

# ASKAYNAK® WELDING CONSUMABLES



Coated Electrodes

MIG/MAG Welding  
Wires

TIG Rods

Submerged Arc  
Welding Wires

Flux Cored Welding  
Wires

Carbon Arc Cutting  
Electrodes

Tungsten TIG Electrodes

**ASKAYNAK**®  
*The Future Starts with a Spark*

WORLD INTELLECTUAL  
PROPERTY ORGANIZATION

34, chemin des Colombettes, P.O. Box 18, CH-1211 Geneva 20 (Switzerland)  
Tel.: (41-22) 320 9111 - Facsimile (International Registry of Marks): (41-22) 740 1439  
Email: [inr@wipo.int](mailto:inr@wipo.int) - Internet: <http://www.wipo.int>



MADRID AGREEMENT AND PROTOCOL

## CERTIFICATE OF RENEWAL

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Geneva, August 27, 2009

**716 926**

Registration date: **June 29, 1999**  
Date of the renewal: **June 29, 2009**  
Date next payment due: **June 29, 2019**

KAYNAK TEKNİKİ SANAYİ  
VE TİCARET ANONİM ŞİRKETİ  
TOSB Taysad Org. San. Böl.,  
2. Cad. No: 5 Sekerpinar  
TR-41480 Gebze  
(Turkey).

Name and address of the representative: MUSTAFA İSLA-  
MOĞLU, Atatürk Bulvarı, 199/A-5 Kavaklıdere, ANKARA  
(Turkey).

*List of goods and services:*

- 6 Rods of metal for welding; non-electric cables and wires of metal, welding and soldering wires of metal, ropes of metal, hangers, belts, bands and straps all made of metal for lifting and conveying of loads.
- 9 Electric welding apparatus; electric soldering irons and welding torches for electrical welding and soldering machines; welding electrodes.

Basic registration: Turkey, 17.06.1999, 99/9782.

Designations under the Madrid Protocol: Benelux, China, Cuba, Czech Republic, Democratic People's Republic of Korea, Denmark, Estonia, Finland, France, Georgia, Germany, Hungary, Iceland, Kenya, Lesotho, Liechtenstein, Lithuania, Monaco, Mozambique, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Swaziland, Sweden, Switzerland, United Kingdom.

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26.4; 27.5; 29.1.



## CERTIFICATE

**TUV NORD**

Management system as per  
ISO 9001 : 2015

In accordance with TÜV NORD CERT procedures, it is hereby certified that

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TOSB - Otomotiv Yan San. İhtisas Org. San. Bölğ., 2. Cad., No 5, Şekerpinar, Çayırova,  
TR-41420 Kocaeli,  
Turkey

Izmir Sales Office: Pamuk Plaza İş Merkezi, 1082 Sok., No 9J, Yenisehir, Konak, Izmir, Turkey  
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applies a management system in line with the above standard for the following scope

Design, production, marketing and after-sales services of welding electrodes and welding machines, supply of necessary raw materials for production, various welding consumables, oxygase welding cutting and soldering equipment, marketing and sales of abrasives with smoke absorption systems, after-sales services; design and manufacture of robotic automation systems that can be used in multiple tasks for specific purposes; design and manufacture of welding mechanizations, molds, fixtures, control gauges and special-purpose tools and automation solutions; marketing of these systems and consumables of these systems, sales and after sales services, foreign trade, customs clearance, logistics, management and administrative organization activities and related activities and related production and service submission

Certificate Registration No. 44 100 073552  
Audit Report No. TR 037

Valid from 2019-04-26  
Valid until 2022-04-25  
Initial certification 1995

  
Certification Body  
at TÜV NORD CERT GmbH

Istanbul, 2019-04-26

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH

Langemarckstraße 20

45141 Essen

[www.tuev-nord-cert.com](http://www.tuev-nord-cert.com)



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# Standards and Classifications

## ASKAYNAK Coated Electrodes for MMA Welding and Submerged Arc Welding Wires

### Rutile, Basic, Cellulosic and Iron Powder Coated Electrodes for Mild Steels

Product Name	C	Si	Mn	Mo	Ni	P	S	AWS A5.1 AWS A5.5 *	EN ISO 2560-A
AS R-116	0.08	0.40	0.60	-	-	-	-	E7014	E 42 0 RR 12
AS R-132	0.08	0.40	0.60	-	-	-	-	E6013	E 42 0 RR 12
AS R-143	0.08	0.35	0.65	-	-	-	-	E6013	E 42 0 RR 12
AS R-144	0.08	0.45	0.55	-	-	-	-	E6013	E 42 0 RC 11
AS R-145	0.07	0.35	0.40	-	-	-	-	E6013	E 42 0 RC 11
AS R-146	0.07	0.20	0.40	-	-	-	-	E6013	E 38 0 R 12
AS B-204	0.06	0.50	1.20	-	-	-	-	E7018	E 46 4 B 32 H10
AS B-235	0.08	0.60	1.00	-	-	-	-	E7048	E 42 2 B 11
AS B-248	0.07	0.50	0.90	-	-	-	-	E7018	E 42 3 B 42 H10
AS B-248 H5	0.07	0.50	0.90	-	-	-	-	E7018	E 42 3 B 42 H5
AS B-248 H4R	0.07	0.50	0.90	-	-	-	-	E7018 H4R	E 42 4 B 42 H5
AS B-255	0.07	0.50	1.20	-	-	-	-	E7018-1 H4	E 46 5 B 32 H5
AS B-255 H4R	0.07	0.50	1.20	-	-	-	-	E7018-1 H4R	E 46 5 B 32 H5
AS B-257 PIPE	0.05	0.50	1.20	-	-	-	-	E7018-1 H4	E 46 5 B 42 H5
AS B-268	0.07	0.50	1.10	-	-	<0.03	<0.03	E7016-1	E 46 6 B 22
AS S-6010+	0.15	0.20	0.55	-	-	-	-	E6010	E 42 3 C 25
AS S-6011	0.09	0.30	0.60	-	-	-	-	E6011	E 42 2 C 11
AS S-7010 Mo	0.08	0.10	0.70	0.50	-	-	-	E7010-A1 *	E 46 2 Mo C 21
AS S-8010 Ni	0.10	0.30	1.10	-	0.20	-	-	E8010-G *	E 46 3 Z C 21
AS DT-165	0.08	0.40	0.70					E7024	E 46 0 RR 74
AS DT-180	0.08	0.45	0.90					E7024	E 46 0 RR 74

### Submerged Arc Welding Wires for Mild and Low Alloyed Steels

Product Name	C	Si	Mn	Cu	Mo	S	AWS A5.17 AWS A5.23 *	EN ISO 14171
AS S1	0.10	0.07	0.50	<0.30	-	<0.025	EL12	S1
AS S2	0.10	0.07	0.90	<0.30	-	<0.025	EM12	S2
AS EM12K	0.10	0.13	0.90	<0.30	-	<0.025	EM12K	S2
AS S2Si	0.07	0.15	1.00	<0.30	-	<0.025	EM12K	S2Si
AS S2Mo	0.10	0.10	1.00	<0.30	0.50	<0.030	EA2 *	S2Mo
AS S3Mo	0.08	0.15	1.40	<0.30	0.50	<0.030	EA4 *	S3Mo

# Standards and Classifications

## ASKAYNAK Coated Electrodes for MMA Welding

### Coated Electrodes for High Strength Low Alloyed Steels

Product Name	C	Si	Mn	Cr	Ni	Mo	Others	AWS A5.5	EN ISO 3580-A EN ISO 2560-A * EN ISO 18275-A **
AS DA-708	0.05	0.30	1.00	-	0.60	-	Cu 0.45	E 8018-G	E 42 2 Z B 42 *
AS DA-710	0.06	0.30	0.90	-	2.40	-	P+S <0.04	E 8018-C1	E 46 6 2 Ni B 42 *
AS DA-715	0.05	0.35	1.30	-	1.00	-	P+S <0.04	E 8018-C3 H4	E 50 6 1 Ni B 42 H5 *
AS DA-717	0.04	0.30	1.00	-	1.10	0.35	-	E 9018-G	E 55 6 1 NiMo B 42 **
AS DA-731	0.08	0.30	0.70	-	-	0.50	-	E 8013-G	E Mo R 22
AS DA-735	0.08	0.30	0.80	-	-	0.50	-	E 7018-A1	E Mo B 22
AS DA-737	0.06	0.40	1.30	-	-	0.40	-	E 9018-D1	E Mo B 22 **
AS DA-741	0.06	0.50	1.20	0.50	-	1.00	-	E 9018-G	E MoV B 32
AS DA-753	0.05	0.40	1.50	0.35	1.80	0.45	-	E 11018-G	E 69 5 Mn 2 NiCrMo BT 42 **
AS DA-771	0.06	0.30	0.80	1.20	-	0.40	-	(E 8013-B2)	(E CrMo 1 R 12)
AS DA-774	0.06	0.50	0.80	1.20	-	0.50	-	E 8018-B2	E CrMo 1 B 22
AS DA-777	0.05	0.40	0.80	2.40	-	1.10	-	E 9018-B3	E CrMo 2 B 22
AS DA-778	0.05	0.50	0.70	5.00	-	0.50	-	E 8018-B6	E CrMo 5 B 42
AS DA-791	0.10	0.30	0.80	9.10	0.70	1.00	-	E 9015-B9	E CrMo 91 B 32

### Coated Electrodes for Overlay Welding and Hardfacing

Product Name	C	Si	Mn	Cr	Ni	Mo	Nb	N	AWS A5.4	EN ISO 3581-A
AS P-307	0.10	0.40	4.50	20	10	1,0	-	-	E 307-15	E 18 9 Mn Mo B 22
AS P-308L Süper	0.03	0.80	0.70	19	10	-	-	-	E 308L-16	E 19 9 LR 12
AS P-308L-17	0.03	0.95	0.75	19	10	-	-	-	E 308L-17	E 19 9 LR 12
AS P-308 H	0.06	0.80	0.70	19	10	-	-	-	E308H-16 / E308-16	E 19 9 HR 12 / E 19 9 R 12
AS P-308L-B	0.03	0.30	1.60	19	9.6	-	-	-	E 308L-15	E 19 9 L B 12
AS P-308Mn	0.10	0.50	6.00	18	9	-	-	-	(E 307-15)	E 18 8 Mn B 22
AS P-308Mo	0.05	0.35	2.50	19	10	2.5	-	-	E 308Mo-15	E 20 10 3 B 22
AS P-309L Süper	0.03	0.80	0.70	23	13	-	-	-	E 309L-16	E 23 12 LR 12
AS P-309L-17	0.03	1.00	0.70	23	13	-	-	-	E 309L-17	E 23 12 LR 12
AS P-309Mo	0.03	0.80	0.80	23	12.5	2.7	-	-	E 309MoL-16	E 23 12 2 LR 32
AS P-309Mo-17	0.03	1.00	0.80	23	12.5	2.7	-	-	E 309MoL-17	E 23 12 2 LR 32
AS P-310R	0.10	0.60	1.70	26	21	-	-	-	E 310-16	E 25 20 R 12
AS P-312	0.10	0.90	0.80	29	9	-	-	-	E 312-16	E 29 9 R 12
AS P-316L Süper	0.03	0.70	0.80	17	11	2.9	-	-	E 316L-16	E 19 12 3 LR 12
AS P-316L-17	0.03	1.00	0.80	17	11	2.9	-	-	E 316L-17	E 19 12 3 LR 12
AS P-316L-B	0.03	0.30	1.60	19	9.6	-	-	-	E 316L-15	E 19 9 L B 21
AS P-316S	0.06	0.70	0.60	17	11	2.9	-	-	(E 316-16)	E 19 12 3 R 73
AS P-318 Super	0.04	0.90	0.80	18	12	2.5	0.5	-	(E 318-16)	E 19 12 3 Nb R 12
AS P-347	0.03	0.90	0.70	19	9.5	-	0.5	-	(E 347-16)	E 19 9 Nb R 12
AS P-2209	0.02	1.00	0.80	22.5	9.5	3.2	-	0.16	(E 2209-16)	E 22 9 3 N L R 32

**Liability :** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes:** Consult information on Welding Safety Sheet, available upon request.

# Standards and Classifications

## ASKAYNAK Coated Electrodes for MMA Welding

### Coated Electrodes for Aluminium and Copper Alloys

Product Name	Cu	Al	Si	Mn	Fe	Sn	Others	AWS A5.3* AWS A5.6 *	DIN 1732 DIN 1733 *
AS Bronze	bal.	-	-	0.50	-	7	P 0.10	ECuSn-C *	EL-CuSn 7 *
AS AISi 5	-	bal.	5	<0.05	<0.20	-	Mg 0.05	E4043	EL-AISI 5
AS AISi 12	-	bal.	12	<0.10	<0.40	-	Mg 0.05	E4047	EL-AISI 12

### Coated Electrodes for Stainless Steels

Product Name	C	Si	Mn	Fe	Ni	Cu	AWS A5.15	EN ISO 1071
AS Pik-55	1.00	-	-	43	bal.	-	E NiFe-Cl	E C NiFe-1 3
AS Pik-65	0.50	0.40	1.00	3	bal.	30	E NiCu-B	E C NiCu-B 3
AS Pik-98 Süper	1.00	-	-	-	bal.	-	E Ni-Cl	E Ni-C1 2

### Coated Electrodes for Stainless Steels

Product Name	C	Si	Mn	Cr	Ni	Mo	Others	EN 14700	DIN 8555
AS SD-CR 10	0.70	0.60	0.70	10	-	-	-	E Fe8	E6-UM-55 R
AS SD-CR 13	0.10	0.50	0.30	13	-	-	-	E Fe7	E5-UM-45 R
AS SD-60	0.40	0.40	0.50	6	-	0.60	-	E Fe4	E6-UM-60
AS SD-65	0.70	4.00	0.30	2	-	-	-	E Fe4	E2-UM-60 Z
AS SD-250	0.11	0.80	1.00	1.50	-	-	-	E Fe1	E1-UM-250
AS SD-300	0.07	0.20	0.60	3.40	-	-	-	E Fe1	E1-UM-300
AS SD-350	0.10	0.50	0.70	3.50	-	-	-	E Fe1	E1-UM-350
AS SD-HSS	0.90	1.20	1.30	4.50	-	7.50	W 1.80 V 1.50	E Fe4	E4-UM-60 (65) S
AS SD-MANGAN	0.70	0.10	14	-	3	-	-	E Fe9	E7-UM-200 K
AS SD-MANGAN 165	0.70	0.10	14	-	3.50	-	-	E Fe9	E7-UM-200 K
AS SD-ABRA Nb	3.40	-	-	22	-	-	Nb 10	E Fe15	(E10-UM-60 GR)
AS SD-ABRA Cr	4.50	-	-	33	-	-	-	E Fe15	E10-UM-60 G



# Standards and Classifications

## ASKAYNAK MIG/MAG Wires for GMA Welding and TIG Rods for GTA Welding

### MIG/MAG Wires for Mild and Low Alloyed Steels

Product Name	C	Si	Mn	Cr	Ni	Mo	Others	AWS A5.18 * AWS A5.28	ISO 14341-A * EN ISO 16834 ** EN ISO 21952-A
AS SG2	0.10	0.90	1.50	-	-	-	-	ER70S-6 *	G 42 3CM G3Si1 *
AS SG2-CF	0.10	0.90	1.50	-	-	-	-	ER70S-6 *	G 42 3CM G3Si1 *
AS SG2 PERFORMANCE	0.10	0.90	1.50	-	-	-	-	ER70S-6 *	G 42 3CM G3Si1 *
AS SG3	0.10	1.00	1.70	-	-	-	-	ER70S-6 *	G 42 3CM G4Si1 *
AS SG3-CF	0.10	1.00	1.70	-	-	-	-	ER70S-6 *	G 42 3CM G4Si1 *
AS SG3 PERFORMANCE	0.10	1.00	1.70	-	-	-	-	ER70S-6 *	G 42 3CM G4Si1 *
AS MIG Mo70	0.09	0.70	1.20	<0.15	-	0.50	Cu <0.25	ER70S-A1	G MoSi
AS MIG Mo80	0.09	0.70	1.90	<0.15	<0.15	0.50	Cu <0.25	ER80S-D2	G MnMo
AS MIG 100S-1	0.07	0.45	1.60	0.15	1.60	0.3	Cu <0.25	ER100S-1	G Mn3Ni1.5Mo **
AS MIG 100SG	0.09	0.75	1.60	0.55	0.60	0.25	Cu <0.25	ER100S-G	G Mn3NiCrMo **
AS MIG 110SG	0.09	0.60	1.65	0.30	1.50	0.30	Cu   V 0.25   0.10	ER110S-G	G Mn3Ni1CrMo **
AS MIG CrMo1	0.08	0.55	0.60	1.30	<0.20	0.55	Cu <0.30	ER80S-B2	(G CrMo1Si)
AS MIG CrMo2	0.08	0.50	0.60	2.40	<0.20	1.00	Cu <0.30	ER90S-B3	(G CrMo2Si)
AS MIG COR-Ni	0.09	0.60	1.40	-	0.90	-	Cu <0.40	ER80S-G	G Mn3Ni1Cu **








### TIG Rods for Mild and Low Alloyed Steels

Product Name	C	Si	Mn	Cr	Ni	Mo	Others	AWS A5.18 * AWS A5.28	EN ISO 636-A * EN ISO 21952-A
AS TIG SG2	0.08	0.85	1.50	-	-	-	-	ER70S-6 *	W 42 3 W3Si1 *
AS TIG SG3	0.10	1.00	1.70	-	-	-	-	ER70S-6 *	W 42 3 W4Si1 *
AS TIG Mo70	0.09	0.70	1.20	<0.15	-	0.50	Cu <0.25	ER70S-A1	W MoSi
AS TIG Mo80	0.09	0.70	1.90	<0.15	<0.15	0.50	Cu <0.25	ER80S-D2	W MnMo
AS TIG CrMo1	0.08	0.55	0.60	1.30	<0.20	0.55	Cu <0.30	ER80S-B2	(W CrMo1Si)
AS TIG CrMo2	0.08	0.50	0.60	2.40	<0.20	1.00	Cu <0.30	ER90S-B3	(W CrMo2Si)
AS TIG CrMo5	0.08	0.45	0.60	5.70	<0.20	0.60	Cu <0.25	ER80S-B6	W CrMo5Si
AS TIG CrMo91	0.09	0.30	0.50	9.10	0.50	0.90	-	ER90S-B9	W CrMo9 1
	V 0.20	Al 0.04	Nb 0.07	N 0.05	Cu <0.25				

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# Lloyd Approvals

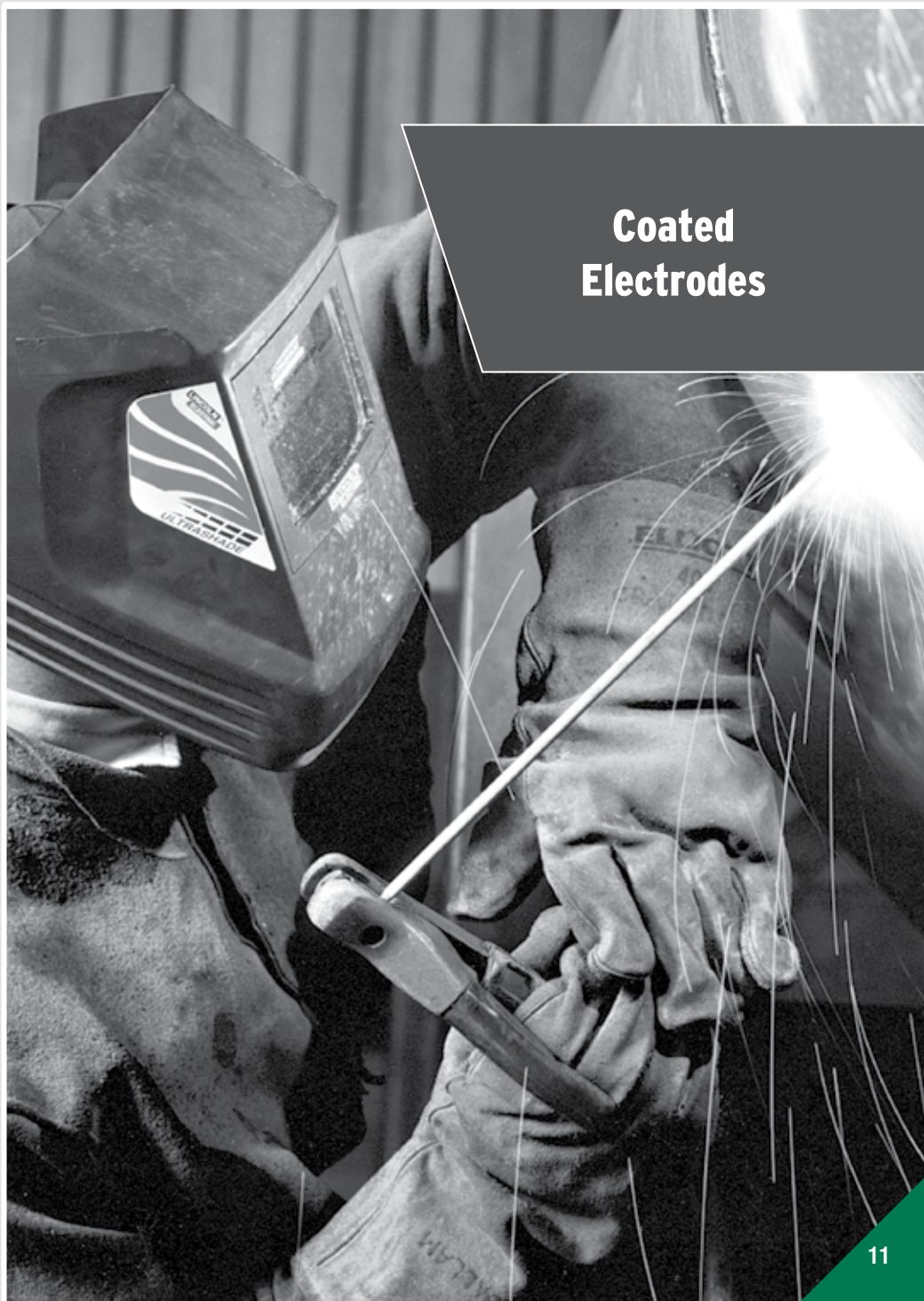
## ASKAYNAK Coated Electrodes, GMA Welding Wires and SA Welding Wires

Product Name							
	ABS	BV	DNV-GL	LRS	RINA	RMRS	TL
AS R-116	2	2	2	2m	-	-	2
AS R-143	2	2	2	2m	2	-	2
AS R-146	-	-	-	-	-	-	2
AS B-204	3H10. 3Y	3YH	-	3m 3Ym H15	-	-	3YH
AS B-248	3H10. 3Y	3YHH	3YH10	3m 3Ym H10	3YH10	3Y40HH	3YH10
AS B-248 H5	3H5. 3Y	3YHHH	3YH5	3m 3Ym H5	-	-	3YH5
AS B-255	3H5. 3Y	3YHHH	3YH5	3m 3Ym H5	3YH5	-	3YH5
AS B-257 PIPE	3YH5	3YH5	-	-	-	-	3YH5
AS DT-165	2	2	-	-	2	-	2
AS DT-180	2	2	2	2m	-	-	2
AS DA-735	-	-	-	-	-	-	1
AS DA-753	-	-	-	-	-	-	1
AS P-308L	E308L-16	308L	NV 308L	-	-	-	-
AS P-309L	E309L-16	309L	NV 309L	-	309L	-	-
AS P-316L	E316L-16	316L	NV 316L	-	316L	-	-
AS P-308Mn	-	-	-	-	-	-	-
AS SD-350	-	-	-	-	-	-	-
AS SG2 (CO <sub>2</sub> )	3SA. 3YSA	3YM	III YMS	3S 3YS H15	3Y42	3Y	3YMS
AS SG2 (Ar+CO <sub>2</sub> )	3YSA	-	IIYMS	-	-	-	3YMS
AS SG3 (CO <sub>2</sub> )	-	3Y	-	-	-	-	-
AS SG3 (Ar+CO <sub>2</sub> )	-	-	-	-	-	-	-
AS S1 (LW 860)	3M	A3M	III M	3M	-	-	3M
AS S2 (LW 761)	-	-	-	-	-	-	3YM
AS S2 (LW 780)	3M. 3YM	-	-	-	-	-	-
AS S2 (LW 860)	3M. 3YM	A3YM	III YM	3M. 3YM	3Y42	-	3YM

**ASKAYNAK**  
WELDING ELECTRODES and WIRES



## Coated Electrodes



## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 0 RR 12  
AWS A5.1 : E7014

### General Description

AS R-116 is a heavily coated rutile electrode. Weld metal has a high resistance to cracking in multipass applications. The slag is easy to remove and it gives high quality, smooth weld beads. It is easy to strike and re-strike and thus an ideal electrode for tacking. It is an easy to use electrode. It has about 100% metal recovery due to high iron powder content in its coating.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.40	0.60

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
Tensile Strength : 550 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (0°C)  
40 J (-20°C)

### Approvals

CE, GOST, SEPRO, TSE

ABS	BV	DNV	GL	LRS	TL
2	2	2	2	2m	2

### Welding Parameters / Packaging and Available Sizes / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (–)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	300	50 - 70	1130	1.7 / 150	2
2.50	350	60 - 100	2120	2.1 / 100	5
3.25	350	95 - 145	3190	3.2 / 100	5
4.00	350	140 - 190	4830	4.8 / 100	5
5.00	350	180 - 245	7410	4.8 / 65	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS R-116 is a general purpose electrode for welding mild steels. Bridging over fairly large gaps that can occur in site welding where preheating is not possible, galvanized plates, rusty or dirty surfaces, ordinary ship's plate of A- and D- quality, automotive bodies and general structural steels are among its application areas.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 420	S255N - S420N
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM	L210 - L360NB L290MB - L360MB
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4 HII, HIII, HIII	P295GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D	-
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 0 RR 12  
AWS A5.1 : E6013

### General Description

AS R-132 is a heavily coated rutile electrode. Weld metal has a high resistance to cracking. The slag is easy to remove, and it gives high quality, excellent smooth weld beads. It is easy to strike and re-strike and thus an ideal and easy to use electrode. Basic component quantity is less than AS R-116.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.40	0.60

### Mechanical Properties, Typical, All Weld Metal

Limite d'élasticité : 450 N/mm<sup>2</sup>  
Résistance à la traction : 550 N/mm<sup>2</sup>  
Allongement (L=5d) : 25 %  
Impact (ISO-V) : 50 J (0°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC ( - )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	300	45 - 70	1100	1.9 / 175	2
2.50	350	50 - 110	2140	2.1 / 100	5
3.25	350	90 - 140	3450	3.4 / 100	5
4.00	450	140 - 190	6670	6.7 / 100	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS R-132 is a general purpose electrode especially used for the welding of medium carbon steels and particularly suitable for butt welding of thin plates and sheet steels. It is also useful for welding mild structural steels and pressure and boiler vessel steels having a tensile strength up to 500 N/mm<sup>2</sup>. Ship's plate of A- quality, automotive bodies and welding of thin plates are among its application areas..

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255	S255N - S420N P255NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, D AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 0 RR 12  
AWS A5.1 : E6013

### General Description

AS R-143 is a heavily coated rutile electrode. As its basic component quantity is higher than AS R-116, weld metal properties are superior accordingly. Weld metal has a high resistance to cracking. The slag is easy to remove, and it gives high quality, smooth and excellent weld beads. It is easy to strike and re-strike and thus an ideal, easy to use electrode.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.35	0.65

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 550 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (0°C)  
40 J (-20°C)

### Approvals

CE, DB, GOST, SEPRO, TSE, TÜV

ABS	BV	DNV	LRS	RINA	TL
2	2	2	2m	2	2

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (-)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	300	50 - 70	1050	2.1 / 195	2
2.50	350	65 - 90	2070	2.1 / 100	5
3.25	350	90 - 140	3230	3.2 / 100	5
4.00	350	140 - 200	4770	4.8 / 100	5
4.00	450	140 - 190	6690	6.7 / 100	6
5.00	350	180 - 240	7550	4.9 / 65	5
5.00	450	180 - 230	9910	6.4 / 65	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS R-143 is a general purpose electrode especially used for the welding of low and medium carbon structural steels ranging between St 33 and St 52.3. Machinery fabrications, bridge constructions; welding of boiler vessels, automotive bodies, steel furnitures, metal plate works, thin plates and small repairs are among its application areas.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255	S255N - S420N P255NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, D AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 0 RC 11  
AWS A5.1 : E6013

### General Description

AS R-144 is a rutile-cellulosic coated electrode. It can be used in all positions including vertical-downwards travel. As it is an easy to bend electrode, it brings great convenience to reach in difficult-to-reach areas. It has a good penetration respectively. The slag is easy to remove and it is very easy to strike and re-strike.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.45	0.55

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup>  
Tensile Strength : 550 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 50 J (0°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (-)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 100	1830	1.8 / 100	5
3.25	350	90 - 150	3040	3.0 / 100	5
4.00	350	140 - 200	4320	5.6 / 130	5
5.00	350	160 - 230	6700	5.4 / 80	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG



## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

Welding of boiler vessels, steel constructions, automotive bodies, steel plate works, ordinary ship's plates, some assembly processes, machinery fabrication and welds required in tubular structures are among its application areas.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 35, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255	S255N - S420N P255NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, D*	-
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

(\* ) It is recommended to use a basic coated electrode in the root pass.

## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 0 RC 11  
AWS A5.1 : E6013

### General Description

AS R-145 is a rutile-cellulosic type coated electrode with medium recovery. It can be used in all positions including vertical downwards position. It is easy to bend electrode, this property brings great convenience to reach the welding groove in difficult to reach areas. Arc stability is high. Especially the thin sheets can be welded easily. It gives uniform and smooth weld beads with easy slag removal. It is very easy to strike and re-strike.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.35	0.40

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 450 N/mm<sup>2</sup>  
Tensile Strength : 540 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (0°C)

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC ( - ) ; DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	50 - 90	1900	1.9 / 100	5
3.25	350	80 - 130	3000	3.0 / 100	5
4.00	350	120 - 170 (*)	4550	4.6 / 100	5

(\*) It is recommended to work with 100-160 A when welding in vertical downwards position.



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG



## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

Welding of boiler vessels, steel constructions, automotive bodies, steel plate works, ordinary ship's plates, some assembly processes, machinery fabrication and welds required in tubular structures are among its application areas.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 35, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255	S255N - S420N P255NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, D*	-
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

(\* ) It is recommended to use a basic coated electrode in the root pass.

## Rutile Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 38 0 R 12  
AWS A5.1 : E6013

### General Description

AS R-146 is a medium coated general purpose rutile electrode. It is a very easy to use electrode. The slag is easy to remove and it gives high quality, smooth weld beads. It is easy to strike and re-strike and thus it is an ideal electrode for tacking .

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.20	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 400 N/mm<sup>2</sup>  
Tensile Strength : 480 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (0°C)

### Approvals

CE, GOST, SEPRO, TSE

TL

2

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC ( - )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	60 - 100	1990	2.0 / 100	5
3.25	350	110 - 140	3190	3.2 / 100	5
4.00	350	140 - 200	4790	4.8 / 100	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Rutile Coated Electrode for Mild Steels

### Applications and Materials to be Welded

Welding of structures in thin and medium thick plates in all positions, bridging over the large gaps in steel constructions, welding of galvanized plates are among its application areas. AS R-146 is relatively insensitive to rust and other surface impurities and recommended especially for welding ordinary ship steels and for structural steels having similar mechanical strength and quality.

	<b>DIN</b>	<b>EN</b>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3 St 37-4, St 44-4	S185, S235, S275 P235TR2 - P275T2
<b>Fine Grained Steels</b>	StE 255 - StE 285 WStE 255	S255N - S275N P255NH
<b>Pipe Materials</b>	StE 210-7 - StE 290-7 X42, X46 (API 5LX)	L210 - L290NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 HII, HIII, HIII*	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, D*	-
<b>Cast Steels</b>	GS-38, GS-45, GS-52*	GE200, GE240, GE260

(\* ) It is recommended to use a basic coated electrode in the root pass.



## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 4 B 32 H10  
AWS A5.1 : E7018

### General Description

AS B-204 is a basic coated electrode. It is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. Weld metal has a high resistance to cracking. The slag is easy to remove and it gives very high quality, smooth weld beads. It has 125% metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.06	0.50	1.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 480 N/mm <sup>2</sup>	
Tensile Strength	: 560 N/mm <sup>2</sup>	
Elongation (L=5d)	: 30 %	
Impact (ISO-V)	: 110 J (-20°C)	Redrying Temperature : 250-400°C/2-3 hours
	80 J (-40°C)	

### Approvals

CE, GOST, SEPRO, TSE

ABS	BV	GL	LRS	TL
3YH10, 3Y	3YH	3YH15	3m 3Ym H15	3YH

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	300	50 - 80	1500	1.9 / 125	2
2.50	350	75 - 110	2390	4.8 / 200	5
3.25	350	110 - 150	3860	5.0 / 130	5
4.00	450	150 - 190	7260	6.2 / 85	6
5.00	450	170 - 240	10440	6.3 / 60	6







## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-204 is suitable for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon steels having high P and S content; welding of high strength ship's plate of A-, D- and E- quality and vessel plates of 17 Mn 4 and 19 Mn 5 type. AS B-204 is also suitable for welding thin plates in the small diameters.

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 22 - C 35 ; Ck 22 - Ck 35	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C22 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 2 B 11  
AWS A5.1 : E7048

### General Description

AS B-235 is a basic coated electrode especially designed for welding in vertical downwards position, with a relatively large diameter electrode, at a very high travelling speed and high current. Thus, it can replace cellulosic coated electrodes in some circumstances. Weld metal has a high resistance to cracking.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.60	1.00

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
Tensile Strength : 560 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 80 J (-20°C)

Redrying Temperature : 250-400°C/2-3 hours

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 150	3020	5.1 / 170	5
4.00	350	140 - 200	4480	4.3 / 95	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG

## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-235 is especially suitable for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon steels having high (P) and (S) content; high strength ship's plate of A-, D- and E- quality and also for low alloyed and structural steels of similar strength with the electrode.

	<b>DIN</b>	<b>EN</b>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 37-4, St 44-4, St 52-4, St 50-2, St 60-2	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 3 B 42 H10  
AWS A5.1 : E7018

### General Description

AS B-248 is a basic coated electrode. It is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. Weld metal has a high resistance to cracking. The slag is easy to remove and it gives excellent quality, smooth weld beads. It is also suitable for welding in vertical upwards position at a high welding speed. It has 125% metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.50	0.90

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 460 N/mm <sup>2</sup>	
Tensile Strength	: 530 N/mm <sup>2</sup>	
Elongation (L=5d)	: 28 %	
Impact (ISO-V)	: 110 J (-30°C) 80 J (-40°C)	Redrying Temperature : 250-400°C/2-3 hours

### Approvals

CE, DB, GOST, NAKS, SEPRO, TSE, TÜV

ABS	BV	DNV	GL	LRS	RINA	RMRS	TL
3H10, 3Y	3YHH	3YH10	3YH10	3m 3Ym H10	3YH10	3Y40HH	3YH10

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]	Tin Can Box Weight [ kg ]
2.00	300	50 - 80	1400	1.8 / 130	2	-
2.50	350	80 - 110	2420	2.2 / 90	5	4.5
3.25	350	110 - 145	3800	3.4 / 90	5	4.5
4.00	450	130 - 190	7230	6.5 / 90	6	6
5.00	450	190 - 245	10700	6.4 / 60	6	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF

## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-248 is suitable for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon, high strength low alloyed steels having high (P) and (S) content; high strength ship's plate of A-, D- and E- quality and vessel plates of 17 Mn 4 and 19 Mn 5 type. AS B-248 can join steel parts to steel casts and can be used in welding of thick parts. It is suitable for the root pass and welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures. It is also very suitable for welding of GALVANIZED plates.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 55, Ck 55	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C55
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60 GS-62	GE200, GE240, GE260, GE300 -

# AS B-248 H5



## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 3 B 42 H5  
AWS A5.1 : E7018

### General Description

AS B-248 H5 is a basic coated electrode. It is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. Weld metal has a high resistance to cracking. The slag is easy to remove and it gives excellent quality, smooth weld beads. It is also suitable for welding in vertical upwards position at a high welding speed. It has 125% metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.50	0.90

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
Tensile Strength : 530 N/mm<sup>2</sup>  
Elongation (L=5d) : 28 %  
Impact (ISO-V) : 110 J (-30°C)  
80 J (-40°C)

Redrying Temperature : 350-400°C / 3 hours

### Approvals

CE, GOST, TSE

ABS	BV	DNV	GL	LRS	TL
3H5, 3Y	3YHHH	3YH5	3YH5	3m 3Ym H5	3YH5

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	AS B-248 H4R	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]	Tin Can Box Weight [ kg ]
2.50	350	80 - 110	2420	4.8 / 200	5	4.5
3.25	350	110 - 145	3800	5.1 / 135	5	4.5
4.00	450	130 - 190	7230	6.5 / 90	6	6
5.00	450	190 - 245	10700	6.4 / 60	6	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF

## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-248 H5 is suitable for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon, high strength low alloyed steels having high (P) and (S) content; high strength ship's plate of A-, D- and E- quality and vessel plates of 17 Mn 4 and 19 Mn 5 type. AS B-248 H5 can join steel parts to steel casts and can be used in welding of thick parts. It is suitable for the root pass and welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures. It is also very suitable for welding of GALVANIZED plates.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 55, Ck 55	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C55
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60 GS-62	GE200, GE240, GE260, GE300 -

# AS B-248 H4R



## Basic Coated Electrode for Mild Steels (Vacuum Pack)

### Classification

EN ISO 2560-A : E 42 4 B 42 H5  
AWS A5.1 : E7018 H4R

### General Description

AS B-248 H4R has a basic coated and moisture resistant coating. Vacuum pack enables electrode coating to keep its moisture content on production levels unless the package is not damaged or opened.

Due to its weld metal's high resistance to cracking AS B-248 H4R can be used for particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. The slag is easy to remove and it gives excellent quality, smooth weld beads. It is also suitable for welding in vertical upwards position at a high welding speed. It has 125% metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.50	0.90

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
Tensile Strength : 550 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 127 J (-40°C)

Re-drying Temperature : 350-400°C / 3 hrs  
(Should be applied if the vacuum pack damaged or opened)

### Approvals

ABS	BV	DNV	GL	LRS
4YH5, 4Y400H5	4Y40 H5	4Y40 H5	4Y40 H5	4Y40m H5

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]
2.50	350	80 - 110	2439	2.0 / 82
3.25	350	110 - 145	3846	2.0 / 52
4.00	450	130 - 190	8519	2.3 / 27
5.00	450	190 - 245	13333	2.4 / 18



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



# AS B-248 H4R



## Basic Coated Electrode for Mild Steels (Vacuum Pack)

### Applications and Materials to be Welded

AS B-248 H4R is suitable for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon, high strength low alloyed steels having high (P) and (S) content; high strength ship's plate of A-, D- and E- quality and vessel plates of 17 Mn 4 and 19 Mn 5 type. AS B-248 H4R can join steel parts to steel casts and can be used in welding of thick parts. It is suitable for the root pass and welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures. It is also very suitable for welding of GALVANIZED plates.

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 55, Ck 55	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C55
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60 GS-62	GE200, GE240, GE260, GE300 -

## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 5 B 32 H5  
AWS A5.1 : E7018-1 H4

### General Description

AS B-255 is a basic coated electrode. Weld metal has high impact strength at low temperatures. As the weld metal is very resistant to hot cracking, it is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. The slag is easy to remove and it gives very high quality, smooth weld beads. It has 125 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.50	1.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 580 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 180 J (-20°C)  
120 J (-50°C)

Redrying Temperature : 300-400°C / 2-3 hours

### Approvals

CE, GOST, NAKS, SEPRO, TSE

ABS	BV	DNV	GL	LRS	RINA	TL
3H5, 3Y	3YHHH	3YH5	3YH5	3m 3Ym H5	3YH5	3YH5

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]	Tin Can Box Weight [ kg ]
2.50	350	80 - 110	2460	2.2 / 90	5	4.5
3.25	350	110 - 145	3890	3.5 / 90	5	4.5
4.00	450	140 - 190	7310	6.6 / 90	6	6
5.00	450	180 - 240	10640	6.4 / 60	6	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-255 is especially suitable for fine grained structural steels having high yield strength values. It is designed for steel constructions and machines operating under dynamic forces at low temperatures. Welding of ship's plate of A-, D- and E-quality, boiler and pressure vessel manufacturing and pipe connections are among its application areas. AS B-255 can join steel parts to steel casts and can be used in the welding of thick parts. It is suitable for the root pass and welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 60, Ck 60	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335, E360 C60
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60, GS-70 GS-62	GE200, GE240, GE260, GE300, S355JOC -

# AS B-255 H4R



## Basic Coated Electrode for Mild Steels (Vacuum Pack)

### Classification

EN ISO 2560-A : E 46 5 B 32 H5  
AWS A5.1 : E7018-1 H4R

### General Description

AS B-255 H4R has a basic coated and moisture resistant coating. Vacuum pack enables electrode coating to keep its moisture content on production levels unless the package is not damaged or opened.

Weld metal has high impact strength at low temperatures. As the weld metal is very resistant to hot cracking, it is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. The slag is easy to remove and it gives very high quality, smooth weld beads. It has 125 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.07	0.50	1.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 490 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 92 J (-50°C)

Re-drying Temperature : 350-400°C / 3 hrs  
(Should be applied if the vacuum pack damaged or opened)

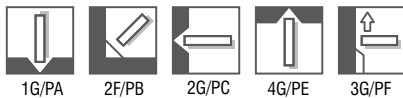
### Approvals

ABS	BV	DNV	GL	LRS
4YH5, 4Y400H5	4Y40 H5	4Y40 H5	4Y40 H5	4Y40m H5

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Vacuum Pack Weight [ kg ]
2.50	350	80 - 110	2439	2.0 / 82
3.25	350	110 - 145	3846	2.0 / 52
4.00	450	140 - 190	8519	2.3 / 27
5.00	450	180 - 240	13333	2.4 / 18



# AS B-255 H4R



## Basic Coated Electrode for Mild Steels (Vacuum Pack)

### Applications and Materials to be Welded

AS B-255 H4R is especially suitable for fine grained structural steels having high yield strength values. It is designed for steel constructions and machines operating under dynamic forces at low temperatures. Welding of ship's plate of A-, D- and E- quality, boiler and pressure vessel manufacturing and pipe connections are among its application areas. AS B-255 H4R can join steel parts to steel casts and can be used in the welding of thick parts. It is suitable for the root pass and welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 60, Ck 60	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335, E360 C60
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 Hl, Hll Hlll	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60, GS-70 GS-62	GE200, GE240, GE260, GE300, S355JOC -

# AS B-257 PIPE



## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 5 B 42 H5  
AWS A5.1 : E7018-1 H4

### General Description

AS B-257 PIPE is a basic coated electrode. Compared to the AS B-255, it allows for welding at lower currents thanks to its thinner cover diameter and special chemical changes made in its formula. This makes it possible to control easily weld pool by the welder when welding in position applications. The wetting capability of the weld metal is increased to ensure a good filling in the weld groove and to provide an excellent bead shape and profile. Weld metal has high impact strength at low temperatures. As the weld metal is very resistant to hot cracking, it is used particularly to weld rigidly restrained mass structures where high welding stresses are unavoidable. The slag is easy to remove and it gives very high quality, smooth weld beads. It has 115 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.05	0.50	1.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 520 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 27 %  
Impact (ISO-V) : 83 J (-50°C)

Redrying Temperature : 300-400°C / 2-3 hrs

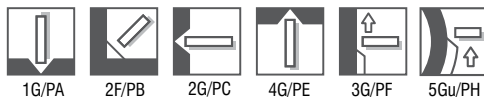
### Approvals

ABS	BV	TL
3YH5	3YH5	3YH5

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	65 - 110	2233	2.0 / 90	2
3.25	350	95 - 145	3526	4.5 / 130	5
4.00	350	120 - 190	5298	4.5 / 85	5
4.00	450	120 - 190	6884	5.8 / 85	6
5.00	350	180 - 240	7894	4.7 / 60	5
5.00	450	180 - 240	10236	6.1 / 60	6



# AS B-257 PIPE



## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-257 PIPE is especially designed for pipe welding applications. However, it provides excellent results in upward and overhead positions. It is suitable for fine grained structural steels having high yield strength values. It is designed for steel constructions and machines operating under dynamic forces at low temperatures. Welding of ship's plate of A-, D- and E- quality, boiler and pressure vessel manufacturing and pipe connections are among its application areas. AS B-255 PIPE can join steel parts to steel casts and can be used in the welding of thick parts. It is suitable for root passes and for welding in difficult positions. It gives excellent weld beads with high impact strength values at subzero temperatures.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 60, Ck 60	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335, E360 C60
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52, GS-60, GS-70 GS-62	GE200, GE240, GE260, GE300, S355J0C -

## Basic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 6 B 22  
AWS A5.1 : E7016-1

### General Description

AS B-268 is a basic coated electrode. It gives excellent quality, smooth and homogeneous weld beads with a very low impurity (like P and S) content. It guarantees a yield strength value up to 430 N/mm<sup>2</sup> for medium and high strength steels.

ø 2.5 or ø 3.25 mm electrode selection in the root pass brings homogeneous weld beads due to full penetration, which brings great advantage in special welding applications.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	P	S
0.07	0.50	1.10	< 0.03	< 0.03

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 460 N/mm <sup>2</sup>	
Tensile Strength	: 550 N/mm <sup>2</sup>	
Elongation (L=5d)	: 30 %	
Impact (ISO-V)	: 240 J (0°C)	Redrying Temperature : 250-400°C / 3 hours
	240 J (-20°C)	
	180 J (-40°C)	
	120 J (-60°C)	

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 110	2080	4.2 / 200	5
3.25	350	100 - 140	3250	4.9 / 150	5
4.00	450	140 - 180	5940	6.5 / 110	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Basic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS B-268 is designed for steel constructions and machines operating under dynamic forces. Ship building, boiler and pressure vessel manufacturing and pipe connections are among its application areas. It is recommended for the welding of high carbon, high strength low alloyed steels having high (P) and (S) content; high strength ship's plate of A-, D- and E- quality and vessel plates of 17 Mn 4 and 19 Mn 5 type. AS B-268 can join steel parts to steel casts and can be used in the welding of thick parts. It is suitable in the root pass and recommended especially in applications where high impact values are required at -30 or -40 °C.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 22 - C 35 ; Ck 22 - Ck 35	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C22 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 42	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM - X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11 H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

## Cellulosic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 3 C 25  
AWS A5.1 : E6010

### General Description

AS S-6010+ is an easy to strike cellulosic coated electrode. Excellent molten pool control due to easily-removable, low-volume slag and gaseous arc shielding eliminates porosity problems in weld beads. In all positions, it enables weld beads of high penetration and it minimizes problems that frequently occur in the welding of rusty or oily steels.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.15	0.20	0.55

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 23 %  
Impact (ISO-V) : 56 J (-30°C)

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (-)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Packing Type
2.50	300	40 - 70	1310	2.5 / 190	Cardboard Box
3.25	350	65 - 130	2610	9.3 / 356	Tin Box
4.00	350	90 - 175	3900	9.3 / 238	Tin Box
5.00	350	140 - 225	6076	9.3 / 154	Tin Box



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG



## Cellulosic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

Site welding of pipe and pipelines carrying natural gas, crude petroleum or alike; ship building; storage tanks, boiler and pressure vessel manufacturing, steel and bridge constructions are among its application areas. AS S-6010+ can be used in applications requiring high penetration. It can be used for root and deposition pass and also for pipe connections of 5LX46 grade line pipes.

	<b>DIN</b>	<b>EN</b>
<b>General Structural Steels</b>	St 33, St 35, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	S255N - S355N P255NH - P355NH
<b>Pipe Materials</b>	StE 240-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X56 (API 5LX)	L245NB - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4 H1, H11, H111	P295GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E	-
<b>Cast Steels</b>	GS-38 - GS-45	GE200, GE240, GE260

## Cellulosic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 42 2 C 11  
AWS A5.1 : E6011

### General Description

AS S-6011 is an easy to strike cellulosic coated electrode. Arc welding may be done with either AC or DC current. Excellent molten pool control due to easily-removable, low-volume slag and gaseous arc shielding eliminates porosity problems in weld beads. In all positions, it enables notch-free, smooth weld beads of high penetration. It also minimizes problems that frequently occur in the welding of rusty or oily steels.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.09	0.30	0.60

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
Tensile Strength : 540 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 45 J (-29°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]			Electrode Weight [ g/100 pcs ]	Box Weight [ kg ]	
		[ Root Pass ]	[ Hot Pass ]	[ Cover Pass ]		Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	40 - 80	-	-	1680	5.4 / 325	5
3.25	350	80 - 100	100 - 125	80 - 100	2950	4.7 / 160	5
4.00	350	110 - 130	115 - 140	110 - 130	4000	4.4 / 110	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG



## Cellulosic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

Site welding of pipe and pipelines made particularly from unalloyed structural steels; ship building; storage tanks, boiler and pressure vessel manufacturing and steel constructions are among its application areas. AS S-6011 can be used in applications requiring high penetration. It can also be used for the root and deposit pass. As it is an easy to bend electrode, it brings great convenience to reach in difficult-to-reach areas. AS S-6011 is an ideal electrode for welding in vertical downwards position.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 35, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	S255N - S355N P255NH - P355NH
<b>Pipe Materials</b>	StE 240-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X56 (API 5LX)	L245NB - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4 H1, H11, H111	P295GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E	-
<b>Cast Steels</b>	GS-38 - GS-45	GE200, GE240, GE260



## Cellulosic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 2 Mo C 21  
AWS A5.5 : E7010-A1

### General Description

AS S-7010 Mo is a cellulosic coated electrode. It has 0.5 % Mo content. Excellent molten pool control due to easily-removable slag and gaseous arc shielding eliminates porosity problems in weld beads which have good mechanical properties. In all positions, it enables notch-free, smooth weld beads of high penetration.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Mo
0.08	0.10	0.70	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 50 J (-20°C)  
40 J (-30°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]			Electrode Weight [ g/100 pcs ]	Box Weight [ kg ]	
		[ Root Pass ]	[ Hot Pass ]	[ Cover Pass ]		Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	40 - 80	-	-	1680	5.4 / 325	5
3.25	350	80 - 100	100 - 125	80 - 100	2950	4.7 / 160	5
4.00	350	110 - 130	115 - 140	110 - 130	4000	4.4 / 110	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG

## Cellulosic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

It is especially designed for the site welding of higher strength pipe and pipelines with 0.5 % Mo, that carry content carrying natural gas, crude petroleum or alike. It is particularly used on pipe steels in the 5LX52 - 5LX56 range. Ship building; storage tanks, and boiler and pressure vessel manufacturing are among its application areas. AS S-7010 Mo is an ideal electrode for welding inverted downwards position.

	DIN	EN
<b>General Structural Steels</b>	St 33, St 35, St 37, St 44, St 44-2, St 44-3, St 52 St 37-4, St 44-4, St 52-4	S185, S235, S275, S355 P235TR2 - P355T2
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	S255N - S355N P255NH - P355NH
<b>Pipe Materials</b>	StE 290-7 - StE 415-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X56, X60 (API 5LX)	L290NB - L415NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 5, 15 Mo 3 H1, H11, H111	P295GH, P310GH, 16 Mo 3 P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E	-
<b>Cast Steels</b>	GS-38 - GS-45	GE200, GE240, GE260

## Cellulosic Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 3 Z C 21  
AWS A5.5 : E8010-G

### General Description

AS S-8010 Ni is an easy to strike cellulosic coated electrode that provide the highest impact notch toughness values among our range of cellulosic coated electrodes. Due to its higher mechanical properties, it is useful for the root and deposit pass of large diameter pipe connections having high yield strength. In all positions, it enables notch-free, smooth weld beads of high penetration. It enables excellent molten pool control due to easily-removable, low-volume slag.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni
0.10	0.30	1.10	0.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (-20°C)  
50 J (-30°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]			Electrode Weight [ g/100 pcs ]	Box Weight [ kg ]	
		[ Root Pass ]	[ Hot Pass ]	[ Cover Pass ]		Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	40 - 80	-	-	1540	6.2 / 400	5
3.25	350	80 - 100	90 - 120	80 - 100	2600	5.7 / 220	5
4.00	350	110 - 130	120 - 140	110 - 130	3910	5.5 / 140	5
5.00	350	-	140 - 170	140 - 160	6060	5.8 / 95	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG





## Cellulosic Coated Electrode for Mild Steels

### Applications and Materials to be Welded

AS S-8010 Ni can be used in the site welding of pipe and pipelines made particularly from low alloyed high strength steels. Site welding of pipe steels in the 5LX60 - 5LX70 range is a good example to application areas. AS S-8010 Ni is an ideal electrode for welding in vertical downwards position.

	<u>DIN</u>	<u>EN</u>
<b>Pipe Materials</b>	StE 290-7 - StE 415-7 StE 290-7 TM - StE 415-7 TM X42, X46, X52, X56, X60, X70 (API 5LX)	L290NB - L415NB L290MB - L360MB -
<b>Ship Plates</b>	A, B, C, D, E	-

## Iron Powder Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 0 RR 74  
AWS A5.1 : E7024

### General Description

AS DT-165 is a heavily coated, high efficiency rutile iron powder electrode. It gives a metal recovery of about 165 % due to high iron powder content in its coating. It is particularly suitable for fillet welding of thick plates. It gives smooth weld bead appearance with a soft arc. The slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.40	0.70

### Chemical Composition (w%), Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (-20°C)

### Approvals

CE, GOST, SEPRO, TSE

ABS	BV	RINA	TL
2	2	2	2

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC ( - )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	450	130 - 155	6540	5.9 / 90	6
4.00	450	170 - 240	10050	6.0 / 60	6
5.00	450	250 - 310	14920	6.0 / 40	6



1G/PA



2F/PB



## Iron Powder Coated Electrode for Mild Steels

### Applications and Materials to be Welded

It is used for the welding of medium carbon and mild steels. AS DT-165 is an ideal electrode particularly used for welding vertical/horizontal fillets. Weld metal goes well up the vertical plate giving a good transition to the base metal without undercutting, even at high currents.

Machinery fabrication and ship building where smooth weld beads are required; boiler and pressure vessel manufacturing; automotive bodies and steel and bridge constructions are among some application areas where AS DT-165 is extensively used as it brings high efficiency in terms of welding cost.

	<b>DIN</b>	<b>EN</b>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52* C 10 - C 22	S185, S235, S275, S355 C10 - C22
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420	S255N - S420N P255NH - P420NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 X42, X46, X52, X60 (API 5LX)	L210 - L360NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D*, E* AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52*	GE200, GE240, GE260

( \* ) It is recommended to use a basic coated electrode in the root pass.



## Iron Powder Coated Electrode for Mild Steels

### Classification

EN ISO 2560-A : E 46 0 RR 74  
AWS A5.1 : E7024

### General Description

AS DT-180 is a heavily coated, high efficiency rutile iron powder electrode. It gives a metal recovery of about 180 % due to high iron powder content in its coating. It is particularly suitable for GRAVITY WELDING of thick plates. It gives smooth weld bead appearance with a soft arc. The slag is easy to remove. As the electrode length is 700 mm, it enables uninterrupted welding with large and long welding beads.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn
0.08	0.45	0.90

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 500 N/mm<sup>2</sup>  
Tensile Strength : 560 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (0°C)

### Approvals

GOST, SEPRO, TSE

ABS	BV	DNV	LRS	TL
2	2	2	2m	2

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC (-)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]
4.00	700	180 - 230	16900	10.1 / 60
5.00	700	240 - 270	25530	10.2 / 40



1G/PA



2F/PB

## Iron Powder Coated Electrode for Mild Steels

### Applications and Materials to be Welded

It is used for the welding of mild steels having a maximum tensile strength of 440 N/mm<sup>2</sup> and for ordinary ship's plate of A- and Dquality. AS DT-180 is an ideal electrode particularly used for fillet and butt joints in flat and horizontal positions. Machinery fabrication and ship building where smooth weld beads are required; boiler and pressure vessel manufacturing; automotive bodies and steel and bridge constructions are among some application areas where AS DT-180 is extensively used. It brings high efficiency as it is a very fast electrode with a very high deposition rate.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52* C 10 - C 22	S185, S235, S275, S355 C10 - C22
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420	S255N - S420N P255NH - P420NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 X42, X46, X52, X60 (API 5LX)	L210 - L360NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11, H111	P295GH, P355GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D*, E* AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52*	GE200, GE240, GE260

(\* ) It is recommended to use a basic coated electrode in the root pass.

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 2560-A : E 42 2 Z B 42  
AWS A5.1 : E8018-G

### General Description

AS DA-708 is a heavily coated, Ni-Cu alloyed basic electrode. It gives a weld metal that has an excellent corrosion resistance to sea water and to flue gases. Weld metal has good mechanical properties. AS DA-708 welds with a quite, stable arc giving very little spatter.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni	Cu
0.05	0.30	1.00	0.60	0.45

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
Tensile Strength : 570 N/mm<sup>2</sup>  
Elongation (L=5d) : 28 %  
Impact (ISO-V) : 120 J (-20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 115	2320	4.6 / 200	5
3.25	350	100 - 140	3700	5.0 / 135	5
4.00	450	150 - 190	7040	5.6 / 80	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF

## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

The electrode can be used in all positions for the welding of all types of joints. AS DA-708 is particularly designed for welding the shell platings of ships where the protective paint coating wears severely. Ship steels of A-, D- and E- quality and slow corrosion steels (due to its copper content) of the CORTEN-A and CORTEN-B type are among other application areas. It can be used in the welding of parts that work under dynamic loads at elevated temperatures; in all construction applications including bridges, boiler and pressure vessels, and shipbuilding. AS DA-708 can also be used in the root pass.

	DIN	EN
<b>General Structural Steels</b>	St 44, St 44-2, St 44-3, St 52-3 St 50-2, St 60-2, St 70-2	S275, S355 E295, E335, E360
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 420 TStE 255 - TStE 420 EStE 255 - EStE 355	S255N - S420N P255NH - P420NH S255NL - S420NL / P275NL1 - P355NL1 S255NL1 - S315NL1 / P275NL2 - P355NL2
<b>Pipe Materials</b>	StE 210-7 - StE 360-7	L245NB - L360NB
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 5 HII, HIII, HIII	P295GH, P310GH P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, D, E	-
<b>Weather Resisting Steels</b>	St 52-3 Cu3	S355 J2G3Cu S235 J0W, S235 J2W, S355 J0W S355 J2W, S355 K2G1W



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 2560-A : E 46 6 2 Ni B 42  
AWS A5.1 : E8018-C1

### General Description

AS DA-710 is a heavily coated, Ni alloyed basic electrode. It is particularly useful for the welding of fine-grained steels and low alloy steels which have high impact resistance at low temperatures down to  $-60^{\circ}\text{C}$ . It is used for the welding of joints which need to have high toughness values at low temperatures. It gives a weld metal that has an excellent corrosion resistance to sea water and to sulphuric acid fumes. It has about 120 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni	P	S
0.06	0.30	0.90	2.40	< 0.02	< 0.02

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 500 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 28 %  
Impact (ISO-V) : 150 J ( $-20^{\circ}\text{C}$ )  
110 J ( $-60^{\circ}\text{C}$ )

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 115	2500	5.0 / 200	5
3.25	350	100 - 140	3740	5.1 / 135	5
4.00	450	140 - 190	7510	6.8 / 90	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

AS DA-710 is particularly designed for the welding of high strength low alloyed steels. It is suitable for the root pass and welding of pipelines and storage tanks that are frequently used in the chemical industry and cold storage areas.

	DIN	EN
<b>General Structural Steels</b>	St 52-3 St 60-2, St 70-2	S355 E335, E360
<b>Fine Grained Steels</b>	StE 255 - StE 500 WStE 255 - WStE 500 TStE 255 - TStE 500 EStE 255 - EStE 500	S255N - S500N P255NH - P500NH S255NL - S500NL / P275NL1 - P460NL1 S255NL1 - S500NL1 / P275NL2 - P460NL2 S355NH - S460NH
<b>Pipe Materials</b>	X52, X56, X60, X65 (API 5LX)	-
<b>Low Temperature</b>	14 Ni 6, 16 Ni 14	-
<b>Steels</b>	TTSt 35 N, TTSt 45 N, TTSt 35 V, TTSt 45 V 10 Ni 14, 12 Ni 9, 14NiMn6	- 12 Ni 14, X12 Ni 5, 15 NiMn 6
<b>Cast Steels</b>	- GS-52, GS-60	11 MnNi 5 3, 13 MnNi 6 3 GE260, GE300

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 2560-A : E 50 6 1 Ni B 42 H5  
AWS A5.1 : E8018-C3 H4

### General Description

AS DA-715 is a thick coated basic electrode. The weld metal contains 1 % Ni. It is particularly used for the welding of fine-grained steels and steels which maintain their toughness at low temperatures down to  $-60^{\circ}\text{C}$ . Weldability is very good at all positions except vertical down. The weld metal diffusible hydrogen level is below 5 ml/100 g. Recovery is 120 %.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni	P	S
0.05	0.35	1.30	1.00	< 0.02	< 0.02

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 540 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 27 %  
Impact (ISO-V) : 80 J ( $-50^{\circ}\text{C}$ )  
60 J ( $-60^{\circ}\text{C}$ )

### Approvals

TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 115	2380	4.8 / 200	5
3.25	350	100 - 150	3700	5.0 / 135	5
4.00	450	140 - 190	7300	6.6 / 90	6
5.00	450	180 - 240	10850	6.1 / 56	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloy Steels

### Applications and Materials to be Welded

It is especially suitable for high strength low alloy steels used at low temperatures and at weld joints which require high impact strength. It is used at root and other passes for chemical industry, cold air warehouses, pressure and boiler vessels, piping/tubing and offshore platforms.

	<u>DIN</u>	<u>EN</u>
<b>General Structural Steels</b>	St 44, St 44-2, St 44-3, St 52-3	S275, S355
<b>Fine Grained Steels</b>	StE 255 - StE 500 WStE 255 - WStE 500 TStE 255 - TStE 500 EStE 255 - EStE 355	S255N - S500N P255NH - P500NH S255NL - S500NL / P275NL1 - P460NL1 S255NL1 - S500NL1 / P275NL2 - P460NL2
<b>Pipe Materials</b>	X42, X46, X52, X56, X60, X65 (API 5LX) -	- L290GA - L360GA
<b>Boiler and Pressure Vessel Steels</b>	H1, H11, H111 17 Mn 4, 19 Mn 5	P235GH, P265GH, P285NH P295GH, P310GH
<b>Ship Plates</b>	A, D, E AH32 - EH36	- -
<b>Low Temperature Steels</b>	TTSt 35 N, TSt 35 V, 15 MnNi 6 3 -	- 11 MnNi 5 3, 13 MnNi 6 3



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 18275-A : E 55 6 1NiMo B 42  
AWS A5.5 : E9018-G

### General Description

DA-717 is a basic electrode. It is used for the welding fine-grained and high strength steels with a yield strength min. 600 N/mm. It gives a weld metal that has a high toughness value and resistant to cracking at low temperatures down to -60°C. It has 120 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni	Mo
0.04	0.30	1.00	1.10	0.35

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 600 N/mm<sup>2</sup>  
Tensile Strength : 650 N/mm<sup>2</sup>  
Elongation (L=5d) : 23 %  
Impact (ISO-V) : 160 J (-30°C)  
70 J (-60°C)

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 120	2320	4.6 / 200	5
3.25	350	110 - 140	3710	5.0 / 135	5
4.00	450	140 - 190	7470	6.7 / 90	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Steels

### Materials to be Welded

	<u>DIN</u>	<u>EN</u>
<b>Fine Grained Steels</b>	StE 420 - StE 500 WStE 420 - WStE 500 TStE 420 - TStE 500	S420N - S500N P420NH - P500NH S420NL - S500NL / P275NL1 - P460NL1
<b>Pipe Materials</b>	X60, X65, X70, X75, X80 (API 5LX)	-

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : E Mo R 22  
AWS A5.5 : E8013-G

### General Description

AS DA-731 is a rutile coated electrode. It gives a Mo alloyed weld metal that is used in the welding of boiler and pressure vessels operating under high temperatures.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Mo
0.08	0.30	0.70	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 500 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 24 %  
Impact (ISO-V) : 50 J (-20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	75 - 110	2020	4.2 / 210	5
3.25	350	100 - 140	3380	5.1 / 150	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

AS DA-731 is used for the welding of low alloyed and pressure vessel steels with a tensile strength up to 540 N/mm. It is ideal for the welding of boiler and pressure vessel steels and pipe connections that operate under temperatures up to 525°C. AS DA-735, a basic coated electrode, should be preferred in multipass applications of thick sectioned or rigidly restrained mass structures.

	<b>DIN</b>	<b>EN</b>
<b>Fine Grained Steels</b>	StE 255 - StE 500	S255N - S500N
<b>Boiler and</b>	WStE 255 - WStE 500	P255NH - P420NH
<b>Pipe Materials</b>	StE 320-7 - StE 415-7 StE 360-7 TM - StE 415-7 TM X52, X56, X60 (API 5LX)	L320 - L415NB L360MB - L415MB -
<b>Boiler and</b>	HI, HII, HIII	P235GH, P265GH, P285NH
<b>Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 5, 15 Mo 3 16 Mo 5	P295GH, P310GH, 16 Mo 3 -
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45 GS-22 Mo 4 GS-C 25	GE240 G20Mo5 GP240GH

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : E Mo B 22  
AWS A5.5 : E7018-A1

### General Description

AS DA-735 is a basic coated electrode. It gives a Mo alloyed weld metal that is used in the welding of boiler and pressure vessels operating under high temperatures. Ductile weld metal has a particular creep resistance. It is ideal in multipass applications that is required in the welding of thick and rigidly restrained mass structures. It gives high quality weld beads with good mechanical properties.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Mo
0.08	0.30	0.80	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 510 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 24 %  
Impact (ISO-V) : 150 J (+20°C)

### Approvals

GOST, SEPRO, TSE

TL

1

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 110	2490	5.0 / 200	5
3.25	350	110 - 140	3840	5.2 / 135	5
4.00	450	150 - 190	7330	5.9 / 80	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

AS DA-735 is used for the welding of 15 Mo 3 grade steels operating under temperatures up to 550°C. It is also ideal for the welding of fine grained steels (up to St E480-7 TM). It is ideal for the welding of boiler and pressure vessel steels and pipe connections that operate under temperatures up to 525°C.

The stable arc enables proper welding in the root pass and in difficult positions

	DIN	EN
<b>Fine Grained Steels</b>	StE 255 - StE 500 WStE 255 - WStE 500	S255N - S500N P255NH - P500NH
<b>Pipe Materials</b>	StE 320-7 - StE 415-7 StE 360-7 TM - StE 415-7 TM X52, X56, X60, X65 (API 5LX)	L320 - L415NB L360MB - L415MB -
<b>Boiler and Pressure Vessel Steels</b>	HI, HII, HIII 17 Mn 4, 19 Mn 5, 15 Mo 3 - 16 Mo 5	P235GH, P265GH, P285NH P295GH, P310GH, 16 Mo 3 P355GH -
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45, GS-52, GS-60 GS-22 Mo 4 GS-C 25	GE240 - GE300 G20Mo5 GP240GH
<b>Steels Resistant to Aging</b>	17 MnMoV 6 4, 15 NiCuMoNb 5 -	- 20 MnMoNi 4 5

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 18275-A : E Mo B 22  
AWS A5.5 : E 9018-D1

### General Description

AS DA-737 is a basic coated, AC/DC electrode for the welding of high tensile strength steels. It gives a weld metal that has good notch toughness down to  $-60^{\circ}\text{C}$ . Grain boundary cracking risk is very low.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Mo
0.06	0.40	1.30	0.40

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 580 N/mm<sup>2</sup>  
Tensile Strength : 660 N/mm<sup>2</sup>  
Elongation (L=5d) : 24 %  
Impact (ISO-V) : 170 J (+20°C)  
50 J (-50°C)  
40 J (-60°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 140	3790	4.6 / 120	5
4.00	450	150 - 190	7300	5.8 / 80	6
5.00	450	190 - 250	10500	6.3 / 60	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

Due to the weld metal's good notch toughness properties down to  $-60^{\circ}\text{C}$ , it is used for welding unalloyed and low alloyed steel structures exposing to low temperatures like LPG holders. Welding of low alloyed high tensile steels when preheating cannot be applied and enclosed joint welding and cladding of rails when a hardness of about 250 HV is required are among its application areas.

	DIN	EN
<b>General Structural Steels</b>	St 50-2, St 60-2, St 70-2	E295, E335, E360
<b>Fine Grained Steels</b>	StE 380 - StE 500 WStE 380 - WStE 500	S380N - S500N P380NH - P500NH
<b>Pipe Materials</b>	X42, X46, X52, X56, X60, X65 (API 5LX)	-
<b>Low Temperature Steels</b>	TTSt 35 N, TTSt 35 V	-

## Coated Electrode for High Strength Low Alloyed Creep Resistant Steels

### Classification

EN ISO 3580-A : E MoV B 3 2  
AWS A5.5 : E9018-G

### General Description

AS DA-741 is a basic type coated electrode. It is suitable for welding of CrMoV alloyed creep-resisting steel with working temperature up to 550°C. Work piece should be pre-heated up to 200°C before welding. The temperature should be kept between 200°C and 300°C during welding.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Mo	Cr	V
0.06	0.50	1.20	1.00	0.50	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 560 N/mm<sup>2</sup>  
Tensile Strength : 640 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Area Reduction : 72 %  
Impact (ISO-V) : 180 J (+20°C)

Post Weld Heat Treatment : 700 °C / 1 hour

### Approvals

TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	60 - 90	2268	2.0 / 90	5
3.25	350	80 - 130	3863	3.0 / 80	5
4.00	350	120 - 180	5658	5.0 / 90	5
4.00	450	120 - 180	7332	6.0 / 83	6



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Creep Resistant Steels

### Applications and Materials to be Welded

ASTM	EN	W. Nr.
A389 Gr. C23 & C24	14MoV6-3	1.7715
A405 Gr. P24	4CrMoV5-5	1.7733
	21CrMoV5-7	1.7709
	21CrMoV5-11	1.8070
	G17CrMoV5-10	1.7706

## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 18275-A : E 69 5 Mn 2 NiCrMo BT 42  
 AWS A5.5 : E11018-G

### General Description

AS DA-753 is a basic coated electrode. It is used for the welding of fine-grained, heat treatable high strength steels with a yield strength up to 760 N/mm. It can also be used in the welding of fine grained structural steels having a yield strength value greater than 760 N/mm. It gives a weld metal that has a high toughness value and resistant to cracking at low temperatures down to - 50°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.05	0.40	1.50	0.35	1.80	0.45

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 700 N/mm<sup>2</sup>  
 Tensile Strength : 800 N/mm<sup>2</sup>  
 Elongation (L=5d) : 20 %  
 Impact (ISO-V) : 115 J (+20°C)  
                           85 J (-20°C)  
                           70 J (-40°C)  
                           55 J (-50°C)  
                           40 J (-60°C)

### Approvals

GOST, SEPRO, TSE

TL

1

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	75 - 110	2290	4.6 / 200	5
3.25	350	100 - 145	3800	5.1 / 135	5
4.00	450	130 - 190	7390	5.9 / 80	6
5.00	450	180 - 250	11550	6.9 / 60	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

It is used for welding fine grained, low alloyed high strength structural steels at room temperature or with moderate preheat. It is used in the welding of steel structures, boiler and pressure vessels, and for construction of heavy machinery. It is particularly used in the root pass of high strength steels (790 N/mm<sup>2</sup>).

- 1) If possible, each joint should be welded continuously, except electrode change and slag removal.
- 2) In multi-pass welding applications, interpass temperature should be maintained at 100-150°C.
- 3) Use only dry electrodes.

	<u>DIN</u>	<u>EN</u>
<b>Fine Grained Steels</b>	StE 500	S500N
	WStE 500	P500NH
	TStE 500	P500NL
	15 NiCrMo 10 6, 16 NiCrMo 12 6	-
	11 NiMnCrMo 5 5, 17 MnCrMo 3 3	-
	12 MnNiMo 5 5, 11 NiMoV 5 3	-
	TStE 620 V - TStE 690 V	S620QL - S690QL
<b>Pipe Materials</b>	X70, X75 (API 5LX)	-
<b>Heat Treated</b>	N-A-XTRA 56, N-A-XTRA 63, N-A-XTRA 70	S550QL1, S620QL1, S690QL1
<b>Fine Grained Structural Steels</b>	T1, T1A, T1B, HSB 7,7 V	-



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : (E CrMo 1 R 12)  
AWS A5.5 : (E8013-B2)

### General Description

AS DA-771 is a rutile coated electrode. It gives a Cr-Mo alloyed weld metal that is used in the welding of creep resistant pressure vessels and pipe steels operating under high temperatures. AS DA-771 is especially used for 13 CrMo 44 type steels that are frequently used in operating temperatures up to 570°C. It gives a root pass free of porosity with a minimum amount of spatter.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo
0.06	0.30	0.80	1.20	0.40

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 520 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Impact (ISO-V) : 60 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC ( - )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 95	2200	3.3 / 150	5
3.25	350	100 - 140	3050	4.1 / 135	5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Applications and Materials to be Welded

### Applications and Materials to be Welded

AS DA-771 is used for the welding of vapor pipes and boiler and pressure vessels that are manufactured from Cr-Mo steels. AS DA-774, a basic coated electrode, should be preferred in the multi-pass welding of thick sectioned and rigidly restrained mass structures.

	DIN	EN	W. Nr.
<b>Heat Resistant Steels</b>	15 CrMo 5	-	1.7205
	-	25CrMo4	1.7218
	-	42CrMo4 *	1.7225
	24 CrMo 5	-	1.7258
	13 CrMo 4 4	13CrMo4-5	1.7335
	22 CrMo 4 4	-	1.7350
	16 CrMoV 4	-	1.7728
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-22 CrMo 5 4	G22CrMo5-4	1.7354
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357

(\* ) Mechanical properties should be considered.



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : E CrMo 1 B 12  
AWS A5.5 : E8018-B2

### General Description

AS DA-774 is a basic coated electrode. It gives a Cr-Mo alloyed weld metal that is used in the welding of creep resistant pressure vessels and pipe steels operating under high temperatures. AS DA-774 is especially used for 13 CrMo 44 type steels that are frequently used in operating temperatures up to 570°C. It gives a root pass free of porosity with a minimum amount of spatter. It is recommended to use the electrode in DC (+).

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo
0.06	0.50	0.80	1.20	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 540 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Impact (ISO-V) : 90 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 100	2030	3.9 / 190	5
3.25	350	90 - 140	3270	4.7 / 145	5
4.00	450	130 - 190	6420	6.1 / 95	6
5.00	450	150 - 240	10000	6.5 / 65	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF

## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

AS DA-774 is used for the welding of vapor pipes and boiler and pressure vessels that are manufactured from Cr-Mo steels. It can also be used in welding similarly alloyed cementation steels, heat treatable steels and cast steels. It is an ideal electrode in the multi-pass welding of thick sectioned and rigidly restrained mass structures.

	DIN	EN	W. Nr.
<b>Heat Resistant Steels</b>	15 CrMo 3	-	1.7205
	-	25CrMo4	1.7218
	-	42CrMo4 *	1.7225
	24 CrMo 5	-	1.7258
	15 CrMo 5	13CrMo4-5	1.7262
	13 CrMo 4 4	-	1.7335
	16 CrMo 4 4	-	1.7337
	22 CrMo 4 4	-	1.7350
	13 CrMoV 4 2	-	1.7709
	16 CrMoV 4	-	1.7728
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-22 CrMo 5	G22CrMo5	1.7252
	GS-22 CrMo 5 4	G22CrMo5-4	1.7354
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357
<b>Cementation Steels</b>	15 Cr 3		1.7015
	-		1.7131
	-		1.7147

(\*) Mechanical properties should be considered.



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : E CrMo 2 B 22  
AWS A5.5 : E9018-B3

### General Description

AS DA-777 is a basic coated electrode for joining and welding of heat and creep resistant steels containing 2.2 % Cr + 1 % Mo that are exposed to operating temperatures up to 600°C. The weld metal has a high resistance to cracking. AS DA-777 runs with a quite, stable arc giving a minimum amount of spatter and smooth weld beads. It is recommended to use the electrode in DC (+).

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo
0.05	0.40	0.80	2.40	1.10

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 560 N/mm<sup>2</sup>  
Tensile Strength : 650 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Impact (ISO-V) : 80 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	80 - 110	2160	4.3 / 200	5
3.25	350	90 - 140	3420	4.8 / 140	5
4.00	450	130 - 190	6450	6.4 / 100	6
5.00	450	150 - 240	10000	6.0 / 60	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

Power plant constructions; flange pipes used in petrochemical plants; forged cast parts, vapor production plants, preheaters and heaters, boiler and pressure vessels and pipe connections are among some application areas where AS DA-777 is used. It can also be used in welding similarly alloyed cementation steels, heat treatable steels and cast steels. Part should be preheated before welding to avoid the cracking risk and operating temperature during welding should not exceed 300°C.

	<u>DIN</u>	<u>EN</u>	<u>W. Nr.</u>
<b>Heat Resistant Steels</b>	26 CrMo 7	-	1.7259
	24 CrMo 10	-	1.7273
	10 CrMo 11	-	1.7276
	16 CrMo 9 3	-	1.7281
	12 CrMo 9 10	-	1.7375
	-	10 CrMo 9-10	1.7380
	10 CrSiMoV 7	-	1.8075
<b>Cast Steels</b>	GS-18 CrMo 9 10	G17 CrMo 9-10	1.7379



## Coated Electrode for High Strength Low Alloyed Steels

### Classification

EN ISO 3580-A : E CrMo 5 B 42  
AWS A5.5 : E8018-B6

### General Description

AS DA-778 is a basic coated electrode particularly used for the welding of steels containing 5 % Cr and 0.5 % Mo. The weld metal has a crack resistance to operating temperatures up to 550°C. Since it is a low hydrogen electrode, the weld metal has a high creep resistance. It has about 110 % metal recovery. It is recommended to use the electrode in DC (+).

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo
0.05	0.50	0.70	5	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 400 N/mm<sup>2</sup>  
Tensile Strength : 580 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Impact (ISO-V) : 80 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	75 - 100	2300	4.6 / 200	5
3.25	350	90 - 140	3640	4.9 / 135	5





## Coated Electrode for High Strength Low Alloyed Steels

### Applications and Materials to be Welded

Power plant constructions; flange pipes used in petrochemical plants; forged cast parts, vapor production plants, preheaters and heaters, boiler and pressure vessels and pipe connections are among some application areas where AS DA-778 is used. It can also be used in welding similarly alloyed cementation steels, heat treatable steels and cast steels.

Part should be preheated to 300°C before welding and operating temperature during welding should not exceed 350°C.

	DIN	EN	W. Nr.
<b>Heat Resistant Steels</b>	15 CrMo 3	-	1.7205
	25 CrMo 4	-	1.7218
	15 CrMo 5	-	1.7262
	22 CrMo 4 4	-	1.7350
	12 CrMo 19 5	X12 CrMo 5	1.7362
<b>Cast Steels</b>	GS-17 CrMo 5 5	G-17 CrMo 5 5	1.7357
	GS-25 CrMo 4	G-25 CrMo 4	1.7218
	GS-22 CrMo 5	G-22 CrMo 5	1.7252
	GS-22 CrMo 5 4	G-22 CrMo 5 4	1.7354
	GS-12 CrMo 19 5	G-X 12 CrMo 19 5	1.7363
<b>Cementation Steels</b>	15 Cr 3	-	1.7015
	-	16 MnCr 5	1.7131
	-	20 MnCr 5	1.7147

## Coated Electrode for High Strength Low Alloyed Creep Resistant Steels

### Classification

EN ISO 3580-A : E CrMo91 B 32  
AWS A5.5 : E9015-B9

### General Description

AS DA-791 is a basic type coated electrode. The chemical alloy of the weld metal comes from the electrode cover. It is especially developed for welding of %9Cr - %1Mo alloyed and T91/P91 grade creep and hydrogen resistant steels. Niobium, Vanadium and Nitrogen content provide better creep resistance and toughness. It is also suitable for all position welding except vertical down. It is mainly used in power plants and petro-chemical industry.

Work piece should be pre-heated up to 200°C before welding. The temperature should be kept between 200°C and 300°C during welding.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo	N	Nb	V
0.10	0.30	0.80	9.10	0.70	1.00	0.05	0.06	0.20

### Mechanical Properties, Typical, All Weld Metal

	Room Temp. (20°C)	550°C	600°C	650°C
Yield Strength	: 640 N/mm <sup>2</sup>	> 400 N/mm <sup>2</sup>	> 350 N/mm <sup>2</sup>	> 200 N/mm <sup>2</sup>
Tensile Strength	: 720 N/mm <sup>2</sup>	> 500 N/mm <sup>2</sup>	> 400 N/mm <sup>2</sup>	> 300 N/mm <sup>2</sup>
Elongation (L=5d)	: 19 %	> 13 %	> 14 %	> 18 %
Area Reduction	: 60 %	> 50 %	> 65 %	> 78 %
Impact (ISO-V) (+20°C)	: 60 J			

Postweld Heat Treatment (\*) : 760°C/2 hrs

It is recommended that heating and cooling processes should be carried out at max. 150°C/hr. During the cooling process, the piece is allowed to cool in air after 300°C.

Hardness : 460 HV (as welded)  
260 HV (after heat treatment)

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 100	2173	2.0 / 97	5
3.25	350	80 - 140	3463	3.0 / 90	5
4.00	350	100 - 180	5258	5.0 / 96	5
4.00	450	100 - 180	6813	6.0 / 90	6



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF





## Coated Electrode for High Strength Low Alloyed Creep Resistant Steels

### Applications and Materials to be Welded

Suitable for welding of high creep resistant 9% Cr - 1% Mo alloys and especially for T91/P91 grade steels.

	ASTM	ASME	EN 10222-2 / EN 10302	W. Nr.
<b>Creep Resistant Steels</b>	–	–	X10CrMoVNb91	1.4903
	A199 Grade T91	SA 182-F91	–	–
	A200 Grade T91	SA 213-T91	–	–
	A213 Grade T91	SA 335-P91	–	–
	A213 Grade P91	SA 336-F91	–	–
	A335 Grade P91	SA 369-F91	–	–
	A336 Grade F91	SA 369-P91	–	–



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 18 9 MnMo B 22  
AWS A5.4 : E307-15

### General Description

AS P-307 is a basic coated electrode. It gives a filler metal of the Cr-Ni-Mo type that is high (4.5 %) in Mn content. Weld beads are highly resistant to impact, wearing and cracking due to heat effects. It gives a fully austenitic, non-magnetic weld metal.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.10	0.40	4.5	20	10	1.00

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
Tensile Strength : 690 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact (ISO-V) : 80 J (+20°C)  
Hardness : 150 HB (as welded)  
250 HB (after cold working)

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

AS P-307 is used for forming a buffer layer for hardfacing and joining of armour steel plates, steel welds that are low hardenable and work-hardening austenitic Mn steels. It can also be used for dissimilar weld joints of C-Mn steels with austenitic and ferritic stainless steels.

There is no need to apply heat treatment to armour steel plates before or after the welding. Interpass temperature during welding should not exceed 120°C.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( + )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	300	80 - 110	2950	2.2 / 75	2.0
4.00	350	120 - 150	4040	2.1 / 50	2.5
5.00	350	150 - 190	6960	3.2 / 45	2.5



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF

# AS P-308L Super



## Coated Electrode for Stainless Steels

EN ISO 3581-A : E 19 9 LR 12      Werkstoff-Nr : 1.4306  
 AWS A5.4 : E308L-16

### General Description

AS P-308L Super is an extra low carbon rutile coated electrode. It gives a filler metal of the Cr-Ni type. Excellent quality smooth weld beads are highly resistant to acids, intergranular corrosion at operating temperatures up to 350°C, and to oxidation up to 800°C. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.03	0.80	0.70	19	10

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
 Tensile Strength : 570 N/mm<sup>2</sup>  
 Elongation (L=5d) : 45 %  
 Impact (ISO-V) : 80 J (+20°C)

### Approvals

CE, GOST, SEPRO, TSE, TÜV  
**ABS (E308L-16) BV (308L) DNV (NV 308L)**  
**GL (4306)**

### Applications and Materials to be Welded

In addition to the welding of steels corresponding to AISI 301, 302, 304, 304L, 308 and 308L; AS P-308 L Super can also be used in the welding of niobium or titanium stabilized austenitic stainless steels. Welding of vapor and pressure fittings, storage tanks and equipment that are used in milk and other food industries, stainless steel or stainless steel plated steels operating under chemical attack are among its application areas. It is an ideal electrode for the joining of stainless steel parts (having similar chemical composition with the electrode) with steel cast pieces. Up to and including 3.25 mm diameter electrodes can be used in all positions; whereas 4 mm and 5 mm electrodes should be used in the flat position.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNi 19 11	-	1.4306
	X2 CrNiN 18 10	-	1.4311
<b>Medium Carbon Stainless Steels</b> C > %0.03)	X4 CrNi 18 10	-	1.4301
	X4 CrNi 18 12	-	1.4303
	-	G-X5 CrNi 19 10	1.4308
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiTi 18 10	-	1.4541
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [mm]	Length [mm]	Current [A]	Electrode Weight [g/100 pcs]	Box Weight [kg] Quantity [pcs/box]	Export Box Box Weight [kg]
2.00	250	45 - 60	990	1.6 / 160	1.5
2.50	250	60 - 80	1660	1.6 / 40	1.5
3.25	300	75 - 115	3230	2.1 / 65	2.0
4.00	350	115 - 150	5420	2.2 / 40	2.5
5.00	350	140 - 160	8112	2.1 / 25	2.5



**Liability :** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes :** Consult information on Welding Safety Sheet, available upon request.

## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 9 LR 12  
AWS A5.4 : E308L-17

### General Description

AS P-308L-17 is an extra low carbon rutile coated electrode. It gives Cr-Ni type filler metal. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C and to oxidation up to 800°C. The excellent side wall wetting characteristic, no undercut and very fine ripple minimize crevice corrosion and grinding time. This is particularly useful in the food and drink industry where a smooth polished surface (mirror like bead appearance) is required. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.03	0.95	0.75	19	10

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
Tensile Strength : 570 N/mm<sup>2</sup>  
Elongation (L=5d) : 45 %  
Impact (ISO-V) : 80 J (+20°C)

### Applications and Materials to be Welded

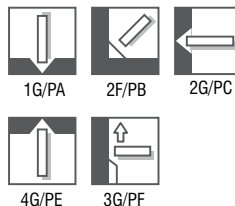
In addition to the welding of steels corresponding to AISI 301, 302, 304, 304L, 308 and 308L; AS P-308 L can also be used in the welding of niobium or titanium stabilized austenitic stainless steels. Welding of vapor and pressure fittings, storage tanks and equipment that are used in milk and other food industries, stainless steel or stainless steel plated steels operating under chemical attack are among its application areas. It is an ideal electrode for the joining of stainless steel parts (having similar chemical composition with the electrode) with steel cast pieces. Up to and including 3.25 mm diameter electrodes can be used in all positions; whereas 4 mm and 5 mm electrodes should be used in the flat position.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNi 19 11	-	1.4306
	X2 CrNiN 18 10	-	1.4311
<b>Medium Carbon Stainless Steels</b> C > %0.03)	X4 CrNi 18 10	-	1.4301
	X4 CrNi 18 12	-	1.4303
	-	G-X5 CrNi 19 10	1.4308
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiTi 18 10	-	1.4541
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [mm]	Length [mm]	Current [A]	Electrode Weight [g/100 pcs]	Box Weight [kg] Quantity [pcs/box]	Export Box Box Weight [kg]
2.00	250	45 - 60	990	1.6 / 160	1.5
2.50	250	60 - 80	1660	1.6 / 40	1.5
3.25	300	75 - 115	3230	2.1 / 65	2.0
4.00	350	115 - 150	5420	2.2 / 40	2.5
5.00	350	140 - 160	8112	2.1 / 25	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 9 H R 12 / E 19 9 R 12  
AWS A5.4 : E308H-16 / E308-16

### General Description

AS P-308H is a high carbon rutile coated electrode. It gives Cr-Ni type filler metal. It is developed for welding of AISI 304H or 1.4948 quality stainless steels. Weld metal has low sensitivity to precipitation of intermetallic phases and better creep resistance than 308L type alloys in high temperature applications up to 730°C. It gives a stable arc and the slag is easy to remove. The weld bead appearance is excellent. It is easy to strike and re-strike the electrode.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.06	0.80	0.70	19	10

Yield Strength	: 495 N/mm <sup>2</sup>
Tensile Strength	: 610 N/mm <sup>2</sup>
Elongation (L=5d)	: 40 %
Impact (ISO-V)	: 80 J (+20°C)

### Applications and Materials to be Welded

AS P-308H is developed for welding of AISI 304 and 304H (1.4948) quality stainless steels. It is used especially in the petrochemical industry for welding of stainless and stainless coated steels operating under high temperatures. It is also ideal for joining stainless steel in the same or near chemical analysis as the electrode to steel casting parts.

	EN 10088-1/-2	EN 10088-1/-2	W. Nr.
<b>Medium Carbon Stainless Steels</b> (C > 0.03%)	X4 CrNi 18 10	-	1.4301
	X4 CrNi 18 12	-	1.4303
	-	G-X5 CrNi 19 10	1.4308
	X6 CrNi 18 10	-	1.4948

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	60 - 80	1581	1.5 / 95	1.5
3.25	350	75 - 115	3760	2.5 / 66	2.5
4.00	350	115 - 150	5350	2.1 / 40	2.0



4G/PE

3G/PF

## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 9 L B 21  
AWS A5.4 : E308L-15

Werkstoff-Nr : 1.4306

### General Description

"AS P-308L B" is an extra low carbon basic type coated electrode. It gives Cr-Ni (E308L) type stainless steel filler metal with very good welding properties in vertical and overhead positions. The high impact toughness at cryogenic temperature (-196°C) makes it excellent in LPG applications. Excellent quality smooth weld beads are highly resistant to acids, intergranular corrosion at operating temperatures up to 350°C and to oxidation up to 800°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.03	0.30	1.60	19	9.6

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 40 %  
Impact (ISO-V) : 110 J (+20°C)  
70 J (-50°C)  
40 J (-196°C)

### Applications and Materials to be Welded

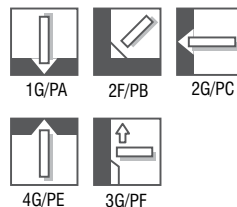
In addition to the welding of steels corresponding to AISI 301, 302, 304, 304L, 308 and 308L; AS P-308 L can also be used in the welding of Nb or Ti stabilized austenitic stainless steels. Welding of vapor and pressure fittings, storage tanks and equipment that are used in milk and other food industries, stainless steel or stainless steel plated steels operating under chemical attack are among its application areas. It is ideal for the joining of stainless steel parts (having similar chemical composition with the electrode) with steel cast pieces.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < 0.03%)	X2 CrNi 19 11	-	1.4306
	X2 CrNiN 18 10	-	1.4311
<b>Medium Carbon Stainless Steels</b> (C > 0.03%)	X4 CrNi 18 10	-	1.4301
	X4 CrNi 18 12	-	1.4303
	-	G-X5 CrNi 19 10	1.4308
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiTi 18 10	-	1.4541
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	300	55 - 85	1325	1.7 / 130	2.0
3.25	350	80 - 120	3184	2.1 / 65	2.5
4.00	350	80 - 180	4806	2.2 / 45	2.5



# AS P-308Mn



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A: E 18 8 Mn B 22  
 AWS A5.4 : (E307-15)  
 DIN 8555 : E8 - 200 CKZ  
 Werkstoff-Nr : 1.4370

### General Description

AS P-308Mn is a basic coated electrode. It gives an austenitic filler metal of the Cr-Ni type that is high (6.0 %) in Mn content. Weld beads are highly resistant to oxidation at operating temperatures up to 850°C and also to acids.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.10	0.50	6	18	9

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 495 N/mm<sup>2</sup>  
 Tensile Strength : 640 N/mm<sup>2</sup>  
 Elongation (L=5d) : 35 %  
 Impact (ISO-V) : 100 J (+20°C)  
                               : 75 J (-60°C)  
 Hardness : 200 HB (as welded)  
                   : 400 HB (after cold working)

### Approvals

CE, GOST, SEPRO, TSE, TÜV  
**GL(4370)**

### Applications and Materials to be Welded

AS P-308Mn can be used for welding hardenable steels (alloyed or unalloyed), Mn steels, armour plates, rail steels, stainless chromium steels, tool steels and steels with poor weldability. Building up of parts operating under impact, high pressure and cavitation; surface build up of water turbine vanes; build up of valve seats and joining and building up of rail switches are among its usage areas. AS P- 308Mn can also be used for forming buffer layer passes before hardfacing applications having a chromium carbide structure.

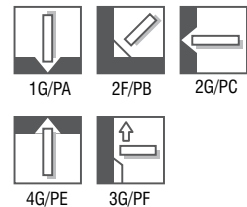
The lowest possible welding current should be selected to avoid the overheating of the electrode during welding. For hard Mn- steels, weld beads should be forged.

	<b>EN 10088-1/-2</b>	<b>W. Nr.</b>	<b>EN 10088-1/-2</b>	<b>W. Nr.</b>
<b>Heat Resistant Stainless Steels</b>	X6 Cr 13	1.4000	X10 CrAlSi 7	1.4713
	X12 Cr 13	1.4006	X10 CrAlSi 13	1.4724
	X20 Cr 13	1.4021		
	X17 CrNi 16 2	1.4057		

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	50 - 80	1590	1.6 / 100	1.5
3.25	300	80 - 110	3030	2.3 / 75	2.0
4.00	350	100 - 140	5100	2.3 / 45	2.5
5.00	350	140 - 160	7060	2.5 / 35	2.5



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## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 20 10 3 B 22  
 AWS A5.4 : E308 Mo-15  
 Werkstoff-Nr : 1.4431

### General Description

AS P-308Mo is a basic coated electrode. It gives a filler metal of the Cr-Ni-Mo type that is high (2.5 %) in Mn content. Weld beads are highly resistant to sudden impact and cracking due to heat effect.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.05	0.35	2.5	19	10	2.5

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
 Tensile Strength : 620 N/mm<sup>2</sup>  
 Elongation (L=5d) : 38 %  
 Impact (ISO-V) : 100 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Applications

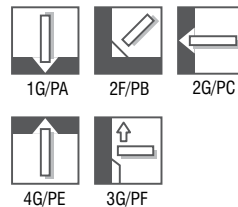
AS P-308Mo is used for forming a buffer layer for hardfacing and joining of armour steel plates, heat treatable steels, different type steels and for steels with poor weldability.

There is no need to apply heat treatment to armour steel plates before or after the welding. Interpass temperature during welding should not exceed 120°C. It is also used to form a buffer layer for stress relief before hardfacing applications.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	300	80 - 110	2855	2.0 / 70	2.0
4.00	350	110 - 140	5095	2.3 / 45	2.5





# AS P-309L Super



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A: E 23 12 LR 12  
 AWS A5.4 : E309L-16  
 Werkstoff -Nr : 1.4332

### General Description

AS P-309L Super is a low carbon rutile coated electrode. It gives a filler metal of the Cr-Ni type. Weld beads are highly resistant to oxidation at operating temperatures up to 1000°C. It can be used in all positions. The weld metal has a high resistance to cracking. Ferrite content is 12 %.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.03	0.80	0.70	23	13

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
 Tensile Strength : 590 N/mm<sup>2</sup>  
 Elongation (L=5d) : 40 %  
 Impact (ISO-V) : 70 J (+20°C)  
 35 J (-80°C)

### Approvals

CE, GOST, SEPRO, TSE  
**ABS** (E309L -16) **BV** (309L) **DNV**(NV 309L)  
**GL** (4332) **RINA** (309L)

### Applications and Materials to be Welded

AS P-309L Super is used for welding of Cr and Cr-Ni alloyed steels that are highly resistant to operating conditions up to 1000°C. It is

particularly used for joining stainless steels with low and medium alloyed steels and for root pass applications before welding of surface plated steels. It can also be used for cladding of mild steels and to form a buffer layer for hardfacing before welding with AS P-308L.

AS P-309L Super is an ideal electrode especially designed for welding pipes, plates and tanks that are used in chemical, petrochemical, food and paper industries; forged and cast pieces and industrial furnaces that are exposed to high temperatures.

	EN 10088-1/-2	W. Nr.
<b>Corrosion Resistant Steels</b>	X2 CrNiN 18 10	1.4311
<b>Stainless Steel Claddings</b>	X2 CrNi 19 11	1.4306
	X4 CrNi 18 10	1.4301

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	50 - 80	1580	1.7 / 105	1.5
3.25	300	80 - 120	3100	1.7 / 55	2.0
4.00	350	120 - 150	5490	2.2 / 40	2.5



# AS P-309L-17



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 23 12 LR 12  
AWS A5.4 : E309L-17

### General Description

AS P-309L-17 is an extra low carbon rutile coated electrode. It gives a high Cr-Ni alloyed filler metal. It is especially developed for welding stainless steel to mild steel. Ferrite content is 12 % and the weld metal has a high resistance to cracking. Weld beads are highly resistant to oxidation at high operating temperatures. The excellent side wall wetting characteristic, no undercut and very fine ripple minimize crevice corrosion and grinding time. This is particularly useful in the food and drink industry where a smooth polished surface (mirror like bead appearance) is required. It can be used in all positions except vertical down. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.03	1.00	0.70	23	13

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 40 %  
Impact (ISO-V) : 70 J (+20°C)

### Applications and Materials to be Welded

AS P-309L-17 is used for welding of Cr and Cr-Ni alloyed steels that are highly resistant to operating conditions up to 1000°C. It is particularly used for joining stainless steels with low and medium alloyed steels and for root pass applications before welding of surface plated steels. It can also be used for cladding of mild steels and to form a buffer layer for hardfacing before welding with AS P-308L-17.

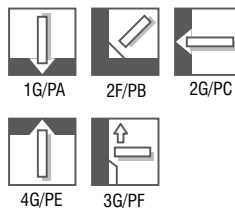
AS P-309L-17 is an ideal electrode especially designed for welding pipes, plates and tanks that are used in chemical, petrochemical, food and paper industries; forged and cast pieces and industrial furnaces that are exposed to high temperatures.

	EN 10088-1/-2	W. Nr.
<b>Corrosion Resistant Steels</b>	X2 CrNiN 18 10	1.4311
<b>Stainless Steel Claddings</b>	X2 CrNi 19 11	1.4306
	X4 CrNi 18 10	1.4301

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	50 - 80	1580	1.7 / 105	1.5
3.25	300	80 - 120	3100	1.7 / 55	2.0
4.00	350	120 - 150	5490	2.2 / 40	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 23 12 2 LR 32  
AWS A5.4 : E309MoL-16

### General Description

A high Cr-Ni-Mo alloyed all position rutile-basic electrode. It gives high corrosion resistant deposit. Weldable on AC and DC (+) polarity.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.03	0.80	0.80	23	12.5	2.7

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 575 N/mm<sup>2</sup>  
Tensile Strength : 720 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 60 J (+20°C)

### Approvals

GOST, SEPRO

### Applications and Materials to be Welded

Specially developed for welding stainless steel to mild steel and root runs in cladding. It is also suitable for repair welding in dissimilar joints and steels difficult to weld. Maximum plate thickness in butt welds is about 12 mm. Build-up welding on mild or low alloyed steels.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>First Layer in CrNiMo Claddings</b>	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	X6 CrNiMoTi 17 12 2	-	1.4571
	X10 CrNiMoTi 17 13 3	-	1.4573
	X6 CrNiMoNb 17 12 2	-	1.4580
		G-X5 CrNiMo 19 11	

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	60 - 85	1755	1.5 / 90	1.5
3.25	300	90 - 125	3355	2.1 / 63	2.0
4.00	350	125 - 160	5550	2.6 / 45	2.5
5.00	350	150 - 190	8660	2.5 / 29	2.5





## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 23 12 2 LR 32  
AWS A5.4 : E309MoL-17

### General Description

AS P-309Mo-17 is an extra low C and high Cr-Ni-Mo alloyed austenitic type electrode. It is especially developed for welding stainless steel to mild steel and as root runs and buffer layers before hardfacing. It is also suitable for repair welding in dissimilar joints and steels difficult to weld. Delta-ferrite content is app. 20 % and the weld metal has a high resistance to cracking. Weld beads are highly resistant to oxidation at high operating temperatures. It gives high corrosion resistant deposit. The excellent side wall wetting characteristic, no undercut and very fine ripple minimize crevice corrosion and grinding time. This is particularly useful in the food and drink industry where a smooth polished surface (mirror like bead appearance) is required. It can be used in all positions except vertical down and on AC and DC (+) polarity. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.03	1.00	0.80	23	12.5	2.7

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 575 N/mm<sup>2</sup>  
Tensile Strength : 720 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 60 J (+20°C)

### Applications and Materials to be Welded

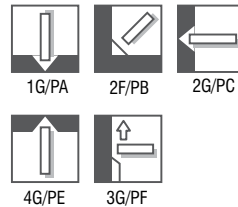
Specially developed for welding stainless steel to mild steel and root runs in cladding. It is also suitable for repair welding in dissimilar joints and steels difficult to weld. Maximum plate thickness in butt welds is about 12 mm. Build-up welding on mild or low alloyed steels.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>First Layer in CrNiMo Claddings</b>	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	X6 CrNiMoTi 17 12 2	-	1.4571
	X10 CrNiMoTi 17 13 3	-	1.4573
	X6 CrNiMoNb 17 12 2	-	1.4580
		G-X5 CrNiMo 19 11	

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	60 - 85	1755	1.5 / 90	1.5
3.25	300	90 - 125	3355	2.1 / 63	2.0
4.00	350	125 - 160	5550	2.6 / 45	2.5
5.00	350	150 - 190	8660	2.5 / 29	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 25 20 R 12      Werkstoff-Nr : 1.4842  
 AWS A5.4 : E310-16

### General Description

AS P-310R is a rutile coated fully austenitic electrode. It gives a fully austenitic filler metal of the Cr-Ni type. Weld beads are highly resistant to oxidation at operating temperatures up to 1150°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.10	0.60	1.70	26	21

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
 Tensile Strength : 600 N/mm<sup>2</sup>  
 Elongation (L=5d) : 35 %  
 Impact (ISO-V) : 60 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

It is an ideal electrode for welding heat resistant stainless steels of the AISI 309 and AISI 310 type. It is used for welding unalloyed steels to stainless steels and to air hardening steels like armour plates. AS P-310R can be used in the welding of chimneys, boilers and heating plates and also for industrial furnaces operating at high temperatures (that are frequently made from ferritic steels of Cr-Si-Al type).

During the welding of high carbon steels to stainless steels, it gives a weld bead that has a better machinability as compared to beads of electrodes with 18 % Cr and 8 % Ni.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Heat Resistant Cr and Cr-Ni Steels</b>	X10 CrAl 7	-	1.4713
	X10 CrAl 24	-	1.4762
	-	G-X40 CrSi 17	1.4740
	-	G-X25 CrNiSi 18 9	1.4825
	-	G-X40 CrNiSi 22 9	1.4826
	X15 CrNiSi 20 12	-	1.4828
	-	G-X25 CrNiSi 20 14	1.4832
	X15 CrNiSi 25 20	-	1.4841
	X12 CrNi 25 21	-	1.4845
	-	G-X40 CrNiSi 25 20	1.4848

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	250	45 - 60	1036	1.7 / 155	1.5
2.50	250	60 - 80	1650	1.6 / 100	1.5
3.25	300	80 - 120	3280	2.0 / 60	2.0
4.00	350	100 - 140	5740	2.3 / 40	2.5
5.00	350	130 - 160	8810	2.2 / 25	2.5





## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 29 9 R 12  
 AWS A5.4 : E312-16  
 DIN 8555 : E9-UM-200 CK  
 Werkstoff-Nr : 1.4337

### General Description

AS P-312 is a rutile coated electrode. It gives a filler metal of the Cr-Ni type. Due to its high tensile and impact resistance, it is used for the joining and build up welding of steels with a high tendency to cracking. It is especially developed for maintenance and repair welding.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni
0.10	0.90	0.80	29	9

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 600 N/mm<sup>2</sup>  
 Tensile Strength : 800 N/mm<sup>2</sup>  
 Elongation (L=5d) : 25 %  
 Impact (ISO-V) : 50 J (+20°C)  
 Hardness : 200 HB (as welded)  
 400 HB (after cold working)

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

Unalloyed steels, high carbon steels (1.4085 : G-X 70 Cr 29), high alloyed steels, tool steels, spring steels, high speed steels, cast pieces and air hardenable armour steel plates that have poor weldability can be welded with AS P-312.

Joining of unalloyed or low alloyed steels with stainless steels and build up welding of gears and shafts are among its application areas. Generally, there is no preheating requirement before welding. If preheating is necessary, preheating temperature might be less than that required for other electrodes.

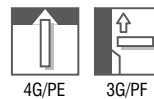
AS P-312 should not be used for the welding of parts that are continuously operating at temperatures exceeding 450°C. Interpass temperature should be controlled in multipass applications.

EN	W. Nr.	EN	W. Nr.
X6 Cr 17	1.4016	X20 Cr 13	1.4021
X7 Cr 14	1.4001	G-X70 Cr 29	1.4085
X15 Cr 13	1.4024		

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	55 - 85	1540	1.5 / 95	1.5
3.25	300	80 - 120	3180	1.9 / 60	2.0
4.00	350	110 - 160	5450	2.2 / 40	2.5
5.00	350	150 - 180	9130	2.3 / 25	2.5



# AS P-316L Super



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A: E 19 12 3 LR 12  
 AWS A5.4 : E316L-16  
 Werkstoff-Nr : 1.4404 / 1.4430

### General Description

AS P-316L Super is a low carbon rutile coated electrode. It gives a filler metal of the Cr-Ni-Mo type. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.03	0.70	0.80	17	11	2.9

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 490 N/mm<sup>2</sup>  
 Tensile Strength : 600 N/mm<sup>2</sup>  
 Elongation (L=5d) : 35 %  
 Impact (ISO-V) : 60 J (+20°C)

### Approvals

CE, GOST, SEPRO, TSE  
**ABS** (E316L-16) **BV** (316L) **DNV** (NV 316L)  
**GL** (4404) **RINA** (316L)

### Applications and Materials to be Welded

AS P-316L Super can be used in the welding of pipes, tanks and vessels that are used in chemical, paint and paper industries. Cr Ni-Mo steels, steel cast parts and pipes that are used for acid, gas and vapor transmission can also be welded with this electrode. AS P-316L can also be used in the build up welding of leakproof surfaces.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
<b>Medium Carbon Stainless Steels</b> (C > %0.03)	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	-	G-X5 CrNiMo 19 11	1.4408
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiMoTi 17 12 2	-	1.4571
	X6 CrNiMoNb 17 12 2	-	1.4580
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.00	250	40 - 60	930	1.6 / 175	1.5
2.50	250	50 - 80	1620	1.6 / 100	1.5
3.25	300	80 - 120	2940	1.9 / 65	2.0
4.00	350	100 - 145	4920	2.0 / 40	2.5





## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 12 3 LR 12  
AWS A5.4 : E316L-17

### General Description

AS P-316L-17 is an extra low carbon rutile coated electrode. It gives Cr-Ni-Mo type filler metal. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C and to oxidation up to 800°C. The excellent side wall wetting characteristic, no undercut and very fine ripple minimize crevice corrosion and grinding time. This is particularly useful in the food and drink industry where a smooth polished surface (mirror like bead appearance) is required. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.03	1.00	0.80	17	11	2.9

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 490 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact (ISO-V) : 60 J (+20°C)

### Applications and Materials to be Welded

AS P-316L-17 can be used in the welding of pipes, tanks and vessels that are used in chemical, paint and paper industries. Cr-Ni-Mo steels, steel cast parts and pipes that are used for acid, gas and vapor transmission can also be welded with this electrode. AS P-316L-17 can also be used in the build up welding of leakproof surfaces.






	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
<b>Medium Carbon Stainless Steels</b> (C > %0.03)	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	-	G-X5 CrNiMo 19 11	1.4408
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiMoTi 17 12 2	-	1.4571
	X6 CrNiMoNb 17 12 2	-	1.4580
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552



## Coated Electrode for Stainless Steels

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]			
2.00	250	40 - 60	930	1.6 / 175	1.5	1G/PA	2F/PB	2G/PC
2.50	250	50 - 80	1620	1.6 / 100	1.5			
2.50	300	50 - 80	1620	1.6 / 100	1.5			
2.50	350	50 - 80	1620	1.6 / 100	1.5			
3.25	300	80 - 120	2940	1.9 / 65	2.0			
3.25	350	80 - 120	2940	1.9 / 65	2.0			
4.00	350	100 - 145	4920	2.0 / 40	2.5			
4.00	350	150 - 190	8660	2.5 / 29	2.5			



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 12 3 L B 22      Werkstoff-Nr : 1.4404 / 1.4430  
 AWS A5.4 : E316L-15

### General Description

“AS P-316L B” is an extra low carbon basic type coated electrode. It gives Cr-Ni-Mo (E316L) type stainless steel filler metal with outstanding welding properties in vertical and overhead positions. The weld metal is very resistant to cracking and porosity. The high impact toughness at cryogenic temperature (-196°C) makes it excellent in LPG applications. Excellent quality smooth weld beads are highly resistant to acids, intergranular corrosion at operating temperatures up to 350°C and to oxidation up to 800°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.03	0.30	1.60	18	12	2.3

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup>  
 Tensile Strength : 570 N/mm<sup>2</sup>  
 Elongation (L=5d) : 36 %  
 Impact (ISO-V) : 99 J (+20°C)  
                           82 J (-50°C)  
                           45 J (-196°C)

### Applications and Materials to be Welded

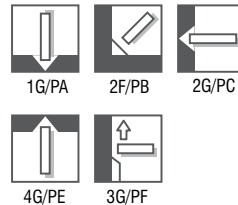
AS P-316 L B can be used in the welding of pipes, tanks and vessels that are used in chemical, paint and paper industries. Cr-Ni-Mo steels, steel cast parts and pipes that are used for acid, gas and vapor transmission can also be welded with this electrode. It can also be used in the build up welding of leakproof surfaces.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < 0.03%)	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
<b>Medium Carbon Stainless Steels</b> (C > 0.03%)	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	-	G-X5 CrNiMo 19 11	1.4408
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiMoTi 17 12 2	-	1.4571
	X6 CrNiMoNb 17 12 2	-	1.4580
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	300	55 - 85	1336	1.7 / 130	2.0
3.25	350	80 - 120	3260	2.1 / 65	2.5
4.00	350	80 - 180	4848	2.2 / 45	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A: E 19 12 3 R 73  
 AWS A5.4 : (E316-16)  
 Werkstoff -Nr : 1.4430

### General Description

AS P-316S is a rutile coated electrode with an unalloyed core. Therefore it can tolerate higher currents than AS P-316L. It has 160 % metal recovery. It gives a filler metal of the Cr-Ni-Mo type. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo
0.06	0.70	0.60	17	11	2.9

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup>  
 Tensile Strength : 565 N/mm<sup>2</sup>  
 Elongation (L=5d) : 30 %  
 Impact (ISO-V) : 70 J (+20°C)

### Approvals

GOST, SEPRO

### Applications and Materials to be Welded

It is an ideal electrode for the welding of austenitic steels and acid resistant steels of the AISI 316 type. It is used for welding mild and low alloyed steels to stainless steels or austenitic manganese steels. It can also be used for stainless cladding of carbon and manganese steels. AS P-316S can be used in the welding of pipes, tanks and vessels that are used in chemical, paint and paper industries. Cr-Ni-Mo steels, steel cast parts and pipes that are used for acid, gas and vapor transmission can also be welded with this electrode. AS P-316S can also be used in the build up welding of leakproof surfaces. Electrode diameters up to 3.25 mm can be used in all positions; whereas 4 and 5 mm electrodes should be used in flat and nearly flat position only.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
<b>Medium Carbon Stainless Steels</b> (C > %0.03)	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	-	G-X5 CrNiMo 19 11	1.4408

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [mm]	Length [mm]	Current [A]	Electrode Weight [g/100 pcs]	Box Weight [kg] Quantity [pcs/box]	Export Box Box Weight [kg]
2.50	350	80 - 120	3190	1.9 / 60	2.5
3.25	350	100 - 140	5520	1.9 / 35	2.5
4.00	350	110 - 180	8500	2.1 / 25	2.5
5.00	350	200 - 240	12500	1.9 / 15	2.5



1G/PA

2F/PB

2G/PC

# AS P-318 Super



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 12 3 Nb R 12  
 AWS A5.4 : (E318L-16)  
 Werkstoff-Nr : 1.4576

### General Description

AS P-318 Super is a low carbon rutile coated electrode. It gives a filler metal of the Cr-Ni-Mo type. AS P-318 Super can also be used in the welding of niobium or titanium stabilized AISI 318 or similar quality stainless steels. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C. It gives a stable arc and the slag is easy to remove.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Mo	Nb
0.04	0.90	0.80	18	12	2.5	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 500 N/mm<sup>2</sup>  
 Tensile Strength : 620 N/mm<sup>2</sup>  
 Elongation (L=5d) : 35 %  
 Impact (ISO-V) : 65 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

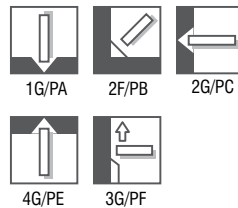
AS P-318 Süper can be used in the welding of corrosion resistant pipes, tanks and vessels that are made of Cr-Ni-Mo type stainless steel. It is also an ideal electrode for the welding of parts that are used in chemical, food and paint industries for acid, salt, gas, vapor and water transmission.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Extra Low Carbon Stainless Steels</b> (C < %0.03)	X2 CrNiMo 17 12 2	-	1.4404
	X2 CrNiMo 18 14 3	-	1.4435
	X2 CrNiMoN 17 11 2	-	1.4406
	X2 CrNiMoN 17 13 3	-	1.4429
<b>Medium Carbon Stainless Steels</b> (C > %0.03)	X4 CrNiMo 17 12 2	-	1.4401
	X4 CrNiMo 17 13 3	-	1.4436
	-	G-X5 CrNiMo 19 11	1.4408
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiMoTi 17 12 2	-	1.4571
	X6 CrNiMoNb 17 12 2	-	1.4580
	X6 CrNiNb 18 10	-	1.4550
	-	G-X5 CrNiNb 19 10	1.4552

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	50 - 80	1570	1.4 / 90	1.5
3.25	300	70 - 120	3140	2.4 / 75	2.0
4.00	350	100 - 150	5870	4.1 / 70	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E 19 9 Nb R 12  
 AWS A5.4 : (E347-16)  
 Werkstoff-Nr : 1.4551

### General Description

AS P-347 is a low carbon rutile coated electrode. It gives a niobium stabilized, Cr-Ni type filler metal of AISI 304 or similar quality. It has an excellent strength especially in oxidizing environments like nitric acid. Smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Ni	Nb
0.03	0.90	0.70	19	9.5	0.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 520 N/mm<sup>2</sup>  
 Tensile Strength : 600 N/mm<sup>2</sup>  
 Elongation (L=5d) : 35 %  
 Impact (ISO-V) : 55 J (+20°C)

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

AS P-347 can be used particularly in the welding of austenitic stainless steels of AISI 321 and 347 type. It can also be used for Cr- Ni steels and for steel cast parts having same or similar analysis results with the electrode. Tanks and vessels that are used in chemical and food industries; parts exposing to the effects of acid, gas and vapor; and water fittings are among some application areas. AS P-308 L can be used for 18 % Cr - 8 % Ni, Nb stabilized steel parts that are working under low operating temperatures.

	EN 10088-1/-2	EN 10213-4	W. Nr.
<b>Stabilized Stainless Steels</b> (Nb/Ti)	X6 CrNiTi 18 10	-	1.4541
	X6 CrNiNb 18 10	-	1.4550
	X8 CrNiTi 18 10	-	1.4878
	-	G-X5 CrNiNb 19 10	1.4552
<b>Non Stabilized Stainless Steels</b>	X2 CrNi 19 11	-	1.4306
	X2 CrNiN 18 10	-	1.4311
	X4 CrNi 18 10	-	1.4301
	-	G-X5 CrNi 19 10	1.4308

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	250	50 - 80	1620	1.5 / 95	1.5
3.25	300	75 - 115	3110	1.9 / 60	2.0
4.00	350	110 - 150	5730	2.6 / 45	2.5
5.00	350	130 - 160	8330	2.5 / 30	2.5



## Coated Electrode for Stainless Steels

### Classification

EN ISO 3581-A : E22 9 3 N L R 32  
AWS A5.4 : E2209-16\*

### General Description

A rutile-basic all position electrode for duplex stainless steel welding. Excellent weldability for filling as well as for root runs. Applicable up to a service temperature at 250°C. High resistance to corrosion, pitting and stress corrosion. Weldability on AC and DC.

### Chemical Composition (W%) - Typical, All Weld Metal

C	Si	Mn	Ni	Cr	Mo	N	FN (acc.WRC 1992)
0.02	1.0	0.8	9.5	22.5	3.2	0.16	30 - 35

### Mechanical Properties- Typical, All Weld Metal

Yield Strength : 650 N/mm<sup>2</sup>  
Tensile Strength : 800 N/mm<sup>2</sup>  
Elongation (L=5d) : 27 %  
Impact (ISO-V) : 60 J (+20°C)  
                          : 50 J (-30°C)  
                          : 40 J (-40°C)

### Applications and Materials to be Welded

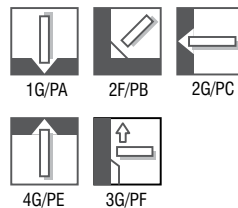
AS P-2209 can be used for welding of mild and low alloyed steels to duplex stainless steels.

	EN 10088-1/-2/-4	EN 10213	W. Nr.	UNS - ASTM A276
Duplex stainless steels	X2CrNiMoN22-5-3		1.4462	S31803
	X3CrNiMoN27-5-2		1.4460	S32900
	X2CrNiN23-4		1.4362	S32304
	X2CrMnNiN22-5-2		1.4162	S32101
		G-X2 CrNiMoN 25 7 3	1.4417	S31500

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]
2.50	300	40 - 75
3.25	350	80 - 110
4.00	350	80 - 150
5.00	350	140 - 220



### Remarks / Application Advice

Welding with Heat-Input max. 2.5 kJ/mm  
Interpass Temperature : 150°C  
Deviations chemical composition;  
\*Si = % 0,4 - 1,2 (AWS = max % 1,0)

## Coated Electrode for Aluminium and Its Alloys

### Classification

ISO 18273 : Al 4043A (AISi5(A))  
 DIN 1732 : EL-AISi 5  
 AWS A5.3 : E4043

### General Description

AS AISi5 is an aluminium electrode with 5 % Si. It is used for joining and repair welding of 5 % Si containing rolled aluminium and cast aluminium parts. It is used on DC positive pole.

### Chemical Composition (w%), Typical, All Weld Metal

Si	Mn	Fe	Mg	Al
4.7 - 5.3	max 0.05	max 0.2	max 0.05	balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 80-90 N/mm<sup>2</sup>  
 Tensile Strength : 150-160 N/mm<sup>2</sup>  
 Elongation (L=5d) : 15 %

### Approvals

GOST, SEPRO

### Applications and Materials to be Welded

It is an ideal electrode particularly used for the welding of 5 % Si containing rolled aluminium parts and for aluminium pipes and plates. It should not be used in the welding of aluminium alloys having high magnesium, copper or zinc content. As the weld pool metal is very fluid, parts should be welded in horizontal position. During welding, electrode should be vertical to the work piece and it should not be oscillated. Arc length should be short.

Preheating to 100-300°C should be applied with respect to the thickness of the part to be welded. The slag should be removed completely after welding, since it is corrosive (the slag might be removed with water as the piece cools).

#### Rolled Aluminium Alloy

DIN 1725-1	W. Nr.	Alloy Nr.
AlMgSi 0.5	3.3206	6060
AlMgSi 0.7	3.3210	6005A
AlMgSi 0.8	3.2316	6181
AlMgSi 1	3.2315	-
AlZn4.5Mg 1	3.4335	-
AlCuMg 1	3.1325	-

#### Cast Aluminium Alloy

DIN 1725-2	W. Nr.	Alloy Nr.
G-AISi 5	3.2341	443.0
G-AISi 6 Cu 4	3.2151	319.0

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Domestic and Export
				Box Weight [ kg ] Quantity [ pcs/box ]
2.50	350	60 - 90	900	2.0 / 222
3.25	350	80 - 110	1320	2.0 / 152
4.00	350	100 - 140	2040	2.0 / 98



1G/PA



2F/PB

## Coated Electrode for Aluminium and Its Alloys

### Classification

ISO 18273 : Al 4047A (AISi12(A))  
 DIN 1732 : EL-AISi 12  
 AWS A5.3 : E4047

### General Description

AS AISi12 is an aluminium electrode with 12 % Si. It is particularly used for joining and repair welding of cast aluminium and Si-alloyed aluminium parts. It is also an ideal electrode for the removal of cast defects and for the fill up of cast cavities. It is used only on DC positive pole.

### Chemical Composition (w%), Typical, All Weld Metal

Si	Mn	Fe	Mg	Al
11 - 12	max 0.10	max 0.40	max 0.05	balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 70-80 N/mm<sup>2</sup>  
 Tensile Strength : 170-180 N/mm<sup>2</sup>  
 Elongation (L=5d) : 4-6 %

### Approvals

GOST, SEPRO

### Applications and Materials to be Welded

It is an ideal electrode for the welding of 12 % Si containing cast aluminium parts. It should not be used in the welding of aluminium alloys having high magnesium, copper or zinc content.

The special covering removes oxide layer on the surface during welding and enables a stable arc. As the weld pool metal is very fluid, parts should be welded in horizontal position. During welding, electrode should be vertical to the work piece and it should not be oscillated. Arc length should be short. Preheating to 100-300°C should be applied with respect to the thickness of the part to be welded. The slag should be removed completely after welding, since it is corrosive (the slag might be removed with water as the piece cools).

#### Cast Aluminium Alloy

DIN 1725-2	W. Nr.	Nombre d'alliage.
G-AISi 11	3.2211	-
G-AISi 12	3.2581	A413.0
G-AISi 12 (Cu)	3.3583	-
G-AISi 6 Cu 4	3.2151	319.0
G-AISi 7 Mg	3.2371	356.0
G-AISi 9 Mg	3.2373	359.0

#### Cast Aluminium Alloy

DIN 1725-2	W. Nr.	Nombre d'alliage
G-AISi 10 Mg	3.2381	361.0
G-AISi 10 Mg (Cu)	3.2383	-
G-AISi 9 Cu 3	3.2161	-

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Domestic and Export
				Box Weight [ kg ] Quantity [ pcs/box ]
2.50	350	60 - 90	980	2.0 / 227
3.25	350	80 - 110	1320	2.0 / 152
4.00	350	100 - 140	1960	2.0 / 102



1G/PA



2F/PB



## Coated Electrode for Copper and Its Alloys

### Classification

AWS A5.6 : ECuSn-C  
 DIN 1733 : EL-CuSn 7  
 Werkstoff-Nr : 2.1025

### General Description

AS Bronz is especially designed for the welding of bronze and brass materials. It gives a filler metal of the tin-bronze type. It is possible to weld in all positions except overhead and vertical upwards.

### Chemical Composition (w%), Typical, All Weld Metal

Mn	P	SN	CU
0.50	0.10	7	balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 160 N/mm<sup>2</sup>  
 Tensile Strength : 260 N/mm<sup>2</sup>  
 Elongation (L=5d) : 20 %  
 Hardness : 90 HB

### Approvals

GOST, SEPRO

### Applications and Materials to be Welded

It is used for the joining and build up welding of copper and its alloys; for the joining of copper and bronze materials with steels and joining of steel casts with cast irons. It is ideal for the copper plating of cast iron and steel parts. If machinability is not considered after welding, it should also be used for the welding of cast iron parts.

It is suitable for the build up welding and joining of machine parts; especially turbine and centrifugal vanes, ship propellers, valve seats, couplings, piston arms and gears. Electrode should be nearly vertical to the work piece and the arc length should be short. To attain the best possible joining, a preheating of 300°C should be applied to copper and bronze parts.

#### Copper-Tin Wrought Alloys

DIN 17662	W. Nr.
CuSn 2	2.1010
CuSn 4	2.1016
CuSn 6	2.1020
CuSn 8	2.1030

#### Copper-Tin Cast Alloys

DIN 1705	W. Nr.
G-CuSn2ZnPb	2.1098
G-CuSn5ZnPb	2.1096
G-CuSn6ZnNi	2.1093

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	90 - 130	3520	2.6 / 75	2.5
4.00	350	130 - 160	5180	2.6 / 50	2.5
5.00	350	160 - 240	6600	2.3 / 35	2.5



1G/PA



2F/PB

## Coated Electrode for Cast Irons

### Classification

EN ISO 1071 : E C NiFe-1 3  
 AWS A5.15 : ENiFe-CI  
 DIN 8573 : E NiFe1-BG 33

### General Description

AS Pik-55 is a nickel cored electrode. It is used for the welding of all types of cast irons and particularly for the joining of austenitic alloyed cast irons; called Ni-resist. It gives a very stable arc and a negligible amount of slag that can easily be removed. Weld metal can be easily machined and it has the same color with that of the cast iron. It has excellent mechanical properties and it is very resistant to cracking.

### Chemical Composition (w%), Typical, All Weld Metal

C	Fe	Ni
1.00	43	balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 320-360 N/mm<sup>2</sup>  
 Tensile Strength : 430-470 N/mm<sup>2</sup>  
 Elongation (L=5d) : 10 %  
 Hardness : 160-200 HB

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

AS Pik-55 is particularly used for the joining and build up welding of gray cast iron, nodular cast iron and malleable cast iron parts. It is an ideal electrode for the joining of cast iron pieces to stainless steel or steel parts. On the other hand, it can also be used for filling up cavities in castings, or cavities that might form after machining. It is also an ideal electrode for the welding of parts, exposing to high dynamic forces, that are found in heavy machinery base and body.

When welding cast iron without preheat, the smallest possible electrode diameter and the lowest possible welding current should be selected to limit the width of the heat affected zone that might occur due to excess heating. When welding thick pieces, a preheating to 150-200°C and slow cooling is recommended.

#### Blackheart Malleable Cast Irons

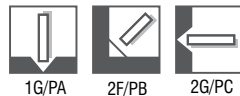
DIN EN 1562	W. Nr.
GTS 35-10	0.8135
GTS 45-06	0.8145
GTS 55-04	0.8155
GTS 65-02	0.8165
GTS 70-02	0.8170

#### Nodular (Spheroid) Cast Irons

DIN EN 1563	W. Nr.
GGG 40	0.7040
GGG 50	0.7050
GGG 60	0.7060
GGG 70	0.7070
GGG 80	0.7080

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	300	45 - 80	1670	1.2 / 70	2.0
3.25	300	60 - 120	2730	1.1 / 40	2.0
4.00	350	90 - 140	4750	2.4 / 50	2.5



Current Type and Polarity: min  
 AC min 50 V ; DC (+)

## Coated Electrode for Cast Irons

### Classification

EN ISO 1071 : E C NiCu-B 3  
 AWS A5.15 : ENiCu-B  
 DIN 8573 : E NiCu-BG 33

### General Description

AS Pik-65 is a Ni-Cu alloyed monel cored electrode. It is used for the welding of all types of cast irons. It gives a minimum amount of spatter and a very stable arc. The slag is easy to remove. Heat effected zone is very narrow. Porosity free weld metal can be easily machined. Filler metal has the same color with that of the work piece.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Fe	Cu	Ni
0.50	0.40	1.00	3	30	65

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 260 - 280 N/mm<sup>2</sup>  
 Tensile Strength : 400 - 420 N/mm<sup>2</sup>  
 Elongation (L=5d) : 15 %  
 Hardness : 140 - 160 HB

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

AS Pik-65 is particularly used for the joining and build up welding of parts made from gray cast iron, nodular cast iron, malleable cast iron and of parts whose analysis is not known. Monel alloy core has 65 % Ni / 30 % Cu. It is an ideal electrode for the joining of cast iron pieces to monel alloys, stainless and ordinary steels. It can also be used for filling up cavities in castings, or cavities that might form after machining.

When welding cast iron without preheat, the smallest possible electrode diameter and the lowest possible welding current should be selected to limit the width of the heat effected zone that might occur due to excess heating. When welding thick pieces, a preheating to 100-200°C and slow cooling is recommended.

#### Gray Cast Irons

DIN EN 1561	W. Nr.
GG 10	0.6010
GG 15	0.6015
GG 20	0.6020
GG 25	0.6025
GG 35	0.6035

#### Blackheart Malleable Cast Irons

DIN EN 1562	W. Nr.
GTS 35-10	0.8135
GTS 45-06	0.8145
GTS 55-04	0.8155
GTS 65-02	0.8165
GTS 70-02	0.8170

#### Nodular (Spheroid) Cast Irons

DIN EN 1563	W. Nr.
GGG 40	0.7040
GGG 50	0.7050
GGG 60	0.7060
GGG 70	0.7070
GGG 80	0.7080

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 50 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	300	65 - 90	1580	1.2 / 75	2.0
3.25	300	85 - 130	2650	1.1 / 45	2.0
4.00	400	110 - 160	5470	2.4 / 65	2.5



1G/PA

2F/PB

2G/PC

# AS Pik-98 Super



## Coated Electrode for Cast Irons

### Classification

EN ISO 1071 : E Ni-CI 2  
 AWS A5.15 : ENI-CI  
 DIN 8573 : E Ni-BG 22

### General Description

AS Pik-98 Süper is a nickel cored electrode. It enables welding with drop arc metal transfer. It is used for the welding of all types of cast irons. It gives a very stable arc and a negligible amount of slag that can easily be removed. Heat effected zone is very narrow. Porosity free weld metal can be easily machined. It has excellent resistant to cracking.

### Chemical Composition (w%), Typical, All Weld Metal

C	Ni
1	balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 300 N/mm<sup>2</sup>  
 Tensile Strength : 380 N/mm<sup>2</sup>  
 Elongation (L=5d) : 8-10 %  
 Hardness : 120-140 HB

### Approvals

GOST, SEPRO, TSE

### Applications and Materials to be Welded

AS Pik-98 Süper is particularly used for the joining and build up welding of gray cast iron, nodular cast iron and malleable cast iron parts. It is an ideal electrode for the joining of cast iron pieces to monel alloys, stainless and ordinary steels. It can also be used for filling up cavities in castings, or cavities that might form after machining.

When welding cast iron without preheat, the smallest possible electrode diameter should be selected to limit the width of the heat effected zone that might occur due to excess heating. When welding thick pieces, a preheating to 150-300°C and slow cooling is recommended.

#### Gray Cast Irons

DIN EN 1561	W. Nr.
GG 10	0.6010
GG 15	0.6015
GG 20	0.6020
GG 25	0.6025
GG 35	0.6035

#### Blackheart Malleable Cast Irons

DIN EN 1562	W. Nr.
GTS 35-10	0.8135
GTS 45-06	0.8145
GTS 55-04	0.8155

#### Whiteheart Malleable Cast Irons

DIN EN 1562	W. Nr.
GTW 35-04	0.8035
GTW 40-05	0.8040
GTW 45-07	0.8045

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 40 V ; DC ( - )

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	300	65 - 100	1810	0.6 / 35	2.0
3.25	300	90 - 130	2830	0.7 / 25	2.0
4.00	350	110 - 160	5082	2.8 / 55	2.5

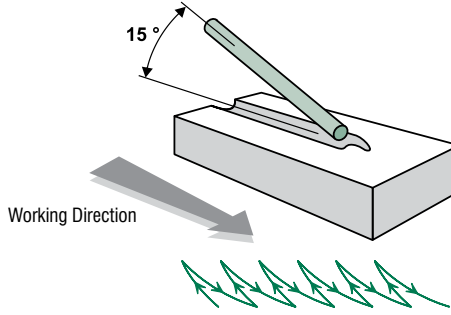


3G/PF

## Coated Electrode for Cutting and Gouging

### General Description

AS Oluk Açma is an ideal electrode for gouging in and joint preparation of all types of steel, cast iron and non-ferrous metal. It is a general purpose electrode especially used before repair and maintenance welding applications.



### Approvals

GOST, SEPRO, TSEK

### Applications

The special coating performs several functions:

- 1 - To form a concentrated powerful arc,
- 2 - To form a stable arc and to reduce the fast melting of the electrode,
- 3 - To produce a strong gas jet to blow away the melted material.

The angle between the electrode and the work piece should be 15°.

It is used for beveling, weld preparation of cracks and for gouging of armour steels, air hardenable steels, stainless steels, cast irons, hard metals, work hardenable and difficult to machine materials. The surface is clean and seldom requires further dressing. Metal removal speed depends on the electrode diameter, ampere selected and to the thickness of the piece. It is recommended to work with a quality power source for best results.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( - ) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	190 - 220	3560	4.1 / 115	4
4.00	350	220 - 280	5170	4.4 / 85	4
5.00	350	260 - 350	8080	3.6 / 45	4



1G/PA



2F/PB



2G/PC



4G/PE

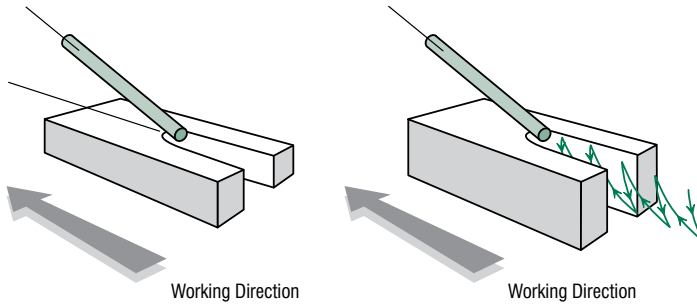


3G/PF

## Coated Electrode for Cutting and Gouging

### General Description

AS Kesme is an ideal electrode for cutting and piercing of all types of steel, cast iron and non-ferrous metal. It is a general purpose electrode especially used before and during repair and maintenance welding applications.



### Approvals

GOST, SEPRO, TSEK

### Applications

Due to the physical properties of the coating material, core wire has a higher melting rate than the coating material. Therefore, 3 to 5 mm crater formation occurs at the tip of the electrode. Particularly in cutting and piercing applications, this crater formation enables the operation of the electrode penetrating into the melting piece without short circuit.

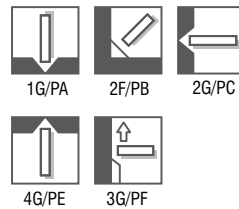
Pieces up to a thickness of 10 mm can be easily cut with this electrode. For thicker pieces (10 mm), electrode should be moved up and down in the direction of material being cut to move away the melted material. In piercing applications, electrode should be perpendicular to the work piece.

It is used for beveling, weld preparation of cracks and for gouging of armour steels, air hardenable steels, stainless steels, cast irons, hard metals, work hardenable and difficult to machine materials. The surface is clean and seldom requires further dressing. Metal removal speed depends on the electrode diameter, ampere selected and to the thickness of the piece. It is recommended to work with a quality power source for best results.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC ( - ) ; AC min 50 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	450	180 - 210	4750	5.2 / 110	5
3.25	350	180 - 210	3542	4.1 / 115	4
4.00	450	210 - 275	6810	4.8 / 70	5
4.00	350	210 - 275	5196	4.5 / 85	4
5.00	450	250 - 300	9860	5.9 / 60	5
5.00	350	250 - 300	8224	3.7 / 45	4



## Carbon Arc Electrode for Cutting and Gouging

### General Description

Arc carbon cutting process is based on the integral function of electric arc and pressurized air using in cutting process. The metal that is molten by electric arc, is removed by the air jet. The tip of the arc cutting torch, is suitable for every cutting/gouging positions and supported by special nozzle that directs to air-jet. This process uses carbon, pressurized air and electric current to cut or gouge the metals and has many advantages over the conventional cutting processes like oxy-fuel or saw blade cutting.

#### Advantages:

- High speed gouging and metal removals,
- Easy usage,
- Cleaner and more comfortable working environment than other ones,
- Enables to work with different materials like mild and stainless steels, cast irons, copper and light alloys,
- No risk of explosion.

### How to Use the Carbon Arc Cutting Electrodes?

- Connect the electrode with the DC (+) current to the work piece,
- Connect the air-jet apparatus to the electrode holder,
- Keep the distance between electrode and work pieces about 150 mm. Consider the type of current (DC or AC), diameter of the electrode, amount of current and other parameters like material type,
- Turn the air-jet valve on,
- Establish the arc between electrode and work piece. Arc distance must be kept around 1 to 5 mm (very short),
- To remove the metal, that is cut or gouge, hold the electrode about 30° (maximum current limit must not be exceeded).

### Approvals

SERPO

+

### Application Areas

#### Foundries:

To remove and gouge of the risers and runners of the mild / alloyed steel and iron castings.

#### Steel Industries:

Removing of the slag inclusions on the alloyed non-alloyed steel billet and slabs, blums, surface cleaning of the faulty weld beads.

#### Manufacturing of the Pressure-Vessel, Ship and Steel Constructions:

The surface cleaning of the rear side of the double sided welding applications before the process removing of the miswelded parts, weld beads from the process region and cutting the alloyed steel work pieces.

#### Repair and Maintenance Factories:

Pipe, metal sheets cutting and maintenance of the cast pieces.

### Carbon Cutting Parameters / Packaging and Available Sizes

Diameter [ mm ]	Length [ mm ]	Current [ Amp ]	Voltage [ V ]	Electrode Weight [ gr/100 pcs ]	Packaging [ pcs/box ]
6.4	305	150 - 350	41 - 43	2000	50
8.0	305	200 - 450	44 - 48	2600	50
10.0	305	300 - 550	46 - 50	4600	50



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E6-UM-55 R  
EN 14700 : E Fe8

### General Description

AS SD-CR 10 is a basic coated electrode. Wear resistant weld metal has a high toughness value and exhibits a high resistance to cracking at operating conditions with high impact. The highest wear resistance is obtained after three passes. 10 % Cr content increases the wear resistance of the weld metal to the simpler forms of corrosive attack. The weld metal is resistant to softening up to 500°C. It can be machined by grinding.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.70	0.60	0.70	10

### Mechanical Properties, Typical, All Weld Metal

Dureté : 52 - 56 HRC

### Approvals

GOST, SEPRO, TSE

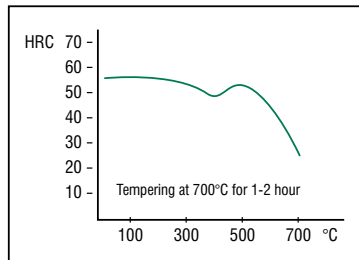
### Applications

It is used for hardfacing of alloyed and unalloyed steels. Worn surfaces of crushing tools in the mining industry, conveyor screws, excavator bucket and teeth, excavator and bulldozer blades, mixer parts, screws of cement pumps, and cutting edges of cold worked tool steels can be hardfaced with AS SD-CR 10.

While there is no need to have a buffer layer for unalloyed steels up to St 70; for high alloyed steels, it is recommended to have a buffer layer with AS B-248 or AS B-255, and in special cases with AS P-308Mn or AS P-312.

**Hardening:** in oil or air at 950-1000°C

**Softening:** in furnace at 850°C



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 140	4340	4.8 / 110	5
4.00	450	150 - 190	8410	6.3 / 75	6
5.00	450	180 - 240	13460	6.1 / 45	6





## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E5-UM-45 R  
EN 14700 : E Fe7

### General Description

AS SD-CR 13 is a rutile coated electrode. It gives a corrosion and wear resistant ferritic-martensitic stainless steel weld metal. It is used in hardfacing applications where a hardness of 42-46 HRC is required. The weld metal is resistant to softening up to 500°C.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.10	0.50	0.30	13

### Mechanical Properties, Typical, All Weld Metal

Dureté : 42 - 45 HRC

### Approvals

GOST, SEPRO, TSE

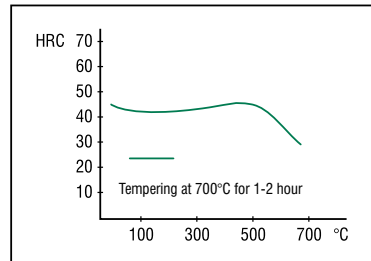
### Applications

It is used for hardfacing of alloyed and unalloyed steels. Worn surfaces of rails and rail surfaces, crane and conveyor wheels, cast steel valve seats, pinions, track rollers and links of earthmoving equipment can be hardfaced with AS SD-CR 13. It can also be used for joining of low carbon steels having 13% Cr.

It is recommended to use AS SD-CR 10 in multipass applications as it is a basic coated electrode. It is also recommended to have a preheating and interpass temperature of minimum 200°C.

**Hardening:** in oil or air at 980-1000°C

**Softening:** in furnace at 780 - 800°C



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 70 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 160	4640	4.6 / 100	5
4.00	350	140 - 200	6880	4.5 / 65	5
5.00	350	180 - 240	10600	4.8 / 45	5



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E6-UM-60  
EN 14700 : E Fe4

### General Description

AS SD-60 is a general purpose, rutile coated hardfacing electrode especially designed to use with small transformers having a relatively low open circuit voltage. It is resistant to softening up to 500°C. It gives a high abrasion resistant martensitic type weld metal with a medium toughness. Weld metal can not be machined.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo
0.40	0.40	0.50	6	0.60

### Mechanical Properties, Typical, All Weld Metal

Hardness : 57 - 62 HRC

### Approvals

GOST, SEPRO, TSE

### Applications

It is used for hardfacing of alloyed and unalloyed steels. Protective lining of worn surfaces of machines used in mines, bulldozer blades, excavator teeth, crushing jaws, conveyors, agricultural and forestry machines that are exposed to wear can be hardfaced with this electrode.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : AC min 65 V ; DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	60 - 120	2450	1.8 / 75	2
3.25	350	100 - 160	4190	4.4 / 105	5
4.00	450	130 - 190	8040	5.6 / 70	6
5.00	450	170 - 240	12760	5.7 / 45	6



2F/PB



2G/PC

## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E2-UM-60 Z  
EN 14700 : E Fe4

### General Description

AS SD-65 is a basic coated electrode. It gives a high oxidation resistant (up to 850°C) weld metal that also have a high wear resistance. It is resistant to wears of medium abrasions at high temperatures.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.70	4	0.30	2

### Mechanical Properties, Typical, All Weld Metal

Dureté : 57 - 62 HRC (3 passes, pas de préchauffage)  
50 - 60 HRC (3 passes, 300°C préchauffage )

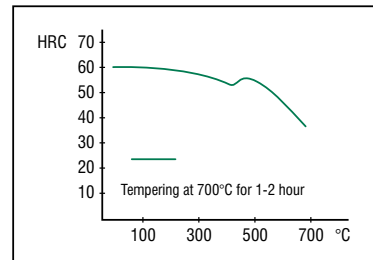
### Approvals

GOST, SEPRO, TSE

### Applications

It is particularly used for repair applications of machine parts that are particularly exposed to wear by stone, coal, sand and soil. Loading machines, band plates, wear plates and parts of grinders can be hardfaced with this electrode. It is recommended to use AS SD-65 in high temperature applications where oxidation resistance is more important than hardness and resistance to tempering like feed screws in furnaces.

**Hardening:** in oil or air at 920-980°C  
**Softening:** in furnace at 680 - 700°C



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	100 - 140	3370	4.7 / 140	5
4.00	450	150 - 180	6660	6.3 / 95	6
5.00	450	180 - 225	9790	6.4 / 65	6



1G/PA



2F/PB



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

EN 14700 : E Fe1  
DIN 8555 : E1-UM-250

### General Description

AS SD-250 is a basic type coated electrode. Thanks to its high toughness value, it is especially used in applications where very good resistance to compressive stresses are required. Provides smooth weld beads without cracks. It can also be used in welding of austenitic manganese steels. Pre-heating is usually not necessary before welding. Weld metal can be machined with carbide cutting tools. Hardness varies with respect to the number of passes.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.11	0.80	1.00	1.5

### Mechanical Properties, Typical, All Weld Metal

Hardness : 225 - 275 HB

### Applications

Especially used for tough build-up on rails, rail crossings, gearwheels, shafts, gear parts and couplings. It is also suitable for buffer layers and fillet welds on carbon steels and low-alloyed steels.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+)

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	100 - 140	3792	4.6 / 120	5
4.00	450	140 - 180	7188	6.8 / 95	6



1G/PA



2F/PB

## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E1-UM-300  
EN 14700 : E Fe1

### General Description

AS SD-300 is a heavily coated basic electrode particularly used for wear conditions where impact stresses are considered. It gives a weld metal that is resistant to deformations of high rolling forces including metal-to-metal friction. Weld metal is air hardenable and can be machined with carbide cutting tools. Hardness varies with respect to the number of passes and cooling rate. It has about 115 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.07	0.20	0.60	3.4

### Mechanical Properties, Typical, All Weld Metal

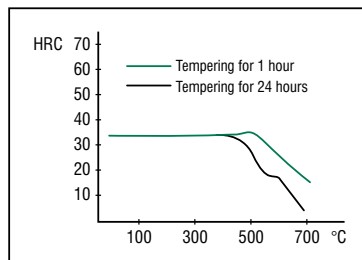
Hardness: 290 - 330 HRC

### Approvals

GOST, SEPRO, TSE

### Applications

It is used for hardfacing of rollers, gears, rail crossings, switch points, brake shoes and crane wheels. Joining of heat treatable steels having a tensile strength of 80 - 90 kg/mm<sup>2</sup> is another application area.



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 140	3340	4.8 / 145	5
4.00	450	150 - 190	6730	6.4 / 95	6
5.00	450	190 - 230	9740	6.3 / 65	6





## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E1-UM-350  
EN 14700 : E Fe1

### General Description

AS SD-350 is a heavily coated basic electrode particularly used for wear conditions where impact stresses are considered. It gives a weld metal that is resistant to deformations of high rolling forces including metal-to-metal friction. Weld metal is air hardenable and can be machined with carbide cutting tools. Hardness varies with respect to the number of passes and cooling rate. It has about 115 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr
0.10	0.50	0.70	3.5

### Mechanical Properties, Typical, All Weld Metal

Hardness : 325 - 350 HRC

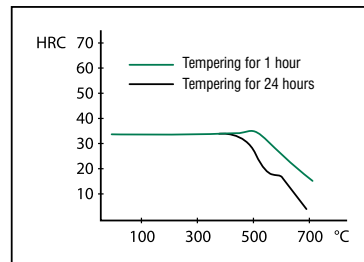
### Approvals

GOST, SEPRO, TSE

GL (\*)

### Applications

It is used for hardfacing of rollers, gears, rail crossings, switch points, brake shoes and crane wheels. Joining of heat treatable steels having a tensile strength of 80-90 kg/mm<sup>2</sup> is another application area.



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	110 - 140	3440	5.0 / 145	5
4.00	450	150 - 190	6770	6.4 / 95	6
5.00	450	190 - 240	10080	6.6 / 65	6



1G/PA



2F/PB

## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E4-UM-60 (65) S  
EN 14700 : E Fe4

### General Description

AS SD-HSS is a basic coated electrode. It gives a Mo alloyed, high speed steel type weld metal. Deposited metal retains its toughness properties at high temperatures enabling the formation of high strength welds, particularly during the hardfacing of cutting and punching tools.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Cr	Mo	W	V
0.90	1.20	1.30	4.5	7.5	1.80	1.50

### Mechanical Properties, Typical, All Weld Metal

Hardness : 57 - 60 HRC (as welded)  
65 HRC (after double tempering)

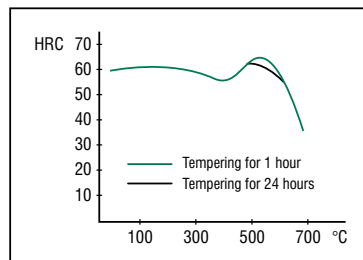
### Approvals

GOST, SEPRO, TSE

### Applications

It is particularly used for hardfacing of cutting and punching tools made of alloyed and unalloyed steels with a hot tool steel structured weld metal. Part that is going to be welded should be preheated to 400-500°C and small beads should be preferred to inhibit overheating.

Machine tools, drilling parts, and tools made of high speed steels are among other application areas.



### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 100	2580	2.1 / 80	5
3.25	350	100 - 140	4370	2.2 / 50	5
4.00	350	150 - 185	6680	2.0 / 30	5



1G/PA



2F/PB

# AS SD-MANGAN



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E7-UM-200 K  
EN 14700 : E Fe9  
AWS A5.13 : E FeMn-A

### General Description

AS SD-MANGAN is a basic coated electrode. It gives an austenitic Hadfield Manganese steel type weld metal with 13 % Mn content. 3 % Ni content increases the ductility and impact properties. Soft weld metal has a low resistance to abrasion after the application; but it hardens rapidly when cold worked or subject to gritty abrasion.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni
0.70	0.10	14	3

### Mechanical Properties, Typical, All Weld Metal

Hardness : 175 - 200 HB (as welded)  
450 HB (after cold working)

### Approvals

GOST, SEPRO, TSE

### Applications

It is used for the surfacing and reclamation of austenitic 12-14 % Mn-steels and joining of these to mild or medium carbon steels. Teeth used for mineral handling, cone, roll and jaw crushers, crushing and grinding hammers, screens and grid bars and parts exposing to impact can be hardsurfaced with AS SD-MANGAN.

Especially on 12-14 % Mn-steels, it is important to use this electrode before using chromium carbide structured hardfacing electrodes to form a buffer layer as it enables a healthy joining of the subsequent hardsurface to the base metal.

### Attention !

As % 12-14 Mn containing weld metal has poor corrosion resistance, its properties are similar to carbon steels.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	80 - 140	3810	5.3 / 140	5
4.00	450	140 - 180	7440	6.7 / 90	6
5.00	450	180 - 230	11610	6.4 / 55	6





# AS SD-MANGAN 165



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E7-UM-200 K  
EN 14700 : E Fe9  
AWS A5.13 : E F eMn-A

### General Description

AS SD-MANGAN 165 is a zircon-basic coated electrode. It gives an austenitic Hadfield Manganese steel type weld metal with 13 % Mn content. 3.5 % Ni content increases the ductility and impact properties. Soft weld metal has a low resistance to abrasion after the application; but it hardens rapidly when cold worked or subject to gritty abrasion. It has about 165 % metal recovery.

### Chemical Composition (w%), Typical, All Weld Metal

C	Si	Mn	Ni
0.70	0 .10	14	3.5

### Mechanical Properties, Typical, All Weld Metal

Hardness : 175-200 HB (as welded)  
450 HB (after cold working)

### Approvals

GOST, SEPRO, TSE

### Applications

It is used for the surfacing and reclamation of austenitic 12-14 % Mn-steels and joining of these to mild or medium carbon steels. Teeth used for mineral handling, cone, roll and jaw crushers, crushing and grinding hammers, screens and grid bars and parts exposing to impact can be hardsurfaced with AS SD-MANGAN 165.

Especially on 12-14 % Mn-steels, it is important to use this electrode before using chromium carbide structured hardfacing electrodes to form a buffer layer as it enables a healthy joining of the subsequent hardsurface to the base metal.

Attention !

As % 12-14 Mn containing weld metal has poor corrosion resistance, its properties are similar to carbon steels.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 70 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
2.50	350	70 - 100	3050	4.6 / 150	5
3.25	350	100 - 150	5350	4.8 / 90	5
4.00	450	150 - 185	10500	5.8 / 55	6
5.00	450	200 - 240	15720	5.5 / 35	6



# AS SD-ABRA Nb



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : (E10-UM-60 GR)  
EN 14700 : E Fe15

### General Description

AS SD-ABRA Nb is a basic coated electrode that is highly resistant to abrasion wear caused by fine or coarse hard minerals. Concentrated Cr and Nb carbides have been finely dispersed in its structure. In corrosive environments, it gives a better resistance to wear caused by fine minerals than hardfaced structures having an ordinary chromium carbide structure.

### Chemical Composition (w%), Typical, All Weld Metal

C	Cr	Nb
3.4	22	10

### Mechanical Properties, Typical, All Weld Metal

Dureté : 55 - 57 HRC  
Dureté du carbure : >1500 HV

### Approvals

GOST, SEPRO, TSE

### Applications

Wear plates, dredgers, rock crushers, grinding hammers and rollers can be hardfaced with AS SD-ABRA Nb. It should not be used for more than three passes.

In applications requiring a thick deposit metal, AS P-308Mn or AS P-312 should be used for buffering. It is crucial to have a buffer layer with AS P-308Mn for 12-14 % Mn containing steels before hardfacing applications.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	100 - 150	5750	4.6 / 80	5
4.00	350	140 - 200	8930	4.5 / 50	5



1G/PA



2F/PB

# AS SD-ABRA Cr



## Coated Electrode for Overlay Welding and Hardfacing

### Classification

DIN 8555 : E10-UM-60 G  
EN 14700 : E Fe15  
AWS A5.13 : E FeCr-A1

### General Description

AS SD-ABRA Cr is a basic coated electrode that is highly resistant to abrasion wear caused by coarse hard minerals. It has a highly concentrated chromium carbide in its structure.

### Chemical Composition (w%), Typical, All Weld Metal

C	Cr
4.5	33

### Mechanical Properties, Typical, All Weld Metal

Hardness : 58 - 62 HRC  
Carbide hardness : 1400 - 1500 HV

### Approvals

GOST, SEPRO, TSE

### Applications

Bucket conveyors, extruder screws, dragline buckets, dredgers, scrapers, screw conveyors, press screws, heads in ceramic industry, mixer blades and grinding rollers can be hardfaced with AS SD-ABRA Cr.

It should not be used for more than three passes. Interpass temperature should be 300-500°C.

In applications requiring a thick deposit metal, AS P-308Mn or AS P-312 should be used for buffering. It is crucial to have a buffer layer with AS P-308Mn for 12-14 % Mn containing steels before hardfacing applications.

### Welding Parameters / Packing and Diameter Informations / Welding Positions

Current Type and Polarity : DC (+) ; AC min 65 V

Diameter [ mm ]	Length [ mm ]	Current [ A ]	Electrode Weight [ g/100 pcs ]	Box Weight [ kg ] Quantity [ pcs/box ]	Export Box Box Weight [ kg ]
3.25	350	115 - 160	5760	4.6 / 80	5
4.00	350	120 - 190	9140	4.6 / 50	5



1G/PA

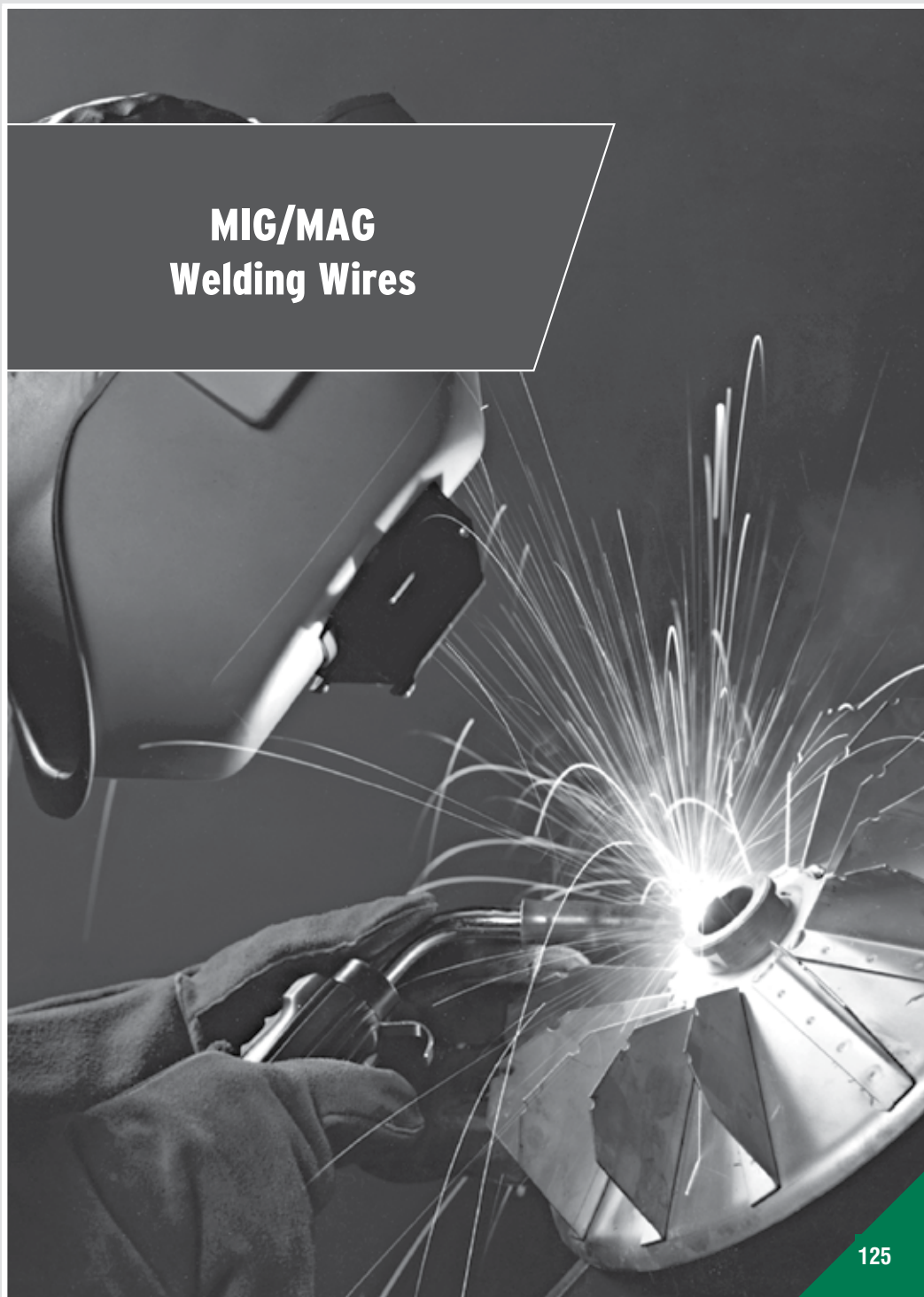


2F/PB





**MIG/MAG  
Welding Wires**





## MIG/MAG Welding Wire for Mild Steels

### Classification

ISO 14341-A : G 42 3 C G3Si1 / G 42 4 M G3Si1  
 AWS A5.18 : ER70S-6

### General Description

AS SG2 is a copper coated gas metal arc welding wire in 15 kg spools or 250 kg drums. It is particularly designed for semiautomatic and full-automatic GMAW applications. Working temperature can range between -50 to 450°C.

CO<sub>2</sub> or 80 % Ar + 20 % CO<sub>2</sub> are used for gas shielding.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	0.85	1.50
0.06 *	0.55 *	1.10 *

(\* ) Typical weld metal composition (CO<sub>2</sub> gas shielding)

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup>  
 Tensile Strength : 540 N/mm<sup>2</sup>  
 Elongation (L=5d) : 30 %  
 Impact (ISO-V) : 60 J (-30°C)

### Approvals

CE, DB, GOST, NAKS, SEPRO, TSE, TÜV

Shielding gas: CO<sub>2</sub>

ABS	BV	DNV	GL	LRS	RINA	RMRS	TL
3SA,3YSA	3YM	III YMS	3YS	3S 3YS H15	3Y42	3Y	3YMS

Shielding gas: Ar+CO<sub>2</sub>

ABS	DNV	GL	TL
3YSA	III YMS	3YS	3YMS

### Shielding Gases (ISO 14175 / EN 439)

MAG: M21- Ar + 5-25% CO<sub>2</sub>  
 C1 - CO<sub>2</sub> (100%)

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight	Drum Weight
MIG/MAG Wire	x	x	x	x	-	-	-	5 kg / 15 kg	50 kg / 250 kg 400 kg / 450 kg

## MIG/MAG Welding Wire for Mild Steels

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 10 - C 35 ; Ck 10 - Ck 35	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C10 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 355	S255N - S420N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 HI, HII	P295GH, P355GH P235GH, P265GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

### Welding Parameters / Welding Positions

Current Type and Polarity : DC (+)

Arc Type	Diameter [ mm ]	Current [ A ]	Voltage [ V ]
Short Arc	0.8	60 - 140	18 - 22
Short Arc	1.0	80 - 175	18 - 24
Short Arc	1.2	120 - 200	18 - 27
Sprey Arc	1.2	150 - 280	25 - 40
Sprey Arc	1.6	225 - 480	28 - 40



1G/PA



2F/PB



2G/PC



4G/PE



3G/PF



3G/PG

# AS SG2 PERFORMANCE



## MIG/MAG Welding Wire for Mild Steels

### Classification

TS EN ISO14341-A : G 42 3 C1 3Si1 / G 42 5 M21- M32 3Si1  
AWS A5.18 : ER70S-6

### General Description

AS SG2 PERFORMANCE is a copper coated gas metal arc welding wire in 15 kg spools or 250 kg drums. It is particularly designed for semiautomatic and full-automatic GMAW applications. Working temperature can range between -50 to 450°C.

CO<sub>2</sub> or 80 % Ar + 20 % CO<sub>2</sub> are used for gas shielding.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	0.85	1.50
0.06 *	0.55 *	1.10 *

(\*) Typical weld metal composition (CO<sub>2</sub> gas shielding)

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup> (M21)  
Tensile Strength : 540 N/mm<sup>2</sup> (M21)  
Elongation (L=5d) : 30 % (M21)  
Impact (ISO-V) : 60 J (-30°C) (M21)

### Approvals

CE, DB, GOST, NAKS, SEPRO, TSE, TÜV

Shielding gas: CO<sub>2</sub>

GL

Shielding gas: Ar+CO<sub>2</sub>

GL

### Shielding Gases (ISO 14175 / EN 439)

MAG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight	Drum Weight
MIG/MAG Wire	x	x	x	x	-	-	-	5 kg / 15 kg	50 kg / 250 kg 400 kg / 450 kg



## MIG/MAG Welding Wire for Mild Steels

### Classification

ISO 14341-A : G 42 3 C G4Si1 / G 42 4 M G4Si1  
 AWS A5.18 : ER70S-6

### General Description

AS SG3 is a copper coated gas metal arc welding wire in 15 kg spools or 250 kg drums. It is particularly designed for semiautomatic and full-automatic GMAW applications. Working temperature can range between -50 to 450°C.

CO<sub>2</sub> or 80 % Ar + 20 % CO<sub>2</sub> are used for gas shielding.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	1.00	1.70
0.06 *	0.60 *	1.20 *

(\* ) Typical weld metal composition (CO<sub>2</sub> gas shielding)

### Approvals

DB, GOST, NAKS, SEPRO, TSE, TÜV

**BV(3Y)** **GL(3YS)** CO<sub>2</sub> gas shielding

**GL(3YS)** Ar+CO<sub>2</sub> gas shielding

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
 Tensile Strength : 570 N/mm<sup>2</sup>  
 Elongation (L=5d) : 25 %  
 Impact (ISO-V) : 60 J (-30°C)

### Shielding Gases (ISO 14175 / EN 439)

MAG: M21- Ar + 5-25% CO<sub>2</sub>  
 C1 - CO<sub>2</sub> (100%)

Current Type and Polarity: DC (+)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 44, St 44-2, St 44-3, St 52, St 52-3 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 10 - C 35 ; Ck 10 - Ck 35	S275, S355 P235TR2 - P355T2 E295, E335, E360 C10 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 355	S255N - S460N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 415-7 X42, X46, X52, X60 (API 5LX)	L210 - L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11	P295GH, P355GH P235GH, P265GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight	Drum Weight
MIG/MAG Wire	x	x	x	x	-	-	-	5 kg / 15 kg	50 kg / 250 kg 400 kg / 450 kg

# AS SG3 PERFORMANCE



## MIG/MAG Welding Wire for Mild Steels

### Classification

TS EN ISO 14341-A : G 42 3 C1 4Si1 / G 46 5 M21-M32 G4Si1  
AWS A5.18 : ER70S-6

### General Description

AS SG3 PERFORMANCE is a copper coated gas metal arc welding wire in 15 kg spools or 250 kg drums. It is particularly designed for semiautomatic and full-automatic GMAW applications. Working temperature can range between -50 to 450°C.

CO<sub>2</sub> or 80 % Ar + 20 % CO<sub>2</sub> are used for gas shielding.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	1.00	1.70
0.06 *	0.60 *	1.20 *

(\*) Typical weld metal composition (CO<sub>2</sub> gas shielding)

### Approvals

DB, GOST, NAKS, SEPRO, TSE, TÜV

GL

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 480 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (-50°C)

### Shielding Gases (ISO 14175 / EN 439)

MAG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity: DC (+)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 44, St 44-2, St 44-3, St 52, St 52-3 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 10 - C 35 ; Ck 10 - Ck 35	S275, S355 P235TR2 - P355T2 E295, E335, E360 C10 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 355	S255N - S460N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 415-7 X42, X46, X52, X60 (API 5LX)	L210 - L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 HI, HII	P295GH, P355GH P235GH, P265GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight	Drum Weight
MIG/MAG Wire	x	x	x	x	-	-	-	15 kg	50 kg / 250 kg 400 kg / 450 kg

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**Liability** : All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes**: Consult information on Welding Safety Sheet, available upon request.

## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 21952-A : G MoSi  
 ISO 14341-A : G2Mo  
 AWS A5.28 : ER70S-A1 (ER80S-G\*)

(\* ) Classification la plus proche

### General Description

It is a low alloyed GMA welding wire, used for the welding creep resistant 0.5 % Mo steels and fine grained steels. It gives a weld metal that is used in operating temperatures between -40°C and 500°C. It is used in the welding of steel construction applications, boiler and pressure vessels, gas pipes and turbin rotors.

**Industry:** Ship building, heavy machinery, petro-chemical, power generation, metal fabrication industry.

### Chemical Composition (w%), Wire

C	Si	Mn	Mo	Cr	Cu
0.085 - 0.09	0.60 - 0.70	1.15 - 1.20	0.50	0.15	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 530 N/mm<sup>2</sup>  
 Tensile Strength : 640 N/mm<sup>2</sup>  
 Elongation (L=5d) : 27 %  
 Impact (ISO-V) : 150 J (+20°C)  
 : 90 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
 C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 255 - StE 460 ; WStE 255 - WStE 460 -	S255N - S460N ; P255NH - P460NH S275ML ; S355M - S420M
<b>Pipe Materials</b>	StE 320.7 - StE 415.7 StE 360.7 TM - StE 480.7 TM X52, X56, X60, X65 (API 5LX)	L320 - L415NB L360MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	15Mo3, 17Mn4, 19Mn6 22Mo4, 20MnMoNi55	6Mo3, P295GH, P310GH -
<b>Elevated Temperature Steels</b>	St 35.8 - St 45.8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45, GS-52, GS-60 -	GE240, GE260, GE300 G20Mo5
<b>Creep Resistant Steels</b>	17MnMoV6-4, 15NiCuMoNb5 -	- 20MnMoNi4-5

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	x	x	x	-	-	-	-	15 kg

# AS MIG Mo80



## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 21952-A : G MnMo  
 ISO 14341-A : G4Mo  
 AWS A5.28 : ER80S-D2

### General Description

It is a low alloyed GMA welding wire, used for the welding low alloyed and high strength steels in operating temperatures up to 550°C. It is used in the welding of creep resistant steels, boiler and pressure vessels, gas pipes. Especially used for low temperature applications that are manufactured from Ni-Cr-Mo steels.

**Industry:** Transportation, bridge, tank and railway fabrication, mining, ship building and petro-chemical industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.09	0.70	1.90	< 0.15	< 0.15	0.50	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 570 N/mm<sup>2</sup>  
 Tensile Strength : 690 N/mm<sup>2</sup>  
 Elongation (L=5d) : 25 %  
 Impact (ISO-V) : 120 J (+20°C)  
 : 80 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21 - Ar + 5-25% CO<sub>2</sub>  
 C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 52.3	S355
<b>Fine Grained Steels</b>	StE 255 - StE 460 ; WStE 255 - WStE 460	S255N - S460N ; P255NH - P460NH
<b>Pipe Materials</b>	StE 320.7 - StE 415.7 StE 360.7 TM - StE 480.7 TM X52, X56, X60, X65 (API 5LX)	L320 - L415NB L360MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	15Mo3, 17Mn4, 19Mn6 22Mo4, 20MnMoNi55 -	16Mo3, P295GH, P310GH - P355GH
<b>Elevated Temperature Steels</b>	St 35.8 - St 45.8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45, GS-52, GS-60 -	GE240, GE260, GE300 G20Mo5
<b>Creep Resistant Steels</b>	17MnMoV6-4, 15NiCuMoNb5 -	- 20MnMoNi4-5

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	x	x	x	-	-	-	-	15 kg

## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 16834 : G Mn3NiCrMo  
AWS A5.28 : ER100S-G

### General Description

It is a low alloyed GMA welding wire, used for the welding fine-grained and high strength steels with a yield strength up to 680 N/mm<sup>2</sup>. Especially used for low temperature applications that are manufactured from Ni-Cr-Mo steels.

**Industry:** Bridge, tank and railway fabrication, mining and ship building industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.09	0.75	1.60	0.60	0.55	0.25	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 680 N/mm<sup>2</sup>  
Tensile Strength : 770 N/mm<sup>2</sup>  
Elongation (L=5d) : 24 %  
Impact (ISO-V) : 110 J (+20°C)  
: 60 J (-40°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 460 - StE 620	S620Q ; P460N
<b>Heat Treated Fine Grained Structural Steels</b>	N-A-XTRA 56, N-A-XTRA 63, N-A-XTRA 70 T1, T1A,T1B	S550QL1, S620QL1, S690QL1 -
<b>Pipe Materials</b>	X60, X65, X70, X80 (API 5LX) -	- L485MB, L555MB

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	x	x	x	-	-	-	-	15 kg

# AS MIG 100S-1



## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 16834 : G Mn3Ni1,5Mo  
 EN ISO 12534 : G Mn3Ni1,5Mo  
 AWS A5.28 : ER100S-1

### General Description

NiCrMo alloyed steel with high yield strength above 690 N/mm<sup>2</sup>, suitable for military applications of welding HY-80 and HY-100 steels.

Excellent impact resistance at low temperatures (70J at -50°C).

**Industry:** Shipbuilding sector, structural work, industrial equipment, petrochemical and building industry, cranes, ground movement, tanks, materials handling, military applications.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	Cu
0.07	0.45	1.60	0.15	1.60	0.30	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 730 N/mm<sup>2</sup>  
 Tensile Strength : 820 N/mm<sup>2</sup>  
 Elongation (L=5d) : 23 %  
 Impact (ISO-V) : 150 J (+20°C)  
                       : 75 J (-50°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
 C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 460 - StE 500 WStE 460 - WStE 500 TStE 690 V - StE 690.7 TM	S460N ; S500N P460NH - P500NH S690QL S690Q L690M
<b>Heat Treated Fine Grained Structural Steels</b>	N-A-XTRA 56, N-A-XTRA 63, N-A-XTRA 70 T1, T1A, T1B HSB 77V, Weldom 700, BH70V, Hardox HY 80, HY 90, HY 100	S550QL1, S620QL1, S690QL1 - - -
<b>Pipe Materials</b>	X65, X70, X80 (API 5LX) -	- L485MB, L555MB

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	-	x	x	-	-	-	15 kg

# AS MIG 110SG



## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 16834 : G Mn3Ni1CrMo  
AWS A5.28 : ER110S-G

### General Description

It is a low alloyed GMA welding wire, used for the welding fine-grained and high strength steels with a yield strength up to 690 N/mm. It gives a weld metal that is used in operating temperatures down to -40°C with a high toughness value. Especially used for low temperature applications that are manufactured from Ni-Cr-Mo steels.

**Industry:** Ship building, petro-chemical, construction, crane and bridge fabrication industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	V	Cu
0.09	0.60	1.65	1.50	0.30	0.30	0.10	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 770 N/mm<sup>2</sup>  
Tensile Strength : 880 N/mm<sup>2</sup>  
Elongation (L=5d) : 21 %  
Impact (ISO-V) : 180 J (+20°C)  
: 70 J (-50°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 420 - StE 500	S420N ; S500N
	TStE 420	S420NL
	WStE 420 - WStE 500	P420NH - P500NH
	TStE 690 V	S690QL
	-	S690Q
	StE 690.7 TM	L690M
<b>Heat Treated Fine Grained Structural Steels</b>	N-A-XTRA 56, N-A-XTRA 63, N-A-XTRA 70	S550QL1, S620QL1, S690QL1
	T1, T1A, T1B	-
	HSB 77V, Weldox 700, BH70V	-
	HY 90, HY 100, Welten 80, Bisalloy 80	-
<b>Pipe Materials</b>	X65, X70, X80 (API 5LX)	-
	-	L485MB, L555MB

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	x	x	-	-	-	-	15 kg

**Liability :** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes:** Consult information on Welding Safety Sheet, available upon request.

## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 16834-A : Mn4Ni2,5CrMo  
AWS A5.28 : ER120S-G

### General Description

It is a low alloyed GMA welding wire, used for the welding fine-grained and high strength steels with a yield strength up to 960 N/mm. It gives a weld metal that is used in operating temperatures down to -40°C with a high toughness value. Especially used for low temperature applications that are manufactured from Ni-Cr-Mo steels.

**Industry:** Ship building, petro-chemical, construction, crane and bridge fabrication industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	V	Cu
0.10	0.66	1.80	2.45	0.38	0.47	0.06	< 0.20

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 960 N/mm<sup>2</sup>  
Tensile Strength : 1040 N/mm<sup>2</sup>  
Elongation (L=5d) : 16 %  
Impact (ISO-V) : 60 J (-40°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 960 -	S960Q S890QL P460NH P460NL1
<b>Heat Treated Fine Grained Structural Steels</b>		Weldox™ 800 Weldox™ 900 Weldox™ 960D Weldox™ 960E

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	x	x	-	-	-	-	15 kg



## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 21952-A : G CrMo1Si\*  
AWS A5.28 : ER80S-B2

(\*) Nearest classification

### General Description

It is a low alloyed GMA welding wire, used for the welding high temperature strength Cr-Mo (1.25 % Cr, 0.5 % Mo) steels (boiler and pressure vessels) in operating temperatures up to 550°C. Also It is used in the welding cementation and nitride steels.

**Industry:** Chemical and petro-chemical industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.08	0.55	0.60	< 0.20	1.30	0.55	< 0.30

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 510 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 24 %  
Impact (ISO-V) : 120 J (+20°C)  
: 100 J (-10°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN	Wr. Nr.
<b>Creep Resistant Steels</b>	15 CrMo 5	-	1.7205
	25 CrMo 4	-	1.7218
	42 CrMo 4	-	1.7225
	13 CrMo 44	13 CrMo 4-5	1.7335
	22 CrMo 44	-	1.7350
	13 CrMoV 42	-	1.7709
	16 CrMoV 4	-	1.7728
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-22 CrMo 5 4	G22CrMo5-4	1.7354
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357
<b>Cementation Steels</b>	-	16MnCr5	1.7131

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	x	x	-	-	-	-	15 kg

## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 21952-A : G CrMo2Si\*  
AWS A5.28 : ER90S-B3

(\*) Nearest classification

### General Description

It is a low alloyed GMA welding wire, used for the welding high temperature strength Cr-Mo (2.25 % Cr, 1.0 % Mo) steels (boiler and pressure vessels) in operating temperatures up to 600°C. It gives a weld metal that is resistant to corrosion and sulphide materials.

**Industry:** Oil industry, thermal plant, chemical and petro-chemical industry..

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.08	0.50	0.60	< 0.20	2.40	1.00	< 0.30

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 540 N/mm<sup>2</sup>  
Tensile Strength : 640 N/mm<sup>2</sup>  
Elongation (L=5d) : 22 %  
Impact (ISO-V) : 150 J (+20°C)  
: 90 J (-10°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN	Wr. Nr.
<b>Creep Resistant Steels</b>	-	-10CrMo9-10	1.7380
	10 CrSiMoV 7	-	1.8075
	10 CrV 63	-	-
	12 CrSiMo 8	-	-
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357
	GS-18 CrMo 9 10	G17CrMo9-10	1.7379

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	x	x	-	-	-	-	15 kg

## MIG/MAG Welding Wire for High Strength and Low Alloyed Steels

### Classification

EN ISO 16834 : G Mn3Ni1Cu  
AWS A5.28 : ER80S-G

(\*) Nearest classification

### General Description

It is a low c alloyed GMA welding wire, used for the welding pressure vessels and gas pipes including nickel. It gives a weld metal that has a high mechanical properties against atmospheric environment.

**Industry:** Petro-chemical industry

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cu
0.09	0.60	1.40	0.90	< 0.40

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 530 N/mm<sup>2</sup>  
Tensile Strength : 610 N/mm<sup>2</sup>  
Elongation (L=5d) : 26 %  
Impact (ISO-V) : 120 J (+20°C)  
: 60 J (-10°C)

### Shielding Gases (ISO 14175 / EN 439)

MIG: M21- Ar + 5-25% CO<sub>2</sub>  
C1 - CO<sub>2</sub> (100%)

Current Type and Polarity : DC (+)

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 255 - StE 380 TSiE 255 - TSiE 380	S255N ; S420N S255NL - S380NL ; P275NL1 - P355NL1
<b>Weather Resisting Steels</b>	WTSt 37.2 - - - - -	S235JRW S355J2G1W, S235J0W, S235J2W S355J01, S355J2W, S355K2G1W Patinax®-F, Patinax®-37 Cor-Ten®-A, Cor-Ten®-B 9CrNiCuP3-2-4
<b>Low Temperature Steels</b>	TTSt35 - -	S225NL 11MnNi5-3 13MnNi6-3

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	x	x	x	-	-	-	-	15 kg

# AS MIG 307Si



## MIG Wire for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ~ ER307  
ISO 14343-A : ~ G 18 8 Mn

### General Description

Solid wire with 7% Mn for welding steels with difficult weldability such as armour plates and austenitic high Mn-steels. Often used as a buffer layer in hardfacing applications.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	P + S
0.07	0.20	0.50	19	9	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 40 %  
Impact ISO-V : 80 J (+20°C)

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : M12 - Ar + 1 - 5 % CO<sub>2</sub>  
M13 - Ar + 1.5 - 3 % O<sub>2</sub>

### Materials to be Welded

Various steel grades such as; armour plates, hardenable steels including steels difficult to weld, non-magnetic steels, work hardening austenitic manganese steels and dissimilar joints (CMn-steels to stainless steels).

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	-	-	X	-	-	-	-	12.5 kg

## MIG Wire for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER308LSi  
ISO 14343-A : G 19 9 LSi

### General Description

Solid wire with extra low carbon for welding austenitic CrNi-steels.  
With increased silicon for improved wettability.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.85	1.70	20	10	0.15	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 390 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 40 %  
Impact ISO-V : 120 J (+20°C)

### Approvals

ABS (ER316L)  
GOST, SEPRO

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : M12 - Ar + 1 - 5 % CO<sub>2</sub>  
M13 - Ar + 1.5 - 3 % O<sub>2</sub>

### Materials to be Welded

	EN 10088-1/-2	EN 10213-4	Mat. Nr.
<b>Extra Low Carbon</b> (C < %0.03)	X2 CrNi 19 11		1.4306
	X2 CrNiN 18 10		1.4311
<b>Medium Carbon</b> (C > %0.03)	X4 CrNi 18 10		1.4301
		G-X5 CrNi 19 10	1.4308
<b>Ti/Nb Stabilized</b>	X6 CrNiTi 18 10		1.4541
	X6 CrNiNb 18 10		1.4550
		G-X5 CrNiNb 19 10	1.4552

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	X	X	X	-	-	-	-	12.5 kg

# AS MIG 309LSi



## MIG Wire for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER309LSi  
ISO 14343-A : G 23 12 LSi

### General Description

Solid wire for welding stainless steel to carbon steel.  
With increased silicon for improved wettability.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.85	1.70	24	13	0.15	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 420 N/mm<sup>2</sup>  
Tensile Strength : 600 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact ISO-V : 120 J (+20°C)

### Approvals

GOST

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : M12 - Ar + 1 - 5 % CO<sub>2</sub>  
M13 - Ar + 1.5 - 3 % O<sub>2</sub>

### Materials to be Welded

	EN 10088-1/-2	Mat. Nr.
<b>Corrosion resistant cladsteels</b>	X2 CrNi 18 10	1.4311
	X2 CrNiN 19 11	1.4306
	X4 CrNi 18 10	1.4301

Dissimilar metals (mild and low alloyed steel to stainless steel)  
Build-up welding on mild and low alloyed steel

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	X	X	X	-	-	-	-	12.5 kg

# AS MIG 316LSi



## MIG Wire for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER316LSi  
EN ISO 14343-A : G 19 12 3 LSi

### General Description

Solid wire with extra low carbon for welding austenitic CrNiMo-steels.  
With increased silicon for improved wettability.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.85	1.70	18.5	12.5	2.75	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 410 N/mm<sup>2</sup>  
Tensile Strength : 640 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact ISO-V : 150 J (+20°C)

### Approvals

ABS (ER316LSi)  
GOST, SEPRO

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : M12 - Ar + 1 - 5 % CO<sub>2</sub>  
M13 - Ar + 1.5 - 3 % O<sub>2</sub>

### Materials to be Welded

	EN 10088-1/-2	EN 10213-4	Mat. Nr.
<b>Extra Low Carbon</b> (C < %0.03)	X2 CrNiMo 17 12 2		1.4404
	X2 CrNiMo 18 14 3		1.4435
	X2 CrNiMoN 17 11 2		1.4406
	X2 CrNiMoN 17 13 3		1.4429
<b>Medium Carbon</b> (C > %0.03)	X4 CrNiMo 17 12 2		1.4401
	X4 CrNiMo 17 13 3		1.4436
		G-X5 CrNiMo 19 11	1.4408
<b>Ti/Nb Stabilized</b>	X6 CrNiMoTi 17 12 2		1.4571
	X6 CrNiMoNb 17 12 2		1.4580
	X6 CrNiNb 18 10		1.4550
		G-X5 CrNiNb 19 10	1.4552

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	X	X	X	-	-	-	-	12.5 kg

# AS MIG 347Si



## MIG Wire for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER347Si  
ISO 14343-A : G 19 9 3 NbSi

### General Description

Solid wire for welding Ti or Nb stabilized austenitic type stainless CrNi-steels.  
High resistance to intergranular corrosion and oxidizing environments.  
With increased silicon for improved wettability.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	Nb	P + S
0.04	0.90	1.30	19.5	10	0.30	0.60	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460 N/mm<sup>2</sup>  
Tensile Strength : 650 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact ISO-V : 100 J (+20°C)

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : M12 - Ar + 1 - 5 % CO<sub>2</sub>  
M13 - Ar + 1.5 - 3 % O<sub>2</sub>

### Materials to be Welded

	EN 10088-1/-2	EN 10213-4	Mat. Nr.
<b>Ti/Nb Stabilized</b>	X6 CrNiTi 18 10		1.4541
	X6 CrNiNb 18 10		1.4550
	X8 CrNiTi 18 10		1.4878
		G-X5 CrNiNb 19 10	1.4552
<b>Non Stabilized</b>	X2 CrNi 19 11		
	X2 CrNiN 18 10		1.4306
	X4 CrNi 18 10		1.4311
			1.4301
		G-X5 CrNi 19 10	1.4308

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	-	X	X	X	-	-	-	12.5 kg



## MIG Wire for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER4043  
ISO 18273 : S Al 4043A / AISi5(Al)

### General Description

Solid wire and rod for welding of aluminium-silicium alloys.

### Chemical Composition (w%), Typical, Wire

Si	Mn	Fe	Cu	Zn	Ti	Al
4.5-5.5	<0.05	<0.50	<0.30	<0.10	<0.01	Balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 100 N/mm <sup>2</sup>	Melting Range	: 575 - 625° C
Tensile Strength	: 160 N/mm <sup>2</sup>	Density	: 2.68 gr/cm <sup>3</sup>
Elongation (L=5d)	: 15 %		
Impact ISO-V	: 20 J (+20°C)		

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : I1 - Ar (100%)

### Materials to be Welded

	DIN 1725-1	DIN 1725-2	Mat. Nr.	Alloy Nr.
<b>Aluminium Wrought Alloys</b>	AlMgSi 0.5		3.3206	6060
	AlMgSi 0.7		3.3210	6005A
	AlMgSi 0.8		3.2316	6181
<b>Aluminium Cast Alloys</b>		G-AISi 5		443.0

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool/Tube Weight
MIG Wire	-	X	X	-	-	-	-	-	7 kg

## MIG Wire for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER4047  
ISO 18273 : S Al 4047A / AISi12(Al)

### General Description

Solid wire and rod for welding of cast aluminium alloys containing up to 12% silicium.

### Chemical Composition (w%), Typical, Wire

Si	Mn	Fe	Ti	Cu	Zn	Al
11.5-12.5	<0.15	<0.50	<0.01	<0.30	<0.20	Balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 80 N/mm <sup>2</sup>	Melting Range	: 575 - 585° C
Tensile Strength	: 180 N/mm <sup>2</sup>	Density	: 2.65 gr/cm <sup>3</sup>
Elongation (L=5d)	: 5 %		

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : I1 - Ar (100%)

### Materials to be Welded

	DIN 1725-1	DIN 1725-2	Mat. Nr.	Alloy Nr.
<b>Aluminium Cast Alloys</b>		G-AISI 12	3.3581	A413.0
		G-AISI 12 (Cu)	3.3583	
		G-AISI 10 Mg	3.2381	361.0
		G-AISI 10 Mg (Cu)	3.2383	
		G-AISI 9 Mg	3.2373	359.0
		G-AISI 9 Cu 3	3.2161	
		G-AISI 7 Mg	3.2171	356.0
		G-AISI 6 Cu 4	3.2151	319.0

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool / Tube Weight
MIG Wire	-	X	X	-	-	-	-	-	7 kg

## MIG Wire for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER5356  
ISO 18273 : S Al 5356 / AlMg5

### General Description

Solid wire and rod for welding of aluminium alloys containing more than 3% magnesium.

### Chemical Composition (w%), Typical, Wire

Si	Mg	Mn	Fe	Cr	Cu	Zn	Ti	Al
0.15	4.5-5.5	<0.20	<0.40	<0.15	<0.10	kalan	<0.06	Ballance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 130 N/mm <sup>2</sup>	Melting Range	: 565 - 635° C
Tensile Strength	: 280 N/mm <sup>2</sup>	Density	: 2.65 gr/cm <sup>3</sup>
Elongation (L=5d)	: 25 %		

### Shielding Gases (acc. ISO 14175 and EN 439)

MIG : I1 - Ar (100%)

### Materials to be Welded

#### Aluminium Wrought Alloys

DIN 1725-1	Mat. Nr.	Alloy Nr.
AlMg 3	3.3535	5754
AlMg 4.5	3.3345	5082
AlMg 5	3.3555	5056A
AlMg 2 Mn 0.8	3.3527	5049
AlMg 2.7 Mn	3.3537	5454
AlMg 4 Mn	3.3545	5086
AlZn 4.5 Mg 1	3.4335	7020

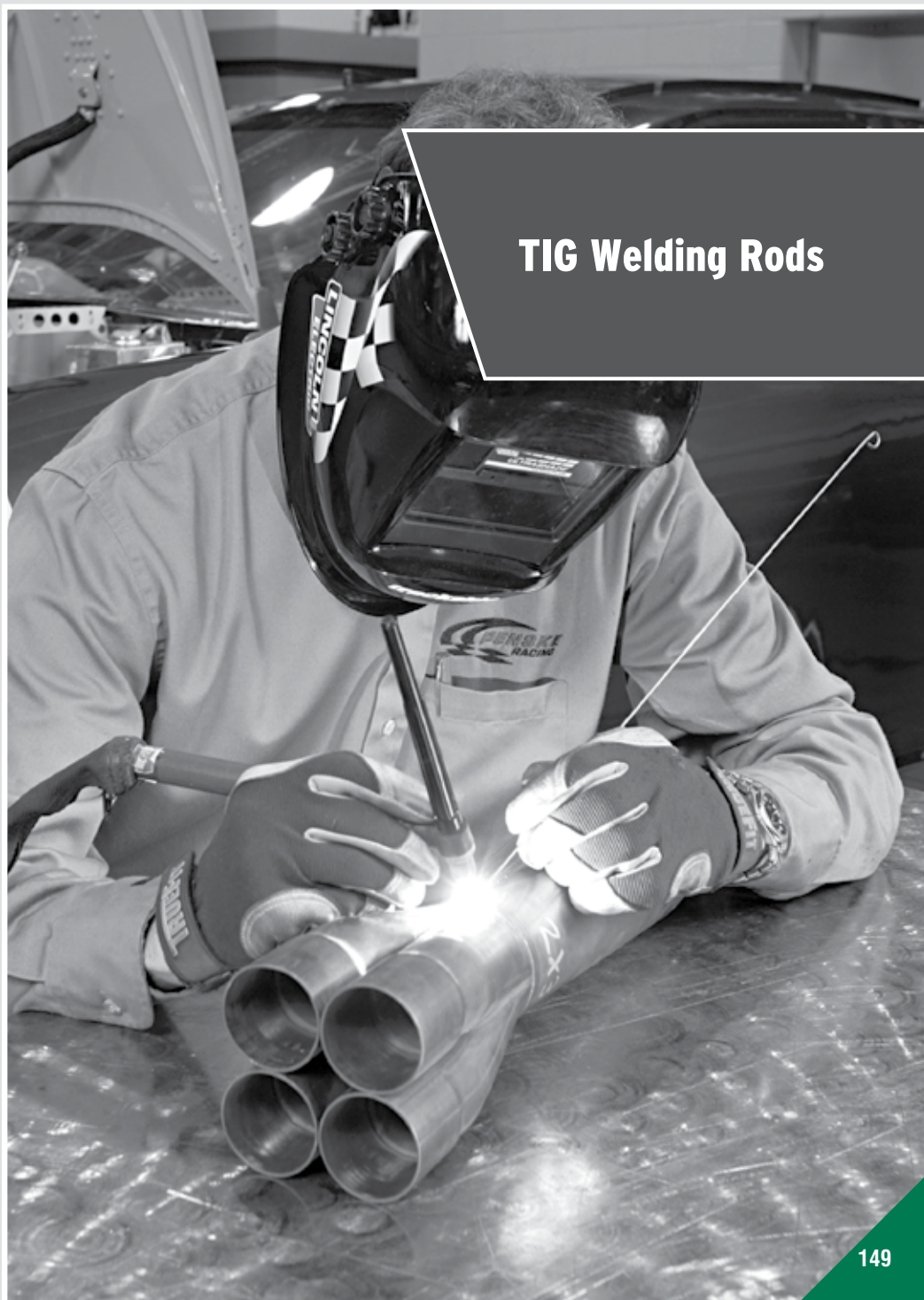
#### Aluminium Cast Alloys

DIN 1725-2	Mat. Nr.	Alloy Nr.
G-AlMg 3	3.3541	
G-AlMg 3 Si	3.3241	512.0
G-AlMg 5	3.3561	B535.0
G-AlMg 5 Si	3.3261	

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool / Tube Weight
MIG Wire	-	X	X	-	-	-	-	-	7 kg





## TIG Welding Rods

## TIG Rod for Mild Steels

### Classification

TS EN ISO 636-A : W 42 3 W3Si1  
AWS A5.18 : ER70S-6

### General Description

AS TIG SG2 is suitable for GTA welding of un-alloyed structural steels with a tensile strength up to 540 N/mm<sup>2</sup>, ship plates and fine-grained C-Mn steels. It gives high-strength weld metal at working temperatures varying between -50 to 450°C.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	0.85	1.50

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 440 N/mm<sup>2</sup>  
Tensile Strength : 540 N/mm<sup>2</sup>  
Elongation (L=5d) : 30 %  
Impact (ISO-V) : 60 J (-30°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 37-4, St 44-4, St 52-4 St 50-2, St 60-2 C 10 - C 35 ; Ck 10 - Ck 35	S185, S235, S275, S355 P235TR2 - P355T2 E295, E335 C10 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 420 WStE 255 - WStE 355	S255N - S420N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52, X60 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11	P295GH, P355GH P235GH, P265GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	x	x	x	x	5 kg

# AS TIG SG3



## TIG Rod for Mild Steels

### Classification

TS EN ISO 636-A : W 42 3 W4Si1  
AWS A5.18 : ER70S-6

### General Description

AS TIG SG3 is suitable for GTA welding of un-alloyed structural steels with a tensile strength up to 570 N/mm<sup>2</sup>, ship plates and fine-grained C-Mn steels. It gives high-strength weld metal at working temperatures varying between -50 to 450°C. It contains higher Si and Mn than AS TIG SG2 welding rod.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn
0.08	1.00	1.70

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 470 N/mm<sup>2</sup>  
Tensile Strength : 570 N/mm<sup>2</sup>  
Elongation (L=5d) : 25 %  
Impact (ISO-V) : 60 J (-30°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 44, St 44-2, St 44-3, St 52, St 52-3 St 37-4, St 44-4, St 52-4 St 50-2, St 60-2, St 70-2 C 10 - C 35 ; Ck 10 - Ck 35	S275, S355 P235TR2 - P355T2 E295, E335, E360 C10 - C35
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 355	S255N - S460N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 415-7 X42, X46, X52, X60 (API 5LX)	L210 - L415NB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11	P295GH, P355GH P235GH, P265GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45, GS-52	GE200, GE240, GE260

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	-	x	x	x	5 kg

**Liability** : All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes**: Consult information on Welding Safety Sheet, available upon request.

## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER70S-A1 (ER80S-G\*) EN ISO 636-A : W2Mo  
 TS EN ISO 21952-A : W MoSi  
 EN ISO 21952-A : W MoSi

(\*) Nearest classification

### General Description

It is a low alloyed TIG rod, used for the welding creep resistant 0.5% Mo steels and fine grained steels. It gives a weld metal that is used in operating temperatures between -40°C and 500°C. It is used in the welding of steel construction applications, boiler and pressure vessels, gas pipes and turbin rotors.

**Industry:** Ship building, heavy machinery, petro-chemical, power generation, metal fabrication industry

### Chemical Composition (w%), Wire

C	Si	Mn	Mo	Cr	Cu
0.085 - 0.09	0.60 - 0.70	1.15 - 1.20	0.50	< 0.15	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 530 N/mm<sup>2</sup>  
 Tensile Strength : 640 N/mm<sup>2</sup>  
 Elongation (L=5d) : 27 %  
 Impact (ISO-V) : 150 J (+20°C)  
 : 90 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)

Current Type and Polarity : DC ( - )

### Materials to be Welded

	DIN	EN
<b>Fine Grained Steels</b>	StE 255 - StE 460 ; WStE 255 - WStE 460 -	S255N - S460N ; P255NH - P460NH S275ML ; S355M - S420M
<b>Pipe Materials</b>	StE 320.7 - StE 415.7 StE 360.7 TM - StE 480.7 TM X52, X56, X60, X65 (API 5LX)	L320 - L415NB L360MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	15Mo3, 17Mn4, 19Mn6 22Mo4, 20MnMoNi55	16Mo3, P295GH, P310GH -
<b>Elevated Temperature Steels</b>	St 35.8 - St 45.8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45, GS-52, GS-60 -	GE240, GE260, GE300 G20Mo5
<b>Creep Resistant Steels</b>	17MnMoV6-4, 15NiCuMoNb5 -	- 20MnMoNi4-5

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	x	x	x	-	5 kg



## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER80S-D2      EN ISO 636-B : W4Mo  
 TS EN ISO 21952-A : W MnMo  
 EN ISO 21952-A : W MnMo

### General Description

It is a low alloyed TIG rod, used for the welding low alloyed and high strength steels in operating temperatures up to 550°C. It is used in the welding of creep resistant steels, boiler and pressure vessels, gas pipes. Especially used for low temperature applications that are manufactured from Ni-Cr-Mo steels.

**Industry:** Transportation, bridge, tank and railway fabrication, mining, ship building and petro-chemical industry.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.09	0.70	1.90	< 0.15	< 0.15	0.50	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 570 N/mm<sup>2</sup>  
 Tensile Strength : 690 N/mm<sup>2</sup>  
 Elongation (L=5d) : 25 %  
 Impact (ISO-V) : 120 J (+20°C)  
                       : 80 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
 Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 52.3	S355
<b>Fine Grained Steels</b>	StE 255 - StE 460 ; WStE 255 - WStE 460	S255N - S460N ; P255NH - P460NH
<b>Pipe Materials</b>	StE 320.7 - StE 415.7 StE 360.7 TM - StE 480.7 TM X52, X56, X60, X65 (API 5LX)	L320 - L415NB L360MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	15Mo3, 17Mn4, 19Mn6 22Mo4, 20MnMoNi55 -	16Mo3, P295GH, P310GH - P355GH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Cast Steels</b>	GS-45, GS-52, GS-60 -	GE240, GE260, GE300 G20Mo5
<b>Creep Resistant Steels</b>	17MnMoV6-4, 15NiCuMoNb5 -	- 20MnMoNi4-5

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	x	x	x	-	5 kg



## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER80S-B2  
 TS EN ISO 21952-A : W CrMo1Si\*  
 EN ISO 21952-A : W CrMo1Si\*

(\*) Nearest classification

### General Description

It is a low alloyed TIG rod, used for the welding high temperature strength Cr-Mo (1.25% Cr, 0.5% Mo) steels (boiler and pressure vessels) in operating temperatures up to 550°C. Also It is used in the welding cementation and nitride steels.

**Industry:** Chemical and petro-chemical industry

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.08	0.55	0.60	< 0.20	0.30	0.55	< 0.30

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 510 N/mm<sup>2</sup>  
 Tensile Strength : 620 N/mm<sup>2</sup>  
 Elongation (L=5d) : 24 %  
 Impact (ISO-V) : 120 J (+20°C)  
 : 100 J (-10°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
 Current Type and Polarity : DC ( - )

### Materials to be Welded

	DIN	EN	Wr. Nr.
<b>Creep Resistant Steels</b>	15 CrMo 5	-	1.7205
	25 CrMo 4	-	1.7218
	42 CrMo 4	-	1.7225
	13 CrMo 44	13 CrMo 4-5	1.7335
	22 CrMo 44	-	1.7350
	13 CrMoV 42	-	1.7709
	16 CrMoV 4	-	1.7728
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-22 CrMo 5 4	G22CrMo5-4	1.7354
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357
<b>Cementation Steels</b>	-	16MnCr5	1.7131

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	X	X	X	-	5 kg

## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER90S-B3  
 TS EN ISO 21952-A : W CrMo2Si\*  
 EN ISO 21952-A : W CrMo2Si\*

(\* Classification la plus proche

### General Description

It is a low alloyed TIG rod, used for the welding high temperature strength Cr-Mo (2.25 % Cr, 1.0 % Mo) steels (boiler and pressure vessels) in operating temperatures up to 600°C. It gives a weld metal that is resistant to corrosion and sulphide materials.

**Industry:** Oil industry, thermal plants, chemical and petro-chemical industry

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.08	0.50	0.60	< 0.20	2.40	1.00	< 0.30

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 540 N/mm<sup>2</sup>  
 Tensile Strength : 640 N/mm<sup>2</sup>  
 Elongation (L=5d) : 22 %  
 Impact (ISO-V) : 150 J (+20°C)  
 : 90 J (-10°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
 Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN	Wr. Nr.
<b>Creep Resistant Steels</b>	-	10CrMo9-10	1.7380
	10 CrSiMoV 7	-	1.8075
	10 CrV 63	-	-
	12 CrSiMo 8	-	-
<b>Cast Steels</b>	GS-25 CrMo 4	G25CrMo4	1.7218
	GS-17 CrMo 5 5	G17CrMo5-5	1.7357
	GS-18 CrMo 9 10	G17CrMo9-10	1.7379

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	x	x	x	-	5 kg

## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER80S-B6  
 TS EN ISO 21952-A : W CrMo5Si  
 EN ISO 21952-A : W CrMo5Si

### General Description

It is a low alloyed TIG rod, used for the welding high temperature strength Cr-Mo (5% Cr, 0.5% Mo) steels (boiler and pressure vessels) in operating temperatures up to 600°C. It gives a weld metal that has creep and hydrogen resistance.

**Industry:** Thermal plants, chemical and petro-chemical industry

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	Cu
0.08	0.45	0.60	< 0.20	5.70	0.60	< 0.25

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 560 N/mm<sup>2</sup>  
 Tensile Strength : 660 N/mm<sup>2</sup>  
 Elongation (L=5d) : 22 %  
 Impact (ISO-V) : 180 J (+20°C)  
 : 50 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)  
 Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN	Wr. Nr.
<b>Creep Resistant Steels</b>	12 CrMo 19 5	X12CrMo5	1.7362
<b>Cast Steels</b>	GS-12 CrMo 9 5	GX12CrMo5	1.7363

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	X	X	X	-	5 kg

# AS TIG CrMo91



## TIG Rod for High Strength and Low Alloyed Steels

### Classification

AWS A5.28 : ER90S-B9  
TS EN ISO 21952-A : W CrMo9 1  
EN ISO 21952-A : W CrMo9 1

### General Description

It is a low alloyed TIG rod used for the welding high temperature strength Cr-Mo (9% Cr, 1.0% Mo) steels in operating temperatures up to 650°C. With addition of "V" and "Nb", it gives a weld metal that has corrosion and thermal oxidation resistance. It is also resistant to creep and hydrogen cracking. Especially used for hydrogen fabrication that are manufactured from Cr-Mo-V-Nb steels.

**Industry:** Turbine and vessel fabrication, thermal plants, chemical and petro-chemical industry

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Ni	Cr	Mo	V	Cu	Al	Nb	N
0.09	0.30	0.50	0.50	9.10	0.90	0.20	< 0.25	0.04	0.07	0.05

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 690 N/mm<sup>2</sup>  
Tensile Strength : 780 N/mm<sup>2</sup>  
Elongation (L=5d) : 21 %  
Impact (ISO-V) : 150 J (+20°C)  
                      : 30 J (-20°C)

### Shielding Gases (ISO 14175 / EN 439)

TIG : I1 - Ar (100%)

Current Type and Polarity : DC (-)

### Materials to be Welded

	DIN	EN	Wr. Nr.
Creep Resistant Steels	-	X10CrMoVnB9-1	1.4903
	-	X20CrMoV12-1	1.4922
	X12 CrMo 9 1	-	1.7386

### Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	X	X	X	-	5 kg

**Liability :** All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. **Fumes:** Consult information on Welding Safety Sheet, available upon request.

## TIG Rod for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER316LSi  
ISO 14343-A : W 199 L

### General Description

Solid rod with extra low carbon for welding austenitic CrNi-steels. High resistance to intergranular corrosion and oxidizing environments.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.45	1.70	20	10	0.15	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 380 N/mm<sup>2</sup>  
Tensile Strength : 570 N/mm<sup>2</sup>  
Elongation (L=5d) : 40 %  
Impact ISO-V : 100 J (+20°C)

### Approvals

ABS (ER3308L)  
GOST, SEPRO

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

	EN 10088-1/-2	EN 10213-4	Mat. Nr.
<b>Extra Low Carbon</b> (C < %0.03)	X2 CrNi 19 11		1.4306
	X2 CrNiN 18 10		1.4311
<b>Medium Carbon</b> (C > %0.03)	X4 CrNi 18 10		
		G-X5 CrNi 19 10	1.4301
<b>Ti/Nb Stabilized</b>	X6 CrNiTi 18 10		1.4308
	X6 CrNiNb 18 10		1.4541
			1.4550
		G-X5 CrNiMo 19 11	1.4552

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG Wire	-	-	-	X	X	X	X	5 kg

## TIG Rod for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER309L  
ISO 14343-A : W 23 12 L

### General Description

Solid rod for welding stainless steel to carbon steel.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.45	1.70	24	13	0.15	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 410 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact ISO-V : 100 J (+20°C)

### Approvals

GOST

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

	EN 10088-1/-2	Mat. Nr.
<b>Corrosion resistant cladsteels</b>	X2 CrNi 18 10	1.4311
	X2 CrNiN 19 11	1.4306
	X4 CrNi 18 10	1.4301

Dissimilar metals (mild and low alloyed steel to stainless steel)  
Build-up welding on mild and low alloyed steel

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
TIG Rod	-	-	-	X	X	X	X	5 kg

# AS TIG 316L



## TIG Rod for Welding of Austenitic Stainless Steels

### Classification

AWS A5.9 : ER316LSi  
ISO 14343-A : W 19 12 3 L

### General Description

Solid rod with extra low carbon for welding austenitic CrNiMo-steels. High resistance to intergranular corrosion and general corrosion conditions.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Ni	Mo	P + S
<0.03	0.45	1.70	18	12	2.50	<0.035

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 400 N/mm<sup>2</sup>  
Tensile Strength : 620 N/mm<sup>2</sup>  
Elongation (L=5d) : 35 %  
Impact ISO-V : 100 J (+20°C)

### Approvals

ABS (ER316L)  
GOST, SEPRO

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

	EN 10088-1/-2	EN 10213-4	Mat. Nr.
<b>Extra Low Carbon</b> (C < %0.03)	X2 CrNiMo 17 12 2		1.4404
	X2 CrNiMo 18 14 3		1.4435
	X2 CrNiMoN 17 11 2		1.4406
	X2 CrNiMoN 17 13 3		1.4429
<b>Medium Carbon</b> (C > %0.03)	X4 CrNiMo 17 12 2		1.4401
	X4 CrNiMo 17 13 3		1.4436
		G-X5 CrNiMo 19 11	1.4408
<b>Ti/Nb Stabilized</b>	X6 CrNiMoTi 17 12 2		1.4571
	X6 CrNiMoNb 17 12 2		1.4580
	X6 CrNiNb 18 10		1.4550
		G-X5 CrNiNb 19 10	1.4552

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Tube Weight
MIG Wire	-	-	-	X	X	X	X	5 kg



## TIG Rod for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER4043  
ISO 18273 : S Al 4043A / AISi5(AI)

### General Description

Solid wire and rod for welding of aluminium-silicium alloys.

### Chemical Composition (w%), Typical, Wire

Si	Mn	Fe	Cu	Zn	Ti	Al
4.5-5.5	<0.05	<0.50	<0.30	<0.10	<0.01	Ballance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 100 N/mm <sup>2</sup>	Melting Range	: 575 - 625° C
Tensile Strength	: 160 N/mm <sup>2</sup>	Density	: 2.68 gr/cm <sup>3</sup>
Elongation (L=5d)	: 15 %		
Impact ISO-V	: 20 J (+20°C)		

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

	DIN 1725-1	DIN 1725-2	Mat. Nr.	Alloy Nr.
<b>Aluminium Wrought Alloys</b>	AlMgSi 0.5		3.3206	6060
	AlMgSi 0.7		3.3210	6005A
	AlMgSi 0.8		3.2316	6181
<b>Aluminium Cast Alloys</b>		G-AISi 5		443.0

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool/Tube Weight
TIG Rod	-	-	-	-	X	X	-	X	5 kg

## TIG Rod for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER4047  
ISO 18273 : S Al 4047A / AISi12(Al)

### General Description

Solid wire and rod for welding of cast aluminium alloys containing up to 12% silicium.

### Chemical Composition (w%), Typical, Wire

Si	Mn	Fe	Ti	Cu	Zn	Al
11.5-12.5	<0.15	<0.50	<0.01	<0.30	<0.20	Balance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 80 N/mm <sup>2</sup>	Melting Range	: 575 - 585° C
Tensile Strength	: 180 N/mm <sup>2</sup>	Density	: 2.65 gr/cm <sup>3</sup>
Elongation (L=5d)	: 5 %		

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

	DIN 1725-1	DIN 1725-2	Mat. Nr.	Alloy Nr.
<b>Aluminium Cast Alloys</b>		G-AISI 12	3.3581	A413.0
		G-AISI 12 (Cu)	3.3583	
		G-AISI 10 Mg	3.2381	361.0
		G-AISI 10 Mg (Cu)	3.2383	
		G-AISI 9 Mg	3.2373	359.0
		G-AISI 9 Cu 3	3.2161	
		G-AISI 7 Mg	3.2171	356.0
		G-AISI 6 Cu 4	3.2151	319.0

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool / Tube Weight
TIG Rod	-	-	-	-	X	-	X	-	5 kg

## TIG Rod for Welding of Aluminium Alloys

### Classification

AWS A5.1 : ER5356  
ISO 18273 : S Al 5356 / AlMg5

### General Description

Solid wire and rod for welding of aluminium alloys containing more than 3% magnesium.

### Chemical Composition (w%), Typical, Wire

Si	Mg	Mn	Fe	Cr	Cu	Zn	Ti	Al
0.15	4.5-5.5	<0.20	<0.40	<0.15	<0.10	kalan	<0.06	Ballance

### Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 130 N/mm <sup>2</sup>	Melting Range	: 565 - 635° C
Tensile Strength	: 280 N/mm <sup>2</sup>	Density	: 2.65 gr/cm <sup>3</sup>
Elongation (L=5d)	: 25 %		

### Shielding Gases (acc. ISO 14175 and EN 439)

TIG : I1 - Ar (100%)

### Materials to be Welded

#### Aluminium Wrought Alloys

DIN 1725-1	Mat. Nr.	Alloy Nr.
AlMg 3	3.3535	5754
AlMg 4.5	3.3345	5082
AlMg 5	3.3555	5056A
AlMg 2 Mn 0.8	3.3527	5049
AlMg 2.7 Mn	3.3537	5454
AlMg 4 Mn	3.3545	5086
AlZn 4.5 Mg 1	3.4335	7020

#### Aluminium Cast Alloys

DIN 1725-2	Mat. Nr.	Alloy Nr.
G-AlMg 3	3.3541	
G-AlMg 3 Si	3.3241	512.0
G-AlMg 5	3.3561	B535.0
G-AlMg 5 Si	3.3261	

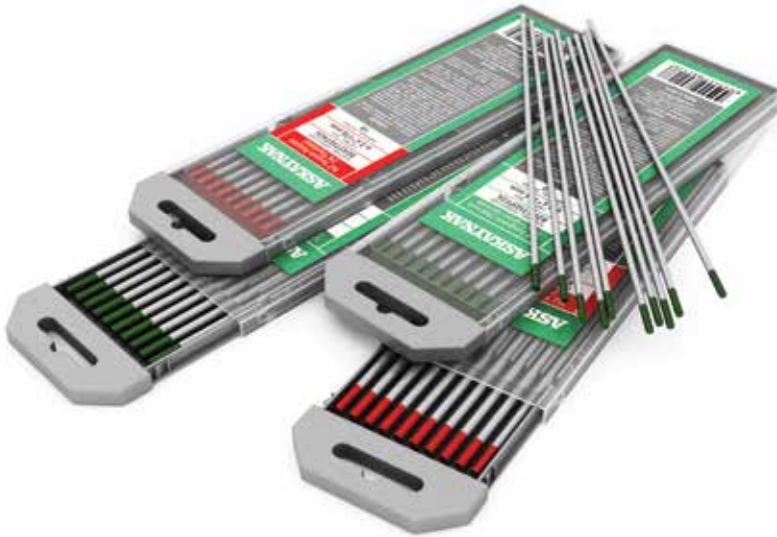
### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool / Tube Weight
TIG Rod	-	-	-	-	X	X	-	-	5 kg

# Tungsten TIG Electrodes



## Pure Tungsten and 2% Thoriated Tungsten TIG Electrodes



### Pure Tungsten (Color Code: GREEN) : AWS A5.12 : EWP

Pure tungsten electrodes have an AWS (American Welding Society) classification of EWP and typically are less expensive than their "alloyed" counterparts. They contain 99.50% tungsten and have the highest consumption rate of all electrodes, and provide a clean, balled tip when heated. This shape offers especially good arc stability for AC welding with a balanced waveform. Pure tungsten electrodes also provide good arc stability for AC sine wave welding on aluminum and magnesium. They are not, however, used for DC welding.

### 2% Thoriated Tungsten (Color Code: RED) : AWS A5.12 : EWTh-2

Preferred for their longevity and ease of use, 2% thoriated tungsten electrodes are the most commonly used electrodes today. They contain a minimum of 97.30% tungsten and 1.70% to 2.20% thorium, and they have an AWS classification of EWTh-2.

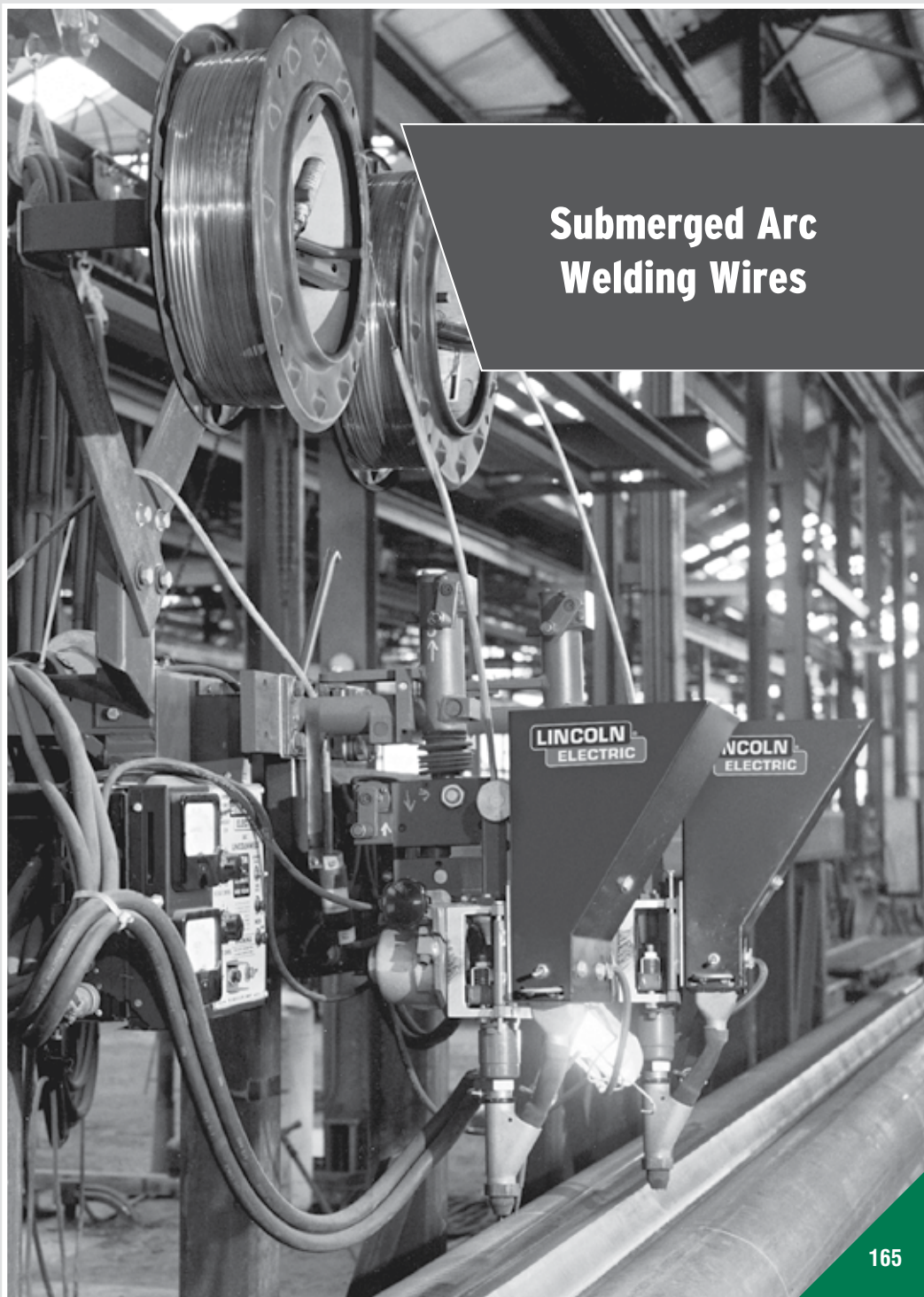
These electrodes offer good arc starts and provide a higher current-carrying capacity than many other types. 2% thoriated tungsten also operates far below its melting temperature, which results in a considerably lower rate of consumption, minimizes arc wandering and lessens instances of weld contamination. These electrodes can be used for AC welding, and they are exceptional for DC electrode negative (straight polarity) on carbon and stainless steel, nickel and titanium applications.

During manufacturing, thorium is evenly dispersed throughout the electrode. This evenness allows the electrode to maintain a sharpened edge the ideal electrode shape for welding thin steel. Sharpening the electrode's point, however, should be done with great care. Thoriated tungsten contains low levels of radioactivity. Therefore, operators must always follow manufacture's warnings, instructions, and the MSDS (Material Safety Data Sheet) for its use.

Diameter [ mm ]	Length [ mm ]	Packaging [ pcs/box ]
1.6	175	10
2.0	175	10
2.4	175	10
3.2	175	10



## Submerged Arc Welding Wires





## Submerged Arc Welding Wire for Mild Steels

### Classification

EN ISO 14171 : S1 (S 38 2 AB S1 avec L-860)  
AWS A5.17 : EL12

### General Description

AS S1 (25 kg spool) and ASFIL S1 (320-350 kg drum) are copper coated submerged arc welding wires designed particularly for the welding of mild steels.

### Approvals (with flux LW-860)

CE, GOST, SEPRO, TSE, TÜV

**ABS** (3M) **BV** (A3M) **DNV** (III M)  
**GL** (3M) **LRS** (3M) **TL** (3M)

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	S	Cu
0.10	0.07	0.50	0.025	< 0.30
0.05 *	0.25 *	1.00 *	0.020 *	< 0.25 *

\*) Typical weld metal composition with flux LincolnWeld 860

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 370-400 N/mm <sup>2</sup>	with flux LincolnWeld 860 : Yield Strength : 400 N/mm <sup>2</sup>
Tensile Strength : 440-490 N/mm <sup>2</sup>	Tensile Strength : 490 N/mm <sup>2</sup>
	Elongation (L=5d) : 34 %
	Impact (ISO-V) : 50 J (-20°C)

Note : Tensile and Yield Strength values are given in a wide range, as the submerged arc welding flux compositions might vary considerably.

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3	S185, S235, S275, S355
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	S255N - S355N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM-StE 360-7 TM X42, X46, X52 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11	P295GH, P355GH P235GH, P265GH
<b>Elevated Temp. Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D	-
<b>Cast Steels</b>	GS-38, GS-45	GE200, GE240

### Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	x	x	x	x	25 kg	350 / 500 kg

## Submerged Arc Welding Wire for Mild Steels

## Classification

EN ISO 14171 : S2 (S 35 2 AB S2 avec L-860)  
AWS A5.17 : EM12

## General Description

AS S2 (25 kg spool) and ASFIL S2 (320-350 kg drum) are copper coated submerged arc welding wires designed particularly for the welding of middle and high strength steels.

## Composition chimique (% en poids), typique, fil

C	Si	Mn	S	Cu
0.10	0.07	0.90	0.025	< 0.30
0.05 *	0.25 *	1.20 *	0.020 *	< 0.15 *

(\*) Typical weld metal composition with flux LW 860

## Approvals (with flux LW-860)

CE, GOST, NAKS, SEPRO, TSE, TÜV

**ABS** (3M,3YM) **BV** (A3YM) **DNV** (III YM)

**GL** (3YM) **LRS** (3M,3YM) **TL** (3YM)

**RINA** (3Y42)

**with flux LW 761**

**TL** (3YM)

**with flux LW 780 :**

**ABS** (3M,3YM) **GL** (3YM)

## Mechanical Properties, Typical, All Weld Metal

Yield Strength	: 370-440 N/mm <sup>2</sup>	with flux LincolnWeld 860	Yield Strength	: 430 N/mm <sup>2</sup>
Tensile Strength	: 450-530 N/mm <sup>2</sup>		Tensile Strength	: 490 N/mm <sup>2</sup>
Elongation (L=5d)	: 25-30 %		Elongation (L=5d)	: 25 %
			Impact (ISO-V)	: 50 J (-20°C)

Note : Tensile and Yield Strength values are given in a wide range, as the submerged arc welding flux compositions might vary considerably.

## Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3	S185, S235, S275, S355 S255N - S355N
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	P255NH - P355NH P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 HI, HII	P295GH, P355GH P235GH, P265GH
<b>Elevated Temp. Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D	-
<b>Cast Steels</b>	GS-38, GS-45	GE200, GE240

## Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	x	x	x	x	25 kg	350 / 500 kg



## Submerged Arc Welding Wire for Mild Steels

### Classification

EN ISO 14171 : S2 (S 35 2 AB S2 avec L-860)  
AWS A5.17 : EM12K

### General Description

AS EM12K is copper coated submerged arc welding wire designed particularly for welding of mild steels. It contains higher Si than AS S2 submerged arc welding wire.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	S	Cu
0.10	0.13	1.90	0.025	< 0.30
0.05 *	0.30 *	1.20 *	0.020 *	< 0.15 *

\*) Typical weld metal composition with flux LincolnWeld 860

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 370-450 N/mm <sup>2</sup>	with flux LincolnWeld 860 : Yield Strength : 440 N/mm <sup>2</sup>
Tensile Strength : 450-540 N/mm <sup>2</sup>	Tensile Strength : 510 N/mm <sup>2</sup>
Elongation (L=5d) : 25-30 %	Elongation (L=5d) : 25 %
	Impact (ISO-V) : 50 J (-20°C)

Note : Tensile and Yield Strength values are given in a wide range, as the submerged arc welding flux compositions might vary considerably.

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3	S185, S235, S275, S355
<b>Fine Grained Steels</b>	StE 255 - StE 355 WStE 255 - WStE 355	S255N - S355N P255NH - P355NH
<b>Pipe Materials</b>	StE 210-7 - StE 360-7 StE 290-7 TM - StE 360-7 TM X42, X46, X52 (API 5LX)	L210 - L360NB L290MB - L360MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 H1, H11	P295GH, P355GH P235GH, P265GH
<b>Elevated Temp. Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D AH32 - EH36	- -
<b>Cast Steels</b>	GS-38, GS-45	GE200, GE240

### Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	x	x	x	x	25 kg	350 / 500 kg





## Submerged Arc Welding Wire for Mild Steels

### Classification

EN ISO 14171 : S2 Si (S 46 2 MS S2 Si avec L-761)  
AWS A5.17 : EM12K

### General Description

AS S2 Si is copper coated submerged arc welding wire designed particularly for the welding of middle and high strength steels.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	S
0.07	0.15	1.00	0.025
0.07 *	0.65 *	1.70 *	0.025 *

### Approvals (with flux LW-761)

GOST, NAKS, SEPRO

(\*) Typical weld metal composition with flux LincolnWeld 761

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 370-440 N/mm <sup>2</sup>	with flux LincolnWeld 761: Yield Strength : 430 N/mm <sup>2</sup>
Tensile Strength : 450-530 N/mm <sup>2</sup>	Tensile Strength : 560 N/mm <sup>2</sup>
Impact (ISO-V) : 47 J (-20°C)	Impact (ISO-V) : 47 J (-20°C)

Note : Tensile and Yield Strength values are given in a wide range, as the submerged arc welding flux compositions might vary considerably.

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3, St 50.2, St 60.2, St 70.2	S185, S235, S275, S355 E295, E335, E360
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 460	S255N - S460N P255NH - P460NH
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 6 HI, HII, HIII St 37.2, St 44	P295GH, P310GH P235GH, P265GH, P285NH P235S, P265S
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D AH32 - EH36	- -

### Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	x	x	x	x	25 kg	350 / 500 kg



## Submerged Arc Welding Wire for Low Alloyed Steels

### Classification

EN ISO 14171 : S2 Mo (S 46 4 AB S2Mo avec L-223)  
 AWS A5.23 : EA2

### General Description

AS S2 Mo is copper coated submerged arc welding wire designed particularly for the welding of high impact resistant steels.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Mo
0.10	0.10	1.00	0.50
0.06 *	0.25 *	1.30 *	0.50 *

(\* ) Typical weld metal composition with flux LW 223

### Approvals (with flux LW-223)

GOST, SEPRO, TSE, TÜV

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 460-600 N/mm <sup>2</sup>	with flux LincolnWeld 223 : Yield Strength : 470 N/mm <sup>2</sup>
Tensile Strength : 550-670 N/mm <sup>2</sup>	Tensile Strength : 550 N/mm <sup>2</sup>
Impact (ISO-V) : 50 J (-20°C)	Elongation (L=5d) : 29 %
	Impact (ISO-V) : 55 J (-20°C)

Note : Tensile and Yield Strength values are given in a wide range, as the submerged arc welding flux compositions might vary considerably.

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3	S185, S235, S275, S355
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 460	S255N - S460N P255NH - P460NH
<b>Pipe Materials</b>	StE 320-7 - StE415-7 StE 290-7 TM - StE 480-7 TM X42, X46, X52, X56, X60, X65, X70, X80 (API 5LX)	L320 - L415NB L290MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 5, 15 Mo 3 HI, HII, HIII	P295GH, P310GH, 16 Mo 3 P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH

### Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	-	-	x	x	25 kg	350 / 500 kg

## Submerged Arc Welding Wire for Low Alloyed Steels

### Classification

EN ISO 14171 : S3Mo (S 46 5 FB S3Mo avec poudre LW-888)  
AWS A5.23 : EA4

### General Description

AS S3Mo is copper coated and Mo-alloyed submerged arc welding wire designed particularly for welding of high impact resistant steels. It is used for the welding creep resistant and fine grained steels in operating temperatures up to 550°C.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	Mo
0.08	0.15	1.40	0.50
0.06 *	0.30 *	1.40 *	0.40 *

(\* ) Typical weld metal composition with flux LW 888

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 490 N/mm<sup>2</sup>  
Tensile Strength : 590 N/mm<sup>2</sup>  
Elongation (L=5d) : 29 %  
Impact (ISO-V) : 60 J (-40°C)

### Materials to be Welded

	DIN	EN
<b>General Structural Steels</b>	St 33, St 34, St 37, St 44, St 44-2, St 44-3, St 52, St 52-3	S185, S235, S275, S355
<b>Fine Grained Steels</b>	StE 255 - StE 460 WStE 255 - WStE 460	S255N - S460N P255NH - P460NH
<b>Pipe Materials</b>	StE 320-7 - StE415-7 StE 290-7 TM - StE 480-7 TM X42, X46, X52, X56, X60, X65, X70, X80 (API 5LX)	L320 - L415NB L290MB - L485MB -
<b>Boiler and Pressure Vessel Steels</b>	17 Mn 4, 19 Mn 5, 15 Mo 3 H1, H11, H111	P295GH, P310GH, 16 Mo 3 P235GH, P265GH, P285NH
<b>Elevated Temperature Steels</b>	St 35-8, St 45-8	P235G1TH - P255G1TH
<b>Ship Plates</b>	A, B, C, D, E	-

### Packing and Diameter Informations

Diameter	2.0	2.4	3.2	4.0	Spool Weight	Drum Weight
Submerged Arc Welding Wire	-	-	x	x	25 kg	350 / 500 kg

# AS FX-B110



## Welding Flux for Un-alloyed and Low-Alloyed Steels

### Classification

**Flux / Wire Combination** **AWS A5.17**  
AS FX-B110 / AS S2Si (AWS A5.17: EM12K, EN 756 : S2Si) F7A4 -EM12K

### General Description

Aluminate-basic type agglomerated submerged arc welding flux. Used for welding of X52, X60 and X65 grade steel pipes and offshore, wind tower applications. It gives an excellent welding performance and bead appearance. The weld metal has good mechanical properties. Also ideal for welding of structural steels performed in horizontal and flat positions. It is easy to remove the slag and should be re-dried at 300-350°C for 2 hours before use.

### Chemical Composition (w%) - Typical, All Weld Metal

Wire Grade	C	Mn	Si	P	S
AS S2Si	0.04	0.92	0.35	0.028	0.018

### Mechanical Properties – Typical, All Weld Metal

Wire Grade	Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Impact (ISO-V) -40 °C	
AS S2Si	After welding	430	550	29	55

### Materials to be Welded

	Standard	Material Type
<b>Ship Plates</b>		A-E AH(32), DH(36), EH(36)
<b>General Structural Steels</b>	EN 10025 EN 10149	S275 - S420,N,M S315-S420,MC S315-S420,NC
<b>Pipe Materials</b>	API 5LX	X52, X60, X65
<b>Boiler and Pressure Vessel Steels</b>	EN 10028	JR (G1 & G2), JO, J2 (G3 & G4) P235 - P420, GH N, NH, M, Q & QH P235 - P460, GH N, NH, M, Q & QH P500, GH, N, NH, M, Q & QH P235 S, P265 S A37 - A52, CP, AP

### Flux Characteristics

Current Type : DC (+) / AC Re-drying Temperature : 300 - 350 °C  
Basicity (Boniszewski) : 1.67  
Density : 1.25 g/cm<sup>3</sup>  
Particulate Size : 10 - 60 Mesh

### Packaging Detail

Packaging Type	Net weight (kg)
Bag	25

## Welding Flux for Un-alloyed and Low-Alloyed Steels

### Classification

<b>Flux / Wire Combination</b> AS FX-N330 / AS S2Si (AWS A5.17: EM12K, EN 756: S2Si)	<b>AWS A5.17</b> F7A2-EM12K
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### General Description

Aluminate-basic and neutral type agglomerated submerged arc welding flux. Used for welding of X42 and X46 grade pipe steels, pressure vessels and LPG cylinders. Suitable for various welding applications. Also ideal for welding of general structural steels performed in horizontal and flat positions. The fast-freezing slag characteristic minimizes slag flow, which is particularly well suited for small diameter, circumferential joint welding. It gives an excellent welding performance and bead appearance. It is easy to remove the slag and should be re-dried at 300-350°C for 2 hours before use.

### Chemical Composition (w%) - Typical, All Weld Metal

Wire Grade	C	Mn	Si	P	S
AS S2Si	0.04	1.07	0.38	0.012	0.010

### Mechanical Properties – Typical, All Weld Metal

Wire Grade		Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Impact (ISO-V) -30 °C
AS S2Si	After welding	425	535	33	60

### Materials to be Welded

	Standard	Material Type
<b>Ship Plates</b>		A-E
<b>General Structural Steels</b>	EN 10125	S185, S235, S275, S355
<b>Cast Steels</b>	EN 10213-2	GP240R
<b>Pipe Materials</b>	EN 10208-2 API 5LX	L210, L240, L290, L360 X42, X46
<b>Boiler and Pressure Vessel Steels</b>	EN 10216-1/ 10217-1	P235, P275, P355
<b>Fine Grained Steels</b>	EN 10218-1 EN 10025	P235GH, P265GH, P295GH, P355GH S275, S355

### Flux Characteristics

Current Type	: DC (+) / AC	Re-drying Temperature	: 300 - 350 °C
Basicity (Boniszewski)	: 1.2		
Density	: 1.23 g/cm <sup>3</sup>		
Particulate Size	: 10 - 60 Mesh		

### Packaging Detail

Packaging Type	Net weight (kg)
Bag	25

# AS FX-N331



## Welding Flux for Un-alloyed and Low-Alloyed Steels

### Classification

**Flux/ Wire Combination**

AS FX-N331 / AS S2 (AWS A5.17: EM12K, EN 14171 : S2Si)

**AWS A5.17**

F7A0 -EM12K

### General Description

Silicon-calcium and neutral type agglomerated submerged arc welding flux. Used for welding of X42 and X46 grade pipes, boilers, off-shore and wind tower applications. It gives an excellent welding performance and bead appearance for high current welding applications. The weld metal has good mechanical properties with large heat input. Also ideal for welding of general and heavy structural steels performed with narrow weld groove in horizontal and flat positions . It is easy to remove the slag and should be re-dried at 300-350°C for 2 hours before use.

### Chemical Composition (w%) - Typical, All Weld Metal

Wire Grade	C	Mn	Si	S
AS S2Si	0.07	1.00	0.60	<0.025

### Mechanical Properties – Typical, All Weld Metal

Wire Grade		Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Impact (Joule) 0 °C
AS S2Si	After welding	423	515	27	110

### Materials to be Welded

	Standard	Material Type
<b>Ship Plates</b>		A-E
<b>General Structural Steels</b>	EN 10125	S185, S235, S275, S355
<b>Cast Steels</b>	EN 10213-2	GP240R
<b>Pipe Materials</b>	EN 10208-2 API 5LX	L210, L240, L290, L360 X42, X46
<b>Boiler and Pressure Vessel Steels</b>	EN 10216-1/ 10217-1	P235, P275, P355
<b>Fine Grained Steels</b>	EN 10218-1 EN 10025	P235GH, P265GH, P295GH, P355GH S275, S355

### Flux Characteristics

Current Type	: DC (+) / AC	Re-drying Temperature : 300 - 350 °C
Basicity (Boniszewski)	: 1.0	
Density	: 1.25 g/cm <sup>3</sup>	
Particulate Size	: 10 - 40 Mesh	

### Packaging Detail

Packaging Type	Net weight (kg)
Bag	25



## Flux Cored Welding Wires



Liability : All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance. Fumes: Consult information on Welding Safety Sheet, available upon request.

# AS FC-71 Super



## Flux Cored Welding Wire for Welding of Un-Alloy Steels

### Classification

AWS A5.20 : E71T-1H8  
EN ISO 17632-A : T42 2 PC 2 H10

### General Description

All position gas shielded flux cored wire for high quality welding. Excellent operator appeal due to superior welding characteristics. Specially developed for welding with 100% CO<sub>2</sub>. Also suitable for welding on coated plate with use of 100% CO<sub>2</sub>. Smooth arc with low spatter. Good mechanical properties. Excellent wire feeding.

### Chemical Composition (w%), Typical, Wire

C	Si	Mn	P	S
0.05	0.50	<1.50	<0.015	<0.015

### Mechanical Properties, Typical, All Weld Metal

Yield Strength : 525 N/mm<sup>2</sup>  
Tensile Strength : 597 N/mm<sup>2</sup>  
Elongation (L=5d) : 28 %  
Impact ISO-V : 106 J (-20°C)

### Approvals

ABS	RINA	SEPRO
E71T-1H8	3Y S H10	+

### Shielding Gases (acc. ISO 14175 and EN 439)

Shielding Gases (acc. ISO 14175 and EN 439)	Amount	Current Type
MAG : C1 - CO <sub>2</sub> (100%)	15 - 25 l/min	DC(+)

### Packaging and Available Sizes

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	4.0	Spool / Weight
Flux Cored Wire	-	-	X	-	-	-	-	-	15 kg

### Materials to be Welded

**General Structural Steel** : S185, S235, S275  
**Ship Plates** : Grade A, B, D, AH32 - EH36  
**Cast Steel** : GP240R  
**Pipe Material** : X42, X46, X52  
**Boiler & Pressure Vessel Steel** : P235GH, P265GH, P295GH, P355GH, P275N/NH, P355N/NH  
**Fine Grained Steel** : S275, S355, S420, S275M, S275ML, S355M, S355ML, S420M, S420ML