

MIG-wires · TIG welding rods · SAW-wires · Gas welding rods

CHECKED QUALITY FLIESS MADE IN GERMANY

Production program

FLIESS
Schweißzusätze
welding wires

since 1915

Introduction

The strengths of Fliess are:

- Highly qualified and motivated employees
- Precise agreement on the specifications of the input material with Western-European steel mills in order to satisfy even the most demanding customer requirements
- Speed from the customer inquiry to the delivery, as a result of an efficient company structure and several thousand tonnes of stored wire rods and predrawn wires
- Flexibility with regard to unusual customer requirements and deadline wishes
- Individually optimised packaging for national and world-wide transport







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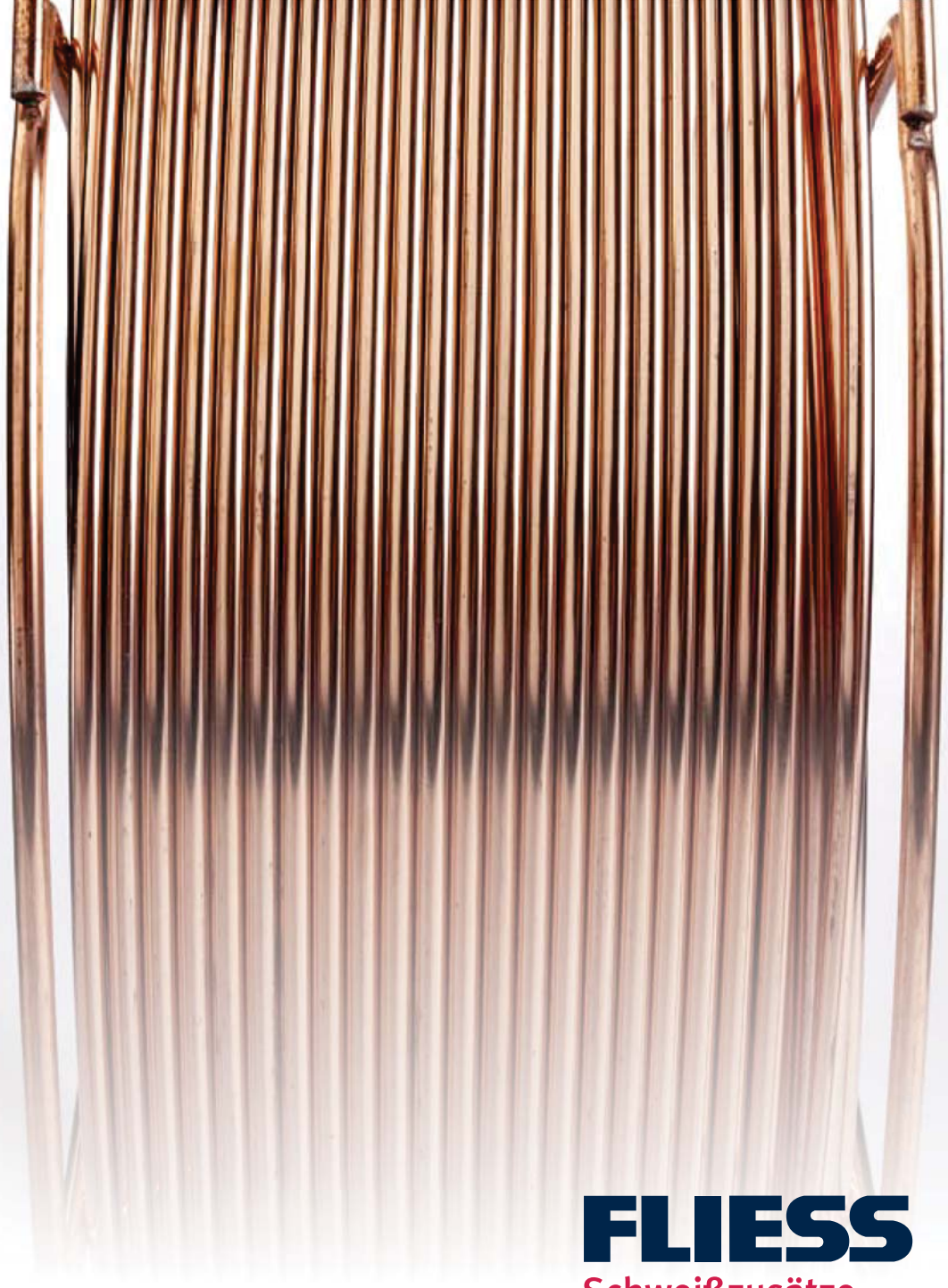
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since 1915

FLIESS
Schweißzusätze
welding wires



Production program

MIG (GMAW) wires for mild and low alloyed steels

FLIESS Schweißzusätze since 1915 welding wires

Quality	Classification DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal				
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)	
ED-SG 1	14341-A G2Si1	1.5112	A5.18 ER70S-3	-	For joining and surfacing of mild steel.	S185 - S275JR, S355JO - E335, S255N - P355N, P255NH - P355NH, P235GH, P265GH, P310GH	C 0,09 Si 0,60 Mn 1,15	≥420	≥500	≥22	RT ≥80	-
ED-SG 1 A	14341-A G2Ti	-	A5.18 ER70S-2	-	For joining and surfacing of mild steel.	S255N - S380N, P235GH, P265GH, P295GH, P355GH	C 0,03 Si 0,55 Mn 1,20 Al 0,10 Ti 0,10 Zr 0,07	≥480	≥560	≥22	RT ≥100	-
ED-SG 2	14341-A G3Si1	1.5125	A5.18 ER70S-6	TÜV, DB	For joining and surfacing of mild steel.	S185 - S275JR, S355JO - E335, S255N - P355N, P255NH - P355NH, P235GH, P265GH, P310GH	C 0,09 Si 0,87 Mn 1,47	≥420	≥500	≥22	RT ≥80	-50 °C ≥47
ED-SG 3	14341-A G4Si1	1.5130	A5.18 ER70S-6	TÜV, DB	For joining and surfacing of mild steel.	S185 - S275JR, S355JO - E335, S255N - P355N, P255NH - P355NH, P235GH, P265GH, P310GH	C 0,09 Si 0,95 Mn 1,67	≥460	≥530	≥22	RT ≥80	-40 °C ≥47
ED-FK 1	16834-A GMn3Ni1CrMo	-	A5.28 ER110S-G	TÜV, DB	For welding of high-strength fine-grain structural steels. Yield strength up to 690 MPa.	S690QL1, S700MC, S420N - S500N, P420NH - P500NH, S420NL - S500NL	C 0,09 Si 0,52 Mn 1,57 Cr 0,30 Ni 1,40 Mo 0,25 V 0,09	≥690	≥790	≥16	RT ≥80	-50 °C ≥47
ED-FK 2	16834-A GZMn3Ni1Mo	-	A5.28 ER100S-G	TÜV, DB	For welding of high-strength fine-grain structural steels. Yield strength up to 690 MPa. For yield strength > 620 MPa only suitable for plate thickness up to 15 mm and fillet weld.	S690QL1, S700MC, S420N - S500N, P420NH - P500NH, S420NL - S500NL	C 0,08 Si 0,57 Mn 1,77 Ni 1,00 Mo 0,38 Ti 0,15	≥690	≥740	≥18	RT ≥100	-40 °C ≥47
ED-FK 800	16834-A GMn4Ni1,5CrMo	-	A5.28 ER110S-G	TÜV, DB	For welding of high-strength fine-grain structural steels with high toughness requirements. Yield strength up to 690 MPa.	S770QL1, S690QL1, S420N - S500N, P420NH - P500NH, S420NL - S500NL	C 0,09 Si 0,55 Mn 1,67 Cr 0,25 Ni 1,52 Mo 0,50 Ti 0,07	≥690	≥770	≥17	RT ≥100	-60 °C ≥47
ED-FK 1000	16834-A GMn4Ni2CrMo	-	A5.28 ER120S-G	TÜV, DB	For welding of high-strength fine-grain structural steels.	S890QL	C 0,09 Si 0,80 Mn 1,80 Ni 2,20 Cr 0,31 Mo 0,55	≥885	≥940	≥14	RT ≥70	-60 °C ≥47

Delivery conditions: copper or bronze coated, bright drawn, diameter between 0,80 – 2,40 mm. Spool types see page 14. Special qualities and special dimensions on request.

MIG (GMAW) wires for mild and low alloyed steels

Quality	Classification DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal				
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)	
ED-SG Mo	14341-A G2Mo 21952-A GMoSi	1.5424	A5.28 ER70S-A1 (ER80S-G)	TÜV, DB	For elevated temperatures. For service temperatures up to 500 °C.	P235G1TH - P255G1TH, P310GH, 16Mo3, L320, L360NB - L415NB	C 0,10 Si 0,60 Mn 1,15 Mo 0,52	≥460	≥560	≥22	RT ≥60	-20 °C ≥47
ED-A 31	14341-A G4Mo 14341-B G4M31	-	A5.28 ER80S-D2 ER90S-D2		For elevated temperatures. For service temperatures up to 500 °C.	P235G1TH - P255G1TH, P310GH, 16Mo3	C 0,09 Si 0,70 Mn 1,95 Mo 0,50	≥540	≥620	≥17	RT ≥90	-29 °C ≥27
ED-SG CrMo 1	21952-A GCrMo1Si	1.7339	A5.28 ER80S-G	TÜV, DB	For elevated temperatures. For service temperatures up to 550 °C. Bruscato Factor max. 12 ppm.	13CrMo4-5	C 0,10 Si 0,60 Mn 1,00 Cr 1,20 Mo 0,52	≥305	≥450	≥20	RT ≥100	-10 °C ≥47
ED-SG CrMo 2	21952-A GCrMo2Si	1.7384	A5.28 ER90S-G	TÜV, DB	For elevated temperatures. For service temperatures up to 600 °C. Bruscato Faktor max. 12 ppm.	10CrMo9-10, 10CrSiMoV7	C 0,08 Si 0,60 Mn 0,92 Cr 2,45 Mo 1,00	≥355	≥540	≥22	RT ≥80	-
ED-SG CrMo 5	21952-A GCrMo5Si	1.7373	A5.28 ER80S-B6	-	For elevated temperatures. For service temperatures up to 600 °C.	X12CrMo5, GX12CrMo5	C 0,08 Si 0,35 Mn 0,55 Cr 6,00 Mo 0,65	≥450	≥570	≥18	RT ≥100	-
ED-SG CrMo 91	21952-A GCrMo91	1.4903	A5.28 ER90S-B9	-	For welding creep resistant steels T91/P91.	A 213 T91, A 335 P91, X10CrMoVNb9-1	C 0,10 Si 0,25 Mn 0,50 Cr 8,70 Ni 0,60 Mo 1,00 V 0,20 Nb 0,05	≥520	≥620	≥16	RT ≥50	-
ED-ER80S-B2	-	-	A5.28 ER80S-B2	-	For elevated temperatures. For service temperatures up to 550 °C. Bruscato Factor max. 12 ppm.	13CrMo4-5	C 0,09 Si 0,55 Mn 0,55 Cr 1,35 Mo 0,50	≥470	≥550	≥19	-	-
ED-ER90S-B3	-	-	A5.28 ER90S-B3	-	For elevated temperatures. For service temperatures up to 600 °C. Bruscato Factor max. 12 ppm.	10CrMo9-10	C 0,09 Si 0,55 Mn 0,55 Cr 2,50 Mo 1,05	≥540	≥620	≥17	-	-

Delivery conditions: copper or bronze coated, bright drawn, diameter between 0,80 – 2,40 mm. Spool types see page 14. Special qualities and special dimensions on request.

MIG (GMAW) wires for mild and low alloyed steels

Quality	Classification DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal				
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)	
ED-ER80S-Ni1	14341-A G3Ni1	-	A5.28 ER80S-Ni1	TÜV, DB	For welding of fine grain structural steels if low temperature impact values are required. For service temperatures down to -60 °C.	P355NL1 - P460NL1	C 0,09 Si 0,50 Mn 1,05 Ni 0,90	≥470	≥560	≥24	-	-60 °C ≥47
ED-SG Ni 2,5	14341-A G2Ni2	-	A5.28 ER80S-Ni2	TÜV, DB	For welding of fine grain structural steels if low temperature impact values are required. For service temperatures down to -60 °C.	S255N - S380N, 14Ni6, 12Ni14, S255NL	C 0,09 Si 0,52 Mn 1,10 Ni 2,45	≥420	≥570	≥22	RT ≥100	-60 °C ≥47
ED-SG NiCu	16834-A GZMn3Ni1Cu	-	A5.28 ER80S-G	DB	For welding of weather resistant fine-grain structural steels.	S235JRW - S355J2G1W, 9CrNiCuP3-2-4	C 0,08 Si 0,80 Mn 1,40 Ni 0,80 Cu 0,40	≥450	≥550	≥22	RT ≥80	-20 °C ≥47

Delivery conditions: copper or bronze coated, bright drawn, diameter between 0,80 – 2,40 mm. Spool types see page 14. Special qualities and special dimensions on request.

MIG-(GMAW-) wires for wear resistant cladding

Quality	Classification DIN EN	Material-No.	Classification AWS	Approvals	Characteristics and application	Hardness	Typical analysis %
ED-A 25	14700 S Fe1	1.8401	-	-	Low alloyed MIG-electrode for wear resistant parts, which have to resist strong impact forces. Machining of weld metal by milling, turning and cutting is possible.	255-275 HB	C 0,03 Mn 1,00 Cr 1,00
ED-A 35	14700 S Fe2	1.8405	-	-	Low alloyed MIG-electrode for wear resistant parts, which have to resist strong impact forces. Machining of weld metal by milling, turning and cutting is possible.	325-375 HB	C 0,07 Mn 2,00 Cr 1,00
ED-A 50	14700 S Fe2	1.8425	-	-	Low alloyed MIG-electrode for wear resistant parts, which have to resist strong impact forces. Machining of weld metal is possible only by grinding.	47 - 52 HRC	C 1,10 Mn 2,00 Cr 1,80
ED-A 60	14700 S Fe8	1.4718	-	-	High-alloyed MIG-electrode for tough and abrasion resistant claddings. Weld metal is resistant against strong impact forces. Machining of weld metal is possible only by grinding.	52 – 57 HRC	C 0,45 Si 3,00 Cr 9,50

Delivery conditions: copper or bronze coated, bright drawn, diameter between 0,80 – 2,40 mm. Spool types see page 14. Special qualities and special dimensions on request.

TIG welding rods for mild and low alloyed steels

Quality	Classification DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal				
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)	
WSG 1	636-A W2Si	1.5112	A5.18 ER70S-3	TÜV	For welding of mild steel in boiler and pipe construction.	S185 - S275JR, 355JO - E335, S255N - P355N, P255NH - P355NH, P235GH, P265GH, P310GH	C 0,09 Si 0,60 Mn 1,15	≥360	≥510	≥22	RT ≥100	-20 °C ≥47
WSG 1 A	636-A W2Ti	-	A5.18 ER70S-2	TÜV	For welding of mild steel in boiler and pipe construction.	S255N - S380N, P235GH, P265GH, P295GH, P355GH	C 0,03 Si 0,55 Mn 1,20 Al 0,10 Ti 0,10 Zr 0,07	≥480	≥560	≥22	RT ≥100	-20 °C ≥47
WSG 2	636-A W3Si1	1.5125	A5.18 ER70S-6	TÜV, DB	For welding of mild steel in boiler and pipe construction.	S185 - P275JR, S355JO - E335, S255N - P355N, P235GH, P265GH, P310GH	C 0,09 Si 0,87 Mn 1,47	≥420	≥500	≥22	≥100	-50 °C ≥47
WSG 3	636-A W4Si1	1.5130	A5.18 ER70S-6	-	For welding of mild steel in boiler and pipe construction.	S185 - P275JR, S355JO - E335, S255N - P355N, P235GH, P265GH, P310GH, S460 N, S 460 M	C 0,09 Si 0,95 Mn 1,67	≥460	≥530	≥22	RT ≥100	-40 °C ≥47
WSG Mo	636-A W2Mo 21952-A WMoSi	1.5424	A5.28 ER70S-A1 (ER80S-G)	TÜV, DB	For welding of low alloyed and creep resistant steel in boiler and pipe construction. Service temperatures up to 500 °C.	P235G1TH - P255G1TH, P310GH, 16Mo3, L320, L360NB - L415NB, 15NiCuMoNb5 (WB36)	C 0,10 Si 0,60 Mn 1,15 Mo 0,52	≥460	≥560	≥22	RT ≥60	-20 °C ≥47
WSG A 31	636-B W4M31	-	A5.28 ER80S-D2 ER90S-D2	-	For elevated temperatures. For service temperatures up to 500 °C.	P235G1TH - P255G1TH, P310GH, 16Mo3	C 0,09 Si 0,70 Mn 1,95 Mo 0,50	≥540	≥620	≥17	-	-29 °C ≥47
WSG CrMo 1	21952-A WCrMo1Si	1.7339	A5.28 ER80S-G	TÜV, DB	For welding of low alloyed and creep resistant steel in boiler and pipe construction. Service temperatures up to 550 °C. Bruscato Faktor max. 12 ppm.	13CrMo4-5	C 0,10 Si 0,60 Mn 1,00 Cr 1,20 Mo 0,52	≥305	≥450	≥22	RT ≥100	-10 °C ≥47
WSG CrMo 2	21952-A WCrMo2Si	1.7384	A5.28 ER90S-G	TÜV	For welding of low alloyed and creep resistant steel in boiler and pipe construction. Service temperatures up to 600 °C. Bruscato Faktor max. 12 ppm.	10CrMo 9-10, 10CrSiMoV7	C 0,08 Si 0,60 Mn 0,92 Cr 2,45 Mo 1,00	≥355	≥540	≥22	RT ≥100	-10 °C ≥47

Delivery conditions: coppered and bright drawn, diameter between 1,00 - 3,00 mm
rods 1000 mm / 500 mm long.
Packing: boxes with 25 kg , 5 x 5 kg, 5 kg, 5 kg plastic tubes.
Special qualities and special diameters on request.

TIG welding rods for mild and low alloyed steels

Quality	Classification DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal				
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)	
WSG CrMo 5	21952-A WCrMo5Si	1.7373	A5.28 ER80S-B6	-	For welding of creep resistant steel. Service temperatures 500- 600 °C.	X12CrMo5	C 0,08 Si 0,35 Mn 0,55 Cr 6,00 Mo 0,65	≥450	≥570	≥18	RT ≥100	-
WSG CrMo 91	21952-A WCrMo91	1.4903	A5.28 ER90S-B9	-	For welding T91/P91 steel.	A 213 T91 A 335 P91 X10CrMoVNb9-1	C 0,10 Si 0,25 Mn 0,50 Cr 8,70 Ni 0,60 Mo 1,00 V 0,20	≥520	≥620	≥16	RT ≥50	-
WSG ER80S-B2	-	-	A5.28 ER80S-B2	-	For elevated temperatures For service temperatures up to 550 °C. Bruscato Factor max. 12 ppm.	13CrMo4-5	C 0,09 Si 0,55 Mn 0,55 Cr 1,35 Mo 0,50	≥470	≥550	≥19	-	-
WSG ER90S-B3	-	-	A5.28 ER90S-B3	-	For elevated temperatures For service temperatures up to 600 °C. Bruscato Factor max. 12 ppm.	10CrMo9-10	C 0,09 Si 0,55 Mn 0,55 Cr 2,50 Mo 1,05	≥540	≥620	≥17	-	-
WSG ER80S-Ni1	636-A W3Ni1	-	A5.28 ER80S-Ni1	TÜV, DB, DNV	For welding of fine grain structural steels if low temperature impact values are required. For service temperatures down to -60 °C.	P355NL1 - P460NL1	C 0,09 Si 0,50 Mn 1,05 Ni 0,90	≥470	≥560	≥24	-	-60 °C ≥47
WSG Ni 2,5	636-A W2Ni2	-	A5.28 ER80S-Ni2	TÜV, DB	For welding of structural steels if low temperature impact values are required. For service temperatures down to -90 °C.	S255N - S380N,14Ni6, 12Ni14	C 0,09 Si 0,52 Mn 1,10 Ni 2,45	≥430	≥540	≥22	-	-90 °C ≥47
WSG NiCu	16834-A WZMn3Ni1Cu	-	A5.28 ER80S-G	DB	For welding of weather resistant fine-grain structural steels.	S235JRW - S355J2G1W, 9CrNiCuP3-2-4	C 0,08 Si 0,80 Mn 1,40 Ni 0,80 Cu 0,40	≥450	≥550	≥22	RT ≥80	-20 °C ≥47

Delivery conditions: coppered and bright drawn, diameter between 1,00 - 3,00 mm rods 1000 mm / 500 mm long.
Packing: boxes with 25 kg , 5 x 5 kg, 5 kg, 5 kg plastic tubes.
Special qualities and special diameters on request.

SAW (Submerged arc welding) wires for mild and low alloyed steels

Quality	Classification DIN EN / DIN EN ISO	Ma-terial-No.	Classification AWS	Appro-vals	Characteristics and application	Base materials	Typical analysis %
UP-99 (S1)	756 S1	1.0351	A5.17 / A5.23 ~EL12	TÜV, DB, GL	For submerged arc welding of mild steels.	S185, P235GH, P265GH, P235G1TH - 255G1TH, Ship construction grades A - D, Fine grain steels up-to P355N	C 0,08 Si 0,10 Mn 0,50
UP-100 (S2)	756 S2	1.0494	A5.17 / A5.23 EM12	TÜV, DB, GL	For submerged arc welding of mild steels.	S275JR - S355JO, P235GH, P265GH, P285NH, P310GH, P255G1TH, Ship construction grades A - E, Fine grain steels up-to S380N	C 0,09 Si 0,08 Mn 1,05
UP-101 (S3)	756 S3	1.0496	A5.17 / A5.23 EH10K	TÜV, DB, GL	For submerged arc welding of mild steels.	S275JR - S355JO, E335, P265GH, P285NH, P310GH, P255G1TH - S355JOCu, Ship construction grades A - E, S420N	C 0,12 Si 0,08 Mn 1,55
UP-102 (S4)	756 S4	1.5086	A5.17 / A5.23 ~EH14	TÜV, DB, GL	For submerged arc welding of mild steels.	S275JR - S355JO, E335, P285NH, P310GH, S355JOCu, Ship construction grades A - E, Fine grain steels up-to P460N	C 0,12 Si 0,08 Mn 1,90
UP-100 Si (S2Si)	756 S2Si	1.0492	A5.17 / A5.23 EM12K	TÜV, DB, GL	For submerged arc welding of mild steels.	S275JR - S355JO, P235GH, P265GH, P285NH, P310GH, P235G1TH - P255G1TH, Ship construction grades A - E	C 0,11 Si 0,28 Mn 1,00
UP-101 Spezial (S3Si)	756 S3Si	~1.0479	A5.17 / A5.23 EH12K	TÜV, GL	For submerged arc welding of fine grain structural steels in OFFSHORE-constructions.	S255N - S500N, P255NH - P500NH, S255NL - S500NL	C 0,11 Si 0,30 Mn 1,72
UP-100 NiMo 1 (S2NiMo1)	756 S2Ni1Mo	-	A5.23 ~EF1	TÜV, GL	For submerged arc welding of HSLA structural steels.	P460N - S500N, P460NH - P500NH, P460NL1 - S500NL, S550QL1 - S620QL1	C 0,12 Si 0,15 Mn 1,00 Mo 0,55 Ni 1,00
UP-101 NiMo 1 (S3NiMo1)	14295 S3Ni1Mo 756 S3Ni1Mo	-	A5.23 EF3N	TÜV, GL	For submerged arc welding of HSLA structural steels.	S550QL1	C 0,12 Si 0,20 Mn 1,75 Mo 0,55 Ni 0,90
UP-101 NiMo Sonder (S3NiMo Sonder)	14295 SZ	-	A5.23 ~EF1	-	For submerged arc welding of high strength quenched and tempered structural steels.	S 460, X65	C 0,10 Si 0,22 Mn 1,45 Mo 0,25 Ni 0,90
UP-100 CrNiMo1 (S2 CrNiMo1)	14295 SZ	-	A5.23 EG	-	For submerged arc welding of high strength quenched and tempered structural steels.	A 302 Grade B, A335 Grade F30, A 487 Class 1 N	C 0,10 Si 0,25 Mn 1,10 Cr 1,00 Mo 0,55 Ni 0,95
UP-101 NiMoCr (S3 NiMoCr)	14295 SZ	-	A5.23 ~EF6	-	For submerged arc welding of high strength quenched and tempered structural steels.	S690QL1, 10CrMo9-10, 16NiCrMo12-6	C 0,13 Si 0,10 Mn 1,60 Cr 0,27 Mo 0,60 Ni 2,10
UP-101 NiCrMo 2,5 (S3 NiCrMo 2,5)	14295 S3Ni2,5CrMo	-	A5.23 ~EM4	-	For submerged arc welding of high strength quenched and tempered structural steels.	S690QL1	C 0,11 Si 0,17 Mn 1,40 Cr 0,70 Mo 0,55 Ni 2,40

Delivery conditions: copper or bronze coated, bright drawn, diameter between 1,60 – 5,00 mm.
Special qualities and special diameters on request. (For more information see page 12).

SAW (Submerged arc welding) wires for mild and low alloyed steels

Quality	Classification DIN EN / DIN EN ISO	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %
UP-S3 TiB	756 SZ	-	A5.23 EG	-	For submerged arc welding of pipeline steels. Optimized for multi-arc welding using DSAW (two-run)-technique. For applications in sour gas service.	X52, X56, X60, X65, X70, X80	C 0,08 Ti 0,15 Si 0,25 B 0,012 Mn 1,55
UP-S3 MoTiB	756 SZ	-	A5.23 ~EA2TiB	-	For submerged arc welding of pipeline steels. Optimized for multi-arc welding using DSAW (two-run)-technique. For applications with high toughness requirements.	X52, X56, X60, X65, X70, X80	C 0,08 Mo 0,52 Si 0,25 Ti 0,14 Mn 1,20 B 0,011
UP-S1 Mo 1,2	756 SZ	-	A5.23 EG	-	For submerged arc welding of pipeline steels. Optimized for multi-wire welding in spiral pipe mills.	X52, X56, X60, X65	C 0,08 Si 0,22 Mn 0,50 Mo 1,20
UP-100 Mo (S2Mo)	756 S2Mo 24598-A SMo	1.5425	A5.23 EA2	TÜV, DB, GL	For submerged arc welding of fine grain and creep resistant steels. Service temperature up to 500 °C.	S355JO, E335, P285NH, P310GH, S355JOCu, 16Mo3, P315N - S420N, P315NH - P420NH	C 0,09 Si 0,15 Mn 1,05 Mo 0,52
UP-101 Mo (S3Mo)	756 S3Mo 24598-A SMnMo	1.5426	A5.23 EA4	TÜV, DB, GL	For submerged arc welding of fine grain and creep resistant steels. Service temperature up to 500 °C.	S550GD, S355JO, E335, P285NH, P310GH, S355JOCu, 16Mo3, P355N - P460N, P355NH - P460NH	C 0,12 Si 0,15 Mn 1,52 Mo 0,52
UP-100 CrMo 1 (S2CrMo1)	24598-A SCrMo1	1.7346	A5.23 EB2R	TÜV, DB, GL	For submerged arc welding of creep resistant steels. Service temperature up to 550 °C. Bruscato Factor max. 12 ppm.	13CrMo4-5, 16CrMo4, 24CrMo5, 25CrMo4	C 0,10 Cr 1,20 Si 0,17 Mo 0,52 Mn 0,95
UP-99 CrMo 2 (S1CrMo2)	24598-A SCrMo2	1.7305	A5.23 EB3R	TÜV, GL	For submerged arc welding of creep resistant steels. Service temperature 500 - 600 °C. Bruscato factor max. 12 ppm.	10CrMo9-10, 12CrMo9-10	C 0,11 Cr 2,60 Si 0,15 Mo 1,00 Mn 0,55
UP-100 CrMo 2 (S2 CrMo 2)	24598-A SZCrMo2Mn	-	A5.23 EG	-	For submerged arc welding of creep resistant steels. Service temperature up to 600 °C.	10CrMo9-10, 10CrSiMoV7	C 0,10 Cr 2,45 Si 0,20 Mo 1,00 Mn 0,95
UP-P24 (S1CrMo2V)	24598-A SZCrMo2V	-	A5.23 EG	-	For creep resistant 2,25% Cr - 1% Mo - 0,25% V steels (P24 / T24).	7CrMoVTiB 10-10	C 0,09 Mo 1,00 Si 0,25 V 0,26 Mn 0,55 Nb 0,04 Cr 2,35
UP-99 CrMo 5 (S1CrMo5)	24598-A SCrMo5	1.7374	A5.23 ~EB6	-	For submerged arc welding of creep resistant steels. Service temperature 500 - 600 °C.	X12CrMo5	C 0,08 Cr 6,00 Si 0,30 Mo 0,60 Mn 0,50
UP-99 CrMo 91 (S1CrMo91)	24598-A SCrMo91	-	A5.23 EB9	-	For creep resistant 9% Cr steel.	A 213 T91 A 335 P91 X10CrMoVNb91	C 0,10 Mo 1,00 Si 0,25 Ni 0,60 Mn 0,50 V 0,20 Cr 8,70

Delivery conditions: copper or bronze coated, bright drawn, diameter between 1,60 – 5,00 mm.
Special qualities and special diameters on request. (For more information see page 12).

SAW (Submerged arc welding) wires for mild and low alloyed steels

Quality	Classification DIN EN	Ma-terial-No.	Classification AWS	Appro-vals	Characteristics and application	Base materials	Typical analysis %
UP-100 Ni 1 (S2Ni1)	756 S2Ni1	1.6222	5.23 ENi1	TÜV, DB, GL	For submerged arc welding of fine grain structural steels where high impact values are required.	S380N - S500N P380NH - P500NH, S380NL - S500NL	C 0,10 Si 0,10 Mn 1,00 Ni 0,90
UP-100 Ni 2 (S2Ni2)	756 S2Ni2	1.6223	5.23 ENi2	TÜV, DB, GL	For submerged arc welding of fine grain structural steels where high impact values are required.	P460N - S500N, P460NL - S500NL, 14Ni6, 12Ni14, 16 Ni 14	C 0,08 Si 0,12 Mn 1,05 Ni 2,25
UP-100 Ni 3 (S2Ni3)	756 S2Ni3	-	5.23 ENi3	TÜV, GL	For submerged arc welding of fine grain structural steels where high impact values are required.	12Ni14	C 0,09 Si 0,17 Mn 1,05 Ni 3,20
UP-100 NiCu (S2NiCu1)	756 S2Ni1Cu	-	5.23 EG	TÜV	For submerged arc welding of weather resistant structural steels.	S235JRW - S355J2G1W, 9CrNiCuP3-2-4	C 0,10 Si 0,25 Mn 1,00 Cu 0,47 Ni 0,85

Delivery conditions: copper or bronze coated, bright drawn, diameter between 1,60 – 5,00 mm.
Special qualities and special diameters on request.
Chemical analysis and properties of pure weld metal:
In submerged arc welding the chemical analysis and the technological properties of the pure weld metal are strongly influenced by the welding flux.
The wire-flux-combination has to fit to the base material to be welded.
Approvals: Approvals have to be performed for the wire-flux-combination.
Wire electrodes conforming to EN or ISO standards are exchangeable if the producer has a certified quality management system.

Gas welding rods for mild and low alloyed steel

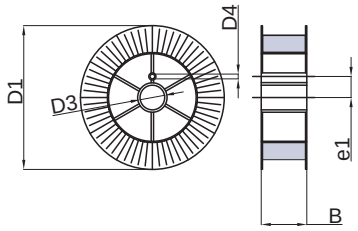
FLIESS Schweißzusätze welding wires since 1915

Quality	Classification DIN EN	Material-No.	Classification AWS	Approvals	Characteristics and application	Base materials	Typical analysis %	Mechanical properties of the pure weld metal			
								Yield strength MPa	Tensile strength MPa	Elongation %	Charpy-V-Value ISO-V (Joule)
U 39	12536 O I	1.0324	A5.2 ~R45	TÜV, DB	Suitable for joining tubes and plates. Highly fluid weld metal.	S235JR, S235JO, S235G2T - S255GT, P235GH, P265GH	C 0,08 Si 0,10 Mn 0,50	≥260	≥360	≥20	RT ≥30
U 40	12536 O II	1.0494	A5.2 ~R60	DB	For joint welding in pipe and tank construction. Tough deposit.	S235G2T - S255GT, S235JO - S275JO, P235G1TH, P255G1TH, P235GH, P265GH, P285NH	C 0,09 Si 0,08 Mn 1,05	≥300	≥400	≥20	RT ≥50
U 40 Ni	12536 O III	1.6215	A5.2 ~R60	TÜV, DB	Well suited for weldments with special requirements. Viscous melting bath and excellent fusion.	S235G2T - S255GT, S235JO - S275JO, P235G1TH, P255G1TH, P235GH, P265GH, P285NH,P295GH	C 0,08 Si 0,10 Mn 1,10 Ni 0,40	≥310	≥400	≥22	RT ≥50
U 47 Mo	12536 O IV	1.5425	A5.2 ~R60	TÜV, DB	High strength and toughness steel used in the boiler, tank and pipe construction industry. Service temperature up to 500 °C. Viscous melting bath. Extremely useful when the exact analysis of the boiler plate is not known.	S235G2T - S355GT, S235JR - S275JO, P355T2, P235GH, P265GH, P285NH, P295GH, 16Mo3	C 0,10 Si 0,15 Mn 1,05 Mo 0,50	≥260	≥440	≥22	RT ≥60
U 49 CrMo	12536 O V	1.7346	A5.2 ~R65	-	As FLIESS U 47 Mo, but for higher service temperatures. Service temperature up to 600 °C. Accomodates a wide range of medium alloyed CrMo boiler plates.	P295GH, 16Mo3, 13CrMo4-5	C 0,12 Si 0,15 Mn 0,95 Cr 1,15 Mo 0,50	≥320	≥510	≥20	RT ≥70
U 50 CrMo	12536 O VI	1.7305	A5.2 ~R65	-	As FLIESS U 49 CrMo, but for higher service temperatures. Service temperature up to 600 °C. Pore insensitive.	P295GH, 16Mo3, 13CrMo4-5, 10CrMo9-10	C 0,08 Si 0,15 Mn 0,55 Cr 2,10 Mo 1,00	≥340	≥520	≥18	RT ≥60

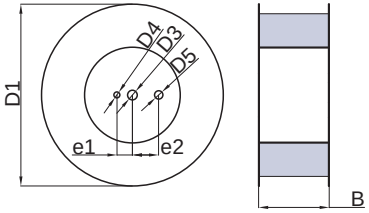
Delivery conditions: coppered or bright drawn, diameter between 1,00 - 6,00 mm
rods 1000 mm / 500 mm long.
Packing: boxes with 25 kg , 5 x 5 kg, 5 kg.
Special qualities and special dimensions on request.

Dimensions of spools, rims and coils

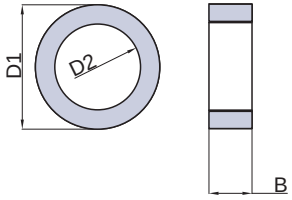
Denomination	DIN EN ISO 544	Type	Outer diameter D_1 mm	Inner diameter D_2 mm	Outer width B mm	Bore diameter D_3 mm	Diameter driver pin hole D_4 mm	D_5 mm	Distance from axis e_1 mm	e_2 mm	Weight ca. kg
Spool (Sigmette)	S 100	Spool (S)	$100^{\pm 2}$	-	45_{-2}	$16{,}5^{+1}$	-	-	-	-	0,5-1,0
Spool (D/117)	~S 117	Spool (S)	117	-	71	48^{+1}	-	-	-	-	2,7
Portawirespool	S 200	Spool (S)	$200^{\pm 3}$	-	55_{-3}	$50{,}5^{+2{,}5}$	10^{+1}	-	$44{,}5^{\pm 5}$	-	5
Spool	S 300	Spool (S)	$300^{\pm 5}$	-	103_{-30}	$50{,}5^{+2{,}5}$	10^{+1}	-	$44{,}5^{\pm 5}$	-	15
Mid Size Reel	~S 500	Reel (S)	500^{+2}_{-5}	-	$350^{\pm 1}$	$40{,}5^{+1}$	25^{+1}		$65^{\pm 1}$	-	150
Reel Steel/Wood	S 760	Reel (S)	760_{-10}	-	290^{+10}_{-1}	$40{,}5^{+1}$	25^{+1}	$35^{\pm 1}$	$65^{\pm 1}$	$110^{\pm 1}$	300
C	-	Coil (C)	295	220^{+5}	50^{+5}_{-3}	-	-	-	-	-	10
B	-	Coil (C)	375	280^{+15}	70^{+10}_{-5}	-	-	-	-	-	20
CC	-	Coil (C)	380-395	300^{+5}	70_{-5}	-	-	-	-	-	20-25
F	C 450	Coil (C)	380	300^{+15}	100^{+10}_{-5}	-	-	-	-	-	25
L	C 450	Coil (C)	400-430	300^{+15}	100^{+10}_{-5}	-	-	-	-	-	30-50
A/90	-	Coil (C)	660-740	570^{+20}	90_{-10}	-	-	-	-	-	50-100
A/100	-	Coil (C)	720-750	610^{+10}	102_{-10}	-	-	-	-	-	75-100
Basket Spool	B300	Basket Rim (B)	$300^{\pm 5}$	$180^{\pm 2}$	$100^{\pm 3}$	-	-	-	-	-	15-20
K/435/70	-	Basket Rim (B)	435	308	70	-	-	-	-	-	20-25
K/415/100	B 450	Basket Rim (B)	415	308	100	-	-	-	-	-	20-30
K/570	-	Basket Rim (B)	760	570	115	-	-	-	-	-	90-100
Basket Spool	BS 300	Basket Spool (BS)	$300^{\pm 5}$	-	103_{-30}	$50{,}5^{+2{,}5}$	-	-	-	-	15-20



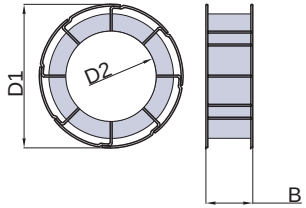
Spool (S)



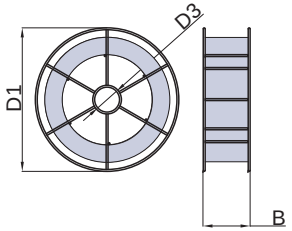
Reel (S)



Coil (C)



Basket Spool (B)



Basket Spool (BS)

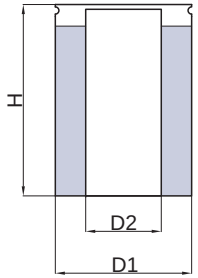
Dimensions of Pay-Off-Packs, Spiders and Coils

FLIESS Schweißzusätze welding wires since 1915

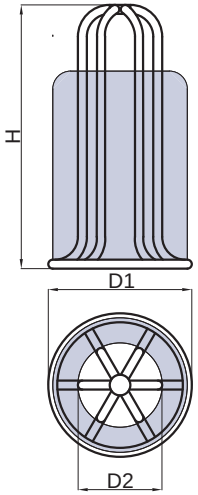
Denomination	Outer diameter $D_{1\ mm}$	Inner diameter $D_{2\ mm}$	Inner tube / inner core $D_{2\ mm}$	Height H mm	Weight ca. kg
MIG-Drum	588	-	300*	870	max. 330
MIG-Drum	650	-	-	875	max. 400
Pay-Off-Pack	570	-	315	1000	max. 400
Pay-Off-Pack	570	-	315	800	max. 300
Pay-Off-Pack	630	-	400	1000	max. 500
Spider	800	480	-	1500	max. 1000
Spider	800	480	-	1200	max. 400
One-Way-Spider	950	500	-	1400	max. 1000
Fliess-Coil**	800	500	-	1000	max. 1000

* Inner core for MIG-Drum only on request.

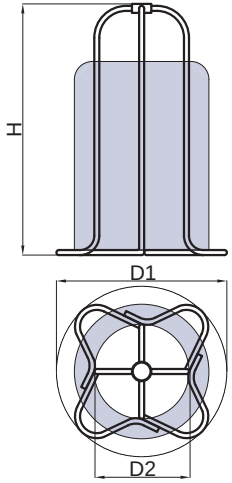
** Random wound spool with two lifting slings and cardboard former. Decoiling stand with empty spider needed.



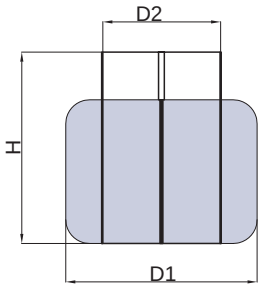
Pay-Off-Pack / Drum



Spider



One-Way-Spider



Fliess-Coil



MIG-wires · TIG welding rods · SAW-wires · Gas welding rods

CHECKED QUALITY
FLIESS
MADE IN GERMANY

since 1915

FLIESS
Schweißzusätze
welding wires

Hermann Fliess & Co. GmbH
Essenberger Straße 85-93
D-47059 Duisburg
Tel.: +49 (0)203-31908-0
Fax: +49 (0)203-3190890
info@fliess.biz · www.fliess.biz

Creation and realization: **www.sanderwerbung.de**