

Welding Alloys Group

ACTING GLOBAL
WELDING LOCAL

WA Tubular Hardfacing Electrodes

This catalogue presents a selection of standard tubular electrodes for hardfacing applications. We will gladly examine any special request. Please do not hesitate to contact us.

The Global Solution

Cored welding wires, Tubular electrodes & Covered electrodes

Since its foundation in 1966, Welding Alloys, an independent group, has specialised in the manufacture of cored welding wires for surfacing applications – **100% produced in our modern factories – 100% our own technology.**

This catalogue presents our range of Tubular Hardfacing Electrodes completing the Welding Alloys Flux Cored Wire and Covered Electrodes range, offering a global product range of welding consumables. The tubular hardfacing electrode with high alloyed content provides excellent deposition rates at low heat input and is very easy to weld.

Our policy of continuous R&D, along with industrial development, enables us to offer a wide range of alloys for the toughest applications used in cement, steel, mining, power plants, agriculture / sugar, recycling and heavy industries.

As a global company, our engineers and technicians are available locally. Technical support and service are provided where needed, from international WA welding specialists.



Why Tubular Electrodes?

- Easy to weld
- One holder fits all diameters 6mm, 8mm, 12mm
- Operates on small portable AC/DC welding units
- Low operating current – low heat input and low base metal dilution
- Less distortion and no burn-through
- High deposition rates and recovery
- Resistance to moisture and hydrogen pick up - no pre-baking
- No special storage
- No de-slagging
- Out of position welding



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Tubular Hardfacing Electrodes



Product name	Tip Colour	Composition [%] - Fe balance						Hardness	
		C	Mn	Si	Cr	Ni	Others	Multi Layers	Hard phases [micro-hardness HV]
HARDFACE HC-TE	●	**5.8**	0.9	0.8	**30.0**			61 HRC	950 - 1450
HARDFACE HC40-TE	●	**6.5**	0.8	0.8	**40.0**			62 HRC	950 - 1450
HARDFACE CNV-TE	○	**6.0**	1.0	0.9	**20.0**	5.0	**Nb : 6.0** V : 1.2 W : 1.5	65 HRC	950 - 2900
HARDFACE STEELCARBW25-TE	●	**6.0**	0.8	0.8	**23.0**		**WC : 25.0**	68 HRC	950 - 2000
HARDFACE STEELCARBW45-TE	●	**3.5**	0.8	0.8	**15.0**		**WC : 45.0**	65 HRC	950 - 2000

Product name	Tip Colour	Standard diameters and length [mm]	Amperes AC/DC	Standard EN 14700	Mineral abrasion	Abrasion under pressure	Hot abrasion	Erosion	Impact	Description and applications
Anti-abrasion										
HARDFACE HC-TE	● BLUE	6.0 x 450 8.0 x 450 12.0 x 450	85 - 155 130 - 190 200 - 430	T Fe15	••	••		•	•	• High chromium carbide containing tubular electrode in an austenitic steel matrix for good abrasion wear resistance • Used in various hardfacing applications in the brick industry and on swing hammers, fixed hammers, ripper teeth, dozer end bits, dredger teeth, grizzly bars etc.
HARDFACE HC40-TE	● BLACK	6.0 x 450 8.0 x 450 12.0 x 450	85 - 155 130 - 190 200 - 430	T Fe15	••	••		•	•	• High chromium containing tubular electrode which ultimately provides a high volume of primary chromium carbides in an austenitic steel matrix • No buffer layers needed to hardface grey iron, austenitic manganese steels and low carbon steels. Gives good abrasion and moderate impact resistance • Hardfacing applications include dredger buckets, crusher rolls, ripper tynes, crusher hammer, muller pan tyres and pathways
HARDFACE CNV-TE	○ WHITE	6.0 x 450 8.0 x 450 12.0 x 450	85 - 155 130 - 190 200 - 430	T Fe15	••	••	••	••	•	• The alloy consists of extremely high wear resistant complex carbides in steel matrix • The alloy can be used up to a temperature of 600˚C • Applications include steelworks spike crusher rolls, grizzly bars, blast furnace bell chutes and other parts subject to high temperatures and high abrasion
HARDFACE STEELCARBW25-TE	● GOLD	6.0 x 450 8.0 x 450	90 - 130 130 - 180	T Fe20	••			•		• Tubular electrode containing tungsten carbide and chromium carbide for extreme abrasion wear resistance • Stress relief cracks are normal • For use on all parts subject to high stress wear
HARDFACE STEELCARBW45-TE	● PURPLE	6.0 x 450 8.0 x 450	110 - 135 110 - 160	T Fe20	••			•		• Tubular electrode containing tungsten carbide and chromium carbide for extreme abrasion wear resistance • The alloy contains tungsten carbides up to 46% • Cannot be machined or drilled • Stress relief cracks are normal • Used on oil drill collars, scrapers and parts subjected to very high abrasion

• Suitable •• Highly suitable

Tubular Hardfacing Electrodes



Understanding Wear Phenomena and Material Attributes

Wear mechanism	Description
Mineral abrasion	Wear by relative movement of mineral particles of suitable hardness, shape and texture to remove material from the metal surface.
Abrasion under pressure	Wear by relative movement under pressure of mineral particles of suitable hardness, shape and texture to remove material from the metal surface, leaving superficial deformation.
Hot abrasion	As above but in a high-temperature environment, leading generally to softening of the metal or its constituents.
Erosion	Repeated high-speed impacts between mineral particles and a material surface. Local destruction by tearing out of metallic grains.
Impact	Impact between two materials, one of which provokes deformation or rupture of the surface of the other. This phenomenon is controlled by the toughness or ductility of the two materials.

Chemical composition

Each alloy is composed of elements expressed as percentages by weight. The values of those elements essential to the physical, chemical and mechanical properties of the deposit are **highlighted** in the composition tables.

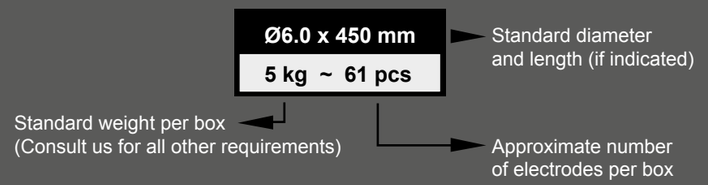
Example:

Product name	Composition [%]			
	C	Mn	Si	Cr
HARDFACE HC-TE	**5.8**	0.9	0.8	**30.0**

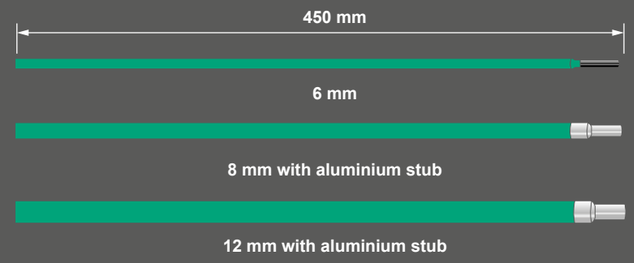
Packaging

Ø6.0 x 450mm	Ø8.0 x 450mm	Ø12.0 x 450mm
5 kg ~ 61 pcs	5 kg ~ 36 pcs	5 kg ~ 17 pcs
5 kg ~ 61 pcs	5 kg ~ 36 pcs	5 kg ~ 17 pcs
5 kg ~ 61 pcs	5 kg ~ 36 pcs	5 kg ~ 17 pcs
5 kg ~ 55 pcs	5 kg ~ 32 pcs	
5 kg ~ 50 pcs	5 kg ~ 28 pcs	

Standard packaging: explanation of the information in the above table
4 x 5kg carton per 20kg boxes



Tubular Electrode Standard Diameter and Length Information



Technical Information

- All chemical compositions given are for all weld metal deposits. All mechanical properties are typical values
- Technical data sheets and safety data sheets are available for all products



Welding products and techniques evolve constantly. All descriptions, illustrations and properties given in this catalogue are subject to change and can only be considered as general guidance.

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Cored welding wires, tubular and covered electrodes

The Global Solution

Welding Alloys Group

Our Technical ‘Spark’ Solves Your Industrial Challenges



WA Consumables
The go-to provider
of advanced welding
consumables

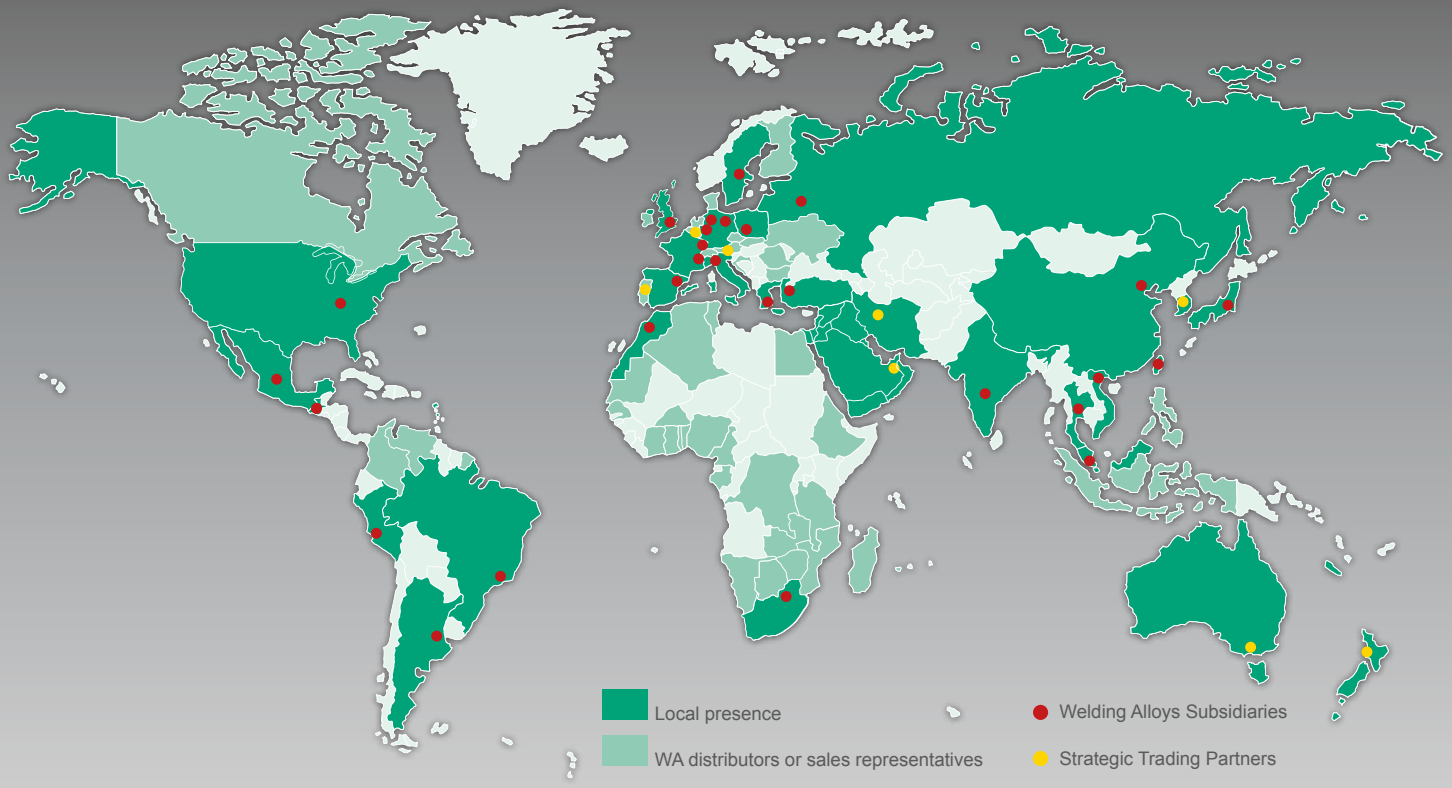


WA Machines
The go-to provider
of automated equipment
for wear protection



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

A worldwide presence



www.welding-alloys.com

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