utp maintenance
by voestalpine

Tailor-Made Protectivity™

FILLER METALS FOR REPAIR, ANTI-WEAR AND ANTI-CORROSION

voestalpine Böhler Welding
www.voestalpine.com/welding

voestalpine
ONE STEP AHEAD.

TAILOR-MADE PROTECTIVITY™

UTP Maintenance ensures an optimum combination of protection and productivity with innovative and tailor-made solutions. Everything revolves around the customer and their individual requirements. That is expressed in the central performance promise: Tailor-Made Protectivity™.

WE OFFER YOU

a wide range of long-life filler metals that help you increase productivity and optimize maintenance, repair, wear and surface protection. Rely on:

- Tailored products to the exact needs of your industry
- Consistently high product quality
- Worldwide distribution and a global service network
- Individual technical support by application specialists and welding engineers
- Decades of experience and application know-how

SOLUTIONS AT EVERY POINT ON THE GLOBE

UTP Maintenance provides products and services through the global branches of voestalpine Böhler Welding and its dealer network in more than 150 countries throughout the world. A team of welding engineers stands at the customer's side, providing advice and support in all matters related to the challenges of welding technology.

CUSTOMIZED PRODUCTS OF SUPERIOR QUALITY

We continuously adapt our product portfolio of about 600 products to customer and industry specifications, while ensuring that we meet the highest quality specifications.

From its in-house production facilities, UTP Maintenance delivers innovative, tailor-made welding filler metals for: unalloyed and fine-grained structural steel, low-grade alloyed steels, rust-proof, acid-proof, and heat-proof steels, nickel-based alloys, cast iron, copper and copper alloys, manganese steels, tool steels, and cobalt steels.

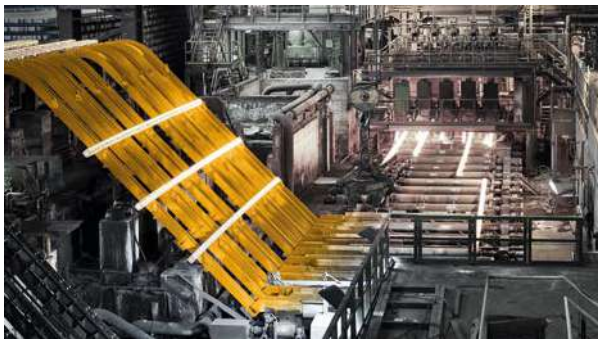
The product portfolio comprises:

- Stick electrodes
- Solid wires and rods
- Flux cored wires
- Submerged arc wires and fluxes
- Submerged arc strips and fluxes
- Spraying- and PTA-powders

Business Product Lines

Maintenance		Cladding
Repair product line	**Surfacing product line**	**Cladding product line**
Repair of cracked material	**Anti-wear applications**	**Anti-corrosion applications**
» Covered Electrodes » TIG Rods » Solid Wires » Metal Cored Wires » Gas Shielded Cored Wires » Open Arc Wires	» Covered Electrodes » Solid Wires » Metal Cored Wires » Gas Shielded Cored Wires » Open Arc Wires » SAW-Wires » SAW-Flux » SAW-Cored Wires » Thermal Spraying Powders	» Covered Electrodes » TIG Rods » Solid Wires » Gas Shielded Cored Wires » Open Arc Wires » SAW-Flux » SAW-Cored Wires » SAW-Strips » Cladding Equipment

Industry Focus



- Agriculture & Food
- Cement
- Earth Moving
- Energy & Power
- Glass
- Mining
- Oil & Gas
- Pulp & Paper
- Pumps, Valves & Fittings
- Railway Systems
- Recycling and Waste Management
- Shipyards
- Steel Structure
- Steel Works
- Sugar & Ethanol
- Tool Construction

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CORRESPONDING FILLER METALS

Covered Electrode	TIG Rod	Solid wire	Gas shielded cored wire	Open Arc wire	SAW Cored wire
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UTP 611		UTP A 119			
UTP 614 KB		UTP A 119	UTP AF152	SK BU-C1	
UTP 63	UTP A 63	UTP A 63	SK 402-G / SK 307-G	SK 402-O	SK 402-S
UTP 68 LC	UTP A 68 LC	UTP A 68 LC	UTP AF 68 LC	SK 308L-O	
UTP 68 Mo	UTP A 68 Mo	UTP A 68 Mo			
UTP 68 MoLC	UTP A 68 MoLC	UTP A 68 MoLC		SK 316L-O	
UTP 6824 LC	UTP A 6824 LC	UTP A 6824 LC	UTP AF 6824 LC	SK 309L-O	
UTP 068 HH	UTP A 68 HH	UTP A 68 HH			
UTP 6222 Mo	UTP A 6222 Mo	UTP A 6222 Mo			
UTP 83 FN	UTP A 8051 Ti		SK FNM-G	SK FN-O	
UTP 86 FN	UTP A 8051 Ti		SK FNM-G	SK FN-O	
UTP 387	UTP A 387	UTP A 387			
UTP 34 N	UTP A 34 N	UTP A 34 N			
UTP 73 G 2	UTP A 73 G 2	UTP A 73 G 2	SK D 12-G / SK D 12S-G		
UTP 73 G 3	UTP A 73 G 3	UTP A 73 G 3			
UTP 73 G 4	UTP A 73 G 4	UTP A 73 G 4	SK 734-G	SK 734-O	
UTP 690			SK 20-G		
UTP 750			SK D35-G		SK D 35-S
UTP 7200				SK 313-O	
UTP BMC			SK AP-G	SK AP-O	SK AP-S
UTP CELSIT 706			SK STELKAY 6-G	SK STELKAY 6-O	
UTP CELSIT 721			SK STELKAY 21-G		
UTP DUR 250		UTP A DUR 250	SK D250-G / SK 250-G	SK BU-O	SK BU-S
UTP DUR 350		UTP A DUR 350	SK 350-G	SK 350-O	SK 350-S
UTP DUR 600		UTP A DUR 600	UTP AF DUR 600 T / SK 600-G	SK A12-O	
UTP LEDURIT 61				SK 460-O	
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COVERED ELECTRODES FOR REPAIR OF CRACKED MATERIAL

Unalloyed and low alloy steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 610	AWS 5.1	Yield strength $R_{P0,2}$	Tensile strength R_m	Rutile cellulose coated stick electrode with very good weldability in all positions, including vertical down. Universal electrode, particularly for small transformers. Bendable covering. Versatile application in steel, vehicle etc.
	E 6013	≥ 380	470-600	
	EN ISO 2560-A	Elongation A	Impact strength K_V	
	E 38 0 RC 11	≥ 20	≥ 47	
UTP 611	AWS 5.1	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 611 is a strongly coated stick electrode for repair of cracked material and surfacing on all kind of steel constructions. It is used in autobody- and wagon industry, boiler construction and shipbuilding.
	E 6013	>380	>510	
	EN ISO 2560-A	Elongation A	Impact strength K_V	
	E 38 0 RR 12	> 22%	>47 J	
UTP 614 Kb	AWS 5.1	Yield strength $R_{P0,2}$	Tensile strength R_m	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
	E 7018	> 420	> 510	
	EN ISO 2560-A	Elongation A	Impact strength K_V	
	E 42 3 B32 H10	> 22	> 47 (-30°)	

Stainless Steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 63	EN 14700	Yield strength $R_{P0,2}$	Tensile strength R_m	With the fully austenitic UTP 63, non-alloy structural and heat-treatable steels can be welded, also in combination with austenitic CrNi steels.
	E Fe10	> 350	> 600	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 18 8 Mn R 32	> 40	> 60	
UTP 65 D	EN 14700	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 65 D has been developed to satisfy the highest requirements for repair and surfacing. It is extremely crack-resistant when joining steels of difficult weldability.
	E Z Fe11	> 640	> 800	
	EN ISO 3581-A	Elongation A		
	~ E 29 9 R 12	> 20		
UTP 68 H	AWS A5.4	Yield strength $R_{P0,2}$	Tensile strength R_m	The rutile coated stick electrode UTP 68 H is suitable for repair and surfacing of heat resistant Cr-, CrSi-, CrAl-, CrNi-steels/cast steels.
	E 310-16	> 350	> 550	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 25 20 R 32	> 30	> 47	
UTP 68 LC	AWS A5.4	Yield strength $R_{P0,2}$	Tensile strength R_m	The rutile coated stick electrode UTP 68 LC, with a low carbon content, is used for repair and building up of identical low carbon, austenitic CrNi steels and CrNi cast steels.
	E 308 L - 17	> 350	> 520	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 19 9 L R 3 2	> 35	> 47	
UTP 68 Mo	AWS A5.4	Yield strength $R_{P0,2}$	Tensile strength R_m	The rutile coated stick electrode UTP 68 Mo is used for repair and surfacing of stabilized and non stabilized CrNiMo steels and CrNiMo cast steels.
	E 318 - 16	380	560	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 19 12 3 Nb R 3 2	30	55	
UTP 68 MoLC	AWS A5.4	Yield strength $R_{P0,2}$	Tensile strength R_m	The rutile coated stick electrode UTP 68 MoLC, with a low C content, is used for repair and surfacing of identical, low carbon, austenitic CrNiMo steels and CrNiMo cast steels.
	E 316 L-17	380	560	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 19 12 3 L R 3 2	30	60	
UTP 6824 LC	AWS A5.4	Yield strength $R_{P0,2}$	Tensile strength R_m	The rutile coated stick electrode UTP 6824 LC is used for repair and surfacing of stainless and heat resistant steels / cast steels as well as for dissimilar metal joints (heterogeneous joints) and for buffer layers on corrosion - or wear resistant claddings on C-steels.
	E 309 L-17	> 390	> 550	
	EN ISO 3581-A	Elongation A	Impact strength K_V	
	E 23 12 L R 32	> 30	> 47	

Nickel Alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 80 M	AWS 5.11	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 80 M is suitable for repair and surfacing of nickel-copper alloys and of nickel-copperclad steels.
	E NiCu-7	> 300	> 480	
	EN ISO 14172	Elongation A	Impact strength K_V	
	E Ni 4060	> 30	> 80	
UTP 068 HH	AWS 5.11	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 068 HH is predominantly used for repair identical or similar heat resistant Ni-base alloys, heat resistant austenites, cold tough Ni-steel, and for joining heat resistant austenitic- ferritic materials.
	E NiCrFe-3 (mod.)	420	680	
	EN ISO 14172	Elongation A	Impact strength K_V	
	E Ni 6082	40	120	
UTP 6222 Mo	AWS 5.11	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 6222 Mo is particularly suited for joining, repair and surfacing on nickel alloys, austenitic steels, low temperature nickel steels, austenitic-ferritic-joints and claddings.
	E NiCrMo-3	> 450	> 760	
	EN ISO 14172	Elongation A	Impact strength K_V	
	E Ni 6625	> 30	> 75	
UTP 7015	AWS 5.11	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 7015 is employed for repair 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.
	E Ni 6182	400	670	
	EN ISO 14172	Elongation A	Impact strength K_V	
	E NiCrFe-3	40	120	

Cast Iron

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 8	AWS A5.15	Yield strength $R_{P0,2}$	Hardness HB	UTP 8 is for cold welding of grey and malleable cast iron, cast steel and for repair these base metals to steel, copper and copper alloys, especially for repair and maintenance.
	E Ni-CI	approx. 220	approx. 180	
	EN ISO 1071			
	E C Ni-CI 1			
UTP 83 FN	AWS A5.15	Hardness HB		UTP 83 FN is suitable for surfacing and repair of all commercial cast iron grades, such as lamellar grey cast iron and nodular cast iron, malleable cast iron and for repair these materials to steel or cast steel.
	E NiFe-CI	approx. 190		
	EN ISO 1071			
	E C NiFe-11			
UTP 86 FN	AWS A5.15	Yield strength $R_{P0,2}$	Hardness HB	UTP 86 FN is suitable for repair, joining and surfacing of lamellar grey cast iron EN GJL 100 - EN GJL 400, nodular cast iron (spheroidal cast iron) EN GJS 400 - EN GJS 700 and malleable cast iron grades EN GJMB 350 - EN GJMB 650 as well as for joining these materials with each other or with steel and cast steel.
	E NiFe-CI	approx. 340	approx. 220	
	EN ISO 1071			
	E C NiFe-13			

Copper alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 32	AWS A5.6	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 32 is a basic-coated tin-bronze stick electrode for repair and surfacing on copper tin alloys with 6 – 8 % Sn, copper-tin alloys and for weld claddings on cast iron materials and on steel.
	E CuSn-C (mod.)	approx. 300	> 30	
	DIN 1733	Elongation A	Hardness HD	
	EL-CuSn7	approx. 7	approx. 100	
UTP 387	AWS A5.6	Yield strength $R_{P0,2}$	Tensile strength R_m	The copper-nickel base stick electrode UTP 387 is used for repair and surfacing alloys of similar com-positions with up to 30 % nickel, as well as non-ferrous alloys and steels of different nature.
	E CuNi	> 240	> 390	
	DIN 1733	Elongation A	Impact strength K_V	
	EL-CuNi30Mn	> 30	> 80	

SURFACING ELECTRODES FOR ANTI-WEAR AND ANTI-CORROSION

Product Name	Abrasion	Corrosion	Erosion	Cavitation	Heat	Impact	Metal to Earth	Metal to Metal
UTP 34 N		•		•				•
UTP 73 G 2	•		•		•	•		•
UTP 73 G 3	•		•		•	•		•
UTP 73 G 4	•		•		•	•		•
UTP 673	•		•		•	•		•
UTP 690					•			•
UTP 750		•			•	•		•
UTP 7200						•		•
UTP BMC						•		•
UTP CELSIT 706	•	•	•	•	•	•		•
UTP CELSIT 721	•	•	•	•	•	•		•
UTP DUR 250								•
UTP DUR 350						•		•
UTP DUR 600	•		•			•	•	•
UTP LEDURIT 61	•		•				•	
UTP LEDURIT 65	•		•		•		•	

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 34 N	AWS A5.13	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP 34 N is suitable for repair and surfacings on copper-aluminium alloys, specially with high Mn-content as well as for claddings on cast iron materials and steel.
	E CuMnNiAl	400	650	
	EN 14700	Elongation A	Hardness HB	
	E Cu1	15	220	
UTP 73 G 2	DIN 8555	Hardness HRC		UTP 73 G 2 is, due to its high hardness, toughness and heat resistance ideally suited for buildups on parts subject to severe friction, compression and moderate impact loads at elevated temperatures.
	E 3-UM-55-ST	55 - 58		
	EN 14700			
	E Fe8			
UTP 73 G 3	DIN 8555	Hardness HRC		UTP 73 G 3 is, due to its high strength, toughness and heat resistance ideally suited for buildups on parts subject to friction, compression and impact at elevated temperatures.
	E 3-UM-45-T	approx. 45-50		
	EN 14700			
	E Fe3			
UTP 73 G 4	DIN 8555	Hardness HRC		UTP 73 G 4 is, due to its toughness and heat resistance, ideally suited for surfacings on parts and tools subject to abrasion, compression and impact at elevated temperatures.
	E 3-UM-40-PT	approx. 38 - 42		
	EN 14700			
	E Z Fe3			

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP 673	DIN 8555	Hardness HRC	Heat resistent	UTP 673 is used for wear resistant buildups on cold and hot working tools, particularly for cutting-edges on hot cutting tools, hot-shear blades, trimming tools and cold cutting knives.
	E 3-UM-40-PT	approx. 58	up to 550° C	
	EN 14700			
	E Z Fe3			
UTP 690	AWS A5.13	Hardness HRC		UTP 690 is used for repair and production of cutting tools, particularly for building-up cutting edges and working surfaces. (soft annealed 800-840°C approx. 25 HRC)
	E Fe 5-B (mod.)	approx. 62		
	EN 14700			
	E Fe4			
UTP 750	DIN 8555	Hardness HRC		UTP 750 is suited for heat resistant buildups on hot working steels particularly exposed to metallic gliding wear and elevated thermal shock stress. (soft annealed 850 – 900 °C approx. 35 HRC)
	E 3-UM-50-CTZ	48 - 52		
	EN 14700			
	E Z Fe6			
UTP 7200	AWS A5.13	Hardness HB	Hardness HRC	UTP 7200 is predominantly suited for tough and crack resistant joinings, repairs and surfacings on parts of high Mn-steel subject to extreme impact, compression and shock.
	~ E FeMn-A	After welding	After workhardening	
	EN 14700	200 - 250	48 - 53	
	EZ Fe9			
UTP BMC	DIN 8555	Hardness HB	Hardness HRC	UTP BMC is suitable for claddings on parts subject to highest pressure and shock in combination with abrasion.
	E 7-UM-250-KPR	After welding	After workhardening	
	EN 14700	approx. 260	48 - 53	
	E Fe9			
UTP CELSIT 706	AWS A5.13	Hardness HRC		UTP CELSIT 706 is used for hardfacing on parts subject to a combination of erosion, corrosion, cavitation, impact, pressure, abrasion and high temperatures up to 900 °C.
	E CoCr-A	40 - 42		
	EN 14700			
	E Z Co2			
UTP CELSIT 721	AWS A5.13	Hardness HRC	Hardness HRC	UTP CELSIT 721 is used for crack resistant hardfacing on parts subject to a combination of impact, pressure, abrasion, corrosion and high temperatures up to 900 °C.
	E CoCr-E	After welding	After workhardening	
	EN 14700	31 - 37	45	
	E Co1			
UTP DUR 250	DIN 8555	Hardness HB		UTP DUR 250 is used for surfacing on parts, where a tough and easily machinable deposit is required.
	E 1-UM-250	approx. 270		
	EN 14700			
	E Fe1			
UTP DUR 350	DIN 8555	Hardness HB		UTP DUR 350 is particularly suited for wear resistant surfacings on Mn-Cr-V alloyed parts.
	E 1-UM-350	approx. 370		
	EN 14700			
	E Fe1			
UTP DUR 600	DIN 8555	Hardness HRC		UTP DUR 600 is universally applicable for cladding on parts of steel, cast steel and high Mn-steel, subject simultaneously to abrasion, impact and compression.
	E 6-UM-60	56 - 58		
	EN 14700			
	E Fe8			
UTP LEDURIT 61	AWS A5.13	Hardness HRC		UTP LEDURIT 61 is suited for highly wear resistant claddings on parts subject to strong grinding abrasion combined with medium impact.
	~ E FeCr-A 1	approx. 60		
	EN 14700			
	EZ Fe14			
UTP LEDURIT 65	DIN 8555	Hardness HRC		UTP LEDURIT 65 is suited for highly abrasion resistant claddings on parts subject to xtreme sliding mineral abrasion, also at elevated temperatures up to 500 °C.
	E 10-UM-65-GRZ	approx. 65		
	EN 14700			
	E Fe16			

TIG RODS FOR REPAIR OF CRACKED MATERIAL

Unalloyed and low alloy steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 118	AWS A5.18	Yield strength $R_{P0,2}$	Tensile strength R_m	GTAW solid rod for the welding repair with argon. Typical fields of use: boiler, tank and pipeline constructions and apparatus engineering.
	ER70S-6	440	560	
	EN ISO 636-A	Elongation A	Impact strength K_V	
	W 42 5 W3Si1	25	130	
UTP A 641	AWS A5.28	Yield strength $R_{P0,2}$	Tensile strength R_m	Welding rod for the welding repair with argon. Suitable for repair creep resistant steels in boiler, tank, pipeline and nuclear reactor construction.
	ER80S-G	450	560	
	EN ISO 21952-A	Elongation A	Impact strength K_V	
	W CrMo1Si	22	90	

Stainless Steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 63	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 63 is suitable for particularly crack resistant joining, repair and surfacing of high-strength ferritic and austenitic steels, hard manganese steels and cold-tough steels, as cushioning layer under hard alloys, dissimilar metal joints.
	ER 307 (mod.)	>370	>600	
	EN ISO 14343-A	Elongation A		
	W 18 8 Mn	>30		
UTP A 68 LC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 LC is suitable for repair and surfacing in chem. apparatus and vessel construction for working temperatures of – 196 °C up to 350 °C.
	ER 308 L (Si)	400	600	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	W 19 9 L (Si)	35	100	
UTP A 68 Mo	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 Mo is aplicable for repair and surfacings of stabilized, corrosion resistant CrNiMo steels of similar nature in the construction of chemical apparatus and vessels up to working temperatures of 120 °C up to 400 °C.
	ER 318 (Si)	460	680	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	W 19 12 3 Nb (Si)	35	100	
UTP A 68 MoLC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 MoLC is used for repair and surfacing of low-carbon, corrosion resistant CrNiMo steels exposed to high corrosion for working temperatures up to + 350 °C.
	ER 316 L (Si)	420	600	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	W 19 12 3 L (Si)	35	100	
UTP A 651	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 651 is suitable for joining, repair and surfacing of steels of difficult weldability, repair of hot and cold working steels, cushioning layers.
	ER 312	650	750	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	W 29 9	25	27	
UTP A 6824 LC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 6824 LC ist used for repair and surfacing in chem. apparatus and vessel construction for working temperatures up to + 300 °C. Weld cladding of non- and low-alloyed base materials. Dissimilar joints.
	ER 309 L (Si)	400	590	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	W 23 12 L (Si)	30	140	

Nickel Alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 80 M	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 80 M is suitable for repair and surfacing of nickel-copper alloys and of nickelcopper-clad steels. Particularly suited for the following materials: 2.4360 NiCu30Fe, 2.4375 NiCu30Al.
	ER NiCu-7	>300	>480	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 4060	>30	>80	
UTP A 068 HH	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 068 HH is predominantly used for repair identical or similar high heat resistant Ni-base alloys, heat resistant austenites, and for joining heat resistant austenitic-ferritic materials.
	ER NiCr-3	>380	>640	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 6082	>35	>160	
UTP A 6222 Mo	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 6222 Mo has a high nickel content and is suitable for repair high-strength and high-corrosion resistant nickel-base alloys.
	ER NiCrMo-3	>460	>740	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 6625	>30	>100	

Cast Iron

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 8051 Ti	EN ISO 1071	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 8051 Ti is particularly suited for welding of ferritic and austenitic nodular cast iron as well as for joining it with unalloyed and high-alloyed steels, copper and nickel alloys. Build-up layers on grey cast iron qualities are also possible.
	S C NiFe-2	>300	>500	
		Elongation A	Hardness HB	
		>25	approx. 200	

Copper alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 34 N	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 34 N is applied in TIG repair and surfacing on complex aluminium bronzes mainly on such materials with a high Mn content as well as on steel and cast steel by using a nodular iron rod.
	ER CuMnNiAl	400	650	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 6338	15	220	
UTP A 38	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 38 is used for oxygen free copper types according to DIN 1787 OF-Cu, SE-Cu, SWCu, SF-Cu. The main applications are in the electrical industry e.g. for conductor rails or other applications where high electricity is required.
	ER Cu	80	200	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 1897 (CuAg1)	20	60	
UTP A 381	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 381 is used for oxygen free copper types according to DIN 1787 OF-Cu, SE-Cu, SWCu, SF-Cu. The main applicational fields are in the apparatus- and pipeline repair.
	ER Cu	50	200	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 1898 (CuSn1)	30	approx. 60	
UTP A 387	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 387 is used for copper nickel alloys with up to 30 % nickel according to DIN 17664, such as CuNi20Fe (2.0878), CuNi30Fe (2.0882). Chemical industry, seawater desalination plants, ship building, offshore technique.
	ER CuNi	>200	>360	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 7158	>30	120	

SOLID WIRES FOR REPAIR OF CRACKED MATERIAL

Unalloyed and low alloy steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 118	AWS A5.18	Yield strength $R_{P0,2}$	Tensile strength R_m	GTAW solid wire for the welding repair with argon. Typical fields of use: boiler, tank and pipeline constructions and apparatus engineering.
	ER70S-6	440	560	
	EN ISO 636-A	Elongation A	Impact strength K_V	
	G 42 2 C1 3Si1 / G 46 4 M21 3Si1	25	130	
UTP A 119	AWS A5.28	Yield strength $R_{P0,2}$	Tensile strength R_m	Welding rod for the welding repair with argon. Suitable for repair creep resistant steels in boiler, tank, pipeline and nuclear reactor construction.
	ER80S-G	450	560	
	EN ISO 21952-A	Elongation A	Impact strength K_V	
	G 46 2 C1 4Si1 / G 46 4 M21 4Si1	22	90	
UTP A 641	AWS A5.28	Yield strength $R_{P0,2}$	Tensile strength R_m	Welding rod for the welding repair with argon. Suitable for repair creep resistant steels in boiler, tank, pipeline and nuclear reactor construction.
	ER80S-G	450	560	
	EN ISO 21952-A	Elongation A	Impact strength K_V	
	G CrMo1Si	22	90	

Stainless Steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 63	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 63 is suitable for particularly crack resistant joining, repair and surfacing of high-strength ferritic and austenitic steels, hard manganese steels and cold-tough steels, as cushioning layer under hard alloys, dissimilar metal joints.
	ER 307 (mod.)	>370	>600	
	EN ISO 14343-A	Elongation A		
	G 18 8 Mn	>30		
UTP A 68 LC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 LC is suitable for repair and surfacing in chem. apparatus and vessel construction for working temperatures of – 196 °C up to 350 °C.
	ER 308 L (Si)	400	600	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	G 19 9 L (Si)	35	100	
UTP A 68 Mo	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 Mo is aplicable for repair and surfacings of stabilized, corrosion resistant CrNiMo steels of similar nature in the construction of chemical apparatus and vessels up to working temperatures of 120 °C up to 400 °C.
	ER 318 (Si)	460	680	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	G 19 12 3 Nb (Si)	35	100	
UTP A 68 MoLC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 68 MoLC is used for repair and surfacing of low-carbon, corrosion resistant CrNiMo steels exposed to high corrosion for working temperatures up to + 350 °C.
	ER 316 L (Si)	420	600	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	G 19 12 3 L (Si)	35	100	
UTP A 651	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 651 is suitable for joining, repair and surfacing of steels of difficult weldability, repair of hot and cold working steels, cushioning layers.
	ER 312	650	750	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	G 29 9	25	27	
UTP A 6824 LC	AWS A5.9	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 6824 LC ist used for repair and surfacing in chem. apparatus and vessel construction for working temperatures up to + 300 °C. Weld cladding of non- and low-alloyed base materials. Dissimilar joints.
	ER 309 L (Si)	400	590	
	EN ISO 14343-A	Elongation A	Impact strength K_V	
	G23 12 L (Si)	30	140	

Nickel Alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 80 M	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 80 M is suitable for repair and surfacing of nickel-copper alloys and of nickelcopper-clad steels. Particularly suited for the following materials: 2.4360 NiCu30Fe, 2.4375 NiCu30Al.
	ER NiCu-7	>300	>480	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 4060	>30	>80	
UTP A 068 HH	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 068 HH is predominantly used for repair identical or similar high heat resistant Ni-base alloys, heat resistant austenites, and for joining heat resistant austenitic-ferritic materials.
	ER NiCr-3	>380	>640	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 6082	>35	>160	
UTP A 6222 Mo	AWS 5.14	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 6222 Mo has a high nickel content and is suitable for repair high-strength and high-corrosion resistant nickel-base alloys.
	ER NiCrMo-3	>460	>740	
	EN ISO 18274	Elongation A	Impact strength K_V	
	S Ni 6625	>30	>100	

Cast Iron

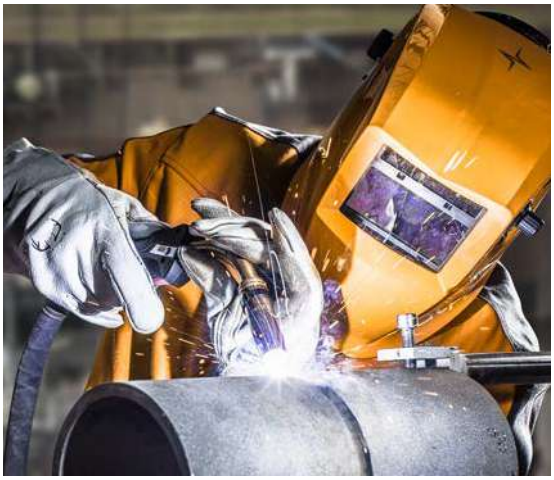
Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 8051 Ti	EN ISO 1071	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 8051 Ti is particularly suited for welding of ferritic and austenitic nodular cast iron as well as for joining it with unalloyed and high-alloyed steels, copper and nickel alloys. Build-up layers on grey cast iron qualities are also possible.
	S C NiFe-2	>300	>500	
		Elongation A	Hardness HB	
		>25	approx. 200	

Copper alloys

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 34 N	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 34 N is applied in TIG repair and surfacing on complex aluminium bronzes mainly on such materials with a high Mn content as well as on steel and cast steel by using a nodular iron rod.
	ER CuMnNiAl	400	650	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 6338	15	220	
UTP A 38	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 38 is used for oxygen free copper types according to DIN 1787 OF-Cu, SE-Cu, SWCu, SF-Cu. The main applications are in the electrical industry e.g. for conductor rails or other applications where high electricity is required.
	ER Cu	80	200	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 1897 (CuAg1)	20	60	
UTP A 381	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 381 is used for oxygen free copper types according to DIN 1787 OF-Cu, SE-Cu, SWCu, SF-Cu. The main applicational fields are in the apparatus- and pipeline repair.
	ER Cu	50	200	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 1898 (CuSn1)	30	approx. 60	
UTP A 387	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 387 is used for copper nickel alloys with up to 30 % nickel according to DIN 17664, such as CuNi20Fe (2.0878), CuNi30Fe (2.0882). Chemical industry, seawater desalination plants, ship building, offshore technique.
	ER CuNi	>200	>360	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 7158	>30	120	

SURFACING SOLID WIRES FOR ANTI-WEAR AND ANTI-CORROSION

Product Name	Abrasion	Corrosion	Erosion	Cavitation	Heat	Impact	Metal to Earth	Metal to Metal
UTP A 34 N		•		•				•
UTP A 73 G 2	•		•		•	•		•
UTP A 73 G 3	•		•		•	•		•
UTP A 73 G 4	•		•		•	•		•
UTP A DUR 250								•
UTP A DUR 350						•		•
UTP A DUR 600	•		•			•	•	•
UTP A DUR 650	•		•		•	•	•	•



Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP A 34 N	AWS A5.7	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP A 34 N is applied for repair and surfacing on complex aluminium bronzes mainly on such materials with a high Mn content as well as on steel and cast steel by using a nodular iron rod.
	ER CuMnNiAl	400	650	
	EN ISO 24373	Elongation A	Hardness HB	
	S Cu 6338	15	220	
UTP A 73 G 2	DIN 8555	Hardness HRC		UTP A 73 G 2 is used for highly wear resistant buildups on machine parts and tools, subject to heavy abrasion and compression combined with moderate impact at elevated temperatures.
	MSG 3-GZ-55-ST	55 - 58		
	EN 14700			
	S Fe8			
UTP A 73 G 3	DIN 8555	Hardness HRC		UTP A 73 G 3 is, due to the excellent hot wear resistance and toughness, used for highly stressed hot working tools, which are simultaneously subject to high mechanical, thermal and abrasive loads.
	MSG 3-GZ-45-T	approx. 45 - 50		
	EN 14700			
	S Z Fe3			
UTP A 73 G 4	DIN 8555	Hardness HRC		UTP A 73 G 4 is, due to its excellent hot wear resistance and toughness, used for buildups on hot working tools and structural parts subject to impact, compression and abrasion at elevated temperatures.
	MSG 3-GZ-40-T	approx. 38 - 42		
	EN 14700			
	S Z Fe3			
UTP A DUR 250	DIN 8555	Hardness HB		UTP A DUR 250 is used for MAG buildups on structural parts subject to rolling wear and where a good machinability is required.
	MSG 1-GZ-250	approx. 250		
	EN 14700			
	SZ Fe 1			
UTP A DUR 350	DIN 8555	Hardness HB		UTP A DUR 350 is suited for MAG buildups on structural parts subject to compression, impact and abrasion, such as caterpillar track components, machine and gear parts, stamps.
	MSG 2-GZ-400	approx. 450		
	EN 14700			
	SZ Fe 2			
UTP A DUR 600	DIN 8555	Hardness HRC		UTP A DUR 600 is universally applicable for MAG buildups on structural parts subject to high impact and medium abrasion.
	MSG 6-GZ-60-S	54 - 60		
	EN 14700			
	S Fe 8			
UTP A DUR 650	DIN 8555	Hardness HRC		UTP A DUR 650 is universally used for MAG buildups on structural parts subject to high impact and abrasion.
	MSG 3-GZ-60	55 - 60		
	EN 14700			
	S Fe 8			

FLUX CORED WIRES FOR REPAIR OF CRACKED MATERIAL

Unalloyed and low alloy steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP AF 152	AWS A5.36	Yield strength $R_{P0,2}$	Tensile strength R_m	Rutile flux cored wire with fast freezing slag. Outstanding repair welding properties in all positions. Excellent mechanical properties and good slag detachability, low spatter losses, smooth, finely rippled seam surface, high x-ray security, notch-free weld toes.
	E71T1-M21A4-CS1-H8 E71T1-C1A2-CS1-H4	500	580	
	EN ISO 17632-A	Elongation A	Impact strength K_V	
	T 46 4 P M 1 H10 T 42 2 P C 1 H5	26	180	
UTP AF 155	AWS A5.18	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP AF 155 is a high-efficiency flux cored wire with metal powder filling, for all position repair welding with mixed gas M21 acc. to EN ISO 14175.
	E70C-6MH4	460	560	
	EN ISO 17632-A	Elongation A	Impact strength K_V	
	T 46 4 M M 1 H5	22	130	
UTP AF 160	AWS A5.36	Yield strength $R_{P0,2}$	Tensile strength R_m	Rutile flux cored wire with fast freezing slag for welding low-temperature steels. Outstanding welding properties in all positions.
	E81T1-M21A8-Ni1-H4	530	570	
	EN ISO 17632-A	Elongation A	Impact strength K_V	
	T 50 6 1Ni P M 1 H5	27	140	

Stainless Steels

Name	Classification	Mechanical properties of the weld metal		Characteristics and field of use
UTP AF 68 LC	AWS A5.22	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP AF 68 LC is a low carbon, CrNi flux-cored wire with rutile slag used for joint-welding of alloyed CrNi-steels and cast steels.
	E 308 LT-0-1 E 308 LT-0-4	380	560	
	EN ISO 17633-A	Elongation A	Impact strength K_V	
	T 19 9 L RM3 T 19 9 L RC3	35	70	
UTP AF 68 MoLC	AWS A5.22	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP AF 68 MoLC is a low carbon, CrNi flux-cored wire with rutile slag for joining and surfacing of CrNisteels and cast steel.
	E 316 LT0-1 E 316 LT0-4	400	560	
	EN ISO 17633-A	Elongation A	Impact strength K_V	
	T 19 12 3 L RM3 T 19 12 3 L RC3	35	55	
UTP AF 6824 LC	ASME II C SFA 5.22	Yield strength $R_{P0,2}$	Tensile strength R_m	UTP AF 6824 LC is a low-carbon flux-cored wire with rutile slag used for repair welding of alloyed CrNi steels among each other or with other unalloyed or low alloyed steels / cast steels.
	E 309 LT 0-1 E 309 LT 0-4	400	550	
	EN ISO 17633-A	Elongation A	Impact strength K_V	
	T 23 12 L RM3 T 23 12 L RC3	35	60	
UTP AF 6222 MoPW	AWS A5.22	Yield strength $R_{P0,2}$	Tensile strength R_m	The nickel-base-flux-cored wire (NiCrMo) UTP AF 6222 Mo PW is suitable for repair and surfacing on nickel-base materials of the same nature and on C- and CrNi-steels as well as for cladding on C-steels, furthermore in high temperature applications.
	ENiCrMo3 T1-4	490	750	
	EN ISO 17633-A	Elongation A	Impact strength K_V	
	T Ni 6625 PM 2	30	70	

GAS SHIELDED CORED WIRES FOR REPAIR, ANTI-WEAR AND ANTI-CORROSION

Product Name	Low stress abrasion	High stress abrasion	Erosion	Impact	Corrosion	Cavitation	Heat	Metal to metal wear
SK AP-G				•	•			•
SK 250-G				•				
SK 350-G				•				
SK 600-G	•			•				•
SK 650-G	•			•				•
SK A45-G		•						•
SK ABRA-MAX O/G		•	•					•
SK D8-G								•
SK D12-G								•
SK D20-G	•							•
SK D35-G					•	•	•	•
SK D250-G				•				•
SK STELKAY 6-G					•	•	•	•
SK STELKAY 21-G				•	•	•	•	•
SK STELKAY 25-G				•	•	•	•	•
SK 900 Ni-G		•			•		•	
SK FNM-G				•	•			
SK 356-G	•				•			•
SK 741-G					•			•
SK ANTINIT DUR 500					•	•	•	•

Manganese steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK AP-G	DIN 8555 MF-7-GF-200 KP ISO 14700 T Fe9	185		0,9	14,5	0,3	12		0,5						Bal.	Austenitic alloy with Chromium designed for rebuilding 14 % Manganese steel parts where parent metal matching colour is a must.

Low alloy steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 250-G	DIN 8555 MF 1-GF-225-GP ISO 14700 TZ Fe1	225		0,09	1,2	0,5	0,4								Bal.	Metal-cored wire designed for building-up by welding in horizontal and vertical-up positions under gas shielding.
SK 350-G	DIN 8555 MF 1-GF-350-GP ISO 14700 T Z Fe1	330		0,35	1,5	0,4	1,4								Bal.	Rebuilding and hardfacing alloy for carbon steel parts.
SK 600-G	DIN 8555 MF 6-GF-60-GP ISO 14700 T Fe8		59	0,52	1,5	1,2	5,9		0,8		0,05				Bal.	Martensitic steel alloy designed for welding in horizontal and vertical-up positions under gas shielding. Its resistance to friction and low stress abrasive wear with moderate impact is excellent.
SK 650-G	DIN 8555 MF 3-GF-60-GT ISO 14700 T Fe8		58	0,45	0,9	0,6	5,5		1,4			1,6	0,5		Bal.	Martensitic steel alloy designed for welding in horizontal and vertical-up positions under gas shielding. Its resistance to friction and medium stress abrasive wear with moderate impact is excellent.

High alloyed steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK A45-G	DIN 8555 MF 10-GF-65-GT ISO 14700 T Fe16		63	5,3	0,1	0,7	21		6,3	6		1,8	0,75		Bal.	Chromium-Niobium-Molybdenum alloy with addition of Tungsten and Vanadium designed to resist high stress grinding abrasion with low impact and solid erosion at service temperatures up to 650 °C.
SK ABRA-MAX O/G	DIN 8555 MF 6-GF-70-GT ISO 14700	HB	HRC		Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	Special hardfacing cored wire designed to give an extreme resistance against high stress grinding abrasion and erosion without impact.
		C +Cr + Mo + Nb + W + V + B (Bal Fe)														
			69 -70													

Tool steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK D8-G	DIN 8555 MF 3-GF-40-T ISO 14700 T Z Fe3		38	0,1	1,1	0,4	2,4					3,8	0,6		Bal.	Special alloy designed for the repair and the hard surfacing of tools working at low and high temperatures.
SK D12-G	DIN 8555 MF 3-GF-55-T EN ISO 14700 T Z Fe3		55	0,35	1,2	0,3	7,5		1,7		0,3				Bal.	Metal cored wire designed for hardsurfacing of tool steel parts.
SK D20-G	DIN 8555 MF 4-GF-60-S EN ISO 14700 T Z Fe8		60	1,2	0,4	0,4	4,5		8			1,8	1,7		Bal.	Special alloy designed to deposit a molybdenum-alloyed high-speed steel. To avoid cracking, a minimum interpass temperature of 300 °C should be applied.
SK D35-G	DIN 8555 MF 6-GF-50-CT EN ISO 14700 T Z Fe3		50	0,16	0,1	0,7	13		2,4	14					Bal.	Special Iron-Chromium-Cobalt-Molybdenum alloy designed to resist metal-to-metal wear, fatigue, oxidation, cavitation and corrosion at high temperature. The typical hardness can be achieved in the first layer.
SK D250-G	DIN 8555 MF 1-GF-350 EN ISO 14700		330	0,09	0,8	0,3	2,9	2,4							Bal.	Special alloy suitable for repair of tool steel parts working at high temperatures. The deposit is particularly resistant against cracks propagation.

Cobalt steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Co	Mo	Nb	Ti	W	V	B	Fe	
SK STELKAY 6-G	DIN 8555 MF 20-GF-40-CTZ ASME IIC SFA 5.21 ERC CoCr-A ISO 14700 T Co2		40	0,95	0,8	1,4	30	Bal.				4,2			3	Cobalt base alloy providing excellent resistance to metal-to-metal wear, oxidation, thermal cycling and impact in corrosive environments at high temperature.
SK STELKAY 21-G	DIN 8555 MF 20-GF-300-CTZ ASME IIC SFA 5.21 ERC CoCr-E ISO 14700 T Co1	HB	HRC	C	Mn	Si	Cr	Ni	Mo	Co	Ti	W	V	B	Fe	Cobalt base alloy providing excellent resistance to metal-to-metal wear, thermal shocks, oxidation in corrosive environments at high temperature.
			32	0,27	1	1,2	28	2,4	5	Bal.					3,5	
SK STELKAY 25-G	DIN 8555 MF 20-GF-200-STZ ISO 14700 T Co1	HB	HRC	C	Mn	Si	Cr	Ni	Co	Nb	Ti	W	V	B	Fe	Cobalt base alloy providing excellent resistance to metal-to-metal wear, thermal shocks, oxidation in corrosive environments at high temperature.
		195		0,01	0,8	0,4	20,2	10	Bal.			13			3,5	

Nickel alloys

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 900 Ni-G	DIN 8555 MF 22-GF-45-G ISO 14700 T Ni20		46	1,7	0,1	0,1		Bal.				41,5		0,8	1,1	Hardfacing cored wire containing about 45 % Tungsten carbide particles incorporated in a NiB matrix.
SK FNM-G	DIN 8555 MSG23-GF-200 ISO 14700	HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	FeNi alloy with 12 % Manganese designed for joining and surfacing of cast iron pieces. Can also be used for dissimilar welding between cast iron and steel.
		145		0,2	12	0,4		Bal.							48	

Stainless Steel

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 356-G	DIN 8555 MF 4-GF-50-ST ISO 14700 T Fe8		47	0,7	1,2	0,9	12	0,7	3,8			0,9	2		Bal.	Special iron base alloy designed to rebuild parts in the rubber industry.
SK 741-G	DIN 8555 MF 5-GF-40-C ISO 14700 T Fe7	HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	Alloy depositing a ferritic-martensitic steel containing 13 % Chromium, 5 % Nickel and 1 % Molybdenum designed to resist metal-to-metal wear, corrosion and thermal fatigue fire cracking.
			41	0,06	0,5	0,6	13	5,5	0,8						Bal.	
SK ANTINIT DUR 500	DIN 8555 MF 9-GF-45-CT ISO 14700 T Fe10	HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	For Hardfacing of or austenitic steels exposed to general corrosion, frictional wear, cavitation , or to high surface pressure. For use at temperatures up to 550 °C. Offers additionally enhanced resistance to pitting and intergranular corrosion. Preheating to 450 - 500 °C.
			43	0,07	4,3	4,5	17,5	8	5,4	1						

OPEN ARC CORED WIRES FOR REPAIR, ANTI-WEAR AND ANTI-CORROSION

Product Name	Low stress abrasion	High stress abrasion	Erosion	Impact	Corrosion	Cavitation	Heat	Metal to metal wear
SK 218-O				•				
SK 624-O		•		•				
SK AP-O				•	•			
SK 258-O	•			•				
SK 258 TIC-O		•		•				
SK 400-O				•				•
SK 162-O		•	•					
SK 255-O		•	•					
SK 256-O		•	•					
SK 866-O		•	•					
SK 867-O		•	•					
SK 900-0		•	•					
SK A43-O		•	•					
SK A45-O		•	•					
SK 370-O					•		•	•
SK 402-O			•		•			•
SK 714 N-O					•			•

Manganese steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 218-O	DIN 8555 MF 7-GF-200-KP ASME IIC SFA 5.21 ERC FeMn-G EN 14700 T Z Fe9	200		0,9	14	0,5	3,5	0,4							Bal.	Self shielded flux cored wire depositing an austenitic alloy designed for rebuilding of 14 % Manganese steel parts.
SK 624-O	DIN 8555 MF 7-GF-250-GKP EN 14700 T Fe9	240		1	17,2	0,3	8,2			2,5	0,12				Bal.	High Manganese-Chromium alloy enriched with Niobium, designed to resist abrasion and solid erosion wear combined with heavy impact. High Managnese alloy resulting in a workhardnable deposit.
SK AP-O	DIN 8555 MF 7-GF-200-KP ASME IIC SFA 5.21 FeMn-Cr EN 14700 T Z Fe9	205		0,37	16	0,3	12,8								Bal.	Multi-purpose cored wire, mainly used for rebuilding and joining of Carbon and 14 % Manganese steels. Can also be used as buffer layer prior to hard overlay. Work-hard-enable alloy.

Low alloy steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 258-O	DIN 8555 MF 6-GF-55-GT EN 14700 T Fe8		55	0,47	1,5	0,8	5,7		1,4			1,5			Bal.	Martensitic alloy designed to give an outstanding resistance to low stress abrasion with heavy impact and high compressive stresses. The deposit is heat treatable and forgeable.
SK 258 TIC-O	DIN 8555 MF 6-GF-60-GP EN 14700 T Z Fe8		58	1,8	0,9	0,2	6,1		1,4		5,5				Bal.	Martensitic Chromium-Titanium alloy designed to resist high stress abrasion with heavy impact. Deposits usually do not show stress relief cracks.
SK 400-O	DIN 8555 MF 1-GF-40-P EN 14700 T Z Fe1		40	0,13	0,7	0,6	2,4								Bal.	Open-arc wire designed for rebuilding and hardfacing of Carbon steel parts subjected to adhesive wear with impacts.

High alloyed steels

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 162-O	DIN 8555 MF 10-GF-65-G EN 14700 T Fe15		63	5,4	0,2	1,3	27								Bal.	High Chromium alloy designed to resist high stress grinding abrasion with low impact. The deposit will show readily stress relief cracks.
SK 255-O	DIN 8555 MF 10-GF-60-G ASME IIC SFA 5.21 FeCr-A9 EN 14700 T Z Fe14		60	5	0,6	1	27							0,5	Bal.	Open-arc metal cored wire designed to deposit a metal resistant to high stress grinding abrasion with low impact. The deposits will readily show stress relief cracks.
SK 256-O	DIN 8555 MF 10-GF-65-G EN 14700 T Fe16		63	5,5	1,1	1,2	25,7								Bal.	High Chromium carbide alloy designed to resist high stress grinding abrasion with low impact. The deposits will readily show stress relief cracks.
SK 866-O	DIN 8555 MF 10-GF-60-G EN 14700 T Z Fe15		60	4,5	0,7	0,8	27							0,5	Bal.	Alloy designed to resist high stress grinding abrasion with low impact. The deposits will readily show stress relief cracks.
SK 867-O	DIN 8555 MF 10-GF-60-G EN 14700 T Fe16		60	4,5	0,7	0,8	27							0,5	Bal.	Alloy designed to resist high stress grinding abrasion with low impact. The deposits will readily show stress relief cracks.
SK 900-O	DIN 8555 MF 21-GF-65-G EN 14700 T Fe20		63	2,9	0,4	0,4	5,8					42			Bal.	Cored wire containing about 60 % Tungsten carbide particles. The composition and particle size have been optimized to provide the best combination of toughness and wear resistance.
SK A43-O	DIN 8555 MF 10-GF-65-G EN 14700 T Z Fe15		64	5,6	0,2	1,3	20,2			6,7					Bal.	CrNb alloy designed to resist high stress grinding abrasion at service temperature not exceeding 450 °C. The deposit will readily show stress relief cracks.
SK A45-O	DIN 8555 MF 10-GF-65-GT EN 14700 T Z Fe16		63	5,3	0,2	0,7	27,2		6,3	6,1		1,9	1		Bal.	Chromium-Niobium-Molybdenum alloy with addition of Tungsten and Vanadium designed to resist high stress grinding abrasion with low impact and solid erosion at service temperatures up to 650 °C.

Stainless Steel

Name	Classification	Hardness		Composition (all weld metal) %												Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 370-O	DIN 8555 MF 5-GF-400-C EN 14700 T Fe7		42	0,03	0,5	0,6	15,5	5,2	0,5						Bal.	Self shielded cored wire depositing a ferritic-martensitic steel designed to resist metal-to-metal wear, corrosion and thermal fatigue fire cracking.
SK 402-O	DIN 8555 MF 8-GF-150/400-KPZ EN 14700 T Z Fe10	160		0,09	6	0,9	18	7,8							Bal.	Austenitic alloy type 18Cr8Ni7Mn recommended for build up and buffer layer prior to hardfacing. It can also be used for joining of dissimilar metals.
SK 714 N-O	DIN 8555 MF 5-GF-45 EN 14700 T Fe7		44	0,03	1	0,6	13	4,2	0,5		0,1				Bal.	Alloy depositing a ferritic-martensitic steel with addition of nitrogen designed to resist metal-to-metal wear, corrosion and thermal fatigue.

SUBMERGED ARC CORED WIRES FOR ANTI-WEAR AND ANTI-CORROSION

Construction and low alloyed steel

Name	Classification	Hardness		Composition (all weld metal) %											Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK BU-S	DIN 8555 UP 1-GF-300-P ISO 14700 T Fe6	275		0,12	1,2	0,6	0,7		0,4						Bal.	Rebuilding alloy for Carbon steel parts.
SK CrMo15-SA	DIN 8555 UP 1-GF-250 ISO 14700 T Fe1	230		0,03	0,8	0,6	1,15		0,5						Bal.	Rebuilding alloy (1% Cr . 0.5% Mo) for not or slightly alloyed steels.

Rostfreie Stähle

Name	Classification	Hardness		Composition (all weld metal) %											Characteristics and field of use
		HB	HRC	C	Mn	Si	Cr	Ni	Mo	Nb	Ti	W	V	B	Fe	
SK 385-SA	DIN 8555 UP 6-GF-55-CG ISO 14700 T Fe8		54	0,3	1,3	0,4	16		0,5						Bal.	Martensitic alloy giving a very good resistance to metal-to-metal wear, corrosion and thermal fatigue.
SK 410 NiMo-SA	DIN 8555 UP 5-GF-40-C ISO 14700 T Fe7		39	0,04	1	0,3	12	5	0,9						Bal.	Alloy depositing a ferritic-martensitic steel containing 13% Chromium, 5% Nickel and 1% Molybdenum designed to resist metal-tometal wear, corrosion and thermal fatigue fire cracking.
SK 415-SA	DIN 8555 UP 5-GF-45-C ISO 14700 T Fe7		42	0,8	0,9	0,4	13,5	2,1	1,1	0,2			0,3		Bal.	Alloy depositing a ferritic-martensitic steel designed to resist metal-to-metal wear, corrosion and thermal fatigue.
SK 420-SA	DIN 8555 UP 6-GF-55-C ISO 14700		53	0,27	1,4	0,4	13,5								Bal.	Alloy depositing a martensitic steel containing 13% Chromium giving a good resistance to metal-to-metal wear and corrosion.
SK 430C-SA	DIN 8555 UP 5-GF-200-C ISO 14700	175		0,04	0,9	0,5	19,5								Bal.	Alloy depositing a ferritic steel containing 17% Chromium giving a good resistance to corrosion and also used as a buffer layer for Surfacing of CC Rollers.
SK 430 NiMo-SA	DIN 8555 UP 5-GF-300-C ISO 14700 T Fe7	220		0,05	0,9	0,7	17	5,6	1,3						Bal.	Flux cored wire for submerged arc welding specially designed to deposit an alloy of the 410 NiMo-type directly on the first layer.
SK 461C-SA	DIN 8555 UP 6-GF-50-C ISO 14700 T Fe8		54	0,26	0,9	0,5	12,2	0,4	1,4			0,9	1	1,8	Bal.	Alloy depositing a ferritic-martensitic steel designed to resist metal-to-metal wear, corrosion and thermal fatigue fire cracking.
SK 742N-SK	DIN 8555 UP 5-GF-45-C ISO 14700 T Fe7		44	0,05	1,2	0,4	13,5	3,3	1,3	0,1				0,1	Bal.	Alloy depositing a ferritic-martensitic steel with addition of Nitrogen designed to enhance the resistance to thermal fatigue and intergranular corrosion by reducing the formation of carbides at grain boundaries.

Hardness conversion table

R_m	HV	HB	HRC
200	63	60	–
210	65	62	–
220	69	66	–
225	70	67	–
230	72	68	–
240	75	71	–
250	79	75	–
255	80	76	–
260	82	78	–
270	85	81	–
280	88	84	–
285	90	86	–
290	91	87	–
300	94	89	–
305	95	90	–
310	97	92	–
320	100	95	–
330	103	98	–
335	105	100	–
340	107	102	–
350	110	105	–
360	113	107	–
370	115	109	–
380	119	113	–
385	120	114	–
390	122	116	–
400	125	119	–
410	128	122	–
415	130	124	–
420	132	125	–
430	135	128	–
440	138	131	–
450	140	133	–
460	143	136	–
465	145	138	–
470	147	140	–
480	150	143	–
490	153	145	–
495	155	147	–
500	157	149	–

R_m	HV	HB	HRC
545	170	162	–
550	172	163	–
560	175	166	–
570	178	169	–
575	180	171	–
580	181	172	–
590	184	175	–
595	185	176	–
600	187	178	–
610	190	181	–
620	193	184	–
625	195	185	–
630	197	187	–
640	200	190	–
650	203	193	–
660	205	195	–
670	208	198	–
675	210	199	–
680	212	201	–
690	215	204	–
700	219	208	–
705	220	209	–
710	222	211	–
720	225	214	–
730	228	216	–
740	230	219	–
750	233	221	–
755	235	223	–
760	237	225	–
770	240	228	–
780	243	231	21
785	245	233	
790	247	235	
800	250	238	22
810	253	240	
820	255	242	23
830	258	245	
835	260	247	24
840	262	249	
850	265	252	

R_m	HV	HB	HRC
890	278	264	
900	280	266	27
910	283	269	
915	285	271	
920	287	273	28
930	290	276	
940	293	278	29
950	295	280	
960	299	284	
965	300	285	
970	302	287	30
980	305	290	
990	308	293	
995	310	295	31
1000	311	296	
1010	314	299	
1020	317	301	32
1030	320	304	
1040	323	307	
1050	327	311	33
1060	330	314	
1070	333	316	
1080	336	319	34
1090	339	322	
1095	340	323	
1100	342	325	
1110	345	328	35
1120	349	332	
1125	350	333	
1130	352	334	
1140	355	337	36
1150	358	340	
1155	360	342	
1160	361	343	
1170	364	346	37
1180	367	349	
1190	370	352	
1200	373	354	38
1210	376	357	
1220	380	361	

R_m	HV	HB	HRC
510	160	152	–
520	163	155	–
530	165	157	–
540	168	160	–
1260	392	372	40
1270	394	374	
1280	397	377	
1290	400	380	
1300	403	383	41
1310	407	387	
1320	410	390	
1330	413	393	42
1340	417	396	
1350	420	399	
1360	423	402	43
1370	426	405	
1380	430	409	
1390	431	410	
1400	434	413	44
1410	437	415	
1420	440	418	
1430	443	421	45
1440	446	424	
1450	449	427	
1455	450	428	
1460	452	429	
1470	455	432	
1480	458	435	46
1485	460	437	
1490	461	438	
1500	464	441	
1510	467	444	
1520	470	447	
1530	473	449	47
1540	476	452	
1550	479	455	
1555	480	456	
1560	481		
1570	484		48
1580	486		
1590	489		
1595	490		
1600	491		
1610	494		

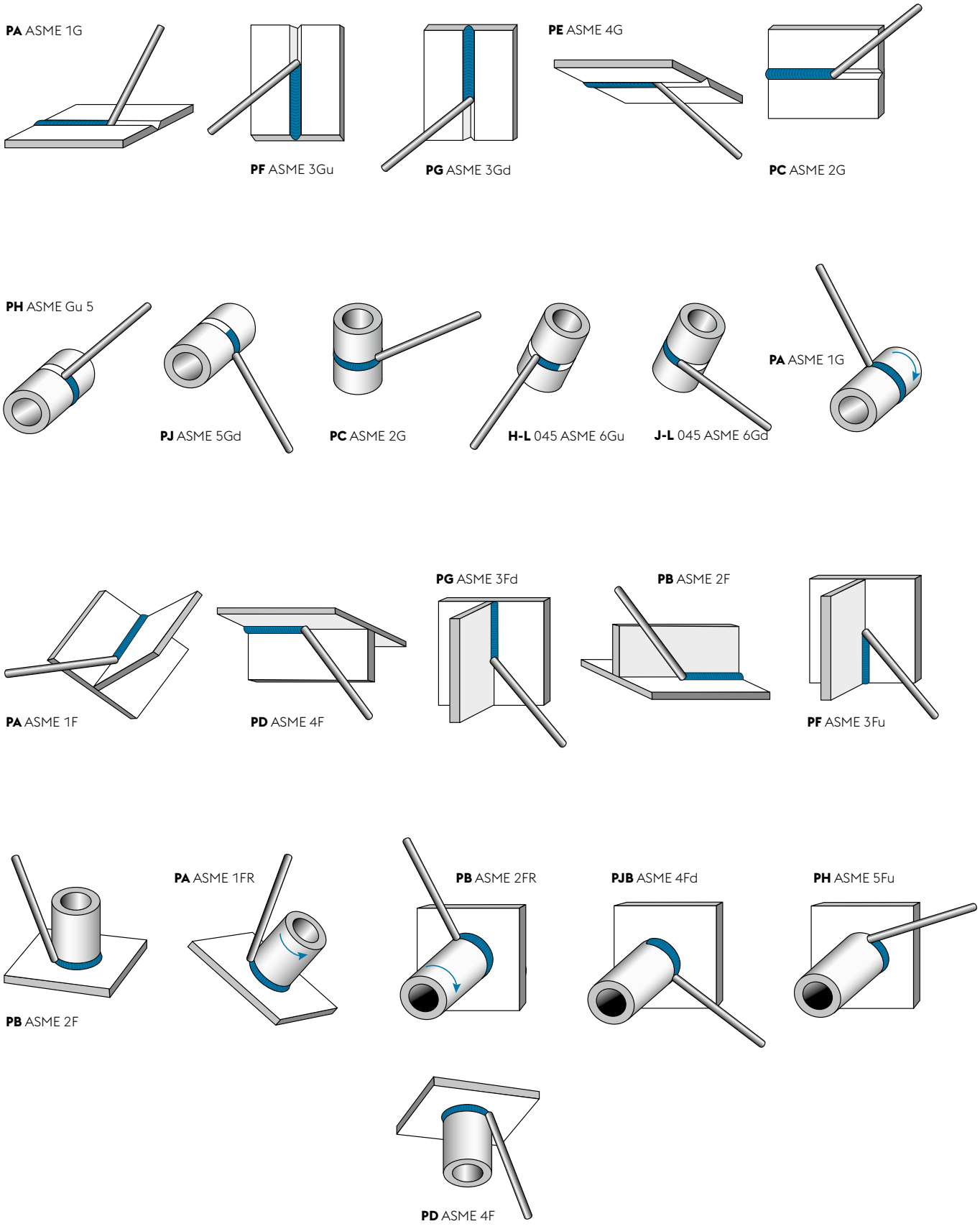
R_m	HV	HB	HRC
860	268	255	25
865	270	257	
870	272	258	26
880	275	261	
1620	497		49
1630	500		
1640	503		
1650	506		
1660	509		
1665	510		
1670	511		
1680	514		50
1690	517		
1700	520		
1710	522		
1720	525		
1730	527		51
1740	530		
1750	533		
1760	536		
1770	539		
1775	540		
1780	541		
1790	544		52
1800	547		
1810	550		
1820	553		
1830	556		
1840	559		
1845	560		53
1850	561		
1860	564		
1870	567		
1880	570		
1890	572		
1900	575		
1910	578		54
1920	580		
1930	583		
1940	586		
1950	589		
1955	590		
1960	591		
1970	594		

R_m	HV	HB	HRC
1230	382	363	39
1240	385	366	
1250	388	369	
1255	390	371	
1980	596		55
1990	599		
1995	600		
2000	602		
2010	605		
2020	607		
2030	610		
2040	613		
2050	615		56
2060	618		
2070	620		
2080	623		
2090	626		
2100	629		
2105	630		
2110	631		
2120	634		
2130	636		
2140	639		57
2145	640		
2150	641		
2160	644		
2170	647		
2180	650		
2190	653		
2200	655		58
	675		59
	698		60
	720		61
	745		62
	773		63
	800		64
	829		65
	864		66
	900		67
	940		68

R_m = Tensile strength (MPa)
HV = Vickers hardness
HB = Brinell hardness
HRC = Rockwell hardness

Caution: Because of their approximate nature, conversion tables must be regarded as only an estimate of comparative values. It is recommended that hardness conversions be applied primarily to values such as specification limits, which are established by agreement or mandate, and that the conversion of test data be avoided whenever possible.

Welding positions according to EN ISO 6947 und ASME code, section IX



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