

# **Electrodes for Hardfacing Applications**





## AMA 1105 V

**Standards:** DIN 8555 E 4 - UM - 60 - 65 - S  
 AWS/ASME SFA - 5.13 E Fe 5 - B

**Application / Properties:** Rutile type electrode with coating for manufacturing and repairing high speed cutting tools.

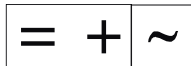
**Weld metal analysis in %(typical values):**

C	Mn	Si	Cr	Mo	V	W
0.9	0.50	0.50	4.20	8.50	0.90	1.10

**Mechanical Properties of all-weld metal**  
 (Single values are typical values) :

HRC Hardness		
50-64	62-66	25-30

Heat Treatment			
(A)		(b)	
Hardening: Quenching temperature	Quenching agent Oil, dry air, hot bath	Tempering: Twice one hour (air cooling)	Annealing (oven cooling)
1180-1240C	450-500C	UP TO 510-540C	2-4 hr AT 820-850c



Amperage:		
2.5 Ø	3.25 Ø	4.0 Ø
70-100	100-150	130-180



**Materials:** Manufacturing and repairing of cutting tools, e.g. for turning, planning, milling, reaming, drills, etc.

**Caution :** In order obtain optimum results, deposit three layers one on top of the other. Before welding, preheat the work piece up to 600-700C and maintain this temperature during welding. Weld at the lowest possible amperage. Do not weld the AMA 1105V electrode if the coating is damaged, as a lose of alloying.



## AMA 1600 V

**Standards:** DIN 8555      E 6 - UM - 60

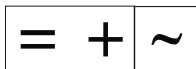
**Application / Properties:** Thick basic-covered electrode for depositing tough and wear resistant overlays on components subject to severe wear. The weld metal is crack-free and without porosity and resistant to impact and shocks. It can be machined only by grinding. A tough buffer layer (with 1803 J electrodes) is only required with very crack sensitive steels. It is possible to deposit a large number of layers without the need of intermediate buffer layers to prevent cracking.

**Weld metal analysis in %(typical values):**

C	Mn	Si	Cr	Mo	V
0.50	0.3	0.40	7.0	0.50	0.50

Mechanical Properties of all-weld metal :  
(single values are typical values)

Hardness as-welding  
**670-770 (57-62 HRC)**



Amperage:					
2.5 Ø	3.25 Ø	4.0 Ø	5.0 Ø	6.0 Ø	
70-90	100-150	140-180	190-240	250-300	



**Suitable for:** Excavator parts, bucket edges, bucket teethes, drilling 1 bits, coal planes, conveyor screws, polygon edges, crusher jaws and cones.

**Rebaking :** required at 300C to 350C for 2hrs.



## AMA 1602 V

**Standards:** DIN 8555 E 10 - UM - 60 R

**Application / Properties:** Thick basic-covered high-alloy electrode depositing a weld metal of hypereutectic chromium hard metal composition. It is suitable for highly wear resistant overlays subject to abrasion by mineral particles. The typical transverse cracks occurring such a hard weld metal are not detrimental to abrasion resistance. However, the weld metal is not suitable for application where impact and shock conditions prevail. It is machinable only by grinding. On difficult-to-weld steels a buffer layer with 1803J is necessary.

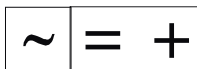
1602V produces extremely smooth weld beads with flat penetration. Metal recovery is approximately 160%.

**Weld metal analysis in %(typical values):**

C	Cr
4.3	35

Mechanical Properties of all-weld metal :  
(single values are typical values)

Hardness as-welding  
**680-770 (58-62 HRC)**



Amperage:		
3.25 Ø	4.0 Ø	5.0 Ø
120-140	170-190	220-250



**Suitable for:**

Wearing parts subject to mineral abrasion such as conveyor screws, mixer blades, concrete pump, stirring and agitator parts, milling parts, excavator bucket edges, cool planes, centrifugal shovels, parts in petrochemistry, Also wearing parts subject to corrosion at elevated temperatures.

**Rebaking :** required at 300C to 350C for 2hrs.



## AMA 1622 V

**Standards:** DIN 8555 E 1 - UM - 400

**Application / Properties:** Thick basic-covered electrode for depositing highly wear resistant overlays. The weld metal can only be machined using sintered hard metal tipped tools. It is particularly resistant to impact and shock.

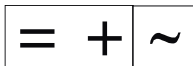
A tough buffer layer (with 1803J electrodes) is only required with crack sensitive steels. It is possible to deposit even a large number of layers without the need of intermediate buffer layers. 1622V can be easily welded in all positions expect vertical-sown.

**Weld metal analysis in %(typical values):**

C	Mn	Si	Cr
0.20	0.40	0.50	2.8

Mechanical Properties of all-weld metal :  
(single values are typical values)

Hardness as-welding: **37-42 HRC**



Amperage:		
3.25 Ø	4.0 Ø	5.0 Ø
105-135	120-180	170-240



**Suitable for:**

Rebuilding of rails, rails crossing and switch pointer, wear parts such as dredger parts, polygon edges, bearing surface, striking tools, dies, tyres, wheel flanges, slide surface subjected to heavy wear, reconditioning of lower dies and punches, etc.

**Rebaking :** required at 300C to 350C for 2hrs.



## AMA 1639 V

**Standards:** DIN 8555

E 6 - VM - 55 - GP

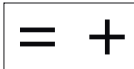
**Application / Properties:** Rutile-covered electrode for depositing hardfacing overlays on components subject by metal to metal. The weld metal is resistant to impact and high compressive stresses. Weldable on AC(OCV 70V) and DC+ in the flat and vertical up position.

**Weld metal analysis in %(typical values):**

C	Mn	Si	Cr
0.50	0.60	1.90	9.50

Mechanical Properties of all-weld metal :  
(single values are typical values)

Hardness as-welding **54 HRC**



Amperage:		
2.5 Ø	3.25 Ø	4.0 Ø
65-95	90-140	125-190



**Materials:**

Crusher hammers, gear wheels, bucket wheels, bucket teeth and lips, mixers, dredge part, moulds repairing.

**Rebaking :** required at 300C to 350C for 2hrs.



# AMA 1760 V

**Standards:** DIN 8555      E 7 - UM - 200 KP

**Application / Properties:** Basic-covered austenitic manganese steels electrode for wear resistant hard facing application. Since the weld metal will adopt high hardness by cold working, it is particularly suited to be used on components subjected to wear by heavy impact and shock. The work piece sown if necessary. In the case of large work pieces must not become too hot a during welding and should be allowed to cool manganese steel, Such as jaw plate for crushers, it is advisable to weld them in a water bath. High current densities and wide weave beads must be avoided. When building up various layers, it is good practice to deposit an intermediate buffer layer with 1803J weld metal.

In joint welding f austenitic manganese steel. it is preferable to use 1803J electrode.

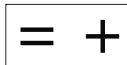
**Weld metal analysis in %(typical values):**

C	Mn	Si
1.20	13.0	0.70

**Mechanical Properties of all-weld metal :**

Hardness as-welding: approx ~ 200 HRC

Hardness after work hardening: approx. ~400-500 HB



Amperage:		
3.25 Ø	4.0 Ø	5.0 Ø
110-135	140-175	180-230



**Materials:**

Hardfacing an repair welding of wear resisting parts made of austenitic manganese steels, Such as : jaws plates for crushers, crusher cones, pulverizing hammers, beating arm, etc.

**Rebaking :** required at 300C to 350C for 2hrs.