DAIKOFCW 1021

FCAW

COBALT ALLOYS
Gr. 21

DESCRIPTION

Cobalt based cored wire for hardfacing

Grade 21 flux cored wire provides a low austenitic type deposit with excellent work hardenable, high temperature, strength, and impact resistance. It is a good choice for valve trim and steam and fluid control valve bodies and seals. It bonds well to all weldable steels, including stainless steel. Excellent for corrosion resistance and metal-to-metal wear resistance. Used for integral seats and guides of large water and high-pressure valve bodies, hot shears, forging dies, pump shafts and sleeves, hot punches etc.

SPECIFICATIONS

EN ISO 14700	TCo1	**AWS A5.21**	ERCCoCr-E
DIN 8555	MF 20-MF-350-CKTZ	**Shielding**	I1, I3
Positions	PA, PB, PC	**Current**	DC+
Packaging Type	BS300 spool		

ASME QUALIFICATIONS

F-No (QW432)	72
A-No (QW442)	-

HARDNESS

31-33 HRC as welded - 38-41 HRC work-hardened

CHEM. COMP. %

C	0.25
Mn	1
Ni	2.5
Cr	28.5
Si	1
Fe	4

WELDING PARAMETERS

	1.2 mm	1.6 mm
Ampere	100A - 250A	140A - 350A
Voltage	16V - 29V	26V - 30V
Packaging	Ø 1,2÷1,6mm	Ø 1,2÷1,6mm
Packaging Type	BS300 spool	BS300 spool

ANTI-WEAR CHARACTERISTICS

Adhesive wear	▲▲▲▲△
Abrasive wear	▲▲△△△
Impact	▲▲▲△△
Corrosion	▲▲▲▲△
Heat	▲▲▲▲▲

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DESCRIPTION

APPLICATION

The Gr. 21 subfamily, cobalt-based with a low carbon content, offers an excellent combination of high-temperature resistance and high ductility. These characteristics provide greater resistance to cracking during welding compared to high carbon content types. The material possesses excellent resistance to corrosion, oxidation, and sulfurization, along with good resistance to cavitation erosion. It's particularly effective against thermal shocks, outperforming high carbon types in such contexts. Although its resistance to adhesive wear is lower than that of high carbon types, its shock-absorbing properties are significantly superior. Gr. 21 is widely used for overlaying on valve fittings and valve seats, hot cutting blades, punches and dies, ingot gripper ends, and hot steel handling equipment. Gate valves in catalytic crackers of the petrochemical industry represent a prime application. It is also employed across various sectors, including steel mills, cement plants, marine industry, and power generation. Although preheating is not strictly necessary, it is advisable for the first layer on hardenable alloy steels. Interpass control up to 200 °C is suggested to minimize the risk of hot cracking in multi-pass deposits. The deposits can be machined with carbide tools and can be finished by grinding if necessary.

ALLOY TYPE

CoCrMo alloy matrix containing dispersed hard carbides.

MICROSTRUCTURE

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

MATERIALS

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) although it is optimized for surfacing not joining.