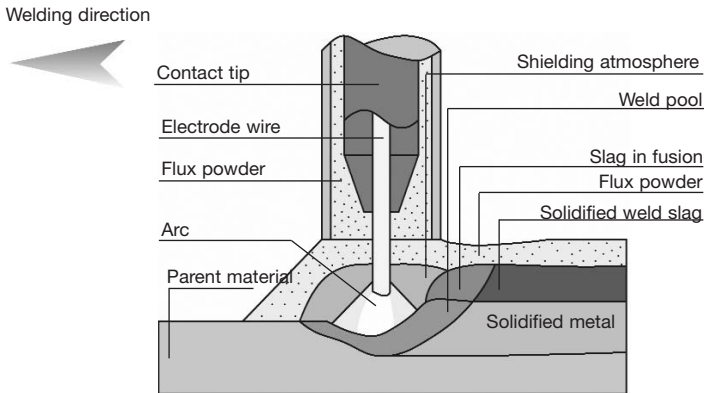


# Subarc Process



*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.*

## Mild steel solid wire

### Classification

AWS A5.17 : EL12  
EN 756 : S1

### General description

A low carbon, low manganese, low silicon general purpose wire

Provides low hardness and is best suited for use with the Lincolnweld® 700 series of active fluxes

### Approvals

	GL	TÜV
782		X
860	X	X
780		X
781		X
761		X

### Chemical composition (w%) typical wire

C	Mn	Si
0.09	0.5	0.06

### Packaging and available sizes

Unit type	Diameter (mm)					
	1.6	2.0	2.4	3.2	4.0	4.8
15KG stein basket	X					
25 kg Stein basket	X	X	X	X	X	X
100 kg Stein basket	X			X	X	
300 kg wooden reel		X	X		X	
350 kg Speed Feed drum		X	X	X	X	X
400 kg Speed Feed drum			X	X	X	
600 kg Speed Feed drum				X	X	
600 Accutrak drum	X	X	X			
1000 kg Accutrak drum		X	X	X	X	

L-60: rev. EN 01

**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

## Mild steel solid wire

### Classification

AWS A5.17	: EM12
EN 756	: S2

### General description

A low carbon, medium manganese, low silicon general purpose wire

Provides low hardness and is best suited for use with the Lincolnweld® 700 and 800 series of active fluxes

### Approvals

	GL	TÜV
782		X
860	X	X
761		X
780		X
P230		X

### Chemical composition (w%) typical wire

C	Mn	Si	P	S
0.1	1.0	0.10	0.015	0.015

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X	
25 kg Stein basket+VCI bag			X	X	
100 kg Stein basket		X	X	X	
300 kg wooden reel		X	X		
400 kg Speed Feed drum				X	
1000 kg Accutrak® Drum	X		X	X	
1000kg coil				X	X

LNS 135: rev. EN 01

**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

## Mild steel solid wire

## Classification

AWS A5.17 : EM12K  
EN 756 : S2Si

## General description

Industry standard for submerged arc welding applications

A low carbon, medium manganese, low silicon general purpose submerged arc wire

A good choice for a wide range of applications with single or multiple pass subarc welding

## Approvals

	ABS	BV	DNV	GL	LRS	RINA	TÜV	RMRS	CRS	PRS
761	X	X	X	X	X	X	X	X	X	X
780		X	X	X	X	X	X	X	X	X
8500				X			X			
888							X			
860	X	X	X	X	X	X	X	X	X	
P230	X			X		X	X			
781							X			

## Chemical composition (w%) typical wire

C	Mn	Si
0.1	1.0	0.25

## Packaging and available sizes

Unit type	Diameter (mm)						
	1.2	1.6	2.0	2.4	3.2	4.0	4.8
15kg Stein basket		X	X	X	X		
25 kg Stein basket	X	X	X	X	X	X	X
25 kg Stein basket+VCI bag		X	X	X	X	X	X
100 kg Stein basket		X	X	X	X	X	X
200 kg Speed Feed drum			X			X	
250 kg Speed Feed drum					X	X	
250 kg Accutrak® Drum		X					
300 kg wooden reel		X	X	X	X	X	
350 kg Speed Feed drum			X	X	X	X	X
400 kg Speed Feed drum		X		X	X	X	
500 kg Accutrak® Drum		X	X				
600 kg Speed Feed drum					X	X	
600 kg Accutrak® Drum		X	X	X			
1000 kg Accutrak® Drum			X	X	X	X	
1000kg coil				X	X	X	

L-61: rev. EN 01

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

# L-50M (LNS 133-U)

## Mild steel solid wire

### Classification

AWS A5.17 : EH12K  
EN 756 : S3Si

### General description

A low carbon, high manganese, low silicon general purpose submerged arc wire  
Suitable for both single and multiarc subarc applications  
Provides extra mechanical properties compared to an EM12K wire grade

### Approvals

	ABS	BV	DNV	LRS	RINA	TÜV	CRS
781	X	X	X	X	X		
782	X	X	X		X		
8500	X	X	X	X			
P230		X	X	X		X	
P240	X	X	X	X		X	X
780						X	

### Chemical composition (w%) typical wire

C	Mn	Si
0.1	1.6	0.25

### Packaging and available sizes

Unit type	Diameter (mm)				
	1.6	2.0	2.4	3.2	4.0
15kg Stein basket	X	X			
25 kg Stein basket	X	X	X	X	X
25 kg Stein basket+VCI bag				X	X
100 kg Stein basket			X	X	X
300 kg wooden reel	X		X		X
350 kg Speed Feed drum		X			X
400 kg Speed Feed drum			X	X	X
600 kg Speed Feed drum				X	X
600 kg Accutrak® Drum	X	X	X		
1000 kg Accutrak® Drum	X	X	X	X	X
1000kg coil			X		X

L-50M (LNS 133-U): rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EA1  
EN 756 : S2 Mo

### General description

A 0,5%Mo wire to be used on steel grades such as 16Mo3 or on non alloy steels to improve impact properties when welding in 2-run technique

### Approvals

	ABS	BV	DNV	GL	LRS	RINA	TÜV	RMRS	PRS
761	X	X	X	X	X	X	X	X	X
780					X		X		X
8500	X			X				X	
860		X	X	X	X		X		
P230	X	X		X		X		X	
P223							X		

### Chemical composition (w%) typical wire

C	Mn	Si	Mo
0.1	0.9	0.10	0.5

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X	X
25 kg Stein basket+VCI bag	X		X	X	
100 kg Stein basket			X	X	X
350 kg Speed Feed drum	X		X	X	
400 kg Speed Feed drum			X	X	
1000 kg Accutrak® Drum	X	X	X	X	X

L-70: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EA2  
EN 756 : S2 Mo

### General description

A 0,5%Mo wire to be used on steel grades such as 16Mo3 or on mon alloy steels to improve impact properties when welding in 2-run technique

### Approvals

	ABS	BV	DNV	GL	LRS	RINA	TÜV	RMRS	PRS
761	X	X	X	X	X	X	X	X	X
780					X		X		X
8500	X			X				X	
860		X	X	X	X		X		
P230	X	X		X		X	X	X	
P223							X		

### Chemical composition (w%) typical wire

C	Mn	Si	Mo
0.1	1.0	0.10	0.5

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
15kg Stein basket	X	X			
25 kg Stein basket	X	X	X	X	X
25 kg Stein basket+VCI bag	X	X	X	X	X
100 kg Stein basket			X	X	
250 kg Speed Feed drum			X		
300 kg wooden reel	X	X	X		
350 kg metal reel				X	
350 kg Speed Feed drum	X		X	X	X
400 kg Speed Feed drum		X	X	X	
600 kg Speed Feed drum			X	X	
600 kg Accutrak® Drum	X	X			
1000 kg Accutrak® Drum	X	X	X	X	
1000kg coil			X	X	

LNS 140A: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EG  
EN 756 : SZ

### General description

Titanium and boron micro alloy wire to achieve optimum impact properties with the 2-run technique, especially with pipemill fluxes

Exclusively for as-welded applications

### Chemical composition (w%) typical wire

C	Mn	Si	Mo	Ti	B
0.06	1.1	0.20	0.5	0.13	0.02

### Packaging and available sizes

Unit type	Diameter (mm)					
	2.0	2.4	3.2	3.5	4.0	4.8
25 kg Stein basket		X	X		X	X
25 kg Stein basket+VCI bag			X		X	X
300 kg wooden reel		X	X			
300 kg Speed Feed drum						X
350 kg metal reel					X	X
350 kg Speed Feed drum			X		X	
400 kg Speed Feed drum			X		X	
1000 kg Accutrak® Drum	X	X	X	X	X	
1000kg coil				X	X	

LNS 140TB: rev. EN 01

**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



## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EB2  
EN 21952-A : S Cr Mo1

### General description

A 1,25%Cr/0,5%Mo wire for creep resistant steels such as 13CrMo4-5.  
Maximal operating temperature is 550°C  
To be used with basic fluxes such as 8500, P240, 888 or MIL800-H

### Approvals

	TÜV
780	X
860	X

### Chemical composition (w%) typical wire

C	Mn	Si	P	Cr	Mo
0.13	0.8	0.15	<0.010	1.2	0.5

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X
25 kg Stein basket+VCI bag				X
100 kg Stein basket	X		X	X
300 kg wooden reel	X	X		
350 kg Speed Feed drum	X	X		
1000 kg Accutrak® Drum			X	

LNS 150: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EB3  
EN 21952-A : S Cr Mo2

### General description

A 2,5%Cr/1%Mo wire for creep resistant steels such as 10CrMo 9-10  
Maximal operating temperature is 600°C  
To be used with basic fluxes such as 8500, P240, 888 or MIL800-H

### Approvals

	TÜV
780	X

### Chemical composition (w%) typical wire

C	Mn	Si	P	Cr	Mo
0.10	0.6	0.15	<0.010	2.6	1.0

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X
100 kg Stein basket	X		X	X
350 kg Speed Feed drum	X			
400 kg Speed Feed drum				X
1000 kg Accutrak® Drum	X			

LNS 151: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : ENi1  
EN 756 : S2 Ni1

### General description

A 1%Ni wire for application requiring good impact toughness down to -60°C  
Optimum results obtained with the multipass technique

### Approvals

	TÜV
P230	X
P240	X

### Chemical composition (w%) typical wire

C	Mn	Si	Ni
0.10	1.1	0.15	1.0

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket		X	X	X
100 kg Stein basket			X	X
1000 kg Accutrak® Drum	X	X	X	X

LNS 160: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : ENi2  
EN 756 : S2 Ni2

### General description

A 2%Ni wire for application requiring excellent impact toughness down to -60°C  
Optimum results obtained with the multipass technique

### Approvals

	TÜV
P230	X
P240	X

### Chemical composition (w%) typical wire

C	Mn	Si	Ni
0.10	1.1	0.15	2.2

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X	X
100 kg Stein basket			X	X	
400 kg Speed Feed drum			X		
1000 kg Accutrak® Drum	X	X	X	X	

LNS 162: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M	EG
EN 756	S2 Ni1Cu

### General description

Submerged arc wire with Cu and Ni addition dedicated to weathering steel assembly like Cor-Ten grades

Matching corrosion resistance as well as color

To be used with 960 flux in most of the applications

Can be used in butt welds single run or multi runs as well as in fillet welds

### Approvals

	TÜV
860	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cu	Ni	Cr	S & P
0.1	1	0.25	0.5	0.7	0,2max	0,02max

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X	X
100 kg Stein basket	X	X	X	X	
350 kg Speed Feed drum		X			
400 kg Speed Feed drum	X	X	X	X	
1000 kg Accutrak® Drum	X	X	X	X	

LNS 163: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EF3  
EN 756 : S3 Ni1Mo

### General description

Nickel and Molybdenum alloy wire to reach both high yield/ tensile properties and good impact toughness at low temperatures

Optimum results obtained with the multipass technique

### Approvals

	TÜV
P230	X
P240	X

### Chemical composition (w%) typical wire

C	Mn	Si	Ni	Mo
0.10	1.6	0.10	0.9	0.5

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X
25 kg Stein basket+VCI bag	X	X	X	
100 kg Stein basket		X	X	
300 kg wooden reel		X	X	X
350 kg Speed Feed drum			X	
400 kg Speed Feed drum			X	

LNS 164: rev. EN 01

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : ENi5  
EN 756 : Sz

### General description

Nickel and Molybdenum alloyed wire to reach both high yield/ tensile properties and good impact toughness at low temperatures

Optimum results obtained with the multipass technique

### Approvals

	ABS	DNV	TÜV
P240	X	X	X

### Chemical composition (w%) typical wire

C	Mn	Si	Ni	Mo
0.10	1.4	0.20	1.0	0.2

### Packaging and available sizes

Unit type	Diameter (mm)				
	2.0	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X	X
25 kg Stein basket+VCI bag		X	X	X	
100 kg Stein basket			X	X	
350 kg Speed Feed drum				X	
400 kg Speed Feed drum			X		
1000 kg Accutrak® Drum		X	X	X	

LNS 165: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EF1\*  
EN 756 : S2 Ni1Mo

\* Nearest classification

### General description

Nickel and Molybdenum alloyed wire to reach both high yield/ tensile properties and good impact toughness at low temperatures

Optimum results obtained with the multipass technique

### Approvals

	TÜV
P230	X

### Chemical composition (w%) typical wire

C	Mn	Si	Ni	Mo
0.13	1.0	0.20	0.9	0.5

### Packaging and available sizes

Unit type	Diameter (mm)
	4.0
25 kg Stein basket	X

LNS 167: rev. EN 01

**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



## Low alloy solid wire

### Classification

ISO 26304-A

S 3Ni2.5CrMo

### General description

Low alloy solid wire dedicated to high strength steel grades ( $R_e > 690 \text{MPa}$ )

Good impact properties guaranteed down to  $-40^\circ\text{C}$  when combined with a basic flux

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo
0.1	1.6	0.15	0.7	2.3	0.6

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.5	3.2	4.0	5
20 kg Stein basket		X		X
25 kg Stein basket	X		X	
380 kg Accutrak® Drum		X		

LNS 168: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M : EM2  
EN 756 : Sz

### General description

A low carbon, high manganese wire with nickel and molybdenum designed to weld high strength steels such as HY-80 and HSLA-80

### Chemical composition (w%) typical wire

C	Mn	Si	P	S	Ni	Mo
0.05	1.7	0.45	<0.010	<0.010	1.9	0.45

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.4	3.2	4.0	4.8
25 kg Stein basket	X	X	X	X
100 kg Stein basket		X	X	
300 kg wooden reel			X	X
1000 kg Accutrak® Drum		X		

LA 100: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M EB9  
ISO 21952-A S CrMo91

### General description

A 9%Cr wire for creep resistant application on steel grades such as P91  
To be used with basic fluxes such as 802, 8500, P240, 888 or MIL800-H

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	V	Nb	Cu	N
0.12	0.6	0.3	8.8	0.7	1	0.2	0.06	0,07	0,04

### Packaging and available sizes

Unit type	Diameter (mm)
25 kg Stein basket	3.2 X

LNS 9Cr: rev. EN 01

**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

## Low alloy solid wire

### Classification

AWS A5.23/A5.23M	ENi3
EN 756	S2Ni3

### General description

A 3,5Ni wire used on cryogenic steels such as SA203Gr or 12Ni14

### Chemical composition (w%) typical wire

C	Mn	Si	Ni
0.08	1	0.1	3.5

### Packaging and available sizes

Unit type	Diameter (mm)	
	2.4	3.2
25 kg Stein basket	X	X

LNS 175: rev. EN 01

**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

## Low alloy Flux cored wire

### Classification

AWS A5.17/A5.17M : EC1 H4  
EN 756 : Sz

### General description

Unalloy basic flux cored wire for subarc applications.  
Higher deposition compared to equivalent solid wire size  
Good impact properties at low temperatures when combined with P230 flux.

### Chemical composition (w%) typical wire

C	Mn	Si	P	S
0.06	1.5	0.6	<0.012	0.010

### Packaging and available sizes

Unit type	Diameter (mm)
	2.8
25 kg Stein basket	X
250kg metal coil	X

LNS T55: rev. EN 01

**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

## Low alloy Flux cored wire

### Classification

AWS A5.23/A5.23M : ECM3 H4  
EN 756 : SZ

### General description

Flux cored SAW wire designed to weld high strength steel grades

Delivers yield strength greater than 690 MPa (100 ksi)

Extremely low H<sub>2</sub> hydrogen levels and impact at -40°C can be achieved when combined with MIL800-H flux

### Chemical composition (w%) typical wire

C	Mn	Si	P	S	Ni	Mo
0.08	1.7	0.6	0,018	0,011	1.8	0.5

### Packaging and available sizes

Unit type	Diameter (mm)
25 kg Stein basket	X

LNS T690: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER308L  
 EN 14343-A : S 19 9 L

### General description

Low carbon austenitic stainless steel wire suitable for 304L base material grade or 321 grade in some applications  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo
0.015	1.8	0.4	20	10	0.1

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 304L: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER308H  
EN 14343-A : S 19 9 H

### General description

High carbon austenitic stainless steel wire for high temperature applications (up to 730°C). Suitable for 304 base material grade

Recommended with P2007 and P2000 fluxes

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni
0.05	1.2	0.6	20.1	10.5

### Packaging and available sizes

Unit type	Diameter (mm)	
	2.4	3.2
25 kg Stein basket	X	X

LNS 304H: rev. EN 01



## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER307  
 EN 14343-A : S 18 8 Mn

### General description

Stainless steel wire for high manganese content base materials, difficult-to-weld steels such as armour plates, and dissimilar joints

Weld deposit features strain hardenability

Recommended with P2007 and P2000 fluxes

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni
0.07	7	0.6	19	8.9

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 307: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER309  
 ISO 14343-A : S 23 12 L

### General description

Low carbon austenitic stainless steel wire suitable for dissimilar welding applications  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000S	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo
0.01	1.8	0.4	23.4	13.8	0.07

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 309L: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER316L  
 ISO 14343-A : S 19 12 3 L

### General description

Low carbon stainless steel wire suitable for 316L base material and similar grades  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo
0.015	1.75	0.4	18.5	12	2.75

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 316L: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER318  
 ISO 14343-A : S 19 12 3 Nb

### General description

Stabilized stainless steel wire suitable for 316Ti and similar grades  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	Nb
0.04	1.8	0.4	19.5	11.3	2.6	0.5

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 318: rev. EN 01

**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

## Stainless steel solid wire

### Classification

ISO 14343-A : S 25 4

### General description

Stainless steel wire with limited Ni content for high temperature application (up to 1100°C)  
Recommended with P2007 and P2000 fluxes

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni
0.09	1.8	1.2	25.5	5.6

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 329: rev. EN 01

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## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER347  
 ISO 14343-A : S 19 9 Nb

### General description

Stabilized stainless steel wire suitable for 321 and similar grades  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	Nb
0.03	1.6	0.4	19.5	9.7	0.1	0.6

### Packaging and available sizes

Unit type	Diameter (mm)			
	2.0	2.4	3.2	4.0
25 kg Stein basket	X	X	X	X

LNS 347: rev. EN 01

**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

## Stainless steel solid wire

### Classification

ISO 14343-A : S 20 16 3 Mn L

### General description

Fully austenitic stainless steel wire

To be used for cryogenic application or with non magnetic stainless steels

Recommended with P2007, P2000 and P7000 fluxes

### Approvals

	TÜV
P2000	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	N
0.01	7.0	0.4	20	16	2.7	0.16

### Packaging and available sizes

Unit type	Diameter (mm)	
	2.4	3.2
25 kg Stein basket	X	X

LNS 4455: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER2209  
 ISO 14343-A : S 22 9 3 N L

### General description

Duplex stainless steel wire suitable for 1.4462 base material and similar grades  
 Recommended with P2007 and P2000 fluxes

### Approvals

	TÜV
P2000S	X
P2007	X

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	N
0.015	1.6	0.5	23	8.6	3.1	0.16

### Packaging and available sizes

Unit type	Diameter (mm)	
	2.4	3.2
25 kg Stein basket	X	X

LNS 4462: rev. EN 01



## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER385  
 ISO 14343-A : G 20 25 5 Cu L

### General description

Fully austenitic stainless steel wire

Used for sulphuric and phosphoric acid environment and in the paper mill industry

Recommended with P2007, P2000 and P7000 fluxes

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	Cu
0.01	1.8	0.3	20	25.2	4.6	1.5

### Packaging and available sizes

Unit type	Diameter (mm)
	3.2
25 kg Stein basket	X

LNS 4500: rev. EN 01

**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

## Stainless steel solid wire

### Classification

AWS A5.9/A5.9M : ER2594  
ISO 14343-A : S 25 9 4 N L

### General description

Superduplex stainless steel wire suitable for Zeron 100 base material and similar grades  
Recommended with P2007, P2000 or P7000 flux

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	N	Cu
0.02	0.7	0.3	25	9.3	3.7	0.23	0.6

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.6	2.4	3.2
25 kg Stein basket	X	X	X

LNS Zeron 100X: rev. EN 01

**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

## Ni-Base solid wire

### Classification

AWS A5.14/A5.14M : ERNiCrMo-3  
ISO 18274 : S Ni 6625 (NiCr22Mo9Nb)

### General description

Ni-base solid wire for welding nickel alloys  
Excellent resistance to various corrosion forms  
Also used for 9%Ni applications  
Recommended with P2007 flux

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	Nb	Fe
0.05	0.02	0.1	22	65	8.7	3.7	0.1

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.6	2.0	2.4
25 kg Stein basket	X	X	X

LNS NiCro 60/20: rev. EN 01

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# LNS NiCrMo 60/16

## Ni-Base solid wire

### Classification

AWS A5.14/A5.14M : ERNiCrMo-4  
ISO 18274 : S Ni 6276 (NiCr15Mo16Fe6W4)

### General description

Ni-base solid wire for welding CrMoW alloyed nickel alloys

Extreme resistance to corrosion environments containing sulphuric acid and chlorides

Also used for 9%Ni applications

Recommended with P2007 flux

### Chemical composition (w%) typical wire

C	Mn	Si	Cr	Ni	Mo	W	Fe
0.006	0.5	0.04	16	58	16	3.6	5.8

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.6	2.4
25 kg Stein basket	X	X

LNS NiCrMo 60/16: rev. EN 01

**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

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[www.lincolnelectric.eu](http://www.lincolnelectric.eu)

## 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 / LNS 140A	F9A0-EA2-G	S 50 0 CS/MS S2Mo	S 4T 2 CS/MS S2Mo
761 / L-70	F9A0-EA1-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
- Coarse grain flux more suitable with the most rusty and dirty plates

### Approvals

Wire grade	ABS	BV	CRS	DNV	PRS	GL	LRS	RINA	RMRS	TÜV
L-61	3YM/2YT	A3YM/A2YT	3YM/2YT	2YT	3YM/2YT	3YM/2YT	3YM/3YT	3YM/2YT	2YT	X
LNS 140A	2YTM	A3YM/A3YT		2Y40M/3Y40T	3YM/2YT	3YTM	2YM/2YT	3YM/3YT	2YM/3YT	X
L-60										X
LNS 135										X
L-70										X

### 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, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	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 / 761-CG: 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

Wire	Characteristics	Applications
L-60	To prevent defects from organic components	Flat fillet, large throat
L-61	Reliable properties	Butt joints in two passes, in medium and thick plates
LNS 140A	For good impact toughness in two-run as welded	Flux backing, modified series arc-welding Low quality steels

## Materials to be welded

STEEL / STANDARD	TYPE	Limited runs		
		L60	L61	LNS140A
<b>Ship plates</b>				
	A to D, A (H) 32 to D(H) 36	x	x	x
<b>General Structural steel</b>				
EN 10025 part 6	500 A			x
EN 10025 part 3/part 4	S275 to S420, N,M	x	x	x
EN 10149	S315 to S420, MC	x	x	x
	S315 to S420, NC	x	x	x
	S460, MC & NC			x
EN 10025 part 2	S185 to S355, E295 to E360, JR(G1 & G2), J0, J2 (G3&G4)	x	x	x
<b>Boiler &amp; pressure vessel steel</b>				
EN 10028	P235 to P420, GH N, NH, M, Q & QH	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, AP	x	x	x

## Flux characteristics

Current type	DC / AC
Basicity (Boniszewski)	0,8
Solidification speed	Low, slag viscous
Density (kg/dm <sup>3</sup> )	1,2
Grain size	761 : 1-16 761-CG : 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 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 / LNS 140A	F8A2-EA2-G		S 4T 2 AR/AB S2Mo
780 / L-70	F8A2-EA1-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 and coarse formula

Fine grain formula preferably used on high speed fillet welds applications

### Approvals

Wire grade	BV	ABS	LRS	DNV	GL	RINA	PRS	RMRS	CRS	TÜV
L-60	A3YT	2YT	2T/2YT	3YT	3YT	2YT				X
L-61	A3YT		3YM/3YT	3YTM	3YT	3YT	3YM/3YT	3YT	3YT	X
LNS 140A			3YT				3YT			X
LNS 150										X
L-70										X
LNS 135										X
LNS 151										X
LNS 133U										X

### 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	
LNS 140A	0.07	1.6	0.6	<0.030	<0.025	0.4

### Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					0 °C	-20°C
L-60	MR	> 420	510	28	50	
L-61	TR	> 420	> 540	28		50
LNS 140A	TR	> 420	> 550	25		60

MR: multi run

TR: two-run

780 / 780-CG / 780-FG: rev. EN 23



# 780 / 780-CG / 780-FG

## Suggestions for use

Wire	Characteristics	Applications
L-60	To prevent defects from organic components	Horizontal fillet
L-61	Reliable properties	High speed on dirty plates
LNS 140A	For good impact toughness in two-run as welded	Good on circumferential welds on small diameters with low voltage

## Materials to be welded

STEEL / STANDARD	TYPE	Limited passes		
		L60	L61	LNS140A
<b>Ship plates</b>				
	A to D, A (H) 32 to D(H) 36	x	x	x
<b>General Structural steel</b>				
EN 10025 part 6	500 A			x
EN 10025 part 3/part 4	S275 to S420, N,M	x	x	x
EN 10149	S315 to S420, MC	x	x	x
	S315 to S420, NC	x	x	x
	S460, MC & NC			x
EN 10025 part 2	S185 to S355, E295 to E360,			
	JR(G1 & G2), JO, J2 (G3&G4)	x	x	x
<b>Boiler &amp; pressure vessel steel</b>				
EN 10028	P235 to P420, GH N, NH, M, Q & QH	x	x	x
	P235 to P460, GH, N, NH, M, Q & QH	x	x	x
	P500, GH, N, NH, M, Q & QH, P235 S, P265 S	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 <sup>3</sup> )	1,4
Grain size	780-FG : 1-16
	780 : 1-20
	780-CG : 2-20

## Packaging and available sizes

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

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## 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 (LNS 133U)			S 4T 2 ZS S3Si
781 / LNS 140A			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  
 Shiny and smooth appearance

## Approvals

Wire grade	BV	ABS	LRS	DNV	RINA	TÜV
L50M (LNS 133U)	A4YT	4Y400T	3YT	3YT	3YT	
L-60						X
L-61						X

## 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 (LNS 133U)	0.06	1.6	1	0.03	<0.02	
LNS 140A (L-70)	0.06	1.3	0.9	0.03	<0.02	0.4

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Impact ISO-V(J) -20°C
L-61	TR	> 420	> 540	50
L50M (LNS 133U)	TR	> 450	> 560	60
LNS 140A (L-70)	TR	> 490	> 580	65

TR: two-run

781: 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

Wire	Characteristics	Applications
L-61	High speeds on clean plate	Single pass or limited passes
L50M (LNS 133U)	Very high speeds	Best results with clean plates and high Si/Mn wires
LNS 140A	Good impact toughness	

### Materials to be welded

STEEL / STANDARD	TYPE	Limited passes		
		L61	L50M (LNS133U)	LNS140A (L-70)
<b>Ship plates</b>				
	A to D, AH32 to DH40	x	x	x
	A to E, AH32 to EH40			x
<b>General Structural steel</b>				
EN 10025 part 6	500 & 550 A	x	x	x
	500 & 550 A & AL			x
EN 10025 part 3/part 4	S275 to S460 N/M	x	x	x
	S275 to S460 all qualities			x
EN 10149	S315 to S600 MC & NC	x	x	x
EN 10025 part 2	S185 to S360 all qualities	x	x	x
<b>Boiler &amp; pressure vessel steel</b>				
EN 10028	P235 to P460, (GH, N NH, M, ML1)	x	x	x
	P235 to P460 all qualities			x
EN 10207	P235 to P275 S	x	x	x
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 <sup>3</sup> )	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 / LNS 135	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 (LNS 133U)		S 45 0 AR/AB S3Si	S 5T 2 AR/AB S3Si
782/ LNS 140A (L-70)		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

Optimal flux for tin-tube welding, especially with the fine grain formulation

## Approvals

Wire grade	BV	ABS	DNV	RINA	TÜV
L50M (LNS 133U)	4YT	4Y400T	4YT	3YT	
LNS 135					X

## 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	-
LNS 135	0.07	1.15	0.7	<0.030	<0.025	-
L-61	0.07	1.15	0.8	<0.030	<0.025	-
L50M (LNS 133U)	0.06	1.7	1	<0.030	<0.025	-
LNS 140A (L-70)	0.07	1.2	0.7	<0.030	<0.025	0.4

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Impact ISO-V(J)	
				0°C	-20°C
L-60	TR	>420	> 520	45	
LNS 135	TR	>420	> 520	55	
L-61	TR	>420	> 520	60	
L50M (LNS 133U)	TR	>460	> 550	65	50
LNS 140A (L-70)	TR		>600	70	50

TR: two-run

782 / 782-FG: 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

Wire	Characteristics	Applications
LNS 135	Limited hardness	Fillet weld, lap joint
L-61	Good properties	<ul style="list-style-type: none"> <li>• truck wheels</li> </ul>
L50M (LNS 133U)	Very high speeds	<ul style="list-style-type: none"> <li>• gas bottles</li> <li>• Tube to fin fillet weld</li> <li>• Boiler tubes</li> </ul>

## Materials to be welded

STEEL / STANDARD	TYPE	Limited passes	
		LNS135	L61
<b>Ship plates</b>			
	A, AH32 to AH40		x
<b>General Structural steel</b>			
EN 10149	S315 to S460 MC	x	x
EN 10025 part 2	S185 to S355 quality, JR(G1&G2)	x	x
	S185 to S355 quality, JR(G1&G2), J10		x
	E2956 to E360	x	x
<b>Boiler &amp; pressure vessel steel</b>			
EN 10028	P235 to 275 GH		x
	P355 to P460M		x
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 <sup>3</sup> )	1,4
Grain size	782-FG : 1-16 782 : 1-20

## 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	Hardfacing flux cored wire		no AWS and EN classification
	Hardfacing solid wire		

## General description

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

Weld metal with min. 0.2% Si and additional V, Nb, Ti and higher Cr-content when combined with previous mentioned Lincore wires.

Excellent slag removal and good bead appearance

Very suitable for hardfacing applications on plates 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, typical, 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 layers hardfacing application

## Packaging and available sizes

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

802: 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

A large rectangular area with horizontal lines for taking notes.

## 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 / LNS 140A	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/LNS T55		S 50 5 FB Tz	

\* Nearest classification

## General description

Basic flux designed for carbon and low alloy 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	RMRS
L-61					3YM/3YT	
L50M (LNS 133U)	A4YTM	3YTM	3YM/3YT	4Y40M/3Y40T		
LNS 140A (L-70)		3YM			3Y40TM	3YM/3YT

## 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 (LNS 133U)	0.07	1.4	0.3	<0.02	<0.015		
LNS 140A (L-70)	0.08	0.9	0.2	0.03	<0.025	0.4	
LNS 160	0.07	1.0	0.1	0.02	0.015		1
LNS 162	0.08	1.0	0.1	0.02	0.015		2
LNS 165 (LA85)	0.07	1.3	0.2	0.02	0.015	0.2	0.9
LNS T55	0.08	1.7	0.7	<0.015	<0.015		

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-60°C
L-61	MR	430	510	28	150	100	50
L50M (LNS 133U)	MR	440	540	28		110	
	SR	> 420	> 500	30		150	
LNS 140A (L-70)	MR	440	540	28		55	
LNS 160	AW	430	510	30		150	50
	SR	400	510	30		150	50
LNS 162	AW	470	560			150	50
	SR	450	530			150	50
LNS 165 (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 23

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## Suggestions for use

### Applications

Suitable for deep groove  
 Low temperatures requirements  
 Highly restrained constructions  
 Single and multi-wire systems  
 Off-shore and on-shore applications  
 Nuclear components

## Materials to be welded

STEEL / STANDARD	TYPE	Multirun														
		L61			L50M (LNS133U)		LNS140A (L-70)		LNS160		LNS 162		LNS165		LNS155	
		AW	AW	SR	AW	SR	AW	SR	AW	SR	AW	SR	AW	SR		
<b>Ship plates</b>																
	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	x	x	x
<b>General Structural steel</b>																
EN 10025 part 2	S185, S235, S275	x	x	x											x	x
	S355	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>Cast steel</b>																
EN 10213-2	GP240R	x	x	x											x	x
<b>Pipe material</b>																
EN 10208-1	L210, L240, L290	x	x	x											x	x
	L360	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	L415		x		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	x	x	x
	X56, X60		x		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	x	x	x
<b>Boiler &amp; pressure vessel steel</b>																
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x	x									x	x
<b>Fine grained steel</b>																
EN 10025 part 3/part 4	S275	x	x	x											x	x
	S355	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	S420		x		x	x				x	x	x	x	x	x	x
	S460											x	x			

## Flux characteristics

Current type	DC / AC
Basicity (Boniszewski)	2,8
Solidification speed	Medium
Density (kg/dm <sup>3</sup> )	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 / LNS 135	F6A2-EM12	S 35 2 AB S2	S 3T 0 AB S2
860 / L50M (LNS133U)	F7A2/F7P2-EH12K	S 42 2 AB S3Si	
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 / LNS 140A	F7A2-EA2-A2	S 42 2 AB S2Mo	S 4T 2 AB S2Mo
860 / LNS T55	F7A2/F7P4-EC1	S 50 3 AB Sz	
860 / LNS 163	F7A4-EG	S 42 4 AB S2Ni1Cu	

## General description

**Multi purpose neutral agglomerated flux**

**Good impact values in both multi-run (with L60/L61/L50M) and two-run (with LNS 140A) techniques**

**High restraint cracking resistant**

## Approvals

Wire grade	BV	ABS	LRS	DNV	GL	RMRS	RINA	CRS	TÜV
L-61	A3YTM/A3TM	3YM/2YT	3YM/3T/3YT	3M/2T	3YM/2YT	3YM/2YT	3M3YM/3T3YT	3YM/2YT	x
LNS 135					3YTM				x
LNS 140A	A3YTM		3M/3YM/3YT	3Y40TM	3YM/2YT				x
L-70	A3YTM		3M/3YM/3YT	3Y40TM	3YM/2YT				x
L-60									x
LNS 150									x
LNS 163									x

## 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	
LNS 135	0.06	1.3	0.3	<0.025	<0.020	
L-61	0.1	1.2	0.3	<0.025	<0.020	
L50M (LNS 133U)	0.07	1.7	0.5	<0.025	<0.020	
LNS 140A	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, typical, all weld metal

Wire grade	condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					0°C	-20°C
L-60	AW	360	480	30	80	50
LNS 135	AW	390	490	33	100	50
L-61	AW	430	510	32	100	60
	SR	400	505	32		115
L50M (LNS 133U)	AW	460	530	28	120	80
	SR	420	520			115
LNS 140A	AW	520	570	26		70
	SR	510	580	30		50
LNS T55	AW	520	610			70
	SR	470	560			70
LNS 163	AW	460	540	27		55

AW : As welded - SR: Stress relieved

860: rev. EN 23

## Suggestions for use

Wire	Characteristics
L-60 & LNS 135	Low yield stress steels
L-61	Yield stress < 430MPa
L50M (LNS 133U)	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 / STANDARD	TYPE	Multirun											
		L61		L60		LNS135		L50M (LNS133U)		LNS 140A		LNS T55	
		AW	AW	AW	AW	SR	AW	SR	AW	SR			
<b>Ship plates</b>													
	A to D	x	x	x	x			x					
	AH(32),DH(36), DH(40)	x				x	x	x	x	x	x	x	
<b>General Structural steel</b>													
EN 10025 part 2	S185, S235, S275	x	x	x	x	x							
	S355	x	x	x	x	x	x	x	x	x	x	x	
<b>Cast steel</b>													
EN 10213-2	GP240R	x	x	x	x	x							
<b>Pipe material</b>													
EN 10208-2	L210, L240, L290	x	x	x	x	x							
	L360	x	x	x	x	x	x	x	x	x	x	x	
	L415					x		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	x	x	
	X56, X60					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	
<b>Boiler &amp; pressure vessel steel</b>													
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x	x	x	x	x	x	x	x	
	P355GH	x	x	x									
<b>Fine grained steel</b>													
EN 10025 part 3/part 4	S275	x	x	x	x	x							
	S355	x	x	x	x	x	x	x	x	x	x	x	
	S420					x		x	x	x	x	x	
	S460							x					
<b>High yield strength steel</b>													
EN 10025 part 6	S460, S500							x					

## Flux characteristics

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

## Packaging and available sizes

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

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## Flux

## Classification

Flux 888	EN 760 :	S A FB 1 66 AC H5
Flux/Wire	AWS A5.17 / A5.23	EN 756 : MR
888/L-61 (LNS 129)	F7A8-EM12K	S 38 6 FB S2Si
888/L50M (LNS 133U)	F7A6/F7P8-EH12K	S 42 6 FB S3Si
888/ LNS 140A	F8A4-EA2-A2	S 46 4 FB S2Mo
888/ L-70	F8A4-EA1-A2	S 46 4 FB S2Mo
888/LNS 160	F7A8/P8-ENi1-Ni1	
888/LNS 162	F8A8/F7P8-ENi2-Ni2	
888/LNS 164 (LA84)	F10A4/F9P6-EF3-F3	S 50 4 FB S3Ni1Mo
888/LNS 165 (LA85)	F8A6/F7P8-ENi5-Ni5	S 50 4 FB Sz
888/LNS 150 (LA92)	F7P6-EB2-B2	S 50 2 FB CrMo1
888/LNS 151 (LA93)	F8P6-EBR3-B3R H4	
888/LA100	F10A4-EM2-M2	S 50 4 FB S3Ni1,5Mo

## General description

**Basic flux designed for carbon and low alloy steels**

**Easy slag removal in deep groove**

**Robust mechanical properties including CTOD values**

**Bruscato factor typically below 10 ppm with LNS150 & LNS151 wires**

**Excellent in multi arc configurations**

**Only available in Sahara ReadyBag™**

## Approvals

Wire grade	TUV
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 (LNS 133U)	0.07	1.45	0.55	<0.02	<0.015				
LNS 140A (L-70)	0.07	1.0	0.35	<0.02	<0.015		0.4		
LNS 160	0.07	1.2	0.4	<0.02	<0.015	0.95			
LNS 162	0.07	1.1	0.4	<0.02	<0.015	2.1			
LNS 164	0.08	1.7	0.5	<0.02	<0.01	0.9	0.5		
LNS 165	0.06	1.50	0.5	<0.02	<0.015	0.97	0.2		
LNS 150	0.069	0.90	0.5	<0.02	<0.015		0.56	1.34	<10 ppm
LNS 151	0.062	0.85	0.3	<0.02	<0.015		0.93	2.15	<10 ppm
LA100	0.06	1.60	0.7	<0.02	<0.015	1.8	0.42	0.08	

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)			
					-30°C	-40°C	-50°C	-60°C
L-61	AW	415	515	31		135		125
L50M (LNS 133U)	AW	480	580	29				70
	SR	430	550	31		105		65
LNS 160	AW	470	550	26		115		
	SR	410	510	27		160		120
LNS 162	AW	500	580	25		100		55
	SR	440	550	25		160		120
LNS 164 (LA84)	AW	650	750	21		65		30
	SR	610	700	23		65		30
LNS 165 (LA85)	AW	530	620	26		70		40
	SR	495	595	27				70
LNS 150 (LA92)	SR	420	580	26		150	115	110
LNS 151 (LA93)	SR	530	645	23		125	70	50
LA100	AW	680	760	25		50		

AW : As welded - SR: Stress relieved

888: rev. EN 23

### Suggestions for use

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

### Materials to be welded

STEEL / STANDARD	TYPE	Multirun																
		L61		L50M (LNS133U)		LNS164		LNS165		LNS150		LNS151		LNS160		LNS 162		LA100
		AW-60°	AW-60°	SR-60°	AW-40°	AW-40°	SR-60°	SR-50°	SR-50°	AW	SR	AW	SR	AW	SR	AW-40°		
<b>Ship plates</b>																		
	A to E	x	x	x														
	AH(32),DH(36), EH(36)	x	x	x	x	x	x					x	x	x	x			
<b>General Structural steel</b>																		
EN 10025 part 2	S185, S235, S275	x	x	x														
	S355	x	x	x	x	x	x					x	x	x	x			
<b>Cast steel</b>																		
EN 10213-2	GP240R	x	x	x														
<b>Pipe material</b>																		
EN 10208-2	L210, L240, L290	x	x	x														
	L360	x	x	x	x	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					x	x	x	x			
<b>Boiler &amp; pressure vessel steel</b>																		
EN 10028-1	P235GH, P265GH, P295GH	x	x	x														
EN 10028-2	16 Mo 3						x	x									x	
(Elevated temperature steel)	13CrMo 4-5								x	x								
	10CrMo 9-10								x	x								
EN 10028-4/10222-3	11MnNi5-3, 13MnNi6-3						x	x				x	x	x	x		x	
<b>Low temperature steel</b>																		
<b>Fine grained steel</b>																		
EN 10025 part 3/part 4	S275	x	x	x														
	S355	x	x	x	x	x	x					x	x	x	x			
	S420		x		x	x	x							x	x			
	S460				x	x	x											
<b>High yield strength steel</b>																		
EN 10025 part 6	S460, S500				x	x	x					x	x	x	x			

### Flux characteristics

Current type	AC/DC (+/-)
Basicity (Boniszewski)	2,6
Density (kg/dm <sup>3</sup> )	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 (LNS 133U)	F7A2-EH12K	S 38 2 AB S3Si	S 3T 2 AB S3Si
960 / LNS 163	F7A4-EG	S 42 4 AB S2Ni1Cu	

## 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 (LNS 133U)	0.07	1.6	0.6	<0.030	<0.025

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-20°C	-40°C
L-61	AW	420	510	28	50	
L50M (LNS 133U)	AW	430	530	28	70	
LNS 163	AW	460	540	27		55

AW : As welded

960: 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

Wire	Characteristics	Applications
L50M (LNS133U)	For dirty plates	Fillet welds
L-61	General purpose	Butt welds (single pass and multi-run)

### Materials to be welded

STEEL / STANDARD	TYPE	Multirun		Two-run	
		L61	L50M (LNS133U)	L61	L50M (LNS133U)
<b>Ship plates</b>					
	A to E	x	x	x	x
	AH(32),DH(36), EH(36)	x	x	x	x
<b>General Structural steel</b>					
EN 10025 part 2	S185, S235, S275	x	x	x	x
	S355	x	x	x	x
<b>Cast steel</b>					
EN 10213-2	GP240R	x	x	x	x
<b>Pipe material</b>					
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
<b>Boiler &amp; pressure vessel steel</b>					
EN 10028-1	P235GH, P265GH, P295GH	x	x	x	x
	P355GH	x	x	x	x
<b>Fine grained steel</b>					
EN 10025 part 3/part 4	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 <sup>3</sup> )	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 (LNS 133U)	0.06	1.9	0.4	<0.020	<0.020

## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -20°C
L-61	AW	420	520	29	50
L50M (LNS 133U)	AW	460	550	29	60

AW : As welded

980: rev. EN 23



### Suggestions for use

Wire	Applications
L-61	Lower cost combination
L50M (LNS133U)	For the best operating characteristics For the best impact values in multi-pass (AW or SR)

### Materials to be welded

STEEL / STANDARD	TYPE	Multirun	
		L61	L50M (LNS133U)
<b>Ship plates</b>			
	A to E	x	x
	AH(32),DH(36), EH(36)	x	x
<b>General Structural steel</b>			
EN 10025 part 2	S185, S235, S275	x	x
	S355	x	x
<b>Cast steel</b>			
EN 10213-2	GP240R	x	x
<b>Pipe material</b>			
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
<b>Boiler &amp; pressure vessel steel</b>			
EN 10028-1	P235GH, P265GH, P295GH	x	x
	P355GH	x	x
<b>Fine grained steel</b>			
EN 10025 part 3/part 4	S275	x	x
	S355	x	x
	S420		x

### Flux characteristics

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

### Packaging and available sizes

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

## Flux (Pipemill)

### Classification

Flux 995N	EN 760 :	S A AB 1 67 AC H5
Flux/Wire	AWS A5.23	EN 756 : TR
995N / LNS 140A		S 4T 2 AB S2Mo
995N / LNS140 TB (LA 81)	F9A2-EG-G	S 5T 5 AB Sz

### General description

Flux designed for longitudinal multi-arc welding pipemill 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 diffusible hydrogen level in the weld deposit

### Chemical composition (w%)

Base material	Wire grade	C	Mn	Si	P	S	Mo	Ti	B	N
X65	LNS 140A	0.07	1.45	0.3	<0.025	<0.025	0.2	-	-	0.005
X80	LNS 140TB (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, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)				Hardness HV30	
					-20°C	-40°C	-50°C	-60°C		
Proced. 1										
LNS 140A (L-70)	AW	580	680	30						230
LNS 140TB (LA81)	AW	630	700	27	115	75	50			235
Proced. 2										
LNS 140TB(LA81)	AW	600	720	25	100	65		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 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

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

### Materials to be welded

STEEL / STANDARD	TYPE	Two-run	
		LNS 140TB	LNS140A (L-70)
<b>Ship plates</b>			
A, B, D, E	A to E	x	x
	A 32 to FH40	x	x
<b>General Structural steel</b>			
EN 10137	500 to 550 A & AL	x	x
EN 10025 part 3/part 4	S275 to S460 all qualities	x	x
EN 10149	S315 to S850 all qualities	x	x
EN 10025 part 2	S185 to S355 all qualities	x	x
	E295 to E360	x	x
<b>Boiler &amp; pressure vessel steel</b>			
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 X70	x	x
	X42 to X80	x	

### Flux characteristics

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

### Packaging and available sizes

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

# Flux (Pipemill)

## 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 pipemill 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 diffusible hydrogen level in the weld deposit

## Chemical composition (w%)

Base material	Wire grade	C	Mn	Si	P	S	Mo	Ti	B	N
X65	LNS 140TB (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	LNS 140TB (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, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)				Hardness HV30
					-20°C	-40°C	-50°C	-60°C	
Proced. 1									
LNS 140A (L-70)	AW	570	680	27					230
LNS 140TB (LA81)	AW	610	700	27	115	75	50		235
Proced. 2									
LNS 140TB (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 / STANDARD	TYPE	Two-run	
		LNS 140TB	LNS140A (L-70)
<b>Ship plates</b>			
A, B, D, E	A to E	x	x
	A 32 to FH40	x	x
<b>General Structural steel</b>			
EN 10025 part 6	500 to 550 A & AL	x	x
EN 10025 part 3/part 4	S275 to S460 all qualities	x	x
EN 10149	S315 to S650 all qualities	x	x
EN 10025 part 2	S185 to S355 all qualities	x	x
	E295 to E360	x	x
<b>Boiler &amp; pressure vessel steel</b>			
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 X70	x	x
	X42 to X80	x	

## Flux characteristics

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

## Packaging and available sizes

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

## Flux (Pipemill)

### 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 / LNS 140A	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%)

Wire grade	C	Mn	Si	P	S	Mo	Ni
L-61	0.08	1.0	0.2	<0.02	<0.015		
L50M (LNS 133U)	0.07	1.4	0.3	<0.02	<0.015		
LNS 140A (L-70)	0.08	0.9	0.2	0.03	<0.025	0.4	
LNS 160	0.07	1.0	0.1	0.02	0.015		1
LNS 162	0.08	1.0	0.1	0.02	0.015		2
LNS 165 (LA85)	0.07	1.3	0.2	0.02	0.015	0.2	0.9
LNS T55	0.08	1.7	0.7	<0.015	<0.015		

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

### Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Impact ISO-V(J)	
				-20°C	-40°C
L-61	TR	450	550	60	
L50M (LNS 133U)	TR	470	570	80	
LNS 140A (L-70)	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 / STANDARD	TYPE	Two-run
		LNS140A (L-70) AW
<b>General Structural steel</b>		
EN 10025 part 6	S200A	x
EN 10025 part 3/part 4	S275 to 460 N, NL, M & ML	x
EN10149	S315 to S500MC & NC	x
EN 10025 part 2	S185, S235, S275, S355	x
<b>Pipe material</b>		
API 5LX	X 42 to X70	x
<b>Boiler &amp; pressure vessel steel</b>		
EN 10028-1	P235 to P460 all qualities	x
EN 10207	P235 to P275 S & SL	x
A36-601 & NF A36-605	A37 to A52 CP, AP & FP	x
EN 10222	P285 & P420 all qualities	x
<b>Offshore plates</b>		
A36-212	PF 24 to PF 36 all qualities	x

## Flux characteristics

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

## Packaging and available sizes

Unit	Net weight (kg)
Bag	25
Sahara ReadyBag™ (SRB)	25
Big Bag	500
Big Bag	600
Big Bag	1000

## 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 / LNS 135	F7A4/F7P6-EM12	S 38 4 AB S2	S 4T 2 AB S2
P230 / L-61	F7A4/F6P5-EM12K	S 38 4 AB S2Si	
P230 / L50M (LNS133U)	F7A5/F7P5-EH12K	S 42 5 AB S3Si	
P230 / LNS 140A	F8A4-EA2-A2	S 46 4 AB S2Mo	S 4T 4 AB S2Mo
P230 / L-70	F8A4-EA1-A2	S 46 4 AB S2Mo	S 4T 4 AB S2Mo
P230 / LNS 160	F7A8/F7P8-ENi1-Ni1	S 46 4 AB S2Ni1*	
P230 / LNS 162	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	BV	ABS	LRS	DNV	GL	RMRS	RINA	TÜV
L-61		3M3YM	3YM/3YT				3YM/3YT	X
L50M (LNS 133U)	A3M,A3YM		4Y40M/4Y40T	4YM				X
LNS 140A	A4YTM	3YM/2YT			3Y40TM	3YM/2YT	4YM/3YT	X
L-70	A4YTM	3YM/2YT			3Y40TM	3YM/2YT	4YM/3YT	X
LNS 135								X
LNS 162								X
LNS 160								X
LNS T55								X

### 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		
LNS 135	0.07	1.4	0.25	<0.030	<0.020		
L50M (LNS 133U)	0.08	1.8	0.5	<0.030	<0.020		
LNS 140A (L-70)	0.07	1.4	0.4	<0.030	<0.020	0.5	
LNS 160	0.07	1.4	0.25	<0.030	<0.020		1.1
LNS 162	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, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-60°C
LNS 135	AW	400	500	30	50		
L-61	AW	450	520	30	100		
	SR	400	490	30	140	80	
L50M (LNS 133U)	AW	480	580	30		80	
	SR	460	540	28		70	
LNS 140A (L-70)	MR	540	620	28	70		
LNS 140A (L-70)	TR		620			60	
LNS 160	AW	490	570	28		120	45
	SR	430	550	28		140	75
LNS 162	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

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## 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 / STANDARD	TYPE	Multirun			
		LNS135	L61	L50M/ LNS133U	LNS140A /L-70
<b>Ship plates</b>					
	A to D	x	x	x	x
	AH(32),DH(40)	x	x	x	x
<b>General Structural steel</b>					
EN 10025 part 6	500A				x
EN 10025 part 3/part 4	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
EN 10149	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 <sup>3</sup> )	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 / LNS 150 (LA92)	F8P2-EB2-B2R		S CrMo1
P230 / LNS 151 (LA93)	F9PZ-EB3-B3R		S CrMo2
P230 / LNS 163		S 38 0 AB SZ	
P230 / LNS 164	F9A6-EF1*-F3	S 50 4 AB S3NiMo1	
P230 / LNS 167	F8A6/F7P6-EF1*-F1	S 50 4 AB S2NiMo1	
P230 / LNS 168		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

### Approvals

Wire grade	TÜV
LNS 164	X
LNS 167	X

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

Wire grade	C	Mn	Si	P	S	Mo	Ni	Cr	Cu
LNS 150 (LA92)	0.08	1.1	0.3	<0.020	<0.010	0.5		0.9	
LNS 151 (LA93)	0.12	0.8	0.3	<0.020	<0.010	1.0		2.6	
LNS 163	0.07	1.1	0.6	0.020	0.020		0.7		0.7
LNS 164	0.07	1.5	0.3	<0.020	<0.010	0.5	1.0		
LNS 167	0.09	1.1	0.3	<0.020	<0.015	0.5	1.0		
LNS 168	0.08	1.7	0.4	<0.020	<0.020	0.4	2.4	0.25	

### Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
					0°C	-20°C	-40°C
LNS 150 (LA92)	SR	535	620	25	70	90**	60**
LNS 151 (LA93)	SR	560	640	24		30	
LNS 163	AW	450	600	20	60	50	
LNS 164	AW	630	710	22	90	80	50
	SR	630	710	24	70	60	35
LNS 167	AW	550	635	22		100	70
	SR	565	650	22		80	65
LNS 168	AW	710	840	20		65	min. 47

MR: multi run

TR: two-run

\*\*SR=2h/720°C

P230-2: 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 / STANDARD	TYPE	Multirun				
		LNS150 (LA92)	LNS151 (LA93)	LNS164	LNS167	LNS168
<b>Pipe material</b>						
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	
<b>Fine grained steel</b>						
EN 10025 part 3/part 4	S420			x	x	
EN 10025 part 6	S460			x	x	
<b>Boiler &amp; pressure vessel steel</b>						
EN 10028-2	13CrMo 4-5	x	x			
Elevated temperature steel	10CrMo 9-10	x	x			
Low temperature steels	11MnNi5-3					x
EN 10028-4/10222-3	13MnNi6-3					x
<b>High strength steel</b>						
EN 10025 part 6	S460, S500				x	x

## Flux characteristics

Current type	DC (+,-) / AC
Basicity (Boniszewski)	1,6
Solidification speed	High
Density (kg/dm <sup>3</sup> )	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 / L61 (LNS129)	F7A4-EM12K	S 42 4 FB S2Si
P240 / L50M (LNS133U)	F7A/P8-EH12K	S 42 6 FB S3Si
P240 / LNS 160	F7A/P10-ENi1-Ni1	S 46 6 FB S2Ni1*
P240 / LNS 162	F7A/P10-ENi2-Ni2	S 46 6 FB S2Ni2*
P240 / LNS 165 (LA85)	F8A/P8-ENi5-Ni5	S 50 6 FB Sz
P240 / LNS 150 (LA92)	F8P2-EB2-B2R	
P240 / LNS 151 (LA93)	F9P0-EB3-B3R	
P240 / LNS 168	F6A5-EM2-M2	S 69 4 FB S0

\* 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	TÜV
L50M (LNS 133U)	3YM	A3M,A3YM	YM>47J<	4Y40M	6YM	x	3YM	X
LNS 162								X
LNS 160								X
LNS 164								X

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

Wire grade	C	Mn	Si	S	P	Ni	Mo	Cr
L61 (LNS129)	0.08	1.0	0.35	< 0.010	< 0.010			
L50M (LNS 133U)	0.08	1.6	0.35	< 0.015	< 0.020			
LNS 160	0.08	1	0.25	< 0.015	< 0.020	1		
LNS 162	0.08	1	0.25	< 0.015	< 0.020	2.2		
LNS 165	0.08	1.3	0.35	< 0.015	< 0.020	0.9	0.15	
LNS 150 (LA92)	0.08	1.2	0.3	< 0.010	< 0.015		0.15	1.1
LNS 151 (LA93)	0.10	0.7	0.3	< 0.010	< 0.015		1.0	2.5
LNS 168	0.08	1.5	0.4	< 0.015	< 0.015	2.4	0.4	0.3

### Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)			
					-20°C	-40°C	-50°C	-60°C
L61 (LNS129)	AW	440	530	30	115	75		
L50M (LNS 133U)	AW	460	560	28				40
	SR	420	540	28				40
LNS 160	AW	470	550	28				80
	SR	430	490	32				100
LNS 162	AW	480	560	26				100
	SR	460	530	30				140
LNS 165	AW	520	600	25				60
	SR	510	580	24				60
LNS 150 (LA92)	SR	520	610	24				100
LNS 151 (LA93)	SR	550	640	24				50
LNS 168	AW	790	840	20			55	

AW : As welded  
 SR: Stress relieved

P240: rev. EN 24

**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 / STANDARD	TYPE	Multirun					
		L50M (LNS133U)	LNS160	LNS162	LNS165	LNS150 (LA92)	LNS151 (LA93)
<b>Ship plates</b>							
	A to E,	x	x	x	x		
	AH32 to EH40	x	x	x	x		
<b>General structural steel</b>							
EN 10025 part 6 (A 36-204)	500 A & AL				x		
EN 10025 part 3/part 4	S275 to S460 all qualities	x	x	x	x		
EN 10149 (A36-231)	S315 to S460 MC & NC	x	x	x	x		
	S315 to S500 MC & NC				x		
EN 10025 part 2	S185 to E360 all qualities	x	x	x	x		
<b>Boiler &amp; pressure vessel steel</b>							
EN 10028 (A 36-205)	P235 to P460 all qualities	x	x	x	x		
EN 10207 (A36-220)	P235 to P275 all qualities	x	x	x	x		
A36-601 & NF A36-605	A37 to A52 all qualities	x	x	x	x		
EN 10028-2	13CrMo 4-5					x	x
(Elevated temperature steel)	10CrMo 9-10					x	x
<b>Steel for dangerous material transportation</b>							
A 36-215	P265 to P460 all qualities	x	x	x	x		
<b>Low temperature steels</b>							
	P285 to P420 all qualities	x	x	x	x		

## Flux characteristics

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

## Packaging and available sizes

Unit	Net weight (kg)
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	ISO 18274 : S Ni 6625	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	
LNS 310	S 25 20	

### General description

Stainless steel welding flux

Excellent slag release

Low flux consumption

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

Wire grade	C	Mn	Si	Cr	Ni	Mo	N	Nb	Cu	W	FN
LNS 304L	0.015	1.5	0.5	19	10						08-10
LNS 309L	0.015	1.5	0.5	23	13						10-20
LNS 316L	0.015	1.5	0.5	18	12	2.5					08-10
LNS 4462	0.015	1.5	0.5	22	8	3	0.1				40-60
LNS 318	0.04	1.5	0.5	19	11	2.5		0.5			08-10
LNS 347	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	
LNS 4439Mn	0.025	3.6	0.5	18	17	3.6	0.15				
LNS 4455	0.025	6	0.5	18.5	15	2.6	0.15				
LNS 4500	0.03	1.5	0.6	19	25	4.1			1.2		
LNS 310	0.5	1.7	0.5	25	21						

### Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
					-20°C	-40°C	-196 °C
LNS 304L	AW	380	550	35	80		
LNS 309L	AW	425	580	33		80	
LNS 316L	AW	425	560	33			50
LNS 4462	AW	550	800	27		50	
LNS Zeron 100X	AW	670	880	21	70	45	
LNS NiCro 60/20	AW	520	780	40			100
LNS 4439Mn	AW	375	630	33			
LNS 4455	AW	360	640	30			
LNS 310	AW	440	600	28			

P2000: 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

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
<b>304L</b>	1.4306	X2 CrNi 19-11	(TP) 304L	S30403	LNS 304L
<b>304LN</b>	1.4311	X2 CrNiN 18-10	(TP) 304LN	S30453	LNS 304L
<b>316LN</b>	1.4406	X2 CrNiMoN 17-11-2	(TP) 316LN	S31653	LNS 316L
<b>316L</b>	1.4404	X2 CrNiMo 17-12-2	(TP) 316L	S31603	LNS 316L
<b>316L</b>	1.4435	X2 CrNiMo 18-14-3	(TP) 316L	S31603	LNS 316L
<b>316LN</b>	1.4429	X2 CrNiMoN 17-13-3			LNS 316L
<b>304</b>	1.4301	X4 CrNi 18-10	(TP) 304	S30409	LNS 304L
<b>321</b>	1.4541	X6 CrNiTi 18-10	(TP) 321	S32100	LNS 304L/347
<b>316</b>	1.4401	X4 CrNiMo 17-12-2	(TP) 316	S31600	LNS 316L
<b>316</b>	1.4436	X4 CrNiMo 17-13-3			LNS 316L
<b>347</b>	1.4550	X6 CrNiNb 18-10	(TP) 347	S34700	LNS 304L/347
<b>318</b>	1.4580	X6 CrNiMoNb 17-12-2	316Cb	S31640	LNS 316L/318
<b>318</b>	1.4583	X10 CrNiMoNb 18-12(DIN)			LNS 316L/318
<b>317LN</b>	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
			Zeron 100	S32760	LNS Zeron 100 X
	2.4856	NiCr22Mo9Nb(DIN)		N06625	LNS NiCr 60/20
	1.5637	12Ni14 (DIN)			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 <sup>3</sup> )	1,2
Grain size	2-20

## Packaging and available sizes

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

## Flux

### Classification

Flux P2007	EN 760 :	S A AF 2 64 AC H5	Wire	ISO 18274	AWS A5.14/A5.14M
LNS 304L	S 19 9 L	ER308L	LNS NiCro 60/20	S Ni 6625	ERNiCrMo-3
LNS 309L	S 24 12 L	ER309L	LNS NiCroMo 60/16	S Ni 6276	ERNiCrMo-4
LNS 316L	S 19 12 3 L	ER316L	LNS NiCroMo 59/23	S Ni 6059	ERNiCrMo-13
LNS 4462	S 22 9 3 N L	ER2209	LNS NiCro 70/19	S Ni 6082	ERNiCr-3
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	
LNS 309L	x	x	x	
LNS 316L	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
LNS 304L	0.015	1.5	0.5	19	10						08-10
LNS 309L	0.015	1.5	0.5	23	13						10-20
LNS 316L	0.015	1.5	0.5	18	12	2.5					08-10
LNS 4462	0.015	1.5	0.5	22	8	3	0.1				40-60
LNS 318	0.04	1.5	0.5	19	11	2.5		0.5			08-10
LNS 347	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	
LNS 4439Mn	0.025	3.6	0.5	18	17	3.6	0.15				
LNS 4455	0.025	6	0.5	18.5	15	2.6	0.15				
LNS 4500	0.03	1.5	0.6	19	25	4.1			1.2		

P2007: rev. EN 03

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## Mechanical properties, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)			
					-20°C	-40°C	-50°C	-196 °C
LNS 304L	AW	390	550	35	80	75		40
LNS 309L	AW	400	580	33		70		
LNS 316L	AW	400	560	33	75	70		45
LNS 347	AW	400	650	34			65	
LNS 4462	AW	585	765	27		75		
LNS NiCro 60/20	AW	520	780	40				100
LNS Zeron 100X	AW	670	880	21	70	45		
LNS 4439Mn	AW	375	630	33				

## 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
<b>304L</b>	1.4306	X2 CrNi 19-11	(TP) 304L	S30403	LNS 304L
<b>304LN</b>	1.4311	X2 CrNiN 18-10	(TP) 304LN	S30453	LNS 304L
<b>316LN</b>	1.4406	X2 CrNiMoN 17-11-2	(TP) 316LN	S31653	LNS 316L
<b>316L</b>	1.4404	X2 CrNiMo 17-12-2	(TP) 316L	S31603	LNS 316L
<b>316L</b>	1.4435	X2 CrNiMo 18-14-3	(TP) 316L	S31603	LNS 316L
<b>316LN</b>	1.4429	X2 CrNiMoN 17-13-3			LNS 316L
<b>304</b>	1.4301	X4 CrNi 18-10	(TP) 304	S30409	LNS 304L
<b>321</b>	1.4541	X6 CrNiTi 18-10	(TP) 321	S32100	LNS 304L/347
<b>316</b>	1.4401	X4 CrNiMo 17-12-2	(TP) 316	S31600	LNS 316L
<b>316</b>	1.4436	X4 CrNiMo 17-13-3			LNS 316L
<b>347</b>	1.4550	X6 CrNiNb 18-10	(TP) 347	S34700	LNS 304L/347
<b>318</b>	1.4580	X6 CrNiMoNb 17-12-2	316Cb	S31640	LNS 316L/318
<b>318</b>	1.4583	X10 CrNiMoNb 18-12(DIN)			LNS 316L/318
<b>317LN</b>	1.4439	X2 CrNiMoN 17-13-5	316LN	S31726	4439Mn
	1.4539	X1 NCrMoCu 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 <sup>3</sup> )	1,2
Grain size	2-20

## Packaging and available sizes

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

## Flux

### Classification

Flux P2000S :	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
LNS 309L	0.015	1.5	0.5	25	13				15-20
LNS 4462	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, typical, all weld metal

Wire grade	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	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

**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

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

Dissimilar  
Duplex

## Flux characteristics

Current type	DC (+,-)
Basicity (Boniszewski)	1,6
Solidification speed	high
Density (kg/dm <sup>3</sup> )	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 / ISO 18974
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
LNS 4455	0.02	7.5	0.6	19	16	2.7	0.13		bal.
LNS 4465	0.02	6	0.6	25	23	2	0.12		bal.
LNS 4500	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, typical, all weld metal

Wire grade	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-100 °C	-196 °C
LNS 4455	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

**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

Good slag release

AC/DC welding and for multi wire systems

## Materials to be welded

AISI	Mat.nr.	EN	UNS
<b>317L</b>	1.4438	X2 CrNiMo 18-15-4	
<b>317LN</b>	1.4439	X2 CrNiMoN 17 13 5	
	1.4455		
	1.4465		
<b>904L</b>	1.4539	X1 NiCrMoCu 25-20-5	N08904
	1.4563	X1 NiCrMoCu 31-27-4	N08028
<b>Alloy 254</b>		X4 CrNi 18-10	S31254
<b>Alloy 625</b>	2.4856	NiCr 22 Mo 9 Nb	N06625
<b>Special</b>	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 <sup>3</sup> )	1,1
Grain size	2-20

## Packaging and available sizes

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

## Cellulosic electrode

### Classification

AWS A5.1 : E6010  
 ISO 2560-A : E 42 3 C 25

### General description

All-position cellulosic pipe electrode designed for all position pipe welding, including vertical down root pass welding  
 Designed for root pass welding of pipe up to and including X80, fill and cap pass welding up to and including X60  
 Light slag with little slag interference for easy arc control  
 Easy slag release and smooth bead appearance  
 Deep penetration with maximum dilution  
 X-ray quality welds, even out of position

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PG/3Gdown PE/4G PF/5Gup PG/5Gdown

### Current type

DC + / -

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

C	Mn	Si	P	S
0.11	0.55	0.18	0.009	0.009

### Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-29°C	-30°C
Required: AWS A5.1		min. 331	min. 414	min. 22	27	
ISO 2560-A		min. 420	500-640	min. 20		47
Typical values	AW	420-524	503-594	24-33	51-85	

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	350
Unit: Metal can	Net weight/unit (kg)	4.5	4.5	4.5

### Identification

Imprint: 6010 PIPELINER 6P+

Tip Color: none

PIPELINER® 6P+: rev. EN 21

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5LX                              X42, X46, X52, X56, X60

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at (s)*	Energy - at max. current E(kJ)	Dep.rate - H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5x350	40-70	DC+/-						
3.2x350	65-130	DC+/-						
4.0x350	90-175	DC+/-						
5.0x350	140-225	DC+/-						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions	
	5G up	5G down
3.2	90A	110A
4.0	130A	150A
5.0	150A	165A

## Remarks/ Application advice

Preheating pipe material L360 (X52) required (acc. EN 1011-1).

Pipeclamps to be removed after finishing root pass, start welding hot pass (within 5 min) after root pass

Use electrodes directly from metal cans

## High strength cellulosic electrode

### Classification

AWS A5.5 : E8010-P1  
ISO 2560-A : E 46 4 1Ni C 25

### General description

Designed for vertical down welding of pipes up to and including X70  
Excellent resistance to porosity, X-ray quality welds  
High stacking efficiency: fill joints in fewer passes  
Exceptional mechanical properties

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PG/3Gdown PE/4G PF/5Gup PG/5Gdown

### Current type

DC +

### Approvals

ABS

+

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

C	Mn	Si	Ni	Mo	P	S
0.17	0.7	0.25	0.8	0.2	0.01	0.01

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
					-29°C	-40°C	-46°C
Required: AWS A5.5		min. 460	min. 550	min. 19	27		
ISO 2560-A		min. 460	530-680	min. 20		min. 47	
Typical values	AW	460-559	550-676	20-27	62-99		46-84

### Packaging and available sizes

	Diameter (mm)	3.2	4.0	5.0
	Length (mm)	350	350	350
Unit: Metal can	Net weight/unit (kg)	4.5	4.5	4.5

### Identification

Imprint: 8010-P1 PIPELINER 8P+

Tip Color: none

PIPELINER® 8P+: rev. EN 21



## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5LX                              X56, X60, X65, X70

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. (s)*	Energy E(kJ)	Dep.rate - current - H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
3.2 x 350	75 - 130	DC+						
4.0 x 350	90 - 185	DC+						
5.0 x 350	140 - 225	DC+						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions	
	5G up	5G down
3.2	90A	110A
4.0	130A	150A
5.0	150A	165A

## Remarks/ Application advice

Preheating pipe material L360 - L480 (X56 - X70) required (acc. EN 1011-1).

Pipeclamps to be removed after finishing root pass, start welding hot pass (within 5 min) after root pass

Use electrodes directly from metal cans

Use PIPELINER 6P+ for lower hardness in the root pass when required

## Basic electrode

### Classification

AWS A5.1 : E7016 H4  
ISO 2560-A : E 42 3 B 12 H5

### General description

Designed for vertical up root pass welding of pipes up to and including X80  
Suitable for hot, fill, and cap pass welding for up to and including X65  
Excellent low temperature impact properties  
Square burnoff makes welding easier, especially in critical pipe welding applications  
Open gap root pass welding with 2.5 and 3.2 mm electrodes using DC - / + polarity

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

DC - / +, AC

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

C	Mn	Si	P	S
0.06	1.3	0.5	0.013	0.009

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-29°C	-30°C
Required: AWS A5.1		min. 400	min. 480	min. 22	27	
ISO 2560-A		min. 420	500-640	min. 20		min. 47
Typical values	AW	448-566	550-640	25-32	54-122	

### Packaging and available sizes

	Diameter (mm)	2.5	3.2	4.0
	Length (mm)	350	350	450
Unit: Metal can	Net weight/unit (kg)	22.7	22.7	22.7

### Identification

Imprint: 7016 H4 PIPELINER 16P

Tip Color: none

PIPELINER® 16P: rev. EN 21

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5LX                              X42, X46, X52, X56, X60, X65

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate - H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
2.5 x 350	55 - 80	DC+						
3.2 x 350	75 - 120	DC+						
4.0 x 350	120 - 160	DC+						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions				
	1G	2F	2G	3Gup	4G
2.5	80A	85A	85A	85A	80A
3.2	120A	115A	115A	115A	110A
4.0	170A	180A	180A	180A	160A

## Remarks/ Application advice

Preheating pipe material L360 - L445 (X56 - X65) required (acc. EN 1011-1).

## Basic electrode

### Classification

AWS A5.5 : E8018-G-H4R  
 ISO 2560-A : E 50 6 Mn1Ni B 32 H5

### General description

Designed for vertical up fill and cap pass welding of welding of high strength pipe up to and including X70  
 Excellent low temperature impact properties down to -60°C  
 Square burnoff makes welding easier, especially in critical pipe welding applications

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PE/4G PF/5Gup

### Current type

AC / DC + / -

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

C	Mn	Si	P	S	Ni
0.05	1.5	0.5	0.010	0.005	0.95

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-46°C	-60°C
Required: AWS A5.1		min. 460	min. 550	min. 19	not required	
ISO 2560-A		min. 500	560-720	min. 18	min. 47	
Typical values	AW	550	640	24	80	

### Packaging and available sizes

	Diameter (mm)	3.2	4.0
	Length (mm)	350	350
Unit: Metal can	Pieces / unit	123	75
	Net weight/unit (kg)	4.2	4.0

Identification Imprint: 8018-G H4R PIPELINER 18P Tip Color: none

PIPELINER® 18P: rev. EN 21

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5LX                              X 56, X60, X65, X70, X80

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
3.2 x 350	80 - 145	DC+	66	220	1.2	37.7	48	1.79
4.0 x 350	120 - 185	DC+	77	355	1.6	54.1	29	1.59

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions					
	1G	2F	2G	3Gup	4G	5G up
3.2	140A	120A	145A	120A	120A	120A
4.0	150A	140A	150A	140A	135A	140A

## Remarks/ Application advice

Preheating pipe material L360 - L480 (X56 - X70) required (acc. EN 1011-1).

# PIPELINER® LH-D80

## High strength basic electrode

### Classification

AWS A5.5 : E8048-P2 H4R  
ISO 2560-A : E 46 4 Z 1Ni B 45 H5

### General description

Specifically designed for vertical down

Basic covered low hydrogen electrode primarily designed for vertical down hot, fill and cap pass pipe welding

Recommended for pipe grades up to and including X70

Low temperature impact properties down to -46°C.

Unique "hot start" tip helps initiate the arc and quickly establish puddle control

Slag design allows for easy control of weld puddle

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G Pg/3Gdown PE/4G PG/5Gdown

### Current type

AC / DC + / -

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

C	Mn	Si	P	S
0.05	1.15	0.45	0.010	0.010

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-30°C	-46°C
Required: AWS A5.5		min. 460	min. 550	min. 19	27	
ISO 2560-A		min. 460	530 - 680	min. 20	min. 47	
Typical values	AW	523-543	599-618	25-30	80	50-95

### Packaging and available sizes

	Diameter (mm)	3.2	4.0	4.5
	Length (mm)	350	350	350
Unit: Metal can	Net weight/unit (kg)	4.5	4.5	4.5

Identification Imprint: LH-D80 8018-G

Tip Color: none

PIPELINER® LH-D80: rev. EN 21

**LINCOLN**  
**ELECTRIC**

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[www.lincolnelectric.eu](http://www.lincolnelectric.eu)

# PIPELINER® LH-D80

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5 L      X60, X65, X70

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
3.2 x 350	140 - 170	DC+						
4.0 x 350	180 - 240	DC+						
4.5 x 350	200 - 260	DC+						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions PG/5G down
3.2	140-170A
4.0	180-240A
4.5	200-260A

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# PIPELINER® LH-D90

## High strength basic electrode

### Classification

AWS A5.5 : E8010-45-P2 H4R  
EN 757 : E 55 4 ZB 45 H5

### General description

Basic covered low hydrogen electrode primarily designed for vertical down hot, fill and cap pass pipe welding

Recommended for pipe grades up to and including API 5L Grade X80

High deposition rates and excellent low temperature impact properties down to -46°C.

Unique "hot start" tip helps initiate the arc and quickly establish puddle control

Slag design allows for easy control of weld puddle

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G Pg/3Gdown PE/4G PG/5Gdown

### Current type

AC / DC + / -

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

C	Mn	Si	P	S	Ni	Mo
0.05	1.30	0.50	0.010	0.0100.80 / 0.25(3.2mm)0.2		

### Mechanical properties, typical, all weld metal

	Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
					-29°C	-50°C
Required: AWS A5.5		min. 530	min. 620	min. 17	27	
EN 757		min. 550	610-780	min. 18		min. 47
Typical values	AW	550-600	630-670	24-28	90-120	65-95

### Packaging and available sizes

	Diameter (mm)	3.2	4.0	4.5
	Length (mm)	350	350	350
Unit: Metal can	Net weight/unit (kg)	4.5	4.5	4.5

Identification Imprint: LH-D90 9018-G

Tip Color: None

PIPELINER® LH-D90: rev. EN 21

**LINCOLN**  
**ELECTRIC**

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# PIPELINER® LH-D90

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5 L                      X65, X70, X80

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
3.2 x 350	140 - 170	DC+						
4.0 x 350	180 - 240	DC+						
4.5 x 350	200 - 260	DC+						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions PG/5G down
3.2	140-170A
4.0	180-240A
4.5	200-260A

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# PIPELINER® LH-D100

## High strength basic electrode

### Classification

AWS A5.5 : E10045-P2 H4R  
ISO 18275 : E 69 15 GA H5

### General description

Basic covered low hydrogen electrode primarily designed for vertical down hot, fill and cap pass pipe welding  
Recommended for pipe grades up to and including API 5L Grade X90  
High deposition rates and excellent low temperature impact properties down to -46°C.  
Unique “hot start” tip helps initiate the arc and quickly establish puddle control  
Slag design allows for easy control of weld puddle

### Welding positions



### Current type

AC / DC + / -

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

C	Mn	Si	P	S	Ni	Mo
0.05	1.55	0.50	0.010	0.010	0.9	0.45

### Mechanical properties, typical, all weld metal

Condition	0.2% Proof strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -29°C	-46°C
Required: AWS A5.5	min. 600	min. 690	min. 16	27	
Typical values	AW 620-690	700-750	21-28	75-110	55-85

### Packaging and available sizes

	Diameter (mm)	3.2	4.0	4.5
	Length (mm)	350	350	350
Unit: Metal can	Net weight/unit (kg)	4.5	4.5	4.5

### Identification

Imprint: LH-D100 10018-G

Tip Color: None

PIPELINER® LH-D100: rev. EN 21

# PIPELINER® LH-D100

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

API 5 L                              X70, X80, X90

## Calculation data

Sizes Diam. x length (mm)	Current range (A)	Current type	Arc time - per electrode at max. current - (s)*	Energy E(kJ)	Dep.rate H(kg/h)	Weight/ 1000 pcs. (kg)	Electrodes/ kg weldmetal B	kg Electrodes/ kg weldmetal 1/N
3.2 x 350	20 - 170	DC+						
4.0 x 350	170 - 250	DC+						
4.5 x 350	200 - 300	DC+						

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions PG/5G down
3.2	20-170A
4.0	170-250A
4.5	200-300A

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## Solid wire

### Classification

AWS A5.18 : ER70S-G  
 ISO 14341 : G 38 3 M G2Si / G 38 3 C G2Si

### General description

Specially intended and packaged for the needs of semiautomatic and automatic root pass pipe welding  
 Fluid puddle provides good wash-in at the weld toes and uniform bead shape  
 Clean weld deposit  
 Foil bag packaging guards against moisture  
 Consistent X-ray quality welds  
 Primarily intended for all position welding on pipe steels such as API 5L X42 through X65  
 Suitable for welding root passes for up to and including API 5L X80

### Shielding gases (acc. ISO 14175)

GMAW	M21	Mixed gas Ar+ >15-25% CO <sub>2</sub>
	C1	Active gas 100% CO <sub>2</sub>

### Chemical composition (w%) typical wire

C	Mn	Si	P	S
0.07	1.25	0.55	0.010	0.020

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -18°C
Typical values	C1	AW	439	525	30	95

### Materials to be welded

Steel grades/Standard	Type
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#### Pipe material

API 5LX	X42, X46, X52, X56, X60, X65
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### Packaging and available sizes

Unit	Diameter (mm)	
	1.1	1.3
4.5 kg Plastic spool SFB	X	X
11.3 kg Plastic spool SFB	X	X

SFB = Sealed Foil Bag

PIPELINER® 70S-G: rev. EN 22

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## Solid wire

### Classification

AWS A5.18 : ER80S-G  
ISO 14341 : G 50 3 M G4Si1

### General description

Specially intended and packaged for the needs of semiautomatic and automatic root pass pipe welding  
Fluid puddle provides good wash-in at the weld toes and uniform bead shape  
Clean weld deposit  
Foil bag packaging guards against moisture  
Consistent X-ray quality welds  
Primarily intended for all position welding on pipe steels such as API 5L X65 through X80

### Shielding gases (acc. ISO 14175)

GMAW M21 Mixed gas Ar+ >15-25% CO<sub>2</sub>

### Chemical composition (w%) typical wire

C	Mn	Si	P	S	Mo
0.09	1.72	0.61	0.012	0.007	0.45

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -29°C
Typical values	M21	AW	634	710	23	147

### Materials to be welded

Steel grades/Standard Type

#### Pipe material

API 5LX X65, X70, X80

### Packaging and available sizes

Unit	Diameter (mm)	
	1.1	1.3
4.5 kg Plastic spool SFB	X	X
11.3 kg Plastic spool SFB	X	X

SFB = Sealed Foil Bag

PIPELINER® 80S-G: 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

# PIPELINER® 80Ni1

## Low alloy solid wire

### Classification

AWS A5.28/A5.28M : ER80S-G  
EN14341-A : G 3Ni1

### General description

Pipelinor® 80Ni1 micro-alloyed MIG wire is designed for semi-automatic or automatic welding of root, hot, fill and cap passes on up to X80 grade pipe and root passes on up to X100 grade pipe. Capable of producing Charpy V-Notch impact properties of 69 - 95 J @ -50°C, Pipelinor® 80Ni1 is designed for tough pipeline jobs. For an electrode that meets the expanding demands of higher strength pipe and severe conditions - choose Pipelinor® 80Ni1.

### Shielding gases (acc. ISO 14175)

75 - 95% Argon / Balance CO<sub>2</sub>  
100% CO<sub>2</sub>

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PF/3Gup PG/3Gdown PE/4G PF/5Gup PG/5Gdown

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

C	Mn	Si	P	S	Ni	Al	Ti	Cu	Mo	Cr	V
0.07	1.50	0.65	<0.15	<0.15	0.85	<0.01	<0.10	<0.20	<0.01	<0.05	<0.01

### Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation %	Impact ISO-V(J)	
					-29°C	-50°C
Required: AWS A5.28			550			
Typical values	AW	575-615	655-685	27-28	99-119	69-95

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.0	1.2
4.5 kg Plastic spool SFB	X	X
15 kg plastic spool SFB	X	X

SFB = Sealed Foil Bag

PIPELINER® 80Ni1: rev. EN 01

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# PIPELINER® 80Ni1

## Suggestions for use

Optimum performance on vertical down hot, fill and cap passes on standard cross-country pipelines and arctic grade pipe  
For consistently high Charpy-V impact values

## Materials to be welded

Steel grades/Standard	Type
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### Pipe material

API 5LX	X42, X46, X52, X56, X60, X65, X70
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## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed cm/min	Current (approx. A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/ kg Weldmetal
2.0	19	170-330	210-305	18-21		

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## Rutile cored wire

### Classification

AWS A5.20/A5.20M : E71T-1M-JH8 / E71T-9M-JH8  
 EN ISO 17632-A : T 46 4 P M 2 H10

### General description

Mix gas shielded flux cored wire for semi-automatic and mechanized hot, fill and cap pass pipeline welding  
 Smooth, spray type arc transfer and low spatter level

Slag system provides for puddle support, good wetting and bead shape in all positions

All position single and multiple pass wire designed for join pipe up to and including X70

Reliable weld metal properties

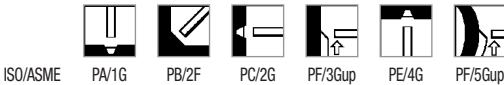
For the root pass, Pipeliner 70S-G is recommended

Excellent wire feeding

In diameter 1.3 mm (0.052") the wire is called PIPELINER AUTOWELD® G70M, and is designed to use with mechanized pipe welding systems.

PIPELINER AUTOWELD® G70M has tightly controlled cast and helix to assure proper wire placement every time

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
 M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
 Amount : 15-25 l/min

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

Shielding gas	C	Mn	Si	P	S	Ni
M21	0.05	1.60	0.45	0.013	0.011	0.36

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J) -40°C
Required: AWS A5.20			min. 400	min. 480	min. 22	min. 27
EN ISO 17632-A			min. 460	530-680	min. 20	min. 47
Typical values	M21	AW	550	612	26	106

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.1	1.3
4.5 kg Plastic spool SFB	X	X
11.3 kg Plastic spool SFB	X	X

SFB = Sealed Foil Bag

PIPELINER® G70M: rev. EN 21

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# PIPELINER® G70M

## Materials to be welded

Steel grades/Standard	Type
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### Pipe material

API 5LX	X42, X46, X52, X56, X60, X65, X70
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## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weldmetal
1.1	19	440-1330	130-275	23-30	1.4-4.4	1.21
1.3	19	380-1140	155-315	22-31	1.6-4.9	1.22

**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

# PIPELINER® G70M-E

## Low temperature rutile cored wire

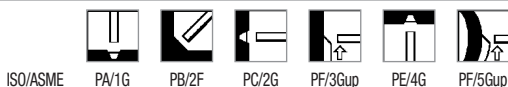
### Classification

AWS A5.29/A5.29M : E81T1-GM-H4  
EN ISO 17632-A : T 50 5 Z P M 2 H5

### General description

All position gas shielded 1% Ni, 0.15% Mo flux cored wire  
Specifically designed for pipeline applications  
Superior weldability, low spatter, good bead appearance  
Outstanding operators appeal  
Exceptional mechanical properties (CVN >47J at -50°C)  
Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
Superior product consistency with optimal alloy control  
Excellent wire feeding

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
Amount : 15-25 l/min

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

Shielding gas	C	Mn	Si	P	S	Ni	Mo
M21	0.05	1.45	0.2	0.013	0.01	0.95	0.15

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
						-20°C	-40°C	-50°C
Required: AWS A5.29			min. 468	550-689	min. 19			
EN ISO 17632-A			min. 500	560-720	min. 18			min. 47
Typical values	M21	AW	580	630	23	100	60	min. 47

### Packaging and available sizes

Unit type	Diameter (mm)
	1.2
4.5 kg Plastic spool S200	X
15 kg Plastic spool B300	X

PIPELINER® G70M-E: rev. EN 04

# PIPELINER® G70M-E

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

EN 10208      L360, L360NB, L360QB, L360MB, L415MB, L415NB, L450MB, L485MB

API 5LX      X52, X60, X65, X70

### Fine grained steel

EN 10025 part 6      S355, S420, S460, S500N, S460NL, S500NL, S500NC, S550NC

## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/ kg weldmetal
1.2	20	445	130	20-22	1.6	1.20
		700	180	23-25	2.5	1.20
		950	220	25-27	3.4	1.20
		1270	265	27-29	4.5	1.20
		1590	305	30-32	5.9	1.20

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions					
	PA/1G	PB/2F	PC/2G	PF/3G up	PF/5G up	PE/4G
1.2	230-280A	230-280A	200-240	200-240	200-240	160-220
	26-32V	26-32V	25-32V	25-28V	25-28V	23-28V

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## Rutile cored wire

### Classification

AWS A5.29/A5.29M : E101T1-G-H8  
EN 12535 : T 62 3 P M 2 H10

### General description

Mix gas shielded flux cored wire for semi-automatic and mechanized hot, fill and cap pass pipeline welding

Smooth, spray type arc transfer and low spatter level

Slag system provides for puddle support, good wetting and bead shape in all positions

All position single and multiple pass wire designed fo join pipe up to and including X80

For the root pass, the use of PIPELINER 70S-G or 80S-G is recommended

Reliable weld metal properties

Excellent wire feeding

In diameter 1.3 mm (0.052") the wire is called PIPELINER AUTOWELD® G80M, and is designed to use with mechanized pipe welding systems.

PIPELINER AUTOWELD® G80M has tightly controlled cast and helix to assure proper wire placement every time

### Welding positions



ISO/ASME

PA/1G

PB/2F

PC/2G

PF/3Gup

PE/4G

PF/5Gup

### Current type/Shielding gas (ISO 14175)

DC +

M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>

Amount : 15-25 l/min

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

Shielding gas	C	Mn	Si	P	S	Ni	Cr	Mo
M21	0.04	1.75	0.40	0.020	0.010	1.0	0.11	0.25

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)		
						-29°C	-30°C	-40°C
Required: AWS A5.29			min. 605	690-825	min. 16	not required		
EN ISO 17632-A			620	700-890	min. 18	min. 47		
Typical values	M21	AW	724	765	21	46	39	

### Packaging and available sizes

Unit type	Diameter (mm)		
	1.1	1.3	1.3
4.5 kg Plastic spool SFB	X	X	X
11.3 kg Plastic spool SFB	X	X	X

SFB = Sealed Foil Bag

PIPELINER® G80M: 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

# PIPELINER® G80M

## Materials to be welded

Steel grades/Standard	Type
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### Pipe material

API 5LX	X70, X80
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## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weldmetal
1.1	19	440-1330	130-275	23-30	1.4-4.4	1.21
1.3	19	380-1140	155-315	22-31	1.6-4.9	1.22

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# PIPELINER® G80M-E

## Low temperature rutile cored wire

### Classification

AWS A5.29/A5.29M : E91T1-GM-H4  
EN ISO 18276-A : T 55 4 Z P M 2 H5

### General description

All position gas shielded 1% Ni and 0.4%Mo alloyed flux cored wire for offshore and pipeline applications  
Superior weldability, low spatter, good bead appearance and outstanding operators appeal  
Exceptional mechanical properties  
Very low hydrogen ( $H_{DM} < 5 \text{ ml/100g}$ )  
Superior product consistency with optimal alloy control  
Excellent wire feeding  
Specific design to withstand high heat input procedures

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
Amount : 15-25 l/min

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

Shielding gas	C	Mn	Si	P	S	Ni	Mo
M21	0.06	1.4	0.3	0.013	0.01	0.95	0.4

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength	Tensile strength	Elongation	Impact ISO-V(J)	
			(N/mm <sup>2</sup> )	(N/mm <sup>2</sup> )	(%)	-40°C	-50°C
Required: AWS A5.29			min. 540	620-760	min. 17		
EN ISO 18276-A			min. 550	640-820	min. 18	min. 47	
Typical values	M21	AW	695	740	21		65

### Packaging and available sizes

Unit type	Diameter (mm)
	1.2
4.5 kg Plastic spool S200	X
15 kg Plastic spool B300	X

PIPELINER® G80M-E: rev. EN 04

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# PIPELINER® G80M-E

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

EN 10208                      L360, L360NB, L360QB, L360MB, L415MB, L415NB, L485MB, L555MB  
API 5LX                        X60, X65, X70, X80

## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weldmetal
1.2	20	445	130	20-22	1.6	1.20
		700	180	23-25	2.5	1.20
		950	220	25-27	3.4	1.20
		1270	265	27-29	4.5	1.20
		1590	305	30-32	5.9	1.20

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions					
	PA/1G	PB/2F	PC/2G	PF/3G up	PF/5G up	PE/4G
1.2	230-280A	230-280A	200-240	200-240	200-240	160-220
	26-32V	26-32V	25-32V	25-28V	25-28V	23-28V

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# PIPELINER® G90M-E

## High strength rutile cored wire

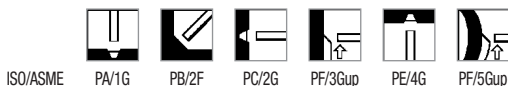
### Classification

AWS A5.29/A5.29M : E111T1-GM-H4  
EN ISO 18276-A : T 69 4 Z P M 2 H5

### General description

All position gas shielded rutile flux cored wire, for high strength steel grades like grade X70-X80  
Outstanding operator appeal  
Excellent mechanical properties (CVN >50J at -40°C)  
Very low hydrogen (H<sub>DM</sub> <5 ml/100g)  
Superior product consistency with optimal alloy control  
Excellent wire feeding

### Welding positions



### Current type/Shielding gas (ISO 14175)

DC +  
M21 : Mixed gas Ar+ (>15-25%) CO<sub>2</sub>  
Amount : 15-25 l/min

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

Shielding gas	C	Mn	Si	P	S	Ni	Mo
M21	0.06	1.	0.2	0.015	0.01	2.0	0.5

### Mechanical properties, typical, all weld metal

	Shielding gas	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact ISO-V(J)	
						-30°C	-40°C
Required: AWS A5.29			min. 680	760-900		min. 27	
EN ISO 18276-A			min. 690	770-970	min. 17		min. 47
Typical values	M21	AW	740	790	19	75	70

### Packaging and available sizes

Unit type	Diameter (mm)	
	1.2	1.6
4.5 kg Plastic spool S200	X	
15 kg Plastic spool B300	X	X

PIPELINER® G90M-E: rev. EN 04

**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



# PIPELINER® G90M-E

## Materials to be welded

Steel grades/Standard      Type

### Pipe material

EN 10208-2      L485MB, L555MB

API 5LX      X70, X80

## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed (cm/min)	Current (A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/kg weldmetal
1.2	20	445	130	20-22	1.6	1.20
		700	180	23-25	2.5	1.20
		950	220	25-27	3.4	1.20
		1270	265	27-29	4.5	1.20
		1590	305	30-32	5.9	1.20
1.6	20	320	170	21-23	1.9	1.20
		510	235	22-24	3.1	1.20
		635	275	24-25	3.9	1.20
		760	310	25-27	4.7	1.20
		890	350	27-29	5.6	1.20
		1015	385	28-30	6.4	1.20
		1080	400	30-31	6.8	1.20

## Welding parameters, optimum fill passes

Diameter (mm)	Welding positions				
	PA/1G	PB/2F	PC/2G	PF/3G up	PE/4G
1.2	230-280A	230-280A	200-240	200-240	160-220
	26-32V	26-32V	25-32V	25-28V	23-28V
1.6	250-350A	250-350A	230-280A	220-260A	170-240A
	24-29V	24-29V	24-28V	24-26V	22-26V

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# PIPELINER® NR®-207+

## Self-shielded cored wire

### Classification

AWS A5.29/A5.29M : E71T8-K6

### General description

Optimum performance on vertical down hot, fill and cap pass welding in pipe steels such as API 5L X42 through X70

Self-shielded, flux cored. No need for external gas or flux

Produces quality welds in moderate wind conditions with no tenting

Superior arc characteristics and feedability

Very good crack resistance, CTOD and Charpy-V impact properties

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PG/3Gdown PE/4G PG/5Gdown

### Current type

DC -

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

C	Mn	Si	P	S	Ni	Al
0.04	1.22	0.25	0.010	0.010	0.82	1.1

### Mechanical properties, typical, all weld metal

	Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation %	Impact ISO-V(J)	
					-29°C	-40°C
Required:	AWS A5.29	min. 400	483-620	20	27	not required
Typical values	AW	400-441	517-551	20-33	176-230	147

### Packaging and available sizes

Unit type	Diameter (mm)
	2.0
6,35 kg Coils 14C	X

PIPELINER® NR®-207+: rev. EN 22

# PIPELINER<sup>®</sup> NR<sup>®</sup>-207+

## Suggestions for use

Optimum performance on vertical down hot, fill and cap passes on standard cross-country pipelines and arctic grade pipe

## Materials to be welded

Steel grades/Standard	Type
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### Pipe material

API 5LX	X42, X46, X52, X56, X60, X65, X70
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## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed cm/min	Current (approx. A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/ kg Weldmetal
2.0	19	170-330	210-305	18-21	1.6-3.0	1.21

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# PIPELINER® NR®-207XP

## Self-shielded cored wire

### Classification

AWS A5.29/A5.29M : E71T8-K6

### General description

Optimum performance on vertical down hot, fill and cap pass welding in pipe steels such as API 5L X42 through X70

Self-shielded, flux cored. No need for external gas or flux

Produces quality welds in moderate wind conditions with no tenting

Great arc characteristics and superior feedability

Superior Charpy-V impact properties, consistent down to -40°C. Virtually eliminates Charpy-V impact values below 56J

### Welding positions



ISO/ASME PA/1G PB/2F PC/2G PG/3Gdown PE/4G PG/5Gdown

### Current type

DC -

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

C	Mn	Si	P	S	Ni	Al
0.04	1.15	0.07	0.010	0.010	0.68	1.0

### Mechanical properties, typical, all weld metal

Condition	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation %	Impact ISO-V(J) -29°C	-40°C	
Required: AWS A5.29	min. 400	483-620	20	27	not required	
Typical values	AW	434	545	30	234-340	199

### Packaging and available sizes

Unit type	Diameter (mm)
	2.0
6,35 kg Coils 14C	X

PIPELINER® NR®-207XP: rev. EN 21

# PIPELINER® NR®-207XP

## Suggestions for use

Optimum performance on vertical down hot, fill and cap passes on standard cross-country pipelines and arctic grade pipe  
For consistently high Charpy-V impact values

## Materials to be welded

Steel grades/Standard	Type
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### Pipe material

API 5LX	X42, X46, X52, X56, X60, X65, X70
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## Calculation data

Diameter (mm)	Electrical Stick-out (mm)	Wire feed speed cm/min	Current (approx. A)	Arc Voltage (V)	Deposition Rate (kg/h)	kg Wire/ kg Weldmetal
2.0	19	170-330	210-305	18-21		

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