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WELDING

MIG WIRES

manufactured and distributed by

FSH WELDING GROUP

1) UN-ALLOYED STEEL			
MIG F55	MIG GALVARC	AWS A5.18	ER70S-2
MIG F57	MIG SG2	AWS A5.18	ER70S-6
2) LOW ALLOYED STEEL			
MIG F60	MIG 80SD2	AWS A5.28	ER80S-D2
MIG F63	MIG 80SB2	AWS A5.28	ER80S-B2
MIG F68	MIG 90SB3	AWS A5.28	ER90S-B3
MIG F69	MIG CrMo5	ISO 21952-A	G CrMo5Si
MIG F691	MIG 90SB9	AWS A5.28	ER90S-B9
MIG F75	MIG CORTEN	AWS A5.28	ER80S-G
MIG F77	MIG 100S1	AWS A5.28	ER100S-1
MIG F82	MIG 80SNi2	AWS A5.28	ER80S-Ni2
MIG A60	MIG A 60	Aerospace	A60
MIG BMS	MIG BMS	Aerospace	8CD12
MIG SCVS	MIG SCVS	Aerospace	15CDV6
MIG F66S	MIG F66S	Aerospace	25CD4
3) STAINLESS STEEL			
MIG 18/8MN	MIG 307Si	AWS A5.9	~ER307
MIG 20/10S	MIG 308LSi	AWS A5.9	ER308LSi
MIG 20/10C	MIG 308H	AWS A5.9	ER308H
MIG 20/10T	MIG 321	AWS A5.9	~ER321
MIG 20/10NBS	MIG 347Si	AWS A5.9	ER347Si
MIG 20/10MS	MIG 316LSi	AWS A5.9	ER316LSi
MIG 20/10MN	MIG 316MnN	AWS A5.9	ER316LMn
MIG 20/10MNB	MIG 347	AWS A5.9	ER347
MIG 20/10MNBS	MIG 318Si	AWS A5.9	~ER318
MIG 24/12S	MIG 309LSi	AWS A5.9	ER309LSi
MIG 24/12M	MIG 309LMo	AWS A5.9	ER309LMo
MIG 25/20	MIG 310	AWS A5.9	ER310
MIG 29/9	MIG 312	AWS A5.9	ER312
MIG 18/15	MIG 317L	AWS A5.9	ER317L

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MIG 20/25CU	MIG 385	AWS A5.9	ER385
MIG 27/31CU	MIG 383	AWS A5.9	ER383
MIG M13/0	MIG 410	AWS A5.9	ER410
MIG M13/4	MIG 410NiMo	AWS A5.9	ER410NiMo
MIG F17/0	MIG 430	AWS A5.9	ER430
MIG D22/09	MIG 2209	AWS A5.9	ER2209
MIG D25/09	MIG 2509	AWS A5.9	ER2594
MIG 21/10MA	MIG 253MA	ISO14343-A	G Z 21 10 N H
MIG 16/8M	MIG 16-8-2	AWS A5.9	ER16-8-2
MIG 17/4CU	MIG 17-4 Cu	AWS A5.9	ER630
MIG 17/4MO	MIG 17-4 Mo	ISO 14343-A	G Z 17 4 Mo
MIG 11/3M	MIG Z12CNDV12	ISO 14343-A	G Z 12 3 MoV
MIG 22/21CO	MIG N155	ISO 14343-A	G Z 22 21 3 CoWNbN

4) NICKEL ALLOYS

MIG NI59	MIG Ni059	AWS A5.14	~ERNiCrMo-13
MIG NI60	MIG Ni60	AWS A5.14	ERNiCu-7
MIG NI61	MIG NiTi4	AWS A5.14	ERNi-1
MIG NI65	MIG Ni65	AWS A5.14	ERNiFeCr-1
MIG NI82	MIG Ni82	AWS A5.14	ERNiCr-3
MIG NI90	MIG Ni90	EN ISO 18274	S-Ni 7090 (NiCr20Co18Ti3)
MIG NI263	MIG Ni263	EN ISO 18274	S-Ni 7263 (NiCr20Co20Mo6Ti2)
MIG NI276	MIG Ni276	AWS A5.14	ERNiCrMo-4
MIG NI601	MIG Ni601	AWS A5.14	ERNiCrFe-11
MIG NI625	MIG Ni625	AWS A5.14	ERNiCrMo-3
MIG NI718	MIG Ni718	AWS A5.14	ERNiFeCr-2
MIG NICR80	MIG NiCr80.20	EN ISO 18274	S-Ni 6076 (NiCr20)
MIG NIW	MIG NiW	AWS A5.14	ERNiMo-3
MIG NIX	MIG NiX	AWS A5.14	ERNiCrMo-2
MIG FENI50	MIG FeNi50	Without	

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5) ALUMINIUM ALLOYS

MIG AL99.7	MIG Al99.5	AWS A5.10	~ER1100
MIG ALG3	MIG AlMg3	AWS A5.10	~ER5654
MIG ALG5	MIG AlMg5	AWS A5.10	ER5356
MIG ALG4M	MIG AlMg4.5Mn	AWS A5.10	ER5183
MIG ALG5M	MIG AlMg5Mn	AWS A5.10	ER5556
MIG ALG4Z2	MIG AlMg4Z2	EN ISO 18273	Al Z (AlMg4Zn2)
MIG ALC6	MIG AlCu6	AWS A5.10	ER2319
MIG ALS5	MIG AlSi5	AWS A5.10	ER4043
MIG ALS7	MIG AlSi7	AWS A5.10	ER357
MIG ALS12	MIG AlSi12	AWS A5.10	ER4047

6) COPPER ALLOYS

MIG CUS	MIG Cu110	AWS A5.7	ERCu
MIG CUS6	MIG Cu114	AWS A5.7	ERCuSn-A
MIG CUS8	MIG CuSn8	ISO 24373	S Cu 5210 (CuSn9P)
MIG CUS13	MIG CuSn13	ISO 24373	S Cu 5410 (CuSn12P)
MIG CUSIL	MIG CuSi3	AWS A5.7	ERCuSi-A
MIG CUAG	MIG CuAg	ISO 24373	S Cu 1897 (CuAg1)
MIG CUA8	MIG CuAl8	AWS A5.7	ERCuAl-A1
MIG CUA8NI	MIG CuAl9Mn	ISO 24373	S Cu 6327 (CuAl8Ni2Fe2Mn2)
MIG CUA9	MIG CuAl9	AWS A5.7	ERCuAl-A2
MIG CUA9NI	MIG CuAl9Ni	AWS A5.7	ERCuNiAl
MIG CUMN13	MIG Cu118	AWS A5.7	ERCuMnNiAl
MIG CUNI10	MIG CuNi90.10	ISO 24373	S Cu 7061 (CuNi10)
MIG CUNI30	MIG CuNi30	AWS A5.7	ERCuNi

7) TITANIUM ALLOYS

MIG T40	MIG T40	AWS A5.16	ERTi-2
	MIG T60	AWS A5.16	ERTi-4
MIG TPD0.2	MIG TPd0,2	AWS A5.16	ERTi-7
MIG TA6V4	MIG TA6V4	AWS A5.16	ERTi-5

8) COBALT ALLOYS

MIG CO25	MIG Co25	EN 14700	S Co1
MIG FICO188	MIG Co188	AMS	5801

9) HARDFACING – MAINTENANCE AND REPAIR

MIG 819 BS	MIG 819 BS	EN 14700	S Fe3
MIG BMS	MIG B.M.S.**	ISO 21952-A	G CrMo2Si
MIG MV5S	MIG MV5S**	EN 14700	S Fe4
MIG MARVAL 18S	MIG MARVAL 18S	EN 14700	S Fe5
MIG MARVAL X12S	MIG MARVAL X12S	EN 14700	S Z Fe7
MIG MVS	MIG M.V.S.	EN 14700	S Fe4
MIG SMV3S	MIG S.M.V3S**	EN 14700	S Fe3
MIG HB25	MIG R250B	EN 14700	S Fe1
MIG HB35	MIG R350B	EN 14700	S Fe2
MIG HB50	MIG R500B	EN 14700	S Fe2
MIG HB60	MIG R600B	EN 14700	S Fe8
MIG HBF17	MIG HBCrMo17-1	EN 14700	S Fe8
MIG HBC62	MIG HBC62	EN 14700	S Fe4
	**Exists in uncoated and copper-coated version		

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F55

Old reference: MIG GALVARC

Classification

AWS A5.18 : ER70S-2

ISO 14341-A : G2Ti

Description & Applications

Copper coated solid wire for GMAW to weld low alloyed standard construction / boiler steels.

Main applications: Especially for galvanized and Zinc coated steels used for general metal constructions, in the automobile industry, blacksmithing etc.

Typical Chemical Composition (%)

C	Si	Mn	Al	Ti	Cu	Zr	S	P	Fe
0.06	0.6	1.2	0.1	0.1	0.2	0.08	0.01	0.015	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
460	560	28	-20°C	120

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.6	40 – 90	18-21	ISO 14175: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	0.8	60 – 100	18-21	
	1.0	75 – 140	18-21	
	1.2	150 – 220	26-28	
	1.6	180 - 250	26-32	

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F57
Old reference: MIG 80SD2

Classification

AWS A5.18 : ER70S-6

ISO 14341-A : G3Si1

Description & Applications

Copper coated solid wire for GMAW to weld unalloyed steels and low alloyed steels.

Main applications: For general metal constructions, in the automobile industry, blacksmithing, ship building etc.

Base material:

Construction steels for general use , Tube steels, Ship steels

EN- Designation	S185 – S355 P235 – P355	L210 – L360
Ship steels	Quality A and B	
ASTM	A285 grade C A442 grade 55, 60	A414 grade C, D, E, F A515 grade 55, 60, 65

Typical Chemical Composition (%)

C	Si	Mn	P	S	Fe
0.08	0.90	1.70	<0.02	<0.015	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
470	550	25	+20°C	150
			-30°C	80

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Current (A)	(V)	
MIG = +	0.6	40 – 90	18-21	ISO 14175: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	0.8	60 – 100	18-21	
	1.0	75 – 140	18-21	
	1.2	150 – 220	26-28	
	1.6	180 - 250	26-32	

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F60

Old reference: MIG 80SD2

Classification

AWS A5.28 : ER80S-D2

ISO 14341-A : G4Mo

Description & Applications

Copper coated solid wire for GMAW -alloyed with Mo- for welding creep resisting steels used at temperatures up to 500°C. Good resistance to Hydrogen attacks (chemical installations). Used for piping systems, boilers...

Base materials:

Steels and pipes for boiler and pressure vessels:

NF A 36-206	: 15D3 - 18MD4 -05
DIN 17155-17245	: HI - HIII - GS C 25 17 Mn4
DIN 17175-17102	: 19Mn5 - 15Mo3 - GS22Mo4 St35,8 - St 45,8 - 17Mn4 - 19Mn5 - 15Mo3 - StE255 - StE420
BS	: BS 1504 Gr 245 BS 3100 Gr B1 BS 3606 Gr 243,245
ASTM	: A335 Gr P1 - A352 GrLC1 - A204 GrA and B-A 155 Gr CM 65/70

Typical Chemical Composition (%)

C	Si	Mn	Mo	Cu	P	S	Fe
0.08	0.7	1.8	0.5	0.2	<0.025	<0.025	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
500	620	25	+20°C 140
After PWHT 650°C/1h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	1.2	180-250	26-28	

Ind.10

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MIG F63

Classification

ISO 21952-B G 1CML
 AWS A5.28 : ER80S-B2

Material N° : 1.7339

Description & Applications

Copper coated solid wire for GMAW -alloyed with Cr and Mo- for welding creep resisting steels with 1% Cr - 0.5% Mo. Resistant to high temperature up to 500-550°C. For piping systems, boilers, overheaters. Nice aspect of the weld bead.

Main applications: Petrochemical industry, chemical industry.

Base materials:

Steels and pipes for boiler and pressure vessels:

NF A 36-206	:	15D3 - 18MD4 -05 -15CD2.05 - 15 CD4.05
DIN 17155	:	13 CrMo 4.4 - 15CrMo3 - 13CrMoV42
DIN 1681	:	GS 22 CrMo5.4 - GS 22 Mo4
ASTM	:	A537 - A299 A355 GrP11 u. P12

Heat treatable steels:

NF A 35-551	:	18CD4 - 16CM5
NF A 35-552	:	25CD4
DIN 17210	:	25CrMo4

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe
0.09	0.6	0.6	1.3	0.5	0.2	0.03	0.01	0.01	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
480	580	23	+20°C 150
After PWHT 700°C/1h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN ISO 14175: M22 (Ar/CO ₂) 12-15 l/min
	1.2	180-250	26-28	

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F68

Old reference: MIG 90SB3

Classification

ISO 21952-A G Z CrMo2Si
AWS A5.28 : ER90S-B3

Material N° : 1.7384

Description & Applications

Copper coated solid wire for GMAW -alloyed with Cr and Mo- for welding creep resisting steels used in service up to 600°C (including 2% Cr - 1% Mo castings). High resistance to H₂S...

Base materials: **Steels and pipes for boiler and pressure vessels:**

NF A 36-206	: 15CD4-05 – 10CD9-10
DIN 17155 and 17245	: 10 Cr Mo 9.10 – 10 Cr Si Mo V7 24 CrMo V55 – 12 Cr Mo 9.10 GS 12 Cr MO 9.10...
BS	: 1501 Gr 622 to 1504 Gr 622, BS 359 Gr 622/640 1503 Gr 660, 1504Gr 660
ASTM	: A 387 GrD – A 335 GrP 22 – A 213 GrT 22, T36
Nuance Vallourec: Chromesco 3	

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Cu	Ni	P	S	Fe
0.1	0.6	0.6	2.4	1.0	0.2	0.03	<0.015	<0.015	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
520	650	22	+20°C 150
After PWHT 700°C/1h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.2	180-250	26-28	

Ind.07

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F69

Old reference: MIG CrMo5

Classification

ISO 21952-A : G CrMo5Si
AWS A5.28 : ER80S-B6

AWS A5.9 : ER502

Description & Applications

Copper coated solid wire for GMAW to weld creep resistant steels such as XC18S, E26, E36, X12CrMo5 (1.7362), ASTM A217 grade C5, ASTM A335 grade P5 used in the chemical industry and in thermal power plants.

Main applications: High temperature heat exchangers, piping systems...

Base material: Pipes and steels for boiler and pressure vessels :

EN	:	17 CrMo 3 5 – 12 CrMo 19 5 – G X12 CrMo5
N° d'alliage	:	1.7332 ; 1.7362 ; 1.7363
ASTM	:	A387 Gr 5Cl1 et 2 – A199 Gr T5 – A182 Gr F5 – A213 G T5 A335 Gr P5 – A336 Gr F5 – A369 GrF5 – A217 Gr C5
EN	:	17 CrMo 3 5 – 12 CrMo 19 5 – G X12 CrMo5

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.08	0.4	0.5	5.6	0.1	0.55	0.15	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R_e (MPa)	R_m (MPa)	A_5 (%)
500	620	20
After PWHT 730°C/2h		

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.2	150-220	26-28	
	1.6	190-300	26-32	

Ind.10



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F691

Old reference: MIG 90SB9

Classification

AWS A5.28 : ER90S-B9

ISO 21952-A : G CrMo91

Description & Applications

GMAW wire for welding creep resisting steels of similar chemical composition (known as P91) used at service temperatures up to 650°C. Deposit resisting to temperature and creep up to 620°C. Highly resistant to hot gas and overheated steam.

Main applications: For power plants, heat exchangers, tubes, steam boilers...

Base materials

Construction and Creep resisting steels:

Mat. N°	EN	ASTM
1.7386	X12CrMo9-1	A187 Gr F9; A336 Gr F9; A335 Gr P9
1.7389	GX12CrMo10-1	A217 C12
1.4903	X10CrMoVNb9-1	A199 gr. T91; A335 gr. P91; A213 gr T91

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	V	Nb	N	P	S
0.09	0.25	0.6	8.8	0.65	0.95	0.03	0.2	0.06	0.05	0.007	0.002

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
630	720	18	+20°C 60
After PWHT 760°C/2h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding gas
		Current (A)	Voltage (V)	
GMAW = +	0.8	60-200	16-28	ISO 14175: 95% Ar + 5% CO ₂ 12-15 l/min
	1.0	80-260	17-32	
	1.2	100-360	18-34	
	1.6	130-450	19-38	

Preheating of joints to weld and interpass temperature: 200-300°C. Slow air cooling to a temperature below 80°C followed by an annealing at 760°C/2-6h with slow cooling.

ind.11

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F75

Old reference: MIG CORTEN

Classification

AWS A5.28 : ER80S-G

ISO 16834-A : G Z Mn3Ni1Cu

Description & Applications

Copper coated solid wire for GMAW, alloyed with Cu-Ni-Cr, for welding all steels resistant to atmospheric corrosion (industrial, sea, rural).

Main applications: Public buildings, department of civil engineering, navy, tanks, water tower, bridges, crash barrier, and electrical pylons.

Base materials:

Steels with improved resistance to atmospheric corrosion:			
UNS	DIN	EN	Mat. N°
	WT St37-2	S255 JOW	1.8958
	WT St37-3	S235 J2W	1.8961
K 11538; K 11541; K 12032	WT St52-3	S355 J2G1W	1.8963
Trademarks: COR-TEN A,B,C – PATINAX – INDATEN – ACOR			

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Cu	P	S	Fe
0.08	0.8	1.4	0.4	0.8	0.4	0.02	0.01	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
530	620	26	-20°C 90

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	1.2	180-250	26-28	

Ind.10



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MIG F77

Old reference: MIG 100S1

Classification

AWS A5.28 : ER100S-1

ISO 16834-A : G Z Mn3Ni1.5Mo

Description & Applications

Copper coated solid wire for GMAW to weld high strength steels with Rm up to 800 MPa (Re up to 690MPa). Used for general metal constructions, blacksmithing, ship building etc. Also used as buffer or build up layer before hardfacing.

Base materials:

Fine grain and cold tough steels:

NF A 36-204	:	E 500T* . E 620T* . E 690T*
DIN 17102	:	StE 590* . StE690* . TStE 500* . WStE 500* . 17MnCrMo 33, 11 NiMnCrMo 55, 16 NiCrMo 12, 12MnNiMo 55.
Material N°.	:	1.8928* - 1.7279* - 1.6780* - 1.6782* - 1.6343* etc.
ASTM	:	A517 - A533GrA - A537 - A678 - A633Gr C bis E N-A XTRA; N-A XTRA70* (Thyssen).
Tube steels	:	API 5 LX: X70* . X75* . X80*

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	S	P	Fe
0.08	0.6	1.7	0.15	1.6	0.35	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
730	820	19	-51°C 70

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	1.2	180-250	26-28	

Ind.10

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F82

Old reference: MIG 80SNi2

Classification

AWS A5.28 : ER80S-Ni2

ISO 14341-A : G 46 8 M GN5

Description & Applications

GMAW wire electrode to weld under shielding gas fine grain construction steels and nickel alloyed steels. Resistant to low temperature down to -60°C. Good characteristics of cold toughness. Frequently used for liquid gas distribution pipes, tanks, off shore, and petro-chemistry.

Base materials

High strength steels, fine grain construction steels, cold tough:

EN	ASTM
12Ni9 1.5635	
14Ni6 1.5622	A352 gr. LC2
13MnNi6-3 1.6217	
S/P275-S/P420	A516 / A255 / A299 / A333 / A350
P235T1/2-P355N	A369 / A210/ A106
L210-L485	
S255 - S550	A516 / A255 / A333 / A350 / A612 / A714

Typical Weld Metal Composition (%)

C	Si	Mn	Ni	Mo	P	S	Fe
0.08	0.6	1.1	2.5	0.05	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
500	600	22	-20 °C 130 -40 °C 80 -80 °C 50

Weld Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG =+	1.0	150-170	25-28	ISO 14175: M21 (Ar/CO2) 12-15 l/min
	1.2	180-250	26-28	

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A60

Classification

AIR 9117 : A 60

Description & Applications

Solid wire electrode for GMAW to weld steels such as XC18S, E26, E36...

Typical Chemical Composition (%)

C	Si	Mn	Cu	P	S	Si+Al+Ti	Fe
<0.12	0.6	1.0	0.2	<0.02	<0.02	<0.90	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)
380	550	24

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) C1 (100% CO ₂) 12-15 l/min
	1.2	180-250	26-28	

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BMS

Classification

AIR 9117 : 8CD12

Description & Applications

Solid wire for GMAW to weld steels such as 15CrMoV6, 25CrMo4, 35CrMo4, 20CrMo12... Product of high purity for welding without micro porosity. It is also used for hardfacing of tool steels.

Available in copper coated or bare form.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	P	S	Fe
0.06	0.7	1.1	2.7	1.0	<0.015	<0.015	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	Hardness as welded
440	570	24	36 HRC
After PWHT 730°C/2h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	190-300	26-32	

Preheating of work piece: ~250°C. Post weld heat treatment: 730°C/2h.

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MV5S

Classification

DIN 8555 : MSG 3-GZ-60-P

EN 14700 : S Fe4

Description & Applications

Solid wire for GMAW for hardfacing. Product of high purity, without copper coating, for welding without micro porosity. Mainly used for build up on equipments stressed by high impact and abrasion. Resistant to temperatures up to 550°C.

Main applications: Moulds for plastic injections, cold working tools, shredder hammers.

Typical Chemical Composition (%)

C	Cr	Mo	W	V	Fe
0.5	5.0	1.3	1.3	0.4	Rem.

All Weld Metal Mechanical Properties

Hardness

~60 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	19-300	26-32	

Preheating of massive parts to 150-300°C is recommended. Maintain temperature during welding and then cool down in furnace if possible, to reduce cracks risks.

For build-up layers use MIG R250B.

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SCVS

Classification

AIR 9117 : 15CDV6

Description & Applications

Solid wire for GMAW to weld steels such as 15CrMoV6, 25CrMo4, 35CrMo4, 20CrMo12... Product of high purity for welding without micro porosity. It is also used for hardfacing of tool steels.

Available copper and no coated.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	V	P	S	Fe
0.14	0.15	1.0	1.4	0.9	0.25	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	Hardness
930	1080-1280	10	42 HRC

Depending on heat treatment

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.2	150-220	26-28	
	1.6	190-300	26-32	

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F66S

Classification

AIR 9117 : 25CD4

Description & Applications

Solid wire for GMAW to weld steels such as 1.7214; 25CrMo4, 35CrMo4, 20CrMo12... Product of high purity for welding without micro porosity. It is also used for hardfacing of tool steels.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Ni	P	S	Fe
0.23	0.2	0.7	1.2	0.2	0.15	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	Hardness
750	880-1080	12	46 HRC

Depending on heat treatment

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.2	150-220	26-28	
	1.6	190-300	26-32	

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18/8MN
Old reference: MIG 307

Classification

ISO 14343-A : G 18 8 Mn
AWS A5.9 : ~ER307

Material N° : 1.4370

Description & Applications

Solid wire for joining and overlaying on manganese steel, high sulphur and phosphorus containing steels. Also used for joining dissimilar steels, construction steels to stainless steels... Also used for cushion layers prior hardfacing, for repairing of pieces submitted to shocks or wear.

Main applications: Civil engineering...

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.09	0.9	7.0	19.0	8.5	0.1	0.08	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
460	650	40	+20°C 140

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10S
Old reference: MIG 308LSi

Classification

ISO 14343-A : G 19 9 L Si
AWS A5.9 : ER308L Si

Material N° : 1.4316

Description & Applications

Solid low carbon wire for joining of stainless steels (304L, 304, 347, 321...).

Main applications: For construction with service temperature lower than 350°C.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.015	0.9	1.8	20.0	10.0	0.1	0.08	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
400	600	38	+20°C 110 -196°C 50

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10C
Old reference: MIG 308H

Classification

ISO 14343-A : G 19 9 H
AWS A5.9 : ER308H

Material N° : 1.4948

Description & Applications

Solid wire electrode for Gas Metal Arc Welding of austenitic stainless steels like 304H, 308H, 321H and 347H grades with increased content of carbon. Mainly used for assemblies resistant to oxidation and creep at service temperatures between 400 and 750°C.

Base materials

Stainless steels for high temperature services:

UNS	Alloy	EN 10088	Material N°
S30409	304H	X6CrNi18-10	1.4948
S32109	321H	X8CrNiTi18-10	1.4878
S34709	347H	X7CrNiNb18-10	1.4912

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe	FN
0.05	0.4	1.8	19.9	9.7	0.2	0.1	<0.02	<0.015	Rem.	~6

All Weld Metal Mechanical Properties

R _{p0,2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
380	580	35	+20°C 95

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG =+	0.8	100-150	22-27	Ar + 2%CO2 Ar + 1%O2 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10T
Old reference: MIG 321

Classification

ISO 14343-A : G Z 19 9 Ti
AWS A5.9 : ~ER321

Material N° : 1.4541

Description & Applications

Solid wire for joining of stabilised stainless steels (321...) or low carbon content stainless steels (304L...). Good inter-granular corrosion resistance.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	Ti	P	S	Fe
0.03	0.5	1.5	18.0	10.5	0.2	0.1	0.5	<0.03	<0.02	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
460	630	35	+20°C 110

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10NBS
Old reference: MIG 347Si

Classification

ISO 14343-A : G 19 9 Nb Si
 AWS A5.9 : ER347Si

Material N° : 1.4551

Description & Applications

Solid wire for GMAW for joining of stabilised stainless steels (347, 321...) or low carbon content stainless steels (304L...). Good inter-granular corrosion resistance.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	Nb	P	S	Fe
0.03	0.8	1.5	19.5	9.8	0.2	0.1	0.5	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)	
460	630	33	+20°C	110
			-196°C	30

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10MS
Old reference: MIG 316LSi

Classification

ISO 14343-A : G 19 12 3 L Si
 AWS A5.9 : ER316LSi

Material N° : 1.4430

Description & Applications

Low carbon solid wire for joining of stabilised stainless steels (316, 316L...) stabilised or not. Service temperature from -120°C up to +400°C.

Main applications: Chemical and petrochemical industries, refineries, food industries...

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.018	0.85	1.7	18.5	12.2	2.7	0.1	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
430	620	35	+20°C	120
			-196°C	45

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10MN
 Old reference: MIG 316MnN

Classification

ISO14343-A : G 20 16 3 Mn N L Material N° : 1.4455
 AWS A5.9 : ER316LMn

Description & Applications

Solid stainless steel GMAW wire, fully austenitic, for joining of high strength stainless steels used for cryogenic applications.

Base materials

Stainless steels for general use:

UNS	Alloy	EN 10088	Mat. N°	UGINE
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
S31651	316N	X2CrNiMoN17-11-2	1.4406	
S31653	316LN	X2CrNiMoN17-13-3	1.4429	
S31600	316	X3CrNiMo17-13-3	1.4436	
S31753	317LN	X2CrNiMoN18-15-4	1.4442	

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	N	P	S	Fe
0.02	0.5	7.0	20.0	16.0	3.0	0.1	0.15	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
500	650	30	+20°C	140
			-196°C	95

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	120-200	24-28	Ar + 2%CO2 Ar+20%He+0.05% CO2 18-20 l/min
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10NB
Old reference: MIG 347

Classification

ISO 14343-A : G 19 9 Nb

AWS A5.9 : ER347

Description & Applications

Solid wire for GMAW for joining of stabilised stainless steels (347, 321...), no stabilised low carbon content stainless steels (304L...). Good inter-granular corrosion resistance.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	Nb	P	S	Fe
0.03	0.6	1.5	19.5	9.8	0.2	0.1	0.5	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)	
460	630	33	+20°C	110
			-196°C	30

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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20/10MNBS

Old reference: MIG 318Si

Classification

ISO 14343-A : G 19 12 3 Nb Si
 AWS A5.9 : ~ER318

Material N° : 1.4576

Description & Applications

Low carbon solid wire for joining of stabilised stainless steels (318, 316Ti...) Good inter-granular corrosion resistance. Service temperature from -120°C up to +400°C.

Main application: Petrochemical industries and for sea water applications...

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	Nb	P	S	Fe
0.02	0.85	1.6	18.5	12.0	2.7	0.1	0.5	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
400	610	35	+20°C 110

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	



24/12S
 Old reference: MIG 309LSi

Classification

ISO 14343-A : G 23 12 L Si
 AWS A5.9 : ER309LSi

Material N° : 1.4332

Description & Applications

Solid wire for joining of stainless steels (309, 309L...). Well adapted for welding of dissimilar steels, carbon to stainless steels.

Main applications: For welding high temperature steels and as buffer layer before hardfacing.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe	FN
0.015	0.85	1.8	23.3	13.7	0.1	0.1	<0.02	<0.01	Rem.	~12

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
420	600	35	+20°C 130

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	



24/12M
Old reference: MIG 309LMo

Classification

ISO 14343-A : G 23 12 2 L
 AWS A5.9 : ~ER309LMo

Material N° : 1.4459

Description & Applications

Solid wire electrode with low carbon content for Gas Metal Arc Welding. Used to weld stainless steels with similar composition stainless steels to carbon steels, for buffer layers and for surfacing. Well adapted for welding of dissimilar steels, carbon to stainless steels. Also suitable as buffer layer before hardfacing. High resistance against cracking and corrosion.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe	FN
0.015	0.55	1.5	21.5	14.5	2.6	0.1	<0.02	<0.01	Rem.	~ 12

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
400	600	35	20°C 120

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG =+	0.8	100-150	22-27	Ar + 2%CO2 Ar + 1%O2 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

Ind.08

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25/20
Old reference: MIG 310

Classification

ISO 14343-A : G 25 20
AWS A5.9 : ER310

Material N° : ~1.4842

Description & Applications

Solid wire for joining of similar austenitic steels (310 ...). Well adapted for welding of dissimilar steels as heat resistant steels to stainless steels. Also suitable for welding high temperature resistant steels for service temperatures up to about 1000°C.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.1	0.45	1.7	26.0	20.5	0.1	0.1	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)	
390	600	40	+20°C	120
			-196°C	60

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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29/9
Old reference: MIG 312

Classification

ISO 14343-A : G 29 9
AWS A5.9 : ER312

Material N° : 1.4337

Description & Applications

Solid wire for joining of dissimilar steels with an austenitic-ferritic stainless steel deposit. Well adapted for steels difficult to weld as tool steels, Mn steels, spring steels... Metal deposit highly resistant to cracks, suitable for buffer layers before hardfacing and for building up cutting tools.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe	FN
0.1	0.45	1.8	30.2	9.3	0.15	0.1	<0.02	<0.02	Rem.	~38

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
520	730	25	+20°C 100

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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18/15

Old reference: MIG 317L

Classification

AWS A5.9 : ER317L
UNS : S31783

ISO 14343-A : G 18 15 3 L

Description & Applications

Solid wire electrode for Gas Metal Arc Welding. Low carbon stainless steel composition with about 3,5% Mo. For welding and cladding on austenitic Cr-Ni-Mo stainless and clad plates. Compared to 316L-grades the higher Mo-content provides better general corrosion resistance, especially to crevice and pitting corrosion in chloride containing solutions.

Main applications: Chemical and petrochemical industries, in refineries, in the food industries and for ship building to weld pipes, tanks...

Base materials

Stainless steel for general use:

UNS	Alloy	EN 10088	Material N°	UGINE
S31603	316L	X2CrNiMo17-12-2	1.4404	UGINOX 18-11 ML
S31653	316LN	X2CrNiMoN17-13-3	1.4429	UGINOX 17-10 M
S31700	317	X5CrNiMo17-13-3	1.4449	
S31703	316L Mo	X2CrNiMo18-14-3	1.4435	UGINOX 18-13 MS
S31703	317L	X2CrNiMo 18-15-4	1.4438	

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe	FN
0.018	0.4	1.4	18.8	13.6	3.5	0.1	<0.03	<0.02	Rem.	~ 10

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
>380	>580	>30

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar+20%He+0.05% CO2
	1.0	120-200	24-28	
	1.2	140-220	24-28	Ar + 2%CO2 18-20 l/min
	1.6	180-260	24-30	

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20/25CU
Old reference: MIG 385

Classification

ISO 14343-A : G 20 25 5 Cu L
AWS A5.9 : ER385

Material N° : 1.4519

Description & Applications

Very low carbon content solid wire for joining of fully austenitic stainless steels (Uranus B6*, 904L...). Very good resistance to attacks by phosphoric and sulphuric acids. High resistance against pitting and stress corrosion in chloride containing media.

* Trademark of CREUSOT LOIRE

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.015	0.4	1.8	20.0	25.0	4.5	1.5	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
330	550	37	+20°C	120
			-196°C	80

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar+20%He+0.05% CO ₂ Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

Ind.10



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27/31CU
Old reference: MIG 383

Classification

AWS A5.9 : ER383

ISO 14343-A : G 27 31 4 Cu L

Description & Applications

Very low carbon content GMAW solid wire for joining of fully austenitic stainless steels (Uranus B28, Sanicro 28...). Very good resistance to attacks by phosphoric and sulphuric acids. High resistance against pitting and stress corrosion in chloride containing media.

NB Sanicro is a trade name of Sandvik, Uranus is a trade name of Creusot Loire Industries

Base materials

UNS	Alloy	EN 10088	Material N°	UGINE / CLI
N08028	28	X1NiCrMoCu31-27-4	1.4563	URANUS B28
N08904	904L	X1NiCrMoCu25-20-5	1.4539	URANUS B6

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.015	0.15	1.8	27.0	31.0	3.5	1.0	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
330	550	35	+20°C	100
			-196°C	50

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar+20%He+0.05% CO2 Ar + 2%CO2 Ar + 1%O2 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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M13/0
Old reference: MIG 410

Classification

ISO 14343-A : G 13
AWS A5.9 : ER410

Material N° : 1.4009

Description & Applications

Solid wire electrode for surfacing of valves as well as for joining stainless steels (403, 405, 416...). Resistant to atmosphere corrosion, water corrosion and light acids. Used for piping systems with maximal temperature service at 450°C.

Typical Chemical Composition (%)

C	Si	Mn	Cr	P	S	Fe
0.03	0.3	0.5	13.1	<0.03	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
250	450	15	+20°C 90
After PWHT 750°C/2h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	EN 439 : M1 Ar + 2%CO ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

For massive parts, preheating is advised at 200-300°C.

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M13/4

Old reference: MIG 410NiMo

Classification

ISO 14343-A : G 13 4

AWS A5.9 : ~ER410NiMo

Description & Applications

Solid wire electrode for repair and construction welding of martensitic Cr-Ni steels with a similar composition. These steels/castings are used for hydraulic turbines, pumps, valve bodies, compressor parts...

Base materials: **Martensitic stainless steels and castings:**

UNS	Alloy	EN/ Symbol	Material N°
J91540	CA6-NM	G-X5CrNi13-4	1.4313
S41500		X3CrNiMo13-4	1.4313
		G-X4CrNi13-4	1.4317
		G-X5CrNiMo13-4	1.4407
		X3CrNiMo13-4	1.4413
		G-X4CrNiMo13-4	1.4414

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.02	0.45	0.7	12.3	4.2	0.5	0.08	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
750	860	17	+20°C 80

After PWHT 580°C/8h

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	120-200	24-28	EN 439 : M1 Ar + 2%CO ₂ 18-20 l/min
	1.2	140-220	24-28	
	1.6	180-260	24-30	

Preheating at 100-150°C. Maintain temperature during welding and then cool down to room temperature. Annealing is advised at 580°C/8h.



F17/0
Old reference: MIG 430

Classification

ISO 14343-A : G 17
 AWS A5.9 : ER430

Material N° : 1.4016

Description & Applications

Solid wire for joining of stainless steels with 17% Chromium content. Good oxidation resistant up to 900°C also in sulphurous gases, used for chimneys as well as for sea water applications,.... Surfacing of fittings and valves.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.05	0.4	0.5	16.5	0.3	0.1	0.08	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
300	450	15
After PWHT 760°C/2h		

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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D22/09
Old reference: MIG 2209

Classification

ISO 14343-A : G 22 9 3 N L
AWS A5.9 : ER2209

Material N° : ~1.4462

Description & Applications

Solid wire electrode with very low carbon content for joining Duplex stainless steels (austenitic-ferritic microstructure) .Resistant in chloride containing media against pitting corrosion as well as crevice and stress corrosion.

Main applications: For pumps, vessels, piping systems etc. attacked by chloride containing solutions. But also for impellers and other components which require high strength combined with corrosion attack.

Base materials:

UNS	Alloy	EN 10088	Material N°	CLI
S31803		X2CrNiMoN22-5-3	1.4462	URANUS 45N
S32304	35N	X2CrNi23-4	1.4362	URANUS 35N
S32900	329	X3CrNiMoN27-5-2	1.4460	

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	N ₂	P	S	Fe
0.012	0.5	1.75	23.0	8.8	3.2	0.1	0.14	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	KV (J)	FN
600	800	28	+20°C 140	-40°C 70	~40

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar+20%He+0.05% CO ₂ Ar + 2%CO ₂ Ar + 1%O ₂ 18-20 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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21/10MA

Old reference: MIG 253MA

Classification

ISO14343-A : G Z 21 10 N H Material N° : ~1.4835

Description & Applications

Solid wire electrode for Gas Metal Arc Welding with an austenitic stainless steel deposit resisting to scaling and oxidation up to 1100°C.

Main applications: Ovens, thermal equipment for heat treatment, chemical installations.

Base materials

UNS	Alloy	EN 10095	Material N°	UGINE
		X15CrNiSi20-12	1.4828	UGINOX R 20-12
		X12CrNi22-12	1.4829	
S30815	253MA	X8CrNiSiN21-11	1.4893	
		X9CrNiSiN21-11-2	1.4835	

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	N	P	S	Fe	FN
0.08	1.5	0.5	21.0	10.0	0.15	<0.02	<0.01	Rem.	~5

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
440	670	38	20°C 120

Welding Current & Instructions

Welding mode	Ø wire (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	100-150	22-27	Ar + 30% He + 2%CO2 Ar + 2%CO2 Ar + 1%O2 16-18 l/min
	1.0	120-200	24-28	
	1.2	140-220	24-28	

Ind.12

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16/8M
Old reference: MIG 16-8-2

Classification

AWS A5.9 : ER16-8-2

ISO 14343-A : G 16 8 2

Description & Applications

Solid wire with low ferrite content for joining similar steels as 316H, used at high temperatures (up to 650-700°C).

Main applications: In petrochemical or incineration industry

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Cu	P	S	Fe
0.1	0.45	2.1	16.5	8.6	2.0	<0.2	<0.03	<0.02	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

Ind.10

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17/4CU

Classification

ISO 14343-A : G Z 17 4 Cu
 AWS A5.9 : ER 630

AMS : 5825

Description & Applications

Solid wire for joining similar steels in aeronautical industry as 17-4PH, 1.4548, X5CrNiCuNb17-4-4; 1.4540, X4CrNiCuNb16-4.

Main applications: Repairing of turbine discs, turbine blades.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Cu	Nb	P	S	Fe
0.03	0.5	0.6	16.0	5.0	3.5	0.2	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	120-200	24-28	EN 439 : M1 Ar + 2%CO ₂ 18-20 l/min
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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17/4MO

Classification

ISO 14343-A : G Z 17 4 Mo

Material N° : 1.4405

Description & Applications

Solid wire for joining and repairing steels of similar chemical composition.

Main applications: Repairing of Pelton* turbines.

* Trademark of Aubert&Duval

Base materials: Martensitic stainless steels and castings:

UNS	Alloy	EN/ Symbol	Material N°
J91540	CA6-NM	GX5CrNi13-4	1.4313
S41500		X3CrNiMo13-4	1.4313
		GX4CrNi13-4	1.4317
		GX5CrNiMo13-4	1.4407
		X5CrNiMo16-5	1.4405
		GX5CrNiMo16-5-1	1.4405

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	P	S	Fe
0.05	0.3	0.9	16.0	4.4	1.0	<0.03	<0.02	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	120-200	24-28	EN 439 : M1 Ar + 2%CO ₂ 18-20 l/min
	1.2	140-220	24-28	
	1.6	180-260	24-30	

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11/3M

Old reference: MIG Z12CNDV12

Classification

ISO 14343-A : G Z 12 3 MoV

Material N° : 1.4939

Description & Applications

Solid wire for joining and repairing steels of similar chemical composition.

Main applications: Repairing of turbine blades.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	V	N ₂	P	S	Fe
0.12	<0.30	0.7	11.8	2.7	1.7	0.3	0.03	<0.03	<0.02	Rem.

All Weld Metal Mechanical Properties

R_{p0.2} (MPa)

R_m (MPa)

A₅ (%)

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

Ind.10

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22/21CO
Old reference: MIG N155

Classification

ISO 14343-A : G Z 22 21 3 CoWNbN AMS : 5794

Description & Applications

Solid wire for welding of similar alloys used for turbines and in aeronautical industry. Good resistance to heat and corrosion.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Co	W	Nb	N ₂	Fe
0.1	<0.4	1.5	22.0	21.0	3.2	20.0	2.8	1.0	0.15	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

Ind.10

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NI59

Old reference: MIG Ni059

Classification

ISO 18274 : S-Ni6059 (NiCr23Mo16)

AWS A5.14 : ERNiCrMo-13

Description & Applications

Nickel alloy with high content of Cr and Mo, which gives it an exceptional corrosion resistance. It is particularly recommended for cladding of carbon steels and for welding of C 276, C 22, alloy 59, other highly corrosion resistant Ni-alloys and special stainless steels.

Main applications: Works well in different environments, de-pollution (absorbers, chimneys), sea water and fertiliser, flue gas desulphurisation.

Base material:

UNS	Alloy	DIN	Material N°
N06059	59	NiCr23Mo16Al	2.4605
N06022	C-22	NiCr21Mo14W	2.4602
N10276	C-276	NiMo16Cr15W	2.4819
N06455	C-4	NiMo16Cr16Ti	2.4610
N06625	625	NiCr22Mo9Nb	2.4856
N08825	825	NiCr21Mo	2.4858
N08926	254SMo	X1NiCrMoCuN25 20 6	1.4529

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe	Al	P	S	Co	Ti	V	Ni
<0.01	0.05	0.2	23.0	15.5	0.3	0.2	<0.01	<0.01	0.02	<0.5	<0.3	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
400	700	25

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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Classification

ISO 18274 : S-Ni 4060 (NiCu30Mn3Ti)
 AWS A5.14 : ERNiCu-7

Material N° : 2.4377

Description & Applications

Solid wire for GMAW for welding alloys like "Monel*". Used to weld components for chemical and petrochemical installations, for sea water and off shore applications.

Main applications: Petro-chemical and chemical industry.

* Trademarks by Inco Alloys

Base material:

UNS	Alloy	DIN	N°d'alliage
C70600	CuNi90/10	CuNi10Fe1Mn	2.0872
C71500	CuNi70/30	CuNi30Mn1Fe	2.0882
N04400	400	NiCu30Fe	2.4360
N05500	K-500	NiCu30Al	2.4375

Typical Chemical Composition (%)

C	Si	Mn	Fe	Ti	Cu	P	S	Ni
0.03	0.4	3.5	0.6	2.2	29.0	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
320	510	38	+20°C 180

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	90-160	24-28	Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.2	160-200	24-28	

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NI61

Old reference: MIG NiTi4

Classification

ISO 18274 : S-Ni 2061 (NiTi3)
 AWS A5.14 : ERNi-1

Material N° : 2.4155

Description & Applications

Solid wire for GMAW of Nickel alloys. Used for lining of steel; welding of steel to Nickel and Nickel-Copper alloys.

Main applications: Energy and chemical industries.

Base material:

UNS	Alloy	DIN	Material N°.
N02200	200	Ni99.2	2.4066
N02201	201	LC-Ni99	2.4068
N02205	205	LC-Ni99.6	2.4061
		Ni99.6	2.4060

Typical Chemical Composition (%)

C	Si	Mn	Fe	Ti	Cu	Al	P	S	Ni
0.02	0.2	0.3	0.1	3.3	0.1	0.15	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
350	540	40	+20°C 250

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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NI65

Classification

ISO 18274 : S-Ni 8065 (NiFe30Cr21Mo3) Material N° : 2.4858
AWS A5.14 : ERNiFeCr-1

Description & Applications

Solid wire used to weld Nickel-Iron-Chromium alloys which have a good resistance to oxidizing and reducing acids like sulphuric and phosphoric acid as well as sea water.

Base material:

UNS	Alloy	DIN	Material N°
N08825	Alloy 825	NiCr21Mo	2.4858

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Fe	Cu	Ti	P	S
0.02	0.2	0.6	20.5	41.0	3.2	30.0	1.8	0.9	<0.01	<0.01

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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NI82

Classification

ISO 18274 : S-Ni 6082 (NiCr20Mn3Nb)
AWS A5.14 : ERNiCr-3

Material N° : 2.4806

Description & Applications

Solid wire for GMAW of high nickel content alloys as Inconel 600* or Incoloy 800*. Highly resistant at low temperatures on steels of 5% and 9% Ni. Used in the construction of equipment submitted to oxidizing and corrosive attacks at high temperatures.

* Trademarks by Inco Alloys

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Nb	Ti	P	S	Ni
0.02	0.2	3.0	20.5	2.0	2.5	0.3	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
410	650	45	+20°C	200
			-196°C	80

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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NI90

Classification

ISO 18274 : S-Ni 7090 (NiCr20Co18Ti3)

Description & Applications

Solid wire for GMAW of high nickel content alloys as example, NIMONIC 80A and 90.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Cu	Ti	Co	Al	Ni
<0.13	0.3	0.5	20.0	1.0	0.1	2.5	16.0	1.5	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min

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NI263

Classification

ISO 18274 : S-Ni 7263 (NiCr20Co20Mo6Ti2) Material N° : 2.4650

Description & Applications

Solid wire for GMAW of high nickel content alloys resistant to oxidation and temperature as NIMONIC 263.

Main applications: Aeronautical industry.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Mo	Co	Ti	Al	Ni
0.08	0.25	0.05	20.0	0.7	5.9	20.0	2.15	0.5	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
	630	12

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min

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NI276

Classification

ISO 18274 : S-Ni 6276 (NiMo16Cr15Fe6W4) Material N° : 2.4886
 AWS A5.14 : ERNiCrMo-4

Description & Applications

Solid wire for GMAW base material of similar composition as Ni-Cr-Mo alloys like NiMo16Cr15W, UNS N10276, alloy C276 and others. Ni 276 is appropriate for lining sheet plates. Excellent resistance in oxide, chloride, acid and saline environments.

Main applications: Chemical industries, piping...

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe	W	P	S	Ni
0.01	0.05	0.4	16.0	16.0	6.0	3.5	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
480	780	35	+20°C 100

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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NI601

Classification

ISO 18274 : S-Ni 6601 (NiCr23Fe15Al) Material N° : 2.4626
 AWS 5.14 : ERNiCrFe-11

Description & Applications

Solid wire for GMAW of similar Nickel-Chromium-Iron-Aluminium alloys. Used in the construction of equipment submitted to high temperature up to 1150°C, like furnaces, heat treatment equipment. Preferred process: GTAW automatic.

Base material:

UNS	Alloy	DIN	Material N°
N06600	600	NiCr15Fe	2.4816
N06601	601	NiCr23Fe	2.4851

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Al	Cu	Co	P	S	Ni
0.05	0.2	0.5	23.0	14.0	1.3	0.1	0.3	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

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NI625

Classification

AWS A5.14 : ERNiCrMo-3
 ISO 18274 : S-Ni 6625 (NiCr22Mo9Nb)

Material N° : 2.4831

Description & Applications

Solid wire for GMAW of high nickel alloys as well as for special austenitic stainless steels. Used in the construction of equipment submitted to oxidizing and corrosive attacks. Excellent resistance to pitting, crevice and stress corrosion cracking in the presence of chlorides. Highly resistant at low temperatures, therefore also applied to weld 9% Ni steels.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe	Nb	P	S	Ni
0.01	0.15	0.1	22.0	8.7	0.3	3.6	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)	
450	760	40	+20°C	140
			-196°C	70

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	80-140	23-27	Ar Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.0	90-160	24-28	
	1.2	160-200	24-28	
	1.6	180-260	24-28	

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NI718

Classification

ISO 18274 : S-Ni 7718 (NiFe19Cr19Nb5Mo3) Material N° : 2.4667
AWS A5.14 : ERNiFeCr-2 AMS : 5832

Description & Applications

Solid wire for GMAW of similar alloys like INCONEL* 718, X 750 and 706. Excellent resistance against thermal shocks and oxidation. Used for structural hardening, for high mechanical resistance up to 700°C. Could be used for hardfacing of hot working tools.

* Trademark of Inco Alloys

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe	Nb	Al	Ti	Ni
0.04	0.2	0.2	19.0	3.0	Rem.	5.0	0.5	0.9	52.0

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	KV (J)
>900	>1200	>8	240 HB as welded ~45 HRC after PWHT

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	90-160	24-28	Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min
	1.2	160-200	24-28	

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NICR80

Old reference: MIG NiCr80.20

Classification

ISO 18274 : S-Ni 6076 (NiCr20)
AWS A5.14 : ERNiCr-6

Material N° : 2.4639

Description & Applications

Solid wire for GMAW of similar alloys like BRIGHTRAY, INCONEL 600, INCOLOY DS and NIMONIC 75.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Cu	P	S	Ni
0.1	0.2	0.5	20.0	0.5	0.1	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
	>560	>25

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

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NIW

Classification

ISO 18274 : S-Ni 1004 (NiMo25Cr5Fe5) AMS : 5786
AWS A5.14 : ERNiMo-3

Description & Applications

Solid wire for GMAW of dissimilar nickel alloys known as HASTELLOY W®.

Main applications: Used in the aeronautical industry for reparation and maintenance of engines.

® Trade mark of Haynes alloys

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe	W	P	S	Ni
0.03	0.2	0.4	5.0	24.0	6.0	0.03	<0.01	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min

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NIX

Classification

ISO 18274 : S-Ni 6002 (NiCr21Fe18Mo9) Material N° : 2.4613
AWS A5.14 : ERNiCrMo-2 AMS : 5798

Description & Applications

Solid wire for GMAW of Nickel alloys, popularly known as HASTELLOY X®. Nickel base alloy generally used in turbines and engines. Best compromise between resistance to oxidation and mechanical characteristics at high temperature.

Main applications: Used in the aeronautical industry (combustion chamber, etc).

® Trade mark of Haynes alloys

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe	Mo	Co	W	Al	Cu	Ni
0.07	0.3	0.6	22.0	19.3	8.5	1.0	0.8	0.3	0.25	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
420	680	23

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar + He Ar/He + 0.05% CO ₂ 18-20 l/min

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MIG FENI50

Classification

Without

Description & Applications

Solid wire used in welding and reparation of cast iron, either cold or after moderate preheating. The colour of the deposit is similar to cast iron, the structure is different. Also used in assembly and surfacing of lamellar and nodular cast iron. MIG FeNi 50 is also used for heterogeneous assembly of cast iron with steel. Can be machined.

Base material:

Nodular cast iron:

ASTM	DIN	NFA
A536 Grade 60-80	GGG-40 à GGG-60 GTS-35 à GTS-65	FGS 400-12 à FGS 600-3 MN350-10 à MN650-3

Typical Chemical Composition (%)

C	Si	Mn	Ni	Fe	P	S
0.03	0.2	0.5	55.0	43.0	<0.015	<0.015

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
320	550	> 25

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Intensity (A)	(V)	
MIG = +	1.2	140 – 180	25 - 30	ISO 14175 : M12 (Ar/CO ₂) 12-15 l/min

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AL99.7

Old reference: MIG Al99.5

Classification

ISO 18273 : S Al 1070 (Al99.7) Material N° : 3.0259
 AWS A5.10 : ~ER1100

Description & Applications

Solid wire for GMAW used to weld pure aluminium or similar chemical composition alloys. Often used for its excellent electrical conductivity or for its high resistance against certain corrosions.

Base material:

Alloy	DIN	Material N°.
1080A	Al99,5	3.0255
1050A	Al99,7	3.0275
1100	Al99,8	3.0285
3004	Al99	3.0205
3005		
3303		

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Zn	Al
0.03	0.13	0.001	0.005	0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
80	100	30

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-280	20-27	



ALG3

Old reference: MIG AlMg3

Classification

ISO 18273 : S Al 5754 (Al Mg3)
AWS A5.10 : ~ER5654

Material N° : 3.3536

Description & Applications

Solid wire for GMAW used to weld Aluminium alloys with up to 3% Mg. Very often used in marine construction for their excellent resistance to salt water corrosion and other types of construction.

Base material:

Alloy	DIN	Material N°.
5005	Al Mg1	3.3315
3303	Al Mg2.5	3.3523
3004	Al Mg3	3.3535
3005	Al Mg Si 0.5	3.3206

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti	Al
0.1	0.2	0.002	0.45	3.2	0.04	0.06	0.07	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
120	250	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-250	20-27	

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ALG5

Old reference: MIG AlMg5

Classification

ISO 18273 : S Al 5356 (AlMg5Cr)
 AWS A5.10 : ER5356

Material N° : 3.3556

Description & Applications

Solid wire for GMAW used to weld Aluminium alloys with more than 3% Mg, up to 5 % of Mg. Very often used in marine construction for their excellent resistance to salt water corrosion and for their very good mechanical characteristics, but also in the railway sector for the welding of wagons to transport phosphate, and also in the road sector for trucks and tractors.

Base material:

Alloy	DIN	Material N°.
5056	Al Mg5	3.3555
5083	Al Mg4.5	3.3345
5086		
5454		
5754		
6005 A		

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti	Al
0.06	0.17	0.004	0.15	4.8	0.01	0.12	0.08	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
130	300	29

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-120	18-22	Ar/He: 18-20 l/min Argon: 18-20 l/min
	1.0	100-150	18-25	
	1.2	130-250	18-27	
	1.6	170-250	20-27	



ALG4M

Old reference: MIG AlMg4.5Mn

Classification

ISO 18273 : S Al 5183 (AlMg4.5Mn0.7)
AWS A5.10 : ER5183

Material N° : 3.3548

Description & Applications

Solid wire for GMAW used to weld Aluminium-Magnesium alloys of similar composition. The deposit shows superior mechanical resistance compared to Al Mg5 due to the addition of Mn.

Base material:

Alloy	DIN	Material N°.
5083	Al Mg4Mn	3.3547
5086	Al Mg4.5Mn	3.3545
5454	Al ZnMgCu1.5	3.4365
5754		
7020		

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti	Al
0.05	0.15	0.01	0.65	4.8	0.02	0.1	0.12	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
140	310	30

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He: 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-250	20-27	

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ALG5M

Old reference: MIG AlMg5Mn

Classification

ISO 18273 : S Al 5556A (AlMg5Mn)

AWS A5.10 : ER5556

Description & Applications

Solid wire for GMAW used to weld the Aluminium alloy AG5MC. High mechanical strength.

Main applications: Used for diverse construction such as armament to boiler-making.

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Ti	Cr	Al
0.2	0.4	0.01	0.7	5.2	0.02	0.1	0.1	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He: 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-250	20-27	

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ALG4Z2

Old reference: MIG AlMg4Z2

Classification

ISO 18273 : Al Z (AlMg4Zn2)

Description & Applications

Solid wire for GMAW used to weld Aluminium-Magnesium alloys like AZ5G.

Main applications: Used in nuclear industry and for armament

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Cr	Ti	Al
0.05	0.1	0.003	0.4	4.0	2.0	0.09	0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar/He: 18-20 l/min

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ALC6

Old reference: MIG AlCu6

Classification

ISO 18273 : S Al 2319 (Al Cu6MnZrTi) AMS : 4191
AWS A5.10 : ER2319

Description & Applications

Solid wire for GMAW used for welding of alloy Aluminium/Copper-AlCu 6.

Main applications: Space industries.

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Zr	V	Ti	Al
0.2	0.1	6.5	0.3	0.12	0.08	0.16	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar/He: 18-20 l/min

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ALS5

Old reference: MIG AISi5

Classification

ISO 18273 : S Al 4043 (Al Si5)
 AWS A5.10 : ER4043

Material N° : 3.2245

Description & Applications

Solid wire for GMAW used to weld Aluminium-Silicon alloys with Si content up to 7%. Applicable for a wide variety of Aluminium alloys. Widely used in foundry reparations.

Base material:

Alloy	DIN	Material N°.
3004-3005	AlMgSi0.5	3.3206
3303	AlMgSi1	3.3210
5005	AlSi7Mg	3.2371
6060-6061-6063-6070-6071	AlSi5Mg	3.2341
6351		

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Ti	Al
5.0	0.15	0.001	0.03	0.003	0.003	0.006	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
80	120	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He: 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-260	20-27	

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ALS12

Old reference: MIG AlSi12

Classification

ISO 18273 : S Al 4047 (Al Si12)
AWS A5.10 : ER4047

Material N° : 3.2585

Description & Applications

Solid wire for GMAW used to weld Aluminium-Silicon alloys with Si content up to 12%. Very similar to a eutectic brazing product (570-585°C), therefore very good flowing and wetting characteristics.

Main applications: Recommended to the reparation of foundry pieces or unidentified nuances of aluminium alloys, which is often the case in reparation of agricultural equipment / machinery.

Typical Chemical Composition (%)

Si	Fe	Cu	Mn	Mg	Zn	Al
12.0	0.2	0.007	0.01	0.02	0.03	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
80	140	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.0	100-150	18-22	Ar/He: 18-20 l/min
	1.2	130-200	18-25	
	1.6	170-280	20-27	

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CUS
Old reference: MIG Cu110

Classification

ISO 24373 : S Cu 1898 (CuSn1)

AWS A5.7 : ERCu

Description & Applications

Wire electrode for MIG welding of oxygen free Copper and copper alloys. Good flow and porosity free weld seams due to the alloying with Tin. The melting temperature is relatively low and projections are minor. If a high electrical conductivity is required use MIG CuAg.

Typical Chemical Composition (%)

Sn	Mn	Si	P	Cu
0.8	0.4	0.2	0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
50	190	35

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

Preheating at about 400°C is advised for massive parts, thickness > 3mm.

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CUS6

Old reference: MIG Cu114

Classification

ISO 24373 : S Cu 5180 (CuSn5P) Material N° : 2.1022
 AWS A5.7 : ERCuSn-A

Description & Applications

Solid wire for GMAW used for joining and repairing of copper and similar copper tin alloys. Surfacing of friction surfaces. Welding of zinc coated sheets.

Base materials

UNS	DIN	Material N°
C50700	CuSn2	2.1010
C51100	CuSn4	2.1016
C51900	CuSn6	2.1020
C52100	CuSn8	2.1030
	CuSn6Zn	2.1080
C52400	G-CuSn10	2.1050

Typical Chemical Composition (%)

Sn	P	Pb	Cu
6.0	0.2	<0.01	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
150	300	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUS8

Old reference: MIG CuSn8

Classification

ISO 24373 : S Cu 5210 (CuSn9P)

Description & Applications

GMAW wire electrode used for welding of copper-tin-bronzes as well as for surfacing of friction surfaces and welding of galvanized sheets.

Typical Chemical Composition (%)

Sn	P	Cu
8.0	0.1	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
	260	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUS13

Old reference: MIG CuSn13

Classification

ISO 24373 : S Cu 5410 (CuSn12P) Material N° : 2.1056

Description & Applications

Solid wire for GMAW used to weld copper-tin-bronzes as well as for copper-tin-castings. Often applied to surface worn pieces as it has a good resistance to wear.

Typical Chemical Composition (%)

Sn	P	Cu
13.0	0.2	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
	320	5

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUSIL

Old reference: MIG CuSi3

Classification

ISO 24373 : S Cu 6560 (CuSi3Mn1) Material N° : 2.1461
AWS A5.7 : ERCuSi-A

Description & Applications

Solid wire for GMAW, especially recommended for welding of bronzes and MIG-brazing of galvanized sheets.

Main applications: Automotive industry.

Typical Chemical Composition (%)

Sn	Mn	Si	Zn	Al	Pb	Cu
0.8	1.0	3.0	<0.1	<0.01	<0.02	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
150	350	42

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar+2,5%CO ₂

Preheating at 200 to 300°C is advised to massive parts.

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CUAG

Classification

ISO 24373 : S Cu 1897 (CuAg1)

Material N° : 2.1211

Description & Applications

Wire electrode for MIG welding of oxygen free Copper and copper alloys where a high electrical conductivity is required. Good flow, porosity free welds seams and high electrical conductivity due to the alloying with Silver. The melting temperature is relatively low and projections are minor.

Main applications: For equipment and pipes made of copper and especially for conductor rails.

Typical Chemical Composition (%)

Ag	Mn	P	Cu
1.0	0.06	0.01	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)	Electrical conductivity (Sxm/mm ²)
60	190	35	40-46

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUA8

Old reference: MIG CuAl8

Classification

ISO 24373 : S Cu 6100 (CuAl7) Material N° : 2.0921
 AWS A5.7 : ERCuAl-A1

Description & Applications

GMAW wire electrode recommended for assemblies made of copper-aluminium like pipelines and heat exchangers.

In general, the product has an excellent resistance to friction and to marine corrosion. Also used in assemblies of galvanised sheets, special brass (CuZn20Al). Frequently used for hardfacing pumps.

Base materials:

UNS	Alloy	DIN	Material N°
C60600		CuAl5	2.0916
C61000		CuAl8	2.0920
C68700	Yorcalbro	CuZn20Al2	2.0460

Typical Chemical Composition (%)

Si	Fe	Mn	Ni	Pb	Al	Zn	Cu
0.03	0.05	0.1	0.2	<0.02	8.1	<0.1	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
190	430	42

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

Preheating at 200 to 300°C is advised to massive parts, thickness > 3mm

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CUA8NI

Old reference: MIG CuAl9Mn

Classification

ISO 24373 : S Cu 6327 (CuAl8Ni2Fe2Mn2) Material N° : 2.0922

Description & Applications

Wire electrode for GMAW recommended for assembly of copper-aluminium of similar composition. Frequently used for welding and reparation of pumps and piping systems for sea water. Often used in anti-wear surfacing. Also used for assembly of galvanized sheets. The product corresponds to Indret N°108 specifications.

Typical Chemical Composition (%)

Al	Mn	Fe	Ni	Zn	Cu
8.5	1.8	1.4	2.3	0.017	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
330	650	27

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUA9

Old reference: MIG CuAl9

Classification

ISO 24373 : S Cu 6180 (CuAl10Fe1) Material N° : 2.0937
AWS A5.7 : ERCuAl-A2

Description & Applications

Solid wire for GMAW of copper-aluminium alloys of similar composition. The deposits are harder than those of MIG CuAl8, and are often used for surfacing of ferritic/perlitic steels. High resistance to wear and metal-metal abrasion.

Main applications: Assemblies and surfacing of aluminium-bronze, of aluminium coated steels, of cast iron used in machining tools industry and in naval construction. Welding of aluminium-bronze piping resistant to seawater corrosion, erosion and cavitation.

Typical Chemical Composition (%)

Al	Fe	Pb	Zn	Ni	Si	Cu
9.8	1.2	<0.02	<0.02	0.007	<0.1	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
	500	35

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUA9NI

Old reference: MIG CuAl9Ni

Classification

ISO 24373 : S Cu 6328 (CuAl9Ni5Fe3Mn2) Material N° : 2.0923
AWS A5.7 : ERCuAlNi UNS : C63280

Description & Applications

Solid wire for GMAW for the assembly of copper-aluminium of similar composition. It has better resistance to wear and corrosion than MIG CuAl9Mn.

Typical Chemical Composition (%)

Al	Mn	Ni	Fe	Cu
9.0	1.3	4.5	3.2	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
400	700	15

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUMN13

Old reference: MIG Cu118

Classification

ISO 24373 : S Cu 6338 (CuMn13Al8Fe3Ni2) Material N° : 2.1368
AWS A5.7 : ER CuMnNiAl

Description & Applications

Solid wire for GMAW used for assembly of copper-aluminium, for surfacing on steels and cast iron as well as for cavitation resistant over layers. It has high resistance to wear and marine / sea water corrosion.

Base materials

UNS	DIN	Material N°
C62300	CuAl10Fe3Mn2	2.0936
C63000	CuAl10Ni5Fe4	2.0966
	G-CuAl10Fe	2.0940
	CuAl9Mn2	2.0960
	G-CuAl8Mn	2.0962

Typical Chemical Composition (%)

Al	Mn	Fe	Ni	Si	Zn	Cu
7.5	12.0	2.5	2.0	0.03	<0.15	Rem.

All Weld Metal Mechanical Properties

$R_{p0.2}$ (MPa)	R_m (MPa)	A_5 (%)
400	650	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUNI10

Old reference: MIG CuNi90.10

Classification

ISO 24373 : S Cu 7061 (CuNi10)

Material N° : 2.0873

Description & Applications

Solid wire for GMAW of copper-nickel types Cu90-Ni10 and lower Ni-alloyed Cu-Ni alloys.

Base materials:

UNS	Alloy	DIN	Material N°
C70600	CuNi90/10	CuNi10Fe1Mn	2.0872

Typical Chemical Composition (%)

Mn	Fe	Ni	Ti	Si	P	Pb	Cu
0.8	1.0	10.5	0.4	<0.2	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
200	320	15

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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CUNI30

Classification

ISO 24373 : S Cu 7158 (CuNi30Mn1FeTi) Material N° : 2.0837
 AWS A5.7 : ERcNi

Description & Applications

Solid wire for GMAW used to weld different copper-nickel types as Cu/Ni70.30, 80.20 and 90.10.

Main applications: For offshore applications, seawater desalination plants, for ship building, in the chemical industry.

Base materials:

UNS	Alloy	DIN	Material N°
C70600	CuNi90/10	CuNi10Fe1Mn	2.0872
	CuNi80/20	CuNi20Fe	2.0878
C71500	CuNi70/30	CuNi30Mn1Fe	2.0882

Typical Chemical Composition (%)

Mn	Fe	Ni	Ti	Si	P	Pb	Cu
0.7	0.6	30.0	0.4	<0.2	<0.02	<0.02	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
240	400	32

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				Ar Ar + He

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T40

Classification

AWS A5.16 : ERTi-2
AMS : 4951

Material N° : 3.7035

Description & Applications

Solid wire for GMAW for welding of pure titanium.

Main applications: Heat exchangers, condensers, evaporators for nuclear plants, oil refinery, aeronautical and chemical industries.

Typical Chemical Composition (%)

C	N ₂	H ₂	O ₂	Fe	Ti
<0.03	<0.015	<0.008	0.08-0.16	<0.12	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
290	390-540	20

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

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TPD0.2

Classification

AWS A5.16 : ERTi-7

Description & Applications

Solid wire for GMAW for welding of similar titanium alloy. The addition of Palladium increases the resistance to reduction background.

Typical Chemical Composition (%)

C	N ₂	H ₂	O ₂	Fe	Pd	Ti
<0.03	<0.015	<0.008	0.08-0.16	<0.12	0.12-0.25	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)	KV (J)
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Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

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TA6V4

Classification

AWS A5.16 : ERTi-5
AMS : 4954

Material N° : 3.7165

Description & Applications

Solid wire for GMAW for welding of similar titanium alloys.

Main applications: Aeronautical industry.

Typical Chemical Composition (%)

C	N ₂	H ₂	O ₂	Fe	Al	V	Y	Ti
<0.05	<0.03	<0.005	0.12-0.20	<0.22	6.0	4.0	<0.005	Rem.

All Weld Metal Mechanical Properties

R _{p0.2} (MPa)	R _m (MPa)	A ₅ (%)
900	960-1270	8

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +				

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CO25

Classification

DIN 8555 : MSG 20-GZ-250-CKTZ EN 14700 : S Z Co1

Description & Applications

Solid wire for welding or surfacing (GMAW-process, Plasma or TIG-automatic). Very good resistance to metal-metal wear, thermal shock and corrosion up to 1000°C even in sulphuric gases. Nonmagnetic deposit.

Main applications: Engine valves, forging dies, gas turbines, mixers.

Base materials: Alloy 25, UNS R30605, AMS 5537, Material N° 2.4964, CoCr20W15Ni and similar.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	W	Fe	Co
0.1	0.8	1.5	20.0	10.0	<0.5	15.0	<3.0	Rem.

All Weld Metal Mechanical Properties

Hardness
~230 HB

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG	1.2	140-180	22-27	Ar + 2%CO ₂
= +	1.6	160-200	24-28	Ar 18 l/min

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FICO188

Old reference: MIG Co188

Classification

AMS : 5801
EN 3888 : CoCr22Ni22W15

Material N° : 2.4683

Description & Applications

Solid wire electrode for welding or surfacing (GMAW-process or TIG-automatic). Very good resistance against oxidation up to 1150°C.

Main applications: Welding of oxidation and creep resisting alloy like alloy 188, UNS R30188, AMS 5608, Material N° 2.4683, CoCr22NiW and similar.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	W	Fe	La	Co
0.1	0.3	0.8	22.0	23.0	14.0	<3.0	0.06	Rem.

All Weld Metal Mechanical Properties

Hardness

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	1.2	140-180	22-27	Ar Ar +He 18 l/min
	1.6	160-200	24-28	

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819 BS

Classification

EN 14700 : S Fe3

Material N° : 1.6773

Description & Applications

Solid wire for GMAW for welding and hardfacing. Product of high purity for welding without micro porosity.

Main applications: For cold working tools, swages for forging, for punching tools as well as for moulds for plastics. Especially designated to repair and to surface the parent material 36NiCrMo16, 1.6773.

Available as copper coated or bare wire.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	P	S	Fe
0.35	0.3	0.4	1.7	3.8	0.3	<0.015	<0.010	Rem.

All Weld Metal Mechanical Properties

Hardness (As welded)

~48 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

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BMS

Classification

AIR 9117 : 8CD12

Description & Applications

Solid wire for GMAW of steels such as 15CrMoV6, 25CrMo4, 35CrMo4, 20CrMo12... Product of high purity for welding without micro porosity. It is also used for hardfacing of tool steels.

Available in copper coated or bare form.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	P	S	Fe
0.06	0.7	1.1	2.7	1.0	<0.015	<0.015	Rem.

All Weld Metal Mechanical Properties

R _e (MPa)	R _m (MPa)	A ₅ (%)	Hardness (as welded)
440	570	24	36 HRC
After PWHT 730°C/2h			

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	190-300	26-32	

Preheating of work-piece at about 250°C. Post weld heat treatment: 730°C/2h/

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MARVAL 18S

Classification

EN 14700 : S Fe5

Material N° : 1.6359

Description & Applications

Solid wire for GMAW for welding steels of similar chemical composition and for hardfacing by the GMAW process. Product of high purity for welding without micro porosity. The deposit can be machined with standard tools after welding and then age hardened by a subsequent heat treatment.

Main applications: For building up dies for extrusion of Al-castings and plastics, for hot working tools, for moulds, etc. Also used to weld Maraging steels like X2NiCoMo18-9-5, 1.6358 and others (Maraging 200-250).

Typical Chemical Composition (%)

C	Si	Mn	Ni	Co	Mo	Ti	Al	Fe
<0.01	<0.1	<0.1	18.0	8.5	5.0	0.5	0.1	Rem.

All Weld Metal Mechanical Properties

Hardness (as welded)

~36 HRC

Hardness after PWHT; 4h at 480°C

~50 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: I1 (Ar+He) 15-18 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

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MARVAL X12S

Classification

DIN 8555 : MSG 5-GZ-400-R
EN 14700 : S Z Fe7

Material N° : 1.4530

Description & Applications

Solid wire for GMAW for welding and for hardfacing. Product of high purity for welding without micro porosity.

Main applications: Used to weld and to repair parent metals like X1CrNiMoAlTi12-9-2 and others.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	Mo	Ti	Al	Fe
<0.01	0.05	0.02	12.0	9.4	2.0	0.3	0.7	Rem.

All Weld Metal Mechanical Properties

Hardness
~32 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG =+	0.8	60-100	18-21	EN 439: I1 (Ar+He) 15-18 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

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SMV3S

Classification

EN 14700 : S Fe3

Material N° : 1.2343

Description & Applications

Solid wire for hardfacing steels of similar chemical composition. Product of high purity, bare wire without copper coating, for welding without micro porosity.

Main applications: For forging and drawing dies, cast moulds.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	V	Fe
0.38	0.9	0.3	5.0	1.2	0.5	Rem.

All Weld Metal Mechanical Properties

Hardness
~58 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
MIG = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 18 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	19-300	26-32	

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HB25
Old reference: MIG R250B

Classification

DIN 8555 : MSG 1-GZ-250-P Material N° : 1.8401
EN 14700 : S Fe1

Description & Applications

Solid wire with copper coated for GMAW for surfacing. Tough deposit, easy to machine.

Main applications: Used for surfacing of rails, shafts, rollers as well as for semi-hard build up and intermediate layers.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Al	Ti	P	S	Fe
0.3	0.5	1.1	1.0	0.1	0.2	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

Hardness
225-275 HB

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

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HB35

Old reference: MIG R350B

Classification

DIN 8555 : MSG 2-GZ-350-P
EN 14700 : S Fe2

Material N° : 1.8405

Description & Applications

Solid wire with copper coated for GMAW for surfacing.

Main applications: Hardfacing of pressing and stamping tools.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Al	Ti	P	S	Fe
0.7	0.5	1.9	1.0	0.1	0.2	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

Hardness
330-370 HB

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

Preheat the parent metal, depending on the carbon-equivalent and thickness, up to about 350°C.

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HB50

Old reference: MIG R500B

Classification

DIN 8555 : MSG 2-GZ-50
EN 14700 : S Fe2

Material N° : 1.8425

Description & Applications

Solid wire with copper coated for surfacing by the GMAW process.

Main applications: For hardfacing of civil engineering equipment such as shovel and bucket teeth, bucket edges, excavators as well as cutting edges.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Al	Ti	P	S	Fe
1.1	0.5	1.9	1.8	0.1	0.2	<0.02	<0.01	Rem.

All Weld Metal Mechanical Properties

Hardness
~50 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

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HB60

Old reference: MIG R600B

Classification

DIN 8555 : MSG 6 GZ-60-S
EN 14700 : S Fe8

Material N° : 1.4718

Description & Applications

Solid wire with copper coated for GMAW for surfacing. Used for hardfacing parts subject to high impact and medium abrasion. A kind of a universal hardfacing wire used in quarries, mines, steel works, cement works, crushing plants, the wood industry, in the car industry and others.

Main applications: Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges etc

Typical Chemical Composition (%)

C	Si	Mn	Cr	Ni	P	S	Fe
0.45	3.0	0.4	9.2	0.17	<0.025	<0.01	Rem.

All Weld Metal Mechanical Properties

Hardness
~60 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	60-100	18-21	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.0	150-170	25-28	
	1.2	150-220	26-28	
	1.6	180-270	26-32	

Tool steels have to be preheated to 300-400°C, depending on the thickness and composition.

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HB60

Old reference: MIG 600HB

Classification

DIN 8555 : MSG 6 GZ-60
EN 14700 : S Fe8

Material N° : 1.4718

Description & Applications

Solid wire with copper coated for GMAW for surfacing. Used for hardfacing parts subject to high impact and medium abrasion. A kind of a universal hardfacing wire used in quarries, mines, steel works, cement works, crushing plants, the wood industry, in the car industry and others.

Main applications: Hardfacing of block presses, crusher jaws, wheel rims, rollers, caterpillar tracks, ploughshares, running surfaces, cutting edges etc

Typical Chemical Composition (%)

C	Si	Mn	Cr	Fe
0.42	2.8	0.4	8.5	Rem.

All Weld Metal Mechanical Properties

Hardness
~60 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	1.0	150-170	25-28	EN 439: M21 (Ar/CO ₂) 12-15 l/min
	1.2	150-220	26-28	

Tool steels have to be preheated to 300-400°C, depending on the thickness and composition.



HBF17

Old reference: MIG HBCrMo17-1

Classification

DIN 8555 : MSG 6-GZ-50-RZ
EN 14700 : S Fe8

Material N° : 1.4122

Description & Applications

Solid wire for GMAW for surfacing. Used for hardfacing parts subject to corrosion and heat as well as for cold working tools. For gas, water and steam valves with service temperatures up to 500°C.

Main applications: Hardfacing and welding of base metals X55CrNiMoV12, X55Cr14, X160CrMoV12

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	Fe
0.4	0.5	0.4	16.5	1.1	Rem.

All Weld Metal Mechanical Properties

Hardness
~53 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	100-150	22-27	EN 439: M1 (Ar+2%CO ₂) 12-15 l/min
	1.0	150-190	25-28	
	1.2	150-220	25-28	
	1.6	180-270	26-32	

Tool steels have to be preheated to 350-450°C, depending on the thickness and composition.

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HBC62

Classification

DIN 8555 : MSG 4-GZ-60-S
EN 14700 : S Fe4

Material N° : 1.3348

Description & Applications

Solid wire for GMAW for surfacing. Composition of high speed steel, used for hardfacing cold working tools as lathe tools, drilling tools, cutting tools.

Main applications: Hardfacing and repairing of high speed steels like 85WMoCrV6.5.4.2, 1.3339, 1.3333 and others.

Typical Chemical Composition (%)

C	Si	Mn	Cr	Mo	V	W	Fe
1.0	0.4	0.2	3.6	8.5	1.8	1.6	Rem.

All Weld Metal Mechanical Properties

Hardness
~62 HRC

Welding Current & Instructions

Welding mode	Wire Ø (mm)	Welding parameters		Shielding Gas
		Pulsed arc (A)	(V)	
GMAW = +	0.8	100-150	22-27	EN 439: M1 (Ar+2%CO ₂) 12-15 l/min
	1.0	150-190	25-28	
	1.2	150-220	25-28	
	1.6	180-270	26-32	

Tool steels have to be preheated to 350-450°C, depending on the thickness and composition.

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