DURAMAX®
Inspiring the future generations of welders

Product
Data Sheet

DURAMAX COBALT #21 -- COBALT STICK ELECTRODE

Classification: **ECoCr-E** ***Specification:*** AWS A5.13 / ASME SFA 5.13

Product Description:

DURAMAX Cobalt #21 SMAW coated electrodes deposit a low austenitic cobalt type alloy with excellent work hardenable high temperature, strength, and impart resistance. It has excellent metal-to-metal wear resistance and bonds well to all weldable steels, including stainless. These electrodes have very good strength and ductility in temperatures up to 1600°F (871°C). The deposits are resistant to thermal shock, oxidizing, and reducing atmospheres. Early applications of these types of alloys were found in jet engine components such as turbine blades and vanes. The deposit is a solid solution straightened alloy with a relatively low weight-percent carbide phase in the microstructure. Hence, the alloy is very tough and will work harden. Deposits possess excellent self-mated galling resistance and also are very resistant to cavitation erosion. electrodes are used where the resistance to thermal shock is important.

Typical Applications:

- Guide Rolls
- Hot Extrusion Dies
- Forging Dies
- Hot Shear Blades
- Tong Bits
- Valve Trim
- Chemical & Petrochemical Valves
- Cavation Repair

Typical Chemical Composition (%)

C	Mn	Si	Cr	Ni	Mo	Fe	W	Co
0.15-0.40	1.5 max	2.0 max	24.0-29.0	2.0-4.0	4.5-6.5	5.0 max	0.50 max	Bal.

Deposited Chemical Composition (%) (Typical)

C	Mn	Si	Cr	Ni	Mo	Fe	W	Co
0.23	0.80	0.80	27.70	2.80	5.40	2.40	0.05	Bal.

Typical Deposit Characteristics:

- Abrasion Resistance	Fair	- Hardness	HRC 24 - 28
- Impact Resistance	Excellent	- Work Hardened	HRC 40 - 45
- Corrosion Resistance	Good	- Hot Weld Hardness	Excellent
- Metal-to Metal Wear	Excellent	- Deposit Layers	3 Layers Maximum
- Machineability	Use Carbide Tools	- Surface Cross Checks	No

Deposited Chemical Composition (%) (Typical)

Polarity	DC + (DCEP)	DC + (DCEP)	DC + (DCEP)
Size	1/8	5/32	3/16
Amperage Range	115-135	145-165	175-195

Note: Minimum preheat recommended is 400°F (204°C). Required preheat will depend on base material composition and component dimensions.

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