

Welding electrodes

made by Kjellberg Finsterwalde, Germany







certified acc. to DIN ISO 9001



CERTIFICATE

DNV ZERTIFIZIERUNG UND UMWELTGUTACHTER GMBH certifies that the company



Kjellberg Finsterwalde Elektroden & Maschinen GmbH

at the site

Leipziger Str. 82 D - 03238 Finsterwalde

has established a

quality management system in conformity with

EN ISO 9001 : 2000

This Certificate is valid for:

Development, Production and Sales of Electric Arc Welding and Cutting Equipment, including Service Activities

Further clarifications regarding the scope of this certificate and the applicability of ISO 9001 : 2000 requirements may be obtained by consulting the certified company.

This Certificate is valid until: 2007-01-31

Certificate-Registration-No.: CERT-14150-2004-AQ-ESN-TGA

Essen, 2004-03-19

Vitalais Them

N. Kim Manager



Essen, 2004-03-19

H.-J. Kinter Lead-Auditor

This Certificate is only valid in connection with the original german Certificate 14150-2004-AQ-ESN-TGA. Stand 08/01 F DNV 14020/1.1



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Explanations

Approvals

- ABS American Bureau of Shipping
- BV Bureau Veritas
- GL Germanischer Lloyd
- LR Lloyd's Register of Shipping
- NV Det Norske Veritas
- RS Register of Shipping (Russland)
- PRS Polski Rejestr Statkow
- DB Deutsche Bahn AG
- TÜV Technischer Überwachungsverein
- UDT Urzad Dozoru Technicznego

Welding current

- Alternating current
- =+ Direct current, electrode on positive polarity
- =- Direct current, electrode on negative polarity



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Electrodes for mild and low alloyed steels

Producer name DIN EN 499 AWS A 5.1	Application, properties, approvals	Current, polarity
LLOYD E 42 0 R 12 E 6012	General purpose electrode with coarse to medium-fine drop transfer. For joint and tack welding. Also suitable for vertical down positions. BV, DB, GL, LR, NV, TÜV, UDT	=-, ~
LLOYD GRÜN E 35 0 RC 11 E 6012	Electrode for joint and tack welding in all branches of sheet metal working. Good bridgeability, stable arc, perfect seam surface, easy slag removal. Very suitable for welding of light grade sheets with small transformers. BV, DB, GL, LR, NV, TÜV, UDT	=-, ~
PRIMA E 38 0 RC 11 E 6013	Easy to handle electrode with versatile applications in machine building, steel construction, shipbuilding and pipeline construction. Excellent welding properties, especially in vertical down positions. Clean appearance, self lifting slag, low spatters, good re-ignition. DB, GL, TÜV, UDT	=-, ~
PRIMA S E 38 0 RC 11 E 6013	Universal electrode with a wide range of application in industry and craft. Excellent weldability in all positions including vertical down. Fine-rippled seams, low spatter, best ignition and re-ignition properties. TÜV	=-, ~
TITAN ROT E 35 0 RR 12 E 6013	Very easy to handle universal electrode with versatile applications in steel construction, shipbuilding and pipe line construction. Excellent strike, smooth arc, low spatters, fine-rippled seams, concave fillets and self lifting slag. BV, DB, GL, LR, NV, TÜV, UDT	=-, ~
TITAN S E 42 0 RR 12 E 6013	Electrode with versatile applications in industry and shops. For joint welding in machine building, steel construction, shipyards, vehicle industry, boiler and tank fabrication, pipeline construction. Excellent striking properties, smooth arc, low spatters, fine-rippled seams, concave fillets, self lifting slag. DB, TÜV, UDT	=-, ~
TITAN E 38 2 RB 12 E 6013	Universal electrode, especially for root and fixed position welding on pipelines, boilers, vessels and ships. Fine-rippled, well formed, x-ray safe seams without undercutting. Easy slag removal, also from root passes. ABS, BV, DB, GL, LR, NV, RS, TÜV, UDT, PRS	=-, ~
TITAN K E 42 2 RB 12 E 6013	Universal electrode, suitable for joint welding in machine building, steel construction, shipyards, boiler and tank fabrication, pipeline construction. Especially for fixed positions and roots on pipes. Fine-rippled x-ray safe seams without undercutting. Fine drop transfer, low spatters, easy slag removal. Weld metal has high mechanical properties. Good cold toughness. DB, TÜV	=-, =+, ~



Producer name DIN EN 499 AWS A 5.1	Application, properties, approvals	Current, polarity
OPTIMAL E 42 0 RB 12 E 6013	Electrode for welding of unalloyed and low alloyed steels. Especially for thin sheet welding and thin-walled pipes. Fine drop transfer, low spatters, fine-rippled seams without undercutting, stable and soft arc. Easy re-strike also with low amperage. BV, DB, GL, LR, NV, RS, TÜV, UDT	=-, =+, ~
KONTAKT 160 E 42 2 RR 53 E 7024	High efficiency electrode, specially designed for fillets, inter and cover passes in horizontal and downhand positions. For machine building, shipyards and bridge construction. Smooth arc, very clean appearance, self lifting slag. BV, DB, GL, LR, NV, RS, TÜV, UDT, PRS	=-, ~
TRUMPF E 35 0 A 13 E 6027	Electrode for very high welding speed for joint welding in machine construction, steel fabrication and shipbuilding. Suitable for fillets and cover passes. Concave fillets, easy slag removal.	=-, ~
PROGRESS E 42 2 B 42 H10 E 7018	Special electrode, especially for welding in vertical positions in pipe construction and shipyards. X-ray safe welding seams on plates below 10 mm thickness. Special coating with low moisture absorption characteristic (LMA-type). ABS, BV, DB, GL, LR, NV, TÜV, UDT	=+, ~
GARANT E 42 2 B 42 H10 E 7018	General purpose basic electrode with 110 % recovery for welding on mild and low alloyed steels in steel construction, boiler and tank fabrication, and for high tensile fine-grained steels and ship steels. All position electrode with perfect welding properties. Also suitable for steels with higher contents of P, S and C because of high ability for de-oxidation. Low moisture properties (LMA-type). ABS, BV, DB, GL, LR, NV, RS, TÜV, UDT, PRS	=+
GARANT S E 46 4 B 42 H10 E 7018	Electrode for high quality and crack resistant joint welding in machine construction, steel fabrication, boiler construction. Also for steels with higher contents of C, P and S. Special coating with low moisture absorption characteristic (LMA-type). DB, UDT	=+
GARANT K E 46 4 B 42 H5 E 7018-1	High quality basic electrode with 120 % recovery for crack resistant welds and excellent toughness values at low temperatures on unalloyed and low alloyed steels, high tensile fine-grained steels up to -60°C, ship steels and offshore work, CTOD tested, low moisture properties (LMA-type). ABS, BV, DB, GL, LR, NV, RS, TÜV, UDT, PRS	=+, ~
GARANT BR E 38 2 B 12 H10 E 7016	Universal electrode for industry, light and medium fabrication, in shops or on construction sites, for repairs. Best welding properties in fixed positions and with AC. DB, GL, TÜV, UDT	=-, =+, ~
GARANT AC/DC E 42 3 B 12 H10 E 7016	General purpose electrode with good mechanical properties for industry and handicraft. Excellent weldability in nearly all positions, suitable for AC- and DC-current. TÜV	=+, ~
PERFEKT E 38 3 B 41 H10 E 7048	Special electrode, especially for vertical down welding position in pipeline construction. The pure basic weld metal gives guaranty for high toughness values, therefore applicable for low temperatures. BV, DB, GL, NV, RS, TÜV, UDT, PRS	=+, ~



2. Electrodes for heat resistant boiler and pipe steels

Producer name DIN EN 1599 AWS A 5.5	Application, properties, approvals	Current, polarity Weld metal composition
KOMPLEX W E Mo R 12 E 7013-G	Electrode with 0.4 % Mo, especially for steel 15Mo3, used in boiler, tank and tube fabrication. Gives smooth, fine-rippled seams without undercutting and good transition to the base material. Very suitable for root runs. TÜV, UDT	=-, ~ 0,4% Mo
IMPULS E Mo B 42 E 7018-A1	Electrode with 0.4 % Mo content in the weld metal, suitable for steel 15Mo3. Low Ni-content ensures cold toughness up to -30°C, also designed for pipe steels. BV, DB, GL, LR, NV, RS, TÜV, UDT, TÜV, UDT	=+ 0,4% Mo; 0,5% Ni
MOB E Mo B 42 E 7018-A1	The pure weld metal of this electrode contains 0.4 $\%$ Mo. Therefore especially designed for 15Mo3-steel, also for boiler, vessel and pipe fabrication at a working temperature up to 520°C. TÜV, UDT	=+ 0,4% Mo
CROMO 1R E CrMo1 R 12 E 8013-G	Electrode for joint welding at boiler and pipe steels and alloyed-similar CrMo-alloyed pressure-hydrogen resistant steels, especially for the 13CrMo4.4 quality at working temperatures up to 550°C. Also for joint welding and surfacing on similar alloyed case hardening steels and quenched subsequently tempered steels. Suitable for root runs.	=-, ~ 1,1% Cr; 0,5% Mo
CROMO 1B E CrMo1 B 42 E 8018-B2	Electrode for joint welding at boiler and pipe steels and alloyed-similar CrMo-alloyed pressure-hydrogen resistant steels, especially for the 13CrMo4.4 quality at working temperatures up to 550°C. Also for joint welding and surfacing on similar alloyed case hardening steels and quenched subsequently tempered steels. TÜV, UDT	=+ 1% Cr; 0,5% Mo
CROMO 2B E CrMo2 B 42 E 9018-B3	Electrode for joint welding at boiler and pipe steels and alloyed-similar CrMo-alloyed pressure-hydrogen resistant steels, especially for heat resistant steel 10CrMo9.10 at working temperatures up to 600°C. Also for joint welding and surfacing on similar alloyed case hardening steels and quenched subsequently tempered steels. TÜV, UDT	=+ 2,2% Cr; 1,1% Mo



3 Electrodes for high temperature and scale resistant steels

Producer name DIN EN 1600 AWS A 5.4	Application, properties, approvals	Current, polarity Weld metal composition
FINOX 4820 AC E 25 4 R 52 approx. E 329-16	Electrode for joint welding and surfacing at similar or alloyed-similar heat resistant CrNi- steels and cast steels at working temperatures up to 1,100°C, also for corrosive resistant Mo-free Cr(Ni)-steels and cast steels. The ferritic-austenitic weld metal is scale resistant at air and oxidic (combustion) gases up to 1,100°C and has good steadiness against reductive sulphur-containing (combustion) gases. Material No.: 1.4710, 1.4712, 1.4713, 1.4722, 1.4724, 1.4740, 1.4741, 1.4742, 1.4745, 1.4762, 1.4821, 1.4822, 1.4823	=+, ~ 26% Cr; 4,5% Ni
FINOX 4842 AC E 25 20 R 12 E 310-16	Electrode for joint welding and surfacing at similar or alloyed-similar heat resistant CrNi-steels and cast steels at working temperatures up to 1,200°C, for tough joints and inter passes on Cr-steels and cast steels. Also suitable for joints between unalloyed and low alloyed steels and cast steels or inoxidable and heat resistant Cr-steels and cast steels with austenitic steels and cast steels, at working temperatures up to 300°C. Not recommended for reductive, sulphur-containing and carbonising gases. For cover passes take FINOX 4820 AC. Material No.: 1.4710, 1.4713, 1.4762, 1.4825, 1.4826, 1.4828, 1.4832, 1.4841, 1.4845, 1.4846, 1.4848	=+, ~ 25% Cr; 20% Ni; 3,5% Mn
FINOX 4842 B E 25 20 B 22 E 310-15	Electrode for joint welding and surfacing at similar or alloyed-similar heat resistant CrNi-steels and cast steels at working temperatures up to 1,200°C, for tough joints and inter passes on Cr-steels and cast steels. Also suitable for joints between unalloyed and low alloyed steels and cast steels or inoxidable and heat resistant Cr-steels and cast steels with austenitic steels and cast steels, at working temperatures up to 300°C. Not recommended for reductive, sulphur-containing and carbonising gases. For cover passes take FINOX 4820 AC. Material No.: 1.4710, 1.4713, 1.4762, 1.4825, 1.4826, 1.4828, 1.4832, 1.4841, 1.4845, 1.4846, 1.48481.4846, 1.4848	=+ 25% Cr; 20% Ni; 3,5% Mn
FINOX 4829 AC E 22 12 R 32 E 309-17	Electrode for joint welding between unalloyed or low alloyed steels with high alloyed steels or cast steels, for austenitic-ferritic joints at working temperatures up to 300°C, for buffering layers and claddings, where the first layer should be corrosion resistant and for welding of fusion zones at CrNi-cladded plates.	=+, ~ 22,5% Cr; 12,5% Ni



Electrodes for stainless and corrosions resistant steels

Producer name DIN EN 1600 AWS A 5.4	Application, properties, approvals	Current, polarity Weld metal composition
FINOX 4316 AC E 19 9 LR 32 E 308 L-16	Electrode for joint welding on low carbon, unstabilised and stabilised austenitic, chemical resistant CrNi-steels at working temperatures up to 350°C, for corrosions resistant Cr- and heat resistant Cr- and CrNi-steels, for impact resistant austenitic steels, also for alloyed-similar claddings. TÜV, DB Material No.: 1.4300, 1.4301, 1.4306, 1.4308, 1.4311, 1.4312, 1.4541, 1.4543, 1.4550, 1.4552, 1.4878, 1.6905	=+, ~ 19,5% Cr; 9,5% Ni
FINOX 4551 AC E 19 9 Nb R 32 E 347-16	Electrode for joint welding on unstabilised and stabilised austenitic, chemical resistant CrNi-steels at working temperatures up to 400°C, for corrosions resistant Cr- and heat resistant CrNi-steels and alloyed-similar claddings. TÜV, DB Material No.: 1.4300, 1.4301, 1.4306, 1.4308, 1.4312, 1.4541, 1.4543, 1.4550, 1.4552, 1.4878, 1.6905	=+, ~ 19% Cr; 9,5% Ni; +Nb
FINOX 4551 B E 19 9 Nb B 22 E 347-15	Electrode for joint welding on unstabilised and stabilised austenitic, chemical resistant CrNi-steels at working temperatures up to 400°C, for corrosion resistant Cr- and heat resistant CrNi-steels and alloyed-similar claddings. Material No.: 1.4300, 1.4301, 1.4306, 1.4308, 1.4311, 1.4312, 1.4541, 1.4543, 1.4550, 1.4552, 1.4878, 1.6905	=+ 19,5% Cr; 10% Ni; +Nb
FINOX 4430 AC E 19 12 3 LR 32 E 316 L-16	Electrode for joint welding on low carbon, unstabilised and stabilised austenitic, chemical resistant CrNiMo-steels at working temperatures up to 400°C, for corrosion resistant Cr- and CrMo-steels, for alloyed-similar claddings and austenitic-ferritic joints. TÜV, DB Material No.: 1.4401, 1.4404, 1.4408, 1.4429, 1.4435, 1.4436, 1.4437, 1.4571, 1.4580, 1.4583	=+, ~ 19% Cr; 12,5% Ni; 2,7% Mo
FINOX 4430 F E 19 12 3 LR 11 E 316-L16	Electrode for joint welding on low carbon, unstabilised and stabilised austenitic, chemical resistant CrNiMo-steels at working temperatures up to 400°C, for corrosion resistant Cr- and CrMo-steels, for alloyed-similar claddings and austenitic-ferritic joints. Especially recommended for vertical down welding. Material No.: 1.4401, 1.4404, 1.4408, 1.4429, 1.4435, 1.4436, 1.4437, 1.4571, 1.4580, 1.45831.4583	=+, ~ 19% Cr; 12,5% Ni; 2,7% Mo
FINOX 4576 AC E 19 12 3 Nb R 32 E 318-16	Electrode for joint welding on unstabilised and stabilised austenitic, chemical resistant CrNiMo-steels at working temperatures up to 400°C, for corrosion resistant Cr- and CrMo-steels, also for alloyed-similar claddings. TÜV, DB, GL Material No.: 1.4401, 1.4404, 1.4406, 1.4408, 1.4410, 1.4417, 1.4429, 1.4435, 1.4436, 1.4437, 1.4571, 1.4573, 1.4580, 1.4583	=+, ~ 18,5% Cr; 11,5% Ni; 2,7% Mo ; +Nb
FINOX 4462 AC E 22 9 3 N LR 32 E 2209-17	Electrode for joint welding on corrosive resistant Duplex-steels. The austenitic weld metal has a ferrite content of 40 to 50 % and especially LS-resistant to pitting corrosion and stress corrosion cracking. Material No.: 1.4460, 1.4462, 1.4463, 1.4582	=+, ~ 22% Cr; 9% Ni; 3% Mo; 0,12% N
FINOX 4519 AC E 20 25 5 Cu LR 32 E 385-16	Electrode for joint welding and surfacing on similar CrNiMoCu-steel and castings. The weld metal is highly resistant to corrosion in reductive media. Material No.: 1.4500, 1.4505, 1.4506, 1.4531, 1.4536, 1.4538, 1.4539, 1.4585, 1.4586	=+, ~ 20% Cr; 25% Ni; 4,5% Mo; 1,5% Cu



Electrodes for dissimilar and difficult to weld steels (ferrit-austenit)

Producer name DIN EN 1600 AWS A 5.4	Application, properties, approvals	Current, polarity Weld metal composition
FINOX 4370 AC E 18 8 Mn R 12 E 307-16	Electrode for joint welding between unalloyed or low alloyed steels with high alloyed steels or cast steels, for austenitic-ferrite joints at working temperatures up to 300 °C, for high carbon containing and difficult to weld steels, austenitic-manganese steels, for buffering layers, wear resistant build-up for stock, pressure and rolling load. The weld metal is austenitic, corrosions resistant, scale resistant up to 850 °C and workhardenable up to approx. 350 HB. TÜV, DB	=+, ~ 19% Cr; 9% Ni; 6% Mn
FINOX 4431 AC E 20 10 3 R 32 E 308 Mo-16	Special electrode for joint welding of austenitic-ferritic joints, also for joining of stainless Cr-steels, high-manganese steels, CrNiMn, armoured steels.	=+, ~ 20% Cr; 10% Ni; 3,3% Mo
FINOX 4337 AC E 29 9 R 12 E 312-16	Electrode for joint welding and surfacing at similar and equal steels or cast steels, for joint welding at high tensile unalloyed steels, tempered and tool steels, high-manganese steels and joints between dissimilar steels with high alloyed stainless steels. Furthermore for crack-proofed and tough inter passes on hard surfacing and for abrasion tight, workhardened and warm hardened surfacing. The austenitic-ferritic weld metal is stainless, corrosion resistant and suitable for working temperatures up to 300 °C. Due to the enhanced delta-ferrite contents black-white joints are very resistant against hot-cracking.	=+, ~ 29% Cr; 9% Ni
FINOX 4332 AC E 23 12 LR 12 E 309 L-16	Electrode for joint welding between unalloyed or low alloyed steels with high alloyed steels or cast steels, for austenitic-ferritic joints at working temperatures up to 300°C, for buffering layers and claddings, where the first layer should be corrosion resistant and for welding of fusion zones at CrNi-cladded plates.	=+, ~ 22% Cr; 13% Ni
FINOX 4459 AC E 23 13 2 LR 12 E 309 MoL-16	Electrode for joint welding of unalloyed Cr-, CrNi- and CrNiMo-steels and cast iron, for austenitic-ferritic joints at working temperatures up to 300°C and intermediate layers for chemical resistant claddings. The weld metal is already corrosive resistant on the first layer and also crack resistant on difficult to weld steels. Above 500 °C embrittlement possible. $TT'IV$	=+, ~ 23% Cr; 13% Ni; 2,6% Mo



6 Electrod nickel-ba

Electrodes for welding of high-temperature steels, nickel- and nickel-base alloys

Producer name DIN 1736 AWS A5.11/5.14	Application, properties, approvals	Current, polarity Weld metal composition
FINOX 182 EL NiCr 16 FeMn E NiCrFe-3	Nickel-base electrode for high grade joint welding and claddings on similar and dissimilar alloys. The fully austenitic weld metal is chemical resistant, cold tough, heat proofed, high temperature resistant and insensitive against embrittlement.	=+, ~ >65% Ni; 16% Cr; 6% Mn; 1% Mo; 2% Nb
FINOX 625 EL NiCr 20 Mo 9 Nb E NiCrMo3	Nickel-base electrode for joint welding and claddings on similar and similar-like corrosion resistant, heat proofed and high temperature resistant steels and alloys. Also for joints on cold tough austenitic CrNi-steels and castings.	=+, ~ >60% Ni; 22% Cr; 9% Mo; 3,5% Nb



Electrodes for cast iron

Producer name DIN 8573 AWS A 5.15	Application, properties, approvals	Current, polarity Weld metal composition
FICAST NI E Ni BG 11 E Ni-C1	Nickel electrode for welding of grey cast iron, malleable iron, cast iron and for welding on fatigued cast parts. For rectification of castings. FICAST NI gives perfect welding results even with low amperages. The arc is smooth and intensive, low spatters, easy removal of slag. The weld is soft and also at the fusion zone machinable.	=−, =+, ~ 98% Ni 165 HB
FICAST NIFE E NiFe-1 BG 11 E NiFe-C1	Nickel-iron electrode for welding of grey cast iron with laminar and globular graphite structure, also for joints of cast iron (GGL- and GGG-types) with unalloyed steels. The alloyed weld metal is mainly produced by the core wire, 60 % Ni and 40 % Fe. The weld metal is easy to machine and crack resistant.	=−, =+, ~ 60% Ni; 40% Fe 180 HB
FICAST NIFE K E NiFe-1 BG 11 E NiFe-C1	Nickel-iron electrode for welding of grey cast iron with laminar and globular graphite structure, also for joints of cast iron (GGL- and GGG-types) with unalloyed steels. In contrast with the FICAST NIFE the core wire is heavily copper coated to have a good current passage. The alloyed weld metal is mainly produced by the core wire, 60 % Ni and 40% Fe. The weld metal is easy to machine and crack resistant. It is coloured like the base material and is corroding like this later. The electrode has good resisting properties and welds smooth.	=−, =+, ~ 60% Ni; 40% Fe 190 HB



8 Electrodes for surfacing

Producer name DIN 8555	Application, properties, approvals	Current, polarity Weld metal composition hardness
FIDUR 1/300 E 1-UM-300	Electrode for tough, hard and impact-proofed surfacing, especially for railways. Also for rail frog and crosspieces and for repair armouring worn out parts on rails surfaces and flanks. For wear-loaded machine members of unalloyed and low alloyed steels having dragged and crushing load; e.g. worms, toothed gears, shafts and gear parts. The weld metal is still machinable. DB	=+ 0,2% C; 0,6% Mo; 0,2% V
FIDUR 2/55 E 2-UM-55	Electrode for very hard and tough surfacing on abrasive loaded parts of unalloyed and alloyed materials. Especially for fabrication and repairs of cold cutting tools with high holding of cutting edges, die plates etc. Machinable only by grinding.	=+ 0,25% C; 2,5% Cr; 1% Ni; 0,4% Mo
FIDUR 3/50 E 3-UM-50T	Electrode for repairs on similar hot working tools, forging dies, press jacks, hotdraw rings, hot cutting and up setting tools. Furthermore for surfacing on warm harden surfaces and edges of tools from low and alloyed high tensile steels.	=+, ~ 0,25% C ; 2,5% Cr ; 4,5% W ; 0,6% V
FIDUR 4/60 E 4-UM-60T	Electrode for hard and abrasive resistant surfacing with high toughness. For armouring of cutting edges on tools of low alloyed steels, for repairs on high-speed tools. The weld metal is very resistant against abrasion, impact and shock proofed and good holding of cutting edges.	=+, ~ 0,9% C ; 4,5% Cr ; 8% Mo ; 2% W ; 1,5% V 60 HRC
FIDUR 6/55 E 6-UM-55	Electrode for tough-hard, impact-hard and abrasive resistant surfacing on unalloyed materials with higher tensile strength. Especially for surfacing at dredger teeth, beater bars, scrapers, conveyor worms, mill hammers, mixer arms, crusher jaws and cones, etc. The weld metal is workable only by grinding.	=+ 0,6% C; 5% Cr 55 HRC
FIDUR 6/60 E 6-UM-60 P	Electrode for tough-hard, impact-tough and abrasive resistant surfacing on unalloyed and low alloyed materials with higher tensile strength. Especially for surfacing on machine parts, dredger teeth, beater bars, scrapers, conveyor worms, mill hammers, mixer arms, crusher jaws and cones. The weld metal is workable only by grinding. Annealing and hardening possible.	=+ 0,5% C; 9% Cr; 1% Mo; 1,5% V 60 HRC
FIDUR 6/60 R E 6-UM-60 P	Electrode for tough-hard, impact-tough and abrasive resistant surfacing on unalloyed and low alloyed materials with higher tensile strength. Especially for surfacing on machine parts, dredger teeth, beater bars, scrapers, conveyor worms, mill hammers, mixer arms, crusher jaws and cones. The weld metal is workable only by grinding. Annealing and hardening possible.	=+,~ 0,5% C; 7,5% Cr; 0,5% Mo; 0,5% V 60 HRC
FIDUR 7/200 E 7-UM-200-500 KP	Austenitic hard-manganese electrode for abrasive surfacing on materials and machine parts from manganese hard steel, as dredger teeth, beater bars, rail frogs and cross pieces, mainly impact and shock loaded. Also for buffer layers on surfacing on difficult to weld high carbon containing materials and manganese hard steels and heat resisting and stainless steels and cast steels with working temperatures up to 300 °C. The austenitic weld metal is stainless, heat and scale resistant up to 850 °C, thermal shock resistant, non-magnetic and workhardening.	=+, ~ 0,8% C; 16% Mn; 14% Cr 200-500 HB
FIDUR 8/200 E 8-UM-200 CKNZ	Electrode for wear-resistant surfacing on machine parts, which have to resist serious rolling and abrasive wear (rail frogs and cross pieces). For buffer layers on surfacing on difficult to weld high carbon containing materials and manganese steels, also for heat resistant and stainless steels and cast steels with working temperatures up to 300 °C. The austenitic weld metal is stainless, heat and scale resistant up to 850 °C, resistant against sulphur containing combustion gases up to 500 °C, thermal shock resistant, non-magnetic and workhardening.	=+, ~ 0,1% C; 19% Cr; 9% Ni; 6% Mn 200 HB



Producer name DIN 8555	Application, properties, approvals	Current, polarity Weld metal composition
FIDUR 10/60 E 10-UM-60 GR	Electrode for reinforcing on materials with very high strength and ductility, especially with high abrasive wear. Especially for mixer blades and arms, pug-mill knives, excavator worms, glide paths, skids. Only in two layers, otherwise filling up with FIDUR 6/60. Only workable by grinding.	=+, ~ 3,8% C; 33% Cr; +2% others 60 HRC
FIDUR 10/65 E 10-UM-65 GR	Heavy coated high-efficiency electrode with 170 % recovery for high abrasive surfacing on machine parts, working under strong grinding conditions. Through high C- and Cr-contents a high hardness and wearing property will be achieved.	=−, =+ ~ 4,5% C; 34% Cr 65 HRC
FIDUR 10/70 E 10-UM-70 GRZC	High-efficiency electrode with 240 % recovery for surfacing on tools and machine parts exposed to extreme abrasion under high temperatures. For surfacing and repairs in mining industries, cement works, steel industry.	=+, ~ 4,8% C; 38% Cr; 3% B 70 HRC
FILIT 6 E 20-UM-40 CTZ	Electrode for abrasive and corrosion resistant impact through surfacing. Especially for armouring of packing surfaces on gas, water, damp or acid armatures at high working temperatures and pressures, for surfacing on high loaded warm working tools and machine parts under high corrosion and erosion. Also for surfacing on unalloyed and low alloyed high tensile steel. The austenitic- ledeburitic weld metal with embedded CrW-carbides is abrasive tight with high corrosion resistance, warm hardness and scale resistance up to 900 °C. It has good sliding properties and a high cavitation resistance. Workable only with hard metal tools or by grinding.	=+, ~ 1% C; 65% Co; 27% Cr; 4,5% W 40 HRC
FILIT 21 E 20-UM-35 CKTZ	Rutile coated electrode for high temperature, corrosion resistant surfacing, having an excellent thermal shock resistance. Suitable for repairs and production of hot-working tools, e.g. dies, forging hammer parts, press jacks, punching tools, trimming shears etc. Also for surfacing on low and unalloyed steel with high strength properties.	=+, ~ 0,3% C; 60% Co; 27% Cr; 5% Mo 35 HRC
FIDUR 23/250 E 23-UM-250 CKNPTZ	Electrode for high-temperature, corrosion resistant surfacing with good thermal shock resistance. For repairs and fabrication on forging dies, die blocks, press jacks, trimming cutters etc. Also for surfacing on unalloyed and low alloyed high tensile steels. The weld metal is corrosion resistant also under oxidising and reducing conditions, extremely tough and crack-resistant, high-temperature resistant and hardenable at approx. 780 °C. It is workhardened under shock load and machinable.	=+, ~ 60% Ni; 16% Cr; 17% Ni; 6 Fe;



9 Cutting electrode

Producer name	Application, properties, approvals	Current, polarity
MET-OX	Electrode for cutting of all kind of metals - alloyed and unalloyed steels, non-ferrous metals, cast iron and cast steel.	=-,~

10 Special range of electrodes

Producer name DIN EN AWS	Application, properties, approvals	Current, polarity Weld metal composition hardness
Anker E 38 A R 12 E 6013	General purpose electrode, especially for tack welding and joint welding for all branches of sheet metal fabrications. Due to the coarse drop transfer high bridgeability.	=-,~
Kontakt 180 E 42 A RR 73 E 7024	High efficiency electrode, specially designed for fillets, inter and cover passes. Very good welding characteristic, fine drop transfer with low spatters, shiny weld surface, self lifting slag, long bead length.	=-,~
Korrex E 42 2 B 41 E 8018-W	Electrode for joint welding in steel fabrication, pipe construction, machine building, bridge construction and wagon building on corrosion resistant and Cu/Ni-alloyed fine-grained steels.	=+ 0,5% Ni; 0,5% Cu
Rasant E 42 2 B 53 E 7028	High efficiency electrode for joint welding, especially for fillets and large seam cross- sections in steel fabrication, boiler construction and shipbuilding.	=+, ~
Garant 75 E 50 4 2Ni B 42 E 8018-C3	Basic electrode for high tensile fine-grained steels with yield strength 600-750 N/mm ² . Medium-fine drop transfer, low spatters, fine-rippled seams, easy slag removal.	=+ 1,85% Ni; 0,25% Mo
Garant NiCrMo E 69 4 Mn2NiCrMo B 42 E 11018-G	Basic electrode especially suitable for welding of high tensile fine-grained steels with a yield strength about 700 N/mm ² . Fine rippled seams, low spatter, easy slag removal.	=+ 2,2% Ni; 0,4% Cr; 0,4% Mo
Cromo 5B E CrMo5 B 42 E 502-15	Electrode with 5% Cr und 0,5% Mo for joint welding at boiler and pipe steels, used widely in chemical and petrochemical plants, and alloyed-similar CrMo-alloyed pressure-hydrogen resistant steels at working temperatures up to 650°C.	=+ 5% Cr; 0,5% Mo
FINOX 4351 B E 13 4 B 53 E 410NiMo-15	Electrode with 13% Cr and 4% Ni for non-corroding same kinds of Cr(Ni)-steels like water turbines with high resistance to cavitation.	=+ 13% Cr; 4% Ni



Producer name DIN EN AWS	Application, properties, approvals	Current, polarity Weld metal composition hardness
FINOX 4015 B E 17 B 53 E 430-15	Electrode with 17% Cr for joint welding and surfacing on corrosions-resistant chromium steels of the same kind. Also suitable for welding overlays on rails.	=+ 17% Cr
FINOX 4370 B E 18 8 Mn B 22 E 307-15	Electrode for joint welding between unalloyed or low alloyed steels with high alloyed steels or cast steels, for austenitic-ferrite joints at working temperatures up to 300 °C, for high carbon containing and difficult to weld steels, austenitic-manganese steels, for buffering layers, wear resistant build-up for stock, pressure and rolling load. The weld metal is austenitic, corrosions resistant, scale resistant up to 850 °C and workhardenable up to approx. 350 HB. TÜV	=+, ~ 19% Cr; 9% Ni; 6% Mn
FINOX 4370 S E 18 8 Mn R 12 E 307-16	Special electrode for tough, hard and impact-proofed surfacings, especially for railways. Also for rail frog and crosspieces and for repair armouring worn out parts on rails surfaces. For buffer layers on surfacings on difficult to weld high carbon containing materials and manganese steels, also for heat resistant and stainless steels and casted steels with working temperatures up to 300°C. The weld metal has in welding condition a hardness of 200 HB and cold-set by mechanical strain of 350 HB. DB	=+, ~ 19% Cr; 9% Ni; 6% Mn
FINOX 4337 Mo E 29 9 3 R 12 E 312-16 mod.	Special electrode with a very high tensile strength and elongation for joint welding and surfacing at similar and equal steels or cast steels, for joint welding at high tensile unalloyed steels, tempered and tool steels, high-manganese steels and joints between dissimilar steels with high alloyed stainless steels.	=+, ~ 29% Cr; 9% Ni; 2,8% Mo
FICAST NIFE B E NiFe-1 BG 11 E NiFe-C1	Nickel-iron electrode for welding of grey cast iron with laminar and globular graphite structure, also for joints of cast iron (GGL- and GGG-types) with unalloyed steels. The alloyed weld metal is mainly produced by the core wire, 60 % Ni and 40 % Fe. Because of the bimetal core wire a high amperage adjustment and a high deposition rate is achieved. The weld metal is easy to machine and highly crack resistant.	=−, =+, ~ 60% Ni; 10% Fe 180 HB
FIDUR 1/250 E 1-UM-250	Electrode for tough and impact-proofed surfacings, especially for overlays on rails and rollers, for machines in agriculture and in building trade. The weld metal is still machinable.	=+ 0,15% C; 0,9% Cr 250 HB
FIDUR 1/350 E 1-UM-350	Electrode with 120% recovery for overlays on machine parts like guideways, rails dredger parts etc.	=+ 0,17% C; 1,8% Cr 350 HB
FIDUR 10/60 S E 10-UM-60 GR	Electrode especially designed for the resurfacing job on sugar-cane-mill-rolls. The surface welding has to be done by spot-type deposits to reach for a rough surface underlining the grip of the rolls and improofes the efficency of the mill. The coating of the electrode allows resurface welding during operation of the mill. Even larger variations in arc length does not make the arc to go out. The operator can always asure a drop-transfere to the place of target.	=+, ~ 4% C; 27% Cr; +B 60 HRC
FIDUR 10/65 W E 10-UM-65 GTZ	Heavy coated high-efficiency electrode with 240 % recovery for high abrasive surfacing on machine parts, working under strong grinding conditions. Ideal for hardsurfacing components used in the mining and quarrying industries. Deposits contain complex Cr-Nb-Mo-W-V-carbides for a very good wear resistance at elevated temperatures up to 500°C.	=+, ~ 5% C; 22% Cr; 7% Mo; 7% Nb; 2% W;
KJELGOUGE	Special covered electrode for chamfering of all metallic materials including stainless steel, cast iron, copper, bronze and aluminium. Kjelgouge strikes easily and generates a high gas pressure, enabling a clean gouge to be achieved.	=-,~



04-01-05

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