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Handbook HILCO Welding Consumables

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Hilarius Haarlem Holland BV, the Netherlands, offers you a complete range of consumables for welding and soldering. Our greatest strength consists in the diversity of our product range. A spectrum from unalloyed to high-alloyed materials: stainless steels, high strength alloys, non-ferrous, aluminium and their respective alloy grades. All chemically right consumables, tested and considered as reliable by both our customers and internationally renowned classification institutes like: Lloyds Register of Shipping, ABS, DNV, TüV and others. Since 1987 Lloyds accredits Hilarius under ISO 9002.

We are in all aspects your ideal partner for new construction and manufacturing projects as well as for repair & maintenance. The highly specialised nature of these tasks requires distinctive approaches, which we cover with our extensive know-how, experience and complete range of products.

Our awareness of the specific demands of your operation will result in the optimum solution for any application. Hence we will never leave you to your own devices. Our experienced, highly motivated and service minded team will therefore gladly answer all your technical questions and propose economical solutions. In other words we will offer you a tailor-made solution - anywhere in the world.

Founded in 1915, Hilarius has a tradition in servicing customers in over 100 countries in the world. This has resulted in strong partnerships with welders, welding engineers, purchasing managers, field technicians, and construction & production managers. This is done either directly or through our well-established network of distributors. You can find us anywhere, even where you do not expect it - typical Dutch isn't!?

The registered brand name HILCO, in combination with the powerful green colour, is the keystone of our success. The famous five letters and their typical type casting is the icon for recognizing our quality products and unparalleled service.

Hilarius is a part of the Böhler Thyssen Welding organisation, one of the very best in the arc welding industry throughout the world. This gives you an additional guarantee that we are the solid partner for you, now and in the future.

At Hilarius we consider welding to be people's business. We are committed to enhance relationships with our partners in business while continuously seeking ways that lead to a positive contribution to your success.

If you are satisfied, we are satisfied - that is our mission,
We are the smile behind the welder!

Our products	Applications for our products
Coated electrodes	Shipyards/offshore
Solid MIG/MAG wires	Pressure vessel & boiler industry
Welding rods for TIG and gas welding	Construction works
Wires and fluxes for sub arc welding	Chemical & petrochemical industry
Rutile, basic and metal cored wires	Heat exchanger industry
Cored wires for hardfacing, overlaying	Transport & lifting industry
High strength and creep resistant alloys	Gas & pipeline industry
High temperature alloys	Road & bridge construction industry
Nickel-, copper, cobalt-, aluminium alloys	Paper, cane sugar & steel mills
Hardfacing alloys	Mine & cement industry
Consumables for repair & maintenance	Repair shops
Brazing filler metals	Marine equipment

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The product data-sheets of the individual HILCO Welding Consumables contain a detailed description of each respective product. The data-sheets are subdivided as follows:

Product identification
Brandname: mentioning the typical name of the respective product
Product ID: in sequence process - steel grade - typical application (optional)
Standard designation: classification according to AWS/ASME (Section II part C), EN and DIN-EN Werkstoffnr. In case an EN standard does not exist the DIN standard is mentioned.

Typical characteristics of the product
Gives information about the specific product, the product properties and our recommendations for welding current, polarity, welding positions, approvals and arc voltage which is the voltage at which you can strike the arc of the stick electrodes. The different welding positions which according to AWS and EN are indicated by code digits are symbolized in the product data-sheet as follows:



AWS: 1G, 2G, 3G, 4G, 5G, 6G
EN: PA, PB, PC, PD, PE, PF, PG
"All positions"



AWS: 1G, 2G, 3G, 4G, 5Gu
EN: PA, PB, PC, PD, PE, PF
"All positions, except vertical down"



AWS: 1G, 1F, 2G, 2F
EN: PA, PB, PC
"Flatt butt and fillet welds only"

Application / properties
A written description of the typical characteristics of the specific product, base materials to be welded mentioning the most important base metals for which the consumable is intended and its typical applications. In case the base metal or application is not included in the product data-sheet, or if you have any questions on the subject, your local HILCO Distributor or HILCO's customer service desk and our Technical Service Department will be pleased to help you. Call HILCO at +31-(0)23-531 91 00, Fax +31-(0)23-532 59 06, email: hilco@wxs.nl

Equivalent product in alternative welding process
HILCO offers you package solutions for the entire range of welding techniques for a large number of our products. These package solutions comprise HILCO Stick electrodes for SMAW, MIG/MAG Solid wires for GMAW, Cored wires for FCAW, TIG Solid wires for GTAW, Fluxes and wires for SAW, OAW Solid wires for Oxy-acetylene gas welding and brazing rods. The mentioned product indicates the first choice in an alternative welding process.

Chemical composition
The weld metal analysis (with the exception of SAW Solid wires) indicates the chemical composition of the deposit weld metal in weight % per element. The values indicated in the product data-sheets were determined by routine testing by our quality assurance department.

Mechanical properties
The specified mechanical properties are typical values and refer to all-weld metal. It must be taken into account that the mechanical properties of welded joints, depending on the base materials, dimensions of the component, welding position, welding parameters, preheating, interpass temperatures, post-weld-heat-treatment (PWHT), may deviate from those of the all-weld metal. The mechanical properties indicated in the product data-sheets are to be considered as general guidelines and they may vary according to the variations of product batches.

Disclaimer
The products and information in this handbook is based on today's knowledge about welding, welding techniques and product development. All technical data mentioned is not binding, alterations are possible at any time. If required please contact us for the latest developments.

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Productname

Process - steel grade - typical application (optional)

Standard designation as per: AWS	American Welding Society
EN	European standard (issued by CEN)
DIN	German standard for industries
Werkstoffnr.	DIN-EN identification for materials

Coating type, wire type or flux type (depending on the process):
Identifies the characteristics of the product concerned by means of either the chemical composition of the covering or core. In case of wire type the specific welding process concerned.

Arc voltage:
Typical starting voltage for stick electrodes. 42V means electrode is suitable for lighting current transformers (in Europe 220V) and transformers with 42V or S marking.

Current:
Identifies the current and polarity recommended. For DC current the sequence identifies our recommendations



AC current = AC



DC current / electrode connected to positive pole = DCEP



DC current / electrode connected to negative pole = DCEN



DC current / negative pole with a remark = DCEN

Welding positions:
Identifies the welding position we recommend the consumable to be used in



All positions



All positions, except vertical downwards



All positions, specifically in vertical down position



Flat butt and fillet welds only



Flat butt and fillet welds, limited vertical upwards

Approvals: consumable is yearly tested and approved by international institutes

ABS	American Bureau of Shipping
BV	Bureau Veritas
CL	Controlas - Netherlands standard
DB+Ü	Deutsche Bundesbahn (German Railways) + Uberwachungsvertrag (U-sign)
DNV	Det Norske Veritas
GL	Germanischer Lloyds
LR	Lloyds Register of Shipping
TüV	Technische überwachungs Verein
Force	Force Institute - Danish standard

Tip colour: (if applicable) colour code for identification of stick electrodes, to be found on grip end of the electrode
Printing: Brandname / EN classification / AWS specification (or parts of this sequence) printed on the electrodes' coating for example: HILCO Red Extra / E42 0 RC / E 6013

Equivalent product in alternative welding process:
Indicates the first choice for a consumable in another welding process, process identification acc. to ASME:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Shielded metal arc welding - stick electrodes - Manual metal arc welding - 111	Gas metal arc welding - MIG/MAG - 131/135	Flux cored arc welding - MAG welding - 136	Gas tungsten arc welding - TIG welding - 141	Submerged arc welding with wire electrode - 121	OAW - Oxy-acetylene welding - 311 / Brazing, soldering and braze welding - 9XX

Stick electrodes
Rutile and low-hydrogen electrodes are packed in cardboard packs with polyethylene shrink wrapping which are then packed in outer boxes made of corrugated board in units of 3 or 4.

Pipeweld electrodes for welding cross-country pipelines are packed in steel metals can to ensure moisture levels necessary for proper operation.

HILCHROME stainless steel electrodes are packed in hermetically sealed metal cans, which are then packed in outer boxes of corrugated board in units of 3. The metal HILcan offers the following advantages:

- Guaranteed completely dry electrodes, maintained in exactly the same quality controlled condition as immediately after production;
- Problem-free storage for an unlimited time in the originally sealed packaging;
- Protection from damage, climate changes and moisture pick-up;
- A weld metal deposit without any porosity when the electrodes are used within one single shift (8 hrs.) in any climate condition.



Hardmelt stick electrodes for depositing wear resistant layers are packed in the same way as rutile and low-hydrogen electrodes.

HILCO electrodes for welding Ni-base alloys, non ferrous alloys, cast iron grades and stellite are packed in small handy packages of max. 2 kilo with polyethylene shrink-wrapping which are then packed in outer boxes of corrugated board in units of 7.

HILCO stick electrodes for welding Aluminium are packed in hermetically sealed aluminium cans, which are then packed in outer boxes made of corrugated board in units of 6.

TIG rods, gas welding rods
TIG rods and gas welding rods are available in 5 kilo packs made of corrugated board or 5 kilo cardboard tubes.

Flux for submerged arc welding
HILCOWELD fluxes are normally supplied in polyethylene bags of 25 kilo. Other types of packaging are available upon request.

MIG/MAG wires, Cored wires and wires for submerged arc welding
Are spooled on various spool type, each spool is packed in a polyethylene bag and individually or combined (S100 spools, some S200 spools) packed in corrugated boxes. With the introduction of the EN standard for technical delivery conditions (EN 759) the name of the spool types have been amended as follows:

DIN 8559 "old name"	EN 759 "new name" (datasheets)	Type	Typical weight * (kgs.)	Outer diameter (mm.)	Inner diameter (mm.)	Outer width (mm.)	Bore diameter (mm.)
D 100	S 100	Spool	1,0	100 +/- 2	-	45 +0/-2	16,5 +1/-0
D 200	S 200	Spool	5,0	200 +/- 3	-	55 +0/-3	50,5 +2,5/-0
D 300	S 300	Spool	15,0	300 +/- 5	-	103 +0/-3	50,5 +2,5/-0
K 300	B 300	Basket rim	15,0	300 +0/-5	180 +/- 2	100 +/- 3	-
- "Sandvik"	BS 300	Basket spool	15,0	300 +/- 5	-	103 +0/-3	50,5 +2,5/-0
K 415	B 415	Basket rim	25,0	415 +/- 5	300 +15/-0	70 +0/-15	-
-	MP	Drums	250,0	-	-	-	-

Note: typical weight indicates the typical content of a spool. Please consult the product data-sheets of the specific product for accurate information.

EN 759	Typical application
S 100	Plastic spools for **orbital welding**
S 200	Plastic spools for usage in **confined areas**
S 300	Plastic spools for universal usage
B 300	**Steel basket rings for universal usage** - to be used with an adaptor
BS 300	**Steel basket rings with characteristics of D 300 spools - environment friendly**
B 415	Steel basket rings for Submerged arc welding wires
MP	**Drums to improve your productivity.** Each MP contains more than thirteen 15 kilo spools, reducing stop-and-go sequences to an absolute minimum. Ideal for automatic welding processes requiring high productivity.

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Designation			Constituents in percent volume						Procedure	Remarks
Group	Code	Mixture (data-sheet)	Oxidising		Inert		Reducing	Un-reactive		
			CO_2	O_2	Ar	He	H_2	N_2		
R	1	-			Bal.		>0-15		TIG, root shielding, plasma cutting	reducing
	2	-			Bal.		>15-35			
I	1	Pure Ar			100				MIG, TIG, root shielding	inert
	2	-				100				
	3	ArHe			Bal.	>0-95				
M1	1	$ArCO_2$	>0-5		Bal.		>0-5		MAG	Slightly oxidizing
	2	$ArCO_2$	>0-5		Bal.					
	3	$ArCO_2O_2$		>0-3	Bal.					
	4	$ArCO_2O_2$	>0-5	>0-3	Bal.					
M2	1	$ArCO_2$	>5-25		Bal.					
	2	ArO_2		>3-10	Bal.					
	3	$ArCO_2O_2$	>0-5	>3-10	Bal.					
	4	$ArCO_2O_2$	>5-25	>0-8	Bal.					
M3	1	$ArCO_2O_2$	>25-50	>10-15	Bal.					Strongly oxidizing
	2	Pure Ar			Bal.					
	3	$ArCO_2O_2$	>5-50	>8-15	Bal.					
C	1	CO_2	100							
	2	CO_2O_2	Bal.	>0-30						
F	1							100	Plasma cutting, root shielding	Unreactive reducing
	2						>0-50	Bal.		
Note: Argon (Ar) may be substituted by Helium (He) up to 95% - the He percentage is indicated by an extra digit.										

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Handling, storage, drying stick electrodes

To ensure satisfactory weld quality, stick must be handled and stored properly before use. Electrode coatings are carefully designed to provide the necessary operating characteristics and weld properties required for each electrode type. Generally stick electrodes should be stored in their original packing. The storage facilities should have an infrastructure which makes the "first in - first out" principle possible. Electrodes are manufactured to be within acceptable moisture limits, consistent with the type of covering and strength of the weld metal. It is recommended to facilitate the storage room in such way that the electrodes are stored dry and safe. Moisturizing units should not be stored in the same area. Open packaging should be stored in special conditioned areas.

TYPICAL STORAGE CONDITIONS FOR STICK ELECTRODES

Storage of covered electrodes in cardboard boxes requires in general humidity and temperature controlled storage areas. Recommended storage conditions include:

- Temperature 18-25°C, relative humidity max. 60%
- Temperature 25-35°C, relative humidity max. 50%

Redrying of stick electrodes is recommended if the electrodes have picked up moisture or is imperiously required for low-hydrogen basic coated electrodes. We advise you to use the electrodes from a quiver after redrying.

TYPICAL REDRYING GUIDELINES FOR STICK ELECTRODES

Electrodes for	Coating type	Redrying recommended	Redry temperature ºC	Redrying time / h.
Unalloyed and low alloy structural steel	A, AR, RC, R, RR	No	--	--
	RB, B	Yes	300-350	2 - 10
Pipelines	C	Not allowed!	--	--
Fine grain steel	B	Yes	300-350	2 - 10
High temperature steel	R	No	--	--
	B	Yes	300-350	2 - 10
Stainless and heat resisting steel	R	Yes	120-200	2 - 10
	RB, B	No	--	--
Soft-martensitic steel	B	Yes	300-350	2 - 10
Duplex steel	R, RB	Yes	250-300	2 - 10
Hardfacing	R	No	--	--
	RB, B	Yes	300-350	2 - 10
Ni-base alloys	All types	If necessary	120-300	2 - 10

In certain cases it may be reasonable to redry electrodes even when they are not mentioned in the table above. Should the coating exhibit and excessively high water content as a result of e.g. improper storage or other adverse influences, which is reflected by the welding behaviour and by increased spattering or formation of pores, the electrodes may be redried at 100-120ºC for one hour. Electrodes in special packaging (f.i. HILcans) can be used without redrying and holding in a drying oven within a period of 8 hours after opening. After that the electrodes can be redried in accordance with the table above.

Handling, storage, drying cored wires

Unalloyed and low-alloyed cored wires are less sensitive to moisture pick-up since a metal sheath mainly covers the internal core. Nevertheless it is possible that the working environment affects the low hydrogen characteristics. For storage we recommend the same conditions as mentioned for stick electrodes (typical storage conditions for stick electrodes). For redrying we suggest to redry the wires at 150ºC / max. 24 h.

Stainless steel cored wires are more sensitive to moisture pick up. Therefore the spools are vacuum packed. Storage facilities and redry procedures are the same as for unalloyed and low-alloyed cored wires. For stainless steel cored wires we kindly ask you to pay extra attention to removing the spools at the end of the working period and store them in a conditioned area. In case of need you can redry the wires at 150ºC / max. 24 h.

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Handling, storage, drying fluxes for submerged arc welding
We recommend to store welding fluxes at a constant temperature in a conditioned area, this to avoid moisture pick-up. The shelf life of welding fluxes can be max. three years if stored properly. Flux in damaged packaging should be used or repacked immediately. To ensure a crack-free usage fluoride-basic fluxes should be dried before usage. Redrying can be avoided in case of usage directly from undamaged, airtight packaging.

TYPICAL REDRYING GUIDELINES SUB-ARC WELDING FLUXES				
Production method	**Type**	**Redrying recommended**	**Redry temperature ºC**	**Redrying time / h.**
Agglomerated flux	FB	Yes	350	2 - 10
	AR	Yes	300	2 - 10
Fused	MS	Yes	150	2 - 500

Redry temperatures as mentioned in the table above are considered to be guidelines only. Redying in multiple sequences is possible within the mentioned redrying time. Fluxes that ar enot used immediately after redrying should be stored in a heated area or in an airtight packaging such a hermetically sealable drums. Storage temperature of the heated area should be around 150ºC, max. storage period is 30 days. We recommend using a redrying oven where special care should be taken to overheating the flux.

Conversion factors

Conversion of international standards

SI Units for use in the welding industry To convert *to* metric, *multiply* by the factor in remarks; To convert *from* metric, *divide* by the factor				
Quantity	**Unit**	**Symbol**	**Other units/symbol**	**Remarks / factor**
Length	Meter	m	Inch (in) Foot (ft) Yard (yd)	0.0254 0.3048 0.9144
Area	Square meter	m^2	$Inch^2$ (in^2) $Foot^2$ (ft^2) $Yard^2$ (yd^2)	0.0064516 0.09290304 0.8361274
Volume	Cubic meter	m^3	$Inch^3$ (in^3) $Foot^3$ (ft^3)	0.001638706 0.02831685
Frequency	Hertz	Hz	-	-
Mass	Kilogram	kg	Pounds (lbs)	0.4535924
Density	Kilogram per cubic meter	Kg/m^3	-	-
Force	Newton	N	kgf lbf	0.980665 0.4448222
Mechanical load	Pascal, Mega Pascal	Pa MPa	Newton per square meter Newton per square millimetre (N/mm^2)	1 1
		MPa	Ton f/in^2 1 ksi = 1.000 psi	0,064749 6,89476
Impact strength	Joule	J	-	1J = 1NM 1J = 0,7377562 fl lbf 1J = 0,1011972 kgf m
Temperature	Kelvin	K	Degree Celsius (ºC) Degree Fahrenheit (F)	tK=tC + 273.15 tK=(tF+ 459.67)/1.8
	Celsius	C	Degree Fahrenheit (F)	tF=(tCx1.8)+32
	Fahrenheit	F	Degree Celcius (ºC)	tC=(tF-32)x1.8
Electric current	Ampere	A	-	-
Electric potential	Voltage	V	-	-
Current density	Ampere per meter	A/m^2	-	-

Conversion international sizes								
mm.	SWG	inch	mm.	SWG	inch.	mm.	SWG	inch.
1,2	-	3/64	3,0	10	1/8	8,0	-	5/16
1,5	16	1/16	4,0	8	5/32	10,0	-	3/8
2,0	14	5/64	5,0	6	3/16	13,0	-	1/2
2,5	12	3/32	6,0	4	1/4	25,4	-	1/1

EURO Conversion rates EU countries					
Country	1 EUR =		Country	1 EUR =	
Austria	ATS	13.7603	France	FRF	6.55957
Belgium	BEF	40.3399	Ireland	IEP	0.787564
Germany	DEM	1.95583	Italy	ITL	1936.27
Spain	ESP	166.386	Netherlands	NLG	2.20371
Finland	FIM	5.94573	Portugal	PTE	200.482

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Material test certificates according to EN 10204
Increasingly, certificates attesting the characteristics and property values of welding filler metals are required by customers or inspection authorities within the framework of the acceptance testing of welded structures.

A few explanatory notes are included in this handbook with the request that they should be kept in mind when making enquiries or placing orders.

The EN standard 10204 is taken as a basis to determine the schedule of such certificates. The standard defines who is responsible for testing and authorized to sign, and whether the certificates must contain details concerning general typical values or specific test results relating to the particular delivery.

We would like to emphasize that EN 10204 does not contain the following details so that these must be specified by the customer upon ordering:

Scope of testing: e.g. type and number of tests, individual elements in case of chemical analysis tests
Consumables: e.g. type of shielding gas etc.
Test parameters: e.g. post weld heat treatment of the test piece, test temperatures
Requirements: e.g. minimum values for yield strength, tensile strength, elongation, impact values, chemical composition tolerances
Inspection society: if required.

All certificates issued in conformity with EN 10204 must be paid for and are charged separately.

HILCO Test Reports
Typical test reports issued by Hilarius Haarlem Holland BV

HTR	Acc. to EN 10204	Issued by	Contents
1	2.2	HILCO Administration dept.	Typical chemical analysis Typical mechanical properties Non specific information
2	2.2	HILCO QA dept.	Typical chemical analysis Typical mechanical properties Specific information about shipment
3	2.3	HILCO QA dept.	Actual chemical analysis Typical mechanical properties Specific information about shipment
4	3.1.B	HILCO QA dept.	Actual chemical analysis Actual mechanical properties Specific information about shipment

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Ships plate

All grades of shipbuilding steels are suitable for welding. Normal shipbuilding steels have a tensile strength of 400-480 Mpa. These steel can be divided into 5 categories according to their quality:

Category	A	killed to semi-killed
	B	killed to semi-killed
	C	Al-killed, fine grained
	D	all deoxidising techniques, not killed
	E	Al-killed, fine grained

The required minimum impact strength values for the materials of categories C, D and E also apply for the filler metals. The values for ISO-V notch specimens are as follows:

Category	1	47 Joule minimum at +20ºC
	2	47 Joule minimum at 0ºC
	3	47 Joule minimum at -20ºC
		61 Joule minimum at -10ºC

Those welding consumables classified as per categories 2 and 3 having a low hydrogen content are additionally marked with:

Category	H15	max. H_2O 0,5 g/100 g samples = (H_{DM} < 15 ml / 100 gr deposit weld metal)
	H10	max. H_2O 0,3 g/100 g samples = (H_{DM} < 10 ml / 100 gr deposit weld metal)
	H5	max.H_2O 0,2 g/100 g samples = (H_{DM} < 5 ml / 100 gr deposit weld metal)

Structural steel

In general the weldability of unalloyed structural steel is easy.
As in all are welding processes the weld metal needs mechanical properties to match the base materials to be welded. The welder must avoid forming defects in the weld.
Unlimited weldability for the different welding processes cannot be guaranteed for structural steels. The behaviour of a steel plate during and after welding has a close relationship to the chemical structure of the material itself as well as its dimensions and shape. Furthermore the fabrication and service conditions of the component are important.

Boiler steel

There are no restrictions to the weldability of boiler steels. Please follow the recommendations mentioned in this handbook or mentioned in the classifications of the base materials to be welded.

Fine grain steel

All fine-grained steels can be welded, restrictions only exist for welding processes involving considerably heat accumulation. Please follow the recommendations mentioned in this handbook or mentioned in the classifications of the base materials to be welded.

Pipe steel

The weldablity of pipe steels is not subject to any restrictions. Please follow the recommendations mentioned in this handbook or mentioned in the classifications of the base materials to be welded.

Cast steel

The weldability of cast steels is only subject to restrictions as per EN 10213. Please follow the recommendations mentioned in this handbook or mentioned in the classifications of the base materials to be welded.

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The known DIN designations 1629, 1681, 17100, 17102, 17155 and 17172 have been replaced by EN standards. A summary of both old designations and their replacements is as follows:

	OLD DESIGNATION (DIN)		EN STANDARD (NEW)	
Base materials	**DIN**	**designation**	**EN**	**designation**
Pipe steel	DIN 1629 / 1630	St. 37.0	EN 10216-1	P235T1
		St. 37.4		P235T2
		St. 44.0		P275T1
		St. 44.4		P275T2
		St. 52.0		P355N
Cast steel	DIN 1681	GS-45	EN 10213-2	GP240R
		GS-52		GP240H T1/T2
Structural steel	DIN 17100	St. 33	EN 10025	S185
		St. 37-2		S235JR
		USt. 37-2		S235JRG1
		RSt. 37-2		S235JRG2
		St. 37-3U		S235J0
		St. 37-3N		S235J2G3
		St. 44-2		S275JR
		St. 44-3U		S275J0
		St. 44-3N		S275J2G3
		St. 52-3U		S355J0
		St. 52-3N		S355J2G3
		St. 50-2		E295
		St. 60-2		E335
		St. 70-2		E360
Fine grain steel	DIN 17 102	StE 285	EN 10028-3	P275N
		WStE 285		P275NH
		TStE 285		P275NL1
		EStE 285		P275NL2
		StE 355		P355N
		WStE 355		P355NH
		TStE 355		P355NL1
		EStE 355		P355NL2
		StE 460		P460N
		WStE 460		P460NH
		TStE 460		P460NL1
		EStE 460		P460NL2
		StE 285 / -	EN 10113-2/3	S275N / S275M
		TStE 285 / -		S275NL / S275ML
		StE 355 / BStE 355 TM		S355N / S355M
		TStE 355 / BTStE355 TM		S355NL / S355ML
		StE 420 / BStE 420 TM		S420N / S420M
		TStE 420 / BTStE420 TM		S420NL / S420ML
		StE 460 / BStE 460 TM		S460N / S460M
		TStE 460 / BTStE460 TM		S460 NL / S460 ML

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	OLD DESIGNATION (DIN)		EN STANDARD (NEW)	
Base materials	**DIN**	**designation**	**EN**	**designation**
Boiler steel	DIN 17 155	H I	EN 10028-2	P235GH
		H II		P265GH
		17 Mn 4		P295GH
		19 Mn 6		P355GH
		15 Mo 3		16 Mo 3
		13 CrMo 4 4		13 CrMo 4-5
		10 CrMo 9 10		10 CrMo 9-10

Fine grain steel (high strength steel)	-	TStE 460 V	EN 10137-2	S460QL
		StE 500 V / TStE 500 V		S500Q / S500QL
		StE 550 V / TStE 550 V		S550Q / S550QL
		StE 620 V / TStE 620 V		S620Q / S620QL
		StE 690 V / TStE 690 V		S690Q / S690QL
		TStE 890 V / TStE 960 V		S890QL / S960QL

Fine grain steel (weather resistant)		S235JRW-S355JRW	S235J2G3Cu-S355J2G3Cu

	OLD DESIGNATION (DIN)		EN STANDARD (NEW)		API 5L
Base materials	**DIN**	**designation**	**EN**	**designation**	**design.**
Pipe steel	DIN 17 172	StE290.7	EN 10208-2	L240MB	X42
		StE290.7TM		L290MB	
		StE240.7		L240NB	
		StE290.7		L290NB	
		StE320.7		L320NB	X46
		StE360.7TM		L360MB	X52
		StE360.7		L360NB	
		StE385.7		L385NB	X56
		StE415.7		L415NB	
		StE415.7TM		L415MB	X60
		StE445.7TM		L445MB	X65
		StE480.7TM		L480MB	X70
		StE550.7TM		L550MB	X80

	DESIGNATION	EN STANDARD (NEW)
Ships plate	Grade A	S235JRS2
	Grade AH32	S315G1S
	Grade AH36	S355G1S
	Grade AH40	-
	Grade B	-
	Grade D	S235J2S1.0
	Grade DH32	S315G2S
	Grade DH36	S355G2S
	Grade DH40	-
	Grade E	S235J4S
	Grade EH32	EN 17102: P315N
	Grade EH36	S355G3S
	Grade EH40	-

Red Extra

Stick electrode - unalloyed steel

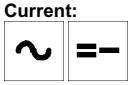
AWS A5.1: E 6013

EN 499: E 42 0 RC 11

Coating type:
Rutile

Arc voltage: 42V

Current:



Welding positions:



Approvals: ABS, BV, DB+Ü, DNV, GL, LR, TüV

Tip colour:
Red

Printing:
HILCO Red Extra / E42 0 RC / E 6013

Red Extra is our universal electrode for all welding positions, including vertical-down position. The electrode is characterised by easy handling, smooth arc transfer, easy slag removal and a finely rippled bead surface. Red Extra is the ideal choice for construction work where the use of one type of electrodes is permissible. Typical applications include assembly, workshop and repair welding of mild and low-alloyed structural steels. Red Extra is an all-current type (AC/DC), which also operates on transformers with low OCV, min. 42V.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 2	H60 / HW430	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,12	0,60	0,40	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 22	0ºC ≥ 50

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,0	300	10,5	40-60
2,5	350	18,2	60-100
3,2	350	28,9	90-140
4,0	350	44,6	150-190
5,0	350	70,4	180-240

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Red

Stick electrodes - unalloyed steel

AWS A5.1: E 6013

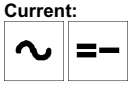
EN 499: E 42 0 RC 11

Coating type:
Rutile

Arc voltage: 42V

Approvals:
-

Current:



Tip colour:
Red

Welding positions:



Printing:
HILCO Red / E 6013

Red is our rutile coated electrode for all welding positions, including vertical-down position. The electrode is characterised by easy handling, smooth arc transfer, easy slag removal and a finely rippled bead surface. Red is selected in a wide range of sheet metal applications. Typical applications include tack welding and welding on galvanised, primer painted and slightly rusted plates. Red is an all-current type (AC/DC) and is suitable for welding on transformers with low OCV, min. 42V.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 2	H60 / HW430	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,09	0,50	0,35	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 22	0ºC ≥ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	18,2	60-90
3,2	350	28,9	90-140
4,0	350	44,6	150-190

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Brown

Stick electrodes - unalloyed steel

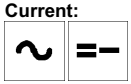
AWS A5.1: E 6013

EN 499: E 42 0 RC 11

Coating type:
Rutile

Arc voltage: 50V

Current:



Welding positions:



Approvals:
ABS, BV, DB+Ü, LR

Tip colour:
Brown

Printing:
Brown / E42 0 RC / E 6013

Brown is our “fast freezing” rutile coated electrode for all welding positions, especially vertical-down position. The electrode is characterised by easy handling, a good penetrating arc and the ability to bridge wide root openings under conditions of poor fit: on rusty, scaled, primer painted and/or contaminated plate material. Brown is selected for bridging gaps, assembly, repair and workshop welding. Typical applications include repair welding in shipbuilding. Brown is an all-current type (AC/DC).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 2	H60 / HW430	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,55	0,35	$\leq$ 0,030	$\leq$ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	$\geq$ 420	$\geq$ 500	$\geq$ 22	0ºC $\geq$ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	18,8	60-100
3,2	350	31,3	90-140
4,0	350	47,0	150-190

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Pipeweld 6010

Stick electrodes - unalloyed steel

AWS A5.1: E 6010

EN 499: E 38 3 C 21

Coating type:
Cellulose

Arc voltage: 70V

Approvals:

Current:
=+ =− * * Root pass!

Tip colour:

Welding positions:


Printing:
E 6010 / Pipeweld 6010

Pipeweld 6010 is our cellulose coated electrode recommended for all welding positions, particularly in vertical down and overhead position. The electrode is characterised by a deeply penetrating, forceful, spray type arc and readily removable slag. The majority of applications are in joining carbon steel, but performance on galvanised and some low-alloy steels is proven to be excellent. Typical applications include shipbuilding, general constructions, bridges, storage tanks, piping and pressure vessel fittings.

Base materials to be welded:
- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Pipelines

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 52	-	H100 / HW430	Fer G 2

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,14	0,55	0,18	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 510	≥ 22	-20ºC ≥ 70

Packaging and welding data:

Dia. Mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	17,7	50-80
3,2	350	25,5	80-130
4,0	350	39,5	120-180
5,0	350	61,4	160-220

Performa

Stick electrodes - unalloyed steel

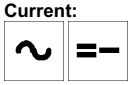
AWS A5.1: E 6013

EN 499: E 42 0 RC 11

Coating type:
Rutile

Arc voltage: 42V

Current:



Welding positions:



Approvals:
GL, LR

Tip colour:
yellow

Printing:
Performa / E42 0 RC / E 6013

Performa is our all-round all-current (AC/DC) electrode for all welding positions. The electrode is characterised by easy handling, smooth arc transfer, easy slag removal and a finely rippled bead surface. Performa is the logic first choice for shipbuilding. Typical applications include assembly, workshop and repair welding of mild and low-alloyed structural steels. Performa also operates on transformers with low OCV, min. 42V.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry
- Do-it-yourself

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 1	H60 / HW430	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,50	0,40	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 22	+20ºC ≥ 55

Packaging and welding data:

Dia. mm.	Length Mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	16,5	80-110
3,2	350	27,9	110-130
4,0	350	42,5	140-160

Velora

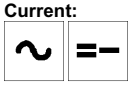
Stick electrodes - unalloyed steel

AWS A5.1: E 6013
EN 499: E 42 0 RR 12

Coating type:
Rutile

Arc voltage: 42V

Current:



Welding positions:



Approvals:
DB+Ü, TüV

Tip colour:
Yellow

Printing:
Velora / E42 0 RR / E 6013

Velora is our “slow freezing” rutile coated electrode for all welding positions, except vertical down position. The electrode is characterised by easy handling, smooth arc transfer, easy slag removal and a finely rippled bead surface. Velora is selected for fast downhand welding of thin sheet metals (≥ 5,0 mm. wall-thickness). Typical applications include assembly, workshop and repair welding of mild and low-alloyed structural steels. Velora is an all-current type (AC/DC), which also operates on transformers with low OCV, min. 42V.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 1	H60 / HW155	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	0,60	0,40	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 22	0ºC ≥ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,0	300	10,9	50-70
2,5	350	20,5	60-100
3,2	350	34,4	100-140
4,0	450	70,0	150-190
5,0	450	112,0	190-270

Velveta

Stick electrodes - unalloyed steel

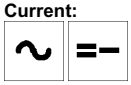
AWS A5.1: E 6013

EN 499: E 42 0 RR 32

Coating type:
Rutile

Arc voltage: 42V

Current:



Welding positions:



Approvals:
CL, LR

Tip colour:
Blue

Printing:
Velveta / E42 0 RR / E 6013

Velveta is our rutile coated electrode for all welding positions, especially for vertical up position. The electrode is characterised by an extremely easy handling, smooth arc transfer, easy slag removal and a finely rippled bead surface. Velveta is the logic first choice for thin-walled pipe welding. Typical applications include assembly, workshop and repair welding of mild and low-alloyed structural steels. Velveta is an all-current type (AC/DC), which also operates on transformers with low OCV, min. 42V.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry
- Pipelines
- Gas industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	Fer SG 2	H60 / HW430	Fer G 1

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,60	0,40	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 510	≥ 22	0ºC ≥ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,0	300	10,0	50-70
2,5	350	19,2	60-100
3,2	350	31,3	80-140
4,0	350	46,0	130-180
4,0	450	59,0	130-180
5,0	450	90,0	180-240

Basic 55

Stick electrodes - unalloyed steel

AWS A5.1: E 7016

EN 499: E 42 2 RB 12 H10

Coating type:
Basic-rutile

Arc voltage: 55V

Current:
~ =+ =−* *root pass

Welding positions:


Approvals:
DB+Ü, DNV, LR, TüV, Force

Tip colour:
-

Printing:
Basic 55 / E 7016

Basic 55 is our double coated electrode for all welding positions, except vertical down position. The electrode is characterised by easy handling, a well controllable arc, excellent root penetration, easy slag removal and excellent metallurgical properties up to -30ºC. Typical applications include shipbuilding, general constructions, bridges, storage tanks as well as root pass and positional welding. Basic Special is an all-current type (AC/DC).

Base materials to be welded:
- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 51	Fer SG 2	H100 / HW530	Fer G 2

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	0,90	0,70	≤ 0,025	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 510	≥ 22	-20ºC ≥ 90

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	19,5	60-90
3,2	350	32,8	95-150
3,2	450	43,2	95-150
4,0	450	65,0	140-190

Basic

Stick electrodes - unalloyed steel

AWS A5.1: E 7018

EN 499: E 42 4 B 32 H5

Coating type:
Basic

Arc voltage: 65V

Current:



Welding positions:



Approvals:
ABS, GL, LR

Tip colour:
-

Printing:
BASIC / E 7018

Basic is our basic coated low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for all welding positions, except vertical down position. The electrode is characterised by a smooth, quiet arc, very low spatter and good arc penetration. Basic can be used at high travel speeds due to its elevated recovery (120%). Typical applications include shipbuilding, general constructions, bridges, storage tanks as well as producing crack-resistant and tough welded joints on mild and low-alloy steels. Basic is welded on AC current.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 51	Fer SG 2	H100 / HW530	Fer G 2

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,00	0,50	≤ 0,025	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 510	≥ 22	-40ºC ≥ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	20,5	65-90
3,2	350	37,3	100-140
4,0	450	64,4	140-190
5,0	450	98,3	180-250

Basic Super

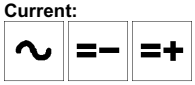
Stick electrodes - unalloyed steel

AWS A5.1: E 7018-1 H8 R

EN 499: E 46 4 B 32 H5

Coating type:
Basic

Arc voltage: 65V

Current:


Welding positions:


Approvals:
DB+Ü, DNV, LR, TüV, Force

Tip colour:
-

Printing:
BASIC SUPER / E7018-1

Basic Super is our universal low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for all welding positions, except vertical down position. The electrode is characterised by a smooth, quiet arc, very low spatter, easy slag removal and excellent mechanical properties even at low temperatures (down to -40°C). Typical applications include shipbuilding, general constructions and offshore constructions. Basic Super is the ideal choice for out-of-position welding. Basic Super is preferably welded on AC current.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / Brazing
-	K 60	Hilcord 51	Fer SG 2	H100 / HW530	Fer G 2

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,05	1,00	0,50	≤ 0,020	≤ 0,020							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 550	≥ 25	-40ºC ≥ 60

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	24,6	70-110
3,2	350	38,2	110-150
3,2	450	49,5	110-150
4,0	450	71,4	140-200
5,0	450	105,8	200-270

Basic Directa

Stick electrodes - unalloyed steel

AWS A5.1: E 7018-1 H4 R
EN 499: E 42 5 B 42 H5

Coating type:
Basic

Arc voltage: 65V

Current:
=+

Welding positions:

Approvals:
DNV, LR, TüV, GL

Tip colour:
-

Printing:
Basic Directa / E 42 5 B / E 7018-1

Basic Directa is our high quality low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for all welding positions, except vertical down position. The electrode is characterised by a smooth, quiet arc, very low spatter, an easy slag removal and good mechanical properties up to -50◦C. Typical applications include shipbuilding, general constructions and offshore constructions. Basic Directa is welded on DC (+) current, has 120% recovery and is suitable to weld fine-grain steel grades.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG 3	Hilcord 51	Fer SG 3	H100 / HW530	Fer G 2

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,20	0,35	≤ 0,020	≤ 0,020							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 20	-50ºC ≥ 47
Stress relieved	≥ 400	≥ 500	≥ 22	-50ºC ≥ 47

Note: stress relieved condition 620ºC / 1 h.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	21,0	65-110
3,2	350	39,1	100-145
3,2	450	50,0	100-145
4,0	450	72,5	135-200
5,0	450	103,6	180-280

Regina 140

Stick electrodes - unalloyed steel - high efficiency

AWS A5.1: E 7024

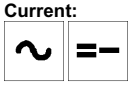
EN 499: E 42 0 RR 53

Coating type:
Rutile

Arc voltage: 65V

Approvals:
-

Current:



Tip colour:
-

Welding positions:



Printing:
Regina 140 / E42 0 RR / E 7024

Regina 140 is our rutile coated high efficiency (recovery 140%) electrode for making fillet welds in the flat and horizontal position. The electrode is characterised by a smooth, quiet arc, very low spatter, and easily removable slag. Regina 140 can be used with high travel speeds, resulting in high deposition rates (> 3,2 kgs./hour). Typical applications include shipbuilding, general constructions, bridges and welding primer painted or contaminated plates. Regina 140 is all-current type (AC/DC).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 40	-	H60 / HW430	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,80	0,25	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 20	0ºC ≥ 47

Packaging and welding data:

Dia. Mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
4,0	450	93,8	180-220
5,0	450	145,0	240-320

Regina 150

Stick electrodes - unalloyed steel - high efficiency

AWS A5.1: E 7024-1

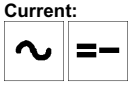
EN 499: E 42 2 RA 53

Coating type:
Rutile-acid

Arc voltage: 65V

Approvals: ABS, BV, CL, DB+Ü, DNV, GL, LR, TüV

Current:



Tip colour:
-

Welding positions:



Printing:
Regina 150 / E42 2 RA / E 7024-1

Regina 150 is our rutile-acid coated high efficiency (recovery 160%) electrode for making x-ray quality fillet welds in the flat and horizontal position. The electrode has a smooth quiet arc, very low spatter and easily removable slag (self-releasing even in narrow angles). Regina 150 can be used with high travel speeds, resulting in high deposition rates (> 3,6 kgs./hour). Typical applications include joining heavier sections of mild and low-alloyed structural steels found in shipbuilding and general constructions as well as usage on primer painted or contaminated plates.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 52	-	H100 / HW530	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,90	0,40	≤ 0,025	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 440	≥ 510	≥ 25	-20ºC ≥ 50
Stress relieved	≥ 420	≥ 500	≥ 27	+20ºC ≥ 75

Note: stress relieved condition 620ºC / 1 h.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
3,2	450	62,5	120-180
4,0	450	96,7	170-240
5,0	450	147,5	230-340
6,0	450	212,0	290-400

Regina 160

Stick electrodes - unalloyed steel - high efficiency

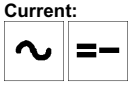
AWS A5.1: E 7024

EN 499: E 42 0 RR 53

Coating type:
Rutile

Arc voltage: 65V

Current:



Welding positions:



Approvals:
BV, LR, Force

Tip colour:
-

Printing:
Regina 160 / E42 0 RR / E 7024

Regina 160 is our easy-to-handle high efficiency (recovery 160%) electrode for making fillet welds in the flat and horizontal position. The electrode has a smooth quiet arc, very low spatter and easily removable slag. Regina 160 can be used with high travel speeds, resulting in high deposition rates (> 3,5 kgs./hour). Typical applications include joining mild and low-alloyed structural steels as well as usage on primer painted or contaminated plates. Regina 160 is an all-current type (AC/DC).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 52	-	H60 / HW430	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,60	0,40	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 430	≥ 510	≥ 24	0ºC ≥ 47
Stress relieved	≥ 410	≥ 470	≥ 26	+20ºC ≥ 70

Note: stress relieved condition 620ºC / 1 h.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
3,2	450	65,6	120-160
4,0	450	103,6	160-230
5,0	450	154,3	250-340
6,0	450	220,0	300-400

Basic 160

Stick electrodes - unalloyed steel - high efficiency

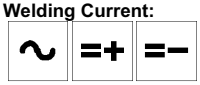
AWS A5.1: E 7028

EN 499: E 42 2 RB 53

Coating type:
Zircon-Basic

Arc Voltage: 65V

Welding Current:



Welding positions:



Approvals:
DNV, LR, TüV

Tip colour:
None

Printing:
Basic 160 / 42 2 B / E7028

Basic 160 is our zircon-basic high efficiency (recovery ≥ 160%) electrode for fast fillet welding, especially to be used for joining heavier sections of mild and low-alloyed structural steels found in construction and shipbuilding applications i.e. demanding applications. The non-basic elements in the electrode coating ensure excellent weldability, smooth bead appearance and an easy slag release. Basic 160 is an all-current type (AC/DC).

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 51	-	H100 / HW530	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,85	0,30	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 430	≥ 510	≥ 25	-20ºC ≥ 47
Stress relieved	≥ 400	≥ 470	≥ 27	-20°C ≥ 47

Note: stress relieved condition 620ºC / 1 h.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
4,0	450	98,2	180-230

Regina 180

Stick electrodes - unalloyed steel - high efficiency

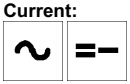
AWS A5.1: E 7024

EN 499: E 42 0 RR 73

Coating type:
Rutile

Arc voltage: 65V

Current:



Welding positions:



Approvals:
BV, LR

Tip colour:
-

Printing:
Regina 180 / E 42 0 RR / E 7024

Regina 180 is our high speed, high productivity (recovery 180%) electrode for making fillet welds in the flat and horizontal position. The electrode has a smooth quiet arc, very low spatter and easily removable slag. Regina 180 can be used with high travel speeds, resulting in high deposition rates (> 3,8 kgs./hour). Typical applications include joining mild and low-alloyed structural steels as well as usage on primed or contaminated plates. Regina 180 is an all-current type (AC/DC), size 5,0x600 mm. can be used for gravity welding.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 60	Hilcord 52	-	H100 / HW530	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,65	0,50	$\leq$ 0,030	$\leq$ 0,030							

Mechanical Properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	$\geq$ 440	$\geq$ 510	$\geq$ 24	0ºC $\geq$ 47

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
4,0	450	105,5	180-220

Pipeweld 6010

Stick electrodes - unalloyed steel - pipeline

AWS A5.1: E 6010

EN 499: E 38 3 C 21

Coating type:
Cellulose

Arc voltage: 70V

Approvals:

Current:
=+ =−* *root pass

Tip colour:

Welding positions:



Printing:
E 6010 / Pipeweld 6010

Pipeweld 6010 is our cellulose coated electrode for cross-country welding API 5L pipe steels in vertical down position. Specially recommended for welding root passes. The electrodes are packed in metal cans to ensure moisture levels for proper operation.

Base materials to be welded:

- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Root passes in pipe steel up to L485MB, X70, StE480.7TM

Applications:

- Pipelines

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K60	Hilcord 52	-	H100 / HW430	Fer G 2

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,14	0,55	0,18	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 510	≥ 22	-20ºC ≥ 70

Packaging and welding data:

Dia. Mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	17,7	50-80
3,2	350	25,5	80-130
4,0	350	39,5	120-180
5,0	350	61,4	160-220

Pipeweld 8010

Stick electrodes - unalloyed steel - pipeline

AWS A5.5: E 8010-P1

EN 499: E 46 3 C 25

Coating type:
Cellulose

Arc voltage: 70V

Current:
=+ =−* *root pass

Welding positions:



Approvals:
-

Tip colour:
-

Printing:
E 8010-P1 / Pipeweld 8010

Pipeweld 8010 is our cellulose coated electrode for cross-country welding high-strength butt joints in API 5L pipe steels. The electrode is characterised by a deeply penetrating, forceful, spray type arc and readily removable slag. Typical application for Pipeweld 8010 is the welding of API 5L: X65 pipe steel. For root pass welding we recommend to use Pipeweld 6010. Electrodes are packed in metal cans to ensure moisture levels for proper operation.

Base materials to be welded:

- Pipe steel P235T1-P355N, L210-L485MB, S275ML-S460ML, X42-X70, TStE290-TstE445.7TM
- Root passes in pipe steel up to L550MB(NB), X80, StE550.7TM

Applications:

- Pipelines

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K60	Hilcord 52	-	H100 / HW430	Fer G-2

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,16	0,85	0,20	≤ 0,030	≤ 0,030		0,20					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 550	≥ 20	-30ºC ≥ 47

Packaging and welding data:

Dia. Mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
3,2	350	26,8	80-130
4,0	350	40,5	120-180
5,0	350	62,0	160-220

SG 1

MAG wires - unalloyed steel

AWS A5.18: ER70S-3

EN 440: G 42 2 M G2 Si 1

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M12-M32 = $ArCO_2$-$ArCO_2O_2$

SG 1 is our copper coated solid wire for MAG welding unalloyed and low alloyed, incl. fine grain types, structural steels. Typical applications include: general constructions, shipbuilding, bridges, tanks etc.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	-	Hilcord 40	Fer SG1	H100 / HW430	Fer G-1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,09	1,20	0,60	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 26	-20°C ≥ 80

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	S300	15	80-180	17-20
1,0	S300	15	120-240	17-22
1,2	S300	15	160-260	18-26

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SG 1A Superflow

MAG wires - unalloyed steel

AWS A5.18: ER70S-2

EN 440: G 42 2 M G 2 Ti

Wire type:
MAG solid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M12-M32 = $ArCO_2$-$ArCO_2O_2$

SG 1 A Superflow is our bronze coated solid wire for MAG welding unalloyed and low alloyed galvanized structural steels. We have added Ti, Zr and Al to the wire which makes SG 1 A Superflow ideal for welding oxidised (rusted) material and also coated plate (primed or painted).

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	-	Hilcord 40	Fer SG 1A	H100 / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Ti	Zr	Al
0,06	1,10	0,50	≤ 0,030	≤ 0,025					0,15	0,12	0,15

Note: single values for Ti, Zr, Al are maximum values

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 27	-20°C ≥ 80

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	BS300	15	80-180	17-20
1,0	BS300	15	120-240	17-22
1,2	BS300	15	160-260	18-26

SG 2

MAG wires - unalloyed steel

AWS A5.18: ER70S-6

EN 440: G 42 2 C G3 Si 1 / G 42 4 M G3 Si 1

Wire type:
MAG Solid wire

Welding Current:
=+

Welding positions:



Approvals:
LR

Shielding gas:
C1 = CO_2, M11-M32 = $ArCO_2$-$ArCO_2O_2$ including M21 (1) = $ArHeCO_2$

SG 2 is our copper coated solid wire for MAG welding unalloyed and low alloyed, incl. fine grain types, structural steels. Typical applications include: general constructions, shipbuilding, bridges, tanks etc.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	-	Hilcord 40	Fer SG 2	H100 / HW530	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,50	0,85	$\leq$ 0,030	$\leq$ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	$\geq$ 430	$\geq$ 510	$\geq$ 22	-20°C $\geq$ 70

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,6	S200	5	60-140	16-20
0,8	S200	5	80-180	17-20
0,6	S300	15	60-140	16-20
0,8	S300	15	80-180	17-20
0,9	S300	15	100-200	17-22
1,0	S300	15	120-240	17-22
1,2	S300	15	160-260	18-26

K 60

MAG wires - unalloyed steel

AWS A5.18: ER 70S-6

EN 440: G 42 2 C G3 Si 1 / G 46 2 M G3 Si 1

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
ABS, CL, DB+Ü, GL, LR, TüV

Shielding gas:
C1 = CO_2, M11-M32 = $ArCO_2$-$ArCO_2O_2$ including M21 (1) = $ArHeCO_2$

K60 is our solid wire for MAG welding unalloyed and low alloyed, incl. fine grain types, structural steels. The wire is used in a wide range of applications: general constructions, shipbuilding, bridges, tanks etc. The stability of the wire makes K60 suitable for controlled automatic and robotic welding processes including T.I.M.E., high efficiency MAG welding etc.

Base materials to be welded:
- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	-	Hilcord 40	Fer SG 2	H100 / HW530	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,40	0,85	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 430	≥ 510	≥ 22	-20°C ≥ 70

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	B300	16	80-180	17-20
1,0	B300	16	120-240	17-22
1,2	B300	16	160-260	18-26
0,8	MP	250	80-180	17-20
1,0	MP	250	120-240	17-22
1,2	MP	250	160-260	18-26

Note: high efficiency MAG welding data on request

SG 3

MAG wires - unalloyed steel

AWS A5.18: ER70S-6

EN 440: G 46 2 C G4 Si 1 / G 46 4 M G4 Si 1

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
C1 = CO_2, M11-M32 = $ArCO_2$-$ArCO_2O_2$ including M21 (1) = $ArHeCO_2$

SG 3 is our copper coated solid wire for MAG welding structural steels with a maximum tensile strength of 620 Mpa. Typical applications include: general constructions, shipbuilding, bridges, tanks etc.

Base materials to be welded:
- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	-	Hilcord 51	Fer SG 3	H100 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,75	1,00	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 600	≥ 24	-40°C ≥ 50

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	B300	16	80-180	17-20
1,0	B300	16	120-240	17-22
1,2	B300	16	160-260	18-26

Hilcord 40

Cored wires - unalloyed steel

AWS A5.20: E 71 T-1M/E 71 T-12MH8

EN 758: T 46 3 P MC 1 H5

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
GL, LR

Shielding gas:
M21 = $ArCO_2$ / C = CO_2

Hilcord 40 is our rutile flux cored wire for MAG welding unalloyed and low alloyed structural steels in all positions. Wire offers excellent weldability, good mechanical properties, practically no spatter and allows you to weld in spray arc mode. Hilcord 40 can be used in single and multipass applications, typical are: shipbuilding, machinery, bridge construction, rolling stock, structural fabrication, size 1,0 mm. is specifically suitable to weld thin sheet metals.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Velora	K 60	-	Fer SG 1	H100 / HW 430	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,05	1,30	0,60	$\leq$ 0,030	$\leq$ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	$\geq$ 460	$\geq$ 530	$\geq$ 24	-30ºC $\geq$ 70

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,0	BS200	4,5	130-250	22-30
1,2	BS200	4,5	150-300	22-32
1,0	BS300	16	130-250	22-30
1,2	BS300	16	150-300	22-32
1,6	BS300	16	160-375	32-33

Hilcord 40C

Cored wires - unalloyed steel

AWS A5.20: E 71 T-1

EN 758: T 42 2 P C 1 H10

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
GL

Shielding gas:
C1 = CO_2

Hilcord 40C is our rutile flux cored wire for MAG welding unalloyed and low alloyed structural steels under CO_2 gas shielding. Wire offers excellent weldability, good mechanical properties, practically no spatter and allows you to weld in spray arc mode. Hilcord 40C can be used in single and multipass applications, typical are: shipbuilding, machinery, bridge construction, rolling stock, structural fabrication.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Velora	K 60	-	Fer SG 1	H100 / HW 430	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,40	0,50	$\leq$ 0,030	$\leq$ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	$\geq$ 420	$\geq$ 520	$\geq$ 22	-20°C $\geq$ 47

Note: properties under C1 = CO_2 gas shielding

Packaging and welding data:

Dia. mm.	Length mm.	Weight / package kg.	Current A	Voltage V
1,2	S200	5	160-260	18-26
1,2	B300	16	160-260	18-26
1,6	B300	16	180-300	20-30

Hilcord 41

Cored wires - unalloyed steel

AWS A5.20: E 71 T-1 M H4
EN 758: T 46 2 P M 1 H5
T 46 2 P C 1 H5

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
ABS, DNV, LR, TüV

Shielding gas:
M21 = $ArCO_2$ / C1 = CO_2

Hilcord 41 is our seamless copper coated rutile flux cored wire for MAG welding unalloyed and low alloyed structural steels in all positions. Wire can be used in a wide range of applications and offers excellent weldability, good mechanical properties, practically no spatter and allows you to weld in spray arc mode. Hilcord 41 is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	K 60	-	Fer SG 1	H 60 / HW 430	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,40	0,50	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 530	≥ 23	-20ºC ≥ 70

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B200	5	150-300	22-32
1,0	B300	16	130-270	21-30
1,2	B300	16	150-300	22-32
1,6	B300	16	180-375	24-33

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Hilcord 41C

Cored wires - unalloyed steel

AWS A5.20: E 71 T-1 H4

EN 758: T 42 2 P C 1 H5

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
C1 = CO_2

Hilcord 41C is our seamless copper coated rutile flux cored wire for MAG welding unalloyed and low alloyed structural steels under CO_2 gas shielding. Wire can be used in a wide range of applications and offers excellent weldability, good mechanical properties, practically no spatter and allows you to weld in spray arc mode. Hilcord 41C is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	K 60	-	Fer SG 1	H 60 / HW 430	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,30	0,45	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	Yield strength Rp 0,2 Mpa	Tensile strength RM Mpa	Elongation A5 - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 22	-20°C ≥ 70

Note: properties under C1 = CO_2 gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	S200	5	150-350	23-33
1,2	B300	16	150-350	23-33
1,6	B300	16	180-400	24-33

Hilcord 2040

Cored wires - unalloyed steel

AWS A5.20: E 71 T-GS

EN 758: T 42 A Z N 2

Wire type:
Open arc

Current:
=−

Welding positions:



Approvals:
-

Hilcord 2040 is our cored wire for self shielded single pass arc welding of unalloyed and low alloyed structural steels. The wire is excellent for joining thin sheet metals, size 0,8 mm. allows you to weld sheets as thin as 1,2 mm. Hilcord 2040 in size 0,8 and 0,9 mm. is ideal for usage on light industrial MAG welding machines with a max. output range up to 160-170A.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry
- Do-it-yourself

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Velveta	K 60	-	Fer SG 1	-	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,25	0,70	0,40	≤ 0,030	≤ 0,025							2,00

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 480	≥ 22	+20°C ≥ 25

Packaging and welding data:

Dia. mm.	Length mm.	Weight / package kg.	Current A	Voltage V
0,8	S200	4,5	40-160	14-22
0,9	S200	4,5	80-200	14-22
1,2	S200	4,5	95-250	15-26
0,9	BS300	15	80-200	14-24
1,2	BS300	15	95-250	15-26

Hilcord 2048

Cored wires - unalloyed steel

AWS A5.20: E 71 T-8

EN 758: T 42 2 Z N 1

Wire type:
Open arc

Current:



Welding positions:



Approvals:
-

Hilcord 2048 is our cored wire for self shielded single pass arc welding unalloyed and low alloyed structural steels in all welding positions. Hilcord 2048 has a fast-freezing slag permitting high deposition rates and excellent welding characteristics. Typical applications include: joining sheet-pile walls, plate and tubular welding, bridge and building fabrication including seismic applications, hull and stiffener welding for ship constructions.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Brown	K 60	-	Fer SG 1	H 100 / HW 430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,20	0,50	0,40	≤ 0,030	≤ 0,025							0,50

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 530	≥ 20	-20°C ≥ 70

Packaging and welding data:

Dia. mm.	Length mm.	Weight / spool kg.	Current A	Voltage V
1,6	S200	4,5	140-240	18-25
1,6	BS300	15	140-240	18-25

Hilcord 51

Cored wires - unalloyed steel

AWS A5.20: E 70 T-5 H4 / E 70 T-5 M H4

EN 758: T 42 4 B C 3 H5 / T 42 4 B M 3 H5

Wire type:
Basic cored wire

Current:
=+

Welding positions:



Approvals:
ABS, DNV, LR, TüV

Shielding gas:
C1 = CO_2, M21 = $ArCO_2$, M33 = $ArCO_2O_2$

Hilcord 51 is our seamless copper coated basic flux cored wire for MAG welding unalloyed and low alloyed structural steels. Wire has characteristics typical for basic type consumables: weld deposits have superior impact toughness and crack resistance comparable to stick electrodes type E7018. Hilcord 51 is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	K 60	-	Fer SG 2	H 100 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,50	0,45	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 24	-40°C ≥ 50

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B300	16	120-350	18-32
1,6	B300	16	200-450	20-34

Hilcord 51.71

Cored wires - unalloyed steel

AWS A5.20: E 71 T-5 / E 71 T-5 MJ

EN 758: T 42 4 B C 1 H5 / T 42 5 B M 1 H5

Wire type:
Basic cored wire

Current:
=+ =−* *all positions

Welding positions:

Approvals:
-

Shielding gas:
C1 = CO_2, M21 = $ArCO_2$

Hilcord 51.71 is our basic flux cored wire for MAG welding unalloyed and low alloyed structural steels. Wire has characteristics typical for basic type consumables: weld deposits have superior impact toughness and crack resistance comparable to stick electrodes type E7018-1. Under mixed gas shielding (M21 = $ArCO_2$) the wire can be welded in all-positions. Hilcord 51.71 can be use in single and multipass applications and is recommended for medium to heavy constructions.

Base materials to be welded:
- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	K 60	-	Fer SG 2	H 100 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,40	0,50	< 0,030	< 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 24	-50°C ≥ 50
Stress relieved	≥ 400	≥ 500	≥ 26	-50°C ≥ 60

Note: properties under M21 = $ArCO_2$ gas shielding
SR 580ºC 15h

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	BS300	15	100-350	18-32
1,6	BS300	15	160-450	20-34

Hilcord 50

Cored wires - unalloyed steel

AWS A5.18: E 70 C-6M H4

EN 758: T 42 3 M M 2 H5

Wire type:
Metal cored wire

Current:
=+

Welding positions:



Approvals:
LR, GL, DNV, CL, TüV, DB+Ü

Shielding gas:
M21 = $ArCO_2$ including M21 (1) = $ArHeCO_2$

Hilcord 50 is our metal cored wire for MAG welding of unalloyed and low alloyed structural steels. Wire offers excellent weldability and deposition rates of > 6,0 kilo per hour can be reached (dia 1,2 mm.). Hilcord 50 is used in a wide range of applications: shipbuilding, machinery, general constructions, bridge constructions etc.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Regina 150	K 60	-	-	H60 / HW430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,35	0,60	≤ 0,030	≤ 0,020							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 500	≥ 24	-30°C ≥ 50

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	S200	4,5	90-340	15-34
1,2	B300	15	90-340	15-34
1,6	B300	15	145-400	15-36
1,2	Drums	200	90-340	15-34

Hilcord 52

Cored wires - unalloyed steel

AWS A5.18: E 70 C-6M H4

EN 758: T 46 2 M M 1 H 5

Wire type:
Metal cored wire

Current:
=+

Welding positions:



Approvals: BV, CL, DB+Ü, DNV, LR, TüV, GL

Shielding gas:
M21 = $ArCO_2$ including M21 (1) = $ArHeCO_2$

Hilcord 52 is our seamless copper coated metal cored wire for MAG welding unalloyed and low alloyed structural steels in all welding positions. Wire is spatter free, offers good side wall wetting, concave weld shape, radiographical soundness and porosity free weld metal. Hilcord 52 is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Regina 150	K 60	-	-	H60 / HW 430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,40	0,65	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 530	≥ 24	-20°C ≥ 50
Stress relieved	≥ 420	≥ 510	≥ 26	-20°C ≥ 70

Note: properties under M21 = $ArCO_2$ gas shielding
SR 620ºC 1h

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	S200	5	120-350	17-32
1,0	B300	16	90-280	16-30
1,2	B300	16	120-350	17-32
1,6	B300	16	200-450	20-34

Hilcord 54

Cored wires - unalloyed steel

AWS A5.18: E 70 C-6M H4

EN 758: T 46 4 M M 1 H 5

Wire type:
Metal cored wire

Current:
=+

Welding positions:



Approvals:
LR, TüV, DNV

Shielding gas:
M21 = $ArCO_2$ including M21 (1) = $ArHeCO_2$

Hilcord 54 is our metal cored wire for all-position welding of unalloyed and low alloyed structural steels under mixed gas shielding. The wire has outstanding welding properties in short-arc and spray-arc range. Excellent mechanical properties in both as welded and PWHT condition. Hilcord 54 is slagless, offers a high efficiency, is almost spatter-free. Wire offers excellent mechanical properties (CNV [1] 60J at - 40ºC).Typical applications include semi-automatic and mechanised welding of thin sheet metals (> 3 mm.).

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	OAW
Regina 150	SG 3	-	Fer SG 2	H 100 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,40	0,60	≤ 0,020	≤ 0,020							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 560	≥ 22	+20◦C ≥ 130 -40°C ≥ 70
PWHT 580◦C/2h.	≥ 420	≥ 520	≥ 22	+20◦C ≥ 130 -40°C ≥ 70

Notes: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B200	5	90-330	16-33
1,2	B300	16	90-330	16-33
1,2	Drums	200	90-340	16-36
1,6	B300	16	170-450	20-34

Fer SG 1

TIG rods - unalloyed steel

AWS A5.18: ER70S-3

EN 1668: W 42 2 W 2 Si 1

Wire type:
TIG Solid wire

Current:
=−

Welding positions:



Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG1 is our copper coated wire for TIG welding unalloyed and low alloyed, incl. fine grain types, structural steels. Typical applications include: general constructions, shipbuilding, bridges, tanks and is extremely suited for joining thin sheet metals. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Velveta	SG 1	Hilcord 40	-	-	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,09	1,20	0,60	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 26	-20°C ≥ 80

Notes: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

Fer SG 1A

TIG rods - unalloyed steel

AWS A5.18: ER70S-2
EN 1668: W 42 2 W 2 Ti

Wire type:
TIG Solid wire

Current:



Welding positions:



Approvals:
TüV

Shielding gas:
I1 = Pure Ar

Fer SG 1A is our copper coated wire for TIG welding unalloyed and low alloyed galvanized structural steels. We have added Ti, Zr and Al to the wire, this makes Fer SG 1A ideal for welding oxydized (rusted) material and also coated plate (primed or painted). To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	SG 1A Superflow	Hilcord 40	-	H100 / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Ti	Zr	Al
0,06	1,10	0,50	≤ 0,030	≤ 0,025					0,15	0,12	0,15

Note: single values for Ti, Zr, Al are maximum values

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 420	≥ 520	≥ 27	-20°C ≥ 80

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

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Fer SG 2

TIG rods - unalloyed steel

AWS A5.18: ER70S-6

EN 1668: W 46 2 W 3 Si 1

Wire type:
TIG Solid wire

Current:



Welding positions:



Approvals:
TüV

Shielding gas:
I1 = Pure Ar

Fer SG 2 is our copper coated wire for TIG welding unalloyed and low alloyed, incl. fine grain types, structural steels. Typical applications include: general constructions, shipbuilding, bridges, tanks etc. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	K 60	Hilcord 40	-	H100 / HW530	Fer G 1

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,40	0,85	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 560	≥ 22	-20°C ≥ 70

Notes: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

Fer SG 3

TIG rods - unalloyed steel

AWS A5.18: ER70S-6

EN 1668: W 46 4 W 4 Si 1

Wire type:
TIG Solid wire

Current:
=−

Welding positions:



Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG 3 is our copper coated wire for TIG welding structural steels with a maximum tensile strength of 620 MPa. Typical applications include: general constructions, shipbuilding, bridges, tanks etc. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry
- Car industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	SG 3	Hilcord 51	-	H100 / HW 530	Fer G 2

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,75	0,90	≤ 0,030	≤ 0,025							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 600	≥ 24	-40°C ≥ 50

Notes: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

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Fer G 1

Gas welding rods - unalloyed steel

AWS A5.2: R 45

EN 12536: O I

Wire type:
OAW Solid wire

Welding positions:



Approvals:
TüV

Shielding gas:
Oxy-acetylene

Fer G 1 is our copper coated rod for oxy-acetylene gas welding of unalloyed structural steels. Fer G 1 is easy flowing and gives a very clean smooth weld. Operating temperature of the workpiece is maximum 350°C.

Base materials to be welded:

- Structural steel S185-255, St.33-St37.3
- Boiler steel P235GH-P265GH, HI, HII
- Pipe steel P235T1-L210, St.37.0-St.44.0

Applications:

- Construction works
- Repair shops
- Office furniture industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	SG 1	Hilcord 40	Fer SG 1	H60 / HW 430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,50	0,15	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 280	≥ 360	≥ 20	+20°C ≥ 30

Note: properties under oxy-acetylene gas

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5 / 25
2,0	1000	5 / 25
2,4	1000	5 / 25
3,0	1000	5 / 25
4,0	1000	5 / 25

Fer G 2

Gas welding rods - unalloyed steel

AWS A5.2: R 60
EN 12536: O II

Wire type:
OAW Solid wire

Welding positions:



Approvals:
TüV

Shielding gas:
Oxy-acetylene

Fer G 2 is our copper coated rod for oxy-acetylene gas welding of unalloyed structural steels. Fer G 2 offers better mechanical properties than Fer G 1. The viscosity of the weld metal makes out-of-position welding very simple. Operating temperature of the workpiece is maximum 350°C.

Base materials to be welded:
- Structural steel S185-S275, St.33-St44.2
- Boiler steel P235GH-P265GH, HI, HII
- Pipe steel P235T1, L210, St.37.0-St.44.0

Applications:
- Construction works
- Pressure vessel & boiler industry
- Repair shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	SG 2	Hilcord 40	Fer SG 2	H60 / HW 430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,15	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 300	≥ 390	≥ 20	+20°C ≥ 50

Note: properties under oxy-acetylene gas

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5
4,0	1000	5

Fer G 3

Gas welding rods - unalloyed steel

AWS A5.2: R 60-G

EN 12536: O III

Wire type:
OAW Solid wire

Welding positions:



Approvals:
TüV

Shielding gas:
Oxy-acetylene

Fer G 3 is our copper coated rod with 0,5% Ni for oxy-acetylene gas welding unalloyed and low alloyed structural steels. Recommended for welding circumferential joints in pipes, where good penetration and good X-ray values is required. Fer G 3 does not spatter and it has an easy controllable molten pool. Operating temperature of the workpiece is maximum 350°C.

Base materials to be welded:

- Structural steel S185-S275, St.33-St50.2
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Pipe steel P235T1, L210, St.37.0-St.52.0, St45.8 X42, StE210.7

Applications:

- Construction works
- Pressure vessel & boiler industry
- Repair shops
- Gas industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	SG 3	Hilcord 40	Fer SG 3	H100 / HW 430	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,10	0,20	≤ 0,030	≤ 0,030		0,50					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 310	≥ 410	≥ 22	+20°C ≥ 60

Notes: properties under oxy-acetylene gas

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
2,0	1000	5
2,4	1000	5
3,0	1000	5

Fer G 4

Gas welding rods - unalloyed steel

AWS A5.2: R 60-G
EN 12536: O IV

Wire type:
OAW Solid wire

Welding positions:



Approvals:
TüV

Shielding gas:
Oxy-acetylene

Fer G 4 is our copper coated rod with 0,5% Mo content for oxy-acetylene gas welding fine grain and creep resistant Mo steels like 16Mo3. Very smoothly flowing wire with no loss due to spatter. Approved for working temperatures up to 500°C. Also available as non copper coated rod.

Base materials to be welded:

- Structural steel S185-S355J2, St.33-St52.3, St50.2
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4 16Mo3, 15Mo3
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel P235T1-P355N, L210-L360MB, St.37.0-St.52.4, St 45.8, X42-X52, StE210.7-StE360.7TM

Applications:

- Construction works
- Pressure vessel & boiler industry
- Repair shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 12 Mo	SG Mo	Hilcord 60M	Fer SG Mo	H100Mo / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,11	1,10	0,20	≤ 0,030	≤ 0,030			0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 350	≥ 450	≥ 22	+20°C ≥ 60

Note: properties under oxy-acetylene gas

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5
4,0	1000	5

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H 60

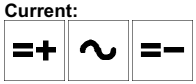
SAW wires - unalloyed steel

AWS A5.17: EL 12

EN 756: S 1

Wire type:
SAW Solid wire

Current:



Welding positions:



Approvals in combination with flux:
HW 430: BV, CL, DNV, LR

H 60 is our solid wire for submerged arc welding of unalloyed and low alloyed structural steels in combination with Hilcoweld fluxes HW 430, HW 450. Also suitable for hardfacing bulldozer tracks in combination with Hilcoweld flux HW 400.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	K 60	Hilcord 40	Fer SG 2	-	Fer G 1

Chemical composition wire, wt.%:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	0,50	0,10	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa		Tensile strength MPa		Elongation Lo=5d - %		Impact Values ISO-V J	
In combination with flux	HW 430	HW 450	HW 430	HW 450	HW 430	HW 450	HW 430	HW 450
As welded	≥ 400	≥ 380	≥ 500	≥ 500	≥ 25	≥ 26	0°C ≥ 50	+20°C ≥ 40

Note: Combination with flux HW 400 gives a hardness of max. 400 HB.

Packaging data:

Dia. mm.	Spooltype	Weight / spool kg.
2,5	B415	25
3,2	B415	25
4,0	B415	25
4,8	B415	25

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H 100

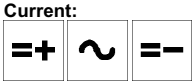
SAW wires - unalloyed steel

AWS A5.17: EM 12

EN 756: S 2

Wire type:
SAW Solid wire

Current:



Welding positions:



Approvals in combination with flux:
HW 530: ABS, BV, CL, DNV, GL, LR, TüV
HW 580: BV, CL, DNV, LR

H 100 is our solid wire for submerged arc welding of unalloyed and low alloyed structural steels in combination with Hilcoweld fluxes HW 430, HW 530, HW 580. H 100 is the ideal choice for shipbuilding, general constructions and pressure vessel industries.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	K 60	Hilcord 51	Fer SG 2	-	Fer G 2

Chemical composition wire, wt.%:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,10	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa			Tensile strength MPa			Elongation Lo=5d - %			Impact Values ISO-V J		
In combination with flux	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580
As welded	≥ 400	≥ 400	≥ 510	≥ 520	≥ 520	≥ 600	≥ 25	≥ 26	≥ 26	-20ºC 27	-40ºC 50	-40ºC 70

Packaging data:

Dia. mm.	Spooltype	Weight / spool kg.
2,0	B415	25
2,5	B415	25
3,2	B415	25
4,0	B415	25

H 100Si

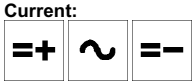
SAW wires - unalloyed steel

AWS A5.17: EM 12K

EN 756 : S 2 Si

Wire type:
SAW Solid wire

Current:



Welding positions:



Approvals in combination with flux:
-

H 100 Si is our silicon alloyed wire for submerged arc welding of unalloyed and low alloyed structural steels in combination with Hilcoweld fluxes HW 430, HW 530, HW 580. Applications include shipbuilding, general construction and pressure vessel industries.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Red Extra	K 60	Hilcord 40	Fer SG 2	-	Fer G 2

Chemical composition wire, wt.%:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,30	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa			Tensile strength MPa			Elongation Lo=5d - %			Impact Values ISO-V J		
In combination with flux	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580
As welded	≥ 400	≥ 430	≥ 480	≥ 520	≥ 530	≥ 550	≥ 25	≥ 28	≥ 27	-20ºC 27J	-20ºC 80J	-20ºC 80J

Packaging data:

Packaging:		
Dia. mm.	Spooltype	Weight / spool kg.
2,0	B415	25
2,5	B415	25
3,2	B415	25
4,0	B415	25

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Hilcord 100

SAW wires - unalloyed steel

AWS A5.18: EC1

EN 756: S 0

Wire type:
SAW Cored wire

Current:
=+

Welding positions:


Approvals in combination with flux:
-

Hilcord 100 is our metal cored wire for submerged arc welding of unalloyed and low alloyed structural steels in combination with Hilcoweld fluxes HW 430, HW 530. Hilcord 100 offers exceptional productivity as deposition rates achieved can be up to +20% higher than with the same size of solid wire at the same welding parameters.

Base materials to be welded:
- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	OAW
Red Extra	K 60	Hilcord 52	Fer SG 2	-	Fer G 2

Chemical composition wire, wt.%:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,50	0,60									

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa		Tensile strength MPa		Elongation Lo=5d - %		Impact Values ISO-V J	
In combination with flux	HW430	HW530	HW430	HW530	HW430	HW530	HW430	HW530
As welded	$\underline{\geq}$ 440	$\geq$ 490	$\underline{\geq}$ 560	$\geq$ 540	$\underline{\geq}$ 28	$\geq$ 28	-20ºC $\geq$ 27	-20ºC $\geq$ 40

Packaging data:

Dia. mm.	Spooltype	Weight / spool kg.
2,0	B415	25
2,4	B415	25
3,2	B415	25

HW 150

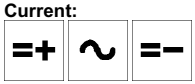
SAW fluxes - unalloyed steel

EN 760: S F MS 1 67 AC
AWS A5.17: F6A0-EL12 / F7A2-EM12(K)
EN 756: S 35 0 MS S1 / S 42 3 MS S2

Flux type:
Fused, Mn/Si alloying

Grain size: 12x150

Current:



Welding positions:



Approvals in combination with wire:
-

HW 150 is our fused flux for submerged arc welding unalloyed and low alloyed structural steels in combination with solid wires H60, H100. HW 150 is suitable for single and multipass welding, for fillet welds and multi wire applications. The weld has an excellent appearance and the slag is self-releasing. The basicity index is 0,8 ca. (Boniszewski).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Repair Shops

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cr	P	S
H 60	0,05	0,40	1,00					
H 100	0,05	0,40	1,40					

Mechanical properties, weld metal – typical:

Condition A = as welded		0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J +20°C	0°C	-20°C	-40°C
H 60	A	≥ 360	≥ 470	≥ 27		≥ 60		
H 100	A	≥ 440	≥ 560	≥ 22		≥ 50		

Packaging data:

type	Weight / kg.
bag	25 kilo

HW 155

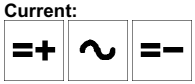
SAW fluxes - unalloyed steel

EN 760: S F MS 1 67 AC
AWS A5.17: F7A0-EL12 / F7A0-EM12(K)
EN 756: S 42 0 MS S1 / S 42 0 MS S2

Flux type:
Fused, Mn/Si alloying

Grain size: 40x150

Current:



Welding positions:



Approvals in combination with wire:
-

HW 155 is our fused flux for submerged arc welding unalloyed and low alloyed structural steels in combination with solid wires H60, H100. HW 155 is specifically developed for high speed welding on thin sheet metals (3 to 5 mm. thickness). Typical applications include the manufacturing of lamp and telephone poles. Flux is suitable for single and multipass welding, for fillet welds and multi wire applications. The weld has an excellent appearance and the slag is self-releasing. The basicity index is 0,9 ca. (Boniszewski).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cr	P	S
H 60	0,04	0,20	1,20					
H 100	0,04	0,30	1,30					

Mechanical properties, weld metal – typical:

Condition A = as welded		0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J			
					+20°C	0°C	-20°C	-40°C
H 60	A	≥ 420	≥ 520	≥ 22		≥ 45		
H 100	A	≥ 440	≥ 560	≥ 22		≥ 45	≥ 30	

Packaging data:

type	Weight / kg.
bag	25 kilo

HW 430

SAW fluxes - unalloyed steel

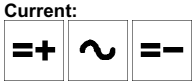
EN 760: S A AR 1 87 AC

AWS A5.17: F7A0-EL12 / F7A0-EM12 / F7A0-EM12K / F7A0-EC1

EN 756: S 4T A AR S1 / S 4T 0 AR S2 / S 4T 0 AR S2Si / S 42 0 AR S0

Flux type:
Agglomerated rutile, Mn/Si alloying

Current:



Welding positions:



Approvals in combination with wire:
H 60: BV, CL, DNV, LR

HW 430 is our agglomerated rutile flux for submerged arc welding unalloyed and low alloyed structural steels in combination with solid wires H60, H100, H100Si and metalcored wire Hilcord 100. HW 430 is suitable for single and multipass welding, for fillet welds and multi wire applications. The weld has an excellent appearance and the slag is self-releasing. Flux/wire usage ratio 1:1, the basicity index is 0,4 ca. (Boniszewski).

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cr	P	S
H 60	0,04	0,80	1,20					
H 100	0,04	0,80	1,40					
H 100 Si	0,04	1,10	1,50					
Hilcord 100	0,08	1,40	1,70					

Mechanical properties, weld metal – typical:

Condition A = as welded		0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J +20°C	0°C	-20°C	-40°C
H 60	A	≥ 400	≥ 500	≥ 25		≥ 50		
H 100	A	≥ 400	≥ 520	≥ 25		≥ 40	≥ 27	
H 100 Si	A	≥ 400	≥ 520	≥ 25		≥ 40	≥ 27	
Hilcord 100	A	≥ 440	≥ 560	≥ 28		≥ 40	≥ 27	

Packaging data:

type	Weight / kg.
bag	25 kilo

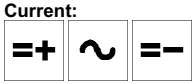
HW 450

SAW fluxes - unalloyed steel

EN 760: S A MS 1 99 AC
AWS A5.17: F7AZ-EL12
EN 756: S 42 A MS S1

Flux type:
Agglomerated rutile, Mn/Si alloying

Current:



Welding positions:



Approvals in combination with wire:
-

HW 450 is our agglomerated rutile flux for submerged arc welding unalloyed and low alloyed structural steels in combination with solid wire H60. HW 450 is specifically developed for applications where a "breathing" flux is required f.i. working temperatures up to 500ºC. Typical applications include reconditioning pistons. HW 450 is suitable for single pass welding, for fillet welds and multi wire applications. The weld has an excellent appearance and the slag is self-releasing. Flux/wire ratio is very economical < 0,7:1.

Base materials to be welded:

- Ships plate A-D, A(H)32-D(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2, St.33-St.52, C(K)10-C(K)35
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4
- Fine grain steel P275N-P355N, S275N-S355M, StE285-StE 355, StE285-StE355TM
- Pipe steel P235T1-P355N, L210-L360NB, St37.0-St52, St45.8, X42-X52, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops
- Office furniture industry

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cr	P	S
H 60	0,05	1,10	1,10					

Mechanical properties, weld metal – typical:

Condition A = as welded	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J +20°C	0°C	-20°C	-40°C
H 60 A	≥ 400	≥ 500	≥ 26		≥ 40		

Packaging data:

type	Weight / kg.
bag	25 kilo

HW 530

SAW fluxes - unalloyed steel

EN 760: S A AB 1 67 AC H5
AWS A5.17: F7AP4-EM12 / F7AP4-EM12K / F7A2-EC1
EN 756: S 42 3 AB S2 / S 42 3 AB S2Si / S 42 2 AB S0

Flux type:
Agglomerated (semi) basic

Welding Current:



Welding positions:



Approvals in combination with wire:
H100: ABS, BV, CL, DNV, GL, LR, TüV

HW 530 is our agglomerated semi-basic flux for submerged arc welding unalloyed and low alloyed structural steels in combination with solid mild steel wires H100, H100Si and metalcored wire Hilcord 100. HW 530 is suitable for single and multipass welding, for fillet welds and multi wire applications. The weld has an excellent appearance and the slag is self-releasing. The weld metal, produced in combination with corresponding wires, offers good mechanical properties also at low temperatures. The basicity index is 1,3 ca. (Boniszewski).

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cu	P	S
H 100	0,04	0,40	1,30					
H 100 Si	0,04	0,60	1,30					
Hilcord 100	0,08	1,00	1,50					

Mechanical properties, weld metal – typical:

Condition A = as welded S = stress relieved 620ºC 1 hr.		0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J		
					0°C	-20°C	-40°C
H 100	A	≥ 400	≥ 520	≥ 26	-	100	50
H 100	S	≥ 400	≥ 500	≥ 25	-	110	50
H 100 Si	A	≥ 400	≥ 530	≥ 28	100	80	-
H 100 Si	S	≥ 400	≥ 500	≥ 25	100	80	-
Hilcord 100	A	≥ 490	≥ 540	≥ 28	-	40	-

Packaging and welding data:

type	Weight / kg.
bag	25 kilo

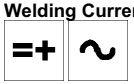
HW 400

SAW fluxes - unalloyed steel

EN 760: S A AR 3 CrMo AC
AWS A5.17: F6AZ-EL12
EN 756: S 35 Z AR S1

Flux type:
Agglomerated rutile, Cr/Mo alloying

Welding Current:



Welding positions:



Approvals in combination with wire:
-

HW 400 is our agglomerated rutile flux for surfacing parts subject to wear using the submerged arc welding process. HW 400 is specifically developed for reconditioning bulldozer tracks and similar applications.

Base materials to be welded:

Applications:
- Repair shops

Chemical composition, wt.% weld metal – typical:

Type of wire	C	Si	Mn	Ni	Mo	Cr	P	S
H 60 (3rd layer)	0,25	0,70	2,00		0,5	3,0		

Mechanical properties, weld metal – typical:

Condition A= as welded	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Hardness
H 60 A	≥ 360	≥ 450	≥ 22	400 HB

Packaging and welding data:

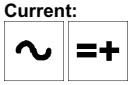
type	Weight / kg.
bag	25 kilo

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Coating type:
Special

Arc voltage: 70V

Current:



Welding positions:



Approvals:
-

Tip colour:
Violet

Printing:
CUTIL

Cutil is our electrode for cutting, gouging, chamfering and piercing of all metals, including stainless, aluminium, cast iron and non ferrous alloys. Cutil guarantees welders easy performance, high cutting and gouging rates and easy handling. Take precautions when using: when grooving it is advised to lift the work so that the molten parent metal can run off better. The electrode should be set as horizontal as possible to the workpiece and kept in contact constantly. Push the electrode slightly to increase the working speed.

Base materials to be welded:
- Structural steels
- Stainless steels
- Aluminium
- Nickel alloys
- Cast iron

Applications:
- All industries related to welding

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
3,2	350	37,9	130-180
4,0	450	72,9	170-230
5,0	450	107,1	210-390

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Carbon gouging rods

Air carbon arc cutting (CAC-A) rods - cutting & gouging

Coating type:
Copper coated

Current:
=+ =−

Arc voltage: 35-55V - power source needs OCV ≥ 60V

Carbon gouging rods are copper-coated air carbon arc cutting rods made from a mixture of graphite and pure carbon. Typical applications can be found in every field of metalworking, in foundries, steel constructions, shipbuilding, repair & maintenance. Carbon gouging rods are used for weld edge preparations, back-gouging in multipass welding, removing unsatisfactory welds, bolt and wire ends, spatter removal, all kinds of cutting.

Base materials to be welded:
- Carbon, low-alloyed steels
- Stainless steels
- Aluminium
- Nickel alloys
- Cast iron
- Copper alloys
- Magnesium

Applications:
- All industries related to welding

Process description, recommendations for usage
Carbon gouging rods remove molten metal with a jet of air. The intense heat of an arc between the carbon-graphite electrode and a workpiece melts a portion of the metal, while simultaneously a jet of air is passed through the arc to blow away the molten metal. The process (Air carbon arc cutting - CAC-A) is used for cutting and gouging, and it can be done manually or mechanized. Carbon steel, stainless steel, copper alloys, cast irons, aluminium, magnesium and nickel alloys can all be cut with Carbon gouging rods. The process requires an electrode holder, cutting electrodes, a power source and an air supply. Manual electrode holders are similar to shielded metal arc electrode holders (stick electrode holders). The electrode is held in a rotatable head containing air orifices. A valve is provided to turn the air on and off. Carbon gouging rods are round, pointed and copper coated. They are intended to use at DC current.

Base material	Electrode	Current	Remarks
Carbon, low-alloyed steels	DC	= +	-
Stainless steels	DC	= +	-
Aluminium	DC	= +	Extend electrode no more than 10 cm.
Nickel alloys	DC	= -	-
Cast iron	DC	= -	At middle of electrode current range
	DC	= +	At maximum current only
Copper alloys	DC	= +	At maximum current only
Magnesium	DC	= +	Clean surface before welding

Packaging and welding data:

Dia. mm.	Length mm.	Current A
4,0	305	90-150
5,0	305	150-200
6,3	305	200-400
8,0	305	250-450
10,0	305	350-600

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Weather resistant steel

Weather resistant steels of Cor-Ten type have excellent weldability. All welding methods can be used when proper precautions are taken. In general matching filler metals should be used. For dissimilar joining i.e. weather resistant steel grades of different strength undermatching filler metals can be used, in such cases we recommend you to contact us for information.
When welding weather resistant steels it is important to minimize the risk of cold cracking (also known as hydrogen cracking or delayed cracking). Hydrogen in weld metal combined to stresses in the welded structure is the main reason for such cracking. The risk of cracking can be minimized by:

- preheating the base materials before welding
- ensuring that the joint surfaces are perfectly clean and dry
- minimizing the shrinkage stresses
- use a low hydrogen filler metal (H_{DM} < 5 ml / 100 gr. deposit weld metal)

Creep resisting steel

Such steels are used for the creep resistance in medium-high to high temperature applications. Depending on the temperature for which they are intended, both base material and filler metals should guarantee strength properties at their respective working temperature. For exact welding recommendations we advise you to contact us.
In general are low alloyed creep resisting steels excellent weldable. Before, during and after welding special precautions should be taken on heat-treatment (preheating), interpass temperatures and post-weld heat-treatment (PWHT).
For more information we recommend you to contact us for information about the exact treatment for your application. In such case please specify the base materials used and provide us with as much specific information as possible.

High strength steel

Low alloyed high strength steels offer users the possibility of reducing the dead weight of a construction and so increasing the possibilities of the same. Steels of this kind are widely used for pressure vessels, mobile cranes, lifting equipment, vehicle frames etc.
Low alloyed high strength steels owe their strength to their lowest as possible alloying content and their specific production process. As a result they can be welded easily when special precautions are taken. After welding it is important that the steel structure has maintained its specific microstructure giving the steel its high strength and toughness. It is therefore of utmost importance to give special attention to shear cutting, machining, forming, cold bending, folding as well as thermal cutting and welding. The welding process may bring a change in the steel's microstructure. If not done properly the base materials will loose its strength.
Take special and extra precautions when welding low alloyed high strength steels:

- ensure that the joint surfaces are perfectly clean and dry
- minimize the shrinkage stresses
- use the lowest heat input possible
- use a low hydrogen filler metal (H_{DM} < 5 ml / 100 gr. deposit weld metal)
- follow the PWHT recommendations of your filler metal supplier, post-heat the welded joint immediately after welding, the PWHT temperature should be the same as the preheat temperature.

When welding low alloyed high strength steels it is important to minimize the risk of cold cracking (also known as hydrogen cracking or delayed cracking). Hydrogen in weld metal combined to stresses in the welded structure is the main reason for such cracking.

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The known DIN designations 1629, 1681, 17100, 17102, 17155 and 17172 have been replaced by EN standards. A summary of both old designations and their replacements is as follows:

	OLD DESIGNATION (DIN)		EN STANDARD (NEW)	
Base materials	**DIN**	**designation**	**EN**	**designation**
Pipe steel	DIN 1629 / 1630	St. 37.0	EN 10216-1	P235T1
		St. 37.4		P235T2
		St. 44.0		P275T1
		St. 44.4		P275T2
		St. 52.0		P355N
Cast steel	DIN 1681	GS-45	EN 10213-2	GP240R
		GS-52		GP240H T1/T2
Structural steel	DIN 17100	St. 33	EN 10025	S185
		St. 37-2		S235JR
		USt. 37-2		S235JRG1
		RSt. 37-2		S235JRG2
		St. 37-3U		S235J0
		St. 37-3N		S235J2G3
		St. 44-2		S275JR
		St. 44-3U		S275J0
		St. 44-3N		S275J2G3
		St. 52-3U		S355J0
		St. 52-3N		S355J2G3
		St. 50-2		E295
		St. 60-2		E335
		St. 70-2		E360
Fine grain steel	DIN 17 102	StE 285	EN 10028-3	P275N
		WStE 285		P275NH
		TStE 285		P275NL1
		EStE 285		P275NL2
		StE 355		P355N
		WStE 355		P355NH
		TStE 355		P355NL1
		EStE 355		P355NL2
		StE 460		P460N
		WStE 460		P460NH
		TStE 460		P460NL1
		EStE 460		P460NL2
		StE 285 / -	EN 10113-2/3	S275N / S275M
		TStE 285 / -		S275NL / S275ML
		StE 355 / BStE 355 TM		S355N / S355M
		TStE 355 / BTStE355 TM		S355NL / S355ML
		StE 420 / BStE 420 TM		S420N / S420M
		TStE 420 / BTStE420 TM		S420NL / S420ML
		StE 460 / BStE 460 TM		S460N / S460M
		TStE 460 / BTStE460 TM		S460 NL / S460 ML

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	OLD DESIGNATION (DIN)		EN STANDARD (NEW)	
Base materials	**DIN**	**designation**	**EN**	**designation**
Boiler steel	DIN 17 155	H I	EN 10028-2	P235GH
		H II		P265GH
		17 Mn 4		P295GH
		19 Mn 6		P355GH
		15 Mo 3		16 Mo 3
		13 CrMo 4 4		13 CrMo 4-5
		10 CrMo 9 10		10 CrMo 9-10

Fine grain steel (high strength steel)	-	TStE 460 V	EN 10137-2	S460QL
		StE 500 V / TStE 500 V		S500Q / S500QL
		StE 550 V / TStE 550 V		S550Q / S550QL
		StE 620 V / TStE 620 V		S620Q / S620QL
		StE 690 V / TStE 690 V		S690Q / S690QL
		TStE 890 V / TStE 960 V		S890QL / S960QL

Fine grain steel (weather resistant)		S235JRW-S355JRW	S235J2G3Cu-S355J2G3Cu

	OLD DESIGNATION (DIN)		EN STANDARD (NEW)		API 5L
Base materials	**DIN**	**designation**	**EN**	**designation**	**design.**
Pipe steel	DIN 17 172	StE290.7	EN 10208-2	L240MB	X42
		StE290.7TM		L290MB	
		StE240.7		L240NB	
		StE290.7		L290NB	
		StE320.7		L320NB	X46
		StE360.7TM		L360MB	X52
		StE360.7		L360NB	
		StE385.7		L385NB	X56
		StE415.7		L415NB	
		StE415.7TM		L415MB	X60
		StE445.7TM		L445MB	X65
		StE480.7TM		L480MB	X70
		StE550.7TM		L550MB	X80

	DESIGNATION	EN STANDARD (NEW)
Ships plate	Grade A	S235JRS2
	Grade AH32	S315G1S
	Grade AH36	S355G1S
	Grade AH40	-
	Grade B	-
	Grade D	S235J2S1.0
	Grade DH32	S315G2S
	Grade DH36	S355G2S
	Grade DH40	-
	Grade E	S235J4S
	Grade EH32	EN 17102: P315N
	Grade EH36	S355G3S
	Grade EH40	-

B 12Mo

Stick electrodes - low alloyed steel - creep resisting

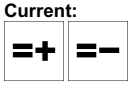
AWS A5.5: E 7018-A1

EN 1599: E Mo B 32 H 5

Coating type:
Basic

Arc Voltage: 70V

Current:



Welding positions:



Approvals:
TüV

Tip colour:
-

Printing:
Hilco B 12 Mo

B 12Mo is our basic-coated low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for welding low alloyed fine grain and creep resisting steels like 16Mo3 up to a maximum operating temperature of 500°C. Typical applications include the construction of pressure vessels, boilers and pipes. B 12Mo is preferably welded on DC current, root pass and narrow gap welding on DC- polarity.

Base materials to be welded:

- Boiler steel P235GH-P310GH, 16Mo3, 17Mo3, 16Mo5, 14Mo6, 15NiCuMoNb5, 17MnMoV64, A355 Grade P1
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel L320NB-L415NB, L360MB-L415MB API 5L X52-X70

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG Mo	Hilcord 60M	Fer SG Mo	H100Mo / HW530	Fer G 4

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	0,80	0,40	≤ 0,010	≤ 0,020			0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 560	≥ 22	-40°C ≥ 40
Stress relieved	≥ 460	≥ 560	≥ 22	-40°C ≥ 60

Note: stress relieved condition 620ºC / 2 h.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	22,7	80-110
3,2	350	37,5	100-140
4,0	350	55,3	130-180
5,0	450	109,1	190-230

B 19CrMo

Stick electrodes - low alloyed steel - creep resisting

AWS A5.5: E 8018-B2

EN 1599: E Cr Mo 1 B 42 H5

Coating type:
Basic

Arc Voltage: 70V

Current:
=+ =−

Welding positions:



Approvals:
TüV

Tip colour:
-

Printing:
Hilco B 19 CrMo

B 19 CrMo is our basic-coated low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) for welding low alloyed fine grain and creep resisting steels like 13CrMo4 5 up to a maximum operating temperature of 550°C. Typical applications include the construction of pressure vessels, boilers and pipes. B 19CrMo is preferably welded on DC current, root pass and narrow gap welding on DC- polarity.

Base materials to be welded:

- Boiler steel 13CrMo4-5, 15CrMo5, 16CrMoV4, A 333 Grade P 11, P 12, G-17CrMo5-5, 22Mo4, G-22CrMo 5-4, 42CrMo4,
- Heat treatable steels up to 780 MPa tensile strength
- Case hardening and nitriding steels

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG CrMo 1	Hilcord 61M	Fer SG CrMo 1	H100CrMo1/HW 580	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,07	0,80	0,40	≤ 0,020	≤ 0,020	1,10		0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 490	≥ 590	≥ 22	+20°C ≥ 100

Notes: stress relieved condition 680ºC / 2 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 13CrMo4-5 preheat 200-250ºC, PWHT 660-700ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	23,6	80-110
3,2	350	38,3	100-140
4,0	350	55,3	130-180

B 20CrMo

Stick electrodes - low alloyed steel - creep resisting

AWS A5.5: E 9018-B3

EN 1599: E Cr Mo 2 B 42 H5

Coating type:
Basic

Arc Voltage: 70V

Current:
=+ =−

Welding positions:



Approvals:
-

Tip colour:
-

Printing:
Hilco B 20 CrMo

B 20 CrMo is our basic-coated low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for welding low alloyed fine grain and creep resisting steels like 10CrMo9.10 up to a maximum operating temperature of 600°C. Typical applications include the construction of pressure vessels, boilers and pipes. B 20CrMo is preferably welded on DC current, root pass and narrow gap welding on DC- polarity.

Base materials to be welded:

- Boiler steel 10CrMo9.10, A335 Grade P22, 10CrSiMoV7 (1.8075), G17CrMo9.10 (1.7379)
- Heat treatable steels up to 980 MPa tensile strength
- Case hardening and nitriding steels

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG CrMo 2	Hilcord 62M	Fer SG CrMo 2	H60CrMo2/HW580	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,07	0,80	0,40	≤ 0,020	≤ 0,025	2,20		1,00				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 530	≥ 620	≥ 20	+20°C ≥ 100

Notes: stress relieved condition 730ºC / 2 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 10CrMo9.10 preheat 200-300ºC, PWHT 660-730ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
3,2	350	39,2	90-145
4,0	350	56,5	120-185

Basic 70

Stick electrodes – low alloyed steel - cryogenic

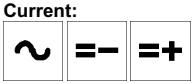
AWS A5.5: E 8018-C3

EN 499 : E 46 6 1Ni B 32 H5

Coating type:
Basic

Arc voltage: 70V

Current:



Welding positions:



Approvals:
-

Tip colour:
-

Printing:
BASIC 70 / E8018-C3

Basic 70 is our basic-coated low hydrogen (H_{DM} < 5 ml. / 100 gr. deposit weld metal) electrode for welding low alloyed structural steels having a nominal yield strength up to 550 MPa used in applications where good sub-zero toughness is required down to -60ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions. Basic 70 is an all-current type (AC/DC).

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355K2G4, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH
- Fine grain steel SP355NL2-S500QL1, S275N-S420ML
- Pipe steel P235T1-P355N, L360-L485MB/NB, St37.0-St52.4, St45.8, X52-X70
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SGNi 1	Hilcord 43	Fer SG Ni1	H100 Ni1/HW530	-

Chemical composition, wt. % weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,05	1,00	0,45	≤ 0,005	≤ 0,010		0,90					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 580	≥ 23	-60°C ≥ 70
Stress relieved	≥ 470	≥ 560	≥ 25	-60°C ≥ 50

Notes: stress relieved condition 620ºC / 1 h. - preheat and PWHT should match with the requirements of the base metal.

Packaging and welding data:

Dia. mm.	Length mm.	Weight (kgs) 1000 pcs.	Current A
2,5	350	19,5	60-110
3,2	350	38,2	80-155
4,0	450	75,0	140-210
5,0	450	107,1	200-270

SG Cor-Ten

MAG wires - low alloyed steel - high strength

AWS A5.28: ER80S-G

EN 440: G 42 2 C G 0 / G 46 2 M G 0

Wire type:
MAG Solid wire

Current:
=+

Welding positions:


Approvals:
-

Shielding gas:
C1 = CO_2, M11-M33 = $ArCO_2$-$ArCO_2O_2$

SG Cor-Ten is our solid wire for MAG welding low alloyed weather resistant steels like Cor-Ten A, B, Patinax and similar CuNi-alloyed steels. Typical applications include steel structures, bridge constructions, railwaycars.

Base materials to be welded:
- Weather resistant steel S235J2G3Cu-S355J2G3Cu S235JRW-S355JRW, S235J2W-S355J2W Corten, Patinax, Alcodur 50, Koralpin 52, Domex

Applications:
- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Rail wagons
- Container frames

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	-	Hilcord Cor-Ten	Fer Cor-Ten	Cor-Ten / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,40	0,80	≤ 0,025	≤ 0,025	0,40	0,40		0,40			

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 550	≥ 24	-20°C ≥ 80

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	B300	16	80-180	17-20
1,0	B300	16	160-260	18-26
1,2	B300	16	180-300	20-29

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K 80

MAG wires - low alloyed steel - high strength

AWS A5.28: ER 110 S-G

Wire type:
MAG Solid wire

Current:
=+

Welding positions:


Approvals:
-

Shielding gas:
M21 = $ArCO_2$

K 80 is our solid wire for MAG welding low alloyed high strength steels having a nominal yield strength of 690 MPa such as: HY 80, N-A-XTRA 63, N-A-XTRA 70, Weldox 700, Grade 100, USS T-1 and similar HSLA steel grades. Typical applications include crane fabrication, automotive and transport industries. A low heat input is recommended to obtain the mechanical properties desired. .

Base materials to be welded:
- Fine grain steel S620QL1, S690QL1, S700MC N-A-XTRA 63-70, TStE620-TStE690, T1, Weldox 700
- Pipe steel L480-L550, API 5L X65-X80

Applications:
- Construction works
- Pipelines
- Transport & lifting industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	-	Hilcord 59M	K80 (TIG)	H150NiCrMo1 / HW 580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,50	0,60	≤ 0,025	≤ 0,025	0,35	1,50	0,25	< 0,25		0,09	

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 690	≥ 750	≥ 17	-40°C ≥ 50

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,0	B300	16	120-240	17-22
1,2	B300	16	160-260	18-26

SG Mo

MAG wires - low alloyed steel - creep resisting

AWS A5.28: ER 80S-G (nearest ER 80S-D2)
EN 440: G 46 2 M G 2 Mo
EN 12070: G MoSi

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M11-M33 = $ArCO_2$-$ArCO_2O_2$

SG Mo is our solid wire for MAG welding of low alloyed fine grain and creep resisting steels like 16Mo3 up to a maximum operating temperature of 500°C. Typical applications include the construction of pressure vessels, boilers and pipes.

Base materials to be welded:

- Boiler steel P235GH-P310GH, 16Mo3, 17Mo3, 16Mo5, 14Mo6, 15NiCuMoNb5, 17MnMoV64, A355 Grade P1
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel L320NB-L415NB, L360MB-L415MB API 5L X52-X70

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 12 Mo	-	Hilcord 60M	Fer SG Mo	H100Mo / HW530	Fer G 4

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,10	0,60	≤ 0,025	≤ 0,025			0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 560	≥ 22	-20°C ≥ 60

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	BS300	15	80-180	17-20
1,0	BS300	15	120-240	18-26
1,2	BS300	15	160-260	20-29

SG CrMo1

MAG wires - low alloyed steel - creep resisting

AWS A5.28: ER 80S-G (nearest ER 80S-B2)

EN 12070: G CrMo 1 Si

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
TüV

Shielding gas:
M11-M33 = $ArCO_2$-$ArCO_2O_2$

SG CrMo1 is our solid wire for MAG welding low alloyed fine grain and creep resisting steels like 13CrMo4 5 up to a maximum operating temperature of 550°C. Typical applications include the construction of pressure vessels, boilers and pipes.

Base materials to be welded:

- Boiler steel 13CrMo4-5, 15CrMo5, 16CrMoV4, A 333 Grade P 11, P 12, G-17CrMo5-5, 22Mo4, G-22CrMo 5-4, 42CrMo4,
- Heat treatable steels up to 780 MPa tensile strength
- Case hardening and nitriding steels

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 19 CrMo	-	Hilcord 61M	SG CrMo1	H100CrMo1/HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,60	≤ 0,025	≤ 0,025	1,20		0,50				

Note: AWS spec. ER80S-B2 Mn 0,40-0,70%

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 460	≥ 560	≥ 26	+20°C ≥ 47

Notes: stress relieved condition 680ºC / 2 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 13CrMo4-5 preheat 200-250ºC, PWHT 660-700ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
0,8	BS300	15	80-180	17-20
1,0	BS300	15	120-240	18-26
1,2	BS300	15	160-260	20-29

SG CrMo2

MAG wires - low alloyed steel - creep resisting

AWS A5.28: ER 90S-G (nearest ER 90S-B3)

EN 12070: G CrMo 2 Si

Wire type:
MAG Soid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M21-M33 = $ArCO_2$-$ArCO_2O_2$

SG CrMo2 is our solid wire for MAG welding low alloyed fine grain and creep resisting steels like 10CrMo9.10 up to a maximum operating temperature of 600°C. Typical applications include the construction of pressure vessels, boilers and pipes.

Base materials to be welded:
- Boiler steel 10CrMo9.10, A335 Grade P22, 10CrSiMoV7 (1.8075), G17CrMo9.10 (1.7379)
- Heat treatable steels up to 980 MPa tensile strength
- Case hardening and nitriding steels

Applications:
- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 20 CrMo	-	Hilcord 62M	SG CrMo2	H60CrMo2/HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,00	0,60	≤ 0,025	≤ 0,025	2,50		1,00				

Note: AWS spec. ER90S-B3 Mn 0,40-0,70%

Mechanical roperties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 400	≥ 500	≥ 22	+20°C ≥ 47

Notes: stress relieved condition 730ºC / 2 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 10CrMo9.10 preheat 200-300ºC, PWHT 660-730ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Length mm.	Weight / package kg.	Current A	Voltage V
0,8	BS300	15	80-180	17-20
1,0	BS300	15	120-240	18-26
1,2	BS300	15	160-260	20-29

SG Ni1

MAG wires - low alloyed steel - cryogenic

AWS A5.28: ER 80 S Ni 1
EN 440: G 46 6 M G3 Ni 1

Wire type:
MAG Solid wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M21 = $ArCO_2$

SG Ni 1 is our solid wire for MAG welding low alloyed structural steels having a nominal yield strength up to 550 MPa used in applications where good sub-zero toughness is required down to -60ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355K2G4, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH
- Fine grain steel SP355NL2-S500QL1, S275N-S420ML
- Pipe steel P235T1-P355N, L360-L485MB/NB, St37.0-St52.4, St45.8, X52-X70
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic 70	-	Hilcord 43	Fer SG Ni1	H100Ni1/HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,60	≤ 0,025	≤ 0,025		0,90					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 580	≥ 24	-60°C ≥ 60

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	BS300	15	160-260	20-29

SG Ni2,5

MAG wires - low alloyed steel - cryogenic

AWS A5.28: ER 80 S Ni 2

EN 440: G 46 6 M G2 Ni 2

Wire type:
MAG Solid wire

Current:
=+

Welding positions



Approvals:
-

Shielding gas:
M21 = $ArCO_2$

SG Ni2,5 is our Ni-alloyed solid wire for MAG welding low alloyed cryogenic steels used in applications where excellent sub-zero toughness is required down to -80ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions.

Base materials to be welded:

- Fine grain steels S275NL2-S500QL1, StE315-StE500 12Ni14 G1/G2, X 12 Ni 5, 13MnNi 6-3

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road construction
- Pressure vessel & boiler industry
- Pipelines

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	-	-	Fer SG Ni 2,5	H100Ni2/HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,10	0,50	≤ 0,025	≤ 0,025		2,50					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 510	≥ 620	≥ 22	-70°C ≥ 60
Stress relieved	≥ 480	≥ 560	≥ 24	-80ºC ≥ 55

Note: stress relieved condition 680ºC / 2 h.

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	BS300	15	160-260	20-29

Hilcord Cor-Ten

Cored wires - low alloyed steel - high strength

AWS A5.29: E 70 T5-G

EN 758: T 42 4 1Ni B H5

Wire type:
Basic cored wire

Current:
=+

Welding positions:



Approvals:
-

Shielding gas:
M21 = $ArCO_2$

Hilcord Cor-Ten is our seamless copper coated basic flux cored wire for MAG welding low alloyed weather resistant steels like Cor-Ten A, B, Patinax and similar CuNi-alloyed steels. Typical applications include steel structures, bridge constructions, railwaycars. Hilcord Cor-Ten is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Weather resistant steel S235J2G3Cu-S355J2G3Cu S235JRW-S355JRW, S235J2W-S355J2W Corten, Patinax, Alcodur 50, Koralpin 52, Domex

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Railway wagons
- Container frames

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG Cor-Ten	-	Fer Cor-Ten	Cor-Ten / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,05	1,20	0,35	≤ 0,025	≤ 0,025		1,20		0,50			

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 470	≥ 540	≥ 24	-40°C ≥ 60

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	BS300	16	160-260	18-26

Hilcord 59M

Cored wires - low alloyed steel - high strength

AWS A5.28: E 110C-G (to be replaced by E110C-K4)

EN 12535: T 69 4 Mn2NiCrMo M M 2 H5

Wire type:
Metal cored wire

Current:
=+

Welding positions:



Approvals:
LR

Shielding gas:
M21 = $ArCO_2$

Hilcord 59M is our seamless copper coated metal cored wire for MAG welding low alloyed high strength steels having a nominal yield strength of 690 MPa such as: HY 80, N-A-XTRA 63, N-A-XTRA 70, Weldox 700, Grade 100, USS T-1 and similar HSLA steel grades. Typical applications include crane fabrication, automotive and transport industries. A low heat input is recommended to obtain the mechanical properties desired. Hilcord 59M is a guaranteed low hydrogen content wire (H_{DM} <5 ml/100 g deposit weld metal).

Base materials to be welded:

- Fine grain steel S620QL1, S690QL1, S700MC N-A-XTRA 63-70, TStE620-TStE690, T1, Weldox 700
- Pipe steel L480-L550, API 5L X65-X80

Applications:

- Construction works
- Pipelines
- Transport & lifting industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K 80	-	K 80 (TIG)	H150NiCrMo1 / HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,50	0,65	≤ 0,020	≤ 0,020	0,40	2,20	0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 690	≥ 760	≥ 17	-51°C ≥ 40

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B300	16	120-350	17-32

Hilcord 60M

Cored wires - low alloyed steel - creep resisting

AWS A5.28: E 80C-G
EN 758: T 46 2 Mo M M 1 H5
EN 12071: T Mo M M 1 H5

Wire type:
Metal cored wire

Current:
=+

Welding positions:



Approvals:
TüV

Shielding gas:
M21 = $ArCO_2$

Hilcord 60M is our seamless copper coated metal cored wire for welding low alloyed fine grain and creep resisting steels like 16Mo3 up to a maximum operating temperature of 500°C. Typical applications include the construction of pressure vessels, boilers and pipes. Hilcord 60M is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Boiler steel P235GH-P310GH, 16Mo3, 17Mo3, 16Mo5, 14Mo6, 15NiCuMoNb5, 17MnMoV64, A355 Grade P1
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel L320NB-L415NB, L360MB-L415MB API 5L X52-X70

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 12 Mo	SG Mo	-	Fer SG Mo	H100Mo / HW 530	Fer G 4

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,00	0,35	≤ 0,015	≤ 0,015			0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 490	≥ 560	≥ 22	-20°C ≥ 50

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B300	16	120-300	17-32

Hilcord 61M

Cored wires - low alloyed steel - creep resisting

AWS A5.28: E 80C-G

EN 12071: T CrMo1 M M 2 H5

Wire type:
Metal cored wire

Current:
=+

Welding positions:


Approvals:
TüV

Shielding gas:
M21 = $ArCO_2$

Hilcord 61M is our seamless copper coated metal cored wire for MAG welding low alloyed fine grain and creep resisting steels like 13CrMo4 5 up to a maximum operating temperature of 550°C. Typical applications include the construction of pressure vessels, boilers and pipes. Hilcord 61M is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:
- Boiler steel 13CrMo4-5, 15CrMo5, 16CrMoV4, A 333 Grade P 11, P 12, G-17CrMo5-5, 22Mo4, G-22CrMo 5-4, 42CrMo4,
- Heat treatable steels up to 780 MPa tensile strength
- Case hardening and nitriding steels

Applications:
- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 19 CrMo	SG CrMo1	-	Fer SG CrMo1	H 100CrMo1/HW 580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,00	0,35	≤ 0,015	≤ 0,015	1,00		0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 470	≥ 560	≥ 22	-20°C ≥ 50

Notes: stress relieved condition 680ºC / 2 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 13CrMo4-5 preheat 200-250ºC, PWHT 660-700ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B300	16	120-300	17-32

Hilcord 62M

Cored wires - low alloyed steel - creep resisting

AWS A5.28: E 90C-G

EN 12071: T CrMo2 M M 2 H5

Wire type:
Metal cored wire

Current:
=+

Welding positions:


Approvals:
TüV

Shielding gas:
M21 = $ArCO_2$

Hilcord 62M is our seamless copper coated metal cored wire for MAG welding low alloyed fine grain and creep resisting steels like 10CrMo9.10 up to a maximum operating temperature of 600°C. Typical applications include the construction of pressure vessels, boilers and pipes. Hilcord 62M is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 gr. deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:
- Boiler steel 10CrMo9.10, A335 Grade P22, 10CrSiMoV7 (1.8075), G17CrMo9.10 (1.7379)
- Heat treatable steels up to 980 MPa tensile strength
- Case hardening and nitriding steels

Applications:
- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 20 CrMo	SG CrMo2	-	Fer SG CrMo2	H 60CrMo2/HW 580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,07	0,90	0,35	≤ 0,015	≤ 0,015	2,20		1,00				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
Stress relieved	≥ 540	≥ 620	≥ 18	+20°C ≥ 80

Notes: Stress relieved condition 710ºC / 1 h. - preheat, interpass and PWHT are essential for obtaining properties as indicated. For welding 10CrMo9.10 preheat 200-300ºC, PWHT 660-730ºC min. 1/2 h., cool down slowly

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B300	16	120-350	17-32
1,4	B300	16	170-380	20-32

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Hilcord 43

Cored wires - low alloyed steel - cryogenic

AWS A5.29: E 81 T1-Ni1 M H4

EN 758: T 50 5 1 Ni P M 1 H5

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
LR, TüV

Shielding gas:
M21 = $ArCO_2$

-

Hilcord 43 is our seamless copper coated rutile flux cored wire for all position MAG welding of low alloyed structural steels having a nominal yield strength up to 550 MPa used in applications where good sub-zero toughness is required down to -50ºC. Typical applications include open butt-joints using non-fusible backing materials. Hilcord 43 is a guaranteed low hydrogen content wire (H_{DM} < 5 ml/100 g deposit weld metal). The specific properties of seamless cored wires offer you a guaranteed problem-free usage at all times!

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355K2G4, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH
- Fine grain steel SP355NL2-S500QL1, S275N-S420ML
- Pipe steel P235T1-P355N, L360-L485MB/NB, St37.0-St52.4, St45.8, X52-X70
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic 70	SG Ni 1	-	-	H100 Ni 1 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,40	0,40	≤ 0,015	≤ 0,012		0,95					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 550	≥ 620	≥ 22	-50°C ≥ 50

Notes: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	BS300	16	120-300	20-32

Hilcord 44

Cored wires - low alloyed steel - cryogenic

AWS A5.29: E 81 T1-Ni1

EN 758: T 50 6 1 Ni P M 1 H5

Wire type:
Rutile cored wire

Current:
=+

Welding positions:



Approvals:
LR

Shielding gas:
M21 = $ArCO_2$

Hilcord 44 is our rutile flux cored wire for all position MAG welding of low alloyed structural steels having a nominal yield strength up to 550 MPa used in applications where good sub-zero toughness is required down to -60ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355K2G4, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH
- Fine grain steel SP355NL2-S500QL1, S275N-S420ML
- Pipe steel P235T1-P355N, L360-L485MB/NB, St37.0-St52.4, St45.8, X52-X70
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic 70	SG Ni 1	-	-	H100 Ni 1 / HW 530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,06	1,20	0,40	≤ 0,025	≤ 0,025		1,0					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 500	≥ 560	≥ 22	-40°C ≥ 70 J (-90J) -60°C ≥ 47 J (-60J)

Note: properties under M21 = $ArCO_2$ gas shielding

Packaging and welding data:

Dia. mm.	Spooltype	Weight / spool kg.	Current A	Voltage V
1,2	B200	5	160-300	20-32
1,2	B300	16	160-300	20-32

Fer Cor-Ten

TIG rods - low alloyed steel - high strength

AWS A5.28: ER 80 S-G

EN 1668: W 46 2 W 0

Wire type:
TIG Solid wire

Current:
=−

Welding positions:



Approvals:
-

Shielding:
I1 = Pure Ar

Fer Cor-Ten is our solid wire for TIG welding low alloyed weather resistant steels like Cor-Ten A, B, Patinax and similar CuNi-alloyed steels. Typical applications include steel structures, bridge constructions, railwaycars. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Weather resistant steel S235J2G3Cu-S355J2G3Cu S235JRW-S355JRW, S235J2W-S355J2W Corten, Patinax, Alcodur 50, Koralpin 52, Domex

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Rail wagons
- Container frames

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG Cor-Ten	Hilcord Cor-Ten	-	Cor-Ten / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,50	0,80	≤ 0,025	≤ 0,025		0,90		0,40			

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 550	≥ 24	-20°C ≥ 80

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5

K 80 (TIG)

TIG rods - low alloyed steel - high strength

AWS A5.28: ER 110 S-G

Wire type:
TIG Solid wire

Current:
=−

Welding positions:


Approvals:
-

Shielding gas:
I1 = Pure Ar

K 80 is our solid wire for TIG welding low alloyed high strength steels having a nominal yield strength of 690 MPa such as: HY 80, N-A-XTRA 63, N-A-XTRA 70, Weldox 700, Grade 100, USS T-1 and similar HSLA steel grades. Typical applications include crane fabrication, automotive and transport industries. A low heat input is recommended to obtain the mechanical properties desired. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:
- Fine grain steel S620QL1, S690QL1, S700MC N-A-XTRA 63-70, TStE620-TStE690, T1, Weldox 700
- Pipe steel L480-L550, API 5L X65-X80

Applications:
- Construction works
- Pipelines
- Transport & lifting industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	K80	Hilcord 59M	-	H150NiCrMo1/HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,60	0,50	≤ 0,025	≤ 0,025	0,30	1,40	0,30	< 0,25		0,10	

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 690	≥ 750	≥ 17	-40°C ≥ 50

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
2,5	1000	5

Fer SG Mo

TIG rods - low alloyed steel - creep resisting

AWS A5.28: ER70S-A1
EN 1668: W 46 2 W 2 Mo
EN 12070: W Mo Si

Wire type:
TIG Solid wire

Current:
=−

Welding positions:



Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG Mo is solid wire for TIG welding low alloyed fine grain and creep resisting steels like 16Mo3 up to a maximum operating temperature of 500°C. Typical applications include the construction of pressure vessels, boilers and pipes. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Boiler steel P235GH-P310GH, 16Mo3, 17Mo3, 16Mo5, 14Mo6, 15NiCuMoNb5, 17MnMoV64, A355 Grade P1
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel L320NB-L415NB, L360MB-L415MB API 5L X52-X70

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 12 Mo	SG Mo	Hilcord 60M	-	H100Mo / HW530	Fer G-4

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,10	0,60	≤ 0,025	≤ 0,025			0,5				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	570	≥ 22	-20°C ≥ 60

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

Fer SG CrMo1

TIG rods - low alloyed steel - creep resisting

AWS A5.28: ER 80S-G (nearest ER 80S-B2)

EN 12070: W Cr Mo 1 Si

Wire type:
TIG Solid wire

Current:



Welding positions:



Approvals:
TüV

Shielding gas:
I1 = Pure Ar

Fer SG CrMo1 is our solid wire for TIG welding low alloyed fine grain and creep resisting steels like 13CrMo4 5 up to a maximum operating temperature of 550°C. Typical applications include the construction of pressure vessels, boilers and pipes. To be used in combination with tungsten electrodes type Wolfram WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Boiler steel 13CrMo4-5, 15CrMo5, 16CrMoV4, A 333 Grade P 11, P 12, G-17CrMo5-5, 22Mo4, G-22CrMo 5-4, 42CrMo4,
- Heat treatable steels up to 780 MPa tensile strength
- Case hardening and nitriding steels

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 19 CrMo	SG CrMo1	Hilcord 61M	-	H100CrMo1/HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,60	≤ 0,025	≤ 0,025	1,20		0,50				

Note: AWS spec. ER 80S-B2 Mn 0,40-0,70%

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 560	≥ 22	+20°C ≥ 100

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5

Fer SG CrMo2

TIG rods - low alloyed steel - creep resisting

AWS A5.28: ER 90S-G (nearest ER 90S-B3)

EN 12070: W CrMo 2 Si

Wire type:
TIG Solid wire

Current:



Welding positions:



Approvals:
TüV

Shielding gas:
I1, Pure Ar

Fer SG CrMo2 is our solid wire for TIG welding low alloyed fine grain and creep resisting steels like 10CrMo9.10 up to a maximum operating temperature of 600°C. Typical applications include the construction of pressure vessels, boilers and pipes. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Boiler steel 10CrMo9.10, A335 Grade P22, 10CrSiMoV7 (1.8075), G17CrMo9.10 (1.7379)
- Heat treatable steels up to 980 MPa tensile strength
- Case hardening and nitriding steels

Applications:

- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry
- Steel mills
- Petrochemical industry
- Cement industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 20 CrMo	SG CrMo2	Hilcord 62M	-	H60CrMo2/HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	1,00	0,60	≤ 0,025	≤ 0,025	2,50		1,00				

Note: AWS spec. ER 90S-B3 Mn 0,40-0,70%

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 460	≥ 570	≥ 20	+20°C ≥ 80

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5

Fer SG CrMo5

TIG rods - low alloyed steel - creep resisting

AWS A5.28: ER 80 S B 6
former spec. ER 502
EN 12070 : W CrMo 5 Si

Wire type:
TIG Solid wire

Current:
=−

Welding positions:


Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG CrMo5 is our solid wire for TIG welding low alloyed fine grain and creep resisting steels like 12CrMo19-5 up to a maximum operating temperature of 600ºC. Typical applications include the construction of pressure vessels, boilers and pipes. Fer SG CrMo5 is also used for repair welding forging dies. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:
- Boiler steel 12CrMo19.5, A335 Grade P5, C5 X12CrMo5 (1.7362), G-X12CrMo5 (1.7363)
- Heat treatable steels up to 1180 MPa tensile strength
- Case hardening and nitriding steels

Applications:
- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW wire	Gas welding / brazing
-	-	-	-	-	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,05	0,50	0,40	≤ 0,025	≤ 0,025	5,70		0,60				

Note:

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 500	≥ 630	≥ 20	+20°C ≥ 60

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	914 / 1000	5
2,0	914 / 1000	5
2,4	914 / 1000	5

Fer SG CrMo9

TIG rods - low alloyed steel - creep resisting

AWS A5.28: ER 80 S B 8
former spec. ER 505
EN 12070 : W CrMo 9 Si

Wire type:
TIG Solid wire

Current:
=−

Welding positions:


Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG CrMo9 is our solid wire for TIG welding low alloyed fine grain and creep resisting steels like A335 Gr. P9 up to a maximum operating temperature of 600ºC. Typical applications include the construction of pressure vessels, boilers and pipes. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:
- Boiler steel X-12CrMo9 1, A335 Grade P9
  G-X12CrMo101 (1.7389)

Applications:
- Pressure vessel & boiler industry
- Pipelines
- Repair shops
- Heat exchanger industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW wire	Gas welding / brazing
-	-	-	-	-	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,08	0,55	0,45	≤ 0,025	≤ 0,025	9,00		1,00				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 500	≥ 650	≥ 18	+20°C ≥ 60

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	914 / 1000	5
2,0	914 / 1000	5
2,4	914 / 1000	5

Fer SG Ni1

TIG rods - low alloyed steel - cryogenic

AWS A5.28: ER 80 S Ni 1

EN 1668 : W 46 6 W 3 Ni 1

Wire type:
TIG Solid wire

Current:
=−

Welding positions:



Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG Ni1 is our solid wire for TIG welding low alloyed structural steel having a nominal yield strength up to 550 MPa used in applications where good sub-zero toughness is required down to -60ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355K2G4, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH
- Fine grain steel SP355NL2-S500QL1, S275N-S420ML
- Pipe steel P235T1-P355N, L360-L485MB/NB, St37.0-St52.4, St45.8, X52-X70
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry
- Repair Shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic 70	SG Ni1	Hilcord 43	-	H100Ni1/HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,60	≤ 0,025	≤ 0,025		0,90					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 480	≥ 580	≥ 24	-60°C ≥ 60

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5

Fer SG Ni2,5

TIG rods - low alloyed steel - cryogenic

AWS A5.28: ER 80 S Ni 2

EN 1668: W 46 6 W 2 Ni 2

Wire type:
TIG Solid wire

Welding Current:



Welding positions:



Approvals:
-

Shielding gas:
I1 = Pure Ar

Fer SG Ni2,5 is our Ni-alloyed solid wire for TIG welding low alloyed cryogenic steels under mixed gas shielding used in applications where excellent sub-zero toughness is required down to -80ºC. Typical applications include heavy machinery, petrochemical equipment and offshore constructions. To be used in combination with tungsten electrodes type WT 20, thorium free WC 20 or WL 20.

Base materials to be welded:

- Fine grain steels S275NL2-S500QL1, StE315-StE500 12Ni14 G1/G2, X 12 Ni 5, 13MnNi 6-3

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road construction
- Pressure vessel & boiler industry
- Pipelines

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
-	SG Ni2,5	-	-	H100Ni2/HW580	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,10	0,50	≤ 0,025	≤ 0,025		2,50					

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 510	≥ 620	≥ 22	-80°C ≥ 50

Note: properties under pure Argon gas shielding

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5

Fer G 4

Gas welding rods - low alloyed steel - creep resisting

AWS A5.2: R 60-G

EN 12536: O IV

Wire type:
OAW Solid wire

Welding positions:



Approvals:
TüV

Shielding gas:
Oxy-acetylene

Fer G 4 is our copper coated rod with 0,5 Mo content for oxy-acetylene gas welding fine grain and creep resistant Mo steels like 16Mo3. Very smoothly flowing wire with no loss due to spatter. Approved for working temperatures up to 500°C. Also available as non copper coated rod.

Base materials to be welded:

- Structural steel S185-S355J2, St.33-St52.3, St50.2
- Boiler steel P235GH-P295GH, HI, HII, 17Mn4 16Mo3, 15Mo3
- Fine grain steel S275N-S500N, P355NH-P460NH, S355NL-S500NL
- Pipe steel P235T1-P355N, L210-L360MB, St.37.0-St.52.4, St 45.8, X42-X52, StE210.7-StE360.7TM

Applications:

- Construction works
- Pressure vessel & boiler industry
- Repair shops

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
B 12 Mo	SG Mo	Hilcord 60M	Fer SG Mo	H100Mo / HW530	-

Chemical composition, wt.% weld metal – typical:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,11	1,10	0,20	≤ 0,030	≤ 0,030			0,50				

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa	Tensile strength MPa	Elongation Lo=5d - %	Impact Values ISO-V J
As welded	≥ 350	≥ 450	≥ 22	+20°C ≥ 60

Note: properties under oxy-acetylene gas

Packaging data:

Dia. mm.	Length mm.	Weight / package kg.
1,6	1000	5
2,0	1000	5
2,4	1000	5
3,0	1000	5
4,0	1000	5

H 100

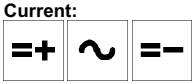
SAW wires - low alloyed steel

AWS A5.17: EM 12

EN 756: S 2

Wire type:
SAW Solid wire

Current:



Welding positions:



Approvals in combination with flux:
HW 530: ABS, BV, CL, DNV, GL, LR, TüV
HW 580: BV, CL, DNV, LR

H 100 is our solid wire for submerged arc welding of unalloyed and low alloyed structural steels in combination with Hilcoweld fluxes HW 430, HW 530, HW 580. H 100 is the ideal choice for shipbuilding, general constructions and pressure vessel industries.

Base materials to be welded:

- Ships plate A-E, A(H)32-E(H)36, S315G1S-S355G3S
- Structural steel S185-S355J2G3, St.33-St.52.3, C(K)10-C(K)35
- Boiler steel P235GH-P355GH, HI, HII, 17Mn4, 19Mn6
- Fine grain steel P275N-P355NL2, S275N-S420N, StE285-EStE355, StE285TM-EStE355TM
- Pipe steel P235T1-P355N, L210-L415MB, St37.0-St52.4, St45.8, X42-X60, StE210.7-StE360.7TM
- Cast steel GP240R, GS45

Applications:

- Shipyards/offshore
- Construction works
- Bridge & road constructions
- Pressure vessel & boiler industry

Equivalent product in alternative welding process:

SMAW	GMAW	FCAW	GTAW	SAW	Gas welding / brazing
Basic Directa	K 60	Hilcord 51	Fer SG 2	-	Fer G 2

Chemical composition wire, wt.%:

C	Mn	Si	S	P	Cr	Ni	Mo	Cu	Nb	V	Al
0,10	1,00	0,10	≤ 0,030	≤ 0,030							

Mechanical properties, weld metal – typical:

Condition	0,2% Yield strength MPa			Tensile strength MPa			Elongation Lo=5d - %			Impact Values ISO-V J		
In combination with flux	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580	HW430	HW530	HW580
As welded	≥ 400	≥ 400	≥ 510	≥ 520	≥ 520	≥ 600	≥ 25	≥ 26	≥ 26	-20ºC 27	-40ºC 50	-40ºC 70

Packaging data:

Dia. mm.	Spooltype	Weight / spool kg.
2,0	B415	25
2,5	B415	25
3,0	B415	25
4,0	B415	25