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E Submerged arc welding fluxes

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LW 250	274
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LW 700	288

LW 250

Classification

Flux/wire	AWS A5.17 / A5.23	DIN 32522	EN 760
LW250/		F MS 1 67 AC 9SKM	S F MS 1 78 AC H10
GRIDUCT UP-S1	EL 12		
GRIDUCT UP-S2	EM12		
GRIDUCT UP-S2Mo	EA 1*		
GRIDUCT UP-S3			
GRIDUCT UP-S4	EH 14*		

*Nearest classification

General description

Multi purpose flux for unalloyed and low alloyed steel
Suitable for rusty plates
Good bead shape with easy slag release
Designed for single and multi-run technique
Molten manganese-silicon flux for butt welds and cladding

Approvals

Wire Grade	TUV	DB	UDT
GRIDUCT UP-S2	+		
GRIDUCT UP-S2Mo	+		

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Mn	Si	P	S	Mo
GRIDUCT UP-S10.06	1.1	0.3	<0.025	<0.015		
GRIDUCT UP-S20.06	1.3	0.4	<0.025	<0.015		
GRIDUCT UP-S2Mo	0.06	1.4	0.4	<0.025	<0.015	0.4
GRIDUCT UP-S30.07	1.7	0.4	<0.025	<0.015		
GRIDUCT UP-S40.07	1.8	0.4	<0.025	<0.015		

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) 0°C -20°C	
GRIDUCT UP-S1	AW	360	470	25	55	50
GRIDUCT UP-S2	AW	380	490	25	70	55
	SR	320	410	28		70
GRIDUCT UP-S2Mo	AW	460	560	22	50	40
GRIDUCT UP-S3	AW	420	500	25	55	40
GRIDUCT UP-S4	AW	440	510	22	52	38

AW = as welded
 SR = stress relieved

Liability: All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance.

LW 250

Materials to be welded		-> increasing strength level ->	specials
General structural steel EN 10025		S185, S235, S275, S355	
Ship plates		Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R	
Pipe material	EN 10208-1 EN 10208-2 API 5LX EN 10216-1/ EN 10217-1	L210, L240, L290 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB X42, X46, X52 P235T1, P235T2, P274T1 P275T2, P355N	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH 16 Mo 3	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL S275M, S275ML, S355M, S355ML	

Flux/wire selection, multi-run			
Wire	Cond.	Min. service temperature (°C), depending on steel quality	
GRIDUCT UP-S1	AW	-20°	
GRIDUCT UP-S2	AW	-40°	
	SR	-40°	
GRIDUCT UP-S2Mo	AW	0°	
GRIDUCT UP-S3	AW		
GRIDUCT UP-S4	AW	-20°	

AW = as welded
SR = stressed relieved, 15h, 600°

Applications and suggestions for use	
Developed for thin plate material Redrying: 2h, +250°C	

Flux characteristics	
Max. current, one wire (A)	900
Current type	AC, DC+
Basicity (Boniszewski)	0.7
Solidification speed	fast
Density (kg/dm ³)	1.2

Packaging	
Unit	Net weight (kg)
bags	25
steel drums	250

Classification

Flux/wire	AWS A5.17/5.23	DIN 32522	EN 760
GRIDUCT LW280/		FCS 1 65 AC 9 M HP 5	S F CS 1 65 DC H 10
GRIDUCT UP-S2	EM 12		
GRIDUCT UP-S2Mo	EA 1*		
GRIDUCT UP-S2CrMo1			
GRIDUCT UP-S3			
GRIDUCT UP-S4	EH 14*		

*Nearest classification

General description

Molten calcium-silicate flux for unalloyed and low alloyed steel

Weldmetal with low hydrogen content

Good impact toughness in low-run and multi run technique

Special developed for welding of thick plates

Can be used in one- or multi wire systems

Approvals

Wire Grade	TUV	DB	UDT
GRIDUCT UP-S2	+	+	+
GRIDUCT UP-S2 Mo	+		+
GRIDUCT UP-S2 CrMo	+		+
GRIDUCT UP-S3	+		+
GRIDUCT UP-S3Mo		+	
GRIDUCT UP-S4	+		+
GRIDUCT UP-S4Mo	+		+

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Mn	Si	Mo	Cr
GRIDUCT UP-S20.09	1.1	0.4			
GRIDUCT UP-S2Mo	0.07	1.0	0.4	0.5	
GRIDUCT UP-S2CrMo1	0.08	1.0	0.4	0.5	0.95
GRIDUCT UP-S30.09	1.3	0.4			
GRIDUCT UP-S40.09	1.5	0.4			
GRIDUCT UP-S4Mo	0.09	1.5	0.4	0.5	

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					0°C	-20°C	-40°C
GRIDUCT UP-S2	AW	460	550	28	-	100	60
	SR	380	470	36	-	130	100
GRIDUCT UP-S2Mo	AW	530	630	22	-	50	-
	SR	460	560	26	70	-	-
GRIDUCT UP-S3	AW	470	580	28	-	80	40
	SR	420	520	28	-	100	80
GRIDUCT UP-S4	AW	480	590	27	-	-	-
GRIDUCT UP-S4Mo	AW	530	660	23	-	50	-

AW = as welded

SR = stress relieved

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Materials to be welded		-> increasing strength level ->	specials
General structural steel Ship plates		EN 10025 S185, S235, S275, S355 Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R	
Pipe material	EN 10208-1 EN 10208-2 API 5LX EN 10216-1/ EN 10217-1	L210, L240, L290, L360 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB, L445 X42, X46, X52, X60 P235T1, P235T2, P274T1 P275T2, P355N	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL, S420N, S420NL S275M, S275ML, S355M, S355ML, S420M, S420ML, S460	
Specials		11 Ni Mo V53	

Flux/wire selection, multi-run / two-run			
Wire	Cond.	Min. service temperature (°C), depending on steel quality	
GRIDUCT UP-S2	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2Mo	AW	0°C	
	SR	-20°C	
GRIDUCT UP-S2CrMo1	T	-20°C	
GRIDUCT UP-S3	AW	-20°C	
	SR	-20°C	
	T	-20°C	
GRIDUCT UP-S4	AW	-20°C	
	SR	-20°C	
	T	-10°C	
GRIDUCT UP-S4Mo	AW	-20°C	
	QT	0°C	
		AW = as welded SR = stress relieved 15h/600°C T = tempered 15h/690°C QT = quenched and tempered 2h,920°C +3h, 600°C	

Applications and suggestions for use	
Special developed for boiler and vessel steel Redrying: 2h, +250°C	

Flux characteristics	
Max. current, one wire (A)	900
Current type	AC, DC+
Basicity (Boniszewski)	1.2
Density (kg/dm ³)	1.6

Packaging	
Unit	Net weight (kg)
bag	20

Classification

Flux/wire	AWS 5.17/5.23	DIN 32522	EN 760
LW 320/		FAB I 58 AC 8 HP 5	S F AB I 58 AC H5
UP-S1	EL 12		
UP-S2	EM 12		
UP-S2Mo	EA 1*		
UP-S2CrMo1	EB 2*		
UP-S2Ni	ENi K		
UP-S2Ni2	ENi 2*		
UP-S2NiMo1	E F1*		
UP-S3	EG		
UP-S3NiMo1	E F1*		*Nearest classification

General description

Aluminate basic molten welding flux for low alloyed and fine grained steel
Low hydrogen content and extra moisture resistant
Can be used in one- or multi wire systems

Approvals

Wire Grade	TUV	DB	UDT	Wire Grade	TUV	DB	UDT
GRIDUCT UP-S1 CrMo2	+		+	GRIDUCT UP-S2 NiCrMo1	+		+
GRIDUCT UP-S2	+	+	+	GRIDUCT UP-S3	+		+
GRIDUCT UP-S2 Mo +		+		GRIDUCT UP-S3 Mo+	+	+	GRIDUCT
GRIDUCT UP-S2 CrMo1	+		+	UP-S3 NiMo1	+	+	
GRIDUCT UP-S2 Ni1 +		+					
GRIDUCT UP-S2 Ni2 +		+					
GRIDUCT UP-S2 NiMo1	+		+				

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Si	Mn	Mo	Ni	Cr
GRIDUCT UP-S1 CrMo2	0.05	0.2	1.7	0.85		1.85
GRIDUCT UP-S2	0.10	0.4	1.3-1.8			
GRIDUCT UP-S2 Mo	0.08	0.2	1.3-1.8	0.4-0.7		
GRIDUCT UP-S2 Ni	0.05	0.2	1.7		1.2	
GRIDUCT UP-S2 Ni2	0.08	0.2	1.3-1.8		1.8-2.3	
GRIDUCT UP-S2 NiMo1	0.08	0.2	1.4-1.8	0.4-0.6	0.8-1.2	
GRIDUCT UP-S2 CrMo1	0.10	0.2	1.2-1.7	0.45-0.6		0.9
GRIDUCT UP-S2 NiCrMo1	0.06	0.2	2.0	0.45	0.75	0.3
GRIDUCT UP-S3	0.10	0.2	1.7-2.2			
GRIDUCT UP-S3 Mo	0.08	0.2	1.4-2.0	0.4-0.6		
GRIDUCT UP-S3 NiMo1	0.06	0.2	1.8	0.45	0.85	

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
					0°C	-20°C	-40°C	-60°C
GRIDUCT UP-S1CrMo2	SR	520	610	23	50	-	-	-
GRIDUCT UP-S2	AW(SR)	490(490)	570(570)	29(26)	-	130(100)	110(60)	50(45)
GRIDUCT UP-S2 Mo	AW(SR)	620(540)	700(610)	24(25)	(100)	120	90	50
GRIDUCT UP-S2CrMo 1	AW(SR)	600(380)	680(450)	22(25)	(100)	80(80)	50	-
GRIDUCT UP-S2Ni2AW(SR)	650(530)	700(600)		22(25)	-	100(80)	70(50)	50(30)
GRIDUCT UP-S2NiMo1	AW(SR)	600(440)	680(580)	24(24)	(70)	100	70	50
GRIDUCT UP-S2 NiCrMo11	SR	380	450	25	100	80	-	-
GRIDUCT UP-S3	AW(SR)	550(480)	640(560)	26(26)	-	110(90)	60(50)	(40)
GRIDUCT UP-S3Mo	SR	520	630	23	110	-	-	-

AW = as welded
SR = stress relieved

Liability: All information in this data sheet is based on the best available knowledge, is subject to change without notice and can only be considered as suitable for general guidance.

Materials to be welded		-> increasing strength level ->	specials
General structural steel EN 10025 Ship plates		S185, S235, S275, S355 Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R, G 17CrMo 9-10	
Pipe material	EN 10208-1 EN 10208-2 API 5LX EN 10216-1/ EN 10217-1	L210, L240, L290, L360 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB, L445, L480MB X42, X46, X52, X60 P235T1, P235T2, P274T1 P275T2, P355N	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH, P460N12 16 Mo3, 13CrMo 4-5	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL, S420N, S420NL, S460NL S275M, S275ML, S355M, S355ML, S420M, S420ML, S460	
Specials	EN 10137-2	S500Q 15 NiMoNb5 20 MnMoNi 4-5	

Flux/wire selection, multi-run / two-run

Wire	Cond.	Min. service temperature (°C), depending on steel quality	
GRIDUCT UP-S2	AW	-40°C	
	SR 1	-40°C	
GRIDUCT UP-S2Mo	AW	-40°C	
	SR 2	-20°C	
GRIDUCT UP-S2CrMo1	T	-20°C	
	SR3	0°C	
GRIDUCT UP Ni2	AW	-40°C	
	SR1	-40°C	
GRIDUCT UPNiMo1	AW	-40°C	
	SR2	-20°C	
GRIDUCT UPNiCu1	AW	-40°C	
	SR	-40°C	
GRIDUCT UP-S3	AW	-40°C	
	SR1	-40°C	

AW = as welded
 SR1 = stress relieved 3h,600°C
 T = tempered 15h/650°C
 SR2 = stress relieved 30h/580°C
 SR3 = 80 min/920°C + 3h,650°C

Applications and suggestions for use

Developed for fine grained steel, boiler and pressure vessel steel

Redrying: 2h, +250°C

Flux characteristics

Max. current, one wire (A)	800
Current type	AC, DC+
Basicity (Boniszewski)	1.4
Density (kg/dm ³)	1.7

Packaging

Unit	Net weight (kg)
bag	20

Classification

Flux/wire	AWS 5.17?5.23	DIN 32522	EN 760
LW 330/		FFB 1 54 DC 10 (HP 7)	S F FB 154 DC H5
UP-S1 CrMo2	EB 3		
UP-S2	EM 12		
UP-S2Ni1	ENi K		
UP-S2Ni2	ENi 2 *		
UP-S2NiMo1	E F1 *		
UP-S2CrMo2			
UP-S3	EG		
UP-S3NiMo1	E F1 *		*Nearest classification

General description

Fluoride basic molten welding flux for fine grained steel

Good slag removal, also in narrow groves

High current capacity!

Low hydrogen content and extra moisture resistant

Can be used in tandem wire systems too

Approvals

Wire Grade	TÜV	UDT
GRIDUCT UP-S1CrMo2	+	+
GRIDUCT UP-S2	+	+
GRIDUCT UP-S2Ni1	+	+
GRIDUCT UP-S2Ni2	+	+
GRIDUCT UP-S3	+	+
GRIDUCT UP-S3NiMo1	+	+

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Si	Mn	Mo	Ni
GRIDUCT UP-S1CrMo2	0.05-0.11	0.25	0.6-0.9	0.8-1.0	
GRIDUCT UP-S20.07-0.12		0.25	0.8-1.1		
GRIDUCT UP-S2Ni1	0.05-0.11	0.2	0.8-1.2		1.1-1.6
GRIDUCT UP-S2Ni2	0.12	0.25	0.8-1.2		2.0-2.5
GRIDUCT UP-S30.05-0.11		0.3	1.2-1.6		

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	0.2% Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
					+20°C	-20°C	-40°C	-60°C
GRIDUCT UP-S1CrMo2	SR	460	550	25	-	-	-	-
GRIDUCT UP-S2	AW(SR)	420(340)	500(440)	29 (32)	140(160)	-	80(150)	50(40)
GRIDUCT UP-S2Ni1	AW(SR)	490(450)	570(520)	27 (30)	160(190)	-	60(135)	45(70)
GRIDUCT UP-S2Ni2	AW(SR)	500(560)	580(610)	28 (24)	-	-	100	50
GRIDUCT UP-S2NiMo1	AW(SR)	600(440)	680(580)	22 (24)	(70)	100	70	50
GRIDUCT UP-S3	AW(SR)	510(450)	580(530)	28(31)	-	-	70(90)	50(60)
GRIDUCT UP-S3NiMo1	AW(SR)	680(600)	790(660)	22(24)	140 (150)	110(130)	85(90)	50

AW = as welded
SR = stress relieved

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Materials to be welded		-> increasing strength level ->	specials
General structural steel EN 10025 Ship plates		S185, S235, S275, S355 Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R, G 17CrMo 9-10	
Pipe material	EN 10208-1 EN 10208-2 API 5LX EN 10216-1/ EN 10217-1 EN 10028-4	L210, L240, L290, L360 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB, L445, X42, X46, X52, X60 P235T1, P235T2, P274T1 P275T2, P355N 12 Ni 14 G 2, 13 MuNi 6 3	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH,	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL, S420N, S420NL, S460N S275M, S275ML, S355M, S355ML, S420M, S420ML, S460	
Specials		20 MnMoNi 4 5 15 NiCuMoNb 4 5	

Flux/wire selection, multi-run / two-run

Wire	Cond.	Min. service temperature (°C), depending on steel quality	
GRIDUCT UP-S1CrMo2	AW	+20°C	
GRIDUCT UP-S2	AW	-40°C	
	SR 1	-40°C	
GRIDUCT UP-S2Mo	AW	-20°C	
GRIDUCT UP-S2Ni1	AW	-40°C	
	SR2	-60°C	
GRIDUCT UP-S2Ni2	AW	-60°C	
	SR1	-60°C	
	Q	-60°C	
GRIDUCT UP-S3	AW	-40°C	
	SR2	-60°C	
GRIDUCT UP-S3NiMo1	AW	-40°C	
	SR1	-40°C	
	SR2	-60°C	
	Q	-40°C	

AW= as welded
 SR1 = stress relieved 15h/600°C
 SR2 = stress relieved 50h/600°C
 Q = quenched, 15h, 900°C,+5h, 680°C

Applications and suggestions for use

Developed for fine grained steel and steels with increased yield strength

Redrying: 2h, +250°C

Flux characteristics

Max. current, one wire (A)	1000
Current type	DC+
Basicity (Boniszewski)	2.5
Density (kg/dm ³)	1.6

Packaging

Unit	Net weight (kg)
bag	20
drum	50

Classification

Flux/wire	AWS A5.9	DIN 32522	EN 760
LW 380/		FCS 6 63346 DC 9 KHP5	S FCS 263 346 DC H10
GRINOX UP-19 9L	ER 308 L		
GRINOX UP-19 9Nb	ER 347		
GRINOX UP-19 12 3L	ER 316 L		
GRINOX UP-19 12 3Nb	ER 318		
GRINOX UP-24 12L	ER 309 L		
GRINOX UP-20 16 3 Mn 8 Ni			
GRINOX UP-18 16 5			
GRINOX UP-22 8 3 N L			
GRINOX UP-20 25 5 Cu L			

General description

Molten calcium silicate welding flux for corrosion resistant steel

Welding stainless steel to carbon steel

Excellent slag release, also in narrow gaps

Can be used one- or multi wire systems

Approvals

Wire Grade	TÜV	DB	UDT
GRINOX UP-19 9 L	+	+	+
GRINOX UP-19 9 Nb	+	+	+
GRINOX UP-19 12 3 L	+	+	+
GRINOX UP-19 12 3 Nb	+	+	+
GRINOX UP-24 12 L	+		+
GRIDUCT UP-S2 CrMoWV12	+		+

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Si	Mn	Cr	Ni	Mo	Nb	W	V
GRINOX UP 19 9 L	0.035	1.0	1.6	17.5-20.6	9.0-11.0	-	-	-	-
GRINOX UP 19 9 Nb	0.06	1.0	1.6	18.0-20.0	8.5-10	-	0.8	-	-
GRINOX UP 19 12 3 L	0.035	1.0	1.6	16.5-18.5	10.0-13.0	2.4-2.9	-	-	-
GRINOX UP 19 12 3 Nb	0.06	1.0	1.6	17.5-19.0	10.5-12.0	2.4-2.9	1.1	-	-
GRINOX UP 24 12 L	0.015	0.7	1.3	22-24.5	11.0-13.0	-	-	-	-
GRIDUCT UP-S2CrMoWV12	0.10	0.6	0.75	10.5	0.4	0.9	-	0.5	0.3

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					RT	-10°C	-196°C
GRINOX UP19 9 L	AW	380	560	50	100	-	60
	SR	380	560	50	90	-	60
GRINOX UP19 9 Nb	AW	430	630	35	130	40	-
GRINOX UP19 12 3 L	AW	400	570	30	80	-	60
		430	600	30	80	-	50
GRINOX UP19 12 3 Nb	AW	450	640	35	110	100	40
GRINOX UP 24 12 L	AW	440	610	30	80	65	-
GRIDUCT UP-S2CrMoWV	SR	590	810	20	40	-	-

AW = as welded, SR = stress relieved

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Materials to be welded			-> increasing strength level ->	specials
AISI	W.Nr.	DIN		
304L	1.4306	X2 CrNi 19 11		
304LN	1.4311	X2 CrNiN 18 10		
316LN	1.4406	X2 CrNiMoN 17 12 2		
316L	1.4404	X2 CrNiMo 17 13 2		
316L	1.4435	X2 CrNiMo 18 14 3		
316LN	1.4429	X2 CrNiMoN 17 13 3		
304H	1.4948	X6 CrNi 18 11		
304	1.4301	X5 CrNi 18 10		
321	1.4541	X6 CrNiTi 18 10		
316	1.4401	X5 CrNiMo 17 12 2		
316	1.4436	X5 CrNiMo 17 13 3		
347	1.4550	X6 CrNiNb 18 10		
318	1.4580	X6 CrNiMoNb 17 12 2		
318	1.4583	X10 CrNiMoNb 18 12		
317LN	1.4439	X2 CrNiMoN 17 13 5		
	1.4539	X1 NiCrMoCuN 25 20 5	Z1 NCDU 25.20	
	1.3952	X2 CrNiMoN 18 14		
	1.4462	X2 CrNiMoN 22 5 3	Z2 CND 25.5 à 1'N	
	1.4465	X1 CrNiMoN 25 25 2		
	1.4922	X20 CrMoV 12-1		
Zeron 100				
and these steels to carbon steels H I /H II , St E255, St E355				

Flux/wire selection, multi-run / two-run		
Wire	Cond.	Min. service temperature (°C), depending on steel quality
GRINOX UP 19 9L	AW	-196°C
GRINOX UP 19 12 3 L	AW	-196°C
GRINOX UP 24 12 L	AW	-10°C
GRIDUCT UP-S2 CrMoWV 12	T	+20°C
AW = as welded		
T = tempered 5h, 760°C		

Applications and suggestions for use

Developed for stainless steel and head resistant steel

Redrying: 2h, +250°C

Flux characteristics	
Max. current, one wire (A)	900
Current type	DC+
Basicity (Boniszewski)	1.3
Density (kg/dm ³)	1.6

Packaging	
Unit	Net weight (kg)
bag	20

Classification

Flux/wire	AWS 5.17/5.23	DIN 32522	EN 760
LW 610F		FFB 1 76 AC 8 SK	S A AB 1 78 AC H5
GRIDUCT UP-S2	EM 12		
GRIDUCT UP-S2Mo	EA 1*		
GRIDUCT UP-S2CrMo1	EB 2*		
GRIDUCT UP-S2Si	EM 12 K		
GRIDUKT UP-S3	EG		

*Nearest classification

General description

Agglomerated aluminate rutil welding flux for carbon and low alloyed steel grades

Suitable for rusty/dirty plates

High welding speed in fillet welds

Specially for thin plates

Grain size (1-16) is different to LW 610 (2-20)

Approvals

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Si	Mn	Mo
GRIDUCT UP-S10.04-0.09		0.6	0.9-1.2	
GRIDUCT UP-S20.05-0.10		0.5	1.0-1.4	
GRIDUCT UP-S2Mo	0.06	0.6	1.0-1.4	0.45-0.65
GRIDUCT UP S2SI	0.05	0.60	1.4	
GRIDUCT UP-S30.04-0.07		0.7	1.6-2.1	

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					RT	-10°C
GRIDUCT UP-S1	AW	430	500	30	100	80
	SR	-	-	-	-	100
GRIDUCT UP-S2	AW	490	580	25	-	160
	SR	480	560	25	-	130
GRIDUCT UP-S2Si	AW	450	550	-	-	40
GRIDUCT UP-S2Mo	AW	610	680	25	80	50
	SR	540	630	25	80	70
GRIDUCT UP-S3	AW	560	640	25	90	100
	SR	510	600	27	70	50

AW = as welded

SR = stress relieved

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MDS LW 610F

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Materials to be welded		-> increasing strength level ->	specials
General structural steel EN 10025		S185, S235, S275, S355	
Ship plates		Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R	
Pipe material	EN 10208-1 EN 10208-2	L210, L240, L290, L360 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB	
	API 5LX	X42, X46, X52	
	EN 10216-1/ EN 10217-1	P235T1, P235T2, P274T1 P275T2, P355N	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH 17Mo 3	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL S275M, S275ML, S355M, S355ML	

Flux/wire selection, multi-run		
Wire	Cond.	Min. service temperature (°C), depending on steel quality
GRIDUCT UP-S1	AW	-10°C
GRIDUCT UP-S2	AW	-10°C
GRIDUCT UP-S2Mo	AW	-10°C
	SR	± 0°C
	T	+10°C
GRIDUCT UP-S2Si	AW	-10°C
GRIDUCT UP-S3Si	AW	-10°C
	SR	-10°C

AW = as welded
 SR = stress relieved
 T = tempered

Applications and suggestions for use	
Mainly single pass or limited pass on plates ≤ 25 mm. LW 610F, GRIDUCT UP-S2Si recommended combination	

Flux characteristics	
Max. current, one wire (A)	800
Current type	AC, DC+
Basicity (Boniszewski)	0.5
Density (kg/dm ³)	1.0

Packaging	
Unit	Net weight (kg)
bag	25

Classification

Flux/wire	AWS A5.17/A5.23	DIN 32522 :	EN 760 :
LW 642F		B AB1 75 AC8 SKM	S A CS 175 AC H5
GRIDUCT UP-S1			
GRIDUCT UP-S2	EM 12		
GRIDUCT UP-S2 Si	EM 12K		
GRIDUCT UP-S2 CrMo1	EB2-B2		
GRIDUCT UP-S2 Ni1	ENi1-Ni1		
GRIDUCT UP-S2 Ni2	ENi2-Ni2		
GRIDUCT UP-S2 Mo	EA 1*		

*Nearest classification

General description

Multi purpose neutral agglomerated flux for un- and low alloyed steels
Good impact values in both multi-run and two run technique
Suitable for butt- and fillet welds
Easy slag removal at high welding speed
Can be used in one- or multi wire systems
Grain size (2-20) is different to LW 642 (1-16)

Approvals

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Mn	Si	P	S	Mo	Ni	Cr
GRIDUCT UP-S1	0.06	1.0	0.5	<0.025	<0.020			
GRIDUCT UP-S2	0.06	1.5	0.5	<0.025	<0.020			
GRIDUCT UP-S2 Si	0.06	1.4	0.6	<0.025	<0.020			
GRIDUCT UP-S2 Mo	0.05	1.3	0.3	<0.025	<0.020	0.45		
GRIDUCT UP-S2 Cr Mo1	0.06	1.2	0.3	<0.025	<0.020	0.4		0.9
GRIDUCT UP-S2 Ni1	0.05	1.3	0.3	<0.025	<0.015		1.0	
GRIDUCT UP-S2 Ni2	0.05	1.3	0.3	<0.025	<0.015		2.0	
GRIDUCT UP-S2 NiCu 1	0.04	1.3	0.4	<0.025	<0.015		0.9	

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
					0°C	-20°C	-40°C	-60°C
GRIDUCT UP-S1	AW(SR)	440(300)	450(420)	34(34)				110(140)
GRIDUCT UP-S2	AW(SR)	430	520					160 (180) 140(150)
GRIDUCT UP-S2 SiAW(SR)	400(360)	520(480)		24(29)				40 (40)
GRIDUCT UP-S2 Mo	AW(SR)	500	580	28				100(140)
GRIDUCT UP-S2 Ni1	AW	410	520					120 100
GRIDUCT UP-S2 Ni2	AW	410	530					100 80
GRIDUCT UP-S2 CrMo1							50	
GRIDUCT UP-S2 NiCu1	AW(SR)	420	530	30				80 (100)

AW = as welded
 SR = stress relieved

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Materials to be welded		-> increasing strength level ->	specials
General structural steel EN 10025 Ship plates		S185, S235, S275, S355 Grade A, B, C, D, A(H)32 to D(H)36	
Cast steel	EN 10213-2	GP240R	
Pipe material	EN 10208-1 EN 10208-2 API 5LX EN 10216-1/ EN 10217-1	L210, L240, L290, L360 L240NB, L290NB, L360NB, L360QB, L240MB, L290MB, L360MB, L415MB, L415NB, L445 X42, X46, X52 P235T1, P235T2, P274T1 P275T2, P355N	
Boiler & pressure vessel steel	EN 10028-2	P235GH, P265GH, P295GH, P355GH 17Mo 3, 13 CrMo 4-5	
Fine grained steel	EN 10113-2 EN 10113-3	S275N, S275NL, S355N, S355NL, S420N, S420NL S275M, S275ML, S355M, S355ML, S420M, S420ML, S460	

Flux/wire selection, multi-run / two-run

Wire	Cond.	Min. service temperature (°C), depending on steel quality	
GRIDUCT UP-S1	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2Mo	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2Si	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2NiCu1	AW	-20°C	
	SR	-20°C	
GRIDUCT UP-S2CrMo1	T	-10°C	

AW = as welded
 SR = stress relieved
 T = tempered

Applications and suggestions for use

Combination GRIDUCT UP-S1/LW 642F for low tensile steels in multi run technique.
 Combination GRIDUCT UP-S2 Si/LW 642F for steel with UTS = 490N/mm² and good impact properties as welded

Flux characteristics

Max. current, one wire (A)	900
Current type	AC, DC+
Basicity (Boniszewski)	1.5
Solidification speed	fast
Density (kg/dm ³)	1.2

Packaging

Unit	Net weight (kg)
bags	25

Classification

Flux/Wire	AWS A5.17/A5.23	DIN 32522:	EN 760:
LW700		BAB 167AC8 SKM	S A AB 167 AC 8 H5
UP-S2			
UP-S2 Mo			
UP-S2 Ni 1			

General description

Agglomerated aluminate basic welding flux for carbon- and low alloyed steel grades.
Outstanding slag removal.

Approvals

Chemical composition (w%), typical, all weld metal

Wire Grade	C	Si	Mn
S2	≤0.11	≤0.5	1.10-1.60

Mechanical properties, typical, all weld metal

Wire Grade	Cond.	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation		Impact ISO-V(J)			
				RT	(%)	0°C	-20°C	-40°C	-60°C
S2	AW	460	530	25	160	130	100		
	SR	440	510	25	170	130	60		

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Materials to be welded		-> increasing strength level ->		specials
General structural steels DIN 17100	St37.2 /3to St50.2	St52.3		
Ship plates Grade	A,B,C,D,E	AH,DH,EH		
Cast steel DIN 1681	GS38, GS45	GS52, GS60		
Pipe material DIN 17172	StE240.7 to StE320.7	StE360.7	StE385.7, StE415.7	StE445.7, StE480.7
API 5LX DIN 1628-1630	X42, X46 X52 St37.0/4, St44.0/4	X56, X60 St52.0/4	X65, X70	
Boiler & pressure vessel steel DIN 17155	HI, HII, 17Mn4	19Mn6		
Elevated temperature steel DIN 17175	St35.8, St45.8,	17 Mn 4, 19 Mn 5		15 Mo 3
Fine grained steel DIN 17102	StE255 to StE 315	StE355	StE380, StE 420	StE460, StE500

Flux/wire selection, multi-run / two-run		
Wire	Cond.	Min. service temperature (°C), depending on steel quality

Applications and suggestions for use	
Special developed for multi wire systems	

Flux characteristics	
Max. current, one wire (A)	800
Current type	AC, DC+
Basicity (Boniszewski)	2.0
Density (kg/dm ³)	1.0

Packaging	
Unit	Net weight (kg)
bag	25