

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6182 (NiCr15Fe6Mn)	E NiCrFe-3	2.4807

Characteristics and field of use

UTP 7015 is employed for joining and surfacing of nickel-base materials. UTP 7015 is also recommended for welding different materials, such as austenitic to ferritic steels, as well as for weld claddings on unalloyed and low-alloyed steels, e. g. for reactor construction.

Weldable in all positions, except vertical down. Stable arc, good slag removability. The seam is finely rippled and notch-free. The weld deposit has a fully austenitic structure and is high-temperature resistant. Not prone to embrittlement either at high or low temperatures

The preheating must be matched to the parent metal. Any thermal post-treatments can be applied without regard for the weld metal.

Typical analysis in %

C	Si	Mn	Cr	Ni	Nb	Fe
0,025	0,4	6,0	16,0	balance	2,2	6,0

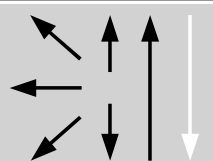
Mechanical properties of the weld metal

Yield strength $R_{p0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V	Hardness Brinell
MPa	MPa	%	J	-196 °C
400	670	40	120	80
				approx. 170

Welding instruction

Opening angle of the prepared seam approx. 70°, root gap approx. 2 mm. The stick electrode is welded with a slight tilt and short arc. Use string beads welding technique. The interpass temperature of 150° C and a max. weaving width 2,5 x diameter of the stick electrode core wire should not be exceeded. Redry stick electrode prior welding for 2 – 3 h at 250 – 300° C, welding out of a hot stick electrode carrier.

Welding positions



Current type DC (+)

Approvals

TÜV (No. 00875), GL, DNV, KTA (No. 08036)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 300	4,0 x 350	5,0 x 400
Amperage [A]	50 – 70	70 – 95	90 – 120	120 – 160

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6025 (NiCr25Fe10AlY)	E NiCrFe-12	2.4649

Characteristics and field of use

UTP 6225 AI is suitable for joining high-temperature and heat resistant nickel-base alloys of identical and similar nature, such as 2.4633 (NiCr25-FeAlY), 2.4851 (NiCr23Fe) and high nickel containing cast alloys.

The special features of the weld metal include an excellent resistance against oxidation and carburization and a good creep rupture strength. For service temperature up to 1200° C, e. g. steel tubes, rolls and baffles in ovens, ethylene cracking tubes, muffles.

Typical analysis in %

C	Si	Mn	Cr	Ni	Ti	Zr	Al	Fe	Y
0,2	0,6	0,1	25,0	balance	0,1	0,03	1,8	10,0	0,02

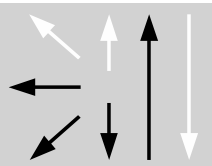
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_v
MPa	MPa	%	J
> 500	> 700	> 15	> 30

Welding instruction

Hold stick electrode as vertically as possible, keep a short arc. Use string beads technique and fill end crater carefully. Interpass temperature max. 150° C. Redry stick electrodes for 2 – 3 h / 250 – 300° C.

Welding positions



Current type DC (+)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 300	4,0 x 350
Amperage [A]	50 – 65	80 – 95	90 – 120

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6625 (NiCr22Mo9Nb)	E NiCrMo-3	2.4621

Characteristics and field of use

UTP 6222 Mo is particularly suited for joining and surfacing on nickel alloys, austenitic steels, low temperature nickel steels, austenitic-ferritic-joints and claddings of the same or similar nature, like 2.4856 (NiCr22Mo 9 Nb), 1.4876 (X30 NiCrAlTi 32 20), 1.4529 (X2 NiCrMoCu 25 20 5).

The weld metal is heat resistant and suitable for operating temperatures up to 1000° C. It must be noted that a slight decrease in ductility will occur if prolonged heat treatment is given within the temperature range 600 - 800° C. Scale-resisting in low-sulphur atmosphere up to 1100° C. High creep strength.

Typical analysis in %

C	Si	Mn	Cr	Mo	Ni	Nb	Fe
0,03	0,4	0,6	22,0	9,0	balance	3,3	< 1

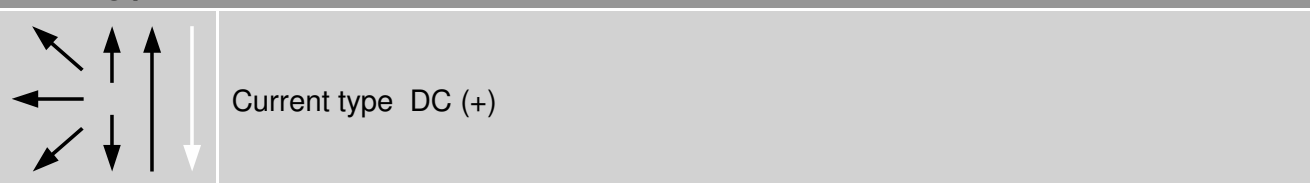
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V	
MPa	MPa	%	J	-196 °C
> 450	> 760	> 30	> 75	45

Welding instruction

Opening angle of the prepared seam approx. 70°, root gap approx. 2 mm. Weld stick electrode with slight tilt and short arc. String beads are welded. The interpass temperature of 150° C and a max. weaving with 2,5 x diameter of the stick electrode core wire should not be exceeded. Redry the stick electrodes 2 – 3 hours at 250 – 300° C before use and weld them out of a warm electrode carrier.

Welding positions



Approvals

TÜV (No. 03610), DNV, ABS, GL, BV

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 300	4,0 x 350	5,0 x 400
Amperage [A]	50 – 70	70 – 95	90 – 120	120 – 160

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6117 (NiCr22Co12Mo)	ENiCrCoMo-1 (mod.)	2.4628

Characteristics and field of use

UTP 6170 Co is suitable for joining high-temperature and similar nickel-base alloys, heat resistant austenitic and cast alloys, such as 2.4663 (NiCr23Co12Mo), 2.4851 (NiCr23Fe), 1.4876 (X10 NiCrAlTi 32 21), 1.4859 (GX10 NiCrSiNb 32 20). The weld metal is resistant to hot-cracking and is used for service temperatures up to 1100° C. Scale-resistance up to 1100° C in oxidizing and carburized atmospheres, e. g. gasturbines, ethylene production plants.

UTP 6170 Co can be welded in all positions except vertical-down. It has a stable arc. The seam is finely rippled and notch-free. Easy slag removal.

Preheating temperature should be adjusted to the base material. Post weld heat treatments can be applied independently of the weld metal.

Typical analysis in %

C	Si	Mn	Cr	Mo	Ni	Co	Al	Ti	Fe
0,06	0,7	0,1	21,0	9,0	balance	11,0	0,7	0,3	1,0

Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_v
MPa	MPa	%	J
> 450	> 700	> 35	> 80

Welding instruction

Hold stick electrode as vertically as possible, keep a short arc. Use string bead technique. Fill end crater carefully. Interpass temperature max. 150° C. Redry stick electrodes for 2 – 3 h / 250 – 300° C.

Welding positions



Approvals

TÜV (No. 04661)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 300	4,0 x 350
Amperage [A]	55 – 75	70 – 90	90 – 110

Classifications

EN ISO 14172	Material-No.
E Ni 8165 (NiCr25Fe30Mo)	2.4652

Characteristics and field of use

UTP 4225 is suitable for joining and surfacing of alloys of similar nature, such as e. g. NiCr21Mo, furthermore for welding of CrNiMoCu-alloyed austenitic steels used for high quality tank and apparatus construction in the chemical industry, corrosion resistance in media of sulphuric- and phosphoric acid.

The stick electrode can be welded in all positions except vertical-down. Stable arc, easy slag removal. The seam is finely rippled and notch-free. The weld metal UTP 4225 is resistant against pitting and stress corrosion cracking in media containing chloride ions. High resistance against reducing acids due to the combination of nickel, molybdenum and copper. Resistant in oxidising acids. UTP 4225 results in a fully austenitic weld metal.

Typical analysis in %

C	Si	Mn	Cr	Mo	Ni	Cu	Fe
< 0,03	0,4	2,5	26,0	6,0	40,0	1,8	balance

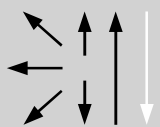
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V
MPa	MPa	%	J
> 350	> 550	> 30	> 80

Welding instruction

The welding zone must be free from residues. Opening angle of the prepared seam 70 - 80°, root gap approx. 2 mm. Weld stick electrode with a slight tilt and with short arc. String beads are welded, if necessary, with little weaving, max. weaving width 2,5 x diameter of the stick electrode core wire. Weldable with very low current adjustment. The end crater should be filled thoroughly and the arc must be drawn away to the side. Re-dry the stick electrodes for 2 - 3 hours at 250 - 300° C before use and weld them out of a warm electrode carrier.

Welding positions



Current type DC (+)

Approvals

TÜV (No. 06680)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	3,2 x 350	4,0 x 350
Amperage [A]	70-100	90-120

Classifications

EN ISO 3581-A	Material-No.
EZ 25 35 Nb B 6 2	1.4853

Characteristics and field of use

UTP 2535 Nb is suitable for joining and surfacing of heat resistant CrNi-cast steels (centrifugal- and mouldcast parts) of the same or of similar nature, such as

1.4848	G-X 40 CrNiSi 25 20
1.4852	G-X 40 NiCrSiNb 35 26
1.4857	G-X 40 NiCrSi 35 26

It is used for operating temperatures up to 1150° C in carburized low-sulphur combustion gas, e. g. reforming ovens in petrochemical plants.

Typical analysis in %

C	Si	Mn	Cr	Ni	Nb	Ti	Fe
0,4	1,0	1,5	25,0	35,0	1,2	0,1	balance

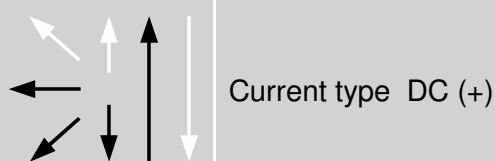
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A
MPa	MPa	%
> 480	> 700	> 8

Welding instruction

Hold stick electrode vertically with a short arc and lowest heat input. String beads are welded. The interpass temperature of 150° C should not be exceeded. Redry stick electrodes for 2 – 3 hours at 250 – 300° C

Welding positions



Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 350	4,0 x 400	5,0 x 400
Amperage [A]	50 – 70	70 – 120	100 – 140	

Classifications

EN ISO 3581-A	Material-No.
EZ 21 33 B 4 2	~ 1.4850

Characteristics and field of use

UTP 2133 Mn is suitable for joining and surfacing of heat-resistant steels and cast steels of the same or of similar nature, such as

1.4876 X10 NiCrAlTi 32 20	UNS	N 08800
1.4859 G-X10 NiCrNb 32 20		
1.4958 X 5 NiCrAlTi 31 20	UNS	N 08810
1.4959 X 8 NiCrAlTi 31 21	UNS	N 08811

It is used for operating temperatures up to 1050° C in carburized low-sulphur combustion gas, e. g. in petrochemical plants.

Typical analysis in %

C	Si	Mn	Cr	Ni	Nb	Fe
0,14	0,5	4,5	21,0	33,0	1,3	balance

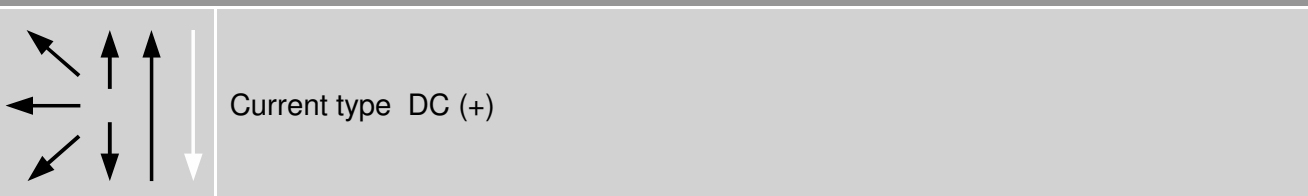
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_v
MPa	MPa	%	J
> 410	> 600	> 25	> 50

Welding instruction

Hold stick electrode vertically with a short arc and lowest heat input. String beads are welded. The interpass temperature of 150° C should not be exceeded. Redry stick electrodes for 2 – 3 h at 250 – 300° C.

Welding positions



Approvals

TÜV (No. 07713)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 350	4,0 x 400
Amperage [A]	50 – 75	70 – 110	90 – 140

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6276 (NiCr15Mo15Fe6W4)	E NiCrMo-4	2.4887

Characteristics and field of use

Joint welding of matching base materials, as Material-No. 2.4819 (NiMo16Cr15W) and surfacing on low-alloyed steels. It is employed primarily for welding components in plants for chemical processes with highly corrosive media, but also for surfacing press tools, punches etc. which operate at high temperatures.

In addition to its exceptional resistance to contaminated mineral acids, chlorine-contaminated media, and chloride containing media, it resists strong oxidisers such as ferric and cupric chlorides and is one of the few materials which will resist wet chlorine gas.

The stick electrode can be welded in all positions except vertical-down. Stable arc, easy slag removal.

Typical analysis in %

C	Si	Mn	Cr	Mo	Ni	W	Fe
< 0,02	< 0,2	0,6	16,5	16,5	balance	4,0	5,0

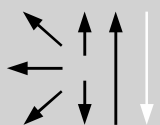
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V
MPa	MPa	%	J
> 450	> 720	> 30	> 70

Welding instruction

For avoidance of intermetallic precipitation the stick electrode should be welded with lowest possible heat input and minimum interpass temperature. Beam width of the prepared seam approx. 70°, root gap approx. 2 mm. Weld stick electrode with slight tilt and with a short arc. String beads are welded. The interpass temperature of 150° C and a max. weaving width 2,5 x diameter of the stick electrode core wire should not be exceeded. Redry the stick electrodes 2 – 3 hours at 250 – 300° C before use and weld them out of a warm stick electrode carrier.

Welding positions



Current type DC (+)

Approvals

TÜV (No. 05257)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 300	4,0 x 350
Amperage [A]	50-70	70-100	90-130

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6059 (NiCr23Mo16)	E NiCrMo-13	2.4609

Characteristics and field of use

UTP 759 Kb is employed primarily for welding components in environmental plants and plants for chemical processes with highly corrosive media. Joint welding of matching base materials as Material-No. 2.4605 or similar matching materials as material No 2.4602 NiCr21Mo14W. Joint welding of these materials with low-alloyed steels. Cladding on low-alloyed steels.

In addition to its good resistance to contaminated oxidating mineral acids, acetic acids and acetic anhydrides, hot contaminated sulphuric - and phosphoric acid, UTP 759 Kb has an excellent resistance against pitting and crevice corrosion. The special composition of the coating extensively prevents the precipitation of intermetallic phases.

UTP 759 Kb can be welded in all positions except vertical down. Stable arc, easy slag removal.

Typical analysis in %

C	Si	Mn	Cr	Mo	Ni	Fe
< 0,02	< 0,2	0,5	22,5	15,5	balance	1,0

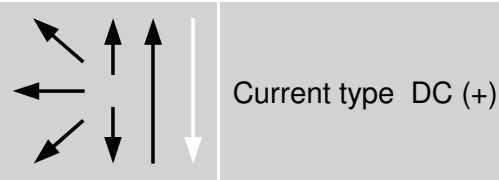
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_v
MPa	MPa	%	J
> 450	> 720	> 30	> 60

Welding instruction

Opening angle of the prepared seam approx. 70° C, root gap approx. 2 mm. Weld stick electrode with slight tilt and with a short arc. String beads are welded. The interpass temperature of 150° C and a max. weaving width 2,5 x diameter of the stick electrode core wire should not be exceeded. Re-dry the stick electrodes 2 – 3 hours at 250 – 300° C before use and weld them out of a warm stick electrode carrier.

Welding positions

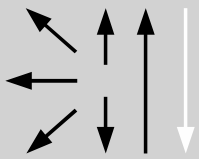


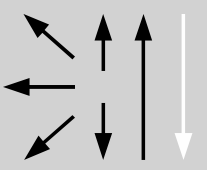
Approvals

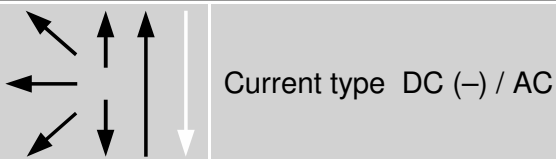
TÜV (No. 06687)

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 300	4,0 x 350
Amperage [A]	50 – 70	70 – 100	90 – 130

Classifications					
EN ISO 2560-A		AWS A5.1			
E 42 3 B32 H10		E 7018			
Characteristics and field of use					
<p>UTP 614 Kb is a double coated stick electrode with a universally suited application field. It is used in industry, trade, as well as in production and repair welds for diverse base materials.</p> <p>Due to a special coating formula UTP 614 Kb shows a smooth and finely rippled weld seam, a stable arc, easy slag removal, and a very slight increase of the weld, as well as a notch-free seam. The weld metal is little affected by steel impurities. Due to the double coating the stick electrode is excellently suited for root- and out-of-position welding. Recovery 120%, H₂ content < 8 ml/100g.</p>					
Base materials					
Unalloyed construction steels					
S235JRG2 – S355J2; E295, E335, St35, St 45, St 35.8, St45.8, St50-2					
Boiler steels P235GH, P265GH, P295GH					
Fine-grained steels up to S355N					
Shipbuilding steels A – E, AH - EH					
Cast steels C 35, GS-38, GS-45					
Typical analysis in %					
C	Si	Mn	Fe		
0,06	0,7	0,9	balance		
Mechanical properties of the weld metal					
Yield strength R _{p0,2}		Tensile strength R _m		Elongation A	
MPa		MPa		%	
> 420		> 510		> 22	
				Impact strength K _v	
				J	
				-30°C	
				> 100	
				> 47	
Welding instruction					
<p>Ignite the electrode and stay at the ignition point until the electric arc is fully stabilised. Keep a short arc during the welding process. Hold stick electrode vertical to the weldment with slight weaving. Redrying: 2 – 3 h at 250 – 300°C. Only use dry stick electrodes</p>					
Welding positions					
 <p>Current type DC (+) / AC</p>					
Approvals					
TÜV (No. 10571), DB (No. 10.138.03), GL, BV, DNV, ABS, LR					
Recommended welding parameters					
Electrodes Ø x L [mm]	2,5 x 350	3,2 x 350	3,2 x 450	4,0 x 450	5,0 x 450
Amperage [A]	60 – 90	100 – 140	100 – 140	140 – 180	190 – 250

Classifications				
EN ISO 2560-A		AWS A5.1		
E 42 5 B42 H5		~ E 7018-1 H4 R		
Characteristics and field of use				
<p>UTP 613 Kb is a basis-coated stick electrode for construction-, boiler-, tube- and fine-grained steels as well as for steels with up to 0,35% C-content. It is recommended especially for the following base metal.</p> <p>UTP 613 Kb has a good weldability and a stable arc. The weld metal is resistant to ageing, crack resistant and is little affected by steel impurities.</p>				
Base materials				
Construction steels	St 34 - St 60			
Fine-grained-steels	St E 255 - 355			
Boiler steels	H I - H II, 17 Mn 4			
Tube steels	St 35 - St 55, St 35.8, St 45.8			
Cast steels	GS 38 - GS 52			
Typical analysis in %				
C	Si	Mn	Fe	
0,07	0,4	1,1	balance	
Mechanical properties of the weld metal				
Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V	
MPa	MPa	%	J	
> 420	> 510	> 25	> 120	
Welding instruction				
<p>Keep a short arc during the welding process. Weld dry stick electrodes only. Re-drying: 2 – 3 h at 250 – 300° C. Preheat weldment if necessary</p>				
Welding positions				
 <p>Current type DC (+)</p>				
Approvals				
TÜV (No. 00794), DB (No. 10.138.02), ABS, BV, DNV				
Recommended welding parameters				
Electrodes $\varnothing \times L$ [mm]	2,5 x 350	3,2 x 350	4,0 x 350	5,0 x 450
Amperage [A]	80 – 100	110 – 150	140 – 200	170 – 210

Classifications						
EN ISO 2560-A	AWS A5.1					
E 38 0 RR 12	~ E 6013					
Characteristics and field of use						
<p>UTP 611 is a strongly coated stick electrode for joining and surfacing on all kind of steel constructions. It is used in autobody- and wagon industry, boiler construction and shipbuilding.</p> <p>UTP 611 is very easy weldable in all positions except vertical down. It possesses excellent welding properties. Very easy slag removal. Smooth, finely rippled weld seam surface. The stick electrode can be applied within a wide amperage range.</p>						
Base materials						
<p>Construction steel St 34 - St 52 Boiler steels H I - H II, WStE 255, 17 Mn 4 Tube steels St 35 , St 45, St 35.8, St 45.8, StE 210.7 - StE 360.7</p>						
Typical analysis in %						
C	Si	Mn	Fe			
0,07	0,5	0,6	balance			
Mechanical properties of the weld metal						
Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_v			
MPa	MPa	%	J			
> 380	> 510	> 22	> 47			
Welding instruction						
<p>UTP 611 is welded with a short to medium-long arc with slight weaving. It is also very good suited as contact electrode for string beads. The stick electrode should be held at a slight angle to the base material.</p> <p>Re-drying: 2 – 3 h at 250 – 300°C.</p>						
Welding positions						
						
Approvals						
TÜV (No. 02180), DB (No. 10.138.08), DNV						
Recommended welding parameters						
Electrodes $\varnothing \times L$ [mm]	2,0 x 300	2,5 x 350	3,2 x 350	3,2 x 450	4,0 x 450	5,0 x 450
Amperage [A]	40 – 70	60 – 90	90 – 140	90 – 140	140 – 190	190 – 230

Classifications

EN ISO 1071	AWS A5.15
E C NiFe-1 3	E NiFe-CI

Characteristics and field of use

UTP 85 FN is suitable for surfacing and joining of all grades of cast iron, particularly nodular cast iron (GGG 38-60) and for joining these materials with steel and cast steel.

UTP 85 FN has excellent welding properties and a smooth, regular flow, a high deposition rate and a finely rippled bead appearance. Very economic for construction and production welding on nodular cast iron parts. High current carrying capacity thank to a bimetallic core wire.

Typical analysis in %

C	Ni	Fe
1,2	54,0	balance

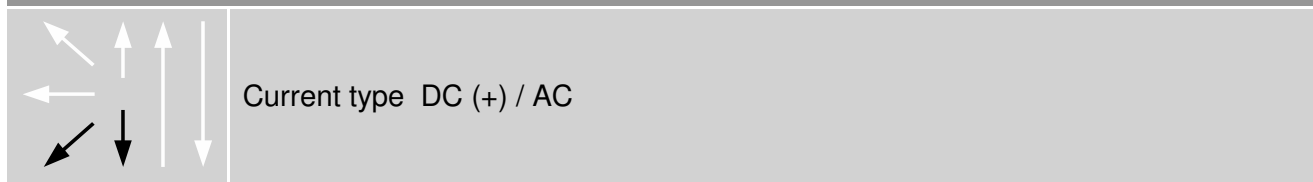
Mechanical properties of the weld metal

Yield strength $R_{P0,2}$	Hardness
MPa	HB
approx. 320	approx. 200

Welding instruction

Prior to welding, the casting skin has to be removed from the welding area. Hold the stick electrode vertically and with a short arc. Apply string beads – if necessary, with very little weaving. Peen the deposit after slag removal for the purpose of stress relief. Avoid high heat concentration.

Welding positions



Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 350	4,0 x 350	5,0 x 400
Amperage [A]	50 – 70	70 – 100	100 – 130	130 – 160

Classifications

EN ISO 1071	AWS A5.15
E C NiFe-11	E NiFe-CI

Characteristics and field of use

UTP 83 FN is suitable for surfacing and joining of all commercial cast iron grades, such as lamellar grey cast iron and nodular cast iron, malleable cast iron and for joining these materials to steel or cast steel. This stick electrode is particularly used where a high deposition rate is needed.

UTP 83 FN has an excellent melting performance and the easily controllable transfer provides a spatterfree deposit of perfect appearance. The weld deposit is easily machinable with cutting tools, tough and crack-resistant.

Hardness of the pure weld metal: approx. 190 HB

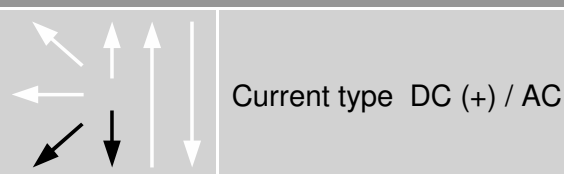
Typical analysis in %

C	Ni	Fe
1,3	52,0	balance

Welding instruction

The casting skin and impurities have to be removed from the welding area. Weld with low amperage and short arc. For the purpose of stress relief in case of difficult weldings, peen the weld metal and reduce the heat input by welding short beads.

Welding positions



Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 350	4,0 x 350
Amperage [A]	50 – 70	70 – 100	100 – 130

Classifications		
EN ISO 14172	AWS A5.11	Material-No.
E Ni 2061 (NiTi3)	E Ni-1	2.4156

Characteristics and field of use

UTP 80 Ni is suited for joining and surfacing on commercial pure nickel grades, including LC nickel, nickel alloys and nickel-clad steels. These materials are employed primarily in the construction of pressure vessels and apparatus in the chemical industry, in the food industry and for power generation, where good behaviour under corrosion and temperature is demanded.

UTP 80 Ni is weldable in all positions, except vertical-down, and gives smooth, notch-free seams.

Typical analysis in %						
C	Si	Mn	Ni	Ti	Al	Fe
< 0,02	0,8	0,25	balance	2,0	0,2	0,1

Mechanical properties of the weld metal			
Yield strength $R_{P0,2}$	Tensile strength R_m	Elongation A	Impact strength K_V
MPa	MPa	%	J
> 300	> 450	> 30	> 160

Welding instruction

Weld with dry stick electrodes only! Prior to welding the stick electrodes must be dried 2 – 3 hours at 250 – 300° C. Clean the weld zone thoroughly. The V angle of the seam should not be less than 70°. Weld with short arc, avoiding weaving as much as possible.

Welding positions



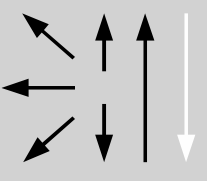
Current type DC (+)

Approvals

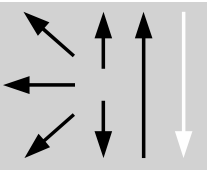
TÜV (No. 00190)

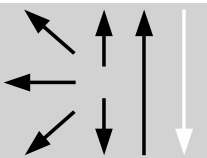
Recommended welding parameters			
Electrodes $\varnothing \times L$ [mm]	2,5 x 300*	3,2 x 300	4,0 x 350
Amperage [A]	60 – 85	90 – 130	110 – 150

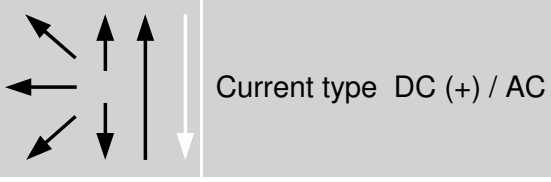
*available on request

Classifications							
EN ISO 14172		AWS A5.11			Material-No.		
E Ni 4060 (NiCu30Mn3Ti)		E NiCu-7			2.4366		
Characteristics and field of use							
<p>UTP 80 M is suitable for joining and surfacing of nickel-copper alloys and of nickel-copper-clad steels. Particularly suited for the following materials: 2.4360 NiCu30Fe, 2.4375 NiCu30Al. UTP 80 M is also used for joining different materials, such as steel to copper and copper alloys, steel to nickel-copper alloys. These materials are employed in high-grade apparatus construction, primarily for the chemical and petrochemical industries. A special application field is the fabrication of seawater evaporation plants and marine equipment.</p> <p>UTP 80 M is weldable in all positions, except vertical-down. Smooth, stable arc. The slag is easily removed, the seam surface is smooth. The weld metal withstands sea water.</p>							
Typical analysis in %							
C	Si	Mn	Ni	Cu	Ti	Al	Fe
< 0,05	0,7	3,0	balance	29,0	0,7	0,3	1,0
Mechanical properties of the weld metal							
Yield strength $R_{P0,2}$		Tensile strength R_m		Elongation A		Impact strength K_v	
MPa		MPa		%		J	
> 300		> 480		> 30		> 80	
Welding instruction							
<p>Thorough cleaning of the weld zone is essential to avoid porosity. V angle of seam about 70°, weld string beads if possible. Weld with dry stick electrodes only! Redry stick electrodes 2 – 3 hours at 200° C.</p>							
Welding positions							
				Current type DC (+)			
Approvals							
TÜV (No. 00248), ABS, GL							
Recommended welding parameters							
Electrodes $\varnothing \times L$ [mm]	2,5 x 300	3,2 x 350	4,0 x 350	5,0 x 400			
Amperage [A]	55 – 70	75 – 110	90 – 130	135 – 160			

Classifications						
EN ISO 3581-A	AWS A5.4			Material-No.		
E 19 9 Nb R 3 2	E 347-17			1.4551		
Characteristics and field of use						
<p>The rutile coated welding stick electrode UTP 68 is suitable for joining and surfacing of stabilized and non stabilized CrNi steels and CrNi cast steels. The deposit is IC resistant with stabilized base material up to + 400°C working temperature. The stick electrode is also applicable for the 2nd layer on cladded CrNi steels.</p> <p>The stick electrode is weldable in all positions except vertical down. It has a stable arc and is spatter free. Easy ignition and re-ignition, self detaching slag. Clean and finely wrinkled bead without undercutting.</p>						
Base materials						
1.4301, 1.4312, 1.4541, 1.4550, 1.4552						
Typical analysis in %						
C	Si	Mn	Cr	Ni	Nb	Fe
0,03	0,8	0,5	19,0	10,0	0,25	balance
Mechanical properties of the weld metal						
Yield strength $R_{P0,2}$		Tensile strength R_m		Elongation A		Impact strength K_v
MPa		MPa		%		J
> 380		> 590		> 30		> 47
Welding instruction						
Weld stick electrode slightly inclined with a short arc. Redrying 2 hours at 120 – 200°C.						
Welding positions						
			Current type DC (+) / AC			
Approvals						
TÜV (No. 02592), ABS, GL						
Recommended welding parameters						
Electrodes $\varnothing \times L$ [mm]	2,0 x 300	2,5 x 350	3,2 x 350	4,0 x 350		
Amperage [A]	40 – 60	50 – 90	80 – 110	110 – 140		

Classifications						
EN ISO 3581-A	AWS A5.4		Material-No.			
E 19 12 3 L R 3 2	E 316 L-17		1.4430			
Characteristics and field of use						
<p>The rutile coated stick electrode UTP 68 MoLC, with a low C content, is used for joining and surfacing of identical, low carbon, austenitic CrNiMo steels and CrNiMo cast steels. The weld deposit has, due to the low C content, a high resistance to intercrystalline corrosion and can be used for working temperatures up to + 400°C.</p> <p>The stick electrode is weldable in all positions except vertical down. The weld deposit is smooth and fine rippled. Slag removal is very easy and without residues.</p>						
Base materials						
1.4401, 1.4404, 1.4436, 1.4571, 1.4573, 1.4580, 1.4583						
Typical analysis in %						
C	Si	Mn	Cr	Ni	Mo	Fe
0,025	0,8	0,5	18,0	12,0	2,8	balance
Mechanical properties of the weld metal						
Yield strength $R_{P0,2}$		Tensile strength R_m		Elongation A		Impact strength K_v
MPa		MPa		%		J
380		560		30		60
Welding instruction						
The stick electrode should be welded slightly inclined and with a short arc. Redrying 2 hours at 120 – 200° C.						
Welding positions						
 <p>Current type DC (+) / AC</p>						
Approvals						
TÜV (No. 00101), ABS, DB (No. 30.138.03), GL, DNV						
Recommended welding parameters						
Electrodes $\varnothing \times L$ [mm]	1,5 x 250	2,0 x 300	2,5 x 350	3,2 x 350	4,0 x 350	5,0 x 450
Amperage [A]	25 – 40	40 – 60	50 – 90	80 – 120	120 – 160	140 – 200

Classifications							
EN ISO 3581-A		AWS A5.4			Material-No.		
E 19 12 3 Nb R 3 2		E 318 - 16			1.4576		
Characteristics and field of use							
<p>The rutile coated stick electrode UTP 68 Mo is used for joining and surfacing of stabilized and non stabilized CrNiMo steels and CrNiMo cast steels. The deposit is IC resistant with stabilized base material up to + 400°C working temperature.</p> <p>The stick electrode is weldable in all positions except vertical down. Even flow, very easy slag removal. Smooth, notch-free seam surface.</p>							
Base materials							
1.4401, 1.4404, 1.4408, 1.4436, 1.4571, 1.4580, 1.4581, 1.4583							
Typical analysis in %							
C	Si	Mn	Cr	Mo	Ni	Nb	Fe
0,025	0,8	0,6	18,0	2,7	12,0	0,25	balance
Mechanical properties of the weld metal							
Yield strength $R_{P0,2}$		Tensile strength R_m		Elongation A		Impact strength K_v	
MPa		MPa		%		J	
380		560		30		55	
Welding instruction							
Clean the weld zone and above all degrease it. Keep a short arc. Weld with dry stick electrodes. Redry for 2 h at 120 – 200° C.							
Welding positions							
 <p>Current type DC (+) / AC</p>							
Approvals							
TÜV (No. 02593)							
Recommended welding parameters							
Electrodes $\varnothing \times L$ [mm]	1,5 x 250	2,0 x 300	2,5 x 350	3,2 x 350	4,0 x 350	5,0 x 450	
Amperage [A]	25 – 40	40 – 60	50 – 90	80 – 120	120 – 160	140 – 200	

Classifications					
EN ISO 3581-A	AWS A5.4			Material-No.	
E 25 20 R 32	E 310-16			1.4842	
Characteristics and field of use					
<p>The rutile coated stick electrode UTP 68 H is suitable for joining and surfacing of heat resistant Cr-, CrSi-, CrAl-, CrNi-steels/cast steels. It is used for operating temperatures up to 1100° C in low-sulphur combustion gas. Application fields are in the engineering of furnaces, pipework and fittings.</p> <p>UTP 68 H is weldable in all positions except vertical down. Fine droplet. The surface of the seams is smooth and finely rippled. Easy slag removal free from residues.</p>					
Base materials					
Material-No.	DIN	Material-No.	DIN		
1.4710	G-X30 CrSi 6	1.4837	G- X40 CrNiSi 25 12		
1.4713	X10 CrAl 7	1.4840	G- X15 CrNi 25 20		
1.4762	X10 CrAl 24	1.4841	X15 CrNiSi 25 20		
1.4828	X15 CrNiSi 20 12	1.4845	X12 CrNi 25 21		
1.4832	G-X25 CrNiSi 20 14	1.4848	G- X40 CrNiSi 25 20		
Joining these materials with non- and low alloyed steels is possible.					
Typical analysis in %					
C	Si	Mn	Cr	Ni	Fe
0,10	0,6	1,5	25,0	20,0	balance
Mechanical properties of the weld metal					
Yield strength $R_{P0,2}$	Tensile strength R_m		Elongation A		Impact strength K_V
MPa	MPa		%		J
> 350	> 550		> 30		> 47
Welding instruction					
<p>Weld stick electrode with slight tilt and with a short arc. Redry the stick electrodes 2 h at 120 – 200° C.</p>					
Welding positions					
					
Recommended welding parameters					
Electrodes $\varnothing \times L$ [mm]	1,5 x 250*	2,0 x 250*	2,5 x 250	3,2 x 350	4,0 x 400
Amperage [A]	25 – 40	40 – 60	50 – 80	80 – 110	130 – 140
*available on request					

Classifications

EN ISO 14172	AWS A5.11	Material-No.
E Ni 6082 (NiCr20Mn3Nb)	E NiCrFe-3 (mod.)	2.4648

Characteristics and field of use

UTP 068 HH is predominantly used for joining identical or similar heat resistant Ni-base alloys, heat resistant austenites, cold tough Ni-steel, and for joining heat resistant austenitic-ferritic materials, such as 2.4817 (LC NiCr15Fe), 1.4876 (X10 NiCrTiAl 32 20), 1.4941 (X8 CrNTi 18 10). Specially also used for joinings of high C content 25/35 CrNi cast steel to 1.4859 or 1.4876 for petrochemical installations with working temperatures up to 900° C. The welding deposit is hot cracking resistant and does not tend to embrittlement.

The welding deposit of UTP 068 HH is hot cracking resistant, does not tend to embrittlement and is scale resistant at high temperatures.

Typical analysis in %

C	Si	Mn	Cr	Mo	Nb	Ni	Fe
0,025	0,4	5,0	19,0	1,5	2,2	balance	3,0

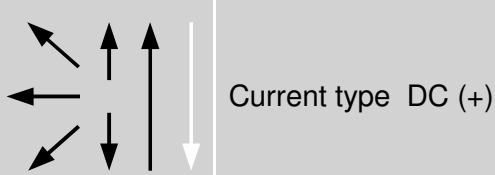
Mechanical properties of the weld metal

Heat-treatment	Yield strength R _{p0,2}	Tensile strength R _m	Elongation A	Impact strength K _V	
	MPa	MPa	%	J	-196 °C
As welded	420	680	40	120	80
15 h 650° C / air				120	70

Welding instruction

Hold stick electrode as vertically as possible, only very little weaving. Fill end crater carefully. Interpass temperature max. 150° C. Redry electrode for 2 – 3 h / 250 – 300° C.

Welding positions



Approvals

TÜV (No. 00230), KTA, ABS, GL, BV, DNV

Recommended welding parameters

Electrodes Ø x L [mm]	2,0 x 250	2,5 x 300	3,2 x 300	4,0 x 350	5,0 x 400
Amperage [A]	35 – 50	50 – 70	70 – 95	90 – 120	120 – 160

Classifications

EN ISO 3581-A	EN 14700	Material-No.
~ E 29 9 R 12	E Z Fe11	1.4337

Characteristics and field of use

UTP 65 D has been developed to satisfy the highest requirements for joining and surfacing. It is extremely crack-resistant when joining steels of difficult weldability, such as e. g. hard manganese steels, tool steels, spring steels, high speed steels as well as dissimilar metal joints. Due to the good corrosion and abrasion resistance and high tensile strength

UTP 65 D finds its application particularly in repair and maintenance of machine and drive components, such as gears, cams, shafts, hot cuts, hot trim plates and dies. Also ideally suited as an elastic cushioning layer for very hard surfacings.

UTP 65 D has outstanding welding properties. Stable arc, spatterfree. The finely rippled seam has a homogeneous structure, very good slag removal, self-lifting on parts. Good weldability in awkward positions. Stainless, creep resistant and workhardening.

Hardness of the pure weld metal: approx. 260 HB

Typical analysis in %

C	Si	Mn	Cr	Ni	Fe
0,1	1,0	1,0	30,0	9,5	balance

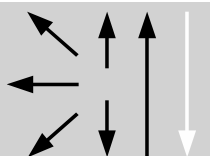
Mechanical properties of the weld metal

Yield strength $R_{p0,2}$	Tensile strength R_m	Elongation A
MPa	MPa	%
> 640	> 800	> 20

Welding instruction

Clean the welding zone thoroughly. Prepare X-, V- or U-groove on thickwalled workpieces with an angle of 60 - 80°. Preheat high-C-containing steels and solid workpieces to appr. 250° C. Keep stick electrode vertical and weld with a short arc, use stringer beads or slight weaving, as applicable. Redry stick electrodes that have got damp for 2 h / 120 – 200° C.

Welding positions

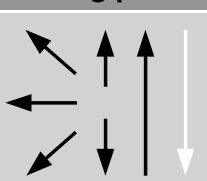


Current type DC (+) / AC

Recommended welding parameters

Electrodes $\varnothing \times L$ [mm]	1,5 x 250*	2,0 x 250	2,5 x 250	3,2 x 350	4,0 x 350	5,0 x 350
Amperage [A]	35 – 45	45 – 60	55 – 75	75 – 115	100 – 145	120 – 195

*available on request

Classifications					
EN ISO 3581-A	EN 14700			Material-No	
E 18 8 Mn R 32	E Fe10			1.4370	
Characteristics and field of use					
<p>With the fully austenitic UTP 63, non-alloy structural and heat-treatable steels can be welded, also in combination with austenitic CrNi steels. Furthermore scale-resisting steels for operating temperatures up to 850° C as well as higher carbon materials and high manganese steel can be joined, also in combination with other steels, with UTP 63. For surfacing on workpieces exposed to impact, pressure and rolling wear, such as curved rails, points, crusher and excavator teeth. Moreover it provides crack-proof buffer layers under hard alloys.</p> <p>UTP 63 has good welding properties, stable arc, finely rippled bead appearance. The weld deposit resists to scaling, rust and cracks, work-hardened.</p> <p>Hardness of the pure weld metal untreated: approx. 200 HB work-hardened: approx. 350 HB</p>					
Typical analysis in %					
C	Si	Mn	Cr	Ni	Fe
0,1	0,5	5,5	19,0	8,5	balance
Mechanical properties of the weld metal					
Yield strength $R_{P0,2}$		Tensile strength R_m		Elongation A	
MPa		MPa		%	
> 350		> 600		> 40	
Impact strength K_v					
J					
> 60					
Welding instruction					
<p>Clean welding area thoroughly. Preheating of thick-walled ferritic parts to 150 – 250° C. Hold stick electrode vertically with a short arc. Redry stick electrodes that have got damp for 2 h / 250 – 300° C.</p>					
Welding positions					
 <p>Current type DC (+) / AC</p>					
Recommended welding parameters					
Electrodes $\varnothing \times L$ [mm]	2,5 x 250	3,2 x 350	4,0 x 400	5,0 x 450	
Amperage [A]	50 – 70	70 – 100	100 – 130	150 – 180	