



**Your reliable partner in the
Offshore Technology Field**



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■ Welding Consumables in the Offshore Technology Field

Particular attention is to be given to the selection of suitable welding consumables in the offshore technology field. As sea water is a highly corrosive medium, particularly stringent requirements are placed on the corrosion resistance of welded joints.

In the use of stainless steels in the offshore technology field, specific corrosive stresses can arise which are not only confined to the wet corrosion range. To render stainless steels resistant to these particularly corrosive stresses, it may be necessary to raise the alloying elements of those elements responsible for stability. This refers primarily, if not exclusively, to the elements of chrome and molybdenum.

After raising these element proportions, the joint can then become either partially or wholly ferritic. What we then have are the "duplex or super-duplex steels". However, if the intention is to remain in the austenitic joint range, then the nickel content needs to be raised. We talk of nickel alloys when the Ni proportion is increased to become the largest single proportion of the alloy. These alloys are always used given the presence of particularly corrosive external conditions which the usual, stainless steels cannot withstand. Not only high-alloy special stainless steels, such as duplex or superduplex, and nickel-based alloys are used in the offshore technology field but also copper/nickel alloys. Their ease of processing and natural anti-fouling properties

explain their wide field of application in this industrial segment.

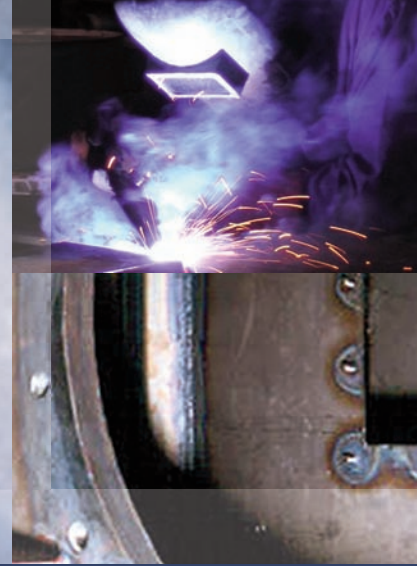
UTP welding consumables cover the entire spectrum of the welding consumables needed in this industrial branch. For use in the duplex or superduplex field, we provide our customers with the globally tried-and-tested UTP welding consumables as electrodes, MIG / TIG wire qualities, SAW wire / flux combinations and as flux cored wire. The UTP nickel-based range has been successfully used for many years now in the offshore technology field. It is here that the UTP copper/nickel alloys used in the construction of seawater desalination plants and in offshore technology have, in particular, proven themselves.



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UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
High strength steels						
6020 EN 499: E 50 0 B 1 2 AWS A5.1 /A5.5: E 11018 M	SMAW	C 0.03 Si 0.4 Mo 0.4 Cr 0.3 Ni 1.8 Mn 1.6 Fe Rest	Rp0,2 665 MPa Rm 765 MPa A 18 % Kv 82 J	-	Basic coated electrode for high-strength tempered fine-grained constructional steels	S620QL - S690QL
A 6020 EN 12 534: G Mn4Ni1, 5Cr Mo AWS A5.28: ER 100S-G	GMAW GTAW	C 0.10 Si 0.5 Mn 1.6 Cr 0.3 Ni 1.4 Mo 0.3 Fe Rest	Rp0,2 670 - 755 MPa Rm 760 - 810 MPa A 20 % Kv > 70 J	TÜV, DB, DNV	Rods and wires for high-strength fine-grained constructional steels	S620QL - S690QL
6025 EN 499: E 46 82 Ni B 42 H 5 AWS A5.1 / A5.5: E 8018-C 1	SMAW	C 0.05 Si 0.3 Ni 2.6 Mn 1.0 Fe Rest	Rp0,2 460 MPa Rm 540 MPa A 24 % Kv 110 J	TÜV	Basic coated electrode, weldable in all positions, except vertical-down. Crack resistant, ageing resistant. Cold-tough Ni alloyed steels	-
A 6025 EN 12 534: G Mn2Ni2 AWS A5.28: ER 80 S-Ni2	GMAW GTAW	C 0.10 Si 0.6 Mn 1.1 Ni 2.5	Rp0,2 500 MPa Rm 600 MPa A 22 % Kv 120 J	TÜV	Rods and wires for welding cold-tough sheets and tube steels used for container- and pipeline construction	-
Martensitic stainless steels						
6635 1.4351 EN 1600: E 13 4 B 4 2 DIN 8556: E 13 4 B 20+ AWS A5.4: E 410 NiMo	SMAW	C 0.03 Si 0.25 Mo 0.45 Cr 13.0 Ni 4.0 Mn 0.8 Fe Rest	Rp0,2 650 MPa Rm 760 MPa A 15 % Kv 55 J	TÜV	Basic coated electrode for joining and build-up welding on stainless, martensitic CrNi steels	1.4313 ◦ G-X5 CrNi 13 4 1.4407 ◦ G-X5 CrNiMo 13 4 1.4413 ◦ X3 CrNiMo 13 4 1.4414 ◦ G-X4 CrNiMo 13 4
A 6635 1.4351 EN ISO 14343: G(W) 13 4 (Si) DIN 8556: SGX3 CrNi 13 4 AWS A5.9: ~ER 410 NiMo	GMAW GTAW	C 0.03 Si 0.7 Mn 0.7 Cr 13.5 Ni 4.5 Mo 0.55	Rp0,2 600 MPa Rm 800 MPa A 15 % Kv 40 J	TÜV	Rods and wires for joining and build-up welding on martensitic CrNi cast steels of identical and similar types. Particularly suitable for water turbine and compressor fabrication	1.4313 ◦ X3 CrNiMo 13 4 1.4313 ◦ G-X5 CrNi 13 4 1.4008 ◦ G-X7 CrNiMo 12-1
AF 6635 1.4351 EN 12 073: T 13 4 RM	FCAW	C 0.025 Si 0.5 Mn 1.0 Cr 13.0 Ni 4.5 Mo 0.5	Rp0,2 700 MPa Rm 850 MPa A 13 % Kv 35 J	-	Flux cored wire for welding of identical or similar types of martensitic CrNi steels. Preferably to be used in water turbine fabrication or repair of water turbines	1.4313 ◦ X3 CrNiMo 13 4 1.4313 ◦ G-X5 CrNi 13 4

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66 1.4009 EN 1600: E 13 B 22 DIN 8556 : E 13 B 20+ AWS A5.4: ~E 410-15	SMAW	C < 0.05 Si 0.5 Cr 13.0 Mn 0.5 Fe Rest	Rp0,2 450 MPa Rm 650 MPa A 25 %	-	Basic coated electrode for joining and build-up welding of martensitic ferritic 12-14 % Cr steels	1.4000 ◦ X6 Cr 13 1.4001 ◦ X5 CrNiMo 17 12 2 1.4002 ◦ X6 CrAl 13 1.4006 ◦ (G) X10 Cr 13 1.4008 ◦ G-X7 CrNiMo 12 1 1.4021 ◦ X20 Cr 13 1.4024 ◦ X15 Cr 13 1.4027 ◦ G-X20 Cr 14
A 66 1.4009 EN ISO 14343: G(W) 13 (Si) DIN 8556: SGX8 Cr 14 AWS A5.9: ~ER 410	GMAW GTAW	C 0.1 Si 0.8 Mn 0.8 Cr 14.5	Rp0,2 450 MPa Rm 650 MPa A 15 %	-	Rods and wires for welding of 13-14% Cr steels, for example sealing surface built-up on non-alloy and low-alloy steels and cast steels	1.4000 ◦ X6 Cr 13 1.4001 ◦ X5 CrNiMo 17 12 2 1.4002 ◦ X6 CrAl 13 1.4006 ◦ (G) X10 Cr 13 1.4008 ◦ G-X7 CrNiMo 12-1 1.4021 ◦ X20 Cr 13 1.4024 ◦ X15 Cr 13 1.4027 ◦ G-X20 Cr 14
Austenitic stainless steels						
68 MoLC 1.4430 EN 1600: E 19 12 3 L R 3 2 DIN 8556: E 19 12 3 L R 26 AWS A5.4: E 316 L-17	SMAW	C 0.025 Si 0.8 Mo 2.8 Cr 18.0 Ni 12.0 Mn 0.5 Fe Rest	Rp0,2 380 MPa Rm 560 MPa A 30 % Kv 60 J	TÜV, TÜV Wien, ABS, DB, GL, DNV	Rutile coated electrode with low C content for welding of low-carbon, austenitic CrNiMo steels and cast steels	1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4436 ◦ X5 CrNiMo 17 13 3 1.4571 ◦ X6 CrNiMoTi 17 12 2 1.4573 ◦ X10 CrNiMoTi 18 12 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4583 ◦ X10 CrNiMoNb 18 12
A 68 MoLC 1.4430 EN ISO 14343: G(W) 19 12 3 L(Si) DIN 8556: SGX2 CrNiMo 19 12 AWS A5.9: ER 316 L (Si)	GMAW GTAW	C 0.02 Si 0.4 Mn 1.5 Mo 2.8 Cr 18.5 Ni 12.0	Rp0,2 420 MPa Rm 600 MPa A 35 % Kv 100 J	TÜV, GL	Rods and wires for welding of low-carbon, CrNiMo steels and cast steels with high chemical resistance	1.4404 ◦ X2 CrNiMo 17 13 2 1.4435 ◦ X2 CrNiMo 18 14 3 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4571 ◦ X6 CrNiMoTi 17 12 2
AF 68 MoLC 1.4430 EN 12 073:T 19 12 3 L RM AWS A5.22: E 316 LT-1-4	FCAW	C 0.025 Si 0.6 Mn 1.5 Cr 19.5 Ni 12.5 Mo 2.7	Rp0,2 400 MPa Rm 560 MPa A 35 % Kv 55 J	TÜV	Low-carbon CrNiMo flux cored wire with rutile slag for joining and build-up welding of CrNiMo steels and cast steels	1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4406 ◦ (G) X10 Cr 13 1.4435 ◦ X2 CrNiMo 18 14 3 1.4436 ◦ X5 CrNiMo 17 13 3 1.4571 ◦ X6 CrNiMoTi 17 12 2 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4583 ◦ X10 CrNiMoNb 18 12
UP 68 MoLC / UP FX 68 MoLC 1.4430 EN 760: SA FB 2 DC DIN 8556: SGX2 CrNiMo 19 12 AWS A5.9: ER 316 L (Si)	SAW	C 0.02 Si 0.6 Mn 1.2 Cr 18.0 Ni 11.6 Mo 2.6 Fe Rest	Rp0,2 420 MPa Rm 600 MPa A 35 % Kv 95 J	-	Wire flux combination for joining and build-up welding of stainless steel alloys	1.4404 ◦ X2 CrNiMo 17 13 2 1.4435 ◦ X2 CrNiMo 18 14 3 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4571 ◦ X6 CrNiMoTi 17 12 2

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68 H ~ I.4842 EN 1600: E 25 20 R AWS A5.4: E310-16	SMAW	C 0.1 Si 0.6 Cr 25.0 Ni 20.0 Mn 1.5 Fe Rest	Rp0,2 > 350 MPa Rm > 550 MPa A > 30 % Kv > 47 J	-	Fully-austenitic CrNi electrode for welding of heat-resistant steels and cast steels	I.4710 ◦ G-X30 CrSi 6 I.4713 ◦ X10 CrAl 7 I.4762 ◦ X10 CrAl 24 I.4828 ◦ X15 CrNiSi 20 12 I.4832 ◦ G-X25 CrNiSi 20 14 I.4837 ◦ G-X40 CrNiSi 25 12 I.4840 ◦ G-X15 CrNi 25 20 I.4841 ◦ X15 CrNiSi 25 20 I.4845 ◦ X12 CrNi 25 21 I.4848 ◦ G-X40 CrNiSi 25 20
A 68 H I.4842 EN ISO 14343: W/G 25 20 AWS A5.9: ~ER 310 (Si)	GMAW GTAW	C 0.12 Si 0.9 Mn 3.2 Cr 25.0 Ni 21.0 Fe Rest	Rp0,2 400 MPa Rm 650 MPa A 30 % Kv 60 J	-	Rods and wires for joining and build-up welding of heat and scale-resistant CrNi steels and cast steels	I.4841 ◦ X15 CrNiSi 25 20 I.4845 ◦ X12 CrNi 25 21 I.4846 ◦ X40 CrNi 25 - 21 I.4849 ◦ G-X40 NiCrSiNb 38 18 I.4713 ◦ X10 CrAl 7 I.4742 ◦ X10CrAl 18 I.4762 ◦ X10 CrAl 24
1925 I.4519 EN 1600: E 20 25 5 Cu N L R 3 2 DIN 8556: E 20 25 5 LCuR 26 AWS A5.4: ~E385-16	SMAW	C 0.025 Si 0.8 Mo 4.5 Cr 20.0 Ni 25.0 Mn 1.5 Cu 1.5 Fe Rest	Rp0,2 400 MPa Rm 580 MPa A 30 % Kv 70 J	TÜV, TÜV Wien	Rutile basic coated electrode for joining and build-up welding of stainless steels and cast steels with increased corrosion resistance against reducing media	I.4500 ◦ G-X7 NiCrMoCuNb 25 20 I.4505 ◦ X4 NiCrMoCuNb 20 18 2 I.4506 ◦ X5 NiCrMoCuTi 20 18 I.4539 ◦ X1 NiCrMoCu 25 20 5
A 1925 I.4519 EN ISO 14343: G(W) 20 25 5 Cu L DIN 8556: SGX2 CrNiMoCu 20 25 AWS A5.9: ER 385	GMAW GTAW	C 0.02 Si 0.5 Mn 1.7 Cr 20.0 Ni 25.0 Mo 4.5 Cu 1.5	Rp0,2 400 MPa Rm 600 MPa A 35 % Kv 100 J	TÜV	Rods and wires with low C content for welding of identical and similar corrosion-resistant austenitic CrNi and CrNiMo steels	I.4500 ◦ G-X7 NiCrMoCuNb 25 20 I.4505 ◦ X4 NiCrMoCuNb 20 18 2 I.4506 ◦ X5 NiCrMoCuTi 20 18 I.4538 ◦ G-X1 NiCrMoCu 25 20 5 I.4539 ◦ X1 NiCrMoCu 25 20 5





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UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
Stainless steel type CrNiMo						
759 Kb 2.4609 EN ISO 14 172: E Ni 6059 (NiCr23Mo16) DIN 1736: EL-NiCr22Mo16 AWS A5.11: E NiCrMo-13	SMAW	C < 0.02 Si < 0.2 Mo 15.5 Cr 22.5 Fe 1.0 Mn 0.5 Ni Rest	Rp0,2 > 450 MPa Rm > 720 MPa A > 30 % Kv > 75 J	TÜV	Basic coated NiCrMo electrode for use in joint and build-up welding of materials where the highest corrosion-resistance properties are required	1.4565 ◦ X3 CrNiMnMoNbN 23 17 53 2.4605 ◦ NiCr23Mo16Al 2.4602 ◦ NiCr21Mo14W 2.4610 ◦ NiCr16Mo16Ti 2.4819 ◦ NiMo16Cr15W ◦ Alloy C 4, Alloy C 276
A 759 2.4607 EN ISO 18 274: S Ni 6059 (NiCr23Mo16) DIN 1736: SG NiCr23Mo16 AWS A5.14: ER NiCrMo-13	GMAW GTAW	C < 0.01 Si 0.1 Cr 22.5 Mo 15.5 Fe < 1.0 Ni Rest	Rp0,2 > 450 MPa Rm > 720 MPa A > 35 % Kv > 100 J	TÜV	Rods and wires for welding of components in chemical process plant with highly-corrosive media	2.4602 ◦ NiCr21Mo14W 2.4605 ◦ NiCr23Mo16Al 2.4610 ◦ NiMo16Cr16Ti 2.4819 ◦ NiMo16Cr15W
Duplex stainless steel						
6808 Mo EN 1600: E 22 9 3 N LR 3 2 DIN 8556: ~E 22 9 3 LR 26 AWS A5.4: E 22 09 - 17	SMAW	C 0.025 Si 0.9 Mo 3.0 Cr 22.5 Ni 9.5 Mn 0.9 Cu 0.8 N 0.2 Fe Rest	Rp0,2 > 540 MPa Rm > 680 MPa A > 22 % Kv > 47 J	TÜV	Rutile basic coated electrode for joining and build-up welding of corrosion-resistant steels and cast steels with austenitic-ferritic structure	1.4347 ◦ G-X6 CrNi 26 7 1.4460 ◦ X3 CrNiMoN 27 5 2 1.4462 ◦ X2 CrNiMoN 22 5 3 1.4463 ◦ G-X6 CrNiMo 24 8 2
A 6808 Mo ~1.4462 EN ISO 14343: G(W) 22 9 3 N L DIN 8556: SGX2 CrNiMo 22 8 3 AWS A5.9: ER 22 09	GMAW GTAW	C 0.015 Si 0.25 Mn 1.5 Cr 22.8 Ni 9.2 Mo 3.0 N 0.14	Rp0,2 600 MPa Rm 800 MPa A 30 % Kv 80 J	TÜV, GL	Rods and wires for welding of corrosion-resistant steels and cast steels, so-called duplex steels	1.4347 ◦ G-X6 CrNi 26 7 1.4460 ◦ X3 CrNiMoN 27 5 2 1.4462 ◦ X2 CrNiMoN 22 5 3
UP 6808 Mo / UP FX 6808 Mo ~1.4462 EN 760: SA FB 2 DC DIN 8556: SGX2 CrNiMo22 8 3 AWS A5.9: ER 22 09	SAW	C 0.02 Si 0.5 Mn 1.2 Cr 22.0 Ni 9.0 Mo 2.8 Ni 0.12 Fe Rest	Rp0,2 570 MPa Rm 780 MPa A 32 % Kv 130 J	-	Wire flux combination for joining and build-up welding of stainless duplex steel alloys	1.4462 ◦ X2 CrNiMoN 22 5 3 1.4460 ◦ X3 CrNiMoN 27 5 2 1.4347 ◦ G-X6 CrNi 26 7
6809 MoCuKb EN 1600: E 25 9 3 Cu N LB 42 DIN 8556: E 25 10 3 Cu LB 20+	SMAW	C 0.025 Si 0.5 Mo 3.0 Cr 25.0 Ni 9.5 Mn 1.2 Cu 3.0 N 0.2 Fe Rest	Rp0,2 650 MPa Rm 850 MPa A 25 % Kv 45 J	-	Basic coated electrode with austenitic-ferritic weld metal for welding of corrosion-resistant super duplex steels and cast steels with Cu content	1.4517 ◦ G-X3 CrNiMoCuN 26 6 3 3

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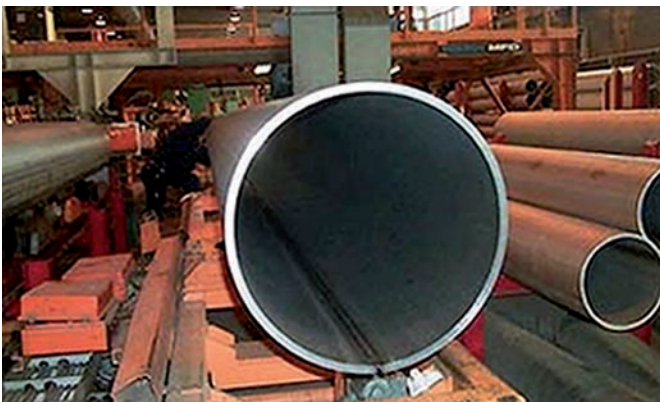
UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
6810 MoKb EN 1600: E 25 9 4 N LB 42 DIN 8556: ~E 25 10 4 LB 20 AWS A5.4: E 2594-15	SMAW	C 0.03 Si 0.55 Mo 4.3 Cr 25.5 Ni 9.5 Mn 1.5 N 0.25 Fe Rest	Rp0,2 720 MPa Rm 850 MPa A 22 % Kv 70 J	-	Basic coated low carbon electrode for welding of highly corrosion-resistant steels and cast steels	1.4469 ◦ G-X2 CrNiMoN 25 7 4 1.4463 ◦ G-X6 CrNiMo 24 8 2 1.4460 ◦ X4 CrNiMoN 25 5 2
A 6810 Mo ~ 1.4501 EN ISO 14343: G(W) 25 9 4 L DIN 8556: SGX2 CrNiMo 25 10 4 AWS A5.9: ~ER 25 53	GMAW GTAW	C 0.02 Si 0.3 Mn 0.7 Cr 25.5 Ni 9.5 Mo 4.0 N 0.22	Rp0,2 720 MPa Rm 850 MPa A 22 % Kv +20 °C 70 J - 50 °C 45 J		Low-carbon rods and wires for joining and build-up welding of steels and cast steels with austenitic-ferritic structure (super-duplex steels)	1.4469 ◦ G-X2 CrNiMoN 25 7 4 1.4463 ◦ G-X6 CrNiMo 24 8 2 1.4460 ◦ X4 CrNiMoN 25 5 2
Dissimilar joint welding steel to CrNi-steel and steel to Cr-steel						
6824 LC ~ 1.4332 EN 1600: E 23 12 L R 3 2 DIN 8556: E 23 12 L R 26 AWS A5.4: E 309 L-17	SMAW	C 0.025 Si 0.8 Cr 22.5 Ni 12.5 Mn 0.8 Fe Rest	Rp0,2 >390 MPa Rm >550 MPa A >30 % Kv >47 J	TÜV, GL, DNV	Low-carbon rutile coated electrode for welding of stainless and heat-resistant steels and cast steels, and for dissimilar joints	1.4541 ◦ X6 CrNiTi 18 10 1.4550 ◦ X6 CrNiNb 18 9 1.4583 ◦ X10 CrNiMoNb 18 12 1.4712 ◦ X10 CrSi 6 1.4724 ◦ X10 CrAl 13 1.4742 ◦ X20 CrAl 13 1.4825 ◦ G-X25 CrNiSi 18 9 1.4826 ◦ G-X40 CrNiSi 22 9 1.4828 ◦ X15 CrNiSi 20 12
A 6824 LC Werkstoff-Nr. 1.4332 EN ISO 14343: G(W) 23 12 L DIN 8556: SGX2 CrNi 24 12 AWS A5.9: ER 309 L (Si)	GMAW GTAW	C 0.02 Si 0.4 Mn 1.8 Cr 23.0 Ni 13.5	Rp0,2 400 MPa Rm 590 MPa A 30 % Kv 140 J	TÜV, GL	Rods and wires for joining and build-up welding of steels which are difficult to weld, weld plating and buffer layers	1.4306 ◦ X2 CrNi 19 11 1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4541 ◦ X6 CrNiTi 18 10 1.4550 ◦ X6 CrNiNb 18 9 1.4571 ◦ X6 CrNiMoTi 17 12 2 1.4580 ◦ X6 CrNiMoNb 17 12 2
AF 6824 LC 1.4332 EN 12 073: T 23 12 L RM AWS A5.22: E 309 LT-1-4	FCAW	C 0.025 Si 0.6 Mn 1.5 Cr 24.0 Ni 12.0	Rp0,2 400 MPa Rm 600 MPa A 35 % Kv 60 J	TÜV	Low-carbon flux cored wire with rutile slag for joint welding of alloyed Cr, CrNi alloys with non-alloy and low-alloy steels and cast steels	1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4406 ◦ (G) X10 Cr 13 1.4435 ◦ X2 CrNiMo 18 14 3 1.4436 ◦ X5 CrNiMo 17 13 3 1.4571 ◦ X6 CrNiMoTi 17 12 2 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4583 ◦ X10 CrNiMoNb 18 12



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Steel to CrNiMo-steel						
6824 MoLC EN 1600: E 23 12 2 L R 3 2 DIN 8556: ~E 23 12 3 L R 26 AWS A5.4: ~E 309 MoL-17	SMAW	C 0.03 Si 0.8 Mo 2.8 Cr 23.0 Ni 12.0 Mn 1.5 Fe Rest	Rp0,2 > 490 MPa Rm > 670 MPa A > 25 % Kv > 47 J	-	Low-carbon rutile coated electrode for welding of CrNiMo steels and cast steels, and for dissimilar joints and plating	1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4571 ◦ X6 CrNiMoTi 17 12 2
A 6824 MoLC 1.4459 EN ISO 14343: G(W) 23 12 MoL DIN 8556: SGX2 CrNiMo 23 13 DIN 8555: W/MSG 9-GZ-200-CKZ AWS A5.9 ER 309 MoL (Si)	GMAW GTAW	C 0.02 Si 0.4 Mn 1.5 Cr 22.0 Ni 14.5 Mo 2.5	Rp0,2 > 500 MPa Rm > 700 MPa A > 25 %	TÜV	Rods and wires with low C content, particularly suitable for joint and build up welding on steels and cast steels which are difficult to weld	1.4401 ◦ X5 CrNiMo 17 12 2 1.4404 ◦ X2 CrNiMo 17 13 2 1.4580 ◦ X6 CrNiMoNb 17 12 2 1.4571 ◦ X6 CrNiMoTi 17 12 2
Steel, CrNi-steel, Ni-base with high corrosion resistance						
6222 Mo 2.4612 EN ISO 14 172: E Ni 6625 (NiCr22Mo9Nb) DIN 1736: EL-NiCr20Mo9Nb AWS A5.11: E NiCrMo-3	SMAW	C 0.03 Si 0.4 Mo 9.0 Cr 22.0 Fe 1.5 Mn 0.6 Nb 3.3 Ni Rest	Rp0,2 > 450 MPa Rm > 760 MPa A > 30 % Kv > 75 J	TÜV, DNV, ABS, GL, BV	Basic coated CrNiMo electrode for welding of corrosion-resistant and highly heat-resistant metals	2.4856 ◦ NiCr 22 Mo 9 Nb 1.4876 ◦ X30 NiCrAlTi 32 20 1.4529 ◦ X2 NiCrMoCu 25 20 5 1.5662 ◦ X8Ni9
A 6222 Mo 2.4831 EN ISO 18 174: S Ni 6625 (NiCr22Mo9Nb) DIN 1736: SG-NiCr21Mo9Nb AWS A5.14: ER NiCrMo-3	GMAW GTAW	C < 0.02 Si < 0.2 Cr 22.0 Mo 9.0 Nb 3.5 Fe 1.0 Ni Rest	Rp0,2 > 420 MPa Rm > 720 MPa A > 30 % Kv + 20 °C > 100 J - 196 °C > 85 J	TÜV, GL, DNV	Highly corrosion-resistant NiCrMo rods and wires for joining and build-up welding of high-strength alloys on Ni basis of similar types	1.4529 ◦ X1 NiCrMoCuN 25 20 6 1.4539 ◦ X1 NiCrMoCuN 25 20 5 2.4858 ◦ NiCr21Mo 2.4856 ◦ NiCr22Mo9Nb 1.5662 ◦ X8Ni9



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AF 6222 Mo PW 2.4621 EN ISO 14 172: E Ni 6625 (NiCr22Mo9Nb) DIN 1736: NiCr20Mo9Nb AWS A5.34: E NiCrMo3 T1-4	FCAW	C 0.03 Si 0.4 Mn 0.4 Cr 21.5 Mo 9.0 Nb 3.5 Fe 0.5 Ni Rest	Rp0,2 500 MPa Rm 770 MPa A 35 % Kv 60 J	TÜV	Nickel base flux cored wire with slag for high-quality welding of Ni-basis materials of the same type and dissimilar joints with C and CrNi steels	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC-NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrAlTi 32 20 1.5662 ◦ X8Ni9
UP 6222 Mo / UP FX 6222 Mo 2.4831 EN ISO 18 174: S Ni 6625 (NiCr22Mo9Nb) EN 760: SA AB 2 DIN 1736: SG-NiCr21Mo9Nb AWS A5.14: ER NiCrMo-3	SAW	C 0.02 Si 0.3 Mn 2.0 Mo 9.0 Cr 21.0 Fe < 2.0 Nb 3.3 Ni Rest	Rp0,2 460 MPa Rm 725 MPa A 40 % Kv +20°C 120 J - 196°C 65 J		Wire flux combination for high-quality welding of base metals with the same or similar chemical compositions	2.4856 ◦ NiCr22Mo9Nb 1.5662 ◦ X8Ni9
Steel, CrNi-steel, Ni-base with high temperature resistance						
068 HH 2.4648 EN ISO 14 172: E Ni 6082 (NiCr20Mn3Nb) DIN 1736: EL-NiCr19Nb AWS A5.11: E NiCrFe-3 (mod.)	SMAW	C 0.03 Si 0.4 Mo 1.5 Cr 19.0 Fe 3.0 Mn 5.0 Nb 2.2 Ni Rest	Rp0,2 390 MPa Rm 620 MPa A 35 % Kv +20°C > 80 J - 196°C > 65 J	TÜV, ABS, GL, BV, DNV, KTA	Basic coated NiCrFe electrode for joint welding high corrosion and high temperature resistant materials	2.4817 ◦ LC NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrTiAl 32 20 1.4941 ◦ X8 CrNiTi 18 10
A 068 HH 2.4806 EN ISO 18 274: S Ni 6082 (NiCr20Mn3Nb) DIN 1736: SG-NiCr20Nb AWS A5.14: ER NiCr-3	GMAW GTAW	C < 0.02 Si < 0.2 Mn 3.0 Cr 20.0 Fe 0.8 Nb 2.7 Ni Rest	Rp0,2 > 420 MPa Rm > 640 MPa A > 35 % Kv +20°C > 200 J - 196°C > 100 J	TÜV, TÜV Wien, ABS, GL, DNV, KTA	NiCrFe rods and wires for joint welding of highly heat-resistant nickel-based alloys of the same and similar types and heat-resistant austenites	1.4816 ◦ NiCr15Fe 2.4817 ◦ LC - NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X 10 NiCrAlTi 32 20 1.6907 ◦ X 3 CrNiN 18 10
AF 068 HH 2.4648 EN ISO 14 172: E Ni 6082 (NiCr20Mn3Nb) DIN 1736: T NiCr19Nb (mod.) AWS A5.34: E NiCr3 T0-4	FCAW	C 0.03 Si 0.4 Mn 3.0 Cr 20.0 Nb 2.4 Fe 1.4 Ni Rest	Rp0,2 400 MPa Rm 650 MPa A 35 % Kv 120 J	TÜV	Nickel base flux cored wire with slag for joining and build-up welding of nickel alloys of the same and similar types	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC NiCr15Fe 1.4583 ◦ X 10 CrNiMoNb 18 12 1.4876 ◦ X 10 NiCrAlTi 32-21 1.4859 ◦ G X 10 NiCrNb 32-20 1.0562 ◦ StE 355
UP 068 HH / UP FX 068 HH 2.4806 EN ISO 18 274: S Ni 6082 (NiCr20Mn3Nb) EN 760: SA - AB 2 DIN 1736: UP-NiCr20Nb AWS A5.14: ER NiCr-3	SAW	C < 0.03 Si < 0.2 Mn 3.0 Cr 20.0 Fe < 1.5 Nb 2.6 Ni Rest	Rp0,2 350 MPa Rm 600 MPa A 35 % Kv 100 J	-	Wire flux combination for nickel and nickel alloys. Particularly suitable for joint welding of base materials of similar types and low-alloy steels with stainless steel	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X 10 NiCrAlTi 32 20

OFFSHORE

■ Welding Consumables in the Offshore Technology Field

UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
Nickel base alloys						
6222 Mo 2.4612 EN ISO 14 172: E Ni 6625 (NiCr22Mo9Nb) DIN 1736: EL-NiCr20Mo9Nb AWS A5.11: E NiCrMo-3	SMAW	C 0.03 Si 0.4 Mo 9.0 Cr 22.0 Fe 1.5 Mn 0.6 Nb 3.3 Ni Rest	Rp0,2 > 450 MPa Rm > 760 MPa A > 30 % Kv > 20°C 75 J > -196°C 45 J	TÜV, DNV, ABS, GL, BV	Basic coated CrNiMo electrode for welding of corrosion-resistant and highly heat-resistant metals	2.4856 ◦ NiCr-22 Mo 9 Nb 1.4876 ◦ X30 NiCrAlTi 32 20 1.4529 ◦ X2 NiCrMoCu 25 20 5 1.5662 ◦ X8Ni9
A 6222 Mo 2.4831 EN ISO 18 174: S Ni 6625 (NiCr22Mo9Nb) DIN 1736: SG-NiCr21Mo9Nb AWS A5.14: ER NiCrMo-3	GMAW GTAW	C < 0.02 Si < 0.2 Cr 22.0 Mo 9.0 Nb 3.5 Fe 1.0 Ni Rest	Rp0,2 > 420 MPa Rm > 720 MPa A > 30 % Kv + 20 °C > 100 J 70 J - 196 °C > 85 J	TÜV, GL, DNV	Highly corrosion-resistant NiCrMo rods and wires for joining and build-up welding of high-strength alloys on Ni basis of similar types	1.4529 ◦ X1 NiCrMoCuN 25 20 6 1.4539 ◦ X1 NiCrMoCuN 25 20 5 2.4858 ◦ NiCr21Mo 2.4856 ◦ NiCr22Mo9Nb 1.5662 ◦ X8Ni9
AF 6222 Mo PW 2.4621 EN ISO 14 172: E Ni 6625 (NiCr22Mo9Nb) DIN 1736: SG-NiCr21Mo9Nb AWS A5.34: E NiCrMo3Ti-4	FCAW	C 0.03 Si 0.4 Mn 0.4 Cr 21.5 Mo 9.0 Nb 3.5 Fe 0.5 Ni Rest	Rp0,2 490 MPa Rm 750 MPa A 30 % Kv + 20 °C 70 J - 196 °C 60 J	TÜV	Nickel base flux cored wire with slag for high-quality welding of Ni-basis materials of the same type and dissimilar joints with C and CrNi steels	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC-NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrAlTi 32 20 1.5662 ◦ X8Ni9
UP 6222 Mo / UP FX 6222 Mo 2.4831 EN ISO 18 174: S Ni 6625 (NiCr22Mo9Nb) EN 760: SA AB 2 DIN 1736: SG-NiCr21Mo9Nb AWS A5.14: ER NiCrMo-3	SAW	C 0.02 Si 0.3 Mn 2.0 Mo 9.0 Cr 21.0 Fe < 2.0 Nb 3.3 Ni Rest	Rp0,2 460 MPa Rm 725 MPa A 40 % Kv + 20°C 120 J - 196°C 65 J	TÜV	Wire flux combination for high-quality welding of base metals with the same or similar chemical compositions	2.4856 ◦ NiCr22Mo9Nb 1.5662 ◦ X8Ni9
759 Kb 2.4609 EN ISO 14 172: E Ni 6059 (NiCr23Mo16) DIN 1736: EL-NiCr23Mo16 AWS A5.11: E NiCrMo-13	SMAW	C < 0.02 Si < 0.2 Mo 15.5 Cr 22.5 Fe 1.0 Mn 0.5 Ni Rest	Rp0,2 > 450 MPa Rm > 720 MPa A > 30 % Kv > 75 J	TÜV	Basic coated NiCrMo electrode for use in joint and build-up welding of materials where the highest corrosion-resistance properties are required	2.4605 ◦ NiCr23Mo16Al 2.4602 ◦ NiCr21Mo14W 2.4610 ◦ NiCr16Mo16Ti 2.4819 ◦ NiMo16Cr15W



■ Welding Consumables in the Offshore Technology Field

UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
A 759 2.4607 EN ISO 18 274: S Ni 6059 (NiCr23Mo16) DIN 1736: SG NiCr22Mo16 AWS A5.14: ER NiCrMo-13	GMAW GTAW	C < 0.01 Si 0.1 Cr 22.5 Mo 15.5 Fe < 1.0 Ni Rest	Rp0,2 > 450 MPa Rm > 720 MPa A > 30 % Kv > 100 J	TÜV	Rods and wires for welding of components in chemical process plant with highly-corrosive media	2.4602 ◦ NiCr21Mo14W 2.4605 ◦ NiCr23Mo16Al 2.4610 ◦ NiMo16Cr16Ti 2.4819 ◦ NiMo16Cr15W
068 HH 2.4648 EN ISO 14 172: E Ni 6082 (NiCr20Mn3Nb) DIN 1736: EL-NiCr19Nb AWS A5.11: E NiCrFe-3 (mod.)	SMAW	C 0.03 Si 0.4 Mo 1.5 Cr 19.0 Fe 3.0 Mn 5.0 Nb 2.2 Ni Rest	Rp0,2 390 MPa Rm 620 MPa A 35 % Kv +20°C > 80 J - 196°C > 65 J	TÜV, ABS, GL, BV, DNV, KTA	Basic coated NiCrFe electrode for joint welding high corrosion and high temperature resistant materials	2.4817 ◦ LC NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrTiAl 32 20 1.4941 ◦ X8 CrNiTi 18 10
A 068 HH 2.4806 EN ISO 18 274: S Ni 6082 (NiCr20Mn3Nb) DIN 1736: SG-NiCr20Nb AWS A5.14: ER NiCr-3	GMAW GTAW	C < 0.02 Si < 0.2 Mn 3.0 Cr 20.0 Fe 0.8 Nb 2.7 Ni Rest	Rp0,2 > 420 MPa Rm > 640 MPa A > 35 % Kv +20°C > 200 J - 196°C > 100 J	TÜV, TÜV Wien, ABS, GL, DNV, KTA	NiCrFe rods and wires for joint welding of highly heat-resistant nickel-based alloys of the same and similar types and heat-resistant austenites	1.4816 ◦ NiCr15Fe 2.4817 ◦ LC - NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrAlTi 32 20 1.6907 ◦ X3 CrNiN 18 10
AF 068 HH 2.4648 EN ISO 14 172: E Ni 6082 (NiCr20Mn3Nb) DIN 1736: T NiCr19Nb (mod.) AWS A5.34: E NiCr3 T0-4	FCAW	C 0.03 Si 0.4 Mn 3.0 Cr 20.0 Nb 2.4 Fe 1.4 Ni Rest	Rp0,2 400 MPa Rm 650 MPa A 35 % Kv 120 J	TÜV	Nickel base flux cored wire with slag for joining and build-up welding of nickel alloys of the same and similar types	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC NiCr15Fe 1.4583 ◦ X10 CrNiMoNb 18 12 1.4876 ◦ X10 NiCrAlTi 32-21 1.4859 ◦ GX 10 NiCrNb 32-20 1.0562 ◦ StE 355
UP 068 HH / UP FX 068 HH 2.4806 EN ISO 18 274: S Ni 6082 (NiCr20Mn3Nb) EN 760: SA - AB 2 DIN 1736: UP-NiCr20Nb AWS A5.14: ER NiCr-3	SAW	C < 0.03 Si < 0.2 Mn 3.0 Cr 20.0 Fe < 1.5 Nb 2.6 Ni Rest	Rp0,2 350 MPa Rm 600 MPa A 35 % Kv 100 J	-	Wire flux combination for nickel and nickel alloys. Particularly suitable for joint welding of base materials of similar types and low-alloy steels with stainless steel	2.4816 ◦ NiCr15Fe 2.4817 ◦ LC NiCr15Fe 2.4851 ◦ NiCr23Fe 1.4876 ◦ X10 NiCrAlTi 32 20



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Welding Consumables in the Offshore Technology Field

UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Approvals	Applications field	Base material No.
7015 2.4807 EN ISO 14 172: Ni 6182 (NiCr15Fe6Mn) DIN 1736: EL-NiCr15FeMn AWS A5.11: E NiCrFe-3	SMAW	C < 0.04 Si 0.4 Cr 16.0 Fe 6.0 Mn 6.0 Nb 2.2 Ni Rest	Rp0,2 > 380 MPa Rm > 620 MPa A > 35 % Kv 20°C > 80 J - 196°C > 65 J	TÜV, GL, DNV, KTA	Basic coated electrode for NiCr alloys and claddings. This filler, with controlled cobalt content is used for joining and build up welding of Ni-based alloys	CrNi Stähle: 1.6907 ◦ G-X 5 NiNb 18 10 1.6907 ◦ X3 CrNiN 18 10 CrMo-Stähle: 1.7380 ◦ 10CrMo 9 10
AF 7015 2.4807 EN ISO 14 172: E Ni 6182 (NiCr15Fe6Mn) DIN 1736: NiCr15FeMn AWS A5.11: E NiCrFe3 AWS A5.34: E NiCrFeT0-4	FCAW	C 0.03 Si 0.4 Mn 7.0 Cr 15.0 Nb 1.5 Fe 1.5 Ni Rest	Rp0,2 390 MPa Rm 610 MPa A 35 % Kv 120 J	-	Nickel base flux cored wire with slag for joining and build up welding of Ni-based materials of similar types and dissimilar joints with C and CrNi steels	2.4816 ◦ NiCr15Fe 2.4817 ◦ X10 CrNiMoNb 18 12 1.0563 ◦ StE355
776 Kb 2.4887 EN ISO 14 172: E Ni 6276 (NiCr15Mo15Fe6W4) DIN 1736: EL-NiMo15Cr15W AWS A5.11: E NiCrMo-4	SMAW	C < 0.02 Si < 0.2 Mo 16.5 Cr 16.5 Fe 5.0 Mn 0.6 W 4.0 Ni Rest	Rp0,2 > 450 MPa Rm > 720MPa A > 30 % Kv > 70 J	TÜV	Basic coated electrode for high corrosion resistant NiCrMo alloys, e.g. C-276	2.4819 ◦ NiMo16Cr15W
A 776 2.4886 EN ISO 18 274: S Ni 6276 (NiCr15Mo16Fe6W4) DIN 1736: SG-NiMo16Cr16W AWS A5.14: ER NiCrMo-4	GMAW GTAW	C < 0.01 Si 0.1 Cr 16.0 Mo 16.0 W 3.5 Fe 6.0 V 0.2 Ni Rest	Rp0,2 > 450 MPa Rm > 750 MPa A > 30 % Kv > 90 J	TÜV	Rods and wires for joint welding of base materials of a similar type and build-up welding on low-alloy steels	2.4819 ◦ NiMo16Cr15W

■ Welding Consumables in the Offshore Technology Field

UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposit	Ap- provals	Applications field	Base material No.
2133 Mn ~1.4850 EN 1600: EZ 21 33 B 4 2	SMAW	C 0.14 Si 0.3 Cr 21.0 Ni 33.0 Mn 4.5 Nb 1.3 Fe Rest	Rp0,2 > 410 MPa Rm > 600 MPa A > 25 % Kv > 70 J	TÜV, TÜV Wien	Fully austenitic CrNi electrode for joining and surfacing of heat-resistant steels and cast steels	1.4876 ◦ X10 NiCrAlTi 32 20 1.4859 ◦ G-X10 NiCrNb 32 20 1.4958 ◦ X5 NiCrAlTi 31 20 1.4959 ◦ X8 NiCrAlTi 31 21
A 2133 Mn ~1.4850 EN ISO 14343: -W/GZ 21 33 Mn Nb	GMAW GTAW	C 0.12 Si 0.3 Mn 4.5 Cr 21.0 Ni 33.0 Nb 1.2 Fe Rest	Rp0,2 400 MPa Rm 600 MPa A 25 % Kv 70 J	TÜV	Fully-austenitic rods and wires for joining and surfacing high-resistant base materials	1.4859 ◦ G X 10 NiCrNb 32 20 1.4876 ◦ X 10 NiCrAlTi 32 20 1.4958 ◦ X 5 NiCrAlTi 31 20 1.4959 ◦ X 8 NiCrAlTi 31 21
80 M 2.4366 EN ISO 14 172: E Ni 4060 (NiCu30Mn3Ti) DIN 1736: EL-NiCu30Mn AWS A5.11: E NiCu-7	SMAW	C < 0.05 Si 0.7 Fe 1.0 Mn 3.0 Cu 29.0 Ti 0.7 Al 0.3 Ni Rest	Rp0,2 > 300 MPa Rm > 450 MPa A > 30 % Kv > 80 J	TÜV, ABS, GL	Basic coated nickel-copper electrode for joining and surfacing of nickel-copper alloys and of copper: Cu alloys and NiCu-plated steels	2.4360 ◦ NiCu30Fe 2.4375 ◦ NiCu30Al
A 80 M 2.4377 EN ISO 18 274: S Ni 4060 (NiCu30Mn3Ti) DIN 1736: SG-NiCu30MnTi AWS A5.14: ER NiCu-7	GMAW GTAW	C < 0.02 Si 0.3 Mn 3.2 Cu 29.0 Fe 1.0 Ti 2.4 Ni Rest	Rp0,2 > 300 MPa Rm > 450 MPa A > 30 % Kv > 80 J	TÜV, ABS, BV	Rods and wires for NiCu alloys are used for joining and surfacing different materials, such as steel to copper and copper alloys, steel to nickel copper alloys	2.4360 ◦ NiCu30Fe 2.4375 ◦ NiCu30Al





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■ Welding Consumables in the Offshore Technology Field

UTP-Product Material No. EN DIN AWS	Welding process	Weld metal analysis	Mechanical properties of the pure weld deposite	Ap-provals	Applications field	Base material No.
Copper base alloys						
387 2.0837 DIN 1733: EL-CuNi30Mn AWS A5.6: E CuNi	SMAW	C 0.03 Si 0.3 Ni 30.0 Fe 0.6 Mn 1.2 Cu Rest	Rp0,2 > 240 MPa Rm > 390 MPa A > 30 % Kv > 80 J	TÜV, GL	Basic coated copper-nickel electrode 70/30 is used for joining and surfacing alloys of similar compositions with up to 30% Ni, as well as non ferrous alloys and steels of different nature	2.0878 ◦ CuNi20Fe 2.0882 ◦ CuNi30Fe
A 387 2.0837 EN 14 640: S Cu 7158 (CuNi30) AWS A5.7: ER CuNi	GMAW GTAW	C < 0.05 Ni 30.0 Fe 0.6 Mn 0.8 Ti < 0.5 Cu Rest	Rp0,2 > 200 MPa Rm > 360 MPa A > 30 %	TÜV, GL	Copper-nickel rods and wires with up to 30% nickel. For use in chemical equipment manufacturing, sea water desalination plant and shipbuilding and offshore engineering	2.0878 ◦ CuNi20Fe 2.0882 ◦ CuNi30Fe
389 2.0877 DIN 1733: EL-CuNi10Mn	SMAW	C < 0.03 Si < 0.4 Ni 10.0 Fe 1.5 Mn 1.5 Ti < 0.5 Cu Rest	Rp0,2 240 MPa Rm 320 MPa A 25 %	TÜV	Basic copper-nickel electrode for joining and surfacing alloys of similar nature with a Ni content of up to 10 %	2.0862 ◦ CuNi5Fe 2.0872 ◦ CuNi10Fe
A 389 2.0873 EN 14 640: S Cu 7061 (CuNi10)	GMAW GTAW	Ni 10.0 Fe 1.35 Mn 0.8 Ti < 0.5 C < 0.05 Cu Rest	Rp0,2 > 150 MPa Rm > 300 MPa A > 30 %	-	Copper-nickel rods and wires with 5-10% nickel, for use in chemical plant industry, sea water desalination plants, shipbuilding and offshore technique	2.0862 ◦ CuNi5Fe 2.0872 ◦ CuNi10Fe



■ Place for notice

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