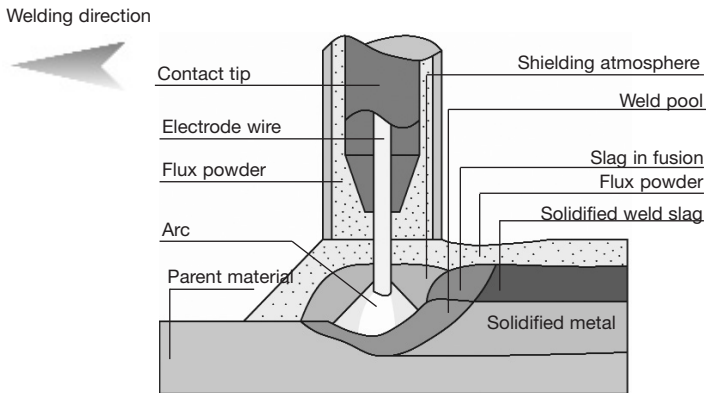


Subarc Process



The mechanics of the Submerged Arc Welding process (SAW): Both the electrode and the base metal are melted beneath a layer of flux. This layer protects the weld metal from contamination and concentrates the heat into the joint. The molten flux rises through the pool, deoxidising and cleaning the molten metal. It then forms a protective slag covering and maintaining the newly deposited weld.

The range of applications can be anything from 2 mm increasing with no upper limit. Subarc is one of the most versatile of welding processes. All steel grades, from non to high alloyed, including Ni-based, can be welded with a combination of various application techniques.

Ranging from a single electrode-single power source to a combination of four power sources feeding two wires each, Lincoln is proud to offer an extensive range of application solutions to the market.

As a global supplier, including equipment and consumables, Lincoln's knowledge in the SAW process will support you in reaching the toughest productivity and quality targets.

Solid and flux cored wires for SA welding of mild and low alloyed steel

SAW

SOLID AND FLUX CORED WIRES FOR SUBMERGED ARC WELDING

MILD STEEL

Product name	Chemical composition (typical values) in %								Classifications		
	C	Mn	Si	P	S	Cr	Ni	Mo	AWS	EN	
LNS 143 (L-60)	0.09	0.5	0.06	-	-	-	-	0.5	A5.17	EL12	EN 756 S1
LNS 135	0.1	1.0	0.10	0.015	0.015	-	-	0.5	A5.17	EM12	EN 756 S2
LNS 129 (L-61)	0.1	1.0	0.25	-	-	-	-	0.5	A5.17	EM12K	EN 756 S2Si
LNS 133U (L-50M)	0.1	1.6	0.25	-	-	-	-	0.5	A5.17	EH12K	EN 756 S3Si

LOW ALLOYED STEEL

Product name	Chemical composition (typical values) in %								Classifications		
	C	Mn	Si	P	S	Cr	Ni	Mo	AWS	EN/ISO	
L-70	0.10	0.9	0.10	-	-	-	-	0.5	A5.23	EA1	EN 756 S2 Mo
LNS 140A	0.10	1.0	0.10	-	-	-	-	0.5	A5.23	EA2	EN 756 S2 Mo
LNS 140TB (LA 81)	0.06	1.1	0.20	-	-	-	-	0.5	A5.23	EG	EN 756 SZ
LNS 141	0.13	1.5	0.15	-	-	-	-	0.5	A5.23	EA4	EN 756 S3 Mo
LNS 140	0.10	1.9	0.10	-	-	-	-	0.5	A5.23	EA3	EN 756 S4 Mo
LNS 150 (LA 92)	0.13	0.8	0.15	<0.010	-	1.2	-	0.5	A5.23	EB2R	EN 12070 Cr Mo1
LNS 151 (LA 93)	0.10	0.6	0.15	<0.010	-	2.6	-	1.0	A5.23	EB3R	EN 12070 Cr Mo2
LNS 160	0.10	1.1	0.15	-	-	-	1.0	-	A5.23	EN1	EN 756 S2 Ni1*
LNS 162	0.10	1.1	0.15	-	-	-	2.2	-	A5.23	EN2	EN 756 S2 Ni2*
LNS 164 (LA 84)	0.10	1.6	0.10	-	-	-	0.9	0.5	A5.23	EF3	EN 756 S3 Ni1Mo
LNS 165 (LA 85)	0.10	1.4	0.20	-	-	-	1.0	0.2	A5.23	EN5	EN 756 SZ
LNS 168	0.10	1.6	0.15	-	-	0.7	2.3	0.6	-	-	ISO 26304-A S3 Ni2.5CrMo
LA 100	0.05	1.7	0.45	<0.010	<0.010	-	1.9	0.45	A5.23	EM2	EN 756 SZ
LNS T55 **	0.06	1.5	0.60	<0.012	<0.010	-	-	-	A5.17	EC1 H4	EN 758 SZ H5
LNS T690	0.08	1.7	0.60	<0.020	<0.015	-	1.8	0.5	A5.23	ECM3 H4	EN 758 SZ

* nearest classifications

** flux cored wires

Solid wires for SA welding of stainless steel and nickel alloys

SOLID WIRES FOR SA-WELDING STAINLESS STEEL

Product name	Chemical composition (typical values) in %											Classifications	
	C	Mn	Si	Cr	Ni	Mo	Nb	N	others	W.Nr.	AWS	EN	
LNS 304L	0.015	1.8	0.4	20	10	0.1	-	-	-	1.4316	A5.9	ER308L EN 12072	
LNS 304H	0.05	1.2	0.6	20.1	10.5	-	-	-	-	-	A5.9	ER308H EN 12072	
LNS 309L	0.01	1.8	0.4	23.4	13.8	0.07	-	-	-	1.4332	A5.9	ER309L EN 12072	
LNS 316L	0.015	1.75	0.4	18.5	12	2.75	-	-	-	1.4430	A5.9	ER316L EN 12072	
LNS 318	0.04	1.8	0.4	19.5	11.3	2.6	0.5	-	-	1.4576	A5.9	ER318 EN 12072	
LNS 329	0.09	1.8	1.2	25.5	5.6	-	-	-	-	-	-	ER318 EN 12072	
LNS 347	0.03	1.6	0.4	19.5	9.7	0.1	0.6	-	-	1.4451	A5.9	ER347 EN 12072	
LNS 4455	0.01	7.0	0.4	20	16	2.7	-	0.16	-	1.4455	-	ER347 EN 12072	
LNS 4462	0.015	1.6	0.5	23	8.6	3.1	-	0.16	-	1.4462*	A5.9	ER2209 EN 12072	
LNS 4500	0.01	1.8	0.3	20	25.2	4.6	-	-	Cu=1.5	1.4539	A5.9	ER385 EN 12072	
LNS Zeron 100X	0.02	0.7	0.3	25	9.3	3.7	-	0.23	Cu=0.6 W=0.6	-	A5.9	ER2553* EN 12072	
LNS CrMn 18/7	0.07	7.0	0.6	19	8.9	-	-	-	-	1.4370	A5.9	ER307* EN 12072	

NICKEL ALLOYS

Product name	Chemical composition (typical values) in %											Classifications	
	C	Mn	Si	Cr	Ni	Mo	Nb	N	others	W.Nr.	AWS	ISO	
LNS NiCr 60/20	0.05	0.02	0.1	22	65	8.7	3.7	-	Fe=0.1	2.4831	A5.14	ERNiCrMo-3 ISO 18274 S Ni 6625	
LNS NiCrMo 60/16	0.006	0.5	0.04	16.0	58	16	-	-	W=3.6 Fe=5.5	2.4886	A5.14	ERNiCrMo-4 ISO 18274 S Ni 6276	

* nearest classifications

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Flux

Classification

Flux 761	EN 760 :	S A CS/MS 1 88 AC H5	
Flux/wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
761 / L-60	F7A2-EL12	S 38 2 CS/MS S1	
761 / L-61	F7A2-EM12K	S 42 2 CS/MS S2Si	S 4T 0 CS/MS S2Si
761 / LNS140A	F9A0-EA2-G	S 50 0 CS/MS S2Mo	S 4T 2 CS/MS S2Mo

General description

High current capacity

Active flux for limited pass welding

High restraint cracking resistant

Suitable for rusty/dirty plates (at high current)

Applicable for low quality steels

Note: Use another flux for thin plates and multi-pass welding of thick plates (without particular caution)

Approvals

Wire grade	ABS	BV	CRS	Cont	DNV	PRS	GL	LRS	RINA	RMRS
L-61	3YM/2YT		3YM/2YT	x	2YT	3YM/2YT	3YM/2YT	3YM/2YT	3YM/2YT	2YT
LNS 140A	2YM/2YT	A3YM		x	2Y40M/3Y40T	3YM/3YT	3YM/3YT		3YM/3YT	2YM/3YT

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

Wire grade	C	Mn	Si	P	S	Mo
L-60	0.05	1.5	0.7	<0.03	<0.025	
L-61	0.08	1.7	0.9	<0.03	<0.025	
LNS 140A	0.06	1.7	0.8	<0.03	<0.025	0.4

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					0°C	-20°C
L-60	MR	380	500	28	80	50
L-61	MR	440	530	28	100	50
	TR	>420	>540		65	
LNS 140A	MR	480	600		80	40
	TR	>440	>540		100	55

MR: multi run

TR: two-run

761: rev. EN 22

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Suggestions for use

Wire	Characteristics	Applications
L-60	Lowest cost combination	Flat fillet, large throat
L-61	Reliable properties	Butt joints in two passes, in medium and thick plates
LNS140A	For good impact toughness as welded TR could be selected	Flux backing, modified series arc-welding Low quality steels

Materials to be welded

STEEL / CODE	TYPE	Multirun			Two-run		
		L60	L61	L70 / LNS140A	L60	L61	L70 / LNS140A
Ship plates							
	A to D, A (H) 32 to D(H) 36	x	x				x
	A 32 to AH36	x	x	x	x	x	x
General Structural steel							
NF EN 10137	500 A						x
NF EN10113	S275 to S420, N,M	x	x				x
NF EN 10149	S315 to S420, MC	x	x	x	x	x	x
	S315 to S420, NC	x	x				x
	S460, MC & NC						x
NF EN 10025	S185 to S355, E295 to E360, JR(G1 & G2), J0	x	x	x	x	x	x
	S185 to S355, E295 to E360, J2 (G3&G4)	x	x				x
Boiler & pressure vessel steel							
NF EN 10028	P235 to P420, GH	x	x	x	x	x	x
	P235 to P420, GH N, NH, M, Q & QH	x	x	x			x
	P235 to P460, GH, N, NH, M, Q & QH	x	x				x
	P500, GH, N, NH, M, Q & QH						x
	P235 S, P265 S	x	x				x
	A37 to A52, CP	x	x	x	x	x	x
	A37 to A52, CP, AP	x	x				x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	0,8
Solidification speed	Low, slag viscous
Density (kg/dm ³)	1,2
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Steel drum	250
Big Bag	1000

Flux

Classification

Flux 780	EN 760 :	S A AR/AB 1 78 AC H5	
Flux/Wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
780 / L-60	F7A0-EL12	S 42 0 AR/AB S1	S 4T 0 AR/AB S1
780 / L-61	F7A2-EM12K	S 42 0 AR/AB S2Si	S 4T 2 AR/AB S2Si
780 / LNS140A	F8A2-EA2-G		S 4T 2 AR/AB S2Mo

General description

Active flux for limited pass welding

Good general purpose flux, including semi-automatic

High speed on dirty plate

Good resistance to porosity on rust and primer

Good slag removal, good bead shape

Product also available in a fine grains formula

Note: Use another flux for thick plates and multi-pass welding of thick plates (without particular caution) and for low quality steel

Approvals

Wire grade	BV	ABS	LRS	DNV	GL	cont	RINA	RMRS	CRS
L-60	A2TM/A2YTM/2YT	2YM/2YT	2YM/2YT	2YM/2YT	2YM/3YT	x	2YT		
L-61	A3YT		3YM/3YT	3YM/3YT	3YT	x	3YT	3YT	3YT
LNS 140A			3YT						

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

Wire grade	C	Mn	Si	P	S	Mo
L-60	0.07	1.4	0.6	<0.030	<0.025	
L-61	0.07	1.6	0.7	<0.030	<0.025	
LNS140A	0.07	1.6	0.6	<0.030	<0.025	0.4

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					0 °C	-20°C
L-60	MR	400	510	28	50	
L-61	TR	> 420	> 540	28		50
LNS140A	TR	> 420	> 550			60

MR: multi run

TR: two-run

780: rev. EN 22

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Suggestions for use

Wire	Characteristics	Applications
L-60	Lowest cost combination	Horizontal fillet
L-61	Reliable properties	High speed on dirty plates
LNS 140A		Good on circumferential welds on small diameters With low voltage

Materials to be welded

STEEL / CODE	TYPE	Multirun			Two-run		
		L60	L61	L70 / LNS140A	L60	L61	L70 / LNS140A
Ship plates							
	A to D, A (H) 32 to D(H) 36	x	x				x
	A 32 to AH36	x	x	x	x	x	x
General Structural steel							
NF EN 10137	500 A						x
NF EN10113	S275 to S420, N,M	x	x				x
NF EN 10149	S315 to S420, MC	x	x	x	x	x	x
	S315 to S420, NC	x	x				x
	S460, MC & NC						x
NF EN 10025	S185 to S355, E295 to E360, JR(G1 & G2), JO	x	x	x	x	x	x
	S185 to S355, E295 to E360, J2 (G3&G4)	x	x				x
Boiler & pressure vessel steel							
NF EN 10028	P235 to P420, GH	x	x	x	x	x	x
	P235 to P420, GH N, NH, M, Q & QH	x	x	x			x
	P235 to P460, GH, N, NH, M, Q & QH	x	x				x
	P500, GH, N, NH, M, Q & QH						x
	P235 S, P265 S	x	x				x
	A37 to A52, CP	x	x	x	x	x	x
	A37 to A52, CP, AP	x	x				x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	0,7
Solidification speed	high
Density (kg/dm ³)	1,4
Grain size	1-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Steel drum	250
Big Bag	1000

Flux

Classification

Flux 781	EN 760 :	S A ZS 1 87 AC H5	
Flux/Wire	AWS A5.17 / A5.23		EN 756 : TR
781 / L-61	F7A0-EM12K		S 4T 2 ZS S2Si
781 / L50M (LNS133U)			S 4T 2 ZS S3Si
781 / LNS140A			S 4T 2 ZS S2Mo

General description

Active flux for limited pass welding

Very high speed on sheet metal

Good impact in two-run technique

High speed fillet weld with very good bead profile

Approvals

Wire grade	BV	ABS	LRS	DNV	RINA
L50M	A3,3YT+	4Y400T	4YT	3YT	3YT

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

Wire grade	C	Mn	Si	P	S	Mo
L-61	0.05	1.3	0.9	0.03	<0.02	
L50M (LNS133U)	0.06	1.6	1	0.03	<0.02	
LNS140A	0.06	1.3	0.9	0.03	<0.02	0.4

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Impact ISO-V(J) -20°C
L-61	TR	> 420	> 540	50
L50M (LNS133U)	TR	> 450	> 560	60
LNS140A	TR	> 490	> 580	65

TR: two-run

781: rev. EN 22

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Suggestions for use

Wire	Characteristics	Applications
L61	high speeds on clean plate	Single pass or limited passes
L50M (LNS133U)	very high speeds	Best results with clean plates and high Si/Mn wires
LNS140A	good impact toughness	

Materials to be welded

STEEL / CODE	TYPE	L61	L50M / LNS133U	L70 / LNS140A
Ship plates				
	A to D, AH32 to DH40	x	x	x
	A to E, AH32 to EH40			x
General Structural steel				
NF EN 10137	500 & 550 A	x	x	x
	500 & 550 A & AL			x
NF EN10113	S275 to S460 N/M	x	x	x
	S275 to S460 all qualities			x
NF EN 10149	S315 to S600 MC & NC	x	x	x
NF EN 10025	S185 to S360 all qualities	x	x	x
Boiler & pressure vessel steel				
NF EN 10028	P235 to P460, (GH, N NH, M, ML1)	x	x	x
"	P235 to P460 all qualities			x
NF EN 10207	P235 to P275 S	x	x	x
NF A36-601 & NF A36-605	A37 to A52 (CP, AP)	x	x	x
	A37 to A52 (CP, AP, FP)			x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	0,7
Solidification speed	fast, fluid slag
Density (kg/dm ³)	1,5
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Steel drum	250

Flux

Classification

Flux 782	EN 760 :	S A AR/AB 1 76 AC H5	
Flux/wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
782 / L-60		S 42 A AR/AB S1	S 4T A AR/AB S1
782 / LNS135	F7AZ-EM12		S 4T 0 AR/AB S2
782 / L-61	F7AZ-EM12K	S 46 0 AR/AB S2Si	S 4T 0 AR/AB S2Si
782 / L50M (LNS133U)		S 45 0 AR/AB S3Si	S 5T 2 AR/AB S3Si
782/ LNS 140A		S 46 0 AR/AB S2Mo	S 5T 2 AR/AB S2Mo

General description

Active flux for limited pass welding

Good bead shape with optimum wetting

High speed on thin plates

Single & multi-electrode welding; butt and fillet welds

Approvals

Wire grade	BV	ABS	LRS	DNV	RINA
L50M	4YT	4Y400T	4YT	4YT	3YT

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

Wire grade	C	Mn	Si	P	S	Mo
L-60	0.07	1	0.6	<0.030	<0.025	-
LNS135	0.07	1.15	0.7	<0.030	<0.025	-
L-61	0.07	1.15	0.8	<0.030	<0.025	-
L50M (LNS133U)	0.06	1.7	1	<0.030	<0.025	-
LNS140A	0.07	1.2	0.7	<0.030	<0.025	0.4

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Impact ISO-V(J)	
				0°C	-20°C
L-60	TR	>420	> 520	45	
LNS135	TR	>420	> 520	55	
L-61	TR	>420	> 520	60	
L50M (LNS133U)	TR	>460	> 550	65	50
LNS140A	TR		>600	70	50

TR: two-run

782: rev. EN 22

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Suggestions for use

Wire	Characteristics	Applications
LNS135	Lowest cost combination	Fillet weld, lap joint
L-61	good properties	• truck wheels
L50M	very high speeds	• gas bottles
		• Tube to fin fillet weld
		• Boiler tubes

Materials to be welded

STEEL / CODE	TYPE	LNS135	L61
Ship plates			
	A, AH32 to AH40		x
General Structural steel			
NF EN 10149	S315 to S460 MC	x	x
NF EN 10025	S185 to S355 quality, JR(G1&G2)	x	x
	S185 to S355 quality, JR(G1&G2), J10		x
	E2956 to E360	x	x
Boiler & pressure vessel steel			
NF EN 10028	P235 to 275 GH		x
	P355 to P460M		x
NF A36-601 & NF A36-605	A37 to A52 (CP)		x

Flux characteristics

Current type	DC(+/-), AC
Basicity (Boniszewski)	0,4
Solidification speed	High
Density (kg/dm ³)	1,4
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Big Bag	500

Flux

Classification

Flux 802	EN 760 :	S A CS 1 55 DC H5	
Flux/wire	Flux cored hardfacing wire		no AWS and EN classification
	Solid hardfacing wire		

General description

Neutral flux for hardfacing applications in combination with flux cored wire as Lincore 102W, Lincore 423L and Lincore 423Cr.

Also suitable for hardfacing applications with solid wires

Weld metal with min. 0.2% Si and additional V, Nb, Ti and higher Cr-content

Excellent slag removal and good bead appearance

Very suitable for hardfacing applications on plate and caster rolls

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	V	W
LINCORE 102W	0.28	1.5	0.4	6.5		1.0	0.15	1.0
LINCORE 423L	0.15	1.2	0.4	11.5	20	1.0	0.15	
LINCORE 423Cr	0.15	1.2	0.4	13.5	2.0	1.0	0.15	

Mechanical properties, all weld metal

Wire grade	AW	2 hours postweld tempering at				
	426°C	482°C	538°C	593°C	649°C	
LINCORE 102W	51	50	50	51	40	35
LINCORE 423L	43	42	46	38	33	32
LINCORE 423Cr	AW	46	45	46	38	32

Hardness: HRC in 6 layer hardfacing application

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

802: rev. EN 21

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Flux

Classification

Flux 8500	EN 760 :	S A FB 1 54 AC H5	
Flux/wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
8500 / L-61	F7A6/F6P8-EM12K	S 38 4 FB S2Si	S 4T 0 FB S2Si
8500 / L50M (LNS133U)	F7A6/F7P8-EH12K	S 42 6 FB S3Si	S 4T 2 FB S3Si
8500 / LNS140A	F8A6-EA2-A2	S 46 4 FB S2Mo	
8500/ LNS 160	F7A8/P8-ENi1-Ni1	S 42 5 FB S2Ni1*	
8500/ LNS 162	F7A8/P8-ENi2-Ni2		
8500/ LNS 165 (LA 85)	F8A8/F7P8-ENi5-Ni5	S 50 6 FB Sz	
8500/LNST55		S 50 5 FB Tz	

* Nearest classification

General description

Basic flux designed for carbon and low alloyed steels**Excellent welding characteristics over a wide range of welding procedures****Superior mechanical properties****Impact properties are consistent throughout the weld joint, including the cap location****Excellent CTOD values**

Approvals

Wire grade	BV	ABS	LRS	DNV	GL	cont
L-61			3YM+/3YT		3YM	
L50M	3YM+/3YT	3YM/3YT	3YM+/3YT	IV40M/IIY40T		x
LNS 140A		3YM	3YM/3YT	3YM/3YT	3Y40M/3Y40T	
LNS140TB	A3YT,A3YT					

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

Wire grade	C	Mn	Si	P	S	Mo	Ni
L-61	0.08	1.0	0.2	<0.02	<0.015		
L50M (LNS133U)	0.07	1.4	0.3	<0.02	<0.015		
LNS140A	0.08	0.9	0.2	0.03	<0.025	0.4	
LNS160	0.07	1.0	0.1	0.02	0.015		1
LNS162	0.08	1.0	0.1	0.02	0.015		2
LNS165 (LA85)	0.07	1.3	0.2	0.02	0.015	0.2	0.9
LNST55	0.08	1.7	0.7	<0.015	<0.015		

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-60°C
L-61	MR	430	510	28	150	100	50
L50M (LNS133U)	MR	440	540	28		110	
	SR	> 420	> 500	30		150	
L-70 (LNS140A)	MR	440	540	28		55	
LNS160	AW	430	510	30		150	50
	SR	400	510	30		150	50
LNS162	AW	470	560			150	50
	SR	450	530			150	50
LNS165 (LA85)	AW	530	600	25		120	50
	SR	480	580	30		120	50
LNS T55	AW	530	620		120	80	
	SR	500	570			70	

MR: multi run / TR: two-run / AW : As welded / SR: Stress relieved

8500: rev. EN 22

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Characteristics :	Applications
Off-shore and on-shore applications	Suitable for deep groove
Nuclear components	Low temperatures requirements
High purity weld metal and high toughness	Highly restrained constructions
	Single and multi-wire systems

Materials to be welded

STEEL / CODE	TYPE	Multirun												
		L61			L50M/LNS133U		L70/LNS140A		LNS160		LNS165		LNS155	
		AW	AW	SR	AW	SR	AW	SR	AW	SR	AW	SR		
Ship plates														
	A to E	x	x	x								x	x	
	AH(32),DH(36),EH(36)	x	x	x	x	x	x	x	x	x	x	x	x	
General Structural steel														
NF EN 10025	S185, S235, S275	x	x	x								x	x	
	S355	x	x	x	x	x	x	x	x	x	x	x	x	
Cast steel														
EN 10213-2	GP240R	x	x	x								x	x	
Pipe material														
EN 10208-1	L210, L240, L290	x	x	x								x	x	
	L360	x	x	x	x	x	x	x	x	x	x	x	x	
	L415		x		x	x				x	x	x	x	
	L445, L480									x	x			
API 5LX	X42, X46	x	x	x										
	X52	x	x	x	x	x	x	x	x	x	x	x	x	
	X56, X60		x		x	x				x	x	x	x	
	X65, X70									x	x			
EN 10216-1/10217-1	P235, P275	x	x	x								x	x	
	P355	x	x	x	x	x	x	x	x	x	x	x	x	
Boiler & pressure vessel steel														
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x	x						x	x	
Fine grained steel														
EN 10113-2/10113-3	S275	x	x	x								x	x	
	S355	x	x	x	x	x	x	x	x	x	x	x	x	
	S420		x		x	x				x	x	x	x	
	S460									x	x			
Elevated temperature steel														
EN 10028-2	16 Mo 3					x				x	x			
High yield strength steel														
EN 10137-2	S460, S500									x	x			
Low temperature steels														
EN 10028-4/10222-3	11MnNi5-3, 13MnNi6-3							x	x	x	x			

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	2,8
Solidification speed	Medium
Density (kg/dm ³)	1,3
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux 860	EN 760 :	S A AB 1 56 AC H5	
Flux/wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
860 / L-60	F6A2-EL12	S 35 2 AB S1	
860 / LNS135	F6A2-EM12	S 35 2 AB S2	S 3T 0 AB S2
860 / L-61	F7A2-EM12K	S 38 2 AB S2Si	S 3T 0 AB S2Si
860 / L-70	F7A2-EA1-A2	S 42 2 AB S2Mo	S 4T 2 AB S2Mo
860 / L50M (LNS133U)	F7A2/F7P2-EH12K	S 42 2 AB S3Si	
860 / LNS T55	F7A2/F7P4-EC1	S 50 3 AB Sz	

General description

Multi purpose neutral agglomerated flux

Good impact values in both multi-run (with L60/L61/L50M) and two-run (with wire L-70) technique

High restraint cracking resistant

Approvals

Wire grade	LRS	BV	ABS	DNV	GL	Controlas	TUV	RMRS	RINA	CRS
L-61	3YM/3YT	A3TM,A3YTM/3YT	3YM/2YT	3YM/2YT	3YM/2YT	x	x	3YM/2YT	3M3YM/3T3YT	3YM/2YT
LNS135					3YM-3YT					
L-70	3YM/3YT	3YM/3YT		3Y40M/3Y40T	3YM/2YT					

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

Wire grade	C	Mn	Si	P	S	Mo
L-60	0.05	1.0	0.25	<0.025	<0.020	
LNS135	0.06	1.3	0.3	<0.025	<0.020	
L-61	0.1	1.2	0.3	<0.025	<0.020	
L50M (LNS133U)	0.07	1.7	0.5	<0.025	<0.020	
L-70	0.05	1.3	0.3	<0.025	<0.020	0.4
LNS T55	0.06	1.8	0.7	<0.020	<0.015	

Mechanical properties, all weld metal

Wire grade	condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) 0°C	-20°C
L-60	AW	360	480	30	80	50
LNS135	AW	390	490	33	100	50
L-61	AW	430	510	32	100	60
	SR	400	505	32		115
L50M (LNS133U)	AW	460	530	28	120	80
	SR	420	520			115
L-70 (LNS140A)	AW	520	570	26		70
	SR	510	580	30		50
LNS T55	AW	520	610			70
	SR	470	560			70

AW : As welded

SR: Stress relieved

860: rev. EN 22

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. Fumes: Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Wire	Characteristics
L-60 & LNS135	low yield stress steels
L-61	Yield stress < 430MPa
L50M (LNS133U)	Yield stress steels < 460MPa and good impact toughness at -20°C
L-70	Good impact toughness in two-run applications

Materials to be welded

STEEL / CODE	TYPE	Multirun								
		L61	L60	L50M / LNS133U		L70 / LNS 140A		LNS135	LNS T55	
		AW	AW	AW	SR	AW	SR	AW	AW	SR
Ship plates										
	A to D	x	x	x		x		x		
	AH(32),DH(36), DH(40)	x		x	x	x	x		x	x
General Structural steel										
NF EN 10025	S185, S235, S275	x	x	x	x			x		
	S355	x	x	x	x	x	x	x	x	x
Cast steel										
EN 10213-2	GP240R	x	x	x	x			x		
Pipe material										
EN 10208-2	L210, L240, L290	x	x	x	x			x		
	L360	x	x	x	x	x	x	x	x	x
	L415			x		x	x		x	x
	L445, L480					x	x			
API 5LX	X42, X46	x	x	x	x			x		
	X52	x	x	x	x	x	x	x	x	x
	X56, X60			x		x	x		x	x
	X65, X70					x	x			
EN 10216-1/10217-1	P235, P275	x	x	x	x			x		
	P355	x	x	x	x	x	x	x	x	x
Boiler & pressure vessel steel										
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x	x	x	x	x	x
	P355GH	x	x					x		
Fine grained steel										
EN 10113-2/10113-3	S275	x	x	x	x			x		
	S355	x	x	x	x	x	x	x	x	x
	S420			x		x	x		x	x
	S460					x				
High yield strength steel										
EN 10137-2	S460, S500					x				

Flux characteristics

Current type	DC (+, -) / AC
Basicity (Boniszewski)	1,1
Solidification speed	High
Density (kg/dm ³)	1,4
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Big Bag	1000

Liability: All information in this data sheet is based on the best available knowledge, is subject to change without notice and can

Flux

Classification

Flux 888	EN 760 :	S A FB 1 66 AC H5
Flux/Wire	AWS A5.17 / A5.23	EN 756 : MR
888/L61 (LNS129)	F7A8-EM12K	S 38 6 FB S2Si
888/L-50M (LNS133U)	F7A6/F7P8-EH12K	S 42 6 FB S3Si
888/ LNS140A	F8A4-EA2-A2	S 46 4 FB S2Mo
888/LNS160	F7A8/P8-ENi1-Ni1	
888/LNS162	F8A8/F7P8-ENi2-Ni2	
888/LNS164 (LA84)	F10A4/F9P6-EF3-F3	S 50 4 FB S3Ni1Mo
888/LNS165 (LA85)	F8A6/F7P8-ENi5-Ni5	S 50 4 FB Sz
888/LA150 (LA92)	F9A4/F7P6-EB2-B2	S 50 2 FB CrMo1
888/LNS151 (LA93)	F8P6-EB3-B3	
888/LA100	F10A6/F10P2-EM2-M2	S 50 4 FB S3Ni1,5Mo

General description

Basic flux designed for carbon and low alloyed steels

Easier slag removal in deep groove

Robust mechanical properties included CTOD values

Suited for step cooling applications with a Bruscato factor typically below 10 ppm (LNS150 & LNS151 wires)

H4 hydrogen level as per AWS A4.3-93

Only available in Sahara ReadyBag™

Approvals

Wire grade	LRS	BV	ABS	DNV	GL	Controlas	TUV	RMRS	RINA	CRS
L-61							x			

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

Wire grade	C	Mn	Si	P	S	Ni	Mo	Cr	Bruscato factor
L-61	0.08	1.05	0.37	<0.02	<0.015				
L50M (LNS133U)	0.07	1.45	0.55	<0.02	<0.015				
LNS140A	0.07	1.0	0.35	<0.02	<0.015		0.4		
LNS160	0.07	1.2	0.4	<0.02	<0.015	0.95			
LNS162	0.07	1.1	0.4	<0.02	<0.015	2.1			
LNS164	0.08	1.7	0.5	<0.02	<0.01	0.9	0.5		
LNS165	0.06	1.50	0.5	<0.02	<0.015	0.97	0.2		
LNS150	0.069	0.90	0.5	<0.02	<0.015		0.56	1.34	<11 ppm
LNS151	0.062	0.85	0.3	<0.02	<0.015		0.93	2.15	<11 ppm
LA100	0.06	1.60	0.7	<0.02	<0.015	1.8	0.42	0.08	

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)			
					-30°C	-40°C	-50°C	-60°C
L-61	AW	415	515	31		135		125
L50M (LNS133U)	AW	480	580	29			70	
	SR	430	550	31		105		65
LNS160	AW	480	550	26		115		
	SR	410	510	27		160		120
LNS162	AW	500	580	25		100		55
	SR	440	550	25		160		120
LNS164 (LA84)	AW	650	750	21		65		30
	SR	610	700	23		65		30
LNS165 (LA85)	AW	530	620	26		70		40
	SR	495	595	27				70
LNS150 (LA92)	AW	600	700	24		47	30	
	SR	500	605	26		150	115	110
LNS151 (LA93)	SR	530	645	23		125	70	50
	AW	680	760	25		85	60	
LA100	AW	680	750	25		55	50	30
	SR	680	750	25				

AW : As welded

SR: Stress relieved

888: rev. EN 22

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. Fumes: Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Boiler and pressure vessels
Off-shore applications
Wind towers
Structural fabrications

Materials to be welded

STEEL / CODE	TYPE	Multirun									
		L61	L50M / LNS133U		LNS164	LNS165	LNS150	LNS151	LA100		
		AW-60°	AW-60°	SR-60°	AW-40°	AW-40°	SR-60°	SR-50°	SR-50°	AW-40°	SR-20°
Ship plates											
	A to E	x	x	x							
	AH(32),DH(36),EH(36)	x	x	x	x	x	x				
General Structural steel											
NF EN 10025 (A35-501)	S185, S235, S275	x	x	x							
	S355	x	x	x	x	x	x				
Cast steel											
EN 10213-2	GP240R	x	x	x							
Pipe material											
EN 10208-2	L210, L240, L290	x	x	x							
	L360	x	x	x	x	x	x				
	L415		x		x	x	x				
	L445, L480				x	x	x				
EN 10216-1/10217-1	P235, P275	x	x	x							
	P355	x	x	x	x	x	x				
Boiler & pressure vessel steel											
EN 10028-1	P235GH, P265GH, P295GH	x	x	x							
EN 10028-2 (Elevated temperature steel)	16 Mo 3						x	x		x	x
	13CrMo 4-5							x	x		
	10CrMo 9-10							x	x		
EN 10028-4/10222-3 (Low temperature steel)	11MnNi5-3, 13MnNi6-3					x	x			x	x
Fine grained steel											
EN 10113-2/10113-3	S275	x	x	x							
	S355	x	x	x	x	x	x				
	S420		x		x	x	x				
	S460				x	x	x				
High yield strength steel											
EN 10137-2	S460, S500				x	x	x			x	x

Flux characteristics

Current type	AC/DC (+/-)
Basicity (Boniszewski)	2,6
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux 960	EN 760 :	S A AB 1 66 AC H5	
Flux/Wire	AWS A5.17	EN 756 : MR	EN 756 : TR
960 / L-61	F7A2-EM12K	S 38 2 AB S2Si	S 3T 2 AB S2Si
960 / L50M (LNS133U)	F7A2-EH12K	S 38 2 AB S3Si	S 3T 2 AB S3Si

General description

General purpose neutral flux

Attractive as the "one-flux" in the shop

Very good results in semi-automatic submerged arc welding

Very good operating characteristics (deslagging - wash in - aspect)

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

Wire grade	C	Mn	Si	P	S
L-61	0.07	1.3	0.4	<0.030	<0.025
L50M (LNS133U)	0.07	1.6	0.6	<0.030	<0.025

Mechanical properties, all weld metal

Wire grade	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) -20°C
L-61	420	510	28	50
L50M (LNS133U)	430	530	28	70

960: rev. EN 22

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Wire	Characteristics	Applications
L-50M	For dirty plates	Fillet welds
L-61	General purpose	Butt welds (single pass and multi-run)

Materials to be welded

STEEL / CODE	TYPE	Multirun		Two-run	
		L61	L50M / LNS133U	L61	L50M / LNS133U
Ship plates					
	A to E	x	x	x	x
	AH(32), DH(36), EH(36)	x	x	x	x
General Structural steel					
NF EN 10025	S185, S235, S275	x	x	x	x
	S355	x	x	x	x
Cast steel					
EN 10213-2	GP240R	x	x	x	x
Pipe material					
EN 10208-2	L210, L240, L290	x	x	x	x
	L360	x	x	x	x
	L415		x		
API 5LX	X42, X46	x	x	x	x
	X52	x	x	x	x
	X56, X60		x		
EN 10216-1/10217-1	P235, P275	x	x	x	x
	P355	x	x	x	x
Boiler & pressure vessel steel					
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x
	P355GH	x	x	x	x
Fine grained steel					
EN 10113-2/10113-3	S275	x	x	x	x
	S355	x	x	x	x
	S420		x		

Flux characteristics

Current type	DC (+/-); AC
Basicity (Boniszewski)	1
Solidification speed	high
Density (kg/dm ³)	1,4
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux 980	EN 760 :	S A AR/AB 1 57 AC H5	
Flux/Wire	AWS A5.17	EN 756 : MR	EN 756 : TR
980/L-61	F7A2-EM12K	S 38 2 AR / AB S2Si	S 3T 2 AR/AB S2Si
980/L50M (LNS133U)	F7A2-EH12K	S 38 2 AR / AB S3Si	S 4T 2 AR/AB S3Si

General description

Outstanding slag removal, also in narrow grooves

Multi purpose flux

Suitable for semi-automatic submerged arc welding

Attractive as the "one-flux" in the shop

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

Wire grade	C	Mn	Si	P	S
L-61	0.06	1.5	0.3	<0.020	<0.020
L50M (LNS133U)	0.06	1.9	0.4	<0.020	<0.020

Mechanical properties, all weld metal

Wire grade	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) -20°C
L-61	420	520	29	50
L50M (LNS133U)	460	550	29	60

980: rev. EN 22

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Wire	Applications
L-50M	For the best operating characteristics For the best impact values in multi-pass (AW or SR)

Materials to be welded

STEEL / CODE	TYPE	Multirun	
		L61	L50M / LNS133U
Ship plates			
	A to E	x	x
	AH(32),DH(36), EH(36)	x	x
General Structural steel			
NF EN 10025	S185, S235, S275	x	x
	S355	x	x
Cast steel			
EN 10213-2	GP240R	x	x
Pipe material			
EN 10208-2	L210, L240, L290	x	x
	L360	x	x
	L415		x
API 5LX	X42, X46	x	x
	X52	x	x
	X56, X60		x
EN 10216-1/10217-1	P235, P275	x	x
	P355	x	x
Boiler & pressure vessel steel			
EN 10028-1	P235GH, P265GH, P295GH	x	x
	P355GH	x	x
Fine grained steel			
EN 10113-2/10113-3	S275	x	x
	S355	x	x
	S420		x

Flux characteristics

Current type	DC (+/-) ; AC
Basicity (Boniszewski)	0,6
Solidification speed	High
Density (kg/dm ³)	1,4
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Flux

Classification

Flux 995N	EN 760 :	S A AB 1 67 AC H5
Flux/Wire	AWS A5.23	EN 756 : TR
995N / LNS140A		S 4T 2 AB S2Mo
995N / LNS140TB (LA 81)	F9A2-EG-G	S 5T 5 AB Sz

General description

Flux designed for longitudinal multi-arc welding pipeline station

High end pipemill applications up to X80

Outstanding welding characteristics and bead profile

Better results on pipe thickness over 12mm

Nitrogen controlled weld metal providing good impact toughness on arctic grade pipes

Very low hydrogen level in the weld deposit

Chemical composition (w%)

Base material	Wire grade	C	Mn	Si	P	S	Mo	Ti	B	N
X65	LNS140A	0.07	1.45	0.3	<0.025	<0.025	0.2	-	-	0.005
X80	LNS140TB (LA81)	0.06	1.6	0.35	<0.025	<0.025	0.2	0.015	0.002	0.004

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.

Proced : tandem AC/AC application on X65 plate 12,7 mm thick.

Mechanical properties

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)				Hardness HV30
					-20°C	-40°C	-50°C	-60°C	
Proced. 1									
LNS140A	AW	580	680	30					230
LNS140TB (LA81)	AW	630	700	27	115	75	50		235
Proced. 2									
LNS140TB(LA81)	AW	600	720	25	100	185		45	220-235

AW : As welded

Remark: the mechanical properties from butt welds in pipe depends on the chemical composition of base material.

Proced1: tandem in 12,5mm X65; Proced2: multiwire weld (4/5 wires) in 19-25mm X65

995N: rev. EN 23

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

One run on each side in one or multi wire systems for high welding speed and excellent mechanical properties.

Materials to be welded

STEEL / CODE	TYPE	Two-run	
		LNS 140TB	L70/ LNS140A
Ship plates			
A, B, D, E	A to E	x	x
	A 32 to FH40	x	x
General Structural steel			
NF EN 10137	500 to 550 A & AL	x	x
NF EN10113	S275 to S460 all qualities	x	x
NF EN 10149	S315 to S650 all qualities	x	x
NF EN 10025	S185 to S355 all qualities	x	x
	E295 to E360	x	x
Boiler & pressure vessel steel			
NF EN 10028	P235 to P460G all qualities	x	x
	P235 to P275		x
	A37 to A52 all qualities	x	x
	PF24 to PF36 all qualities	x	x
	P265 to P460 all qualities	x	x
	A37 to A52, CP	x	x
	X42 to X80	x	x

Flux characteristics

Current type	DC(+/-), AC
Basicity (Boniszewski)	1,3
Solidification speed	medium
Density (kg/dm ³)	1
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Bigbag	500
Bigbag	600

Flux

Classification

Flux 998N	EN 760 :	S A AB 1 67 AC H5
Flux/Wire	AWS A5.23	EN 756 : TR
998N / LNS 140A		S 4T 2 AB S2Mo
998N / LNS 140TB (LA 81)	F9A2-EG-G	S 5T 5 AB Sz

General description

Flux designed for longitudinal multi-arc welding pipeline station

High end pipemill applications up to X80

Superior resistance to undercuts on thin metal sheet work at high speed

Designed to operate on all the range of pipe thickness (6 to 50 mm)

Nitrogen controlled weld metal providing good impact toughness on arctic grade pipes

Superior resistance to surface defects

Very low high hydrogen level in the weld deposit

Chemical composition (w%)

Base material	Wire grade	C	Mn	Si	P	S	Mo	Ti	B	N
X65	LNS140TB (LA 81)	0.067/0.076	1.41/1.51	0.28/0.34	0.017/0.020	0.003/0.004	0.22/0.27	0.024/0.034	0.0028/0.0036	0.005/0.01
X80	LNS140TB (LA 81)	0.045/0.06	1.6/1.64	0.35/0.4	0.016/0.017	0.004/0.005	0.3/0.35	0.031/0.034	0.0029/0.0032	0.005/0.006

AW : As welded

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.

Proced1: triple arc application on X65 plate 15,9 mm thick; Proced2: tandem applications on X80 plate 12,7mm thick

Mechanical properties

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)				Hardness HV30
					-20°C	-40°C	-50°C	-60°C	
Proced. 1									
L-70 (LNS140A)	AW	570	680	27					230
LNS140TB (LA81)	AW	610	700	27	115	75	50		235
Proced. 2									
LNS140TB (LA81)	AW	640	730	24	160	120	90	70	220-235

AW : As welded

Remark: the mechanical properties from butt welds in pipe depends on the chemical composition of base material.

Proced1: tandem in 12,5mm X65; Proced2: multiwire weld (4/5 wires) in 19-25mm X65

998N: rev. EN 22

Materials to be welded

STEEL / CODE	TYPE	Two-run	
		LNS 140TB	L70/ LNS140A
Ship plates			
A, B, D, E	A to E	x	x
	A 32 to FH40	x	x
General Structural steel			
NF EN 10137	500 to 550 A & AL	x	x
NF EN10113	S275 to S460 all qualities	x	x
NF EN 10149	S315 to S650 all qualities	x	x
NF EN 10025	S185 to S355 all qualities	x	x
	E295 to E360	x	x
Boiler & pressure vessel steel			
NF EN 10028	P235 to P460G all qualities	x	x
	P235 to P275		x
	A37 to A52 all qualities	x	x
	PF24 to PF36 all qualities	x	x
	P265 to P460 all qualities	x	x
	A37 to A52, CP	x	x
	X42 to X80	x	x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	1,3
Solidification speed	fast
Density (kg/dm ³)	1,3
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Bigbag	500
Bigbag	600

Flux

Classification

Flux P223	EN 760 :	S A AB 1 67 AC H5
Flux/Wire	AWS A5.17 / A5.23	EN 756 : TR
P223 / L-61	F7A4-EM12K	S 4T 2 AB S2Si
P223 / L50M (LNS133U)	F7A5-EH12K	S 4T 2 AB S3Si
P223 / LNS140A	F8A4-EA2-A2	S 4T 4 AB S2Mo

General description

Aluminate basic agglomerated flux

Good impact values in two-run and multi-run technique

Low hydrogen content

Very suitable for longitudinal and spiral pipe welding

Usable up to 3 wire systems

Chemical composition (w%)

Remark: the chemical composition from butt welds in pipe depends on the chemical composition of base material.

Mechanical properties

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Impact ISO-V(J)	
				-20°C	-40°C
L-61	TR	450	550	60	
L50M (LNS133U)	TR	470	570	80	
LNS140A	TR	500	600		60
TR: two-run					

P223: rev. EN 21

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Single/ multi wire welding
Longitudinal and spiral pipe welding

Materials to be welded

STEEL / CODE	TYPE	Two-run	
		L70 LNS140A	AW
Ship plates			
	A to E		
	AH32 to EH36		
General Structural steel			
NF EN 10137	500A		x
NF EN10113	S275 to 355 N & M		
	S275 to 420 N, NL, M & ML		
	S275 to 460 N, NL, M & ML		x
NF EN10149	S315 & S355 MC & NC		
	S315 to S420MC & NC		
	S315 to S460MC & NC		
	S315 to S500MC & NC		x
NF EN 10025	S185, S235, S275, S355		x
Pipe material			
API 5LX	X 42 to X80		x
Boiler & pressure vessel steel			
EN 10028-1	P235 to P355 GH, N, NH, Q & M		
	P235 to P420 all qualities		
	P235 to P460 all qualities		x
NF EN10207	P235 to P275 S		
	P235 to P275 S & SL		x
NF A36-601 & NF A36-605	A37 to A52 CP & AP		
	A37 to A52 CP, AP & FP		x
NF EN10222	P285 & P355 NH		
	P285 & P420 all qualities		x
Offshore plates			
NF A36-212	PF 24 to PF 36 - 4		
	PF 24 to PF 36 all qualities		x

Flux characteristics

Current type	DC (+, -) / AC
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Flux

Classification

Flux P230	EN 760 :	S A AB 1 67 AC H5	
Flux/Wire	AWS A5.17 / A5.23	EN 756 : MR	EN 756 : TR
P230 / LNS135	F7A4/F7P6-EM12	S 38 4 AB S2	S 4T 2 AB S2
P230 / L61	F7A4/F6P5-EM12K	S 38 4 AB S2Si	
P230 / L50M (LNS133U)	F7A5/F7P5-EH12K	S 46 5 AB S3Si	
P230 / LNS140A	F8A4-EA2-A2	S 46 4 AB S2Mo	S 4T 4 AB S2Mo
P230 / LNS160	F7A8/F7P8-ENi1-Ni1	S 46 4 AB S2Ni1*	
P230 / LNS162	F7A8/F7P8-ENi2-Ni2	S 46 6 AB S2Ni2*	
P230 / LNS T55	F7A4/F7P5-EC1	S50 4 AB Tz	

* Nearest classification

General description

Aluminate basic agglomerated flux

Low hydrogen content

One flux to combine with a wide range of wire electrodes

Good impact values in two-run and multi-run technique

Selection of wires provides application possibilities from -40 to +400°C

Approvals

Wire grade	LRS	BV	ABS	DNV	GL	Controlas	RMRS	RINA
L-61	3YM		3M3YM			x		3YM
L50M	4Y40M	A3M,A3YM		4YM		x		
LNS 140A	3YM/3YT	3YTM	3YM/2YT		3Y40M/3Y40T	x	3YM/2YT	4YM/3YT

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

Wire grade	C	Mn	Si	P	S	Mo	Ni
L-61	0.06	1.4	0.4	<0.030	<0.020		
LNS135	0.07	1.4	0.25	<0.030	<0.020		
L50M (LNS133U)	0.08	1.8	0.5	<0.030	<0.020		
LNS140A	0.07	1.4	0.4	<0.030	<0.020	0.5	
LNS160	0.07	1.4	0.25	<0.030	<0.020		1.1
LNS162	0.08	1.2	0.3	<0.030	<0.020		2.1
LNS T55	0.07	1.8	0.8	0.020	0.015		

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-60°C
LNS135	AW	400	500	30	50		
L-61	AW	450	520	30	100		
	SR	400	490	30	140	80	
L50M (LNS133U)	AW	480	580	30		80	
	SR	460	540	28		70	
LNS140A	MR	540	620	28	70		
LNS140A	TR		620			60	
LNS160	AW	490	570	28		120	45
	SR	430	550	28		140	75
LNS162	AW	500	590	28		120	50
	SR	460	570	28		150	80
LNS T55	AW	540	630	28	90	60	
	SR	520	610	28	80	50	

MR: multi run

TR: two-run

P230-1: rev. EN 23

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Excellent multi application flux on the shop floor

Excellent welding behaviour in single arc and tandem application

Very good mechanical properties at low temperature in either two-run or multi run technique

Materials to be welded

STEEL / CODE	TYPE	Mutirun			
		LNS135	L61	L50M/ LNS133U	L70/ LNS140A
Ship plates					
	A to D	x	x	x	x
	AH(32),DH(40)	x	x	x	x
General Structural steel					
NF EN 10137	500A				x
NF EN10113	S275 to 355 N & M	x	x	x	x
	S275 to 420 N, NL, M & ML		x	x	x
	S275 to 460 N, NL, M & ML			x	x
NF EN10149	S315 & S355 MC & NC	x	x	x	x
	S315 to S420MC & NC		x	x	x
	S315 to S460MC & NC			x	x
	S315 to S500MC & NC				x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P230	EN 760 :	S A AB 1 67 AC H5	
Flux/Wire	AWS A5.17 / A5.23	EN756/EN14295: MR	EN 12070
P230 / LNS150 (LA92)	F8P2-EB2-B2R		S CrMo1
P230 / LNS151 (LA93)	F9PZ-EB3-B3R		S CrMo2
P230 / LNS164	F9A6-EF1*-F3	S 50 4 AB S3NiMo1	
P230 / LNS167	F8A6/F7P6-EF1*-F1	S 50 4 AB S2NiMo1	
P230 / LNS168		S 69 4 AB S3Ni2.5CrMo	

General description

Aluminate basic agglomerated flux

Low hydrogen content

One flux to combine with a wide range of wire electrodes

Good impact values in two-run and multi-run technique

Selection of wires provides application possibilities from -40 to +400°C

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

Wire grade	C	Mn	Si	P	S	Mo	Ni	Cr
LNS150 (LA92)	0.08	1.1	0.3	<0.020	<0.010	0.5		0.9
LNS151 (LA93)	0.12	0.8	0.3	<0.020	<0.010	1.0		2.6
LNS164	0.07	1.5	0.3	<0.020	<0.010	0.5	1.0	
LNS167	0.09	1.1	0.3	<0.020	<0.015	0.5	1.0	
LNS168	0.08	1.7	0.4	<0.020	<0.020	0.4	2.4	0.25

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	elongation (%)	Impact ISO-V(J)		
					0°C	-20°C	-40°C
LNS150 (LA92)	SR	535	620	25	70	90**	60**
LNS151 (LA93)	SR	560	640	24		30	
LNS164	AW	630	710	22	90	80	50
	SR	630	710	24	70	60	35
LNS167	AW	550	635	22		100	70
	SR	565	650	22		80	65
LNS168	AW	710	840	20		65	min. 47

MR: multi run

TR: two-run

**SR=2h/720°C

P230-2: rev. EN 21

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Excellent multi application flux on the shop floor

Excellent welding behaviour in single arc and tandem application

Very good mechanical properties at low temperature in either two-run or multi run technique

Materials to be welded

STEEL / CODE	TYPE	Multirun				
		LNS150 (LA92)	LNS151 (LA93)	LNS164	LNS167	LNS168
Pipe material						
EN 10208-2	L415			x	x	
	L445, L480			x	x	
API 5LX	X56, X60			x	x	
	X65, X70			x	x	
Gaz de France	X63			x	x	
Fine grained steel						
EN 10113-2/10133-3	S420			x	x	
NF EN10113	S460			x	x	
Boiler & pressure vessel steel						
EN 10028-2						
Elevated temperature steel	13CrMo 4-5	x	x			
	10CrMo 9-10	x	x			
Low temperature steels	11MnNi5-3					x
	EN 10028-4/10222-3	13MnNi6-3				x

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P240	EN 760 :	S A FB 1 55 AC H5
Flux/Wire	AWS A5.17 / A5.23	EN 756 : MR
P240 / L50M (LNS133U)	F7A/P8-EH12K	S 42 6 FB S3Si
P240 / LNS160	F7A/P10-ENi1-Ni1	S 46 6 FB S2Ni1*
P240 / LNS162	F7A/P10-ENi2-Ni2	S 46 6 FB S2Ni2*
P240 / LNS165 (LA85)	F8A/P8-ENi5-Ni5	S 50 6 FB Sz
P240 / LNS150 (LA92)	F8P2-EB2-B2R	
P240 / LNS151 (LA93)	F9P0-EB3-B3R	

* Nearest classification

General description

Highly basic fluoride agglomerated flux
Good impact values suitable for offshore constructions
Consistently good CTOD values with CMn and Ni-alloyed wires
Low hydrogen content
Suitable for single/multi wire welding

Approvals

Wire grade	LRS	BV	ABS	DNV	GL	Controlas	CRS
L50M	3YM	A3M,A3YM	YM>47J<	4Y40M	6YM	x	3YM

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

Wire grade	C	Mn	Si	S	P	Ni	Mo	Cr
L50M (LNS133U)	0.08	1.6	0.35	< 0.015	< 0.020			
LNS160	0.08	1	0.25	< 0.015	< 0.020	1		
LNS162	0.08	1	0.25	< 0.015	< 0.020	2.2		
LNS165	0.08	1.3	0.35	< 0.015	< 0.020	0.9	0.15	
LNS150 (LA92)	0.08	1.2	0.3	< 0.010	< 0.015		0.15	1.1
LNS151 (LA93)	0.10	0.7	0.3	< 0.010	< 0.015		1.0	2.5

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	elongation (%)	Impact ISO-V(J) -60°C
L50M (LNS133U)	AW	460	560	28	40
	SR	420	540	28	40
LNS160	AW	470	550	28	80
	SR	430	490	32	100
LNS162	AW	480	560	26	100
	SR	460	530	30	140
LNS165	AW	520	600	25	60
	SR	510	580	24	60
LNS150 (LA92)	SR	520	610	24	100
LNS151 (LA93)	SR	550	640	24	50

AW : As welded

SR: Stress relieved

P240: rev. EN 22

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

Characteristics :	Applications
Boiler and pressure vessels	Low temperature applications
Off-shore applications	Highly restraint constructions
Nuclear components	Single and multi-wire systems

Materials to be welded

STEEL / CODE	TYPE	Multirun					
		L50M (LNS133U)	LNS160	LNS162	LNS165	LNS150 (LA92)	LNS151 (LA93)
Ship plates							
	A to E,	x	x	x	x		
	AH32 to EH40	x	x	x	x		
General structural steel							
NF EN 10137 (A 36-204)	500 A & AL				x		
NF EN10113 (A35-502)	S275 to S460 all qualities	x	x	x	x		
NF EN 10149 (A36-231)	S315 to S460 MC & NC	x	x	x	x		
	S315 to S500 MC & NC				x		
NF EN 10025 (A35-501)	S185 to E360 all qualities	x	x	x	x		
Boiler & pressure vessel steel							
NF EN 10028 (A 36-205)	P235 to P460 all qualities	x	x	x	x		
NF EN 10207 (A36-220)	P235 to P275 all qualities	x	x	x	x		
NF A36-601 & NF A36-605	A37 to A52 all qualities	x	x	x	x		
EN 10028-2							
Elevated temperature steel	13CrMo 4-5					x	x
	10CrMo 9-10					x	x
Steel for dangerous material transportation							
NF A 36-215	P265 to P460 all qualities	x	x	x	x		
Low temperature steels	P285 to P420 all qualities	x	x	x	x		

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	3
Density (kg/dm ³)	1,1
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P2000	EN 760 :	S A AF 2 64 DC H5
Wire	ISO 14343-A	
LNS 304L	S 19 9 L	
LNS 309L	S 24 12 L	
LNS 316L	S 19 12 3 L	
LNS 4462	S 22 9 3 N L	
LNS 318	S 19 12 3 Nb	
LNS 347	S 19 9 Nb	
LNS Zeron 100X	S 25 9 4 N L	
LNS NiCro 60/20	EN xx:	R-NiCr 21 Mo 9Nb
LNS 4439Mn	S 18 16 5 N L	
LNS 4455	S 20 16 3 Mn L	
LNS 4500	S 20 25 5 Cu L	

General description

Stainless steel welding flux

Excellent slag release, even in narrow gaps

Low flux consumption

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	N	Nb	Cu	W	FN
LNS304L	0.015	1.5	0.5	19	10						08-10
LNS309L	0.015	1.5	0.5	23	13						10-20
LNS316L	0.015	1.5	0.5	18	12	2.5					08-10
LNS4462	0.015	1.5	0.5	22	8	3	0.1				40-60
LNS318	0.04	1.5	0.5	19	11	2.5		0.5			08-10
LNS347	0.03	1.4	0.5	19	10			0.6			08-10
LNS Zeron 100X	0.03	0.6	0.5	25	9.5	3.6		0.2	0.7	0.6	30-60
LNS NiCro 60/20	0.006	0.1	0.4	21.5	64.5	8.7	3.8			0.8	
LNS4439Mn	0.025	3.6	0.5	18	17	3.6	0.15				
LNS4455	0.025	6	0.5	18.5	15	2.6	0.15				
LNS4500	0.03	1.5	0.6	19	25	4.1			1.2		

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-196 °C
LNS304L	AW	380	550	35	80		
LNS309L	AW	425	580	33		80	
LNS316L	AW	425	560	33			50
LNS4462	AW	550	800	27		50	
LNS Zeron 100X	AW	670	880	21	70	45	
LNS NiCro 60/20	AW	520	780	40			100
LNS4439Mn	AW	375	630	33			
LNS4455	AW	360	640	30			

P2000: rev. EN 22

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 **Fumes:** Consult information on Welding Safety Sheet, available upon request

Suggestions for use

General stainless steel welding flux

Applicable in the boiler and pressure vessel industry as well as pipe fabrication

Due to low Si-content very good impact toughness at low temperature

Materials to be welded

AISI	Mat.nr.	EN 10088-1/2	ASTM/ACI	UNS	Wire
304L	1.4306	X2 CrNi 19-11	(TP) 304L	S30403	LNS 304L
304LN	1.4311	X2 CrNiN 18-10	(TP) 304LN	S30453	LNS 304L
316LN	1.4406	X2 CrNiMoN 17-11-2	(TP) 316LN	S31653	LNS 316L
316L	1.4404	X2 CrNiMo 17-12-2	(TP) 316L	S31603	LNS 316L
316L	1.4435	X2 CrNiMo 18-14-3	(TP) 316L	S31603	LNS 316L
316LN	1.4429	X2 CrNiMoN 17-13-3			LNS 316L
304	1.4301	X4 CrNi 18-10	(TP) 304	S30409	LNS 304L
321	1.4541	X6 CrNiTi 18-10	(TP) 321	S32100	LNS 304L/347
316	1.4401	X4 CrNiMo 17-12-2	(TP) 316	S31600	LNS 316L
316	1.4436	X4 CrNiMo 17-13-3			LNS 316L
347	1.4550	X6 CrNiNb 18-10	(TP) 347	S34700	LNS 304L/347
318	1.4580	X6 CrNiMoNb 17-12-2	316Cb	S31640	LNS 316L/318
318	1.4583	X10 CrNiMoNb 18-12(DIN)			LNS 316L/318
317LN	1.4439	X2 CrNiMoCu 17-13-5	316LN	S31726	4439Mn
	1.4539	X1 NCrNiMoCu 25-20-5			4500
	1.3952	X2 CrNiMoN 18-14-3(DIN)			4455
	1.4462	X2 CrNiMoN 22-5-3			4462
	2.4856	NiCr22Mo9Nb(DIN)	Zeron 100	S32760	LNS Zeron 100 X
	1.5637	12Ni14 (DIN)		N06625	LNS NiCr 60/20
	1.5680	12Ni19 (DIN)			LNS NiCr 60/20
	1.5662	X8Ni9 (DIN)			LNS NiCr 60/20

Flux characteristics

Current type	DC (+,-)
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P2007	EN 760 :	S A AF 2 64 AC H5	Wire	EN 18274	AWS A5.14
Wire	ISO 14343-A	AWS A5.9	LNS NiCro 60/20	S Ni 6625	ERNiCrMo-3
LNS 304L	S 19 9 L	ER308L	LNS NiCroMo 60/16	S Ni 6276	ERNiCrMo-4
LNS 309L	S 24 12 L	ER309L	LNS NiCroMo 59/23	S Ni 6059	ERNiCrMo-13
LNS 316L	S 19 12 3 L	ER316L	LNS NiCro 70/19	S Ni 6082	ERNiCr-3
LNS 4462	S 22 9 3 N L	ER2209			
LNS 318	S 19 12 3 Nb	ER318			
LNS 347	S 19 9 Nb	ER347			
LNS Zeron 100X	S 25 9 4 N L	ER2553*			
LNS 4439Mn	S 18 16 5 N L	-			
LNS 4455	S 20 16 3 Mn L	ER316LMn			
LNS 4500	S 20 25 5 Cu L	ER385			
LNS 304H	S 19 9 H	ER308H			
LNS 310	S 25 20	ER310			
LNS 307	S 18 8 Mn	ER307*			

General description

Stainless steel welding flux
 Excellent slag release
 Homogeneous stainless steel colour bead appearance
 Straight edges on butt welds applications
 Excellent behaviour on 9% Nickel steel
 Suitable in AC current

Approvals

Wire grade	ABS	LRS	DNV	TUV
LNS 304L	x	x	x	x
LNS 309L	x	x	x	x
LNS 316L	x	x	x	x
LNS 4462				x

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	N	Nb	Cu	W	FN
LNS304L	0.015	1.5	0.5	19	10						08-10
LNS309L	0.015	1.5	0.5	23	13						10-20
LNS316L	0.015	1.5	0.5	18	12	2.5					08-10
LNS4462	0.015	1.5	0.5	22	8	3	0.1				40-60
LNS318	0.04	1.5	0.5	19	11	2.5		0.5			08-10
LNS347	0.03	1.4	0.5	19	10			0.6			08-10
LNS Zeron 100X	0.03	0.6	0.5	25	9.5	3.6		0.2	0.7	0.6	30-60
LNS NiCro 60/20	0.006	0.1	0.4	21.5	64.5	8.7	3.8			0.8	
LNS4439Mn	0.025	3.6	0.5	18	17	3.6	0.15				
LNS4455	0.025	6	0.5	18.5	15	2.6	0.15				
LNS4500	0.03	1.5	0.6	19	25	4.1			1.2		

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-196 °C
LNS304L	AW	390	550	35	80	75	40
LNS309L	AW	400	580	33		70	
LNS316L	AW	400	560	33	75	70	45
LNS4462	AW	585	765	27		75	
LNS NiCro 60/20	AW	520	780	40			100
LNS Zeron 100X	AW	670	880	21	70	45	
LNS4439Mn	AW	375	630	33			

P2007: rev. EN 02

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Suggestions for use

General stainless steel welding flux

Applicable in the boiler and pressure vessel industry as well as pipe fabrication

Due to low Si-content very good impact toughness at low temperature

Materials to be welded

AISI	Mat.nr.	EN 10088-1/2	ASTM/ACI	UNS	Wire
304L	1.4306	X2 CrNi 19-11	(TP) 304L	S30403	LNS 304L
304LN	1.4311	X2 CrNiN 18-10	(TP) 304LN	S30453	LNS 304L
316LN	1.4406	X2 CrNiMoN 17-11-2	(TP) 316LN	S31653	LNS 316L
316L	1.4404	X2 CrNiMo 17-12-2	(TP) 316L	S31603	LNS 316L
316L	1.4435	X2 CrNiMo 18-14-3	(TP) 316L	S31603	LNS 316L
316LN	1.4429	X2 CrNiMoN 17-13-3			LNS 316L
304	1.4301	X4 CrNi 18-10	(TP) 304	S30409	LNS 304L
321	1.4541	X6 CrNiTi 18-10	(TP) 321	S32100	LNS 304L/347
316	1.4401	X4 CrNiMo 17-12-2	(TP) 316	S31600	LNS 316L
316	1.4436	X4 CrNiMo 17-13-3			LNS 316L
347	1.4550	X6 CrNiNb 18-10	(TP) 347	S34700	LNS 304L/347
318	1.4580	X6 CrNiMoNb 17-12-2	316Cb	S31640	LNS 316L/318
318	1.4583	X10 CrNiMoNb 18-12(DIN)			LNS 316L/318
317LN	1.4439	X2 CrNiMoN 17-13-5	316LN	S31726	4439Mn
	1.4539	X1 NCrNiMoCu 25-20-5			4500
	1.3952	X2 CrNiMoN 18-14-3(DIN)			4455
	1.4462	X2 CrNiMoN 22-5-3			4462
	2.4856	NiCr22Mo9Nb(DIN)	Zeron 100	S32760	LNS Zeron 100 X
	1.5637	12Ni14 (DIN)		N06625	LNS NiCro 60/20
	1.5680	12Ni19 (DIN)			LNS NiCro 60/20
	1.5662	X8Ni9 (DIN)			LNS NiCro 60/20

Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm ³)	1,2
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P2000 S :	EN 760 :	S A AF 2 64Cr DC H5
Wire	ISO 14343-A	
LNS 309L	S 24 12 L	
LNS 4462	S 22 9 3 N L	
LNS Zeron 100X	S 25 9 4 N L	

General description

Compensates Cr-burn off and increases the Cr-content in the weldmetal
 Welding stainless steel to carbon steel
 To be used to weld first layers in carbon steel with over-alloyed wires
 Applicable where a higher weldmetal ferrite is needed

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	N	other	FN
LNS309L	0.015	1.5	0.5	25	13				15-20
LNS4462	0.015	1.5	0.5	24	8	3	0.1		40-60
LNS Zeron 100X	0.02	0.5	0.4	26	9	3.7	0.2	W=0.6 Cu = 0.7	30-60

Mechanical properties, all weld metal

Wire grade	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J) -40°C
LNS 309L	450	600	33	80
LNS 4462	700	850	27	50
LNS Zeron 100X	670	880	25	45

P2000S: rev. EN 22

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Suggestions for use

Especially developed for welding stainless steel to carbon steel. Also to be used in welding root runs in clad steel as well as root runs in Nitrogen alloyed fully austenitic steels to avoid hot cracking

Materials to be welded

AISI	Mat.nr.	EN 10088-1/2	ASTM/ACI	UNS	Wire LNS
304L	1.4306	X2 CrNi 19-11	(TP) 304L	S30403	LNS 304L
304LN	1.4311	X2 CrNiN 18-10	(TP) 304LN	S30453	LNS 304L
316LN	1.4406	X2 CrNiMoN 17-11-2	(TP) 316LN	S31653	LNS 316L
316L	1.4404	X2 CrNiMo 17-12-2	(TP) 316L	S31603	LNS 316L
316L	1.4435	X2 CrNiMo 18-14-3	(TP) 316L	S31603	LNS 316L
316LN	1.4429	X2 CrNiMoN 17-13-3			LNS 316L
304	1.4301	X4 CrNi 18-10	(TP) 304	S30409	LNS 304L
321	1.4541	X6 CrNiTi 18-10	(TP) 321	S32100	LNS 304L/347
316	1.4401	X4 CrNiMo 17-12-2	(TP) 316	S31600	LNS 316L
316	1.4436	X4 CrNiMo 17-13-3			LNS 316L
347	1.4550	X6 CrNiNb 18-10	(TP) 347	S34700	LNS 304L/347
318	1.4580	X6 CrNiMoNb 17-12-2	316Cb	S31640	LNS 316L/318
318	1.4583	X10 CrNiMoNb 18-12(DIN)	Zeron 100	S32760	LNS 316L/318 LNS Zeron 100 X

Flux characteristics

Current type	DC (+,-)
Basicity (Boniszewski)	1,6
Solidification speed	high
Density (kg/dm ³)	1,2
Grain size	1-16

Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25

Flux

Classification

Flux P7000	EN 760 :	S A AB/AR 2 69 AC H5
Wire	AWS 5.9 / 5.14	ISO 14343-A /EN xx:
P7000 / LNS 4439 Mn		S-18 16 5 L
P7000 / LNS 4455		S-20 16 3 Mn L
P7000 / LNS 4465		S-25 22 2 L
P7000 / LNS 4500	ER 385 L	S-20 25 5 Cu L
P7000 / LNS NiCro 31/27		
P7000 / LNS NiCro 70/19	NiCr-3	R-NiCr 20 Nb
P7000 / LNS NiCro 60/20	NiCrMo-3	R-NiCr 21 Mo 9 Nb

General description

Agglomerated aluminate basic welding flux which increases the Mn content of the weld metal
For full austenitic stainless steel grades,
Suitable for Ni-based alloys in multi run butt welding (Alloy 625)
For welding low Ni-alloyed structural steels (12Ni14, 12Ni19, X8Ni9)
Good resistance to hot cracking

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	N	Nb	Fe
LNS4455	0.02	7.5	0.6	19	16	2.7	0.13		bal.
LNS4465	0.02	6	0.6	25	23	2	0.12		bal.
LNS4500	0.02	3	0.6	20	25	4.5			bal.
LNS NiCro 31/27	0.02	2.7	0.4	27	31	3.5			bal.
LNS NiCro 70/19	0.025	4.8	0.45	19	bal.			2.5	1.2
LNS NiCro 60/20	0.01	2	0.3	21	bal.	8.5		4	6

Mechanical properties, all weld metal

Wire grade	Condition	Yield strength (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Impact ISO-V(J)	
					-100 °C	-196 °C
LNS4455	AW	420	620	30		40
	SR	420	610	30		40
LNS NiCro 60/20	AW	450	740	40	90	90

AW : As welded
 SR: Stress relieved

P7000: rev. EN 22

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Suggestions for use

Good slag release

AC/DC welding and for multi wire systems

Materials to be welded

AISI	Mat.nr.	EN	UNS
317L	1.4438	X2 CrNiMo 18-15-4	
317LN	1.4439	X2 CrNiMoN 17 13 5	
	1.4455		
	1.4465		
904L	1.4539	X1 NiCrMoCu 25-20-5	N08904
	1.4563	X1 NiCrMoCu 31-27-4	N08028
Alloy 254		X4 CrNi 18-10	S31254
Alloy 625	2.4856	NiCr 22 Mo 9 Nb	N06625
Special	1.5637	12 Ni 14	
	1.5680	12 Ni 19	
	1.5662	X8 Ni 9	

Flux characteristics

Current type	AC, DC(+/-)
Basicity (Boniszewski)	1,5
Solidification speed	High
Density (kg/dm ³)	1,1
Grain size	2-20

Packaging and available sizes

Unit	Net weight (kg)
Drum	40
Sahara ReadyBag™ (SRB)	25