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DATA SHEET E-66

COBSTEL 8

Product description

MMA electrode with rutile type flux made on special cobalt alloy core wire. Electrode coating is designed to give sound porosity-free deposits coupled with smooth operation and low dilution. Recovery is about 110% with respect to core wire, 65% with respect to whole electrode.

Specifications

AWS A5.13	ECoCr-E (anticipated)
UNS	W73021
DIN 8555	E20-UM-300-CKTZ
BS EN 14700	E Co1

Materials to be welded

Used for surfacing mild, low alloy and stainless steels; and also for nickel base alloys.

Can also be used for the repair of similar base materials (UNS R30021, Stellite 21 - Deloro Stellite, and BS 3146 ANC 14 castings) although it is optimised for surfacing not joining.

Applications

This low carbon cobalt base type combines good high temperature strength with high ductility. The improved ductility provides better resistance to weld cracking than the high carbon types. It has high resistance to corrosion, oxidation and sulphidation; good resistance to cavitation-erosion and resists thermal shock better than high carbon types. Galling resistance is inferior to high carbon types but bed-in properties are better.

It is used to surface **valves** and **valve seats**, **hot shear blades**, **hot work dies**, **ingot tong ends** and **equipment** for **handling hot steel**. Used for cat cracker **slide valves** in **petrochemical industry**. Also finds applications in a very wide range of industries including **steel**, **cement**, **marine** and **power generation**.

Microstructure

In the as-welded condition the microstructure consists of a cobalt based austenite with a number of carbides and other complex phases.

Welding guidelines

For smoothest operation DC+ve or AC should be used, but for minimum dilution DC-ve is preferable.

Preheat not required, but advisable for first layer when deposited on hardenable alloy steels. Interpass control to ~200°C maximum is advisable to minimise possible hot cracking in heavy multipass deposits.

Deposits are machinable with carbide tools and may be finished by grinding where necessary.

Composition (weld metal wt %)

	C	Mn	Si	Cr	Ni	Mo	W	Fe	Co
min	0.2	--	--	24.0	2.0	4.5	--	--	bal
max	0.4	2.0	1.0	29.0	4.0	6.5	0.50	5.0	bal
typ	0.3	0.2	0.6	26	3	5.5	<0.1	3	60

All-weld mechanical properties

Typical as-welded hardness:

Temperature, °C	Vickers, HV	Rockwell, HRC
+20	320	30
+400	210	--
+600	170	--
+800	110	--
+900	100	--

The as-deposited room temperature hardness can be increased to 450HV (44HRC) by work hardening.

Parameters

DC ±ve or AC (OCV: 50V min)

ø mm	3.2	4.0
min A	90	130
max A	155	210

Packaging data

ø mm	3.2	4.0
length mm	350	350
kg/carton	13.5	13.5
pieces/carton	384	279

Storage

3 hermetically sealed ring-pull metal tins per carton, with unlimited shelf life. Direct use from tin is satisfactory.
For electrodes that have been exposed:
Redry 150 – 250°C/1-2h to restore to as-packed condition. Maximum 350° C, 3 cycles, 10h total.
Storage: Recommended ambient storage conditions for opened tins (using plastic lid): < 60% RH, > 18°C.

Fume data

Fume composition, wt % typical:

Fe	Mn	Ni	Cr	Co	W	F	OES (mg/m^3)
1	4	1	10	19	1	9	0.5