



Your welding power

WELDING CONSUMABLES



**Your welding power**

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# AN ITALIAN STORY

**INE's** history reflects over seventy years of Italian industry history.

A fully independent company, in a field dominated by multinationals, that produces and supplies a wide range of consumables and equipment for the welding industry.





It is the story of a company that has been able to create a recognised brand, an authoritative voice in the sector, which is committed to providing reliable, high quality products, the fruit of research and innovation.

Thanks to a pioneering spirit and a vision always focused on the future, **INE** has built a flexible and adaptable corporate structure based on its various clients' needs. The company relies on the expertise of specialist technicians and production capabilities of the two sites of Cittadella and Bagnoli, in the heart of Veneto, the Italian manufacturing district.



# FOR THE CLIENT

**INE's** business is not limited to the production and supply of materials and equipment, but is above all a consultancy and guidance operation that supports clients, to respond to every need and technical requirement for welding. In recent years, the company has invested heavily in training its employees, who have received the most prestigious industry certifications.

A commitment that demonstrates **INE's** invested interest in its clients and attention to an increasingly accurate and qualified customer service.







**INE**

SKYLINE 150C







# PRODUCT FOCUSED

Attentiveness towards the product and production is an integral part of **INE's** mission, which is committed to supply select raw materials. Supplier steelworks must meet strict requirements in terms of chemical composition and product quality.

## Quality control

From selection of materials to the finished product, excellence is at every stage of **INE's** production. Thanks to the research and development department, engineers and technicians design cutting-edge technologies and products, with the aim of meeting every need. The quality control laboratory is the highlight of the entire process. It is equipped with the most modern equipment for the mechanical and chemical characterisation of metal alloys.

During the assembly process, every single welding machine is tested and subjected to a rigorous process of controls, to verify the quality standard of the products.

**INE's** products have obtained quality certification and approval from major international bodies. Thanks to consolidated experience in this field, **INE** can accompany and support clients in the certification of welding processes, with a dedicated consultancy service.

## Manufacturing Execution System

To ensure maximum product reliability, every single coil is subject to a complete traceability system. The Manufacturing Execution System makes available all production information, via traceability of each coil, from the end product to the individual coil.

The MES collects production data via networked wire drawing machines. These data are then analysed to increase the production efficiency and quality of the end product.



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# PRODUCTS INDEX

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MIG/MAG SOLID WIRES

MIG/MAG SOLID WIRES

TIG RODS

TIG RODS



TIG RODS

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TIG RODS

METAL  
CORED WIRES

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METAL  
CORED WIRES

FLUX CORED WIRES

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FLUX CORED WIRES

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COATED ELECTRODES

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SUBMERGED ARC WELDING WIRES AND FLUX

SUBMERGED ARC WELDING WIRES AND FLOWS

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	INESUB S2MO	Page 54
	INESUB EB2	Page 54
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<b>FLUXES FOR LOW ALLOY STEELS</b>	INEFLUX BLKV	Page 54
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<i>TIG RODS</i>	INETIG INOX 307 SI	Page 60
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<i>ELECTRODES</i>	INOX 307	Page 62
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SECTION DESCRIPTION	PRODUCT DESCRIPTION	
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SECTION DESCRIPTION	PRODUCT DESCRIPTION	
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<i>ELECTRODES</i>	INE RD 600	Page 68
<i>FLUX CORED WIRES FOR HARDFACING</i>	INETUB MHF 600	Page 68

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## CARBON AND HSLA STEELS

BASIC MATERIAL TYPE	PRODUCTS TYPE			
	GMAW	GTAW		
CARBON STEEL CONVENTIONAL ROLLING EN 10025-2: from S275 to S355K2 EN 10028-2: from P235GH to P355GH	INEFIL S2	Page 20	INETIG S2	Page 30
	INEFIL 13.7	Page 20	INETIG 13.7	Page 30
HSLA CARBON STEEL CONTROLLED ROLLING EN 10025-3: from S275N to S460NL EN 10025-4: from S275M to S460ML EN 10028-3: from P275N to P460NL2 EN 10028-4: from P355M to P460ML2	INEFIL TITAN 1	Page 20	INETIG	Page 30
	INEFIL	Page 20	INETIG 19.12	Page 30
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	INEFIL 19.12	Page 20		
	INEFIL 19.12 NR	Page 20		

## HIGH STRENGTH STEELS

MECHANICAL CHARACTERISTICS		PRODUCTS TYPE			
Min. Yield Strength (MPa)	Min. UTS (MPa)	GMAW	GTAW		
460	550	INEFIL 19.12	Page 20	INETIG 19.12	Page 30
500	590	INEFIL D2	Page 26	INETIG D2	Page 34
550	640	INEFIL 70	Page 24		
620	700	INEFIL NIMO	Page 24	INETIG 100	Page 32
		INEFIL 100	Page 24		
690	770	INEFIL NIMOCR	Page 24	INETIG 110	Page 32
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790	880	INEFIL 120 S1	Page 24	INETIG 120 S1	Page 32
890	940	INEFIL 120	Page 24	INETIG 120	Page 32

## CREEP RESISTANT STEELS

ALLOY TYPE	PRODUCTS TYPE			
	GMAW	GTAW		
1/2Mo	INEFIL G2MO	Page 26	INETIG G2MO	Page 34
	INEFIL D2	Page 26	INETIG D2	Page 34
1-1/4Cr - 1/2Mo P11 / 10 CrMo 5-5	INEFIL B2	Page 26	INETIG B2	Page 34
	INEFIL B2L	Page 26	INETIG B2L	Page 34
	INEFIL CROMO 1	Page 26	INETIG CROMO 1	Page 34
2-1/4Cr - 1Mo (P22 / 10 CrMo 9-10)	INEFIL B3	Page 26	INETIG B3	Page 34
	INEFIL B3L	Page 26	INETIG B3L	Page 34
	INEFIL CROMO 2	Page 26	INETIG CROMO 2	Page 34
5Cr - 1/2Mo	INEFIL B6	Page 28	INETIG B6	Page 36
9Cr - 1Mo (P9 / X12 CrMo 9-1)	INEFIL B8	Page 28	INETIG B8	Page 36
9Cr - 1 Mo, Nb and V mod. (P91 / X10 CrMoVNb 9-1)	INEFIL B9	Page 28	INETIG B9	Page 36
	INEFIL B9 Low-Ni	Page 28	INETIG B9 Low-Ni	Page 36

## LOW TEMPERATURE TOUGHNESS STEELS

CVN IMPACT TOUGHNESS > 47J	PRODUCTS TYPE			
	GMAW	GTAW		
-40°C	INEFIL 19.12	Page 20	INETIG 19.12	Page 30
	INEFIL 19.12 NR	Page 20		
-50°C, (S460ML, P460ML2)	INEFIL 80 Ni1	Page 22	INETIG 80 Ni1	Page 32
-60°C, (11MnNi5-3, 13MnNi6-3, S460QL1)	INEFIL 80 Ni2	Page 22	INETIG 80 Ni2	Page 32
-80°C, (15NiMn6)	INEFIL 80 Ni3	Page 22	INETIG 80 Ni3	Page 32

<b>SMAW</b>		<b>FCAW</b>		<b>SAW</b>		<b>CARBON AND HSLA STEELS</b>
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INE 47	Page 44			INESUB S2 + INEFLUX SP	Page 50	
INE 48A	Page 44			INEFLUX S2Si + INEFLUX SP	Page 50	
INE SUPER	Page 44					
INE VERTICAL	Page 44					
INE AR 150	Page 44					
INE RB 86	Page 46	INETUB R71T1	Page 40	INESUB S2 + INEFLUX MP	Page 50	
INE 50B	Page 46	INETUB B71T5	Page 40	INESUB S2Si + INEFLUX MP	Page 50	
INE 55B	Page 46	INETUB M71TG	Page 38	INESUB S3Si + INEFLUX MP	Page 50	

<b>SMAW</b>		<b>FCAW</b>		<b>SAW</b>		<b>HIGH STRENGTH STEELS</b>
INE 55B	Page 46	INETUB M81TG-Ni1	Page 38	INESUB S3Si + INEFLUX MP	Page 50	
INE 57 B CNC	Page 46					
INE 57 B CNC	Page 46	INETUB M90	Page 38	INESUB S3NiMo + INEFLUX BLKV	Page 52	
INE 80B	Page 46					
		INETUB M110	Page 38			

<b>SMAW</b>		<b>FCAW</b>		<b>SAW</b>		<b>CREEP RESISTANT STEELS</b>
INE A1	Page 48	INETUB M81TG-A1	Page 38	INESUB S2MO + INEFLUX BLKV	Page 54	
		INETUB B71T5-A1	Page 40			
INE B2	Page 48	INETUB B81T5-B2	Page 40	INESUB EB2R + INEFLUX BLKV	Page 54	
INE B2L	Page 48					
INE B3	Page 48	INETUB B91T5-B3	Page 40	INESUB EB3R + INEFLUX BLKV	Page 54	
INE B3L	Page 48					
INE B6	Page 48			INESUB EB6 + INEFLUX BHA	Page 56	
INE B8	Page 48			INESUB EB8 + INEFLUX BHA	Page 56	
INE B9	Page 48			INESUB EB9 + INEFLUX BHA	Page 56	

<b>SMAW</b>		<b>FCAW</b>		<b>SAW</b>		<b>LOW TEMPERATURE TOUGHNESS STEELS</b>
INE C3	Page 46	INETUB R81T1-Ni1	Page 40	INESUB S3Si + INEFLUX BLKV	Page 50	
		INETUB M81TG-Ni1	Page 38	INESUB S2Ni1 + INEFLUX BLKV	Page 52	
				INESUB S2Ni2 + INEFLUX BLKV	Page 52	
				INESUB S2Ni3 + INEFLUX BLKV	Page 52	



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## MATERIALS FOR HARDFACING

			WELDING PROCESS	CLASSIFICATION	HADRNESS
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<b>INEFIL 600</b>	<i>Page 68</i>		GMAW - MAG 135 (gas M21)	EN 14700: S Fe8 - 600(60)	600 HB 60 HRC
<b>INETUB MHF 600</b>	<i>Page 68</i>		FCAW - MAG 135 (gas M21)	EN 14700: T Fe8 - 600(60)	600 HB 60 HRC
<b>INE RD 600</b>	<i>Page 68</i>		SMAW - MMA 111	EN 14700: E Fe4 - 600(60)	600 HB 60 HRC

## STAINLESS STEEL

ALLOY TYPE		PRODUCTS TYPE	
		<b>GMAW</b>	
<b>304/304L</b>		INEFIL INOX 308 LSI	<i>Page 58</i>
<b>309</b>		INEFIL INOX 309 LSI	<i>Page 58</i>
<b>310</b>		INEFIL INOX 310	<i>Page 58</i>
<b>316 / 316L</b>		INEFIL INOX 316 LSI	<i>Page 58</i>
<b>WeldAll</b>		INEFIL INOX 307 SI	<i>Page 58</i>
		INEFIL INOX 312	<i>Page 58</i>
<b>Hadfield (13%Mn)</b>		INETIG INOX 307 SI	<i>Page 58</i>

## ALUMINIUM ALLOYS

		2 <sup>ND</sup> ALLOY TO WELD	
		5052, 5454	5182, 5754
1 <sup>ND</sup> ALLOY TO WELD	<b>7003, 7004, 7005</b>	INEFIL AL5%MG	<i>Page 64</i>
		INETIG AL5%MG	<i>Page 64</i>
	<b>Al-Mg casting</b>	INEFIL AL5%MG	<i>Page 64</i>
		INETIG AL5%MG	<i>Page 64</i>
	<b>Al-Si casting</b>	INEFIL AL5%SI	<i>Page 64</i>
		INETIG AL5%SI	<i>Page 64</i>
		INE AL5%SI	<i>Page 64</i>
	<b>6009, 6010, 6111, 6016, 6022</b>	INEFIL AL5%MG	<i>Page 64</i>
		INETIG AL5%MG	<i>Page 64</i>
	<b>6005, 6061, 6063, 6082, 6116, 6463</b>	INEFIL AL5%MG	<i>Page 64</i>
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**STRENGTHS**

**MICRO-STRUCTURE**

**TYPICAL APPLICATIONS**

Friction- Impact - High temperatures

martensitic + carbides

Roller table, mould, jaw crusher, tiller roller, ploughshare

Friction - Impact

martensitic + carbides

Roller table, mould, jaw crusher, tiller roller, ploughshare, hammers for crushers

Impact - Friction

martensitic + carbides

Roller table, mould, jaw crusher, tiller roller, ploughshare, hammers for crushers

Friction - High temperatures

martensitic + carbides

Cutting blade, punch

**GTAW**

**SMAW**

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INETIG INOX 309 LSI *Page 58*

INOX 309 RLC *Page 62*

INOX 310 R *Page 62*

INETIG INOX 316 LSI *Page 58*

INOX 316 RLC *Page 62*

INETIG INOX 307 SI *Page 58*

INOX 312 R *Page 62*

INETIG INOX 307 SI *Page 58*

INOX 307 *Page 62*

**6005, 6061, 6063, 6082, 6116, 6463**

**6009, 6010, 6111, 6016, 6022**

**Al-Si casting**

**Al-Mg casting**

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INETIG AL5%MG *Page 64*

INETIG AL5%MG *Page 64*

INEFIL AL5%SI *Page 64*

INEFIL AL5%SI *Page 64*

INEFIL AL5%SI *Page 64*

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INE AL5%SI *Page 64*

INE AL5%SI *Page 64*

INEFIL AL5%MG *Page 64*

INETIG AL5%MG *Page 64*

(\*) Row type aluminium alloy 1 / Column type aluminium alloy 2





# PRODUCTS

# PRODUCTS

## MIG/MAG SOLID WIRES

CARBON AND HSLA STEELS

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL 13.7</b>	Solid wire for carbon steel S235/S275/S355. Indicated for single pass and multipass in general carpentry.	AWS A5.18: ER70S-3 EN ISO 14341-A: G 42 2 M21 2Si EN ISO 14341-A: G 38 2 C1 2Si
<b>INEFIL</b>	Solid wire SG2 for carbon steel and HSLA steel S355/S420. Top quality materials chosen. Reduced spray. Controlled silicate islands.	AWS A5.18: ER70S-6 EN ISO 14341-A: G 46 4 M21 3Si1 EN ISO 14341-A: G 42 4 M21 3Si1 EN ISO 14341-A: G 42 2 C1 3Si1
<b>INEFIL NR</b>	Copper free solid wire SG2 for carbon steel and HSLA steel S355/S420/S460. Fully-mechanised and robotic applications with high parameters.	AWS A5.18: ER70S-6 EN ISO 14341-A: G 46 4 M21 3Si1 EN ISO 14341-A: G 42 4 M21 3Si1 EN ISO 14341-A: G 42 2 C1 3Si1
<b>INEFIL 19.12</b>	Solid wire SG3 for carbon steel and HSLA steel S355/ S420/S460. Top quality materials chosen. Reduced spray. Controlled silicate islands.	AWS A5.18: ER70S-6 EN ISO 14341-A: G 46 4 M21 4Si1 EN ISO 14341-A: G 42 2 C1 4Si1
<b>INEFIL 19.12 NR</b>	Copper free solid wire SG3 for carbon steel and microalloyed steel S355/S420/S460. Fully-mechanised and robotic applications with high parameters.	AWS A5.18: ER70S-6 EN ISO 14341-A: G 46 4 M21 4Si1 EN ISO 14341-A: G 42 2 C1 4Si1
<b>INEFIL TITAN 1</b> <i>GALVANISED STEEL</i>	Solid wire in copper free and bronze version for welding galvanised sheet metal. Stable arc without spray.	AWS A5.18: ER70S-G EN ISO 14341-A: G 42 2 M21 Z
<b>INEFIL S2</b>	Solid wire for carbon steel S235/S275/ S355. The addition of deoxidizers Ti and Zr enable optimal welding in difficult conditions.	AWS A5.18: ER70S-2 EN ISO 14341-A: G 42 2 M21 2Ti EN ISO 14341-A: G 38 2 C1 2Ti
<b>INEFIL CU</b> <i>CORTEN</i>	Ni-Cr-Cu Solid wire for weathering steels (CORTEN/S355J2W).	AWS A5.28: ER80S-G EN ISO 14341-A: G 50 4 M21 Z (EN ISO 16834-A: G Mn3Ni1Cu)



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INEFIL 13.7	C 0.07 Si 0.60 Mn 1.20	C1	400	490	26	R.T. 100J 0°C 70 J -20°C 50 J		CE UK CA
		M21	420	530	28	R.T. 130J 0°C 90 J -20°C 70 J		
INEFIL	C 0.07 Si 0.80 Mn 1.40	C1	440	530	26	-20°C 70 J -30°C 50 J		TÜV DB ABS DNV RINA LR CWB CE UK CA
		M21	470	560	26	-20°C 90 J -30°C 70 J -40°C 60 J		
INEFIL NR	C 0.07 Si 0.80 Mn 1.40	C1	440	530	26	-20°C 70 J -30°C 50 J		TÜV DB ABS DNV RINA LR CE UK CA
		M21	470	560	26	-20°C 90 J -30°C 70 J -40°C 60 J		
INEFIL 19.12	C 0.08 Si 0.90 Mn 1.70	C1	450	550	27	-20°C 70 J -30°C 60 J		TÜV DB RINA DNV ABS CWB CE UK CA
		M21	510	580	26	-20°C 100 J -30°C 80 J -40°C 70 J		
INEFIL 19.12 NR	C 0.08 Si 0.90 Mn 1.70	C1	450	550	27	-20°C 70 J -30°C 60 J		TÜV DB RINA DNV ABS CE UK CA
		M21	510	580	26	-20°C 100 J -30°C 80 J -40°C 70 J		
INEFIL TITAN 1		M21	440	520	28	-20°C 70 J		CE UK CA
INEFIL S2	C 0.06 Si 0.50 Mn 1.10 Ti 0.10 Zr 0.09 Al 0.10	C1	400	490	27	-20°C 60 J -30°C 50 J		CE UK CA
		M21	440	520	28	-20°C 70 J -30°C 60 J		
INEFIL CU	C 0.08 Si 0.75 Mn 1.40 Ni 0.70 Cr 0.30 Cu 0.40	M21	530	620	26	-20°C 90 J -40°C 70 J -50°C 50 J		TÜV DB CE UK CA

CARBON AND HSLA STEELS

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength



# PRODUCTS

## MIG/MAG SOLID WIRES

LOW TEMPERATURE TOUGHNESS STEELS

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL 80 Ni 1</b>	Solid wire 1% Ni for fine grain steel (S460ML) with optimum toughness up to -50°C. Offshore platforms, gas transport.	AWS A5.28: ER80S-Ni1 EN ISO 14341-A: G 46 5 M21 3Ni1
<b>INEFIL 80 Ni 2</b>	Solid wire 2% Ni for Nickel-Manganese steel (11MnNi5-3) with optimum toughness up to -60°C. Transport and storage of LPG.	AWS A5.28: ER80S-Ni2 EN ISO 14341-A: G 50 6 M21 2Ni2
<b>INEFIL 80 Ni 3</b>	Solid wire 3% Ni for Nickel-Manganese steel (15NiMn6/ASTM A203 Gr.A) with optimum toughness up to -80°C. Transport and storage of LPG.	AWS A5.28: ER80S-Ni3 EN ISO 14341-B: G 57P 7 M22 SN71



# PRODUCTS

## MIG/MAG SOLID WIRES

HIGH STRENGTH STEEL

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL 70</b>	Solid wire for high strength steel with UTS $\geq$ 640 MPa. Use on earth moving machinery, lifting systems, heavy frames.	AWS A5.28: ER90S-G AWS A5.28: ER100S-G EN ISO 16834-A: G 55 3 M21 Mn3NiCrMo EN ISO 16834-A: G 62 4 M13 Mn3NiCrMo
<b>INEFIL NIMO</b>	Solid wire for high strength steel with UTS $\geq$ 700 MPa. Use on earth moving machinery, lifting systems, heavy frames.	AWS A5.28: ER100S-G EN ISO 16834-A: G 62 4 M21 Mn3Ni1Mo
<b>INEFIL NIMOCR</b>	Solid wire for high strength steel with UTS $\geq$ 770 MPa (HY100, S690QL) Optimum toughness up to -50°C. Welding of high strength components.	AWS A5.28: ER110S-G EN ISO 16834-A: G 69 4 M21 Mn3Ni1CrMo EN ISO 16834-A: G 69 5 M13 Mn3Ni1CrMo
<b>INEFIL 100</b>	Solid wire for high strength steel with UTS $\geq$ 700 MPa (HY90, S620QL). Optimum toughness up to -50°C. Fabrication of high strength components.	AWS A5.28: ER100S-1 EN ISO 16834-A: G 62 5 M13 Mn3Ni1,5Mo
<b>INEFIL 110</b>	Copper free, solid wire for high strength steel with UTS $\geq$ 770 MPa (HY100, S690QL). Optimum toughness up to -50°C. Fabrication of high strength components.	AWS A5.28: ER110S-1 EN ISO 16834-A: G 69 5 M21 Mn4Ni2Mo
<b>INEFIL 120 S1</b>	Copper free, solid wire for high strength steel with UTS $\geq$ 880 MPa (A514, A517). Excellent toughness up to -60°C. Fabrication of high strength components.	AWS A5.28: ER120S-1 EN ISO 16834-A: G 69 5 M21 Mn4Ni2Mo EN ISO 16834-A: G 79 6 M21 Mn4Ni2,5CrMo EN ISO 16834-A: G 79 6 M13 Mn4Ni2,5CrMo
<b>INEFIL 120</b>	Solid wire for high strength steel with UTS $\geq$ 940 (S890QL) MPa (S620QL). Fabrication of high strength components.	AWS A5.28: ER120S-G EN ISO 16834-A: G 89 4 M21 Mn4Ni2CrMo



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INEFIL 70	C 0.08 Si 0.70 Mn 1.40 Cr 0.60 Mo 0.20 Ni 0.60	M21 M13	600 640	680 720	19 20	-20°C 90 J -30°C 70 J -20°C 90 J -30°C 80 J -40°C 70 J		CE UK CA
INEFIL NIMO	C 0.08 Si 0.70 Mn 1.50 Cr 0.10 Mo 0.40 Ni 1.10	M21	680	750	20	-20°C 90 J -30°C 70 J -40°C 60 J		TÜV CE UK CA
INEFIL NIMOCR	C 0.08 Si 0.50 Mn 1.60 Cr 0.30 Mo 0.25 Ni 1.50 V 0.09	M21 M13	750 790	820 840	19 20	-20°C 90 J -40°C 60 J -20°C 100 J -40°C 80 J -50°C 60 J		TÜV DB ABS CE UK CA
INEFIL 100	C 0.07 Si 0.50 Mn 1.50 Cr 0.10 Mo 0.30 Ni 1.60	M13	660	760	20	-20°C 140 J -40°C 90 J -50°C 70 J		CE UK CA
INEFIL 110	C 0.07 Si 0.40 Mn 1.70 Cr 0.10 Mo 0.50 Ni 2.30	M21	700	790	20	-20°C 140 J -40°C 110 J -50°C 100 J -60°C 80 J		
INEFIL 120 S1	C 0.09 Si 0.50 Mn 1.60 Cr 0.45 Mo 0.60 Ni 2.65	M21 M13	840	910	19	-50°C 110 J -60°C 95 J -70°C 90 J -50°C 150 J -60°C 100 J -70°C 95 J		
INEFIL 120	C 0.09 Si 0.80 Mn 1.90 Cr 0.40 Mo 0.50 Ni 2.15	M21	890	940	16	-30°C 100 J -40°C 90 J		TÜV DB CE UK CA

HIGH STRENGTH STEEL

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength



# PRODUCTS

## MIG/MAG SOLID WIRES

CREEP RESISTANT STEEL (Cr-Mo STEEL)

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL G2MO</b> <i>1/2 Mo</i>	Solid wire for creep resistant steel 0.5Mo. Pipes and superheaters up to 450°C (A204 Gr.A,B,C).	AWS A5.28: ER70S-A1 EN ISO 14341-A: G 46 2 M21 2Mo EN ISO 21952-A: G MoSi
<b>INEFIL D2</b> <i>HARDOX</i>	Solid wire 0.5Mo. Resistance to hot cracking due to higher Mn. Ideal for welding Hardox 400 and 450 type steel.	AWS A5.28: ER80S-D2 AWS A5.28: ER90S-D2 EN ISO 14341-A: G 50 5 M21 4Mo
<b>INEFIL CROMO 1</b> <i>1-1/4Cr - 1/2Mo HIGH Mn</i>	Solid wire for creep resistant steel 1.25Cr – 0.5Mo (P11). Resistance to hot cracking due to higher Mn. Hot piping up to 500°C.	AWS A5.28: ER80S-G EN ISO 21952-A: G CrMo1Si
<b>INEFIL CROMO 2</b> <i>2-1/4Cr - 1Mo HIGH Mn</i>	Solid wire for creep resistant steel 2.5Cr – 1Mo (P22). Resistance to hot cracking due to higher Mn. Petrochemical with operation up to 600°C.	AWS A5.28: ER90S-G EN ISO 21952-A: G CrMo2Si
<b>INEFIL B2</b> <i>1-1/4Cr - 1/2Mo</i>	Solid wire for creep resistant steel 1.25Cr – 0.5Mo (P11). Heat exchangers, boilers, piping operating up to 550°C.	AWS A5.28: ER80S-B2 EN ISO 21952-B: G 55 M22 1CM
<b>INEFIL B2 L</b> <i>1-1/4Cr - 1/2Mo LOW CARBON</i>	Low carbon solid wire for creep resistant steel 1.25Cr–0.5Mo. C max 0.05% allows a reduction in pre-heatings on smaller thicknesses (tubes).	AWS A5.28: ER70S-B2L EN ISO 21952-B: G 52 M22 1CML
<b>INEFIL B3</b> <i>2-1/4Cr - 1Mo</i>	Solid wire for creep resistant steel 2.25Cr – 1Mo (P22). Petrochemical with operation up to 600°C.	AWS A5.28: ER90S-B3 EN ISO 21952-B: G 62 M22 2C1M
<b>INEFIL B3 L</b> <i>2-1/4Cr - 1Mo LOW CARBON</i>	Low carbon solid wire for creep resistant steel 2.25Cr – 1Mo (P22). C max 0.05% allows a reduction in pre-heatings on smaller thicknesses (tubes).	AWS A5.28: ER80S-B3L EN ISO 21952-B: G 55 M22 2C1ML



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INEFIL G2MO	C 0.09 Si 0.60 Mn 1.20 Mo 0.50	M21	500	620	23	R.T. 150J 0°C 130 J -20°C 90 J		TÜV DB   
		M21	480 (T)	600 (T)	25 (T)	R.T. 170 J (T) 0°C 150 J (T) -20°C 100 J (T)		
INEFIL D2	C 0.08 Si 0.70 Mn 1.80 Mo 0.50	M21	560	650	22	0°C 120 J -40°C 75 J -50°C 60 J		TÜV   
INEFIL CROMO 1	C 0.10 Si 0.60 Mn 1.10 Cr 1.20 Mo 0.50	M21	460 (T)	570 (T)	23 (T)	R.T. 150 J (T)		TÜV DB   
INEFIL CROMO 2	C 0.09 Si 0.60 Mn 1.00 Cr 2.60 Mo 1.00	M21	540 (T)	650 (T)	23 (T)	R.T. 170 J (T)		TÜV   
INEFIL B2	C 0.08 Si 0.60 Mn 0.60 Cr 1.30 Mo 0.50	M22	480 (T)	570 (T)	21 (T)	R.T. 150 J (T)		TÜV   
INEFIL B2 L	C 0.03 Si 0.60 Mn 0.60 Cr 1.30 Mo 0.50	M22	420 (T)	530 (T)	23 (T)	R.T. 150 J (T)		
INEFIL B3	C 0.08 Si 0.60 Mn 0.60 Cr 2.50 Mo 1.00	M22	560 (T)	650 (T)	20 (T)	R.T. 170 J (T)		TÜV   
INEFIL B3 L	C 0.03 Si 0.60 Mn 0.60 Cr 2.50 Mo 1.00	M22	490 (T)	580 (T)	22 (T)	R.T. 170 J (T)		

CREEP RESISTANT STEEL (Cr-Mo STEEL)

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## MIG/MAG SOLID WIRES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL B6</b>  <i>5Cr - 1/2Mo</i>	Solid wire for creep resistant steel 5Cr-0.5Mo (12 CrMo 19-5). Used to repair moulds with similar composition.	AWS A5.28: ER80S-B6 EN ISO 21952-A: G CrMo5Si
<b>INEFIL B8</b>  <i>9Cr - 1Mo</i>	Solid wire for creep resistant steel 9Cr-1Mo (P9). Heat exchangers, boilers, piping with working T up to 600°C.	AWS A5.28: ER80S-B8 EN ISO 21952-A: G CrMo9
<b>INEFIL B9</b>  <i>9Cr - 1Mo - V - Nb</i>	Copper free solid wire for creep resistant steel 9CrMoVNb9-1(P91) Heat exchangers, boilers, piping operating up to 600°C. X and J controlled factors.	AWS A5.28: ER90S-B91 EN ISO 21952-A: G CrMo91
<b>INEFIL B9LowNi</b>  <i>9Cr - 1Mo - V - Nb LOW NICKEL</i>	Copper free solid wire with Nickel base for creep resistant steel 9CrMoVNb9-1 (P91). Ni + Mn < 1% allows you to carry out PWHT at higher temperatures.	AWS A5.28: ER90S-B91

CREEP RESISTANT STEEL (Cr-Mo STEEL)





# PRODUCTS

## TIG RODS

	PRODUCT	PRODUCT DESCRIPTION	NORMS
CARBON AND HSLA STEELS	<b>INETIG 13.7</b>	TIG rod for root pass of P295/P355 carbon steel piping. Also available in spools for automatic TIG.	AWS A5.18: ER70S-3 EN ISO 636-A: W 42 2 2Si
	<b>INETIG</b>	TIG rod for root pass of P460NL1 carbon steel piping. Also available in spools for automatic TIG.	AWS A5.18: ER70S-6 EN ISO 636-A: W 46 4 3Si1
	<b>INETIG 19.12</b>	TIG rod for carbon steel and HSLA steel P460NL2. Optimum toughness up to -50°C. Also available in spools for automatic TIG.	AWS A5.18: ER70S-6 EN ISO 636-A: W 46 5 4Si1
	<b>INETIG S2</b>	TIG rod for carbon steel and HSLA steel. Excellent toughness thanks to the addition of Ti and Zr. Also available for automatic TIG.	AWS A5.18: ER70S-2 EN ISO 636-A: W 46 4 2Ti
OFW	<b>INEGAS G1</b>	Rod for oxyfuel gas welding of carbon steels. High fluidity of the welding pool. Applications on tubes and tanks.	AWS A5.2: R45 EN ISO 20378: O I
	<b>INEGAS G2</b>	Rod for oxyfuel gas welding of carbon steel S275 gas welding rod. Low porosity. Applications on pipes and tanks.	AWS A5.2: R60 EN ISO 20378: O II



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INETIG 13.7	C 0.07 Si 0.60 Mn 1.10	I1	440	530	28	-20°C 150 J		CE CCK DB
INETIG	C 0.08 Si 0.80 Mn 1.45	I1	480	580	28	-20°C 120 J -30°C 90 J -40°C 70 J		TÜV DB CE CCK DB
INETIG 19.12	C 0.08 Si 0.90 Mn 1.70	I1	530	620	26	-20°C 140 J -30°C 110 J -40°C 80 J -50°C 60 J		
INETIG S2	C 0.06 Si 0.50 Mn 1.20 Ti 0.10 Zr 0.09 Al 0.10	I1	490	600	28	-20°C 120 J -30°C 100 J -40°C 70 J		CE CCK DB
INEGAS G1	C 0.07 Si 0.07 Mn 0.50		500					
INEGAS G2	C 0.10 Si 0.20 Mn 1.00		520					

CARBON AND HSLA STEELS

OFW

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## TIG RODS

	PRODUCT	PRODUCT DESCRIPTION	NORMS
LOW TEMPERATURE TOUGHNESS STEELS	<b>INETIG 80 Ni 1</b>	TIG rod 1%Ni for root pass of fine grain steel (S460ML). Optimum toughness up to -50°C. Offshore platforms, gas transport.	AWS A5.28: ER80S-Ni1 EN ISO 636-A: W 46 5 3Ni1
	<b>INETIG 80 Ni 2</b>	TIG rod 2%Ni for root pass of Ni-Mn steel piping Optimum toughness up to -60°C. Transport and storage of LPG.	AWS A5.28: ER80S-Ni2 EN ISO 636-A: W 50 6 2Ni2
	<b>INETIG 80 Ni 3</b>	TIG rod 3%Ni for root pass of Ni-Mn steel piping (15niMn6/ASTM A203). Optimum toughness up to -80°C. Transport and storage of LPG.	AWS A5.28: ER80S-Ni3 EN ISO 636-B: W 57P 7 N71
HIGH STRENGTH STEEL	<b>INETIG 100</b>	TIG rod for high strength steel with UTS ≥ 700 (P500QL1) MPa (S620QL). Optimum toughness up to -50°C. Fabrication of high strength components.	AWS A5.28: ER100S-1 EN ISO 16834-A: W 62 5 I1 Mn3Ni1,5Mo
	<b>INETIG 110</b>	TIG rod for high strength steel with UTS ≥ 770 (P690QL1) MPa (S620QL). Optimum toughness up to -50°C. Fabrication of high strength components.	AWS A5.28: ER110S-1 EN ISO 16834-A: W 69 5 I1 Mn3Ni2,5CrMo
	<b>INETIG 120 S1</b>	Copper free TIG rod for root pass of high strength steel with UTS ≥ 880 (S690QL1) MPa (S690QL1). Excellent toughness at -60°C.	AWS A5.28: ER120S-1 EN ISO 16834-A: W 79 6 I1 Mn4Ni2,5CrMo
	<b>INETIG 120</b>	TIG rod for root pass of high strength steel with UTS ≥ 940 (S890QL) MPa (S890QL). Fabrication of high strength components.	AWS A5.28: ER120S-G EN ISO 16834-A: W 89 4 I1 Mn4Ni2CrMo





# PRODUCTS

## TIG RODS

CREEP RESISTANT STEEL (Cr-Mo STEEL)

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INETIG G2MO</b> <i>1/2 Mo</i>	TIG rod for creep resistant steel 0.5Mo. Piping and superheaters up to 450°C.	AWS A5.28: ER70S-A1 EN ISO 636-A: W 46 2 2Mo EN ISO 21952-A: W MoSi
<b>INETIG D2</b> <i>HARDOX</i>	TIG rod 0.5Mo. Resistance to hot cracking due to higher Mn. Ideal for welding Hardox 400 and 450 type steel.	AWS A5.28: ER80S-D2 AWS A5.28: ER90S-D2 EN ISO 636-B: W 57A 5 4M31
<b>INETIG CROMO 1</b> <i>1-1/4Cr - 1/2Mo HIGH Mn</i>	TIG rod for creep resistant steel 1.25Cr–0.5Mo (P11). Resistance to hot cracking due to higher Mn. Hot piping up to 500°C.	AWS A5.28: ER80S-G EN ISO 21952-A: W CrMo1Si
<b>INETIG CROMO 2</b> <i>2-1/4Cr - 1Mo HIGH Mn</i>	TIG rod for creep resistant steel 2.5Cr–1Mo (P22). Resistance to hot cracking due to higher Mn. Petrochemical with operation up to 600°C.	AWS A5.28: ER90S-G EN ISO 21952-A: W CrMo2Si
<b>INETIG B2</b> <i>1-1/4Cr - 1/2Mo</i>	TIG rod for creep resistant steel 1.25Cr–0.5Mo (P11). Heat exchangers, boilers, piping operating up to 550°C.	AWS A5.28: ER80S-B2 EN ISO 21952-B: W 55 I1 1CM
<b>INETIG B2 L</b> <i>1-1/4Cr - 1/2Mo LOW CARBON</i>	Low carbon TIG rod for creep resistant steel 1.25Cr–0.5Mo. C max 0.05% allows a reduction in pre-heatings on smaller thicknesses (tubes).	AWS A5.28: ER70S-B2L EN ISO 21952-B: W 52 I1 1CML
<b>INETIG B3</b> <i>2-1/4Cr - 1Mo</i>	TIG rod for creep resistant steel 2.25Cr–1Mo (P22). Petrochemical with operation up to 600°C.	AWS A5.28: ER90S-B3 EN ISO 21952-B: W 62 I1 2C1M
<b>INETIG B3 L</b> <i>2-1/4Cr - 1Mo LOW CARBON</i>	Low carbon TIG rod for creep resistant steel 2.25Cr–1Mo (P22). C max 0.05% allows a reduction in pre-heatings on smaller thicknesses (tubes).	AWS A5.28: ER80S-B3L EN ISO 21952-B: W 55 I1 2C1ML



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	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INETIG G2MO	C 0.09 Si 0.60 Mn 1.20 Mo 0.50	I1	520	630	23	R.T. 200J -20°C 80 J		TÜV DB CE UK CA
		I1	500 (T)	610 (T)	25 (T)	R.T. 220 J (T) -20°C 100 J (T)		
INETIG D2	C 0.08 Si 0.70 Mn 1.90 Mo 0.50	I1	610	700	24	-40°C 40 J -50°C 35 J		
INETIG CROMO 1	C 0.10 Si 0.60 Mn 1.10 Cr 1.20 Mo 0.50	I1	490 (T)	590 (T)	26 (T)	R.T. 250 J (T)		TÜV DB CE UK CA
INETIG CROMO 2	C 0.10 Si 0.60 Mn 1.10 Cr 2.40 Mo 0.95	I1	500 (T)	610 (T)	23 (T)	R.T. 200 J (T)		TÜV CE UK CA
INETIG B2	C 0.08 Si 0.60 Mn 0.60 Cr 1.30 Mo 0.50	I1	490 (T)	590 (T)	25 (T)	R.T. 250 J (T)		TÜV CE UK CA
INETIG B2 L	C 0.03 Si 0.60 Mn 0.60 Cr 1.30 Mo 0.50	I1	450 (T)	560 (T)	23 (T)	R.T. 250 J (T)		
INETIG B3	C 0.08 Si 0.60 Mn 0.60 Cr 2.50 Mo 1.00	I1	570 (T)	650 (T)	22 (T)	R.T. 230 J (T)		TÜV CE UK CA
INETIG B3 L	C 0.03 Si 0.60 Mn 0.60 Cr 2.50 Mo 1.00	I1	510 (T)	600 (T)	22 (T)	R.T. 200 J (T)		

CREEP RESISTANT STEEL (Cr-Mo STEEL)

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## TIG RODS

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INETIG B6</b> <i>5Cr - 1/2Mo</i>	TIG rod for creep resistant steel 5Cr-0.5Mo (12 CrMo 19-5). Used to repair moulds with similar composition.	AWS A5.28: ER80S-B6 EN ISO 21952-A: W CrMo5Si
<b>INETIG B8</b> <i>9Cr - 1Mo</i>	TIG rod for creep resistant steel 9Cr-1Mo (P9). Heat exchangers, boilers, piping with working T up to 600°C.	AWS A5.28: ER80S-B8 EN ISO 21952-A: W CrMo9
<b>INETIG B9</b> <i>9Cr - 1Mo - V - Nb</i>	Copper free TIG rod for creep resistant steel 9CrMoVNb9-1 (P91) Heat exchangers, boilers, piping operating up to 600°C. X and J controlled factors.	AWS A5.28: ER90S-B91 EN ISO 21952-A: W CrMo91
<b>INETIG B9LowNi</b> <i>9Cr - 1Mo - V - Nb LOW NICKEL</i>	Low Nickel TIG rod for creep resistant steel 9CrMoVNb9-1 (P91). Ni + Mn < 1% allows you to carry out PWHT at higher temperatures.	AWS A5.28: ER90S-B91

CREEP RESISTANT STEEL (Cr-Mo STEEL)





# PRODUCTS

## METAL CORED WIRES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INETUB M71TG</b> <i>MILD STEEL</i>	Metal cored wire for carbon steel and microalloyed steel (S355/ S420/S460). High productivity and excellent toughness at -40°C. Hydrogen < 5ml/100g.	AWS A5.18: E70C-6M H4 EN ISO 17632-A: T 46 4 M M21 2 H5
<b>INETUB M71TG-CU</b> <i>CORTEN</i>	Metal cored wire for for weathering steels (CORTEN). High productivity.	AWS A5.28: E80C-W2 EN ISO 17632-A: T 46 3 Z M M21 2 H5
<b>INETUB M81TG-Ni1</b> <i>LOW TEMPERATURE</i>	Metal cored wire 1%Ni for fine grain steel (S460ML) with optimum toughness up to -60°C. Controlled hydrogen H5 <5ml/100g. Offshore and gas transport.	AWS A5.28: E80C-Ni1 EN ISO 17632-A: T 46 6 1Ni M M21 2 H5
<b>INETUB M90</b> <i>HIGH STRENGTH</i>	Metal cored wire for high strength steel with UTS ≥ 640MPa (HY80, S550Q). Optimum tenacity at -40°C. Reduced heat input.	AWS A5.28 E90C-K3 EN ISO 18276: T 55 4 2NiMo M M21
<b>INETUB M110</b> <i>HIGH STRENGTH</i>	Metal cored wire for high strength steel with UTS ≥ 770MPa (HY110/S690QL/ Strenx700). Optimum tenacity at -50°C. Reduced heat input.	AWS A5.28: E110C-K4 EN ISO 18276-A: T 69 5 Mn2NiCrMo M M21
<b>INETUB M81TG-A1</b> <i>1/2Mo</i>	Metal cored wire with 0.5%Mo for creep resistant steel. Good toughness at -40°C. Diffusible hydrogen H5 <5ml/100g.	AWS A5.28: E80C-G EN ISO 17632-A: T 46 A Mo M M21 2 H5

METAL CORED WIRES



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INETUB M71TG	C 0.05 Si 0.60 Mn 1.50	M21	500	575	25	-20°C 110 J -40°C 80 J		ABS LR RINA DNV TÜV DB   
INETUB M71TG-CU	C 0.05 Si 0.60 Mn 1.20 Cr 0.50 Ni 0.50 Cu 0.50	M21	535	615	25	-30°C 50 J		
INETUB M81TG-Ni1	C 0.05 Si 0.50 Mn 1.55 Ni 0.95	M21	520	610	29	-40°C 115 J -50°C 100 J -60°C 80 J		
INETUB M90	C 0.06 Si 0.50 Mn 1.20 Ni 2.00 Mo 0.50	M21	630	700	22	-20°C 80 J -40°C 70 J		
INETUB M110	C 0.06 Si 0.50 Mn 1.60 Ni 2.00 Cr 0.40 Mo 0.40	M21	740	830	17	-20°C 80 J -40°C 70 J -50°C 60 J		
INETUB M81TG-A1	C 0.05 Si 0.40 Mn 1.00 Mo 0.50	M21	470	560	22	-20°C 80 J		

METAL CORED WIRES

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## FLUX CORED WIRES

	PRODUCT	PRODUCT DESCRIPTION	NORMS
RUTILE FLUX CORED WIRES	<b>INETUB R71T1</b> <i>ALL POSITIONS, MILD STEEL</i>	Bigas rutile flux cored wire for welding carbon steel and HSLA steel. Optimum toughness tested up to -40°C. Shipyards. Weldable in M21 or 100% CO <sub>2</sub> .	AWS A5.20. E71T1-M AWS A5.20. E71T1-C EN ISO 17632-A: T 46 2 P M21 1 H5 EN ISO 17632-A: T 46 2 P C1 1 H5
	<b>INETUB R81T1-CU</b> <i>ALL POSITION, CORTEN</i>	Rutile flux cored wire with added Ni-Cr-Cu for for weathering steels (CORTEN/ S355J2W).	AWS A5.29: E81T1-W2M EN ISO 17632-A: T 50 3 Z P M21 2 H5
	<b>INETUB R81T1-Ni1</b> <i>ALL POSITION, LOW TEMPERATURE</i>	Rutile flux cored wire with 1%Ni for vertical-up welding of fine-grained carbon steels with CVN impact toughness down to -40°C.	AWS A5.29: E81T1-Ni1M-J EN ISO 17632-A: T 46 4 1Ni P M21 2 H5
BASIC FLUX CORED WIRES	<b>INETUB B71T5</b> <i>FLAT/HORIZONTAL - MILD STEEL</i>	Basic flux cored wire for flat or horizontal welding of carbon steels and HSLA steels (S460ML) with excellent toughness up to -40°C.	AWS A5.20: E71T-5M-J EN ISO 17632-A: T 46 4 B M21 2 H5
	<b>INETUB B71T5-A1</b> <i>FLAT/HORIZONTAL - 1/2Mo</i>	Basic flux cored wire 0.5Mo for flat and horizontal welding of creep resistant steels. Piping up to 450°C.	AWS A5.29: E71T5-A1M EN ISO 17634-A: T Mo B M21 H5
	<b>INETUB B81T5-B2</b> <i>FLAT/HORIZONTAL - 1-1/4Cr - 1/2Mo</i>	Basic flux cored wire 1.25Cr - 0.5Mo for flat and horizontal welding of creep resistant (P11) steels. Heat exchangers up to 550°C.	AWS A5.29: E81T5-B2M EN ISO 17634-A: T CrMo1 B M21 2 H5
	<b>INETUB B91T5-B3</b> <i>FLAT/HORIZONTAL - 2-1/4Cr - 1Mo</i>	Basic flux cored wire 2.25Cr - 0.5Mo for flat and horizontal welding of creep resistant (P22) steels. Petrochemical up to 600°C.	AWS A5.29: E91T5-B3M EN ISO 17634-A: T CrMo2 B M21 2 H5



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INETUB R71T1	C 0.06 Si 0.50 Mn 1.45	M21	550	600	24	-20°C 110 J -40°C 50 J		TÜV DB ABS LR RINA CE DIN EN
INETUB R81T1-CU	C 0.05 Si 0.55 Mn 1.15 Ni 0.60 Cu 0.55 Cr 0.60	M21	570	650	20	-20°C 100 J -30°C 90 J -40°C 80 J		
INETUB R81T1-Ni1	C 0.05 Si 0.40 Mn 1.20 Ni 0.90	M21	550	625	25	-20°C 110 J -30°C 100 J -40°C 85 J		
INETUB B71T5	C 0.05 Si 0.50 Mn 1.20	M21	510	580	26	-20°C 120 J -30°C 95 J -40°C 80 J		TÜV DB ABS LR RINA DNV CE DIN EN
INETUB B71T5-A1	C 0.08 Si 0.20 Mn 1.00 Mo 0.50	M21	520 (T)	620 (T)	26 (T)	-20°C 140 J (T) -40°C 90 J (T) -50°C 70 J (T)		CE DIN EN
INETUB B81T5-B2	C 0.07 Si 0.40 Mn 1.00 Cr 1.20 Mo 0.45	M21	570 (T)	685 (T)	20 (T)	R.T. 140 J (T)		
INETUB B91T5-B3	C 0.07 Si 0.35 Mn 1.00 Cr 2.20 Mo 1.00	M21	660 (T)	740 (T)	20 (T)	R.T. 140 J (T)		

RUTILE FLUX CORED WIRES

BASIC FLUX CORED WIRES

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## SELF-SHIELDED FLUX CORED WIRES

SELF-SHIELDED FLUX CORED WIRES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INETUB S71T11</b> <i>OPEN ARC - MILD STEEL</i>	Self-shielded flux cored wire (open-arc) for welding sheet metal in carbon steel. Easy slag removal. No Barium.	AWS A5.20: E71T-11 EN ISO 17632-A: T 42 Z W NO 1 H15
<b>INETUB S71TGS</b> <i>OPEN ARC - MILD STEEL</i>	Self-shielded flux cored wire (open-arc) for welding sheet metal in carbon steel. Easy slag removal. No Barium.	AWS A5.20: E71T-GS EN ISO 17632-A: T 42 Z W NO 1 H15
<b>INETUB BA71T11</b> <i>OPEN ARC - MILD STEEL</i>	Self-shielded flux cored wire (open-arc) for welding sheet metal in carbon steel. Easy slag removal. Very stable arc.	AWS A5.20: E71T-11 EN ISO 17632-A: T 42 Z W NO 1 H15
<b>INETUB BA71TGS</b> <i>OPEN ARC - MILD STEEL</i>	Self-shielded flux cored wire (open-arc) for welding sheet metal in carbon steel. Easy slag removal. Very stable arc.	AWS A5.20: E71T-GS EN ISO 17632-A: T 42 Z W NO 1 H15





# PRODUCTS

## COATED ELECTRODES

### RUTILE ELECTRODES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INE 45</b>	Highly versatile rutile electrode (R). Easy trigger, stable arc, easy slag removal. Usable with OCV > 50 V in CCPD, CCPI, CA.	AWS A5.1: E6013 EN ISO 2560-A: E 42 0 R 1 2
<b>INE 46</b> <i>VERTICAL DOWN WELDING</i>	Rutile-cellulose blue electrode (RC) with high penetration for root pass and welding in position (PF/3G up, PE/4G). Good mechanical properties.	AWS A5.1: E6013 EN ISO 2560-A: E 42 0 RC 1 1
<b>INE 47</b>	Rutile electrode with thick coating (RR). Better weldability on oxidised sheet metal and corner beads. Easy trigger, easy slag removal.	AWS A5.1: E6013 EN ISO 2560-A: E 42 0 RR 1 2
<b>INE 48A</b>	Highly versatile rutile electrode (R) and simple use. Immediate trigger and re-ignition, easy slag removal Improved performance. Ideal for tack- welding.	AWS A5.1: E6013 EN ISO 2560-A: E 42 0 R 1 2
<b>INE SUPER</b> <i>VERTICAL DOWN WELDING</i>	Rutile-cellulose electrode (RC) with high penetration for root pass and welding in position (PF/3G up, PE/4G). Good mechanical properties.	AWS A5.1: E6013 EN ISO 2560-A:
<b>INE AR 150</b> <i>HIGH DEPOSITION</i>	High performance rutile electrode ~150%. Head/head and flat corner joint welding on medium to large thicknesses in shipyards.	AWS A5.1: E7024 EN ISO 2560-A: E 42 0 RR 5 4
<b>INE VERTICAL</b> <i>VERTICAL DOWN WELDING</i>	Rutile- cellulose (RC) electrode for welding in a vertical ascending and descending position (PG/3G down)	AWS A5.1: E6012 EN ISO 2560-A: E 42 0 RC 1 1



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	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INE 45	C 0.06 Si 0.40 Mn 0.50	450	540	23	0°C 50 J		TÜV DB CE UK CA
INE 46	C 0.06 Si 0.40 Mn 0.50	440	540	24	0°C 50 J		TÜV CE UK CA
INE 47	C 0.07 Si 0.40 Mn 0.50	470	540	24	0°C 55 J		TÜV DB CE UK CA
INE 48 A	C 0.06 Si 0.40 Mn 0.50	440	540	24	0°C 50 J		CE UK CA
INE SUPER	C 0.06 Si 0.35 Mn 0.50	460	540	24	0°C 50 J		TÜV DB CE UK CA
INE AR 150	C 0.07 Si 0.40 Mn 0.80	460	550	24	0°C 60 J		
INE VERTICAL	C 0.06 Si 0.35 Mn 0.70	460	530	24	0°C 60 J		TÜV CE UK CA

RUTILE ELECTRODES

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## COATED ELECTRODES

### BASIC ELECTRODES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INE 50B</b>	H5 low hydrogen basic electrode and high yield for fine grain carbon steel (S420N). Excellent mechanical properties up to -40°C.	AWS A5.1: E7018 EN ISO 2560-A: E 42 4 B 4 2 H5
<b>INE 55B</b> <i>LOW HYDROGEN</i>	H5 low hydrogen basic electrode for fine grain carbon steel with CVN toughness at -50°C (P355NL2). Boiler works, shipyard.	AWS A5.1: E7018-1 H4 EN ISO 2560-A: E 42 5 B 4 2 H5
<b>INE RB 86</b>	Special basic electrode with double coating for carbon steel S355. Excellent arc thrust and appearance of bead, low spattering.	AWS A5.1: E7016 EN ISO 2560-A: E 42 2 B 1 2 H10
<b>INE 57 B CNC</b> <i>CORTEN</i>	Basic electrode for weathering steels (Corten) and high strength steels (P500QL1). Excellent mechanical properties and good strength against corrosion.	AWS A5.5: E8018-W2 EN ISO 2560-A: E 50 4 Z B 4 2
<b>INE C3</b> <i>LOW TEMPERATURE</i>	Basic electrode with 1% Ni with low hydrogen content for fine grain steel (S460ML). Optimum toughness up to -50°C. Offshore platforms.	AWS A5.5: E8018-C3 EN ISO 2560-A: E 46 4 1Ni B 4 2
<b>INE 80B</b> <i>HIGH STRENGTH</i>	Basic electrode with low hydrogen content (<5ml/100g) for high strength steel with UTS ≥ 700 MPa (S620QL1, HY80). Optimum radiographic quality.	AWS A5.5: E10018M EN ISO 18275-A: E 62 4 1,5NiMo B 4 2 H5



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	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INE 50B	C 0.05 Si 0.40 Mn 1.30 Ni 0.10 Cr 0.10 Mo 0.08	470	540	26	-30°C 80 J -40°C 50 J		RINA ABS LRS DNV CE UK CA
INE 55B	C 0.05 Si 0.40 Mn 1.40 P 0.015 S 0.010 Ni 0.05 Cr 0.05 Mo 0.05 V 0.01	450	550	26	-20°C 200 J -40°C 140 J -45°C 80 J -50°C 60 J		TÜV DB ABS LRS RINA DNV CE UK CA
		430 (T)	520 (T)	26 (T)	-20°C 200 J -40°C 150 J -45°C 80 J -50°C 60 J		
INE RB 86	C 0.07 Si 0.50 Mn 1.20	470	540	26	-20°C 70 J -30°C 50 J		CE UK CA
INE 57 B CNC	C 0.06 Si 0.40 Mn 0.70 Cr 0.50 Ni 0.60 Cu 0.50	530	600	24	-40°C 50 J		
INE C3	C 0.05 Si 0.30 Mn 1.00 Ni 0.90	480	570	26	-40°C 85 J -50°C 50 J		
INE 80B	C 0.05 Si 0.40 Mn 1.30 Cr 0.30 Ni 1.50 Mo 0.40	660	750	22	-50°C 50 J		

BASIC ELECTRODES

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## COATED ELECTRODES

### BASIC ELECTRODES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INE A1</b> <i>1/2Mo</i>	Basic electrode 0.5Mo for creep resistant steel. Controlled hydrogen H4. Heat exchangers up to 500°C.	AWS A5.5: E7018-A1 H4 EN ISO 2560-A: E 46 2 Mo B 4 2 EN ISO 3580-A: E Mo B 4 2 H5
<b>INE B2</b> <i>1-1/4Cr - 1/2Mo</i>	Basic electrode 1.25Cr-0.5Mo for creep resistant steel (P11). Low hydrogen content (H4). Heat exchangers and boilers operating at 550°C.	AWS A5.5: E8018-B2 H4 EN ISO 3580-A: E CrMo1 B 4 2 H5
<b>INE B2 L</b> <i>1-1/4Cr - 1/2Mo LOW CARBON</i>	Basic electrode 1.25Cr-0.5Mo for creep resistant steel (P11). Low hydrogen content (H4). Cmax 0.05% allows reduced PWHT on small thicknesses.	AWS A5.5: E7018-B2L H4 EN ISO 3580-A: E CrMo1L
<b>INE B3</b> <i>2-1/4Cr - 1Mo</i>	Basic electrode 2.25Cr- 1Mo for creep resistant steel (P22). Low hydrogen content (H4). Petrochemical up to a 600°C.	AWS A5.5: E9018-B3 H4 EN ISO 3580-A: E CrMo2 B 4 2 H5
<b>INE B3 L</b> <i>2-1/4Cr - 1Mo LOW CARBON</i>	Basic electrode 2.25Cr- 1Mo for creep resistant steel (P22). Low hydrogen content (H4). Cmax 0.05% allows reduced PWHT on small thicknesses.	AWS A5.5: E8018-B3L H4 EN ISO 3580-A: E CrMo2L
<b>INE B6</b> <i>5Cr - 1/2Mo</i>	Basic electrode 5Cr-0.5Mo for creep resistant steel (12 CrMo 19-5). Low hydrogen content (H4). Repair of moulds with similar composition.	AWS A5.5: E8018-B6 H4 EN ISO 3580-A: E CrMo5 B 3 2 H5
<b>INE B8</b> <i>9Cr - 1Mo</i>	Basic electrode 9Cr- 1Mo for creep resistant steel (P9). Low hydrogen content (H4). Heat exchangers, boilers, piping with working T up to 600°C.	AWS A5.5: E8018-B8 H4 EN ISO 3580-A: E CrMo9
<b>INE B9</b> <i>9Cr - 1Mo - V - Nb</i>	Basic electrode for creep resistant steel 9CrMoVNb9-1 (P91). Heat exchangers, boilers, piping operating up to 600°C. X and J controlled factors.	AWS A5.5: E9018-B91 H4 EN ISO 3580-A: E CrMo91



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	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INE A1	C 0.04 Si 0.40 Mn 0.70 Mo 0.50	480 (T)	510-600 (T)	26 (T)	-20°C 80 J (T) -40°C 47 J (T)		
INE B2	C 0.07 Si 0.40 Mn 0.70 Cr 1.30 Mo 0.50	520 (T)	550-690 (T)	24 (T)	-20°C 90 J (T) -40°C 47 J (T)		
INE B2 L	C 0.03 Si 0.40 Mn 0.70 Cr 1.25 Mo 0.50	480 (T)	520-650 (T)	25 (T)	R.T. 150 J (T) -20°C 90 J (T) -40°C 47 J (T)		
INE B3	C 0.07 Si 0.40 Mn 0.70 Cr 2.25 Mo 1.00	580 (T)	630-720 (T)	22 (T)	R.T. 140 J (T) -30°C 47 J (T)		
INE B3 L	C 0.03 Si 0.40 Mn 0.70 Cr 2.30 Mo 1.00	520 (T)	630-720 (T)	22 (T)	R.T. 160 J (T) -30°C 47 J (T)		
INE B6	C 0.07 Si 0.40 Mn 0.70 Cr 4.50 Mo 0.50 Mo 0.50	560 (T)	580-700 (T)	22 (T)	R.T. 60 J (T)		
INE B8	C 0.07 Si 0.30 Mn 0.70 Cr 9.00 Mo 1.00	600 (T)	710 (T)	22 (T)	R.T. 60 J (T)		
INE B9	C 0.08 Si 0.20 Mn 0.70 Cr 9.00 Mo 0.95 V 0.20 N 0,05 Nb 0,05	610 (T)	620-700 (T)	22 (T)	R.T. 70 J (T)		

BASIC ELECTRODES

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength



# PRODUCTS

## SUBMERGED ARC WELDING WIRES AND FLUX

	PRODUCT	PRODUCT DESCRIPTION	NORMS
CARBON AND HSLA STEELS	<b>INESUB S1</b> + INEFLUX MP	Solid wire SAW 0.5%Mn for welding carbon steel S235/S275. Recommended flux: INEFLUX MP.	AWS A5.17: EL12 EN ISO 14171-A: S1
	<b>INESUB S2</b> + INEFLUX MP + INEFLUX SP	Solid wire SAW 1%Mn for carbon steel S355N. RINA and LR approved, available with INEFLUX MP. Improved productivity combined with INEFLUX SP.	AWS A5.17: EM12K EN ISO 14171-A: S2
	<b>INESUB S2Si</b> + INEFLUX MP + INEFLUX SP	Solid wire SAW 1%Mn with high Si for carbon steel and HSLA steel S355N/S420N. Recommended flux: INEFLUX MP for improved mechanical performance at low temperature or INEFLUX SP for higher productivity.	AWS A5.17: EM12K EN ISO 14171-A: S2Si
	<b>INESUB S3Si</b> + INEFLUX MP	Solid wire SAW with >1,5%Mn and >0.2%Si for carbon steel and HSLA steel S420N/S460N. Flows: INEFLUX MP or INEFLUX BLKV for toughness up to -60°C.	AWS A5.17: EH12K EN ISO 14171-A: S3Si
	<b>INESUB S2CU</b> + INEFLUX MP	Solid wire SAW in Ni-Cr-Cu for weathering steels (CORTEN/S355J2W). Recommended flux: INEFLUX MP.	AWS A5.23: EG EN ISO 14171-A: SZ
FLUX FOR SUBMERGED ARC	<b>INEFLUX MP</b>	Semi-basic aluminised agglomerate flux for welding carbon steel and HSLA steel. Boniszewski basicity: 1.7, Average pick-up of Si and Mn.	EN ISO 14174: S A AB 1 67 AC H5 EN 760: SA AB 1 67 AC H5*
	<b>INEFLUX SP</b>	Rutile agglomerate flux for high productivity welding of carbon steel and micro-alloy steel. Boniszewsky basicity: 0.6, Medium pick-up of Mn for welding carbon steel and HSLA steel. Boniszewsky basicity: 1.7, Average pick-up of Si and Mn.	EN ISO 14174: S A AR 1 76 AC H5



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	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS	
		FLUX	YS (MPa)*	UTS (MPa)*	El. (%)*			CVN (J)*
INESUB S1	C 0.06 Si 0.07 Mn 0.50	INEFLUX MP	>400	>500	>24	0°C >70 -20°C >50		TÜV CE UK CA
INESUB S2	C 0.10 Si 0.12 Mn 1.00	INEFLUX MP	>420	>500	>22	0°C >100 -20°C >70 -40°C >27		
INESUB S2Si	C 0.10 Si 0.20 Mn 1.00	INEFLUX SP	> 420	>500	>22	0°C >47		
		INEFLUX MP	>420	>500	>22	0°C >100 -20°C >70 -40°C >27		
INESUB S3Si	C 0.10 Si 0.30 Mn 1.70	INEFLUX MP	>420	>570	>22	0°C >100 -20°C >80 -40°C >47		TÜV CE UK CA
INESUB S2CU	C 0.10 Si 0.25 Mn 1.00 Ni 0.75 Cr 0.20 Cu 0.45	INEFLUX MP	>470	>520	>22	0°C >100 -20°C >60		
INEFLUX MP							TÜV +INESUB S2 +INESUB S2Si RINA +INESUB S2 LR +INESUB S2	
INEFLUX SP							TÜV +INESUB S2Si	

CARBON AND HSLA STEELS

FLUX FOR SUBMERGED ARC

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## SUBMERGED ARC WELDING WIRES AND FLUX

LOW ALLOY STEEL

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INESUB S2Ni1</b> + INEFLUX BLKV	Solid wire SAW 1% Ni for fine grain steel (S460ML). Optimum toughness up to -60°C with INEFLUX BLKV. Offshore platforms, gas transport.	AWS A5.23: ENi1 EN ISO 14171-A: S2Ni1
<b>INESUB S2Ni2</b> + INEFLUX BLKV	Solid wire SAW 2% Ni for Nickel-Manganese steel (11MnNi5-3) Optimum toughness up to -80°C with INEFLUX BLKV. LPG transport and storage.	AWS A5.23: ENi2 EN ISO 14171-A: S2Ni2
<b>INESUB S2Ni3</b> + INEFLUX BLKV	Solid wire SAW 3.5% Ni for Nickel-Manganese steel (A203 Gr.A). Optimum toughness up to -80°C with INEFLUX BLKV. LPG transport and storage.	AWS A5.23: ENi3 EN ISO 14171-A: S2Ni3
<b>INESUB S3NiMo</b> + INEFLUX BLKV	Solid wire SAW for high strength steel (S500QL1). Combined with INEFLUX BLKV, it produces welds with UTS ≥ 640 Mpa and good toughness at -60°C.	AWS A5.23: EG EN ISO 26304-A: S3Ni1Mo
<b>INESUB EF3</b> + INEFLUX BLKV	Solid wire SAW for high strength steel and fine grain (S460QL1/S500QL1). Combined with INEFLUX BLKV, it produces welds with UTS ≥ 640 Mpa and good toughness at -60°C.	AWS A5.23: EF3 EN ISO 26304-B: SUN2M33



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	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INESUB S2Ni1	C 0.10 Si 0.15 Mn 1.00 Ni 0.95	>440	>540	>22	0°C >150 -20°C >140 -40°C >100 -60°C >80		TÜV CE UK CA
INESUB S2Ni2	C 0.10 Si 0.15 Mn 1.00 Ni 2.25	>470	>550	>22	0°C >150 -20°C >140 -40°C >120 -60°C > 80 -80°C > 47		CE UK CA
INESUB S2Ni3	C 0.10 Si 0.15 Mn 1.00 Ni 3.50	>500	>590	>22	-20°C >160 -40°C >140 -60°C >100 -80°C >100		CE UK CA
INESUB S3NiMo	C 0.10 Si 0.15 Mn 1.50 Mo 0.50 Ni 1.00	>570	>670	>22	0°C >120 -20°C >80 -40°C >70 -60°C >47		TÜV CE UK CA
INESUB EF3	C 0.15 Si 0.15 Mn 2.30 Mo 0.50 Ni 0.90	>570	>670	>22	0°C >120 -20°C >80 -40°C >70 -60°C >47		

LOW ALLOY STEEL

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## SUBMERGED ARC WELDING WIRES AND FLUX

	PRODUCT	PRODUCT DESCRIPTION	NORMS
LOW ALLOY STEEL	<b>INESUB S2MO</b> + INEFLEX BLKV	Solid wire SAW with 0.5%Mo for creep resistant steel. Recommended flux: INEFLEX BLKV	AWS A5.23: EA2 EN ISO 14171-A: S2Mo
	<b>INESUB EB2</b> + INEFLEX BLKV	Solid wire SAW for creep resistant steel 1.25Cr – 0.5Mo (P11). Heat exchangers, boilers, piping operating up to 550°C. Flux: INEFLEX BLKV	AWS A5.23: EB2 EN ISO 24598-A: S CrMo1
	<b>INESUB EB2R</b> + INEFLEX BLKV	Copper free, solid wire SAW for creep resistant steel 1.25Cr – 0.5Mo (P11). Controlled chemical (R) with low impurities, Xfmax = 15. Flux: INEFLEX BLKV	AWS A5.23: EB2R EN ISO 24598--A: S CrMo1
	<b>INESUB EB3</b> + INEFLEX BLKV	Solid wire SAW for creep resistant steel 2.25Cr – 1Mo (P22). Petrochemical with operation up to 600°C. Flux: INEFLEX BLKV	AWS A5.23: EB3 EN ISO 24598-A: S CrMo2
	<b>INESUB EB3R</b> + INEFLEX BLKV	Copper free, solid wire SAW for creep resistant steel 2.25Cr – 1Mo (P22). Controlled chemical (R) with low impurities, Xfmax = 15. Flux: INEFLEX BLKV	AWS A5.23: EB3R EN ISO 24598-A: S CrMo2
FLUX FOR SUBMERGED ARC	<b>INEFLEX BLKV</b>	Basic agglomerate flux for low-alloy steel welding. Boniszewsky basicity: 3.2. Neutral for Si and Mn.	EN ISO 14174: SA FB 1 55 AC H5



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INESUB S2M0	C 0.10 Si 0.10 Mn 1.10 Mo 0.55	>450 (T)	>560 (T)	>20 (T)	0°C >120 (T) -20°C >100 (T) -40°C >47 (T)		TÜV  
INESUB EB2	C 0.12 Si 0.15 Mn 0.80 Cr 1.10 Mo 0.50	>470 (T)	>560 (T)	>22 (T)	0°C >120 (T) -20°C >80 (T) -40°C >40 (T)		TÜV  
INESUB EB2R	C 0.12 Si 0.15 Mn 0.80 Cr 1.10 Mo 0.50	>470 (T)	>560 (T)	>22 (T)	0°C >120 (T) -20°C >80 (T) -40°C >40 (T)		
INESUB EB3	C 0.12 Si 0.15 Mn 0.60 Cr 2.50 Mo 1.00	>470 (T)	>560 (T)	>22 (T)	0°C >120 (T) -40°C >40 (T)		TÜV  
INESUB EB3R	C 0.12 Si 0.15 Mn 0.60 Cr 2.50 Mo 1.00	>470 (T)	>560 (T)	>22 (T)	0°C >120 (T) -40°C >40 (T)		
INEFLUX BLKV							

LOW ALLOY STEEL

FLUX FOR SUBMERGED ARC

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength



# PRODUCTS

## WIRES FOR SUBMERGED ARC

	PRODUCT	PRODUCT DESCRIPTION	NORMS
LOW ALLOY STEEL	<b>INESUB EB6</b> + INEFLUX BHA	Solid wire SAW for creep resistant steel 5Cr-0.5Mo (12 CrMo 19-5). Recommended flux: INEFLUX BHA.	AWS A5.23: EB6 EN ISO 24598-A: S CrMo5
	<b>INESUB EB8</b> + INEFLUX BHA	Solid wire SAW for creep resistant steel 9Cr-1Mo (P9). Heat exchangers, boilers, piping with operating T up to 600°C. Recommended flux: INEFLUX BHA.	AWS A5.23: EB8 EN ISO 24598-A: S CrMo9
	<b>INESUB EB9</b> + INEFLUX BHA	Copper free solid wire SAW for creep resistant steel 9CrMoVNb9-1(P91) Heat exchangers, boilers, piping with operating temperatures up to 600°C. Recommended flux: INEFLUX BHA.	AWS A5.23: EB91 EN ISO 24598-A: S CrMo91
	<b>INESUB EB9LowNi</b> + INEFLUX BHA	Copper free, solid wire SAW with Nickel base for creep resistant steel 9CrMoVNb9-1 (P91). Ni + Mn < 1% allows you to carry out PWHT at higher temperatures.	AWS A5.23: EB91
FLUX FOR SUBMERGED ARC	<b>INEFLUX BHA</b>	Semi-basic flux for welding austenitic stainless steel and Cr-Mo high alloys. Boniszewsky basicity: 1.3, Low pick-up of Si and burn-out of Mn.	ISO 14174 -S F CS 2 5742 DC (stainless steel) ISO 14174 -S F CS 1 63 DC (stainless steel)



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INESUB EB6	C 0.07 Si 0.40 Mn 0.50 Cr 5.60 Mo 0.55	>470 (T)	>600 (T)	>718 (T)	RT > 70 (T)		TÜV CE CCK CA
INESUB EB8	C 0.07 Si 0.35 Mn 0.50 Cr 9.00 Mo 1.00	> 470 (T)	>600 (T)	>17 (T)	RT > 47 (T)		TÜV
INESUB EB9	C 0.10 Si 0.20 Mn 0.60 Cr 8,80 Mo 0.95 V 0.20 Ni 0.60 N 0,05 Nb 0,06	> 540 (T)	>660 (T)	>17 (T)	RT > 47 (T)		TÜV CE CCK CA
INESUB EB9LowNi	C 0.09 Si 0.20 Mn 0.60 Cr 8.80 Mo 0.95 V 0.20 Ni 0.03 N 0,05 Nb 0,08	> 540 (T)	>660 (T)	>17 (T)	RT > 47 (T)		
INEFLUX BHA							

LOW ALLOY STEEL

FLUX FOR SUBMERGED ARC

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## STAINLESS STEEL

MIG/MAG SOLID WIRES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INEFIL INOX 307 SI</b> <i>AISI 307</i>	ER307 stainless steel solid wire suitable for heterogeneous welds, steel with 13% Mn (Hadfield type), buffer layers for cladding.	AWS A5.9: ER307 EN ISO 14343-A: G 18 8 Mn
<b>INEFIL INOX 308 LSi</b> <i>AISI 308</i> <i>Wr.Nr. 1.4316</i>	ER308LSi solid stainless steel wire for AISI 304. The low carbon provides good intergranular corrosion resistance. Increased silicon for better control of the weld pool.	AWS A5.9: ER308LSi EN ISO 14343-A: G 19 9 L Si
<b>INEFIL INOX 309 LSi</b> <i>AISI 309</i>	ER309LSi solid stainless steel wire for AISI 309. Also suitable for heterogeneous welds and buffer layers for cladding.	AWS A5.9: ER309LSi EN ISO 14343-A: G 23 12 L Si
<b>INEFIL INOX 310</b> <i>AISI 310</i> <i>Wr.Nr.1.4841</i>	ER310 solid stainless steel wire for welding AISI 310. It is used on pressure vessels and exchangers in the petrochemical industry.	AWS A5.9: ER310 EN ISO 14343-A: G 25 20
<b>INEFIL INOX 312</b> <i>AISI 312 - WELDALL</i>	ER312 (WeldAll) solid stainless steel wire for heterogeneous welds, for steels with Mn13% (Hadfield) and hard to weld high-carbon steels.	AWS A5.9: ER312 EN ISO 14343-A: G 29 9
<b>INEFIL INOX 316 LSi</b> <i>AISI 316</i> <i>Wr.Nr. 1.4430</i>	Low carbon ER316LSi solid wire for AISI 316. The low carbon provides good intergranular corrosion resistance. Increased silicon for better control of the weld pool.	AWS A5.9: ER316LSi EN ISO 14343-A: G 19 12 3 L Si



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INEFIL INOX 307 SI	C 0,05 Si 0.70 Mn 6.80 Ni 8.00 Cr 18.50 Mo 0.10	M13	490	650	34	R.T. >47 J		TÜV DB CE UK CA
INEFIL INOX 308 LSI	C 0,03 Si 0.85 Mn 1.80 Ni 10.00 Cr 20.00 Mo 0.10	M13	440	580	42	R.T. >47 J		TÜV DB CE UK CA
INEFIL INOX 309 LSI	C 0,02 Si 0.70 Mn 1.80 Ni 14.00 Cr 24.00 Mo 0.10	M13	440	560	40	R.T. >47 J		CE UK CA
INEFIL INOX 310	C 0,10 Si 0.40 Mn 1.80 Ni 21.00 Cr 26.00 Mo 0.20	M13	355	610	35			
INEFIL INOX 312	C 0,10 Si 0.40 Mn 1.80 Ni 9.20 Cr 30.00 Mo 0.20	M13	450	660	22			
INEFIL INOX 316 LSI	C 0,02 Si 0.80 Mn 1.70 Ni 12.20 Cr 18.50 Mo 2.50	M13	440	560	40	R.T. >47 J		TÜV DB CE UK CA

MIG/MAG SOLID WIRES

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## STAINLESS STEEL

TIG RODS

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INETIG INOX 307 SI</b> <i>HADFIELD 12%Mn</i>	ER307 stainless steel TIG rod suitable for heterogeneous welds, steel with 13% Mn (Hadfield type), bearing layers and buffer layers in cladding.	AWS A5.9: ER307 EN ISO 14343-A: W 18 8 Mn
<b>INETIG INOX 308 LSI</b> <i>AISI 308</i> <i>Wr.Nr. 1.4316</i>	ER308LSi stainless steel TIG rod for AISI 304. The low carbon provides good intergranular corrosion resistance. Increased silicon for better control of the weld pool.	AWS A5.9: ER308LSi EN ISO 14343-A: W 19 9 L Si
<b>INETIG INOX 309 LSI</b> <i>AISI 309</i>	ER309LSi stainless steel TIG rod for AISI 309. Also suitable for heterogeneous welds and buffer layers for cladding.	AWS A5.9: ER309LSi EN ISO 14343-A: W 23 12 L Si
<b>INETIG INOX 316 LSI</b> <i>AISI 316</i> <i>Wr.Nr. 1.4430</i>	ER316LSi stainless steel TIG rod for AISI 316. The low carbon provides good intergranular corrosion resistance. Increased silicon for better control of the weld pool.	AWS A5.9: ER316LSi EN ISO 14343-A: W 19 12 3 L Si



Scan the QR code to download the technical data sheet of the product.



INEFIL INOX 307 SI

INETIG INOX 308 LSI

INETIG INOX 309 LSI

INETIG INOX 316 LSI

**TYPICAL CHEMICAL ANALYSIS**

C 0,07  
Si 0.85  
Mn 7.00  
Ni 8.00  
Cr 18.50

C 0,025  
Si 0.85  
Mn 1.80  
Ni 10.00  
Cr 20.00

C 0,02  
Si 0.70  
Mn 1.80  
Ni 14.00  
Cr 24.00  
Mo 0.10

C 0,02  
Si 0.80  
Mn 1.70  
Ni 12.20  
Cr 18.50  
Mo 2.50

**GAS**

I1

I1

I1

I1

**TYPICAL MECHANICAL CHARACTERISTICS  
(T = after heat treatment)**

YS (MPa)\*    UTS (MPa)\*    El. (%)\*    CVN (J)\*

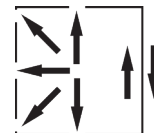
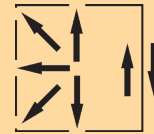
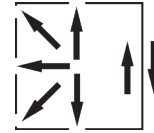
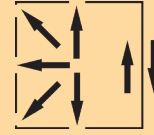
500    660    34

470    640    36    R.T. >47 J

420    620    42    R.T. >47 J

490    670    34    R.T. >47 J

**WELDING POSITIONS**



**APPROVALS**

TÜV DB  
CE  
UK  
CA

TÜV DB  
CE  
UK  
CA

TIG RODS

(\*) YS (MPa): El. yield strength (%): Elongation % 5d    CVN (J): Average toughness  
UTS (MPa): Tensile strength



# PRODUCTS

## STAINLESS STEEL

ELECTRODES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INOX 307</b> <i>HADFIELD 12%Mn</i>	Semi-basic electrode suitable for heterogeneous welds, steels with 13% Mn (Hadfield type) and buffer layers in hardfacing.	AWS A5.4: E307-16 EN ISO 3581-A: E 18 9 Mn Mo R
<b>INOX 308 RLC</b>	Rutile electrode for AISI 304. The low carbon content offers good resistance against intergranular corrosion.	AWS A5.4: E308L-17 EN ISO 3581-A: E 19 9 L R
<b>INOX 309 RLC</b>	Low carbon rutile electrode for AISI 309. Also suitable for heterogeneous welds and buffer layers in hardfacing.	AWS A5.4: E309L-16 EN ISO 3581-A: E 23 12 L R
<b>INOX 310 R</b>	Rutile electrode for welding AISI 310. It is used on pressure vessels and exchangers in the petrochemical industry.	AWS A5.4: E310-16 EN ISO 3581-A: E 25 20 R
<b>INOX 312 R</b> <i>WELDALL</i>	Rutile electrode for heterogeneous welds between stainless steel and carbon steel, for steel with Mn13% (Hadfield) and high carbon steel difficult to weld.	AWS A5.4: E312-16 EN ISO 3581-A: E 29 9 R
<b>INOX 316 RLC</b>	Rutile electrode for AISI 316. The low carbon content offers good resistance against intergranular corrosion.	AWS A5.4: E316L-17 EN ISO 3581-A: E 19 12 3 L R



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS
		YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*		
INOX 307	C 0,10 Mn 3.80 Si 0.80 Cr 20.00 Ni 10.00 Mo 0.60	450	620	35			
INOX 308 RLC	C 0,03 Mn 0.70 Si 0.70 Cr 19.00 Ni 10.00	350	520	35			
INOX 309 RLC	C 0,03 Mn 1.30 Si 0.80 Cr 24.00 Ni 13.00	440	600	32			
INOX 310 R	C 0.10 Mn 1.80 Si 0.60 Cr 27.00 Ni 21.00	450	580	30	R.T. 60J		
INOX 312 R	C 0.10 Mn 1.20 Si 0.80 Cr 30.00 Ni 10.00	610	760	23	R.T. 35J		
INOX 316 RLC	C 0.03 Mn 1.00 Si 0.70 Cr 18.00 Ni 12.00 Mo 2.70	440	580	35			

ELECTRODES

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS

## ALUMINIUM ALLOYS

	PRODUCT	PRODUCT DESCRIPTION	NORMS
MIG/MAG SOLID WIRES	<b>INEFIL AL5%SI - 4043</b> <i>Wr.Nr. 3.2245</i>	Solid wire 5%Si for aluminium series 6XXX. High resistance to hot cracking under high dilution conditions and binding joints.	AWS A5.10: ER4043 EN ISO 18273: S AISi5 EN ISO 18273: S Al 4043
	<b>INEFIL AL5%MG</b> <i>Wr.Nr. 3.3556</i>	Solid wire 5% Mg for aluminium series 6XXX and 5XXX. Welds with good appearance and better resistance to corrosion.	AWS A5.10: ER5356 EN ISO 18273: S AlMg5Cr(A) EN ISO 18273: S Al 5356
TIG RODS	<b>INETIG AL5%SI</b> <i>Wr.Nr. 3.2245</i>	TIG rod 5%Si for aluminium series 6XXX. High resistance to hot cracking under high dilution conditions and binding joints.	AWS A5.10: ER4043 EN ISO 18273: S AISi5 EN ISO 18273: S Al 4043
	<b>INETIG AL5%MG</b> <i>Wr.Nr. 3.3556</i>	TIG rod 5% Mg for aluminium series 6XXX and 5XXX. Welds with good appearance and better resistance to corrosion.	AWS A5.10: ER5356 EN ISO 18273: S AlMg5Cr(A) EN ISO 18273: S Al 5356
ELECTRODES	<b>INE AL5%Si</b>	Electrode 5%Si for aluminium series 6XXX. High resistance to hot cracking under high dilution conditions and binding joints.	AWS A5.3: E4043



Scan the QR code to download the technical data sheet of the product.



	TYPICAL CHEMICAL ANALYSIS	GAS	TYPICAL MECHANICAL CHARACTERISTICS (T = after heat treatment)				WELDING POSITIONS	APPROVALS	
			YS (MPa)*	UTS (MPa)*	El. (%)*	CVN (J)*			
INEFIL AL5%SI - 4043	Mn 0.01 Si 5.00 Fe 0.14 Al Bal.	I1	40	150	10		CE UK CA	MIG/MAG SOLID WIRES	
	Mn 0.15 Mg 5.00 Fe 0.13 Cr 0.14 Al Bal.	I1	110	240	17				
INETIG AL5%SI - 4043	Mn 0.01 Si 5.00 Fe 0.14 Al Bal.	I1	40	120	8		CE UK CA	TIG RODS	
	Mn 0.15 Mg 5.00 Fe 0.13 Cr 0.14 Al Bal.	I1	120	250	18				
INE AL5%SI	Mn 0.04 Si 5.00 Mg 0.04 0.08 Fe 0.30 Cu 0.05 Al Rem.							ELECTRODES	

(\*) YS (MPa): El. yield strength (%): Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength

# PRODUCTS CAST IRON

ELECTRODES

PRODUCT	PRODUCT DESCRIPTION	NORMS
<b>INE MONEL</b>	Basic graphite electrode with MONEL alloy core (ENiCu-B) for cold welding of cast iron. Used to repair casts and jets.	AWS A5.15: ENiCu-B
<b>INE NICHEL</b>	Basic graphite electrode with Nickel core (eni-CI) for cold welding of cast iron or with preheating (max 300 C). Used for buffer layers on hardfacing.	AWS A5.15: ENi-CI
<b>INE Ni-Fe</b>	Basic graphite electrode with Nickel-Iron (ENiFe-CI) core for welding grey cast iron, malleable cast iron and cast-steel couplings.	AWS A5.15: ENiFe-CI
<b>INE GHISA</b>	Basic graphite electrode with iron core (E C Fe-1) for welding cast iron.	EN ISO 1071: E C Fe-1



# PRODUCTS HARDFACING

	PRODUCT	PRODUCT	NORMS
MIG/MAG SOLID WIRES	<b>INEFIL 350</b> <i>Wr.Nr. 1.7363</i>	Solid wire for hardfacing (Wr.Nr.~ 1.7363) with an all weld hardness of 350 HB (38 HRC). Good resistance against abrasion and impact. Deposit free of cracks.	
	<b>INEFIL 600</b> <i>Wr.Nr. 1.4718</i>	Solid wire for hardfacing (Wr.Nr. 1.4718) with all weld hardness of 600 HB (57 HRC). Good resistance against abrasion and impact. Deposit free of cracks.	EN 14700: S Fe8
FLUX CORED WIRES FOR HARDFACING	<b>INETUB MHF 600</b>	Metal cored wire for hardfacing 600HB (60HRC). Optimum resistance against abrasion from friction and impact.	EN 14700: T Fe8
ELECTRODES	<b>INE RD 600</b>	Basic electrode for hardfacing with All Weld hardness 600 HB (57 HRC). Good resistance against abrasion and impact. Deposit free of cracks.	EN 14700: E Fe4





Scan the QR code to download the technical data sheet of the product.



	<b>NORMS</b>	<b>GAS</b> <b>TYPICAL MECHANICAL CHARACTERISTICS</b> ( T = after heat treatment ) YS (MPa)* UTS (MPa)* El. (%)* CVN (J)* HARDNESS (HRc, HB)	<b>WELDING POSITIONS</b>	<b>APPROVALS</b>
INEFIL 350	C 0.07 Si 0.40 Mn 0.50 Cr 5.80 Mo 0.60	M21    HB 350		
INEFIL 600	C 0.45 Si 3.00 Mn 0.40 Cr 9.50	M21    HRc 58		
INETUB MHF 600	C 0.55 Si 0.60 Mn 1.40 Cr 5.60 Mo 0.80	    HRc 56		
INE RD 600	C 0.40 Mn 1.90 Cr 2.80	    HRc 56		

MIG/MAG SOLID WIRES

FLUX CORED WIRES FOR HARDFACING

ELECTRODES

(\*) YS (MPa): El. yield strength (%) : Elongation % 5d CVN (J): Average toughness  
UTS (MPa): Tensile strength



A large decorative graphic on the left side of the page. It features a solid yellow vertical bar on the far left, followed by a series of concentric, semi-circular lines in shades of gray and yellow that curve towards the right. The background is a dark gray.

## PACKAGING

# PACKAGING MIG/MAG WIRES

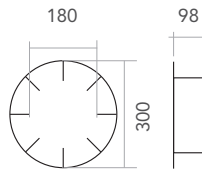
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## K 300

**STEEL**

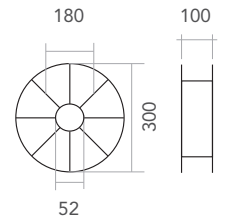
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## BS 300

**STEEL**

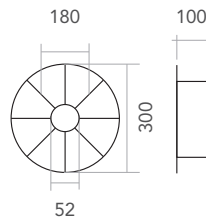
Net weight 15 kg



## BS 300

**STEEL**

Only for INEFIL NR and INEFIL 19.12  
NR Net weight 18 kg



# MIG/MAG WIRES / FLUX CORED WIRE

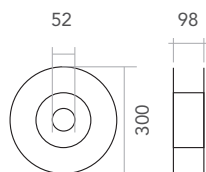
**PALLET:** 72 SPOOLS OF 15KG PER PALLET



## D 300

**PLASTIC**

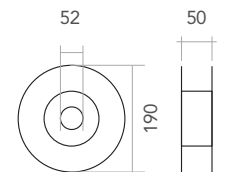
Net weight 15 kg



## D 200

**PLASTIC**

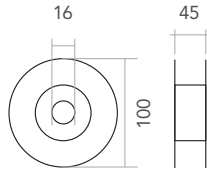
Net weight 5 kg





**D 100**  
**PLASTIC**

Net weight 0.45 kg - 0.90 kg - 1kg



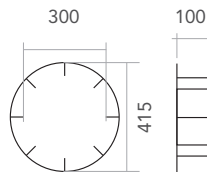
**SUBMERGED ARC**

**PALLET: 40 SPOOLS OF 25KG PER PALLET**



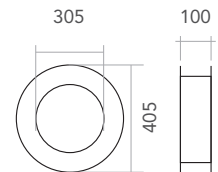
**K 415/25**  
**STEEL**

Net weight 25 kg



**D 400/25**  
**PLASTIC**

Net weight 25 kg



**MIG/MAG WIRE / SUBMERGED ARC / FLUX CORED WIRE**

**PALLET: 4 DRUMS 250 - 2 DRUMS 350 - 1 DRUM 500**

**DRUM**  
**BOX**

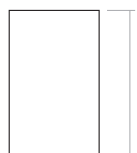
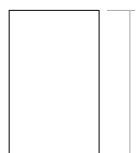
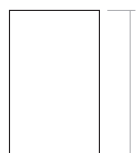


**MIG/MAG WIRES / FLUX CORED WIRE**

Weight 250kg

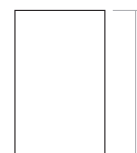
Weight 350kg

Weight 500kg



**SUBMERGED ARC WIRE**

Weight 300kg



**COVER**

In cardboard for drum  
250 kg

In cardboard with metal closure  
350 kg and 500 kg

# PACKAGING ELECTRODES



## PACKET

Dimensions 66x40x300 mm  
66x40x350 mm  
66x78x300 mm  
66x78x350 mm  
66x78x450 mm



## TIG RODS

Dimensions 1045mm x 45 mm diameter  
Weight 5kg

Packaging: box 50 pcs - 250 kg 1060x390x300 mm  
box 100 pcs - 500 kg 1040x362x700 mm



## BLISTER

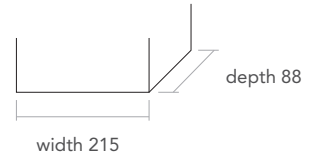
Dimensions 415x275x125 mm



## BOX

Contains 6 packets 66x40 mm  
or Vacuum  
3 packets 66x78 mm  
or Vacuum

Lengths 330 / 380 / 480 mm



## TUBE FOR ELECTRODES

Dimensions 67x31x300 mm  
67x31x350 mm  
67x31x450 mm



## VACUUM

Dimensions 375x85x368 mm  
375x85x394 mm







# PACKAGING ELECTRODES

ELECTRODES

PRODUCT	ø (mm)	L (mm)	PIECES PER KG (~)	PACKAGING	DIM. PACKET <sup>(*)</sup>	PACKET NET WEIGHT (kg)(~)	PIECES PER PACKET (~)
<b>INE 45</b>	1.6	300	140.0	PACKET	A	2.0	280
	2	300	90.0	PACKET	C	3.9	350
	2.5	300	61.0	PACKET	C	3.8	230
	3.2	450	24.0	PACKET	E	6.2	150
	4	450	16.0	PACKET	E	6.2	100
	5	450	10.0	PACKET	E	6.2	60
<b>INE 46 (blue)</b>	2.5	350	54.0	PACKET	D	5.0	270
	3.2	350	35.0	PACKET	D	5.0	175
	4	350	23.0	PACKET	D	5.0	115
	2.5	350	54.0	PACKET	B	2.5	135
	3.2	350	35.0	PACKET	B	2.5	88
	4	350	23.0	PACKET	B	2.5	58
<b>INE 47</b>	2	300	90.0	PACKET	C	3.9	350
	2.5	300	53.0	PACKET	C	4.3	230
	3.2	450	23.0	PACKET	E	6.5	150
	4	450	16.0	PACKET	E	6.2	100
	5	450	10.0	PACKET	E	6.0	60
<b>INE 48 A (red)</b>	2	300	90.0	PACKET	C	3.9	350
	2.5	300	59.0	PACKET	C	3.8	230
	3.2	450	24.0	PACKET	E	6.0	150
<b>INE 50B</b>	2	300	83.0	PACKET	C	4.2	350
	2.5	300	50.0	PACKET	C	4.8	240
	2.5	350	42.0	PACKET	D	5.0	210
	3.2	350	27.0	PACKET	D	5.0	135
	3.2	450	21.0	PACKET	E	6.7	140
	4	350	19.0	PACKET	D	5.0	96

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450

<b>DIM. BOX</b> (*2)	<b>PACKETS PER BOX</b>	<b>BOX NET WEIGHT (kg)(~)</b>	<b>PIECES PER BOX (~)</b>	<b>BOX PER PALLET</b>	<b>PALLET NET WEIGHT (kg)(~)</b>	<b>PIECES PER PALLET (~)</b>
A	6	12.0	1,680	72	864	120,960
A	3	11.7	1,050	72	842	75,600
A	3	11.4	690	72	821	49,680
C	3	18.6	450	54	1,004	24,300
C	3	18.6	300	54	1,004	16,200
C	3	18.6	180	54	1,004	9,720
B	3	15.0	810	72	1,080	58,320
B	3	15.0	525	72	1,080	37,800
B	3	15.0	345	72	1,080	24,840
B	6	15.0	810	72	1,080	58,320
B	6	15.0	528	72	1,080	38,016
B	6	15.0	348	72	1,080	25,056
A	3	11.7	1,050	72	842	75,600
A	3	12.9	690	72	929	49,680
C	3	19.5	450	54	1,053	24,300
C	3	18.6	300	54	1,004	16,200
C	3	18.0	180	54	972	9,720
A	3	11.7	1,050	72	842	75,600
A	3	11.4	690	72	821	49,680
C	3	18.0	450	54	972	24,300
A	3	12.6	1,050	72	907	75,600
B	3	14.4	720	72	1,037	51,840
B	3	15.0	630	72	1,080	45,360
B	3	15.0	405	72	1,080	29,160
C	3	20.1	420	54	1,085	22,680
B	3	15.0	288	72	1,080	20,736

# PACKAGING ELECTRODES

PRODUCT	∅ (mm)	L (mm)	PIECES PER KG (~)	PACKAGING	DIM. PACKET (*)	PACKETS NET WEIGHT (kg)(~)	PIECES PER PACKET (~)
<b>INE 50 B</b>	4	450	15,0	PACKET	E	5,3	80
	5	450	10,0	PACKET	E	5,0	50
<b>INE 55 B</b>	2	300	83,0	PACKET	C	4,0	350
	2,5	300	50,0	PACKET	C	4,7	240
	2,5	350	42,0	PACKET	D	5,0	210
	3,2	350	27,0	PACKET	D	5,0	135
	3,2	450	21,0	PACKET	E	7,0	140
	4	350	19,0	PACKET	D	5,0	95
	4	450	15,0	PACKET	E	5,6	80
	5	450	10,0	PACKET	E	5,0	50
	2	300	83,0	VACUUM	F	2,0	166
	2,5	300	50,0	VACUUM	F	2,0	100
	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	3,2	450	21,0	VACUUM	H	2,5	53
	4	350	19,0	VACUUM	G	2,0	38
	4	450	15,0	VACUUM	H	2,5	38
	5	450	10,0	VACUUM	H	2,5	25
	<b>INE 57 B CNC</b>	2,5	300	50,0	VACUUM	F	2,0
2,5		350	42,0	VACUUM	G	2,0	84
3,2		350	27,0	VACUUM	G	2,0	54
3,2		450	21,0	VACUUM	H	2,5	42
4		350	19,0	VACUUM	G	2,0	38
4		450	15,0	VACUUM	H	2,5	38
5		450	10,0	VACUUM	H	2,5	25

ELECTRODES

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450

<b>DIM. BOX</b> (*2)	<b>PACKETS PER BOX</b>	<b>BOX NET WEIGHT (kg)(~)</b>	<b>PIECES PER BOX (~)</b>	<b>BOXES PER PALLET</b>	<b>PALLET NET WEIGHT (kg)(~)</b>	<b>PIECES PER PALLET (~)</b>
C	3	15,9	240	54	859	12.960
C	3	15,0	150	54	810	8.100
A	3	12,0	1.050	72	864	75.600
B	3	14,1	720	72	1.015	51.840
B	3	15,0	630	72	1.080	45.360
B	3	15,0	39	72	1.080	2.808
C	3	21,0	420	54	1.134	22.680
B	3	15,0	282	72	1.080	20.304
C	3	16,8	240	54	907	12.960
C	3	15,0	144	54	810	7.776
A	6	12,0	996	72	864	71.712
B	6	12,0	600	72	864	43.200
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	15,0	318	72	1.080	22.896
B	6	12,0	228	72	864	16.416
B	6	15,0	228	72	1.080	16.416
C	6	15,0	150	54	810	8.100
A	6	12,0	600	72	864	43.200
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	15,0	318	72	1.080	22.896
B	6	12,0	228	72	864	16.416
C	6	15,0	228	54	810	12.312
C	6	15,0	150	54	810	8.100

# PACKAGING ELECTRODES

PRODUCT	ø (mm)	L (mm)	PIECES PER KG (~)	PACKAGING	DIM. PACKET <sup>(*)</sup>	PACKETS NET WEIGHT (kg)(~)	PIECES PER PACKET (~)
<b>INE 80 B</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
<b>INE A 1</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
<b>INE AR 150</b>	3,2	450	14,5	ASTUCCIO	E	7,0	100
	4	450	10,0	ASTUCCIO	E	7,0	70
	5	450	6,3	ASTUCCIO	E	7,0	45
<b>INE B2</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
<b>INE B2 L</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
<b>INE B3</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
<b>INE B3 L</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38

ELECTRODES

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450

<b>DIM. BOX (*2)</b>	<b>PACKETS PER BOX</b>	<b>BOX NET WEIGHT (kg)(~)</b>	<b>PIECES PER BOX (~)</b>	<b>BOXES PER PALLET</b>	<b>PALLET NET WEIGHT (kg)(~)</b>	<b>PIECES PER PALLET (~)</b>
B	6	12,0	504	72	864	36.288
C	6	12,0	324	54	648	17.496
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
C	3	21,0	300	54	1.134	16.200
C	3	21,0	210	54	1.134	11.340
C	3	21,0	135	54	1.134	7.290
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
B	6	15,0	150	72	1.080	10.800
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416

# PACKAGING ELECTRODES

PRODUCT	ø (mm)	L (mm)	PIECES PER KG (~)	PACKAGING	DIM. PACKET <sup>(*)</sup>	PACKETS NET WEIGHT (kg)(~)	PIECES PER PACKET (~)
<b>INE B3 L</b>	5	450	10,0	VACUUM	H	2,5	25
<b>INE B6</b>	2,5	350	42,0	VACUUM	G	2,0	84
	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
	2,5	350	42,0	VACUUM	G	2,0	84
<b>INE B8</b>	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
	2,5	350	42,0	VACUUM	G	2,0	84
<b>INE B9</b>	3,2	350	27,0	VACUUM	G	2,0	54
	4	350	19,0	VACUUM	G	2,0	38
	5	450	10,0	VACUUM	H	2,5	25
	2,5	350	42,0	VACUUM	G	2,0	84
<b>INE C3</b>	4	350	27,0	VACUUM	G	2,0	54
	4	350	27,0	VACUUM	G	2,0	54
	5	450	10,0	VACUUM	H	2,5	25
	2,5	300	74,0	ASTUCCIO	C	2,0	145
<b>INE MONEL</b>	2,5	300	55,0	VACUUM	F	2,0	110
	3,2	350	30,0	VACUUM	G	2,0	60
<b>INE NICHEL</b>	2,5	350	47,0	VACUUM	G	2,0	94
	3,2	350	32,0	VACUUM	G	2,0	64
<b>INE NI-FE</b>	2,5	300	62,0	VACUUM	F	2,0	124
	3,2	350	32,0	VACUUM	G	2,0	64
	4	350	21,0	VACUUM	G	2,0	42
<b>INE RB 86</b>	2,5	350	50,0	VACUUM	G	2,0	95

ELECTRODES

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450



<b>DIM. BOX (*2)</b>	<b>PACKETS PER BOX</b>	<b>BOX NET WEIGHT (kg)(~)</b>	<b>PIECES PER BOX (~)</b>	<b>BOX PER PALLET</b>	<b>PALLET NET WEIGHT (kg)(~)</b>	<b>PIECES PER PALLET (~)</b>
B	6	15,0	150	72	1.080	10.800
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
B	6	12,0	228	72	864	16.416
C	6	15,0	150	54	810	8.100
B	6	12,0	504	72	864	36.288
B	6	12,0	324	72	864	23.328
C	6	12,0	324	54	648	17.496
C	6	15,0	150	54	810	8.100
A	3	6,0	435	72	432	31.320
A	6	12,0	660	72	864	47.520
B	6	12,0	360	72	864	25.920
B	6	12,0	564	72	864	40.608
B	6	12,0	384	72	864	27.648
A	6	12,0	744	72	864	53.568
B	6	12,0	384	72	864	27.648
B	6	12,0	252	72	864	18.144
B	6	12,0	12	72	864	864

# PACKAGING ELECTRODES

PRODUCT	ø (mm)	L (mm)	PIECES PER KG (~)	PACKAGING	DIM. PACKET(*)	PACKETS NET WEIGHT (kg)(~)	PIECES PER PACKET (~)
<b>INE RB 86</b>	3,2	350	30,0	VACUUM	G	2,0	60
	4	350	19,0	VACUUM	G	2,0	38
	3,2	450	24,0	VACUUM	G	2,0	48
<b>INE RD 600</b>	2,5	300	50,0	PACKET	C	4,8	240
	3,2	350	27,0	PACKET	D	5,0	135
	3,2	450	21,0	PACKET	E	6,7	140
	4	450	15,0	PACKET	E	5,3	80
	5	450	10,0	PACKET	E	5,0	50
<b>INE SUPER</b>	2	300	90,0	PACKET	C	5,0	450
	2	350	75,0	PACKET	D	5,0	370
	2,5	350	54,0	PACKET	D	5,0	270
	3,2	350	35,0	PACKET	D	5,0	175
	4	350	23,0	PACKET	D	5,0	115
	1,6	300	140,0	PACKET	A	2,5	350
	2	300	90,0	PACKET	A	2,5	225
	2	350	75,0	PACKET	B	2,5	188
	2,5	350	54,0	PACKET	B	2,5	135
	3,2	350	35,0	PACKET	B	2,5	88
4	350	23,0	PACKET	B	2,5	58	
<b>INE VERTICAL</b>	2	300	94,0	PACKET	C	5,0	470
	2,5	350	54,0	PACKET	D	5,0	270
	3,2	350	30,0	PACKET	D	5,0	150
	4	350	22,0	PACKET	D	5,0	110

ELECTRODES

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450

<b>DIM. BOX</b> (*2)	<b>PACKETS PER BOX</b>	<b>BOX NET WEIGHT (kg)(~)</b>	<b>PIECES PER BOX (~)</b>	<b>BOX PER PALLET</b>	<b>PALLET NET WEIGHT (kg)(~)</b>	<b>PIECES PER PALLET (~)</b>
B	6	12,0	12	72	864	864
B	6	12,0	12	72	864	864
B	6	12,0	12	72	864	864
B	3	14,4	14	72	1.037	1.037
B	3	15,0	15	72	1.080	1.080
C	3	20,1	20	54	1.085	1.085
C	3	15,9	16	54	859	859
C	3	15,0	15	54	810	810
A	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
A	6	15,0	2.100	72	1.080	151.200
A	6	15,0	1.350	72	1.080	97.200
B	6	15,0	1.128	72	1.080	81.216
B	6	15,0	810	72	1.080	58.320
B	6	15,0	528	72	1.080	38.016
B	6	15,0	348	72	1.080	25.056
A	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080
B	3	15,0	15	72	1.080	1.080

# PACKAGING ELECTRODES


ELECTRODES

PRODUCT	ø (mm)	L (mm)	PACKAGING	PIECES PER BLISTER (~)	DIM. BOX (*)	BLISTERS PER BOX	PIECES PER BOX	BOXES PER PALLET
<b>INE 45</b>	1.6	300	BLISTER	20	A	25	500	54
	2.0	300	BLISTER	25	A	25	625	54
	2	300	BLISTER	50	A	25	1250	54
	2,5	300	BLISTER	50	A	25	1250	54
	2.5	300	BLISTER	14	A	25	350	54
<b>INE NI-FE</b>	2.5	300	BLISTER	11	A	25	275	54
	3.2	350	BLISTER	9	A	25	225	54
<b>INE SUPER</b>	1.6	300	BLISTER	20	A	25	500	54
	2.0	350	BLISTER	25	A	25	625	54
	2.0	350	BLISTER	50	A	12	600	54
	2.5	350	BLISTER	14	A	25	350	54
	2.5	350	BLISTER	50	A	10	500	54
	3.2	350	BLISTER	9	A	25	225	54
	3.2	350	BLISTER	55	A	10	550	54
	4.0	350	BLISTER	6	A	25	150	54
<b>INOX 308 RLC</b>	2.0	300	BLISTER	12	A	25	300	54
	2.5	300	BLISTER	10	A	25	250	54
	3.2	350	BLISTER	8	A	25	200	54
<b>INOX 312 R</b>	2.0	300	BLISTER	12	A	25	300	54
	2.5	300	BLISTER	10	A	25	250	54
	3.2	350	BLISTER	8	A	25	200	54
<b>INOX 316 RLC</b>	2.0	300	BLISTER	12	A	25	300	54
	2.5	300	BLISTER	10	A	25	250	54
	3.2	300	BLISTER	8	A	25	200	54

(\*) PACKETS A: 66x40x300 B: 66x40x350 C: 66x78x300 D: 66x78x350 E: 66x78x450  
VACUUM F: 67x31x300 G: 67x31x350 H: 67x31x450

PRODUCT	ø (mm)	L (mm)	PCS-KG (~)	PACKAGING	NET TUBE WEIGHT (kg)(~)	PIECES PER TUBE	DIM. BOX (*)	TUBE per BOX	PIECES per BOX	NET WEIGHT	BOX per PAL	PALLET NET WEIGHT (~)
<b>INE ALL.5%</b>	2,5	350	111	TUBO	2	222	B	4	888	8	72	576
	3,2	350	75	TUBO	2	149	B	4	596	8	72	576
<b>INOX 307</b>	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	75	B	4	300	10	72	720
	4	350	20	TUBO	2,5	50	B	4	200	10	72	720
<b>INOX 308 RLC</b>	2	300	89	TUBO	2,5	230	A	4	920	10	72	720
	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	75	B	4	300	10	72	720
	4	350	20	TUBO	2,5	50	B	4	200	10	72	720
<b>INOX 309 RLC</b>	2	300	89	TUBO	2,5	230	A	4	920	10	72	720
	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	75	B	4	300	10	72	720
	4	350	19	TUBO	2,5	50	B	4	200	10	72	720
<b>INOX 310 R</b>	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	70	B	4	280	10	72	720
	4	350	20	TUBO	2,5	50	B	4	200	10	72	720
<b>INOX 312 R</b>	2	300	89	TUBO	2,5	140	A	4	560	10	72	720
	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	75	B	4	300	10	72	720
	4	350	20	TUBO	2,5	50	B	4	200	10	72	720
<b>INOX 316 RLC</b>	2	300	89	TUBO	2,5	230	A	4	920	10	72	720
	2,5	300	55	TUBO	2,5	140	A	4	560	10	72	720
	3,2	350	29	TUBO	2,5	75	B	4	300	10	72	720
	4	350	20	TUBO	2,5	50	B	4	200	10	72	720



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## GENERAL INFORMATION AND TABLES



## GENERAL STORAGE CONDITIONS AND RECOMMENDATIONS

The filling materials must be stored in a dry place to prevent condensation. To avoid condensation, it is necessary to keep the humidity of the air (the water vapor content in a cubic meter of air) below a certain value. This value depends strongly on the temperature, as shown in the table below.

For example, in a typical warehouse in continental Europe during the winter (temperature around 10°C), water vapor must be kept below 9.4 g/m<sup>3</sup>, while in summer (temperature 30°C) water vapor can reach up to 30.4 g/m<sup>3</sup> without condensation, three times higher than in winter. Therefore, it is very important to avoid sudden temperature changes, which are common during transport. The humidity of the air can be measured with a portable hygrometer.

<b>TEMPERATURE (°C)</b>	<b>WATERVAPOUR (G/ M<sup>3</sup>)</b>
0	4,8
10	9,4
20	17,3
30	30,4
30	50,7

### **STORAGE AND RECOMMENDATIONS FOR BASIC COATED ELECTRODES**

Keep dry at a temperature between 10°C and 40°C and relative humidity <80%.

To achieve a diffusible hydrogen content < 4 ml/100g H<sub>4</sub>, the electrodes must be reconditioned at 350°C for at least 1 hour. During welding, low hydrogen electrodes must be kept at 100°C before welding.

### **STORAGE AND RECOMMENDATIONS FOR THE FLUX**

The diffusible hydrogen  $\leq 5$  ml/100g is determined in the deposited metal according to the method described in the ISO 3690 standard. Type of current DC; drying conditions 300 - 350 °C for 2 hours. The rutile type flux such as INEFLUX SP can be used directly from a sealed aluminum bag. The amount of flux from an open bag that is not used immediately must be stored at 80°C-100°C to avoid moisture absorption.

### **SHELF LIFE**

INEFIL solid wires and INETIG TIG rods, if correctly stored in the original unopened packaging and under the conditions listed above, can be used up to 10 years from the date of production.

INE electrodes, INETUB flux-cored wires and INEFLUX fluxes, if correctly stored in the original unopened packaging and under the conditions listed above, can be stored up to 2 years from the date of production.

INE electrodes in the unopened and undamaged VACUUM packaging can be stored up to 5 years.

# GENERAL INFORMATION AND TABLES

## SOLID WIRES

EN ISO 14341-A

FILLER MATERIALS FOR CONTINUOUS WIRE WELDING UNDER GAS PROTECTION OF FINE GRAIN NON-ALLOY STEEL

# G

# 46

# 4

# M21

# 3Si1

### SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
35	355	410-780	22
38	380	470-600	20
42	420	500-640	20
46	460	530-680	20
50	500	560-720	18

### SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TUGHNESS ENERGY OF 47J, °C
Z	no requirement
A	20
0	0
2	-20
3	-30
4	-40
5	-50
6	-60
7	-70
8	-80
9	-90
10	-100

### SYMBOL FOR PROTECTIVE GAS

SYMBOL	
M12	Ar - O <sub>2</sub>
M13	Ar - O <sub>2</sub>
M20	Ar - CO <sub>2</sub>
M21	Ar - CO <sub>2</sub>
C1	CO <sub>2</sub>
Z	Not specified

NOTE= Symbol in agreement with ISO 14175

### SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %											
	C	Mn	Si	P	S	Ni	Cr	Mo	V	Cu	Al	Ti + Zr
2Si	0.06-0.14	0.9-1.3	0.50-0.80	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.02	0.15
3Si1	0.06-0.14	1.30-1.60	0.70-1.00	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.02	0.15
3Si2	0.06-0.14	1.30-1.60	1.00-1.30	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.02	0.15
4Si1	0.06-0.14	1.60-1.90	0.80-1.20	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.02	0.15
2Ti	0.04-0.14	0.90-1.40	0.40-0.80	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.05-0.20	0.05-0.25
2Al	0.08-0.14	0.90-1.30	0.30-0.50	0.025	0.025	0.15	0.15	0.15	0.03	0.35	0.35-0.75	0.15
3Ni1	0.06-0.14	1.00-1.60	0.50-0.90	0.02	0.02	0.80-1.50	0.15	0.15	0.03	0.35	0.02	0.15
2Ni2	0.06-0.14	0.80-1.40	0.40-0.80	0.02	0.02	2.10-2.70	0.15	0.15	0.03	0.35	0.02	0.15
2Mo	0.08-0.12	0.90-1.30	0.30-0.70	0.02	0.02	0.15	0.15	0.40-0.60	0.03	0.35	0.02	0.15
4Mo	0.06-0.14	1.70-2.10	0.50-0.80	0.025	0.025	0.15	0.15	0.40-0.60	0.03	0.35	0.02	0.15
Z	any other agreed composition											

NOTE = The individual values indicate maximum values

# SOLID WIRES

AWS A5.18

SPECIFICATION FOR WIRE AND TIG RODS FOR WELDING UNDER PROTECTIVE GAS OF CARBON STEEL

**ER**

**70**

**S**

**-**

**6**

## SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	MINIMUM TENSILE STRENGTH MPa
70	400 (58 000 psi)	515 (75 000 psi)

## TYPE OF WIRE

SYMBOL	
S	Solid wire
C	Flux cored wire

## SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %												
	C	Mn	Yes	P	S	Ni	Cr	Mo	V	Ti	Zr	Al	Cu
ER70S-2	0.07	0.90-1.40	0.40-0.70	0.025	0.035	0.15	0.15	0.15	0.03	0.05-0.15	0.02-0.12	0.05-0.15	0.50
ER70S-3	0.06-0.15	0.90-1.40	0.45-0.75	0.025	0.035	0.15	0.15	0.15	0.03	-	-	-	0.50
ER70S-4	0.06-0.15	1.00-1.50	0.65-0.85	0.025	0.035	0.15	0.15	0.15	0.03	-	-	-	0.50
ER70S-6	0.06-0.15	1.40-1.85	0.80-1.15	0.025	0.035	0.15	0.15	0.15	0.03	-	-	-	0.50
ER70S-7	0.07-0.15	1.50-2.00	0.50-0.80	0.025	0.035	0.15	0.15	0.15	0.03	-	-	-	0.50
ER70S-8	-	1.40-1.90	0.55-1.10	0.025	0.035	0.15	0.15	0.15	0.03	-	-	-	0.50

# GENERAL INFORMATION AND TABLES

## SOLID WIRES

EN ISO 16384-A

FILLER MATERIALS FOR CONTINUOUS WIRE WELDING UNDER GAS PROTECTION OF HIGH STRENGTH STEEL

# G

# 69

# 4

# M21

# Mn3Ni1CrMo

### SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
55	550	640-820	18
62	620	700-890	18
69	690	770-940	17
79	790	880-1080	16
89	890	940-1180	15

### SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TOUGHNESS ENERGY OF 47J, °C
Z	no requirement
A	20
0	0
2	-20
3	-30
4	-40
5	-50
6	-60

### SYMBOL FOR PROTECTIVE GAS

SYMBOL	
M12	Ar - O <sub>2</sub>
M13	Ar - O <sub>2</sub>
M20	Ar - CO <sub>2</sub>
M21	Ar - CO <sub>2</sub>
C1	CO <sub>2</sub>
Z	Not specified

NOTE= Symbol in agreement with ISO 14175

### SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %										
	C	Mn	Yes	P	S	Ni	Cr	Mo	V	Cu	Other
Mn3NiCrMo	0.14	1.30-1.80	0.60-0.80	0.015	0018	0.50-0.65	0.40-0.65	0.15-0.30	0.03	0.30	0.25
Mn3Ni1CrMo	0.12	1.30-1.80	0.40-0.70	0015	0018	1.20-1.60	0.20-0.40	0.20-0.30	0.05-0.13	0.35	0.25
Mn3Ni1Mo	0.12	1.30-1.90	0.40-0.80	0015	0018	0.80-1.30	0.15	0.25-0.65	0.03	0.30	0.25
Mn3Ni1.5Mo	0.08	1.30-1.80	0.20-0.60	0015	0018	1.40-2.10	0.15	0.25-0.65	0.03	0.30	0.25
Mn3Ni1Cu	0.12	1.20-1.80	0.20-0.60	0015	0018	0.80-1.25	0.15	0.20	0.03	0.30-0.65	0.25
Mn3Ni1MoCu	0.12	1.20-1.80	0.20-0.60	0015	0018	0.80-1.25	0.15	0.20-0.55	0.03	0.30-0.65	0.25
Mn3Ni2.5CrMo	0.12	1.30-1.80	0.40-0.70	0015	0018	2.30-2.80	0.20-0.60	0.30-0.65	0.03	0.30	0.25
Mn4Ni1Mo	0.12	1.60-2.10	0.50-0.80	0015	0018	0.80-1.25	0.15	0.20-0.55	0.03	0.30	0.25
Mn4Ni2Mo	0.12	1.60-2.10	0.25-0.60	0015	0018	2.00-2.60	0.15	0.30-0.65	0.03	0.30	0.25
Mn4Ni1.5CrMo	0.12	1.60-2.10	0.50-0.80	0015	0018	1.30-1.90	0.15-0.40	0.30-0.65	0.03	0.30	0.25
Mn4Ni2CrMo	0.12	1.60-2.10	0.60-0.90	0015	0018	1.80-2.30	0.20-0.45	0.45-0.70	0.03	0.30	0.25
Mn4Ni2.5CrMo	0.13	1.60-2.10	0.50-0.80	0015	0018	2.30-2.80	0.20-0.60	0.30-0.65	0.03	0.30	0.25
Z	any other agreed composition										

NOTE = The individual values indicate maximum values

# SOLID WIRES

AWS A5.28

SPECIFICATION FOR WIRE AND TIG RODS FOR WELDING UNDER PROTECTIVE GAS OF LOW ALLOY STEEL

**ER**

**80**

**S**

-

**B2**

## SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa
70	400 (58 000 psi)	515 (75 000 psi)
80	470 (68 000 psi)	550 (80 000 psi)
90	540 (78 000 psi)	620 (90 000 psi)
100	610 (88 000 psi)	690 (100 000 psi)
110	660 (95 000 psi)	760 (110 000 psi)
120	750 (108 000 psi)	830 (120 000 psi)

## TYPE OF WIRE

SYMBOL	
S	Solid wire
C	Cored wire

## SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %													
	C	Mn	Yes	P	S	Ni	Cr	Mo	V	Ti	Zr	Al	Cu	Others
ER70S-A1	0.12	1.30	0.30-0.70	0.25	0.25	0.20	-	0.40-0.65	-	-	-	-	0.35	0.50
ER80S-B2	0.07-0.12	0.40-0.70	0.40-0.70	0.25	0.25	0.20	1.20-1.50	0.40-0.65	-	-	-	-	0.35	0.50
ER70S-B2L	0.05	0.40-0.70	0.40-0.70	0.25	0.25	0.20	1.20-1.50	0.40-0.65	-	-	-	-	0.35	0.50
ER90S-B3	0.07-0.12	0.40-0.70	0.40-0.70	0.25	0.25	0.20	2.30-2.70	0.40-0.65	-	-	-	-	0.35	0.50
ER80S-B3L	0.05	0.40-0.70	0.40-0.70	0.25	0.25	0.20	2.30-2.70	0.90-1.20	-	-	-	-	0.35	0.50
ER80S-B6	0.10	0.40-0.70	0.50	0.25	0.25	1.00	4.50-6.00	0.45-0.65	-	-	-	-	0.35	0.50
ER80S-B8	0.10	0.40-0.70	0.50	0.25	0.25	0.50	8.00-10.50	0.80-1.20	-	-	-	-	0.35	0.50
ER90S-B91	0.07-0.13	1.20	0.15-0.50	0.10	0.10	1.20	8.00-10.50	0.85-1.20	0.15-0.30	-	-	0.04	0.20	0.50
ER80S-Ni1	0.12	1.25	0.40-0.80	0.25	0.25	0.80-1.10	0.15	0.35	0.05	-	-	-	0.35	0.50
ER80S-Ni2	0.12	1.25	0.40-0.80	0.25	0.25	2.00-2.75	-	-	-	-	-	-	0.35	0.50
ER80S-Ni3	0.12	1.25	0.40-0.80	0.25	0.25	3.00-3.75	-	-	-	-	-	-	0.35	0.50
ER80S-D2	0.07-0.12	1.60-2.10	0.50-0.80	0.25	0.25	0.15	-	0.40-0.60	-	-	-	-	0.50	0.50
ER90S-D2	0.07-0.12	1.60-2.10	0.50-0.80	0.25	0.25	0.15	-	0.40-0.60	-	-	-	-	0.50	0.50
ER100S-1	0.08	1.25-1.80	0.20-0.55	0.10	0.10	1.40-2.10	0.30	0.25-0.55	0.05	0.10	0.10	0.10	0.25	0.50
ER110S-1	0.09	1.40-1.80	0.20-0.55	0.10	0.10	1.90-2.60	0.50	0.25-0.55	0.04	0.10	0.10	0.10	0.25	0.50
ER120S-1	0.10	1.40-1.80	0.25-0.60	0.10	0.10	2.00-2.80	1.00	0.30-0.65	0.03	0.10	0.10	0.10	0.25	0.50

# GENERAL INFORMATION AND TABLES

## CORED WIRES

EN ISO 17632-A

FILLER MATERIALS FOR WELDING TUBULAR CORED WIRE FOR ARC WELDING, WITH OR WITHOUT PROTECTIVE GAS OF FINE GRAIN ALLOY STEEL

**T 46 2 1Ni P M21 1 H5**

### SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
35	350	440-570	22
38	380	470-600	20
42	420	500-640	20
46	460	530-680	20
50	500	560-720	18

### SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TOUGHNESS ENERGY OF 47J, °C
Z	no requirement
A	20
0	0
2	-20
3	-30
4	-40
5	-50
6	-60
7	-70
8	-80
9	-90
10	-100

### SYMBOL FOR CHEMICAL COMPOSITION OF PURE FILLER

SYMBOL	CHEMICAL COMPOSITION, mass %											
	C	Si	Mn	P	S	Ni	Cr	Mo	V	Cu	Nb	Al
no symbol	-	-	2.0	-	-	0.5	0.2	0.2	0.08	0.30	0.05	2.0
Mo	-	-	1.4	-	-	0.5	0.2	0.3-0.6	0.08	0.30	0.05	2.0
MnMo	-	-	1.4-2.0	-	-	0.5	0.2	0.3-0.6	0.08	0.30	0.05	2.0
1Ni	-	0.80	1.4	-	-	0.6-1.2	0.2	0.2	0.08	0.30	0.05	2.0
1.5Ni	-	-	1.6	-	-	1.2-1.8	0.2	0.2	0.08	0.30	0.05	2.0
2Ni	-	-	1.4	-	-	1.8-2.6	0.2	0.2	0.08	0.30	0.05	2.0
3Ni	-	-	1.4	-	-	2.6-3.8	0.2	0.2	0.08	0.30	0.05	2.0
Mn1Ni	-	-	1.4-2.0	-	-	0.6-1.2	0.2	0.2	0.08	0.30	0.05	2.0
1NiMo	-	-	1.4	-	-	0.6-1.2	0.2	0.3-0.6	0.08	0.30	0.05	2.0
Z	any other agreed composition											

NOTE = The individual values indicate maximum values

### SYMBOL FOR DIFFUSIBLE HYDROGEN

SYMBOL	MAXIMUM HYDROGEN CONTENT IN METAL DEPOSITED, ml/100g
H 5	5
H 10	10
H 15	15

### SYMBOL FOR WELDING POSITION

WELDING POSITIONS ACCORDING TO ISO 6947
1 - PA, PB, PC, PD, PE, PF, PG
2 - PA, PB, PC, PD, PE, PF
3 - PA, PB
4 - PA
5 - PA, PB, PG

NOTE1 = Welding positions in agreement with ISO 6947

### SYMBOL FOR PROTECTIVE GAS

SYMBOL	
M12	Ar - O <sub>2</sub>
M13	Ar - O <sub>2</sub>
M20	Ar - CO <sub>2</sub>
M21	Ar - CO <sub>2</sub>
C1	CO <sub>2</sub>
Z	Not specified

NOTE = Symbol in agreement with ISO 14175

### SYMBOL FOR TYPE OF ELECTRODE CORE

SYMBOL	CHARACTERISTICS	WELDING PROCESS	PROTECTIVE GAS
R	Rutile, slow cooling slag	Single pass and multipass	Yes
P	Rutile, fast cooling slag	Single pass and multipass	Yes
B	Basic	Single pass and multipass	Yes
M	Metal powder	Single pass and multipass	Yes
V	Rutile or Basic/with fluorides	Single pass	No
W	Basic/with fluorides, slow cooling slag	Single pass and multipass	No
Y	Basic/with fluorides, fast cooling slag	Single pass and multipass	No
Z	Other type		

# ELECTRODES

EN ISO 2560-A

COATED ELECTRODES FOR MANUAL ARC WELDING OF NON-ALLOY STEEL AND WITH FINE GRAIN

**E 46 3 1Ni B 5 4 H5**

## SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
35	355	410-780	22
38	380	470-600	20
42	420	500-640	20
46	460	530-680	20
50	500	560-720	18

## SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TOUGHNESS ENERGY OF 47J, °C
Z	no requirement
A	20
0	0
2	-20
3	-30
4	-40
5	-50
6	-60

## SYMBOL FOR CHEMICAL COMPOSITION OF PURE FILLER

SYMBOL	CHEMICAL COMPOSITION, mass %		
	Mn	Mo	Ni
no symbol	2.0	-	-
Mo	1.4	0.3-0.6	-
MnMo	1.4-2.0	0.3-0.6	-
1Ni	1.4	-	0.6-1.2
2Ni	1.4	-	1.8-2.6
3Ni	1.4	-	2.6-3.8
Mn1Ni	1.4-2.0	-	0.6-1.2
Mn2Ni	1.4-2.0	-	1.2-2.6
1NiMo	1.4	0.3-0.6	0.6-1.2
Z	any other agreed composition		

NOTE = The individual values indicate maximum values

## SYMBOL FOR DIFFUSIBLE HYDROGEN

SYMBOL	MAXIMUM HYDROGEN CONTENT IN METAL DEPOSITED, ml/100g
H5	5
H10	10
H15	15

## SYMBOL FOR WELDING POSITION

WELDING POSITIONS ACCORDING TO ISO 6947
1 - PA, PB, PC, PD, PE, PF, PG
2 - PA, PB, PC, PD, PE, PF
3 - PA, PB
4 - PA
5 - PA, PB, PG

NOTE= Welding positions in agreement with ISO 6947

## SYMBOL FOR ELECTRODE YIELD AND TYPE OF CURRENT

SYMBOL	DEPOSIT EFFICIENCY	TYPE OF CURRENT
1	<105	AC + DC
2	<105	DC
3	>105 <125	AC + DC
4	>105 <125	DC
5	>125 <160	AC + DC
6	>125 <160	DC
7	>160	AC + DC
8	>160	DC

NOTE AC = alternating current , DC = direct current

## SYMBOL FOR COATING TYPE

SYMBOL	
A	Acid
C	Cellulose
R	Rutile
PM	Rutile-Cellulose
RA	Rutile-Acid
RB	Rutile-Basic
RR	Rutile, large coating
B	Basic



# GENERAL INFORMATION AND TABLES

## SAW

EN ISO 14171-A

COMBINATION OF ELECTRODE WIRE/FLUX AND DEPOSIT OF ALL FILLER METAL

**S**

**38**

**5**

**AB**

**S2Si**

### SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
35	355	440-570	22
38	380	470-600	20
42	420	500-640	20
46	460	530-680	20
50	500	560-720	18

### SYMBOL FOR CHEMICAL COMPOSITION OF FLUX

SYMBOL	
MS	Manganese-silicate
CS	Calcium-silicate
ZS	Zirconium-silicate
RS	Rutile-silicate
AR	Aluminate-rutile
AB	Aluminate-basic
AS	Aluminate-silicate
AF	Aluminate-fluoride-basic
FB	Fluoride-basic
GS	Magnesium-silicate
Z	Any other composition

### SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TOUGHNESS ENERGY OF 47J, °C
Z	no requirement
A	20
0	0
2	-20
3	-30
4	-40
5	-50
6	-60
7	-70
8	-80

### SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %						
	C	Yes	Mn	Ni	Mo	Cr	Other
SZ							
S1	0.05-0.15	0.15	0.35-0.60	0.15	-0.15	-0.15	
S2	0.07-0.15	0.15	0.80-1.30	-0.15	-0.15	-0.15	
S3	0.07-0.15	0.15	1.30-1.75	-0.15	-0.15	-0.15	
S4	0.07-0.15	0.15	1.75-2.25	-0.15	-0.15	-0.15	
S1Si	0.07-0.15	0.15-0.40	0.35-0.60	-0.15	-0.15	-0.15	
S2Si	0.07-0.15	0.15-0.40	0.80-1.30	-0.15	-0.15	-0.15	
S2Si2	0.07-0.15	0.40-0.60	0.80-1.20	-0.15	-0.15	-0.15	
S3Si	0.07-0.15	0.15-0.40	1.30-1.85	-0.15	-0.15	-0.15	
S4Si	0.07-0.15	0.15-0.40	1.85-2.25	-0.15	-0.15	-0.15	
S1Mo	0.05-0.15	0.05-0.25	0.35-0.60	-0.15	0.45-0.65	-0.15	
S2Mo	0.07-0.15	0.05-0.25	0.80-1.30	-0.15	0.45-0.65	-0.15	
S2MoTiB	0.05-0.15	0.15-0.35	1.00-1.35	-	0.40-0.65	-	
S3Mo	0.07-0.15	0.05-0.25	1.30-1.75	-0.15	0.45-0.65	-0.15	
S4Mo	0.07-0.15	0.05-0.25	1.75-2.25	-0.15	0.45-0.65	-0.15	
S2Ni1	0.07-0.15	0.05-0.25	0.80-1.30	0.80-1.20	-0.15	-0.15	
S2Ni1.5	0.07-0.15	0.05-0.25	0.80-1.30	1.20-1.80	-0.15	-0.15	
S2Ni2	0.07-0.15	0.05-0.25	0.80-1.30	1.80-2.40	-0.15	-0.15	
S2Ni3	0.07-0.15	0.05-0.25	0.80-1.30	2.80-3.70	-0.15	-0.15	
S2Ni1Mo	0.07-0.15	0.05-0.25	0.80-1.30	0.80-1.20	0.45-0.65	-0.20	
S3Ni1.5	0.07-0.15	0.05-0.25	1.30-1.70	1.20-1.80	-0.15	-0.20	
S3Ni1Mo	0.07-0.15	0.05-0.25	1.30-1.80	0.80-1.20	0.45-0.65	-0.20	
S3Ni1Mo0.2	0.07-0.15	0.10-0.35	1.20-1.60	0.80-1.20	0.15-0.30	-0.15	P, S: -0.015
S3Ni1.5Mo	0.07-0.15	0.05-0.25	1.20-1.80	1.20-1.80	0.30-0.50	-0.20	
S2Ni1Cu	0.06-0.12	0.15-0.35	0.70-1.20	0.65-0.90	0.15	-0.40	Cu 0.40-0.65
S3Ni1Cu	0.05-0.15	0.15-0.40	1.20-1.70	0.60-1.20	0.15	-0.15	Cu 0.30-0.60

# SAW

AWS A5.17

SPECIFICATION FOR WIRE AND FLUX FOR SUBMERGED ARC WELDING OF CARBON STEEL

## F 7 A 5 - EM12K

### SYMBOL OF RESISTANCE AND ELONGATION OF PURE FILLER

SYMBOL	MINIMUM YIELD STRENGTH, MPa	TENSILE STRENGTH, MPa	MIN ELONGATION, %
6	330	415-550	22
7	340	480-650	20

### SYMBOL THAT SPECIFIES STATUS OF MATERIAL AFTER WELDING

SYMBOL	
A	As Welded
P	PWHT 620°C/1h

### SYMBOL FOR IMPACT PROPERTIES OF PURE FILLER

SYMBOL	TEMPERATURE FOR THE MINIMUM AVERAGE TENSILE ENERGY OF 27J, °C
Z	no requirement
2	-18
3	-29
4	-40
5	-46
6	-51
8	-62

### SYMBOL FOR CHEMICAL COMPOSITION OF WIRE

SYMBOL	CHEMICAL COMPOSITION, mass %						
	C	Mn	Si	S	P	Cu(4)	Ti
<b>LOW MANGANESE WIRES</b>							
EL8	0.1	0.25/0.60	0.07	0.03	0.03	0.35	-
EL8K	0.1	0.25/0.60	0.10/0.25	0.03	0.03	0.35	-
EL12	0.04/0.14	0.25/0.60	0.1	0.03	0.03	0.35	-
<b>MEDIUM MANGANESE WIRES</b>							
EM11K	0.07/0.15	1.00/1.50	0.65/0.85	0.03	0,025	0.35	-
EM12	0.06/0.15	0.80/1.25	0.1	0.03	0.03	0.35	-
EM12K	0.05/0.15	0.80/1.25	0.10/0.35	0.03	0.03	0.35	-
EM13K	0.06/0.16	0.90/1.40	0.35/0.75	0.03	0.03	0.35	-
EM14K	0.06/0.19	0.90/1.40	0.35/0.75	0,025	0,025	0.35	0.03/0.17
EM15K	0.10/0.20	0.80/1.25	0.10/0.35	0.03	0.03	0.35	-
<b>HIGH MANGANESE WIRES</b>							
EH10K	0.07/0.15	1.30/1.70	0.05/0.25	0,025	0,025	0.35	-
EH11K	0.07/0.15	1.40/1.85	0.80/1.15	0.03	0.03	0.35	-
EH12K	0.06/0.15	1.50/2.00	0.20/0.65	0,025	0,025	0.35	-
EH14	0.10/0.20	1.70/2.20	0.1	0.03	0.03	0.35	-

NOTE = The individual values indicate maximum values

**SAW**

EN ISO 14174

CLASSIFICATION FLUX FOR SUBMERGED ARC

**S                    A                    AB                    1                    67                    AC                    H5**

**SYMBOL FOR FLUX PRODUCTION METHOD**

SYMBOL	
F	Fused flux
A	Agglomerate flux
M	Mixed flux

**SYMBOL FOR CHEMICAL COMPOSITION OF FLUX**

SYMBOL	
MS	Manganese-silicate
CS	Calcium-silicate
ZS	Zirconium-silicate
RS	Rutile-silicate
AR	Aluminate-rutile
AB	Aluminate-basic
AS	Aluminate-silicate
AF	Aluminate-fluoride-basic
FB	Fluoride-basic
GS	Magnesium-silicate
Z	Any other composition

**APPLICATION**

SYMBOL	
1	Submerged arc welding of carbon steel and low alloy steel.
2 or 2B	(2) Flux for welding and facing of stainless steel and creep resistant steel. Cr and Cr-Ni steel and/or Nickel alloys. (2B) indicates flows for facing with strip fillers.
3	Flux for hardfacing with the addition of C, Cr and Mo to filler metal.
4	Other flux not in class 1-3.

**SYMBOL FOR CURRENT TYPE**

SYMBOL	
AC	Alternating current and direct current
DC	Exclusively direct current

**SYMBOL FOR METALLURGY REACTIVITY OF FLUX**

SYMBOL (SEQUENCE: Si, Mn)	METALLURGY ACTION	FLUX CONTRIBUTION
1	Burn-out	>0.7
2	Burn-out	0.5-0.7
3	Burn-out	0.3-0.5
4	Burn-out	0.1-0.3
5	Neutral	0.0-0.1
6	Pick-up	0.1-0.3
7	Pick-up	0.3-0.5
8	Pick-up	0.5-.07
9	Pick-up	>0.7

**SYMBOL FOR DIFFUSIBLE HYDROGEN**

SYMBOL	MAXIMUM HYDROGEN CONTENT IN METAL DEPOSITED, ML/100G
H5	5
H10	10
H15	15



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