Welding Alloys Group

ACTING GLOBAL
WELDING LOCAL

WA Applications

for Hydropower

Let the water flow with Welding Alloys!

WA Consumables

The go-to provider of advanced Welding Consumables.

This catalogue presents a range of high performance cored wires dedicated to hydropower applications. We will gladly examine any special request, please do not hesitate to contact us.

Hydropower plant equipment is subject to high cavitation, erosion and vibration wear, this type of wear can occur on the scroll casing, guide vanes and runner blades. Welding Alloys has designed special cladding wires and special repair and cladding services to repair damage from wear on turbines and mantles. The combination of these specially-developed products and our Integra™ services results in the equipment achieving a considerably longer lifetime.

Martensitic steel is useful for applications requiring high mechanical strength and moderate, but adequate, corrosion resistance and other forms of wear such as cavitation and erosion.

If you take martensitic steel containing 13% chrome, reduce its carbon content to less than 0.04% and make up for this reduction by adding approximately 4% of nickel, you will obtain a more user-friendly martensitic steel called “soft” martensitic steel (e.g. CA6NM)

Type	Slag	Product Name	Welding positions	EN ISO	ASME / AWS Standard	Shielding Gas	H_{DM} [ml/100g]	Typical CVN [J] *After PWHT*		PWHT
Joining & Repairing	*Metal cored (No slag)*	**CHROMECORE M 410NiMo-G**	All positions *	T 13 4 M M12 1	EC410NiMo (modified)	M12 (Ar + 0.5-5% CO_2)	1	+20°C: 65	-20°C : 55	580°C → 8h
	Rutile (fast freezing)	**CHROMECORE V 410NiMo-G**	All positions (rutile slag)	T 13 4 P M21 1	E410NiMoT1-4	M21 (Ar + 15-25% CO_2)	4	+20°C: 50	-20°C : 43	580°C → 8h
	Basic	**CHROMECORE B 13 4-G**		T 13 4 B M12 2	E410NiMoT0-4	M20 (Ar + 5-15% CO_2)	2	+20°C: 110	-20°C : 100	580°C → 8h
		CHROMECORE B 16 5 1-G		T Z 16 5 1 B M12 2	-	M12 (Ar + 0.5-5% CO_2)	2	+20°C: 90	-20°C : 60	580°C → 8h
Hardfacing	*Metal cored*	**CAVITALLOY**	All positions *	T Z 18 10 10 CrCoMnN M M12 3	-	M12 (Ar + 0.5-5% CO_2)	-	Hardness HRC 25 as welded HRC 50 work hardened		-
Heterogeneous joining and repairing	*Rutile*	**TETRA V 309L-G**	All positions *	T 23 12 L P M21 1 T 23 12 L P C1 1	E309LT1-4 E309LT1-1	M21 (Ar + 15 - 25% CO_2) M20 (Ar + 5 - 15% CO_2) C1 (100% CO_2)	-	- 60°C : 35 (Without PWHT)		-

* Position welding is possible using pulsed arc modes of transfer (similar to solid wire)

CHROMECORE M 410NiMo-G

Metal cored wire (no slag)

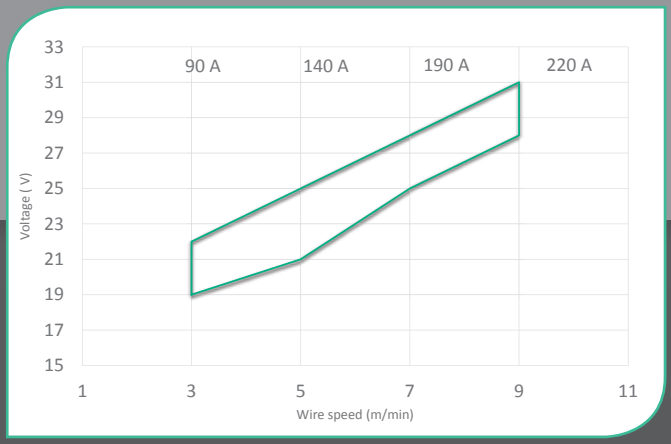
ASME / AWS → EC410NiMo

EN ISO → T 13 4 M M12 1

The safest solution for narrow gap welding

Features

- Metal cored wire
- Semi or fully automatic process
- Low diffusible hydrogen (~1ml/100g)
- Excellent bead appearance
- Wide range of parameters



Benefits to You!

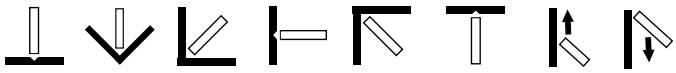
- Slag free deposit
- No defect, easy to operate
- Less preheating required
- One diameter for all purposes
- Also existing to fulfill the 16Cr-5Ni-1Mo chemical analysis (CHROMECORE M 17 6-G)

CHROMECORE V 410NiMo-G

Rutile flux cored wire

ASME / AWS → E410NiMoT1-4 / E410NiMoT1-1

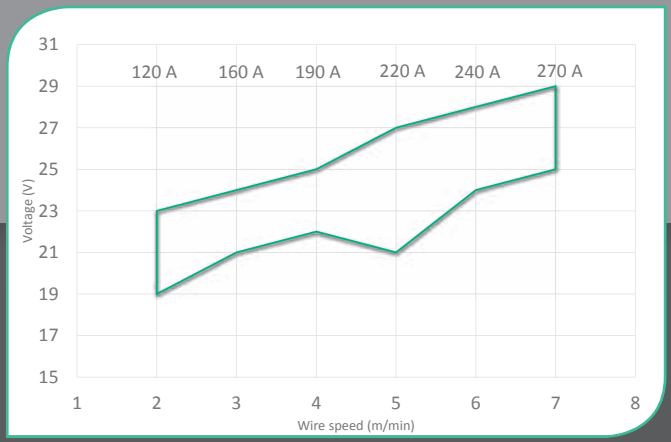
EN ISO → T 13 4 P M21 1 / T 13 4 P C1 1



Most suitable solution for all position welding

Features

- All position flux cored wire
- Semi or fully automatic process
- Low diffusible hydrogen (~4ml/100g)
- High deposition rate
- Easy slag removal



Benefits to You!

- Easy to use
- Nice bead appearance
- No cleaning, no grinding
- Reduce drastically welding time

CHROMECORE B 13 4-G

Basic flux cored wire

ASME / AWS → E410NiMoT0-4

EN ISO → T 13 4 B M12 2

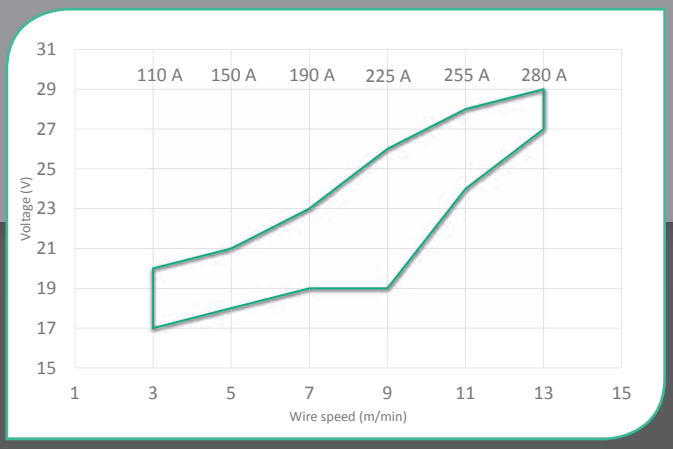
The only solution providing outstanding toughness results

Features

- Basic flux cored wire
- Semi or fully automatic process
- Low diffusible hydrogen (~2ml/100g)
- Excellent bead appearance

Benefits to You!

- Outstanding mechanical properties
- Less preheating required
- Can be used in 45° semi vertical up position
- Also existing to fulfill the 16Cr-5Ni-1Mo chemical analysis **(CHROMECORE B 16 5 1-G)**



CAVITALLOY

Metal cored wire (no slag)

EN ISO → T Z 18 10 10 CrCoMnN M M12 3

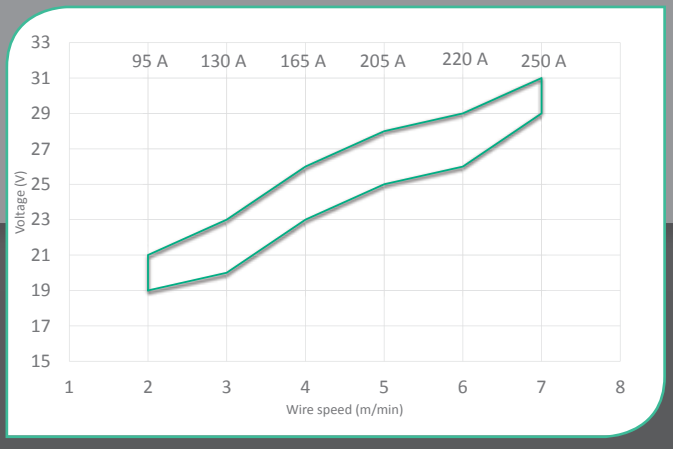
The hardfacing deposit you need to fight cavitation/erosion

Features

- Metal cored wire
- Semi or fully automatic process
- Cavitation, corrosion and erosion resistant
- Work-hardened welding deposit (240 HB → 50 HRC)

Benefits to You!

- Slag free deposit – No defects
- Easy to operate
- Increase wear resistance



WA Integra™

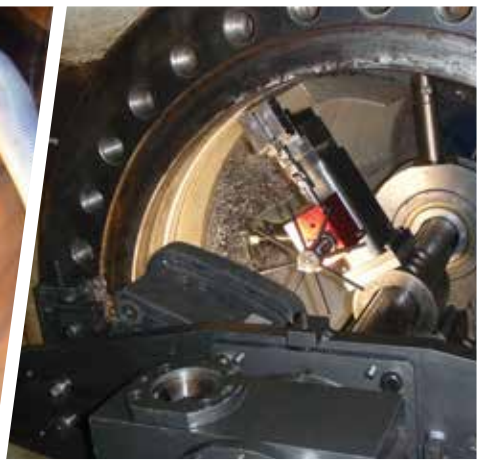
The go-to provider of engineered wear protection solutions

WA Integra™ is an integrated part of the Welding Alloys Group specifically set up to support industries that require wear control.

Globally renowned for the quality of service we provide to various industries from our workshops and on-site, WA Integra™ acts as a reliable and cost-effective engineering partner for local and international companies alike, leading the way in advanced welding technologies.

Kaplan turbine - Guide vanes
TETRA V 309L-G
CHROMECORE B 16 5 1-G
On-site building-up operation

Kaplan turbine - Mantle
TETRA V 309L-G
CHROMECORE B 16 5 1-G
On-site cladding operation



Spiral casing - Flange
TETRA V 309L-G
TETRA V 316L-G
On-site machining

Pelton turbine - Bucket
CHROMECORE M 410NiMo-G
Building-up

Francis turbine - Blade
CHROMECORE B 13 4-G
Building-up, grinding and controlling

Kaplan turbine - Blade
TETRA V 309L-G
CAVITALLOY
Hardfacing job

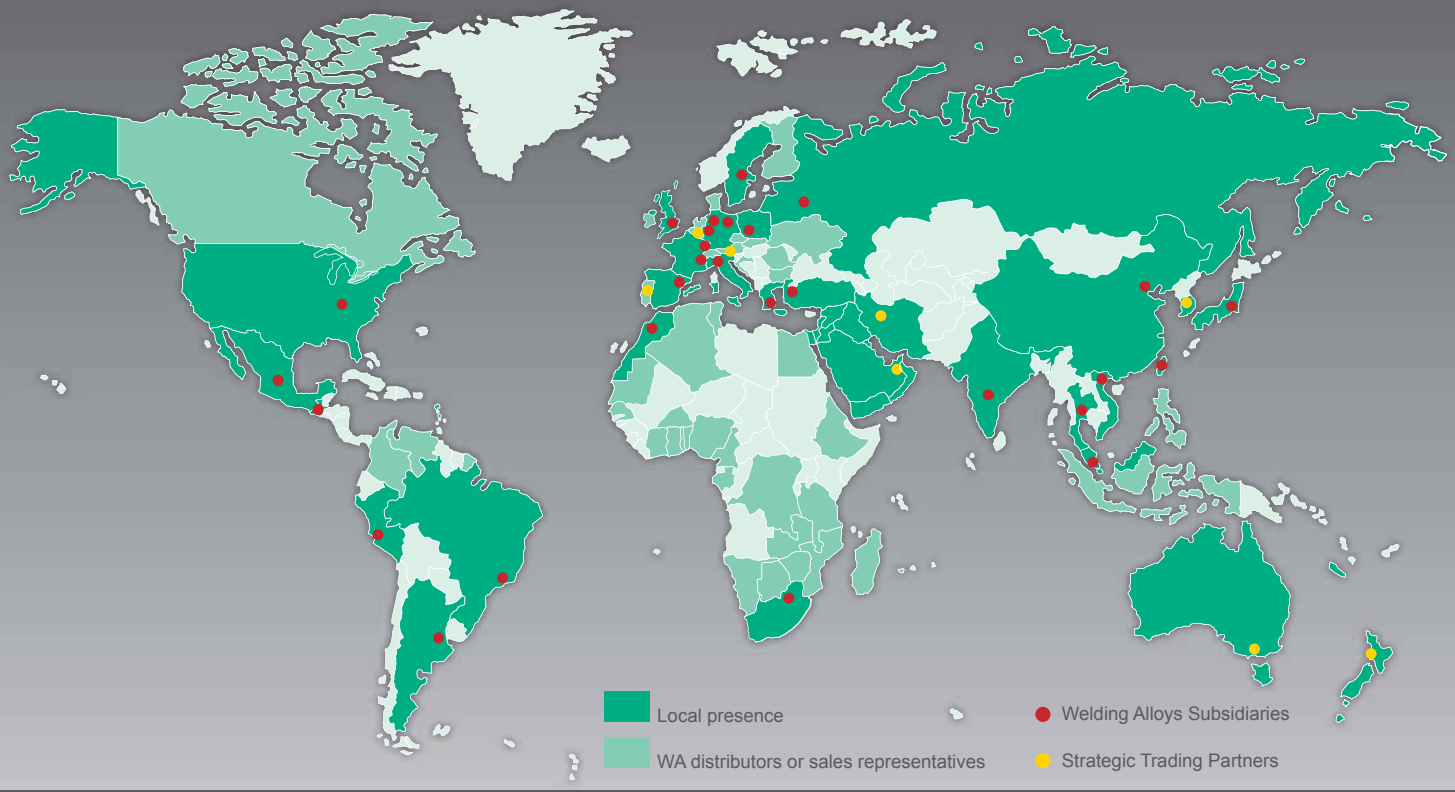
Our Technical ‘Spark’ Solves Your Industrial Challenges

WA Consumables
The go-to provider of advanced welding consumables

WA Machines
The go-to provider of automated equipment for wear protection

WA Integra™
The go-to provider of engineered wear protection solutions

A worldwide presence



www.welding-alloys.com

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