSi1), AlSi und AlSiMg casting with max. 7% Si

Material properties

Welding process	Manual metal arc welding	Mechanical properties of the weld metal as per DIN EN 1597-1
Test temperature	20°C	90
0.2% yield strength $R_{p0.2}$	[MPa]	120
Tensile strength R_m	[MPa] [%]	15
Elongation A ($L_0 = 5d_0$ %)	[W/(m*K)]	170-190
Thermal conductivity		

Approvals

(Request current scope if required)

Product forms (others available on request)

2.5 x 300	40- 70 A	4.0 x 350	90 – 130 A
3.2 x 350	60-100 A		

Welding position/ polarity

PA; PB; PC; PF



AX-EAISi12

Standard

DIN 1732	EL-AISi12
Material no.	3.2585
AWS A5.3	E4047

Application

AX-EAISi12 is a bar electrode with coating for welds on aluminium-silicon casting alloys. The welding area is to be thoroughly cleaned, the weld zones must be metallic plain. The weldability and slag removal of the electrode is good. To obtain a tight non-porous seam the electrode must be welded in horizontal position (PA) with short electric arc. For larger workpieces (> 6 mm) preheat to approx. 100-250°C.

Special hints

As the coating of aluminium electrodes is hygroscopic, it is essential to ensure dry, cool storage. Electrodes that have become damp must be rebaked before welding. The rebaking temperature is 120°C /1h.

Typical analysis in %

Al	Si	Mn	Fe				
Basis	12	0.5	0.5				

Important base materials /most important areas of application

Aluminium casting alloys up to 12%Si e.g.:
EN AC-43000 (G-AISi10Mg), EN AC-44200 (G-AISi12), EN AC-44000 (G-AISi11), EN AC-46200 (G-AISi8Cu3)

Material properties

Welding process	Manual metal arc	Mechanical properties of the
Test temperature	welding	weld metal as per DIN EN 1597-1
Yield strength $R_{p0.2}$	20°C	80
Tensile strength R	[MPa]	200
Elongation A ($L_0^m = 5d_0$ %)	[MPa] [%]	8
Thermal conductivity	[W/(m*K)]	150-170

Approvals

(Request current scope if required)

Product forms (others available on request)

2.5 x 300	40- 70 A	4.0 x 350	90 – 130 A
3.2 x 350	60-100 A		

Welding position/ polarity

PA; PB; PC; PF

