

## Ni-base electrode

### Classification

AWS A5.4 : E383-16  
EN 1600 : E 27 31 4 Cu L R 12

### General description

**A rutile-basic all position fully austenitic NiCrMoCu electrode**  
**Especially for phosphoric and sulphuric acid plants**  
**Designed for Mo and Cu alloyed high NiCr-alloyed grades**  
**Very smooth bead appearance and easy slag release**  
**Also approved for welding dissimilar metals for service up to 450°C**  
**High resistance to pitting (PREN ~40)**

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

AC / DC +

### Approvals

TÜV  
+

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo	Cu	Fe	FN (acc. WRC 192)
0.02	0.8	0.9	31.0	27.1	3.5	0.9	35.8	0

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) +20°C
Required: AWS A5.4	not required	min. 520	min. 30	not required
EN 1600	min. 240	min. 500	min. 25	not required
Typical values AW	440	640	38	70

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	350
Unit: PE tube	Pieces / unit	91	66	45
	Net weight/unit (kg)	1.8	2.0	2.0

Identification Imprint: NICRO 31/27

Tip Color: orange

NiCro 31/27: rev. EN 22

## Materials to be welded

Steel grades	Standard	Type	Mat. Nr	ASTM/ACI	UNS
<b>Copper alloyed CrNiMo and NiCrMo steels</b>					
	EN 10088-1/-2	X1NiCrMoCu 31 27 4	1.4563	Alloy 28	N08028
		X1NiCrMoCu 25-20-5	1.4539	Alloy 904L	N08904
	DIN 17744	NiCr 21 Mo	2.4858	Alloy 825	N08825
		NiCr 21 Mo 6Cu	2.4641	Alloy 825 h Mo	N08821
		X3NiCrMoTi 27 23	1.4503		

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5x350	45-70	DC+	52	95	0.84	21.3	83	1.75
3.2x350	70-95	DC+	56	132	1.3	31.2	48	1.49
4.0x350	110-150	DC+	53	198	2.0	46.0	34	1.56

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	65A	70A	70A	60A	60A	60A
3.2	95A	95A	95A	80A	80A	80A
4.0	120A	120A				

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm  
Interpass temperature max. 150°C

## Ni-base electrode

### Classification

AWS A5.11/A5.11M : ENiCrMo-3  
 ISO 14172 : E Ni 6625 (NiCr22Mo9Nb)

### General description

Fully basic Ni-base high CrMoNb alloyed austenitic all position electrode  
 Extreme high resistance to general and intergranular corrosion, pitting and crevice corrosion and stress corrosion cracking  
 Suitable for welding dissimilar joints; high resistance to hot cracking  
 High resistance to high temperature oxidation (max. 1200°C) and carburization  
 Good impact values at low temperatures (down to -196°C), suitable for 9% Ni steel

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

DC +

### Approvals

TÜV  
 +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo	Nb	Fe
0.03	0.5	0.35	62	22	9	3.4	2

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -196°C
Required: AWS A5.11	not required	min. 760	min. 30	not required
ISO 14172	min. 420	760	min. 27	not required
Typical values AW	510	770	44	92

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	300	300	350
Unit: PE tube	Pieces / unit	94	61	45
	Net weight/unit (kg)	1.6	1.7	2.1

### Identification

Imprint: NiCrMo-3 / NICRO 60/20

Tip Color: green

NiCro 60/20: rev. EN 21

## Materials to be welded

Steel grades	DIN/EN	Mat. Nr	ASTM/ACI	UNS
<b>NiCrMo-steel type alloy 625 and welding dissimilar high NiCrMo-steels for corrosion and heat resisting purposes</b>				
	X1NiCrMoCuN25-20-6	1,4529	Alloy 925	N08925
	X1NiCrMoCu25-20-5	1,4539	Alloy 904L	N08904
	X1CrNiMoCuN20-18-7	1,4547	Alloy 254	S31254
	X2NiCrAlTi32-20	1,4558	Alloy 800L	N08800
	G-X10NiCrNb32-20	1,4859		
	X10NiCrAlTi32-20	1,4876	Alloy 800/800H	N08800/-10
	NiCr22Mo6Cu	2,4618	Alloy G	N06007
	NiCr22Mo7Cu	2,4619	Alloy G-3	N06985
	NiCr21Mo6Cu	2,4641	Alloy 825hMo	N08821
	NiCr20CuMo	2,4660	Alloy 20	N08020
	NiCr15Fe	2,4816	B168-Alloy 600	N06600
	NiCr22Mo9Nb	2,4856	B443-Alloy 625	N06625
	NiCr21Mo	2,4858	B424-Alloy 825	N08825
	NiCr20Ti	2,4951	Alloy 75	N06075
	NiCr20TiAl	2,4952	Alloy 80A	N07080
<b>Low Alloyed steels</b>				
	10Ni14 (3.5% Ni)	1,5637	ASTM A333 Grade 3	-
	12Ni19, X12Ni5	1,5680	-	K41583
<b>9% Ni steel for LNG storage tanks</b>				
	X8Ni9 (9% Ni)	1,5662	A353/A353M	-
	X8Ni9 (9% Ni)	1,5662	A553/A553M Type I	-
	(8% Ni)		A553/A553M Type II	K71340

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	45 - 70	DC+	44	80	0.95	17.2	87	1.51
3.2 x 300	70 - 100	DC+	44	101	1.5	26.8	55	1.48
4.0 x 350	100 - 130	DC+	53	215	2.2	46.4	30	1.41

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	60A	55A	60A	60A	60A	60A
3.2	90A	80A	85A	80A	80A	80A
4.0	120A	120A				

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm

Interpass temperature max. 150°C

## Ni-base electrode

### Classification

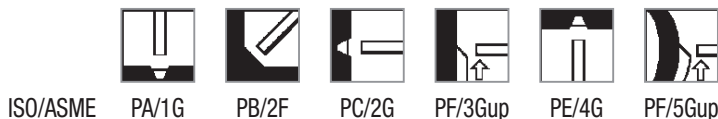
AWS A5.11/A5.11M : ENiCrFe-2\*  
 ISO 14172 : E Ni 6182\* (NiCr15Fe6Mn)

\*: Deviation, see remarks

### General description

Fully basic all position NiCr electrode  
 High creep resistance up to 815°C  
 High resistance to embrittlement  
 High toughness at low temperature (-196°C)  
 For welding, Ni base alloys (as Alloy 600) and dissimilar joints  
 High resistance to carburization

### Welding positions



### Current type

DC +

### Approvals

TÜV  
 +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Nb	Fe
0.02	4.4	0.45	68.4	18	1.9	6

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					+20°C	-196°C
Required: AWS A5.11		not required	min. 550	min. 30	not required	
ISO 14172		min. 360	min. 550	min. 27	not required	
Typical values	AW	430	680	40	145	130

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	300	300	350
Unit: PE tube	Pieces / unit	90	57	43
	Net weight/unit (kg)	1.6	1.9	2.1

### Identification

Imprint: NICRO 70/15

Tip Color: silver

NiCro 70/15: rev. EN 21

# NiCro 70/15

## Materials to be welded

Steel grades	BS 3076	DIN 17742 SEW 470/595	Mat. Nr	ASTM / ACI B366	UNS
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## Ni base on Cr alloyed steels for high and low temperature service

		LC-NiCr15Fe	2.4817		N06600
NA14		NiCr15Fe	2.4816	Alloy600/B168	N06600
		NiCr23Fe	2.4851	Alloy601(H)	N06601
		NiCr60 15	2.4867		
		NiCr80 20	2.4869		
		NiCr20Ti	2.4951	Alloy75	N06075
		NiCr20TiAl	2.4952	Alloy80A	N07080
NA17		X12NiCrSi36 16	1.4864	330	N08330
		G-X10NiCrNb32 20	1.4859		
NA15		X10NiCrAlTi32 20	1.4876	Alloy800/800H	N08800/ N08810

Suitable for welding dissimilar metals:

- Mild- and low-alloyed steel to stainless steel
- Mild- and low-alloyed steel to Ni base alloys
- Stainless steel to low-alloyed creep resisting steel

Not sensitive for embrittlement after heat treatment

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	45 - 60	DC+	44	63	0.9	17.5	91	1.59
3.2 x 300	70 - 100	DC+	52	107	1.3	29.2	52	1.54
4.0 x 350	90 - 160	DC+	61	214	2.0	51.0	29	1.47

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	60A	55A	60A	60A	60A	60A
3.2	90A	80A	90A	80A	80A	80A
4.0	120A	120A				

## Remarks/ Application advice

Deviations: chemical composition

Mn = 3.0 - 6.0%

Cr = max. 18.0%

Welding with Heat-Input max. 1.5 kJ/mm

Interpass temperature max. 150°C

AWS: Mn = 1.0 - 3.5%

AWS: Cr = max. 17.0%

ISO: Mn = 5.0 - 10%

ISO: Cr = max. 17%

## Ni-base electrode

### Classification

AWS A5.11/A5.11M : ENiCrFe-3  
 ISO 14172 : E Ni 6182 (NiCr15Fe6Mn)

### General description

Fully basic all position NiCr electrode  
 For welding Ni-base alloys (as Alloy 600), claddings and dissimilar metals  
 High creep resistance up to 815°C  
 High resistance to embrittlement  
 High toughness also at low temperature (-196°C)  
 High resistance to carburization  
 Extra alloyed with ~6% Mn to provide hot cracking resistance

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

DC +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	S	Ni	Cr	Nb
0.025	5.5	0.4	0.010	76.1	16	2.0

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -196°C
Required: AWS A5.11		not required	min. 550	min. 30	not required
ISO 14172		min. 360	min. 550	min. 27	not required
Typical values	AW	400	630	40	125

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0	5.0
	Length (mm)	300	300	350	450
Unit: PE tube	Pieces / unit	91	57	39	45
	Net weight/unit (kg)	1.6	1.9	1.9	4.5

Identification Imprint: NiCrFe-3 / NICRO 70/15Mn Tip Color: yellow

NiCro 70/15Mn: rev. EN 21

# NiCr 70/15Mn

## Materials to be welded

Steel grades	BS 3076	DIN 17742 SEW 470/595	Mat. Nr	ASTM / ACI B366	UNS
<b>Ni base on Cr alloyed steels for high and low temperature service</b>					
		LC-NiCr15Fe	2.4817		N06600
	NA14	NiCr15Fe	2.4816	Alloy600/B168	N06600
		NiCr23Fe	2.4851	Alloy601(H)	N06601
		NiCr60 15	2.4867		
		NiCr80 20	2.4869		
		NiCr20Ti	2.4951	Alloy75	N06075
		NiCr20TiAl	2.4952	Alloy80A	N07080
	NA17	X12NiCrSi36 16	1.4864	330	N08330
		G-X10NiCrNb32 20	1.4859		
	NA15	X10NiCrAlTi32 20	1.4876	Alloy800/800H	N08800/N08810

Suitable for welding dissimilar metals:

- Mild- and low-alloyed steel to stainless steel
- Mild- and low-alloyed steel to Ni base alloys
- Stainless steel to low-alloyed creep resisting steel

Not sensitive for embrittlement after heat treatment

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	40 - 70	DC+	80	119	0.52	17.4	86	1.49
3.2 x 300	70 - 100	DC+	77	193	0.84	29.0	56	1.61
4.0 x 350	90 - 140	DC+	74	289	1.7	50.9	29	1.47
5.0 x 450	130 - 160							

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	60A	55A	60A	60A	60A	60A
3.2	90A	80A	90A	80A	80A	80A
4.0	120A	120A				

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm

Interpass temperature max. 150°C



## Ni-base electrode

### Classification

AWS A5.11/A5.11M : ENiCrFe-2\*  
 ISO 14172 : E Ni 6082 (NiCr20Mn3Nb)

\*: Deviation, see remarks

### General description

Fully basic NiCr alloyed all position electrode  
 For welding high Ni alloyed material such as Alloy 600 and Alloy 601  
 Also applicable for welding dissimilar joints and for CMn- and low alloyed clad steel  
 High resistance to oxidation at high temperature  
 High impact values at low temperature (-196°C)

### Welding positions



### Current type

DC +

### Approvals

TÜV  
 +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo	Nb	Fe
0.03	4.7	0.6	67.7	19.0	1.5	1.9	4.0

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
				+20°C	-196°C
Required: AWS A5.11	not required	min. 550	min. 30	not required	
ISO 14172	min. 360	min. 600	min. 22	not required	
Typical values	AW 400	650	40	110	90

### Packaging and available sizes

Unit: PE tube	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	300	300	350
Pieces / unit	76	57	31	
Net weight/unit (kg)	1.5	1.7	1.8	

### Identification

Imprint: NICRO 70/19

Tip Color: blue

NiCrO 70/19: rev. EN 21

## Materials to be welded

Steel grades	BS3076	DIN 17744/17465 SEW 595	Mat. Nr	ASTM/ACI B366	UNS
<b>Ni base to CrNi alloyed steel for composition in highly corrosive environments</b>					
	NA 14	NiCr15Fe	2.4816	B168-Alloy 600	N06600
		LC-NiCr15Fe	2.4817	Alloy 600L	N06600
		NiCr20Ti	2.4951	Alloy 75	
		NiCr20TiA1	2.4952	Alloy 80A	N07080
	NA 15	X10NiCrAlTi32 20	1.4876	Alloy 800/800H	N08800/10
		NiCr23Fe	2.4851	Alloy 601(H)	N06601
	NA 17	X12NiCrSi36 16	1.4864	330	N08330
		G-X40NiCrNb35 25	1.4852		
		G-X40NiCrSi35 25	1.4857	HP	

Suitable for welding dissimilar metals:

- Mild- and low-alloyed steel to stainless steel
- Mild- and low-alloyed steel to Ni base alloys
- Stainless steel to low-alloyed creep resisting steel

Not sensitive for embrittlement after heat treatment

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	45 - 65	DC+	41	61	0.95	19.3	92	1.79
3.2 x 300	70 - 95	DC+	59	127	1.2	32.7	51	1.64
4.0 x 350	100 - 140	DC+	75	314	1.7	59.3	29	1.72

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	60A	55A	60A	60A	55A	60A
3.2	90A	80A	90A	80A	80A	80A
4.0	120A	120A				

## Remarks/ Application advice

Deviations: chemical composition

Mn = 2.0 - 6.0%

AWS: Mn = 1.0 - 3.5%

Cr = 18.0 - 22.0%

AWS: Mn = 13.0 - 17%

Welding with Heat-Input max. 1.5 kJ/mm

Interpass temperature max. 150°C

## Ni-base electrode

### Classification

AWS A5.11/A5.11M : ENiCrMo-4  
 ISO 14172 : E Ni 6276 (NiCr15Mo15Fe6W4)

### General description

A basic all position Ni-base CrMoW-alloyed electrode  
 For welding Alloy C276 and comparable compositions  
 Depending on the corrosion requirements also applicable for welding C-22 and C-4  
 Applicable for surfacing in high temperature applications (up to 1200°C)  
 Suitable for welding low temperature steel such as 5% and 9% Ni steel

### Welding positions



### Current type

DC +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo	W	Fe
0.015	0.5	0.05	57.9	15.5	16.0	3.5	6.5

### Mechanical properties, typical, all weld metal

Condition	Yield Strength (N/mm <sup>2</sup> )	Tensile Strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
				20 °C	-196 °C
Required: AWS A5.11M	not required	min. 690	min. 25	not required	
ISO 14172	min. 400	min. 690	min. 22	not required	
Typical values	AW 550	800	40	60	50

### Packaging and available sizes

Unit: PE tube	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	300	350	350
Pieces / unit	100	63	37	
Net weight/unit (kg)	1.7	1.8	1.9	

Identification Imprint: NiCrMo-4 / NICROMO 60/16 Tip Color: grey

NiCrMo 60/16: rev. EN 22

# NiCrMo 60/16

## Materials to be welded

Steel grades	DIN/EN	Mat. Nr.	ASTM/ACI	UNS
<b>Ni Base high CrMo steel for high corrosion environments</b>				
	NiMo 16Cr15W	2.4819	C-276	N10276
	NiCr21Mo14W	2.4602	C-22	N06022
	NiMo 16Cr16Ti	2.4610	C-4	N06455
<b>9% Ni steel</b>				
	X8Ni9	1.5662	A353/A353M A553/553M Type I A553/553M Type II	
<b>5% Ni steel</b>				
	X12Ni5 (12Ni19)	1.5680		

NiCrMo 60/16 is developed for welding C-276 material

Can also be applied for welding C-22 and C-4, depending on the corrosion requirements

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	40-70	DC+						
3.2 x 350	70-100	DC+	61	137	1.34	32.5	44	1.43
4.0 x 350	90-140	DC+	65	219	1.92	50.9	29	1.47

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	60A	55A	60A	60A	60A	60A
3.2	90A	80A	85A	80A	80A	80A
4.0	130A	130A	120A	120A	120A	120A

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm

Interpass temperature max. 150°C

## Ni-base electrode

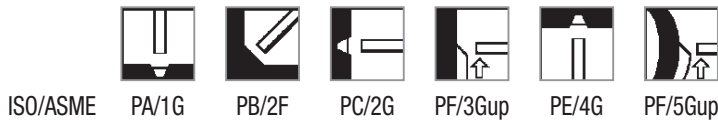
### Classification

AWS A5.11/A5.11M : ENiCrMo-13  
 ISO 14172 : E Ni 6059 (NiCr23Mo16)

### General description

Basic coated 22%Cr and 16% Mo alloyed Ni-base electrode for all positions without vertical down  
 Excellent resistance against pitting-, crevice and stress corrosion in sulphur and phosphorus environments also at higher temperature  
 Suitable for welding Alloy 59 (UNS N06059), Alloy C 276 (UNS N10276), C4 (UNS N06455) and C 22 (UNS N06022) in the chemical industry  
 Suitable for dissimilar joints such as mentioned above to low alloyed steel grades  
 Wear resistant overlays for high temperature applications  
 Also for superaustenitic steel alloyed with 6% Mo (UNS S 31254)

### Welding positions



### Current type

DC +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo
0.015	0.4	0.15	59.0	22.5	15.5

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) +20°C
Required: AWS A5.11	not required	min. 690	min. 25	not required
ISO 14172	min. 350	min. 690	min. 22	not required
Typical values	AW 450	720	30	75

### Packaging and available sizes

	Diameter (mm)	2.5	3.2
	Length (mm)	300	350
Unit: PE tube	Pieces / unit	85	52
	Net weight/unit (kg)	1.7	1.8

Identification Imprint: NiCrMo-13 / NICROMO 59/23 Tip Color: light green

NiCrMo 59/23: rev. EN 22

# NiCrMo 59/23

## Materials to be welded

Steel grades	Standard	Type	Mat. Nr	ASTM/ACI	UNS
<b>Ni base alloys with high CrMo content</b>					
	DIN 17744	NiCr23Mo16	2.4605		N06059
		NiMo16Cr16Ti	2.4610	C-4	N06455
		NiMo16Cr15Ti	2.4819	C-276	N10276
		NiCr21Mo14W	2.4602	C-22	N06022
		NiCr22 Mo 9Nb	2.4856	625	N06625
<b>High Mo stainless steel for high corrosion environments</b>					
	EN 10088-1/-2	X1 NiCrMoCuN25-20-7	1.4529	904hMo	N08925
		X1 CrNiMoCuN20-18-7	1.4547		S31254

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	50 - 70	DC+	48	56	0.8	21.7	94	1.61
3.2 x 350	70 - 100	DC+	60	149	1.3	36.8	46	

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G
2.5	65A	65A	60A
3.2	90A	90A	80A

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm  
Interpass temperature max. 150°C

## Ni-base electrode

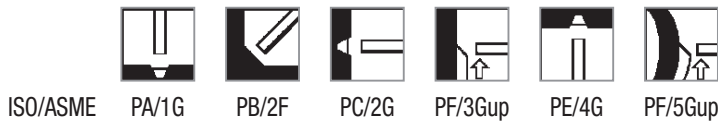
### Classification

AWS A5.11/A5.11M : ENiCu-7  
 ISO 14172 : E Ni 4060 (NiCu30Mn3Ti)

### General description

Basic all position electrode for welding CuNi and NiCu-alloys  
 High resistance to seawater corrosion (not stagnant)  
 Applicable for welding NiCu-alloys to mild and low alloyed steel  
 Very suitable for welding salt fabrication components  
 Excellent weldability and self releasing slag

### Welding positions



### Current type

DC +

### Approvals

TÜV  
 +

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cu	Fe	Ti
0.03	3.0	0.4	64.5	30	1.75	0.35

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -196°C
Required: AWS A5.11M	not required	min. 480	min. 30	not required
ISO 14172	min. 200	min. 480	min. 27	not required
Typical values	AW 300	485	40	110

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	300	350	350
Unit: PE tube	Pieces / unit	105	61	45
	Net weight/unit (kg)	1.7	1.9	2.1

### Identification

Imprint: NiCu-7 / NICU 70/30

Tip Color: black

NiCu 70/30: rev. EN 22

# NiCu 70/30

## Materials to be welded

Steel grades	BS3076	DIN 17743	Mat. Nr	ASTM/ACI	UNS
	NA 13	NiCu30Fe	2.4360	Monel 400	N04400
		G-NiCu30Nb	2.4365		
	NA 18	NiCu30Al	2.4375	Monel K500	N05500

The NiCu 70/30 is also applicable for welding mild, low alloy, and stainless steels to CuNi and NiCu alloys

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 300	45 - 70	DC+	50	72	0.80	20.7	90	1.85
3.2 x 350	70 - 90	DC+	65	129	1.2	32.5	46	1.49
4.0 x 350	90 - 130	DC+	67	245	1.75	47.17	31	1.51

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	65A	60A	65A	55A	55A	55A
3.2	90A	85A	90A	75A	75A	75A
4.0						

## Remarks/ Application advice

Welding with Heat-Input max. 1.5 kJ/mm  
Interpass temperature max. 150°C



## Ni-base electrode

### Classification

AWS A5.11/A5.11M : ENiCrMo-6  
 ISO 14172 : E Ni 6620 (NiCr14Mo7Fe)

### General description

Basic high recovery all position electrode for welding low temperature steels  
 Recovery of approximately 150%, providing high deposition rates  
 Especially developed for welding 9% Ni steel  
 Linear expansion coefficient equivalent to that of 9% Ni steel  
 Excellent impact toughness at -196°C, reliable 0.2%-Yield strength  
 Weldable on AC as well as DC+ polarity  
 Only available in Sahara ReadyPack (vacuum sealed)

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

AC / DC +

### Approvals

GL	TÜV
5680	+

### Chemical composition (w%), typical, all weld metal

C	Mn	Si	Ni	Cr	Mo	Nb	W	Fe
0.05	3.0	0.4	68	13	6	1.5	1.5	6

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
				+20°C	-196°C
Required: AWS A5.11M	not required	min. 620	min. 35	not required	
ISO 14172	min. 350	min. 620	min.32	not required	
Typical values	AW 475	725	40	100	90

### Packaging and available sizes

Unit: SRP	Diameter (mm)	2.5	3.2	4.0	5.0
		Length (mm)	350	350	350
	Pieces / unit	62	52	27	10
	Net weight/unit (kg)	1.7	2.2	1.8	1.5

### Identification

Imprint: NiCrMo-6 / NYLOID 2

Tip Color: white

Nyloid 2: rev. EN 22

## Materials to be welded

Steel grades	EN 10028-4	Mat. Nr	ASTM	UNS
<b>9% Ni steel for LNG storage tanks</b>				
	X8Ni9	1.5662	A353/A353M	
	X8Ni9 (9% Ni) (8% Ni)	1.5662	A553/A553M Type I A 553/A553M Type II	K71340
<b>Low alloyed steel for cryogenic applications</b>				
	X12Ni5 (12Ni19)	1.5680		K41583
	10Ni14 (3.5% Ni)	1.5637	A333 Grade 3	
	12Ni14 (3.5% Ni)	1.5637	A202 Grade E	

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 350	70 - 100	AC	54	128	1.3	26.5	53	1.39
3.2 x 350	85 - 145	AC	63	229	1.8	43.6	31	1.37
4.0 x 350	140 - 190	AC	73	355	2.4	65.8	21	1.33
5.0 x 450	180 - 280	AC	94	764	3.7	133.5	10	1.35

\* stub end 35 mm

## Welding parameters, optimum fill passes

Welding positions Diameter (mm)	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G	PF/5G up
2.5	90 - 100A	90 - 100A	90 - 100A	90 - 100A	90 - 100A	80 - 100A
3.2	135 - 145A	135 - 145A	135 - 145A	125 - 135A	125 - 135A	120 - 135A
4.0	170 - 185A	170 - 185A	170 - 185A	140 - 165A		
5.0	220 - 270A	220 - 280A				

## Remarks/ Application advice

Recommended Heat-Input for plate thickness:

≤ 15 mm: 1.4 kJ/mm

15 - 20 mm: 1.6 kJ/mm

< 20 mm: 2.0 kJ/mm