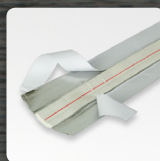
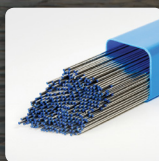


# Product Catalogue



**NSWE and NST seamless wires ■**

**FCAW, TIG, MIG, MMA and ESW welding consumables ■**

**Ceramic backing, wire feeding systems ■**

**and more ...**

Perfect Welding by





**NST (Norsk Sveiseteknikk AS) was established in 1991, enabling us to offer you over 30 years of experience in the welding industry.**

**NST now represents NSWE (Nippon Steel Welding & Engineering) in three world regions, Europe, America and Asia.**

**Our main product is seamless flux and metal cored wires from NSWE, but we also offer a complete NST product range of high quality welding consumables to meet the increasing demands from our customers.**

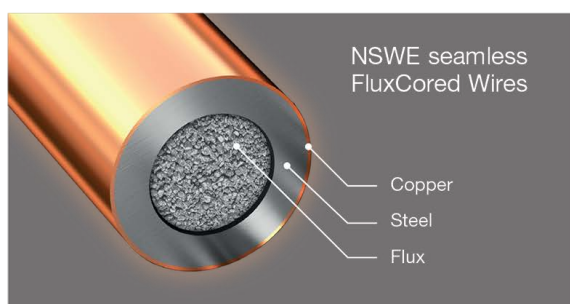
**NST has a highly qualified staff on call to give you full technical and practical support, including welding demonstrations of our products and special training programs tailored to the needs of the individual companies.**

**Our main warehouse facilities in Norway holds about 2.000 tons of welding consumables, ensuring quick and reliable deliveries of large volumes. NST also has warehouses in the UK, Poland and Singapore.**

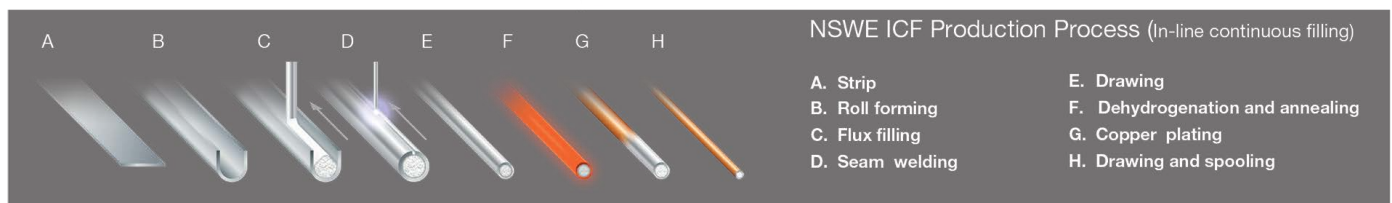
**Our slogan is "Perfect Welding", and with perhaps the highest quality products available today, we at NST are ready to back this up.**

# NSWE seamless flux and metal cored wires.

From the first time they were developed NSWE seamless flux cored wires have continually been adapted to new conditions and requirements from our customers. The unique properties of NSWE's innovative seamless flux and metal cored wires have been developed in step with the renewal of production techniques. The excellent properties are mainly achieved using the NSWE ICF production process (In-line continuous filling) by welding the outer metal layers, joining the seams together and perfectly sealing the flux inside at the time of production. This technique prevents post production atmospheric moisture absorption as well. The biggest advantage with NSWE seamless wires is its extremely low hydrogen content, achieved with heat treatment as an important part of the production process. The copper coating and exact symmetrical cross-sectional shape results in excellent wire feeding properties, tip abrasion resistance and stable targeting, making it ideal also for mechanized/robotic welding purposes.

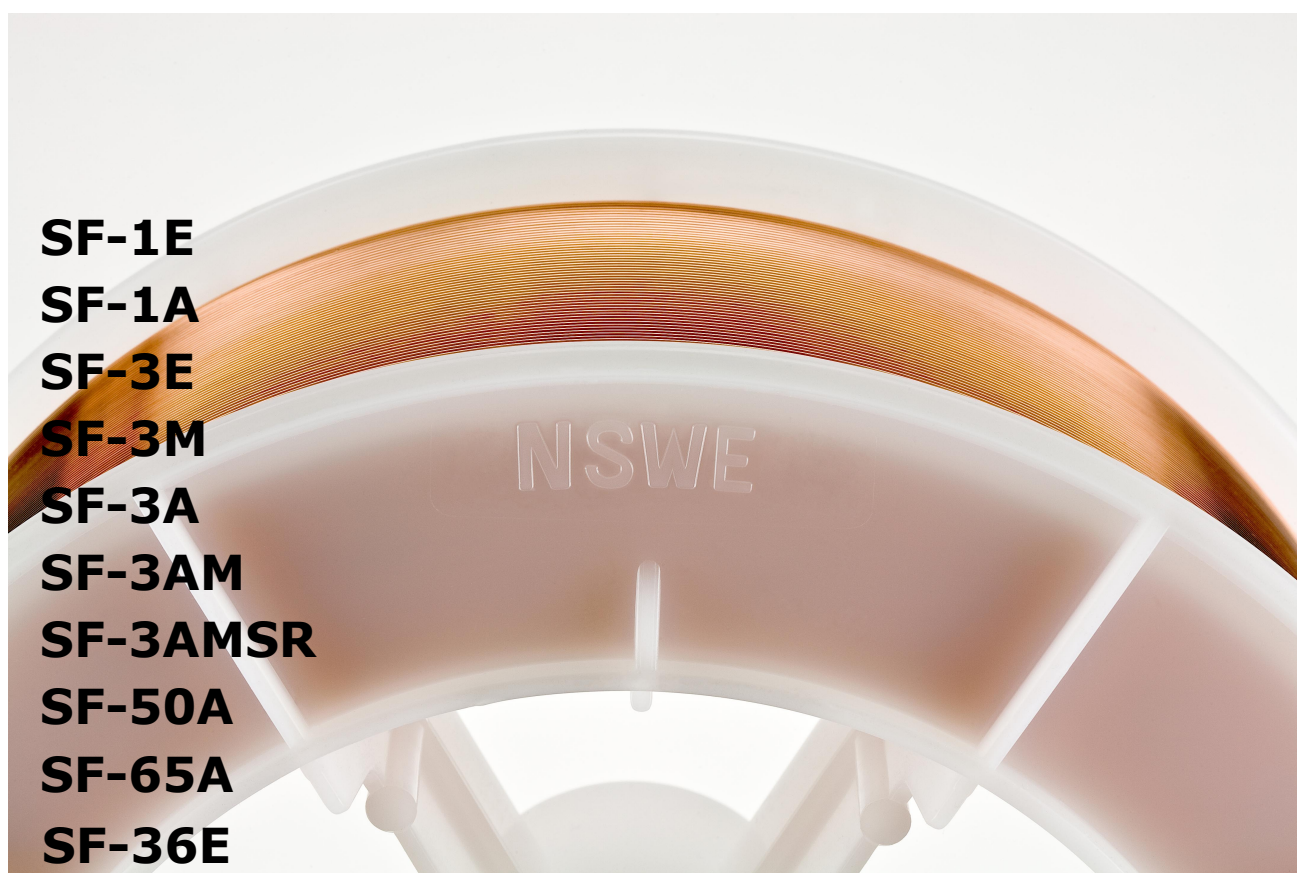


NSWE FCW	Benefits:
✓	Extremely low hydrogen content
✓	Superior wire feeding properties
✓	Excellent conductivity and stable arc
✓	Reliable quality with no downtime
✓	Deep penetration into base material
✓	Less cleanup and finishing work





## **Rutile wires for non- and low alloyed steels**





## Seamless flux and metal cored wires.

NST and NSWE (formerly known as NSSW and Nittetsu) seamless flux and metal cored wires are manufactured in a manner which provides wires with no open seams, preventing moisture from penetrating the wire. NST/NSWE seamless wires provides the customer with a product that has a guaranteed low hydrogen control (the only point of ingress for moisture is at the start and end of the wire). The seamless manufacturing process has the additional benefit of enabling the wire to be copper coated, this provides extended shelf life due to rust prevention.

### Method of storage:

To ensure the wire is used at its optimum the following guidelines should be observed:

- Welding materials shall be stored inside, away from rain, snow and dew.
- Welding materials should be stored off the floor, preferably on wooden pallets which enable air circulation to take place (10cm off the floor, and 10cm off the wall).
- It is recommended to store materials places where the temperature is below 35°C and the relative humidity is less than 80%. However, the product can still be used after storing above 35°C/80% humidity -if the following requirements are met:
  - a) No physical or chemical changes are observed on the exterior wire surface. For example rust, discoloration etc.
  - b) No deterioration phenomena are observed in welding usability.
- Environments where rusting tends to occur due to sea breeze, SO<sub>2</sub> etc., should be avoided.
- A plan should be devised to use materials on a first in, first out basis.
- The packing shipped from the manufacturer must be kept as it is until just before use.

### Storage period - Quality guarantee period:

The quality guarantee period of seamless flux cored wire shall be for 36 months after production as long as they have been stored under the conditions specified in "method of storage" above. However, products can be used even after the lapse of the above mentioned period if no physical or chemical changes such as rusting, discoloration etc. are observed on the surface of the wires.

### Handling:

The original packaging must be kept as it is until the wire is used. NST/NSWE can not specify the period of usage after unpacking since the users storage conditions can differ greatly. If any discoloration or rust is found prior to usage, please discard the discolored/rusted part of the wire.

### Hydrogen levels:

As part of the manufacturing process hydrogen measurements are taken of all NST and NSWE seamless flux cored seamless wires (this data is available on the wire batch certificate).

### Reference/ date:

Storage and handling,  
Seamless flux and metal cored wires.  
English. 11.06.2021.

# SF-1E

AWS A5.36 E71T1-C1A2-CS1 / AWS A5.36M E491T1-C1A3-CS1

EN ISO 17632-A: T 42 2 ZMnNi P C1 1 H5

EN ISO 9606-1: FM1



## General purpose flux cored wire for shipbuilding and structures with 100% CO<sub>2</sub> shielding gas.

### General description:

SF-1E is a seamless, rutile flux cored wire for welding with 100% CO<sub>2</sub> shielding gas. Due to the seamless design the wire has an extremely low diffusible hydrogen content, typical 2.7ml/100g weld metal.

The flux cored wire has excellent weldability in all positions and is extremely efficient in the root pass against ceramic backing.

Good penetration in vertical down greatly reduces the risk of imperfections.

It also gives excellent performance against porosity on primed steel plates when using automated

welding such as a fillet welding tractor.

SF-1E has a stable welding arc with less spatter and perfect bead surface.

The flux cored wire has a clean, copper coated surface.

Together with exact diameter and roundness it provides a stable and even wire feeding.

This reduces wear and tear of liners and contact tips.

The wire is classified as a grade 3 (-20 °C).

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

100% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Ni				
0,06	0,38	1,20	0,011	0,007	0,30				

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,7 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	
530	590	27	100	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm	1,4 mm	
Ampere / Volt	180-300A / 22-32V	250-350A / 25-33V	

### Packaging information:

1,2mm x 5,0kg spool D200  
1,2mm x 12,5kg spool D300  
1,4mm x 12,5kg spool D300

### Approvals:

DNV-GL, LR, ABS, GL, CWB, PRS,  
Rina, BV, CE

### Reference / date:

SF-1E, English, 20.08.2020

# SF-1A

AWS A5.20 E71T-1M / AWS A5.36 E71T1-M21A2-CS1

EN ISO 17632-A: T 42 2 ZMn P M21 1 H5

EN ISO 9606-1: FM1



## General purpose flux cored wire for shipbuilding and structures with impact test req. at -20 °C.

### General description:

SF-1A is a seamless rutile flux cored wire for welding with Argon/CO<sub>2</sub> mixed shielding gas. Being seamless it provides welds with very low diffusible hydrogen content, typical 2.8ml/100g weld metal.

The flux cored wire has excellent weldability in all positions and is extremely efficient in the root pass against ceramic backing. Good penetration in vertical down greatly reduces the risk of imperfections.

It also gives excellent performance against porosity on primed steel plates when using automated welding

such as a fillet welding tractor.

SF-1A has a stable welding arc with less spatter and perfect bead surface.

The flux cored wire has a clean, copper coated surface.

Together with exact diameter and roundness it provides a stable and even wire feeding.

This reduces wear and tear of liners and contact tips.

The wire is classified as a grade 3 (-20 °C).

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu				
0,05	0,41	1,36	0,010	0,008	0,26				

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,8 ml/100g typical).

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	
530	590	28	95	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm	1,4 mm	1,6 mm
Ampere / Volt	180-300A / 22-32V	250-350A / 25-33V	300-400A / 25-35V

### Packaging information:

1,0mm x 5,0kg spool D200  
1,2mm x 5,0kg spool D200  
1,2mm x 12,5kg spool D300  
1,2mm x 250kg drum Ø51cm  
1,4mm x 12,5kg spool D300  
1,4mm x 250kg drum Ø51cm  
1,6mm x 12,5kg spool D300  
1,6mm x 250kg drum Ø51cm

### Approvals:

DNV-GL, LR, ABS, GL, CWB, BV,  
PRS, RINA, CE

### Reference / date:

SF-1A, English, 07.06.2019.

Perfect Welding

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# SF-3E

AWS A5.29 E81T1-GC / AWS A5.36 E81T1-C1A4-CS1

EN ISO 17632-A: T 46 4 ZMn P C1 2 H5

EN ISO 9606-1: FM1



## Flux cored wire for low temperature steels with impact requirements down to -40 °C.

### General description:

SF-3E is a seamless rutile flux cored wire for welding with 100% CO<sub>2</sub> shielding gas.

The deposited weld metal has excellent mechanical properties down to -40°C.

The wire has a stable arc, minimum spatter, good penetration with excellent visual results.

SF-3E can also be used for root runs against ceramic backing.

Due to its seamless design, the wire has an extremely low hydrogen content which does not pick up moisture from the environment ensuring a very low risk of hydrogen cracks (Typical 3.0ml/100g).

The SF-3E wire has a clean copper coated surface with exact diameter and roundness which ensures stable and even wire feeding.

Mechanical properties have been designed for Charpy impact values  $\geq 47$  joule at -40°C.

The wire is CTOD tested.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

100% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Ni	Mo			
0,05	0,40	1,32	0,015	0,003	0,64	0,01			

### Diffusible hydrogen content (ml/100g):

$\leq 5$  ml/100g (3,0 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
564	597	29	121	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300A / 22-32V		

### Packaging information:

1,2mm x 12,5kg spool D300

### Approvals:

DNV-GL, LR, ABS, CWB, CE

### Reference / date:

SF-3E, English, 07.06.2019.

Perfect Welding

www.nst.no

# SF-3M

AWS A5.20 E71T-9C-J / AWS A5.36 E71T1-C1A4-CS1

EN ISO 17632-A: T 46 4 ZMnNi P C1 2 H5

EN ISO 9606-1: FM1



**Flux cored wire for carbon steel in e.g. shipbuilding and offshore structures with impact requirements down to -40 °C.**

## General description:

SF-3M is a seamless rutile flux cored wire designed for shipbuilding and offshore structure welding with 100% CO<sub>2</sub> shielding gas.

The wire is CTOD tested.

The deposited weld metal has excellent mechanical properties down to -40°C.

The wire has a stable arc, minimum spatter, good penetration with excellent visual results.

SF-3M can also be used for root runs against ceramic backing.

Due to its seamless design, the wire has an extremely low hydrogen content which does not pick up moisture

from the environment ensuring a very low risk of hydrogen cracks.

The SF-3M wire has a clean copper coated surface with exact diameter and roundness which ensures stable and even wire feeding.

## Welding positions:



## Welding current:

DC+

## Type of gas / flow:

100% CO<sub>2</sub>

20-25 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Ni				
0,04	0,25	1,31	0,009	Max. 0,004	Max. 0,43				

## Diffusible hydrogen content (ml/100g):

≤5 ml/100g (3,0 ml/100g typical)

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
545	595	28	115	

## Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300A / 22-32V		

## Packaging information:

1,2mm x 12,5kg spool D300

## Approvals:

DNV-GL, LR, ABS, CE

## Reference / date:

SF-3M, English, 09.10.2019.

Perfect Welding

www.nst.no

# SF-3A

AWS A5.20 E71T-9M-J / AWS A5.36 E71T1-M21A4-CS1

EN ISO 17632-A: T 46 4 ZMnNi P M21 1 H5

EN ISO 9606-1: FM1



## Flux cored wire for welding carbon steel with impact requirements down to -40 °C.

### General description:

SF-3A is a seamless, rutile flux cored wire designed for welding of steel with impact requirements down to -40°C such as grade E often used in shipbuilding. The flux cored wire uses a Argon/CO<sub>2</sub> mixed shielding gas which gives good weldability and a stable arc, minimum spatter, good visual bead and even transition to parent material. Due to the seamless design the wire has an extremely low hydrogen content, (typical of ≤2.8 ml/100g) which greatly reduces the possibility of cold cracks.

SF-3A emits little welding fume and has great weldability in all positions. The wire has a clean copper coated surface which together with exact diameter and roundness, ensures stable and even wire feeding. Wire stick out should be between 15-25mm dependent upon the welding parameters. Voltage should be approx. 10% of the Ampere, which is 1-3 Volts lower than that of which conventional folded flux cored wires require.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,05	0,50	1,50	0,010	0,006	0,30	0,35			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,8 ml/100g typical).

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	Charpy V (J) -40 °C
547	612	25		90

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300A / 22-32V		

### Packaging information:

1,2mm x 5,0kg spool D200  
1,2mm x 12,5kg spool D300  
1,2mm x 250kg drum Ø51cm

### Approvals:

DNV-GL, LR, ABS, GL, CWB, DB,  
BV, PRS, TÜV, CE

### Reference / date:

SF-3A, English, 07.06.2019.



# SF-3AM

AWS A5.29 E81T1-GM / AWS A5.36 E81T1-M21A8-Ni1-H4  
EN ISO 17632-A: T 46 4 ZMn1Ni P M21 2 H5  
EN ISO 17632-A: T 46 6 ZMn1Ni P M21 2 H5  
EN ISO 9606-1: FM1



## Flux cored wire for low-alloyed steel, offshore applications, piping etc.

### General description:

SF-3AM is a seamless rutile flux cored wire for welding using Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a stable welding arc with less spatter, excellent visual bead shape and smooth transition to the base material.

SF-3AM has acceptable charpy impact values down to -60 °C.

The flux cored wire is CTOD-tested with good results. Due to the seamless design the wire has an extremely low diffusible hydrogen content (typical 3 ml/100g) which greatly eliminates the risk of hydrogen cracks.

SF-3AM has low visible welding fume and has excellent weldability in all welding positions.

The wire has a clean copper coated surface which together with exact diameter and roundness ensures stable and even wire feeding.

Wire stick out should be between 15-25 mm depending upon welding parameters.

Voltage should be about 10% of the Ampere, which is about 1-3 Volts lower than that of which conventional folded flux cored wires require.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,06	0,30	1,27	0,011	0,005	0,26	0,95			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (3,0 ml/100g typical).

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	Charpy V (J) -60 °C
550	590	29	128	92

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm	1,4 mm	1,6 mm
Ampere / Volt	180-300A / 22-32V	250-350A / 25-35V	280-380A / 25-35V

### Packaging information:

1,0mm x 5,0kg D200  
1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300  
1,2mm x 250kg DrumØ51cm  
1,4mm x 12,5kg D300  
1,4mm x 250 kg DrumØ51cm  
1,6mm x 12,5kg D300

### Approvals:

DNV-GL, LR, DB, ABS, CWB, PRS, CE

### Reference / date:

SF-3AM, English, 07.06.2019.

Perfect Welding

[www.nst.no](http://www.nst.no)

# SF-3AMSR

AWS A5.29 E71T1-GM

AWS A5.36 E71T1-M21A6-K6-H4 / AWS A5.36 E71T1-M21P6-K6-H4

EN ISO 17632-A: T 42 4 ZMnNi P M21 2 H5

EN ISO 9606-1: FM1



## Flux cored wire for piping and constructions with PWHT requirements.

### General description:

SF-3AMSR is a seamless rutile flux cored wire for welding using Argon/CO<sub>2</sub> mixed shielding gas. This ensures a stable welding arc with less spatter, excellent visual bead shape and smooth transition to the base material.

SF-3AM has excellent charpy impact values down to -46°C.

Due to seamless design the wire has an extremely low diffusible hydrogen content (typical 3 ml/100g), which greatly eliminates the risk of hydrogen cracks.

SF-3AMSR has low welding fume and excellent operations in all welding positions.

Like all other Nittetsu seamless wires the wire has a clean copper coated surface.

This combined with exact diameter and roundness ensures a stable and even wire feeding.

Stick out should be between 15-25 mm depending upon welding parameters.

Voltage should be about 10% of the ampere, which is about 1-3 Volts lower than what conventional folded flux cored wires requires.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,05	0,28	1,25	0,009	0,005	0,27	0,80			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (3,0 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C (AW)	Charpy V (J) -40 °C (PWHT)
AW 528 / PWHT 512	AW 563/ PWHT 565	AW 30 / PWHT 32	125	118

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300A / 22-32V		

### Packaging information:

1,2mm x 5,0kg D200 / (upon request)  
1,2mm x 12,5kg D300

### Approvals:

DNV-GL(PWHT), LR, CE

### Reference / date:

SF-3AMSR, English, 07.06.2019.

Perfect Welding

www.nst.no

# SF-50A

AWS A5.29 E91T1-GM / AWS A5.36 E91T1-M21A4-K2-H4

EN ISO 17632-A: T 50 4 ZMn1.5Ni P M21 2 H5

EN ISO 9606-1: FM1



## Flux cored wire for welding high tensile steels such as Weldox 500.

### General description:

SF-50A is a seamless rutile flux cored wire developed for welding high tensile steel such as i.e. Weldox 500. The wire uses an Argon/CO<sub>2</sub> mixed shielding gas, ensuring a user friendly and stable arc with minimum spatter and good transition to the parent material. SF-50A is CTOD tested with good results. Due to its seamless characteristic, the wire has an extremely low content of hydrogen (typical 3ml/100g weld metal), something which ensures low risk of cold cracks.

The wire is copper coated and has a clean surface which together with exact diameter and perfect roundness ensures a stable and even wire feeding. The stick out should be between 15-25mm depending upon welding parameters. Volts should be 10% of the Amperage, this is about 1-3 volts lower than that of which conventional folded flux cored wires require.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,05	0,48	1,22	0,012	0,005	0,31	1,55			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,8 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
606	657	27	75	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	200-300A / 22-32V		

### Packaging information:

1,2mm x 12,5kg spool D300

### Approvals:

DNV-GL, LR, ABS, CE

### Reference / date:

SF-50A, English, 07.06.2019.

Perfect Welding

www.nst.no



# SF-65A

AWS A5.36 E91T1 M21A4 K2 H4

EN ISO 18276-A: T 55 4 ZMn1.5Ni P M21 2 H5

EN ISO 9606-1: FM2



## Flux cored wire for welding high tensile steels.

### General description:

SF-65A is a seamless rutile all position flux-cored wire developed for welding high tensile steel such as S550 and similar high tensile strength steel.

The wire is to be used with a M21 Argon/CO<sub>2</sub> mixed shielding gas, which ensuring a user friendly and stable arc with minimum spatter and good transition to the parent material.

Due to its seamless characteristic, the wire has an extremely low content of hydrogen (typical <3ml/100g weld metal), something which ensures low risk of cold cracks.

The wire is copper coated and has a clean surface with exact diameter and perfect roundness ensures a stable and even wire feeding as well as easy handling and storage procedures.

The stick out should be between 15-20mm depending upon welding parameters.

Volts should be app'x 10% of the Amperage, this is about 1-3 volts lower than a conventional folded flux cored wire.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

M21 (80%Ar+20% CO<sub>2</sub>)

20-25 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V
0,02-0,09	0,30-0,70	1,00-1,50	Max. 0,030	Max. 0,030	Max. 0,40	1,00-2,00	Max. 0,15	Max. 0,35	Max. 0,05

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,8 ml/100g typical)

### Mechanical properties of all-weld-metal (ISO):

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
≥550	640 - 840	≥18	≥47	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	200-300A / 22-32V		

### Packaging information:

1,2mm x 12,5kg spool D300  
1,2mm x 5,0kg spool D200

### Approvals:

CE

### Reference / date:

SF-65A, English, 17.03.2020.

Perfect Welding

www.nst.no

# SF-36E

AWS A5.29 E81T1-GC / AWS A5.36 E81T1-C1A8-K2-H4

EN ISO 17632-A: T 46 6 ZMn1.5Ni P C1 2 H5

EN ISO 9606-1: FM1



## Flux cored wire for low temperature steels and offshore constructions etc.

### General description:

SF-36E is a seamless rutile flux cored wire for welding using 100% CO<sub>2</sub> shielding gas. The deposited weld metal has excellent mechanical properties down to -60°C.

The wire has a stable arc, minimum spatter, good penetration with excellent visual result.

SF-36E is also perfect for root runs against ceramic backing.

Due to its seamless design, the wire has a very low hydrogen content which ensures very low risk of cold cracks.

SF-36E has been CTOD tested at -40°C.

The flux cored wire is copper coated, has a clean surface which together with exact diameter and roundness ensures stable and even wire feeding.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

100% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,04	0,37	1,32	0,016	0,006	0,24	1,53			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (3,0 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	Charpy V (J) -60 °C
570	610	29	112	76

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300A / 22-32V		

### Packaging information:

1,2mm x 12,5kg spool D300

### Approvals:

DNV-GL, ABS, LR, BV, CE

### Reference / date:

SF-36E, English, 07.06.2019.

Perfect Welding

www.nst.no

# SF-47E

AWS A5.29 E81T1-Ni1C-J / AWS A5.36 E81T1-C1A8-Ni1-H4

EN ISO 17632-A: T 46 6 ZMn1Ni P C1 2 H5

EN ISO 9606-1: FM1



**Rutile low alloyed Flux cored wire for welding in all positions with impact requirements down to -60°C using 100% CO<sub>2</sub> shielding gas.**

## General description:

SF-47E is a seamless rutile flux cored wire for welding using 100% CO<sub>2</sub> shielding gas.

SF-47E has excellent weldability, visual bead shape and smooth transition to the base material.

Due to the seamless design the wire has an extremely low diffusible hydrogen content (typical 3 ml/100g) which greatly eliminates the risk of hydrogen cracks.

The wire has a clean copper coated surface which together with exact diameter and roundness ensures stable and even wire feeding.

Wire stick out should be kept approximately 20 mm. SF-47E has very good mechanical properties including Charpy impact values down to -60°C.

## Welding positions:



## Welding current:

DC+

## Type of gas / flow:

100% CO<sub>2</sub>

18 - 25 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,05	0,46	1,31	0,012	0,004	0.29	0,96			

## Diffusible hydrogen content (ml/100g):

≤5 ml/100g (3,0 ml/100g typical).

## Typical Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -60 °C	
545	600	28	70	

## Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	180-300 / 22-32		

## Packaging information:

1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

DNV-GL, ABS, CWB, LR, CE

## Reference / date:

SF-47E, English, 07.06.2019.

Perfect Welding

www.nst.no



# SF-50E

AWS A5.36. E91T1-C1A8-Ni2-H4

EN ISO 17632-A: T 50 6 ZMn2.5Ni P C1 2 H5

EN ISO 9606-1: FM1



## Flux cored wire for welding high tensile steels min. YP 500 Mpa.

### General description:

SF-50E is a seamless rutile flux cored wire developed for welding high tensile steel such as i.e. Weldox 500. The wire is developed for 100% CO<sub>2</sub> (C1) as shielding gas.

SF-50E is CTOD tested.

Due to its seamless characteristic, the wire has an extremely low hydrogen content (typical 3ml/100g weld metal), something which ensures low risk of cold cracks.

The wire is copper coated and has a clean surface which together with exact diameter and perfect roundness ensures a stable and even wire feeding. The wire stick out should be between 15-25mm

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

100% CO<sub>2</sub>

20-25 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
Max.0,12	Max.0,80	Max.1,50	Max.0,030	Max.0,030	Max.0,40	1,75-2,75			

### Diffusible hydrogen content (ml/100g):

≤4 ml/100g

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -60 °C	
Min.537	621-720	Min.18	Min.47	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt			

### Packaging information:

1,2mm x 12,5kg spool D300

### Approvals:

DNV-GL, ABS, BV, CE

### Reference / date:

SF-50E, English, 07.06.2019.

Perfect Welding

www.nst.no

# SF-80A

AWS A5.36 E111T1-M21A4-G-H4

EN ISO 18276-A: T69 4 ZMn2.5NiMo P M21 2 H5

EN ISO 9606-1: FM2



## Flux cored wire for welding extra high tensile steels min. YP 690

### General description:

SF-80A is a seamless, rutile flux cored wire designed for welding extra high tensile steels with min.690 mpa. The flux cored wire uses a Argon/CO<sub>2</sub> mixed shielding gas which gives good weldability and a stable arc, minimum spatter, good visual bead and even transition to parent material. Due to the seamless design the wire has an extremely low hydrogen content (<4 ml/100g) which is very important when welding extra high tensile steels.

The wire has a clean copper coated surface which together with exact diameter and roundness, ensures stable and even wire feeding.

Wire stick out should be between 15-20mm dependent upon the welding parameters.

Mechanical properties are designed for >47 joule at -40°C.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

M21 (Ar+CO<sub>2</sub>)

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,06	0,46	1,82	0,012	0,005	0,22	2,19			

### Diffusible hydrogen content (ml/100g):

≤4 ml/100g

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
Min. 690	770 - 900	Min. 17	Min. 47	

### Guidance - Ampere (DC+):

Wire diameter			
Ampere / Volt			

### Packaging information:

1,2mm x 12,5kg D300

### Approvals:

DNV-GL ,ABS, LR, BV, CE

### Reference / date:

SF-80A, English, 11.05.2020.

Perfect Welding

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## Rutile-basic wires for non- and low alloyed steels



**SF-36EA**

# SF-36EA

AWS A5.29 E81T1-GM

AWS A5.36 E81T1-M21A6-K6-H4 / AWS A5.36 E81T1-M21P6-K6-H4

EN ISO 17632-A: T 46 4 ZMnNi R M21 2 H5

EN ISO 9606-1: FM1



## Rutile basic flux cored wire for tough requirements in restraint joints.

### General description:

SF-36EA is a seamless rutile basic flux cored wire for welding non- and low alloyed steels with Argon/CO<sub>2</sub> mixed shielding gas. The wire has good weldability with a stable arc, minimum spatter, good penetration and bead appearance.

SF-36EA is your choice if you want a safe alternative against cracks and has very good mechanical properties down to -60°C.

Due to its seamless characteristic, the wire has an extremely low content of hydrogen.

One of the main benefits with this wire is that it has

far better results against cracks in restraint joints than normal rutile wires.

The wire can also be used as the root run against ceramic backing.

SF-36EA has documented results in PWHT.

The wire has approvals in all positions although it is most suitable in PA/PB and PC.

The wire has a copper coated smooth surface which together with exact diameter and perfect roundness ensures even and safe wire feeding even with extended conduit cables.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+18-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,06	0,35	1,27	0,007	0,005	0,27	0,85			

### Diffusible hydrogen content (ml/100g):

≤5 ml/100g (2,0 ml/100g typical)

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	Charpy V (J) -40 °C (PWHT)
560	620	30	106	75

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt	200-300A/22-30V		

### Packaging information:

1,2mm x 12,5kg spool D300  
1,2mm x 5kg spool D200

### Approvals:

DNV-GL, LR, CE

### Reference / date:

SF-36EA, English, 07.06.2019.

Perfect Welding

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## **Metal cored wires for non- and low alloyed steels**



**SM-3A**

**SM-47A**

**SM-80A**



# SM-3A

AWS A5.18 E70C-GM / AWS A5.36 E71T15-M21A4-CS1

EN ISO 17632-A: T 42 4 ZMn M M21 1 H5

EN ISO 9606-1: FM1



## Metal cored wire without slag for non-alloyed steels and Argon/mix shielding gas.

### General description:

SM-3A, is a metal cored seamless wire developed for use with Argon/CO<sub>2</sub> mixed (M21) shielding gas. The wire is designed to be used both for automated and manual welding of horizontal butt welds plus fillet welds in the spray arc range.

It can also be used successfully in all positional welding in the short arc range (dip transfer mode). SM-3A consists mainly of metal flux which ensures high productivity. The seamless wire has a stable welding arc with low spatter and excellent visual bead shape. With only minor surface silica isles this greatly reduces re-ignition problems and ensures the welding

of multiple layers without the need for inter run de-slagging.

The metal cored wire has a clean, copper coated surface together with exact diameter and roundness which produces stable and even wire feeding.

This is of great value when long conduit cables are used and when using any automated welding processes.

Mechanical properties have been designed for Charpy impact values  $\geq 47$  joule at -40°C.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar+8-25% CO<sub>2</sub>

18-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu				
0,05	0,56	1,56	0,010	0,013	0,25				

### Diffusible hydrogen content (ml/100g):

$\leq 5$  ml/100g (2 ml/100g typical).

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
520	580	29	70	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm	1,4 mm	
Ampere / Volt	70-330A / 14-32V	80-420A / 23-35V	

### Packaging information:

1,2mm x 5,0kg spool D200  
1,2mm x 12,5kg spool D300  
1,2mm x 250kg drum Ø51cm  
1,4mm x 12,5kg spool D300  
1,4mm x 250 kg drum Ø51cm

### Approvals:

DNV-GL, LR, ABS, BV, GL, DB,  
CWB, RINA, CE

### Reference / date:

SM-3A, English, 07.06.2019.

Perfect Welding

www.nst.no

# SM-47A

AWS A5.36 E80T15-M21A8-Ni1-H4

EN ISO 17632-A: T 46 6 1Ni M M21 1 H5

EN ISO 9606-1: FM1



## Metal cored wire for low temperature pipe and steel applications down to -60°C.

### General description:

SM-47A, is a 1% Ni alloyed metal cored seamless wire developed for use with Argon/CO<sub>2</sub> mixed (M21) shielding gas.

The wire is designed to be used both in the short-arc range (dip transfer mode) for single side root runs and for automated and manual welding of horizontal butt welds plus fillet welds in the spray-arc range.

SM-47A consists mainly of metal flux which ensures high productivity.

The seamless wire has a stable welding arc with low spatter and excellent visual bead shape.

The metal cored wire has a clean, copper coated surface together with exact diameter and roundness which produces stable and even wire feeding.

This is of great value when long conduit cables are used and when using any automated welding processes.

Mechanical properties have been designed for Charpy impact values  $\geq 47$  joule at -60°C.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

Ar + 15-25% CO<sub>2</sub>

15-25 l/min.

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni			
0,07	0,62	1,38	0,013	0,009	0,19	0,92			

### Diffusible hydrogen content (ml/100g):

$\leq 5$  ml/100g (2 ml/100g typical).

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	Charpy Impact Test
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	Charpy V (J) -60 °C
539	627	26	112	75

### Guidance - Ampere (DC+):

Wire diameter			
Ampere / Volt			

### Packaging information:

1,2mm x 5,0kg spool D200  
1,2mm x 12,5kg spool D300  
1,2mm x 250kg drum Ø51cm  
1,4mm x 12,5kg spool D300  
1,4mm x 250kg drum Ø51cm

### Approvals:

DNV-GL, ABS, CWB, PRS, RINA,  
DB, LR, CE

### Reference / date:

SM-47A, English, 26.06.2020.

Perfect Welding

www.nst.no

# SM-80A

AWS A5.36 E110T15-M21A4-G-H4

EN ISO 18276-A T69 4 ZMn2.5NiCrMo M M21 2 H5

EN ISO 9606-1: FM2



## Metal cored wire for welding extra high tensile steels min. 690mpa.

### General description:

SM-80A, is a Ni-Cr-Mo alloyed metal cored seamless wire developed for use with Argon/CO<sub>2</sub> mixed (M21) shielding gas.

The wire is designed to be used both in the short-arc range (dip transfer mode) for single side root runs and for automated and manual welding of butt welds and fillet welds in the spray-arc range.

SM-80A consists mainly of metal flux which ensures high productivity.

The seamless wire has a stable welding arc with low spatter and excellent visual bead shape.

A clean, copper coated surface together with exact diameter and roundness which secure stable and even wire feeding. This is of great value when long conduit cables are used and when using any automated welding processes.

Mechanical properties have been designed for Charpy impact values  $\geq 47$  joule at -40°C.

### Welding positions:



### Welding current:

DC+

### Type of gas / flow:

M21 Ar+CO<sub>2</sub>

20-25 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.03 - 0.08	0.20 - 0.60	1.20 - 1.80	Max. 0.020	Max. 0.010	Max. 0.40	2.20 - 2.80	0.30 - 0.70	0.30 - 0.70	

### Diffusible hydrogen content (ml/100g):

$\leq 4$  ml/100g.

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
Min. 690	770 - 900	Min. 17	Min. 47	

### Guidance - Ampere (DC+):

Wire diameter	1,2 mm		
Ampere / Volt			

### Packaging information:

1,2mm x 12,5kg spool D300

### Approvals:

DNV-GL, ABS, CE

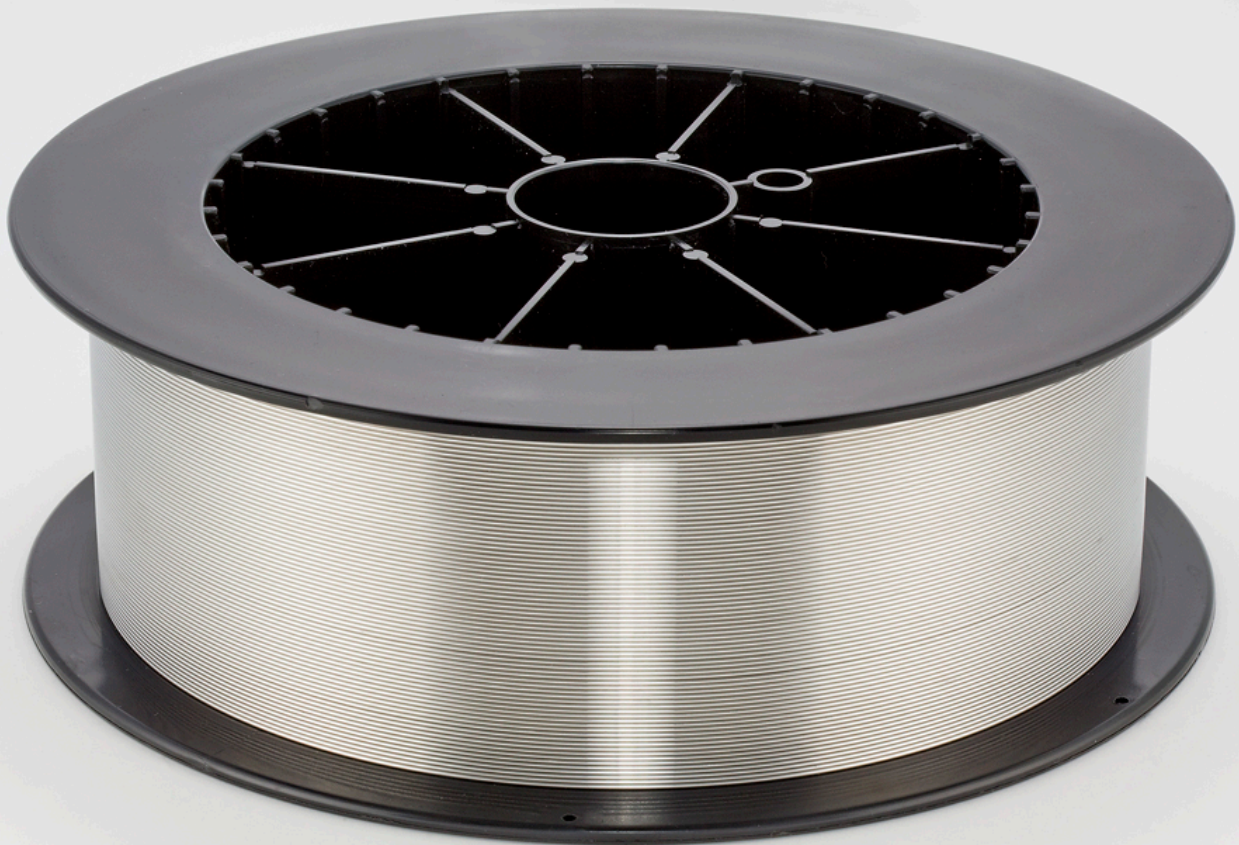
### Reference / date:

SM-80A, English, 07.06.2019.

Perfect Welding

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## **Flux cored wires for high alloyed steels**



**NST A-308L**

**NST A-309L**

**NST A-316L**

**NST A-309MoL**

**NST 329J3L Duplex**

**NST 329J3L XLT Duplex**

**NST 309LT**

**NST 316LT**

**NST 309MoLT**

# NST A-308L

AWS: A5.22-95: E308LT 1-4

NS EN ISO 17633-A: T 19 9 L P M 1

EN ISO 9606-1: FM5



**Flux cored wire for positional welding of corrosion resistant materials such as AISI 304, EN 1.4301 etc.**

## General description:

NST A-308L is a rutile flux cored wire for positional welding of corrosion resistant materials such as AISI 304 etc.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

The newly developed slag system gives the welder better control of the weld pool and this wire can now be welded without weaving in all positions

It is also suitable for use with ceramic backing for single sided welding.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.024	0.60	1.38	0.020	0.003	0.05	9.79	20.44	0.02	

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
415	603	38		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

CE

## Reference / date:

NST A-308L,  
English, 06.02.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST A-309L

AWS: A5.22 -95: E309LT 1-4

NS-EN ISO 17633-A: T 23 12 L P M1

EN ISO 9606-1: FM5



**Flux cored wire for positional welding of corrosion resistant materials against carbon steel, and for cladding of carbon steels.**

## General description:

NST A-309L is a rutile flux cored wire for positional welding of corrosion resistant materials such as AISI 304 etc. against carbon steel.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

The newly developed slag system gives the welder better control of the weld pool and this wire can now be welded without weaving in all positions

It is also suitable for use with ceramic backing for single sided welding.

NST A-309L's chemical composition ensures a weld metal equivalent of AISI 304 in the first layer of a cladding process.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.018	0.58	1.82	0.019	0.002	0.03	12.92	24.17	0.01	

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
430	562	41		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

DNV, CE

## Reference / date:

NST A-309L,  
English, 06.02.2018.

Perfect Welding

www.nst.no



# NST A-316L

AWS: A5.22-95: E316LT 1-4

NS-EN ISO 17633-A: T 19 12 3 L P M1

EN ISO 9606-1: FM5



**Flux cored wire for positional welding of corrosion resistant and stainless materials such as AISI 316, EN 1.4404 etc.**

## General description:

NST A-316L is a rutile flux cored wire for positional welding of corrosion resistant and stainless steel materials such as AISI 316 etc.

The wire can be used with an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, with less spatter, good visual bead appearance and smooth transition to the parent material.

The newly developed slag system gives the welder better control of the weld pool and this wire can now be welded without weaving in all positions.

It is also suitable for use with ceramic backing for single sided welding.

The flux cored wire can be used on Ti- and Nb-stabilized materials as long as the operating temperature does not exceed 400 °C.

## Welding positions:



## Welding current:

DC+

## Shielding gas/Gas flow:

Argon+18-25% CO<sub>2</sub>.  
15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.024	0.51	1.37	0.022	0.005	0.10	11.40	19.25	2.61	

## Ferrite content(Typical):

12,5% (Delong).

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
436	580	42		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

0,9mm x 5,0kg D200  
1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

DNV, CE

## Reference / date:

NST A-316L,  
English, 27.06.2019.

Perfect Welding

www.nst.no

# NST A-309MoL

AWS: A5.22-95: E309LMoT 1-4

NS-EN ISO 17633-A: T 23 12 2 L P M1

EN ISO 9606-1: FM5



**Flux cored wire for positional welding of dissimilar steels, i.e. carbon steel against stainless materials such as AISI 316 etc.**

## General description:

NST A-309MoL is a rutile flux cored wire for positional welding of stainless materials such as AISI 316 and similar against carbon steel.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

The newly developed slag system gives the welder better control of the weld pool and this wire can now be welded without weaving in all positions.

It is also suitable for use with ceramic backing for single sided welding.

NST A-309MoL is the right choice for cladding carbon steel with a stainless (Mo alloyed) material.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.027	0.57	1.39	0.021	0.006	0.26	12.8	23.28	2.48	

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
503	653	30		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

0,9mm x 5,0kg D200  
1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

DNV, CE

## Reference / date:

NST A-309MoL,  
English, 06.02.2018.

Perfect Welding

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# NST 329J3L Duplex

AWS: A5.22-95: E2209T1-4

NS-EN ISO 17633-A: T 22 9 3 N L P M 1

EN ISO 9606-1: FM5



**Flux cored wire for all-round welding of Duplex materials such as SAF 2205 and EN 1.4462.**

## General description:

NST 329J3L is a rutile flux cored wire for welding of Duplex materials such as SAF 2205, EN 1.4462 and UNS 31803.

The wire can be used in all welding positions.

Shielding gas is Argon/CO<sub>2</sub> mixed gas.

This enables a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent material.

The newly developed slag system gives the welder better control of the weld pool and this wire can now be welded without weaving in all positions.

NST 329J3L is also suitable for use with ceramic backing for single sided welding.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-20 l/min

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	N
0.02	0.41	1.35	0.023	0.009	0.05	8.66	23.19	3.02	0.14

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %	Charpy V (J) -46 °C	
640	806	26	37	

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

1.2mm x 12.5kg D300

1.2mm x 5kg D200

## Approvals:

CE

## Reference / date:

NST 329J3L Duplex,  
English, 06.02.2018.

Perfect Welding

www.nst.no

# NST 329J3L XLT Duplex

AWS: A5.22-2012: E2209T1-4

NS-EN ISO 17633-A: T 22 9 3 N L P M 1

EN ISO 9606-1: FM5



**Flux cored wire for all-round welding of Duplex materials such as SAF 2205 and EN 1.4462.**

## General description:

The NST 329J3L XLT Duplex is a rutile flux cored wire for welding of Duplex materials such as SAF 2205, EN 1.4462 and UNS 31803.

The wire can be used in all welding positions and gives very good properties at very low temperatures down to -60 °C.

Shielding gas is Argon/CO<sub>2</sub> mixed gas.

This enables a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent material.

The newly developed slag system gives the welder better control of the weld pool in all positions. NST 329J3L XLT is also suitable for use with ceramic backing for single sided welding.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	N
0.021	0.49	1.25	0.021	0.002	0.06	9.0	22.5	2.8	0.13

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %	Charpy V (J) -46 °C	Charpy V (J) -60 °C
640	806	26	48	43

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

1.2mm x 12.5kg D300  
1.2mm x 5 kg D200

## Approvals:

CE

## Reference / date:

NST 329J3L XLT Duplex,  
English, 06.02.2018.

Perfect Welding

www.nst.no

# NST 309LT

AWS: A5.22-95: E309LT 0-4

NS-EN ISO 17633-A: T 23 12 L R M3

EN ISO 9606-1: FM5



**Flux cored wire mainly for flat position and fillet welding of corrosion resistant materials against carbon steels and for cladding carbon steels.**

## General description:

NST 309LT is a rutile flux cored wire for flat position (PA) and fillet welding (PB and PC) of corrosion resistant materials such as AISI 304 etc. against carbon steel.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

NST 309LT has a slag freezing system which is slightly slower than wires designed for positional welding.

This makes this wire suitable for flat position and fillet welds.

It is also suitable for use with ceramic backing for single sided welding.

The wire's composition ensures weld metal equivalent AISI 304 in the first layer of the cladding process.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.028	0.77	1.25	0.023	0.002	0.13	12.77	24.81	0.13	

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
425	550	36		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

1,2mm x 12,5kg

## Approvals:

CE

## Reference / date:

NST 309LT,  
English, 06.02.2018.

Perfect Welding

www.nst.no

# NST 316LT

AWS: A5.22-95: E316LT 0-4

NS-EN ISO 17633-A: T 19 12 3 L R M3

EN ISO 9606-1: FM5



**Flux cored wire for flat position and fillet welding of corrosion resistant and stainless steel materials of AISI 316, EN 1.4404 etc.**

## General description:

NST 316LT is a rutile flux cored wire for flat position (PA) and fillet welding (PB and PC) of corrosion resistant and stainless steel materials such as AISI 316 etc.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

NST 316LT has a slag freezing system which is slightly slower than wires designed for positional welding.

This makes this wire suitable for flat position and fillet welds.

It is also suitable for use with ceramic backing for single sided welding.

NST 316LT is also suitable for Ti- and Nb-stabilized materials when the operating temperature does not exceed 400 °C.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0.022	0.66	1.12	0.025	0.004	0.15	11.69	18.44	2.56	

## Shielding gas:

Argon+ 18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
404	552	44		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

0,9mm x 12,5kg D300  
1,2mm x 12,5kg D300

## Approvals:

CE

## Reference / date:

NST 316LT,  
English, 06.02.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)



# NST 309MoLT

AWS: A5.22-95 E309LMoT 0-4

NS-EN ISO 17633-A: T 23 12 2 L R M3

EN ISO 9606-1: FM5



**Flux cored wire for flat position and fillet welding of carbon steels against stainless steel materials such as AISI 316 etc.**

## General description:

NST 309MoLT is a flux cored wire for flat position (PA) and fillet welding (PB and PC) of stainless steel materials such as AISI 316 and similar against carbon steel.

The wire is also suitable for cladding of carbon steel where a Mo stainless cladding is needed.

The flux cored wire uses an Argon/CO<sub>2</sub> mixed shielding gas.

This ensures a user friendly and stable welding arc, less spatter, good visual bead appearance and smooth transition to the parent materials.

NST 309MoLT has a slag freezing system which is slightly slower than wires designed for positional welding.

This makes this wire suitable for flat position and fillet welds.

It is also suitable for use with ceramic backing for single sided welding.

## Welding positions:



## Welding current:

DC+

## Gas flow:

15-23 l/min.

## Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
0,020	0.63	1.18	0.024	0.002	0.14	12.88	22.82	2.49	

## Shielding gas:

Argon+18-25% CO<sub>2</sub>.

## Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
533	690	29		

## Guidance - Ampere (DC+):

Electrode diameter			
Ampere / Volt			

## Packaging information:

0,9mm x 12,5kg D300  
1,2mm x 5,0kg D200  
1,2mm x 12,5kg D300

## Approvals:

CE

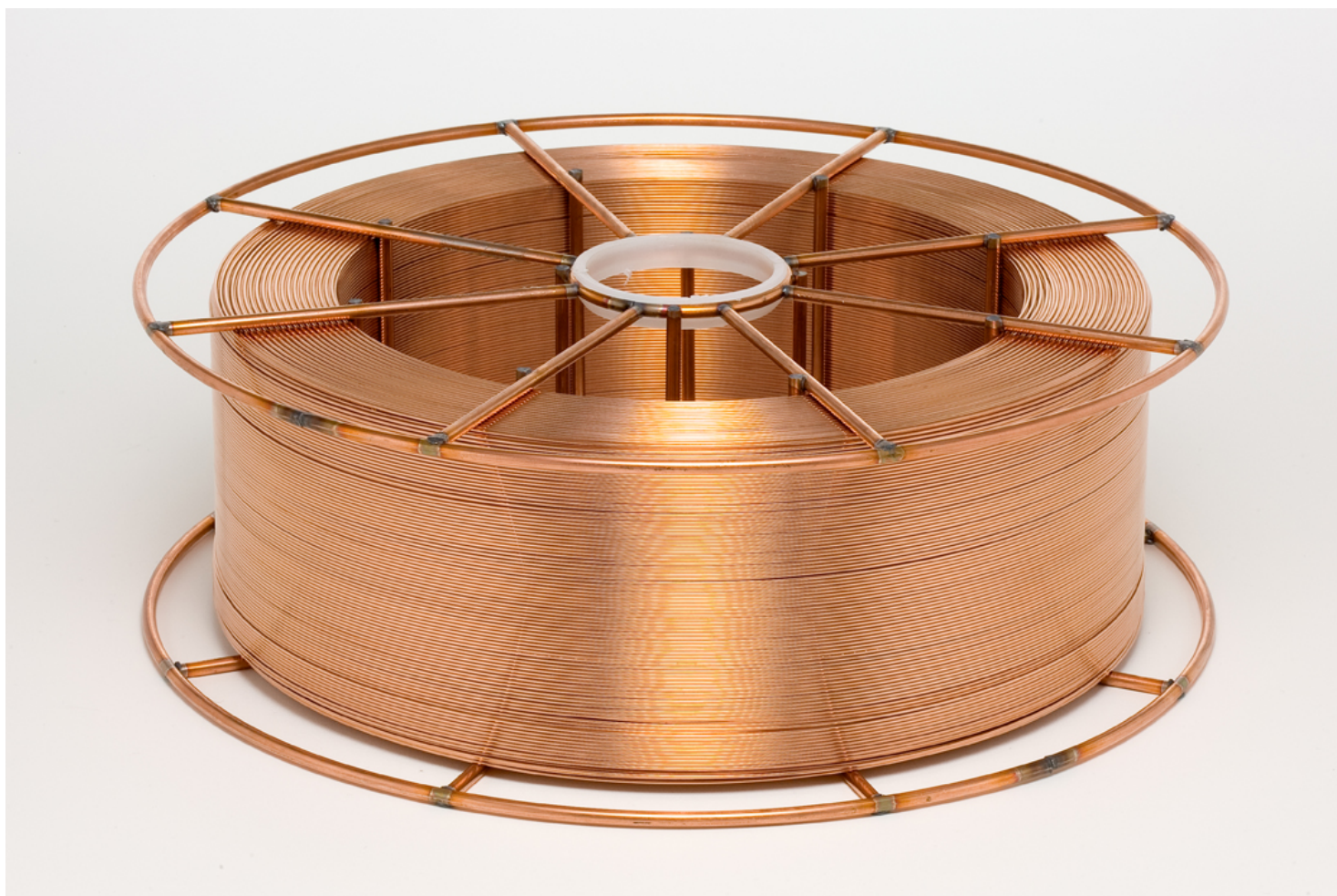
## Reference / date:

NST 309MoLT,  
English, 11.10.2019.

Perfect Welding

[www.nst.no](http://www.nst.no)

## **MIG/MAG wires for non-alloyed steels**



**NST Carbomig 2N**  
**NST Carbomig 3N**  
**NST MIG ER80S Ni1**

# NST Carbomig 2N

AWS: A5-18/SFA5.18: ER70S-6

EN ISO 14341-A: G 46 2 M21 3Si1

EN ISO 14341-A: G 42 2 C1 3Si1



## Solid wire for welding of mild and high strength steels.

### General description:

NST Carbomig 2N is a copper coated solid (SG2) wire for MIG/MAG welding of unalloyed steels with CO<sub>2</sub> or Argon/CO<sub>2</sub> mix shielding gas.

The wire is suitable for welding in a wide range of welding currents with excellent appearance.

Also suitable for welding thin walled steels or sheet metal.

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Typical chemical composition of welding wire:

C	Si	Mn							
0,08	0,90	1,50							

### Type of gas:

Ar/CO<sub>2</sub> or CO<sub>2</sub>.

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -30 °C	
≥420	500-640	≥22	≥47	

### Guidance - Ampere (DC+):

Wire diameter			
Ampere / Volt			

### Packaging information:

0,8mm x 15Kg + drum Ø51cm  
1,0mm x 15Kg + drum Ø51cm  
1,2mm x 15Kg + drum Ø51cm

### Approvals:

TÜV, CE,

### Reference / date:

NST Carbomig2N,  
English, 29.04.2016.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST Carbomig 3N

AWS: A5-18/SFA5.18: ER70S-6

EN ISO 14341-A: G 42 2 C1 G4Si1

EN ISO 14341-A: G 46 3 M21 G4Si1



## Solid wire for welding of mild and high strength steels.

### General description:

NST Carbomig3N is a copper coated solid (SG3) wire for MIG/MAG welding of unalloyed steels with CO<sub>2</sub> or Argon/CO<sub>2</sub> mixed shielding gas.

The wire is suitable for welding in a wide range of welding currents with excellent appearance.

Low spatter CO<sub>2</sub> performance, and excellent wire feeding capability.

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Typical chemical composition of welding wire:

C	Si	Mn							
0,08	1,00	1,75							

### Type of gas:

Ar/CO<sub>2</sub> or CO<sub>2</sub>.

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -30 °C (M21)	Charpy V (J) -20 °C (Co <sup>2</sup> )
C1≥420/M21≥460	500-640/530-680	≥22	≥47	≥47

### Guidance - Ampere (DC+):

Wire diameter			
Ampere / Volt			

### Packaging information:

0,8mm x 15Kg + drum Ø51cm  
1,0mm x 15Kg + drum Ø51cm  
1,2mm x 15Kg + drum Ø51cm

### Approvals:

TÜV, CE

### Reference / date:

NST Carbomig3N,  
English, 29.04.2016.

Perfect Welding

www.nst.no

# NST MIG ER80S Ni1

AWS A5.28: ER80S-Ni1

EN ISO 14341-A: G 46 6 M21 3Ni1



## Solid wire for welding of mild and low alloyed steels.

### General description:

NST MIG ER 80S Ni1 is a copper coated solid wire for MIG/MAG welding of fine grain structural steels with Argon/CO<sub>2</sub> (M21) mixed shielding gas.

Typical usage is within offshore and Oil & Gas steelworks and pipe welding.

The wire is suitable for welding with a wide range of welding currents with excellent appearance.

It has low spatter performance, and excellent wire feeding capabilities.

Suitable for both manual welding and for robotic / -mechanised welding in all positions, including vertical downwards.

Can be used for applications where service temperature is down to -60 °C.

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Typical chemical composition of welding wire:

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V
0,10	0,65	1,1	0,008	0,009	0,13	0,03	0,86	0,09	0,002

### Type of gas:

Ar/CO<sub>2</sub> mix ( M21).

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -60 °C	
>470	550-680	≥24	≥ 47	

### Packaging information:

0.8mm x 15Kg / 250Kg  
1.0mm x 15Kg / 250Kg  
1.2mm x 15Kg / 250Kg  
1.6mm x 15Kg / 250Kg

### Approvals:

VdTÜV, CE

### Reference / date:

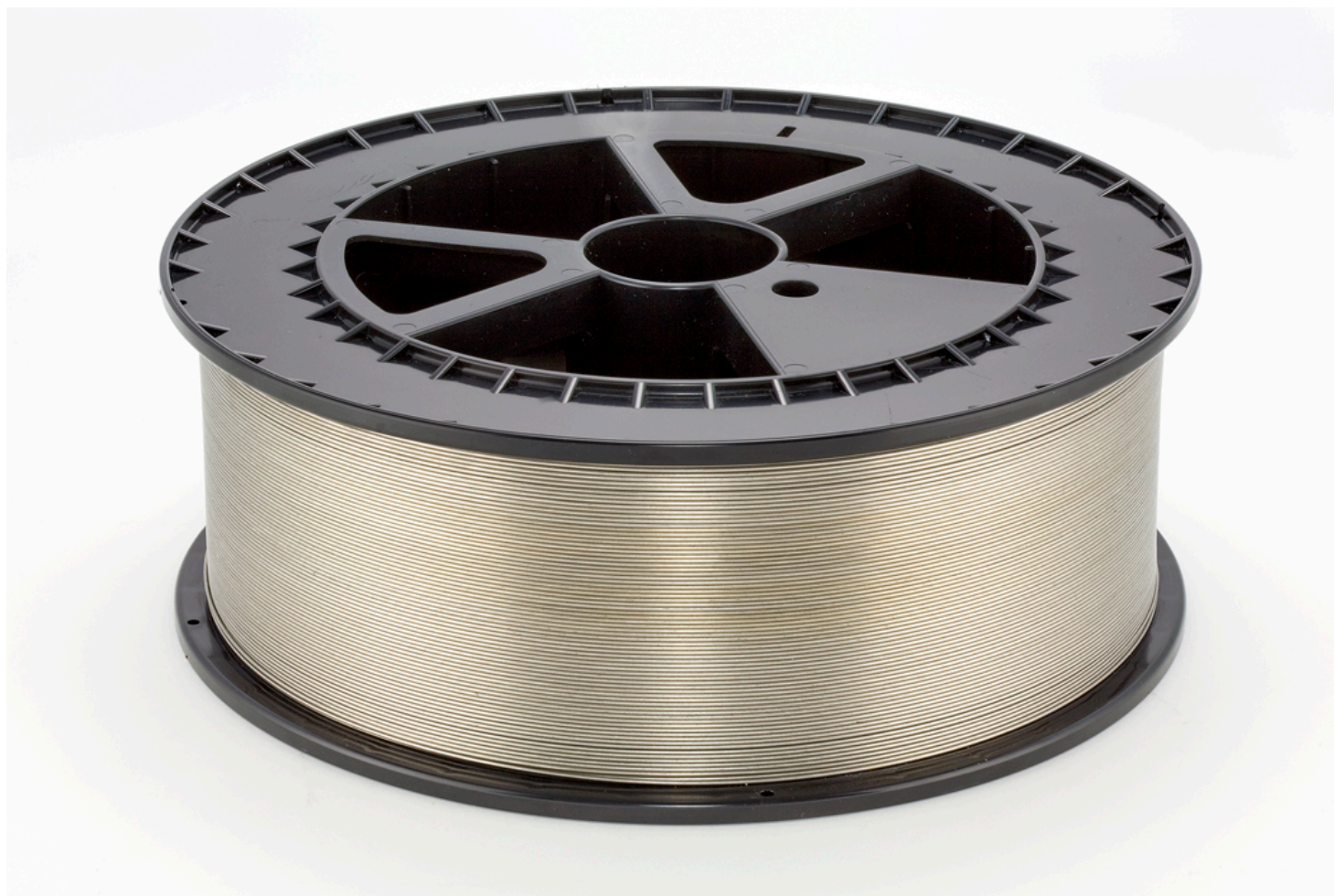
NST MIG ER80S Ni1,  
English, 26.04.2017.

Perfect Welding

www.nst.no



## **MIG/MAG wires for high alloyed steels**



**NST MIG 308LSi**

**NST MIG 309LSi**

**NST MIG 316LSi**

**NST MIG Duplex 2209**

**NST MIG ERNiCrMo-3(625)**



# NST MIG 308LSi

AWS: A5.9 ER308LSi

EN ISO 14343: 2009 19 9 LSi



## Solid wire for welding of corrosion resistant materials.

### General description:

NST MIG 308LSi is a low-carbon, solid MIG/MAG wire for welding of corrosion resistant materials such as AISI 304, EN 1.4301, EN 1.4307 etc.

Normally, mixed gas Argon/CO<sub>2</sub> or Argon/O<sub>2</sub> are used as the shielding gas.

This ensures a user friendly, stable welding arc with less spatter, a good visual bead appearance and smooth transition to the parent material.

The wire can be used both with or without Pulse-synching.

And it can also be used for welding of Nb- and Ti-stabilized materials (i.e. ASTM 321) when operating

temperature does not exceed 400 °C.

By higher operating temperatures, a Nb-stabilized welding wire is used.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld, will cause porosity.

Inter-pass temperature should not exceed 150 °C.

Heat input should not exceed <2.0kJ/mm.

The weld metal will have an Austenitic structure with a low portion of Ferrite (typically 5-9% ferrite).

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
Max 0.03	0.65-1.0	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	9.0-11.0	19.5-21.0	Max 0.30	

### Shielding gas:

Shielding gas: Ar+2-3% CO<sub>2</sub>, Ar+2% O<sub>2</sub>.

Purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
410	590	44		

### Ferrite content(typical):

WRC	De long	Schaeffler	
13.3FN	15.4%	12.6%	

### Packaging information:

1,0mm x 12,5kg D300  
1,0mm x 200kg Ø51cm drum  
1,2mm x 12,5kg D300  
1,2mm x 200kg Ø51cm drum

### Approvals:

CE

### Reference / date:

NST MIG 308LSi,  
English, 04.02.2016.

Perfect Welding

www.nst.no

# NST MIG 309 LSi

AWS: A5.9 ER 309LSi

EN ISO 14343: 2009 23 12 LSi



## Solid wire for welding of corrosion resistant materials (without Mo) against carbon steel.

### General description:

NST MIG 309LSi is a low-carbon, solid MIG/MAG wire for welding of corrosion resistant materials such as AISI 304, EN 1.4301, EN1.4307 against carbon steel. The wire is also used for cladding of carbon steel. Normally an Argon/CO<sub>2</sub> or Argon/O<sub>2</sub> mix are used as the shielding gas. This ensures a user friendly stable welding arc, with less spatter, good visual bead appearance and smooth transition to the parent material. The wire can be used both with or without Pulse-synching.

When cladding carbon steel, the analysis of the weld metal in first layer is equivalent to AISI304.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld will cause porosity.

Inter-pass temperature should not exceed 150 °C.

Heat input should not exceed <2.0kJ/mm.

The weld metal will have an Austenitic structure with a low portion of Ferrite, typically 5-9%.

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	N
Max 0.03	0.65-1.0	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	12.0-14.0	23.0-25.0	Max 0.30	-

### Shielding gas:

Shielding gas: Ar+2-3% CO<sub>2</sub>, Ar+2% O<sub>2</sub>.

Purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
410	575	42		

### Ferrite content(typical):

WRC	De long	Schaeffler	
8.7FN	12.8%	9.6%	

### Packaging information:

1,0mm x 12,5kg D300

1,2mm x 12,5kg D300

### Approvals:

TÜV, CE

### Reference / date:

NST MIG 309LSi,  
English, 04.02.2016.

Perfect Welding

www.nst.no

# NST MIG 316LSi

AWS: A5.9 ER 316LSi

EN ISO 14343: 2009 G 19 12 3 LSi



## Solid wire for welding of corrosion resistant and stainless materials.

### General description:

NST MIG 316LSi is a solid, MIG/MAG wire for welding of corrosion resistant materials such as AISI 316, EN 14401, EN 14404 etc.

Normally Argon/CO<sub>2</sub> or Argon/O<sub>2</sub> mix are used as the shielding gas.

This ensures a user friendly, stable welding arc, with less spatter, good visual bead appearance and smooth transition to the parent material.

The wire can be used both with or without Pulse-synching.

It can also be used for welding of Nb- and Ti-stabilized materials (i.e. ASTM 316Ti) when operating

temperature does not exceed 400 °C.

In higher operating temperature a Nb-stabilized welding wire should be used.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld, will cause porosity.

Inter-pass temperature should not exceed 150 °C.

Recommended heat input should be low: <2.0kJ/mm, typically between 0.5-2.0 kJ/mm.

The wire gives an Austenitic structure with very low Ferrite (typically 5-9%).

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
Max 0.03	0.65-1.0	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	11.0-14.0	18.0-20.0	2.5-3.0	

### Shielding gas:

Shielding gas: Ar+2-3% CO<sub>2</sub>, Ar+2% O<sub>2</sub>.

Purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
411	598	40		

### Ferrite content(typical):

WRC	De long	Schaeffler	
8.0FN	10.8%	10.5%	

### Packaging information:

0,8mm x 5,0kg D200 + 12,5kg D300 + 200kg Ø51cm drum

1,0mm x 12,5kg D300 + 250kg drum

1,2mm x 12,5kg D300 + 250kg drum

1,6mm x 12,5kg D300

### Approvals:

TÜV, CE

### Reference / date:

NST MIG 316LSi,  
English, 04.02.2016.

Perfect Welding

www.nst.no

# NST MIG Duplex 2209

AWS: A5.9 ER 2209

EN ISO 14343: 2009 22 9 3 N L



## Solid wire for welding of Duplex materials.

### General description:

NST MIG Duplex 2209 is a low-carbon, solid MIG/MAG wire for welding of Duplex materials such as SAF2205. Normally, Argon/CO<sub>2</sub> or Argon/O<sub>2</sub> mix are used as the shielding gas.

This provides a user friendly, stable welding arc with minimum spatter, excellent visual bead appearance and smooth transition to the parent material. The wire can be used both with or without Pulse-synching.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld, will cause porosity.

Inter-pass temperature should not exceed 150 °C. Heat input needs extra attention with regards to the cooling rate in order to ensure the correct balance between Austenite and Ferrite, typically between 0.5 and 2.0kJ/mm.

The wire gives an Austenitic-Ferrite weld metal with good mechanical properties combined with good corrosion ability (typically 45-55% ferrite).

### Welding positions:



### Welding current:

DC+

### Gas flow:

12-20 l/min.

### Chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	N
Max 0.03	Max 0.90	Max 2.0	Max 0.03	Max 0.02	Max 0.30	7.5-9.5	21.5-23.5	2.5-3.5	0.10-0.20

### Shielding gas:

Shielding gas: Ar+2% O<sub>2</sub>, Ar+2-3% CO<sub>2</sub>.

Purge gas: Ar, Ar+N<sub>2</sub>, N<sub>2</sub>.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
660	830	30		

### Ferrite content(typical):

WRC	De long	Schaeffler	
50FN	28,6%	55%	

### Packaging information:

1,0mm x 12,5kg D300

1,2mm x 12,5kg D300

### Approvals:

### Reference / date:

NST MIG Duplex 2209,  
English, 11.04.2016.

Perfect Welding

www.nst.no



# NST MIG ERNiCrMo-3(625)

AWS A5.14/A5.14M: 2011 ERNiCrMo-3

EN ISO 18274: 2011 NiCr22Mo9Nb



## MIG Wire for welding of 6Mo alloy (i.e 254 SMO and Inconel 625).

### General description:

NST MIG ERNiCrMo-3 is used for welding of 6Mo alloy (i.e. 254 SMO and Inconel 625) and for cladding of mild steel and other stainless steels. The filler metal is used for both manual welding and for robotic or mechanized application on both pipes and plates. Normally Ar/He is used as shielding gas. The level of gas flow will depend upon wire diameter and the specific application. When welding pure Austenite materials, it is recommended to use very low heat input, low mixture with parent material and low interpass temperature.

"Purity" is the keyword when welding high alloyed materials. Impurities in the weld, will cause porosity. Welding of pipes require the use of purge gas in order to ensure a stainless root face of the weld. Please contact us for further details on purge equipment. Interpass temperature should not exceed 150 °C, and heat input should not exceed 1,5kJ/mm.

Can be supplied in dull or bright surface.

### Welding positions:



### Welding current:

DC+

### Gas flow:

Typ. 15-20 l/min

### Typical chemical composition of welding wire:

C	Mn	Si	P	S	Cu	Ni	Cr	Mo	Fe	Ti	Al	Nb+Ta	Other
0.01	0.01	0.07	0.003	0.001	<0.01	64.33	22.32	9.10	0.3	0.018	0.12	3.44/0.01	Max 0.50

### Shielding gas:

Shielding gas: Ar/He.

Root gas/Purge gas for single sided welding: Ar

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
470	750	42		

### Packaging information:

1.0mm x 15kg D300  
1.14mm x 15kg D300  
1.2mm x 15kg D300  
1.0mm x 250kg Ø 51cm drum  
1.14mm x 250kg Ø 51cm drum  
1.2mm x 250kg Ø 51cm drum

### Approvals:

CE

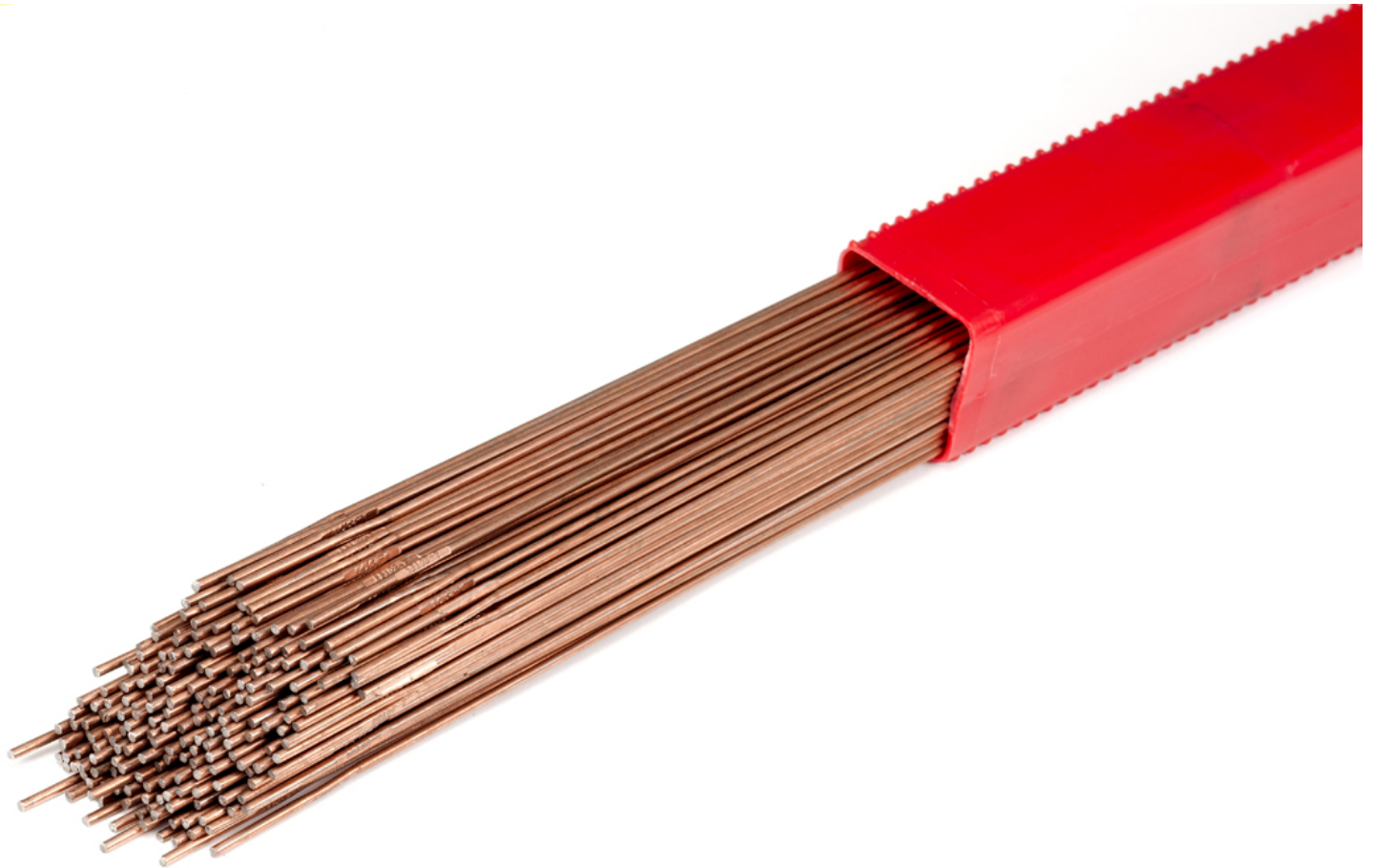
### Reference / date:

NST MIG ERNiCrMo-3(625),  
English, 10.02.2016.

Perfect Welding

www.nst.no

## **TIG rods for non- and low alloyed steels**



**NST Carbotig 2F**  
**NST TIG ER80S-Ni1**



# NST Carbotig 2F

AWS: A5-18: ER70S-6

EN ISO 636-A: W 46 5 W3Si1



## TIG rod for welding unalloyed steels.

### General description:

NST Carbotig 2F is a copper coated TIG wire rod for welding unalloyed steels with pure argon shielding gas.

### Welding positions:



### Current:

DC-

### Gas flow:

12-20 l/min.

### Chemical composition of welding rod:

C	Mn	Si	P	S	Cu	Ni	Cr	Mo	V	Al	Ti+Zr		
0,06-0,14	1,40-1,60	0,80-1,00	Max 0.025	Max 0.025	Max 0.35	Max 0.15	Max 0.15	Max 0.15	Max 0.03	Max 0.02	Max 0.15		

### Type of gas:

Argon

### Mechanical properties of all-weld-metal:

Yield and Tensile Strength			Charpy Impact Test	
Yield Mpa	Tensile Mpa(Rm)	Elongation %	Charpy V (J) -50 °C	
≥460	530-680	Min. 22	≥47	

### Packaging information:

1,6mm x 1000mm x 2,5Kg  
2,0mm x 1000mm x 2,5Kg  
2,4mm x 1000mm x 2,5Kg  
3,2mm x 1000mm x 2,5Kg

### Approvals:

CE

### Reference / date:

NST Carbotig 2F,  
English, 15.02.2016.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST TIG ER80S-Ni1

AWS A5-28: ER80S-Ni1

EN ISO 636-A: W 46 6 W3Ni1



## Low alloyed Tig rod for welding in low temperature applications.

### General description:

NST TiG ER80S Ni1 is a copper coated solid wire rod for TIG welding.

Typical usage is within offshore and Oil & Gas pipe welding with low temperature requirements.

Max. Ni content is 1,0%

Can be used for applications where service temperature is down to -60 °C.

### Welding positions:



### Welding current:

DC-

### Gas flow:

10-15 l/min.

### Typical chemical composition of welding wire:

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V
0,09	0,67	1,08	0,006	0,014	0,01	0,00	0,87	0,015	0,002

### Type of gas:

Argon

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -60 °C	
>470	550 - 680	≥24	≥ 47	

### Guidance - Ampere (DC-):

Wire diameter	1,6	2,0	2,4

### Packaging information:

1,6mm x 1000mm x 3,0 kg

2,0mm x 1000mm x 3,0 kg

2,4mm x 1000mm x 3,0 kg

### Approvals:

CE

### Reference / date:

NST TIG ER80S-Ni1  
English, 28.10.2019.

Perfect Welding

www.nst.no

## **TIG rods for high alloyed steels**



**NST TIG 309LSi**  
**NST TIG 316LSi**  
**NST TIG 309LMo**  
**NST TIG Duplex 2209**  
**NST TIG ErNiCrMo-3(625)**

# NST TIG 309 LSi

AWS: A5.9 ER 309LSi

EN ISO 14343: 2009 23 12 LSi



## Tig-rod for welding of corrosion resistant material against carbon steels.

### General description:

NST TIG 309LSi is a TIG-rod for welding corrosion resistant materials against carbon steel and for cladding of carbon steel.  
The filler rod is used for manual welding of both pipes and plates.  
Normally, Argon or Argon/Helium mix is used as the shielding gas.  
Level of gas flow is dependent upon diameter and specific application.  
NST TIG 309LSi gives a ductile and crack resistant weld metal.  
The TIG-rods are being supplied in 1000mm lengths,

colour coded in orange with zebra stripes, and with the AWS designation embossed, according to the requirements of the NORSOK standard.  
"Purity" is the keyword when welding high alloyed materials. Impurities in the weld, will cause porosity.  
When cladding carbon steel, the analysis of the weld metal will be equivalent of AISI 304 in the first layer.  
Inter-pass temperature should not exceed 150 °C, and heat input should not exceed 2.0kJ/mm.

### Welding positions:



### Welding current:

DC-

### Gas flow:

8-20 l/min.

### Chemical composition of welding rod:

C	Si	Mn	P	S	Cu	Ni	Cr		
Max 0.03	0.65-1.0	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	12.0-14.0	23.0-25.0		

### Shielding gas:

Shielding gas: Ar, Ar+He.  
Root gas/purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
410	570	38		

### Ferrite content:

WRC	De Long	Schaeffler	
8.7FN	12.8%	9.6%	

### Packaging information:

1,6 mm x 1000mm x 5Kg  
2,0 mm x 1000mm x 5Kg  
2,4 mm x 1000mm x 5Kg

Colour coding: Orange with zebra stripes.

### Approvals:

TÜV, DB, CE

### Reference / date:

NST TIG 309LSi,  
English, 06.08.2018.

Perfect Welding

www.nst.no

# NST TIG 316LSi

AWS: A5.9 ER 316LSi

EN ISO 14343: 2009 19 12 3 LSi



## TIG-rod for stainless steel welding.

### General description:

NST TIG 316LSi is used for welding of "stainless" materials as AISI 316L, EN 14404 and similar. Argon or Argon/Helium mix is used as the shielding gas. The TIG-rod is used for manual welding of both pipes and plates. Level of gas flow depends upon diameter and specific application. The filler rod ensures a crack resistant Austenitic weld metal with some Ferrite content (typical 4-10%). The rod is also suitable for welding Ni and Titanium stabilized steels with operating temperatures up to 400 °C.

The TIG-rods are supplied colour coded in blue with the AWS designation embossed, according to the requirement of the NORSOK standard. "Purity" is the keyword when welding high alloyed materials. Impurities in the weld, will cause porosity. Welding of pipes require use of purge gas in order to ensure a stainless root face of the weld. Inter-pass temperature should not exceed 150 °C, and heat input should not exceed 2.5kJ/mm.

### Welding positions:



### Welding current:

DC-

### Gas flow:

10-20 l/min.

### Chemical composition of welding rod:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
Max 0.03	0.65-1.0	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	11.0-14.0	18.0-20.0	2.5-3.0	

### Shielding gas:

Shielding gas: Ar, Ar+He.  
Root gas/purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
414	592	40		

### Ferrite content:

WRC	De Long	Schaeffler	
8.4FN	11.2%	10.1%	

### Packaging information:

1,0mm x 1000mm x 5kg  
1,2mm x 1000mm x 5kg  
1,6mm x 1000mm x 5kg / 1,6mm x 500mm x 2,5kg  
2,0mm x 1000mm x 5kg / 2,0mm x 500mm x 2,5kg  
2,4mm x 1000mm x 5kg / 2,4mm x 500mm x 2,5kg  
3,2mm x 1000mm x 5kg  
4,0mm x 1000mm x 5kg

Colour coding: Blue

### Approvals:

TÜV, DB, CE

### Reference / date:

NST TIG 316LSi,  
English, 06.08.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST TIG 309LMo

AWS: A5.9 ER 309LMo\*

EN ISO 14343: 2009 23 12 2 L



## TIG-rod for stainless steel welding.

### General description:

NST TIG 309LMo is used for welding of stainless materials against carbon steel and for cladding of carbon steel. Normally, Argon or Argon/Helium mix is used as the shielding gas.

The wire is used for manual welding of both pipes and plates.

Level of gas flow will depend upon diameter and specific application.

NST TIG 309LMo gives a ductile and crack resistant weld metal.

The TIG-rods are supplied colour coded in orange, with the AWS designation embossed, according to the

requirement of the NORSOK standard.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld, will cause porosity.

When cladding carbon steel, the analysis of the weld metal is the equivalent of AISI 304 in the first layer.

Welding of pipes require use of purge gas in order to ensure a corrosion resistant root face of the weld.

Inter-pass temperature should not exceed 150 °C, and heat input should not exceed 2.0kJ/mm.

\*Cr can be lower and Ni higher than the AWS standard.

### Welding positions:



### Welding current:

DC-

### Gas flow:

8-20 l/min.

### Chemical composition of welding rod:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
Max 0.03	Max 0.65	1.0-2.5	Max 0.03	Max 0.02	Max 0.30	11.0-15.5	21.0-25.0	2.0-3.0	

### Shielding gas:

Shielding gas: Ar, Ar+He.

Root gas/purge gas: Ar.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
430	625	43		

### Ferrite content:

WRC	De Long	Schaeffler	
8.2FN	10.6%	7.0%	

### Packaging information:

1,6mm x 500mm x 2,5kg  
2,0mm x 500mm x 2,5kg  
2,4mm x 500mm x 2,5kg

Colour coding: Orange

### Approvals:

### Reference / date:

NST TIG 309LMo,  
English, 02.06.2020.

Perfect Welding

www.nst.no



# NST TIG Duplex 2209

AWS: A5.9 ER 2209

EN ISO 14343: 2009 22 9 3 N L



## TIG-rod for stainless steel welding.

### General description:

NST TIG Duplex 2209 is used for welding Duplex materials such as SAF2205, EN 14462 and similar. Normally Argon or Argon/N<sub>2</sub> mix is used as the shielding gas.

The TIG-rod is used for manual welding of both pipes and plates.

Level of gas flow is dependent upon TIG-rod diameter and specific application.

The balance between Austenite and Ferrite in the weld metal will depend upon welding parameters, choice of gas and cooling rate.

The rod is also suitable for welding of corrosion-

resistant and stainless materials against Duplex materials and also for welding 'Lean' Duplex grades. The TIG-rods are supplied colour coded in yellow with the AWS designation embossed, according to the requirement of the NORSOK standard.

"Purity" is the keyword when welding high alloyed materials.

Impurities in the weld, will cause porosity.

Welding of pipes require use of purge gas in order to ensure a stainless root face of the weld.

Inter-pass temperature should not exceed 150 °C, and heat input should not exceed 1.5kJ/mm.

### Welding positions:



### Welding current:

DC-

### Gas flow:

10-20 l/min.

### Chemical composition of welding rod:

C	Si	Mn	P	S	Cu	Ni	Cr	Mo	
Max 0.03	Max 0.90	Max 2.0	Max 0.03	Max 0.02	Max 0.30	7.5-9.5	21.0-23.5	2.5-3.5	

### Shielding gas:

Shielding gas: Ar, Ar+N<sub>2</sub>.

Root gas/purge gas: Ar, Ar+N<sub>2</sub>, N<sub>2</sub>.

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %	Charpy V -46°C	
660	830	28	105	

### Ferrite content:

WRC	De Long	Schaeffler	
50.0FN	28.6%	55.6%	

### Packaging information:

1,6mm x 500mm x 2,5 Kg  
2,0mm x 500mm x 2,5 Kg  
2,4mm x 500mm x 2,5 Kg  
1,6mm x 1000mm x 5 Kg  
2,0mm x 1000mm x 5 Kg  
2,4mm x 1000mm x 5 Kg

Colour coding: Yellow

### Approvals:

### Reference / date:

NST TIG Duplex 2209,  
English, 11.04.2016.

Perfect Welding

www.nst.no

# NST TIG ERNiCrMo-3

AWS A5.14/A5.14M ERNiCrMo-3

EN ISO 18274:NiCr22Mo9Nb



## Tig-rod for welding of 6Mo alloy (i.e 254 SMO and Inconell 625).

### General description:

NST TIG ERNiCrMo-3 is used for welding of 6Mo alloy (i.e. 254 SMO and Inconell 625) and for cladding of mild steel and other stainless steels. The filler metal is used for manual welding of both pipes and plates. Normally, pure Argon or Argon/Helium mix is used as the shielding gas. Level of gas flow will depend upon TIG-rod diameter and specific application. When welding pure Austenite materials, it is recommended to use very low heat input, low mixture with parent material and low inter-pass temperature.

Each TIG-rod is colour coded in black and has the AWS designation embossed according to the requirements of the NORSOK standard. "Purity" is the keyword when welding high alloyed materials. Impurities in the weld, will cause porosity. Welding of pipes require use of purge gas in order to ensure a stainless root face of the weld. Please contact us for further details on purge equipment. Inter-pass temperature should not exceed 150 °C, and heat input should not exceed 1.5kJ/mm.

### Welding positions:



### Current:

DC-

### Gas flow:

8-20 l/min.

### Chemical composition of welding rod:

C	Mn	Si	P	S	Cu	Ni	Cr	Mo	Fe	Ti	Al	Nb+Ta	
Max 0.10	Max 0.50	Max 0.50	Max 0.02	Max 0.015	Max 0.50	Min 58.0	20.0-23.0	8.0-10.0	Max 0.5	Max 0.40	Max 0.40	3.15-4.15	

### Shielding gas:

Shielding gas: Ar or Ar/He  
Root gas/Purge gas: Ar

### Mechanical properties of all-weld-metal:

Yield and Tensile Strength				
Yield Mpa(Rp0.2)	Tensile Mpa(Rm)	Elongation %		
>565	>785	≥39		

### Ferrite content:

WRC	De Long	Schaeffler	
-	-	-	

### Packaging information:

1,6mm x 500mm x 2,5 Kg  
2,0mm x 500mm x 2,5 Kg  
2,4mm x 500mm x 2,5 Kg

1000mm on special order.

### Approvals:

### Reference / date:

NST TIG ERNiCrMo-3,  
English, 06.10.2016.

Perfect Welding

www.nst.no

# **Electrodes for non- and low alloyed steels**



**NST E-6013**

**NST E-7016**

**NST E-7018**

**NST E-7024**

**NST 7016S**

**16V**

**TW-50**

## NST Electrodes.

### Method of storage:

Coated electrodes should be stored in it's original packaging/ container until use. The withdrawal of electrode packages from stock should be based on the "first-in / first-out" principle.

In order to prevent humidity-induced damage, the electrodes should be stored under climatically controlled conditions with ideal temperatures between 17 and 25°C and a maximum relative air humidity of 60%.

Recommended maximum storage time is 3 years.

### Handling / Re-drying:

Electrodes needs re-drying before use. The recommended temperature and period of time are indicated on the electrode packaging labels and technical specification. Electrodes in vacuum-packed or sealed containers does not need re-drying provided the original packaging seal is unbroken. No special storage climate control is necessary for these electrodes.

Electrodes exhibiting poor arc-stability, heavy spatter or slag removal difficulties have probably been damaged by moisture pick-up. In these cases good welding properties can only be restored by re-drying.

It is recommended that the re-drying process takes place immediately prior to welding. For basic coated and high alloyed electrodes it is recommended using heated electrode quivers during welding.

### Reference / date:

Storage and handling,  
NST Electrodes.  
English. 09.12.2019.

# NST E 6013

AWS: A5.1 E 6013

EN ISO 2560-A: E 42 0 RC 11



## Rutile all round electrode for welding low and unalloyed steels.

### General description:

NST E 6013, is a thick coated rutile-cellulose type electrode for welding low and unalloyed steels. Suitable for welding constructions, maintenance and repairing purposes. Excellent welding properties in all welding positions.

### Welding positions:



### Welding current:

DC+/-/AC

### Redrying:

140 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,08	0,45	0,65	<0,035	<0,035					

### Diffusible hydrogen content (ml/100g):

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) 0 °C	
≥420	500-640	≥22	≥47	

### Guidance - Ampere (DC+/-/AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	60-85	90-135	130-170

### Packaging information:

2,0 x 300 2,0kg pack, carton 12,0kg  
2,5 x 350 2,0kg pack, carton 12,0kg  
3,2 x 350 2,0kg pack, carton 12,0kg  
4,0 x 350 2,0kg pack, carton 12,0kg

### Approvals:

TÜV, CE

### Reference / date:

NST E 6013, English,  
02.05.2022.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST E 7016

AWS: A5.1 E 7016

EN ISO 2560-A: E 42 4 B 12 H10



## All round rutile-basic electrode for welding unalloyed steels.

### General description:

NST E 7016, is a double coated, basic CTOD-tested electrode with excellent welding properties suitable for welding in difficult positions, with the exception of vertical down (PG).

It has a stable welding arc even at low current settings. Ignites and re-ignites easily.

Very suitable for welding root-runs with DC and AC currents.

This product is also available in a premium vacuum-packed version, with smart 2-in-1 packaging.

**VacuumPack SuperDry 2-in-1**

### Welding positions:



### Welding current:

DC+ / AC

### Redrying:

380 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,05	0,65	1,00	<0,035	<0,035					

### Diffusible hydrogen content (ml/100g):

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
≥420	500-640	≥22	≥47	

### Guidance - Ampere (DC+ / AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	60-90	90-140	140-190

### Packaging information:

2,0 x 300 1,8kg pack, carton 10,8kg  
2,5 x 350 2,0kg pack, carton 12,0kg  
3,2 x 450 2,4kg pack, carton 14,4kg  
4,0 x 450 2,6kg pack, carton 15,6kg  
Vacuum pack: 2,5 x 350 1,8kg(2 x 0,9kg) pack, carton 16,2kg  
Vacuum pack: 3,2 x 350 1,6kg(2 x 0,8kg) pack, carton 16,0kg  
Vacuum pack: 3,2 x 450 2,0kg(2 x 1,0kg) pack, carton 20,0kg  
Vacuum pack: 4,0 x 350 1,0kg(2 x 0,5kg) pack, carton 10,0kg  
Vacuum pack: 4,0 x 450 1,2kg(2 x 0,6kg) pack, carton 12,0kg

### Approvals:

DNVGL, TÜV, CE

### Reference / date:

NST E 7016,  
English, 11.09.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)



# NST E 7018

AWS: A5.1 E7018

EN ISO 2560-A: E 42 4 B 32 H5



## Basic electrode for welding unalloyed and fine grained steels.

### General description:

NST E 7018 is a basic, CTOD tested electrode with excellent welding characteristics, recommended for welding structural steels and steel castings with tensile strength up to 610 N/mm<sup>2</sup>, and fine grained steels with increased yield strength.

Weld metal Deposits have a very low hydrogen content (HD < 5 ml/100 g).

Excellent welding properties in difficult positions, except vertical down (PG).

Efficiency of approximately 120%.

This product is also available in a premium vacuum-packed version, with smart 2-in-1 packaging.

**VacuumPack SuperDry 2-in-1**

### Welding positions:



### Welding current:

DC+ / AC

### Redrying:

400 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,07	0,60	1,00	<0,035	<0,035					

### Diffusible hydrogen content (ml/100g):

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -40 °C	
≥420	500-640	≥22	≥47	

### Guidance - Ampere (DC+ / AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	65-90	110-140	140-180

### Packaging information:

2,0 x 300 1,8kg pack ,carton 10,8kg  
2,5 x 350 2,0kg pack ,carton 12,0kg  
3,2 x 450 2,4kg pack ,carton 14,4kg  
4,0 x 450 2,7kg pack ,carton 16,2kg  
5,0 x 450 2,7kg pack ,carton 16,2kg  
Vacuum pack: 2,5 x 350 0,7kg(2 x 0,35kg) pack, carton 8,4kg  
Vacuum pack: 3,2 x 450 1,1kg(2 x 0,55kg) pack, carton 13,2kg  
Vacuum pack: 4,0 x 450 1,4kg(2 x 0,7kg) pack, carton 16,8kg

### Approvals:

DNVGL, TÜV, CE

### Reference / date:

NST E 7018,  
English, 24.08.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST E 7024

AWS: A5.1 E7024

EN ISO 2560-A: E 42 0 RR 74



## Rutile high efficiency electrode for welding unalloyed steel.

### General description:

NST E 7024 is a high efficiency, rutile electrode for high productivity welding in heavy fabrications and ordinary structural steels, exhibiting excellent welding properties.

Very good choice for vertical fillet welding.

Tensile strength up to 510 N/mm<sup>2</sup> and approximately 200% efficiency.

### Welding positions:



### Welding current:

DC-/AC

### Redrying:

250 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,08	0,30	0,75	<0,035	<0,035					

### Diffusible hydrogen content (ml/100g):

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) 0 °C	
≥420	500-640	≥22	≥47	

### Guidance - Ampere (DC-/AC):

Electrode diameter	3,2 mm	4,0 mm	5,0 mm
Ampere / Volt	130-180	180-220	240-290

### Packaging information:

3,2 x 450 2,5kg pack, carton 15,0kg  
4,0 x 450 2,5kg pack, carton 15,0kg  
5,0 x 450 2,5kg pack, carton 15,0kg

### Approvals:

DNV, CE

### Reference / date:

NST E 7024,  
English, 28.01.2016.

Perfect Welding

www.nst.no

# NST 7016 S

AWS: SFA5.1 E 7016

EN 499: E 38 2 B 12 H10

DIN 1912 E 51 43 B R 10



**Basic electrode for low and unalloyed steels of up to 600N/mm<sup>2</sup>.**

## General description:

NST 7016 S is a multi-purpose electrode suitable for assembly work, workshop and repair welding.  
Smooth and clean welds which blend into base metal reducing the chances of undercut.  
Excellent gap bridging properties.  
Due to its double covering, the electrode has a stable and concentrated arc and is therefore ideally suited for root pass and positional welding.

## Welding positions:



## Welding current:

DC+/AC

## Redrying:

330 °C/2 hours.

## Typical chemical composition of all-weld-metal:

C	Si	Mn							
0,06	0,70	0,90							

## Diffusible hydrogen content (ml/100g):

## Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	
≥380	470-600	≥20	≥100	

## Guidance - Ampere (DC+/AC):

2,0 mm	2,5 mm	3,2 mm	4,0 mm
55-65 A	60-90 A	90-150 A	140-190 A

## Packaging information:

2,0 x 300 2,0kg pack , carton 12,0kg  
2,5 x 350 2,0kg pack , carton 12,0kg  
3,2 x 450 2,3kg pack , carton 13,8kg  
4,0 x 450 2,6kg pack , carton 15,6kg

## Approvals:

VdTÜV, CE

## Reference / date:

NST 7016 S,  
English, 11.09.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# 16V

AWS: A5.1: E7048



## Basic electrode for welding unalloyed steels in the vertical downward(PG) position.

### General description:

16V is a low hydrogen type electrode designed especially for vertical down butt and fillet welding. Welding efficiency is twice as high as vertical up welding since a high current is used. Deposited metal shows high crack resistance and excellent mechanical properties and therefore is applicable for various types of steel. Easy slag removal. Also suitable for tack welding, and welding over using the MIG/MAG process.

### Welding positions:



### Welding current:

AC/DC+

### Redrying:

300 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,08	0,53	0,84	0,014	0,011					

### Diffusible hydrogen content (ml/100g):

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	Charpy V (J) 0 °C
440	540	33	158	170

### Guidance - Ampere (AC/DC+):

Electrode diameter	3,2 mm	4,0 mm	
Ampere / Volt	100-150	160-210	

### Packaging information:

3,2 x 400mm pr. pack 5,0kg, pr. carton 20,0kg  
4,0 x 450mm pr. pack 5,0kg, pr. carton 20,0kg

### Approvals:

ABS, LR, CE

### Reference / date:

16V,  
English, 12.06.2019.

Perfect Welding

[www.nst.no](http://www.nst.no)

# TW-50

AWS: A5.1: E7048



## Basic low hydrogen electrode for tack welding unalloyed steels.

### General description:

TW-50 is a low hydrogen type electrode for tack welding in all positions of mild steels and 490 N/mm<sup>2</sup> high tensile strength steels for ships, structures and bridges.

Crack resistance, slag removal and resistance to moisture absorption are excellent.

Ignites and re-ignites easily.

Vertical downward welding is easy and assures high efficiency using the same current as flat position.

The weld deposit is suitable to be welded over by a mechanised or manual MIG/MAG process.

### Welding positions:



### Welding current:

AC/DC+

### Redrying:

300 °C/1 hour

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S					
0,08	0,45	1,02	0,010	0,007					

### Diffusible hydrogen content (ml/100g):

### Typical mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) -20 °C	Charpy V (J) 0 °C
460	530	32	126	160

### Guidance - Ampere (AC/DC+):

Electrode diameter	3,2 mm	4,0 mm	5,0 mm
Ampere / Volt	110-170	140-230	200-290

### Packaging information:

3,2 x 350mm pr. pack 5,0kg, pr. carton 20,0kg  
4,0 x 400mm pr. pack 5,0kg, pr. carton 20,0kg  
5,0 x 450mm pr. pack 5,0kg, pr. carton 20,0kg

### Approvals:

ABS, LR, DNVGL, CE

### Reference / date:

TW-50,  
English, 12.06.2019.

Perfect Welding

[www.nst.no](http://www.nst.no)

## Electrodes for high alloyed steels



**NST E-309L**

**NST E-316L**

**NST E-309MoL**



# NST E 309L

AWS: A5.4 E 309L-17

EN ISO 3581-A: E 23 12 LR 32



## Rutile low carbon electrode for welding heat resistant steels.

### General description:

NST E 309L is a rutile, low carbon electrode for welding analogous, heat resistant steels and steel castings. Scaling resistant up to 1000 °C. Suitable for joining dissimilar steels (unalloyed steels with stainless steels), welding steam boiler constructions, hardening plants, crude oil and ceramics industries.

Also suitable for buffer layers.

Excellent welding properties in all welding positions, except vertical down ward (PG).

This product is delivered in a premium vacuum-pack, with smart 2-in-1 packaging.

**VacuumPack SuperDry 2-in-1**

### Welding positions:



### Welding current:

DC+ / AC

### Redrying:

300 °C/2 hours

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cr	Ni			
0,04	0,90	0,70	<0,035	<0,025	23,0	13,0			

### Ferrite content:

FN $\approx$ 15

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) +20 °C	
$\geq 320$	550-650	$\geq 30$	$\geq 47$	

### Guidance - Ampere (DC+ / AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	40-80	70-100	110-160

### Packaging information:

2,5mm x 300mm x 16,2kg (SuperDry 2-in-1 packs, 2 x 0.9kg)  
3,2mm x 350mm x 16,0kg (SuperDry 2-in-1 packs, 2 x 0.8kg)  
4,0mm x 350mm x 10,0kg (SuperDry 2-in-1 packs, 2 x 0.5kg)

### Approvals:

CE

### Reference / date:

NST E 309L,  
English, 24.08.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST E 316L

AWS A5.4: E 316L-17

EN ISO 3581-A: E 19 12 3 LR 12



## Rutile electrode for welding stainless 316 steels.

### General description:

NST E 316L is an austenitic rutile, low carbon electrode for welding non-stabilised and stabilised stainless steels.

Resistant to inter-granular corrosion up to 350 °C, resistant to oxidation up to 800°C, and good low-temperature ductility down to -120°C. Excellent welding properties in all welding positions, except vertical down (PG). Also suitable for 304 steels.

This product is delivered in a premium vacuum-pack, with smart 2-in-1 packaging.

**VacuumPack SuperDry 2-in-1**

### Welding positions:



### Welding current:

DC+ / AC

### Redrying:

300 °C/2 hours

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cr	Ni	Mo		
≤0,03	0,80	0,70	<0,030	<0,025	18,5	11,5	2,7		

### Ferrite content:

FN≈8

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) +20 °C	
≥320	≥510	≥30	≥47	

### Guidance - Ampere (DC+ / AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	50-85	70-125	110-165

### Packaging information:

2,0mm x 300mm x 16,2 kg (SuperDry 2-in-1 packs, 2 x 0,9kg)  
2,5mm x 300mm x 14,4kg (SuperDry 2-in-1 packs, 2 x 0,8kg)  
3,2mm x 350mm x 16,0kg (SuperDry 2-in-1 packs, 2 x 0,8kg)  
4,0mm x 350mm x 10,0kg (SuperDry 2-in-1 packs, 2 x 0,5kg)

### Approvals:

TÜV, CE

### Reference / date:

NST E 316L,  
English, 24.08.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# NST E 309MoL

AWS: A5.4: E 309MoL-17

EN ISO 3581-A: E 23 12 2 LR 32



## Rutile low carbon molybdenum electrode for welding heat resistant steels.

### General description:

NST E 309MoL is a rutile, low carbon electrode for welding analogous, heat resistant steels and steel castings. Scaling resistant up to 1000 °C. Suitable for joining dissimilar steels (unalloyed steels with stainless steels), welding steam boiler constructions, hardening plants, crude oil and ceramics industries.

Also suitable for buffer layers.

Excellent welding properties in all welding positions, except vertical down (PG).

This product is delivered in a premium vacuum-pack, with smart 2-in-1 packaging.

**VacuumPack SuperDry 2-in-1**

### Welding positions:



### Welding current:

DC+ / AC

### Redrying:

300 °C/2 hours

### Typical chemical composition of all-weld-metal:

C	Si	Mn	P	S	Cr	Ni	Mo		
0,04	0,80	0,60	<0,030	<0,025	23,0	13,0	3,0		

### Ferrite content:

FN $\approx$ 20

### Mechanical properties of all-weld-metal:

Yield and Tensile Strengths			Charpy Impact Test	
Yield Mpa	Tensile Mpa	Elongation %	Charpy V (J) +20 °C	
$\geq 350$	$\geq 550$	$\geq 25$	$\geq 47$	

### Guidance - Ampere (DC+ / AC):

Electrode diameter	2,5 mm	3,2 mm	4,0 mm
Ampere / Volt	40-80	70-100	110-160

### Packaging information:

2,0mm x 300mm x 16,2kg (SuperDry 2-in-1 packs, 2 x 0.9kg)  
2,5mm x 300mm x 16,2kg (SuperDry 2-in-1 packs, 2 x 0.9kg)  
3,2mm x 350mm x 16,0kg (SuperDry 2-in-1 packs, 2 x 0.8kg)

### Approvals:

TÜV, CE

### Reference / date:

NST E 309MoL,  
English, 24.08.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

## Ceramic backing



# Kerback FS Backing

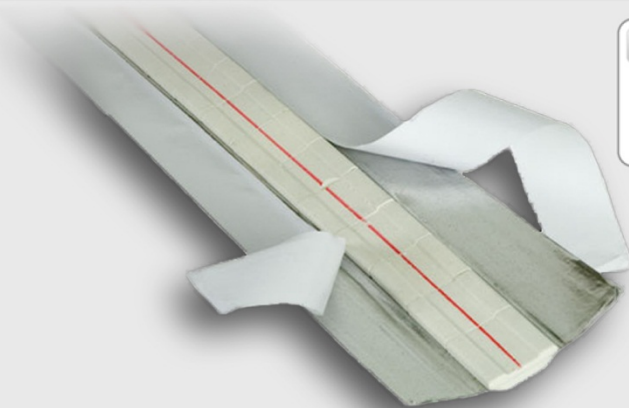
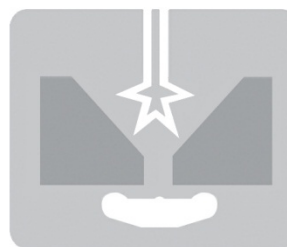
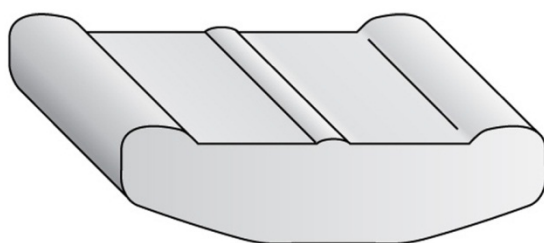


- Flat ceramic backing.
- Square groove for butt welding.
- Supplied on alutape, 100mm wide.

## Dimensions/weight:

<b>FS</b> (Flat type/ <b>S</b> quare groove)	Total width	Groove width	Groove depth	Length piece	Length tile	Length per box	Weight per box
<b>Kerback FS 271412 T</b>	27mm	14mm	1,2mm	60cm	25mm	18m	7.6kg
<b>Kerback FS 271815 T</b>	27mm	18mm	1,5mm	60cm	25mm	18m	7.7kg
<b>Kerback FS 401805 T</b>	40mm	18mm	0,5mm	60cm	25mm	12m	7.9kg
<b>Kerback FS 502510 T</b>	50mm	25mm	1,0mm	60cm	25mm	12m	9.5kg

## Design:



## Reference/date:

Kerback FS, English, 03.10.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# Kerback FR Backing

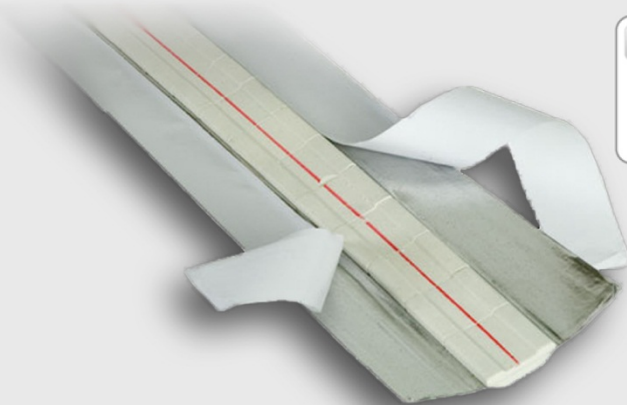
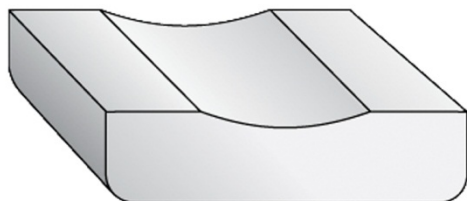


- Flat ceramic backing.
- Round groove for butt welding.
- Supplied on alutape, 100mm wide.

## Dimensions/weight:

<b>FR</b> (Flat type/Round groove)	Total width	Groove width	Groove depth	Length piece	Length tile	Length per box	Weight per box
<b>Kerback FR 221215 T</b>	22mm	12mm	1,5mm	60cm	25mm	24m	7,4kg
<b>Kerback FR 270613 T</b>	27mm	6.0mm	1,3mm	60cm	25mm	18m	8,2kg
<b>Kerback FR 271009 T</b>	27mm	10mm	0,9mm	60cm	25mm	18m	7,7kg
<b>Kerback FR 271313 T</b>	27mm	13mm	1,3mm	60cm	25mm	18m	7,8kg
<b>Kerback FR 301615 T</b>	30mm	16mm	1,5mm	60cm	25mm	18m	7,8kg
<b>Kerback FR 361805 T</b>	36mm	18mm	0,5mm	60cm	25mm	18m	11,1kg

## Design:



## Reference/date:

Kerback FR, English, 03.10.2018.

Perfect Welding

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# Kerback RAD Backing

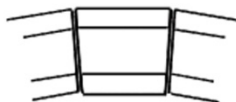
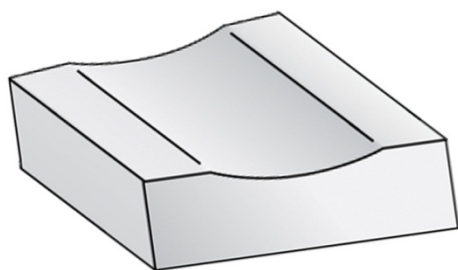


- Radius ceramic backing.
- Perfect for manholes etc.
- 90°, 72° and 45° units.
- Supplied with alutape, 100mm wide

## Dimensions/weight:

<b>RAD</b> ( <b>RAD</b> ius backing)	Covers area	Groove width	Groove depth	Circle Radius	Circle Diameter	Pcs. per box	Weight per box
<b>Kerback RAD 075T 90</b>	90°	13mm	1.0mm	75mm	150mm	44pcs	2.3kg
<b>Kerback RAD 100T 90</b>	90°	13mm	1.0mm	100mm	200mm	44pcs	3.4kg
<b>Kerback RAD150T 90</b>	90°	13mm	1.0mm	150mm	300mm	36pcs	3.8kg
<b>Kerback RAD200 T 72</b>	72°	13mm	1.0mm	200mm	400mm	40pcs	4.7kg
<b>Kerback RAD300 T 45</b>	45°	13mm	1.0mm	300mm	600mm	56pcs	5.0kg

## Design:



## Reference/date:

Kerback RAD, English, 03.10.2018.

# Kerback RD Backing



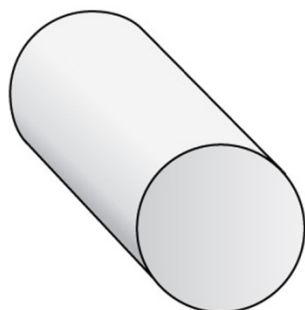
- Round ceramic backing.
- For T-butts, K-, 1/2V and butt X-joints.
- Supplied on alutape, 100mm wide

## Dimensions/weight:

### RD (Round backing)

	Total width	Groove width	Groove depth	Length piece	Length tile	Length per box	Weight per box
<b>Kerback RD 0602 T</b>	6mm	-	-	60cm	25mm	45m	5.0kg
<b>Kerback RD 0802 T</b>	8mm	-	-	60cm	25mm	48m	6.5kg
<b>Kerback RD 1002 T</b>	10mm	-	-	60cm	25mm	36m	7.2kg
<b>Kerback RD 1202 T</b>	12mm	-	-	60cm	25mm	36m	9.9kg
<b>Kerback RD 1501 T</b>	15mm	-	-	60cm	25mm	18m	7.7kg
<b>Kerback RD 2002 T</b>	20mm	-	-	60cm	25mm	12m	8.2kg

## Design:



## Reference/date:

Kerback RD, English, 03.10.2018.

# Kerback Special Backing



- Special ceramic backing.
- Supplied on alutape, 100mm wide.

## Dimensions/weight:

### Special

	Total width	Groove width	Groove depth	Total length	Tile length	Length per box	Weight per box
<b>Kerback FAR 271220 T</b>	27mm	12mm	2.0mm	60cm	25mm	18m	7.1kg
<b>Kerback F 50 T</b>	50 mm	-	-	60cm	23mm	12m	9.0
<b>Kerback TJ 2701 T</b>	27mm	10mm	2.0mm	60cm	30mm	18m	7.6kg
<b>Kerback TR 1302 T</b>	13mm	-	-	60cm	25mm	24m	7.3kg
<b>Kerback TR 101406 T</b>	10/14mm	-	-	60cm	24mm	36m	7.2kg
<b>Kerback TR 121606 T</b>	12/16mm	-	-	60cm	22mm	36m	7.7kg
<b>Kerback FR 271009 T Bulb</b>	27mm	10mm	0.9mm	24cm	30mm	12m	5.0kg
<b>Kerback FR 271313 T Bulb</b>	27mm	13mm	1.3mm	60cm	10mm	18m	7.8kg

## Design/application:

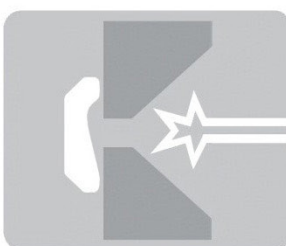
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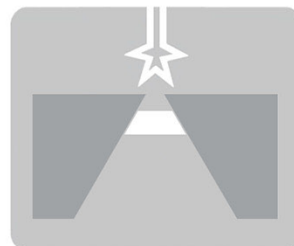
**TR1302T**



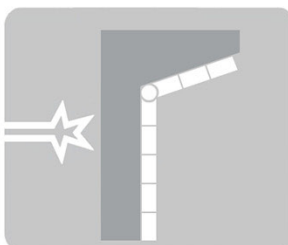
**FAR271220T**



**TR101406T  
TR120606T**



**FR271009T**



**FR271313T**



**F50T**



## Reference/date:

Kerback Spesial, English,  
16.05.2022

# Kerback Glasback 3530

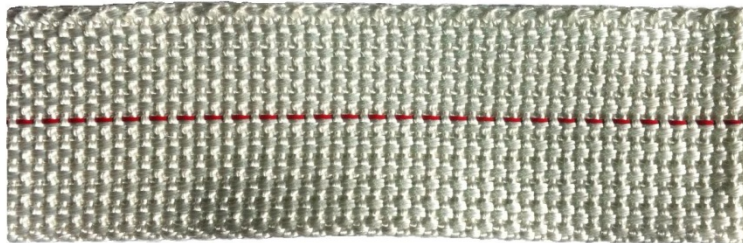


- Fibreglass backing 35mm wide, mainly for use with SAW welding.
- Easy to mount.
- No alutape.

## Dimensions/weight:

	Width	Thickness	Length per bag	Weight per bag
<b>Kerback Glasback 3530</b>	35mm	3mm	550m	85,0kg

## Design:



## Reference/date:

Kerback Glasback 3530,  
English, 03.10.2018.

# Kerback Magnback 2501



- Magnetic clamp, 250mm.
- Holds metal tray backing and standard alu foil backing mounted tightly to a magnetic ground plate.

## Dimensions/weight:

	Length	Width	Height	Magnet Height	Pcs per box	Weight per box
<b>Kerback Magnback 2501</b>	250mm	50mm	1,0mm	6,0mm	50stk	7,8kg

## Design:



## Reference/date:

Kerback Magnback 2501,  
English, 03.10.2018.

## NST gouging electrodes





# NST Carbon Gouging Rods



**For gouging non-, low- and high alloyed steels.**

## Product description:

NST Carbon Gouging Rods is made from the best raw materials, under strict quality control. The electrodes are copperclad to ensure optimal conductivity. Superior metal removal rates, cool operation, and uniform diameters.

## Ideal for a broad range of applications:

- Creating u-grooves for weld joint
- Removing old welds
- Gouging out cracks
- Cleaning and repairing castings
- Removing hard surface material
- Rough machining

## Positions:



## Current:

DC+

## Data:

Product Name	NST CGR4	NST CGR6	NST CGR8	NST CGR10	NST CGR13
Diameter (mm)	4	6,4	8	10	13
Length (mm)	305	305	305	305	305
Amperage Range(A)	150-250	320-370	400-450	500-550	800-1000
Air Pressure (bar)	4	4	5.5	5.5	5.5
Air Flow Rate (m <sup>3</sup> /h)	15	15	40	40	50
Quantity per Carton (pcs)	100	50	50	50	50
Weight pr Carton (kg)	0.8	1.0	1.35	2.2	3.7
Article No.	25001	25002	25003	25004	25005

## Reference / date:

NST Carbon Gouging Rods,  
English, 15.10.2018.

Perfect Welding

www.nst.no

## Wire feeding systems



# Dura-Dome® 20



## Dome for drums 200-250kg.

### Product description:

Dura-Dome® 20, Fast 'N Easy® dome.  
For drums 51,3cm til 52,1cm



Order nr: A 1669

### Reference/date:

Dura-Dome 20,  
English, 24.11.2011.

Perfect Welding

[www.nst.no](http://www.nst.no)

# Straight 'N Easy® Wire straightener



**Wire straightener for pay-out systems.**

**Product description:**

Wire straightener for wires 0,6mm-3,2mm.



Order nr: A 1932

**Reference/date:**

StraightnEasy Wire straightener,  
English, 24.11.2011.

Perfect Welding

[www.nst.no](http://www.nst.no)

# Pay-out systems



## Connectors and conduits .

### Product description:

Dome connector kit for centric dome attachment.

Size: 9/16" (14,3mm) to 7/8" (22mm) diameter.



**Order nr: A-1826**

### Product description:

HQCA adaptor kit

Size: 3/8" (9,5mm) to 7/8" (22mm) diameter.



**Order nr: A-1827-1**

### Product description:

QCC Coupler with insulating sleeve and retaining strap.  
Double sided female quick connector, ideal for extending conduit systems



**Order nr: A-1810**

### Product description:

Conduit 108" (2,75m).  
With swaged-on male bayonet quick connection terminations.



**Order nr: QCC 108**

### Product description:

Conduit 240" (6.10m)  
With swaged-on male bayonet quick connection terminations.



**Order nr: QCC 240**

### Reference/date:

Connectors and conduits,  
English, 22.10.2018.

Perfect Welding

[www.nst.no](http://www.nst.no)

# Pay-out systems



## Connectors and conduits .

### Product description:

Bulk conduit 90' (27,40m).  
Without terminations.



**Order nr: A-2046**

### Product description:

Male connector for bulk conduit  
(ferrule included).



**Order nr: A-1831**

### Product description:

Ferrule.



**Order nr: A-1646**

### Product description:

Lincoln® female quick connector  
for wire straightener.



**Order nr: A-1791**

### Product description:

Lincoln® Bayonet male quick  
connector for wire straightener.



**Order nr: A-1886**

### Reference/date:

Connectors and conduits 2,  
English, 23.05.2019.

Perfect Welding

[www.nst.no](http://www.nst.no)



# Welding parameters/guidance values



# SF-1A/SF-3A/SF-3AM



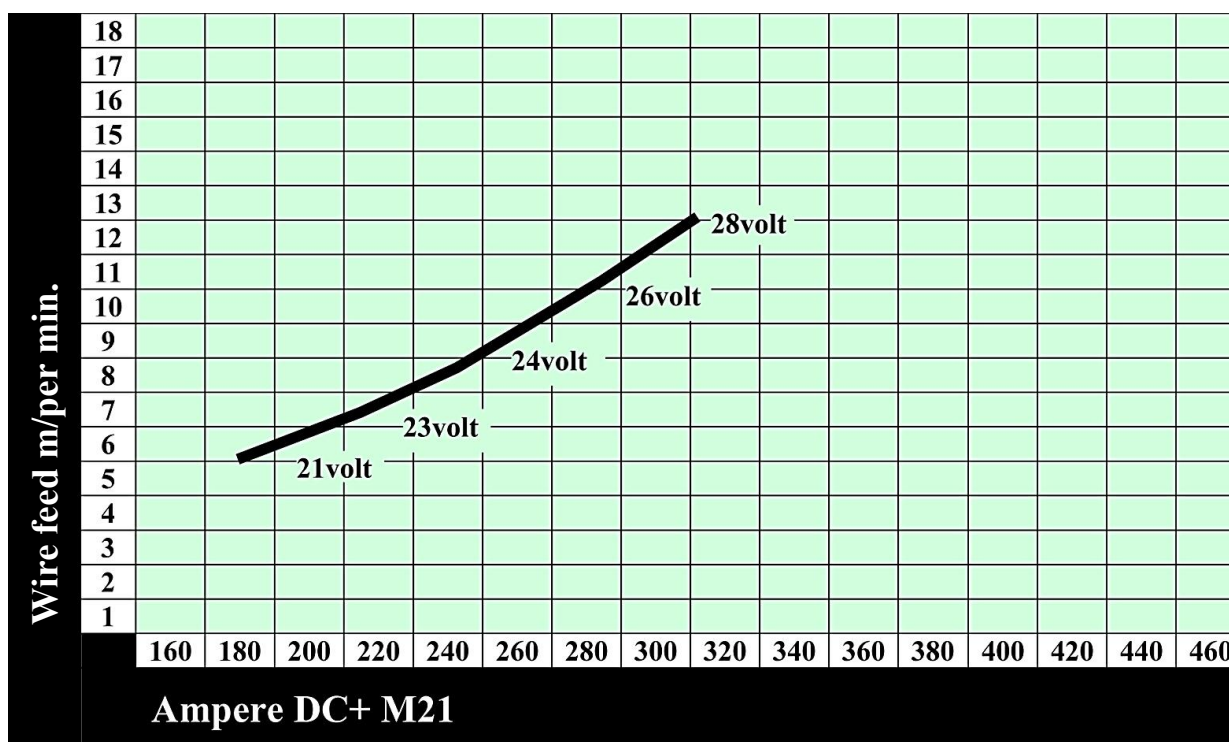
## Welding parameters

### Example:

Wire feed m/per min.	Volt	Amp
5	21-22	170 -180
8	23-24	225 -235
10	26	250 -270
12	28	290 -310

Wire stick out approx. 20-25mm

## Guidance values SF-1A / SF-3A / SF-3AM $\varnothing$ 1,2mm



The variation of wire stick out changes the ampere readings.

A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading.

Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere.

Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.

# SF-1A/SF-3A/SF-3AM



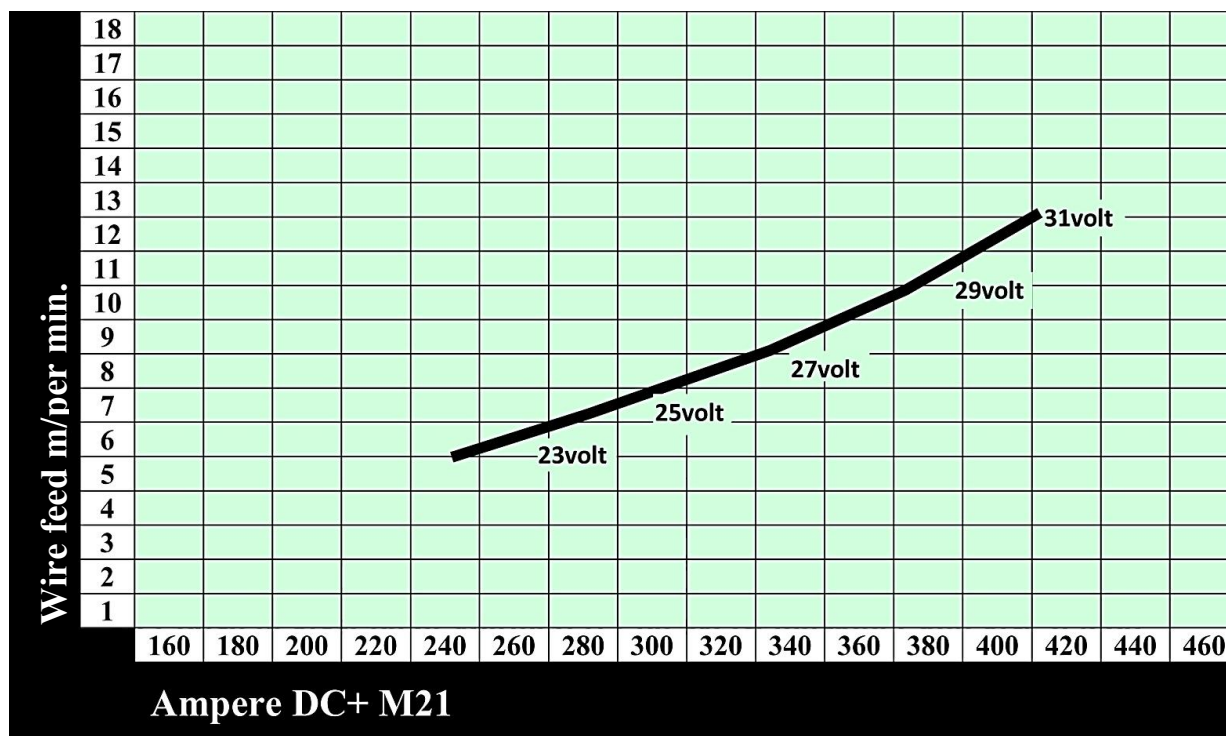
## Welding parameters

Example:

Wire feed m/per min.	Volt	Amp
6	24-25	240 -260
8	26-27	315 - 325
10	29-30	365 - 375
12	31-32	400 - 410

Wire stick out approx. 20-25mm

## Guidance values SF-1A / SF-3A / SF-3AM $\varnothing$ 1,4mm



The variation of wire stick out changes the ampere readings.

A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading.

Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere.

Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.

# SF-1E



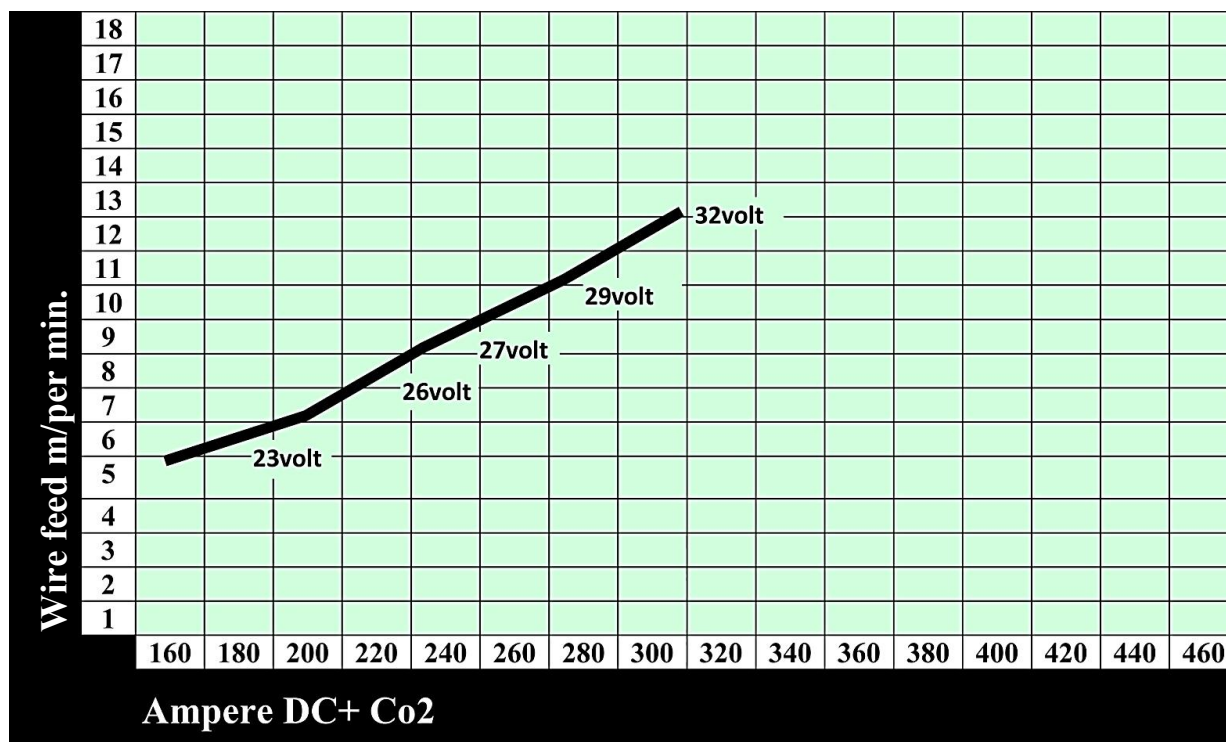
## Welding parameters

Example:

Wire feed m/per min.	Volt	Amp
5,0	22,5- 24,5	150 – 160
6,5	24,5- 26,5	185 - 195
8	26,0-28,0	220 - 230
10	28,0 – 30,0	250 - 260
12	31,0 – 33,0	290 - 300

Wire stick out approx. 15-20mm

## Guidance values SF-1E ø 1,2mm



The variation of wire stick out changes the ampere readings.

A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading.

Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere.

Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.

# SM-3A



## Welding parameters

### Example:

Wire feed m/per min.	Volt	Amp
1,6 – 1,7	14	70
2,0	14,5	110
2,5	14,5 – 15	130 – 140

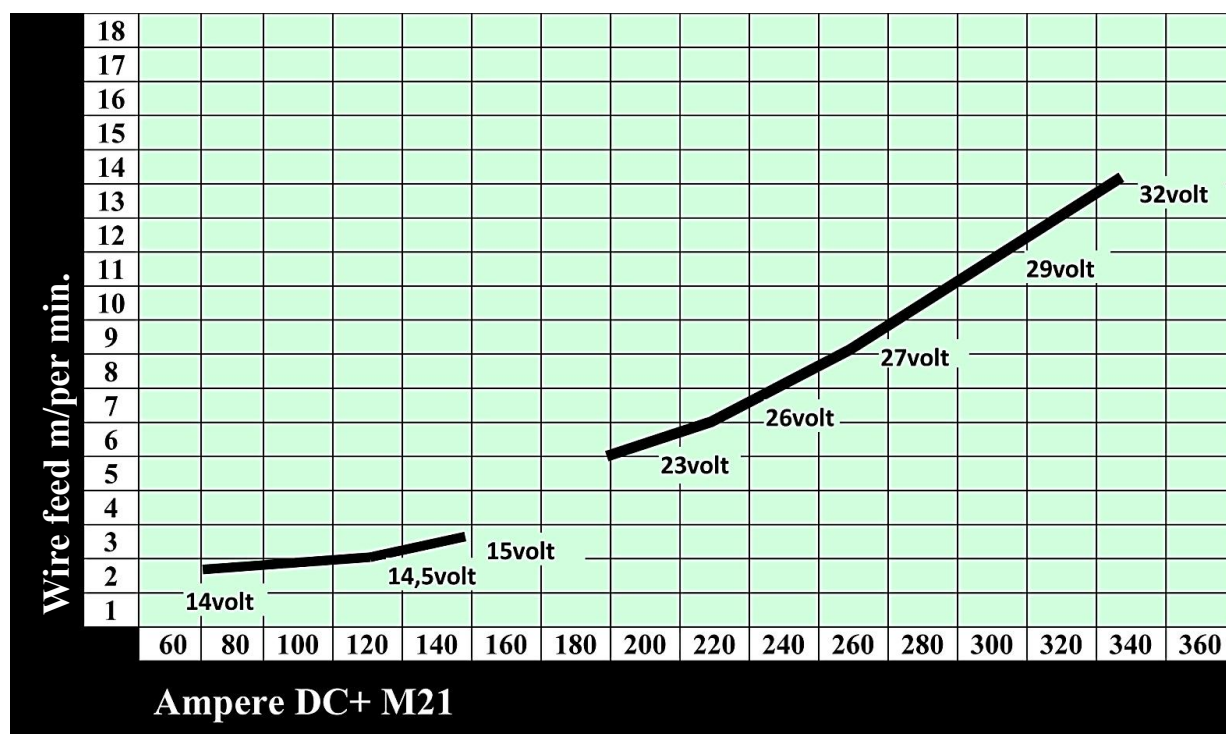
Wire stickout approx. 15mm

Wire spool inductance is significant in dip transfer mode, and values may have to be adjusted to achieve a stable welding arc.

Wire feed m/per min.	Volt	Ampere
5,0	22,5- 25,5	180 – 190
6,0	24,5- 26,5	210 – 220
8,0	26,0-28,0	250 – 260
11,0	29,0 – 31,0	290 – 300
13,0	30,0 – 32,0	320 – 330

Wire stick out approx. 15-20mm

## Guidance values SM-3A $\varnothing$ 1,2mm



The variation of wire stick out changes the ampere readings.

A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading. Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere. Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.



# SM-3A



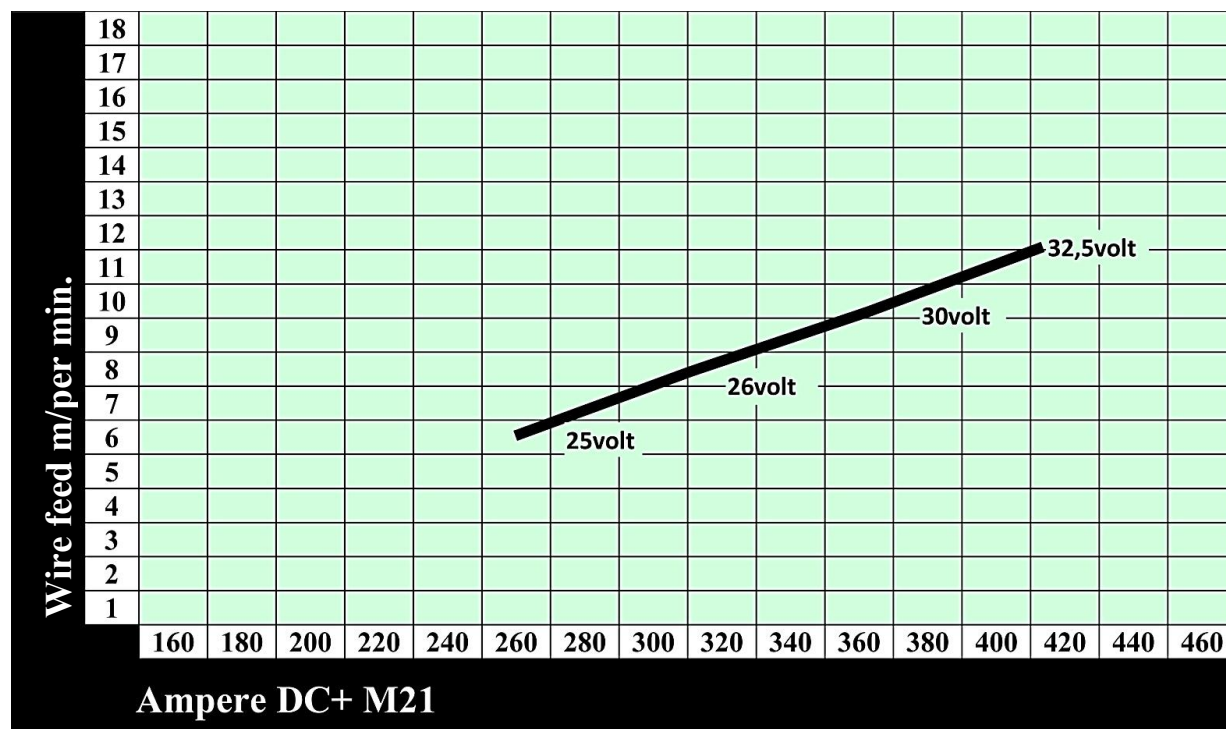
## Welding parameters

Example:

Wire feed m/per min.	Volt	Amp
5,5	25	250
7,0	26	300
9,0	30	350
10,8	32,5	400

Wire stick out approx. 20-25mm

### Guidance values SM-3A $\varnothing$ 1,4mm



The variation of wire stick out changes the ampere readings.  
A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading.

Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere.

Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.



# NST 316LT/309LT/309MoL



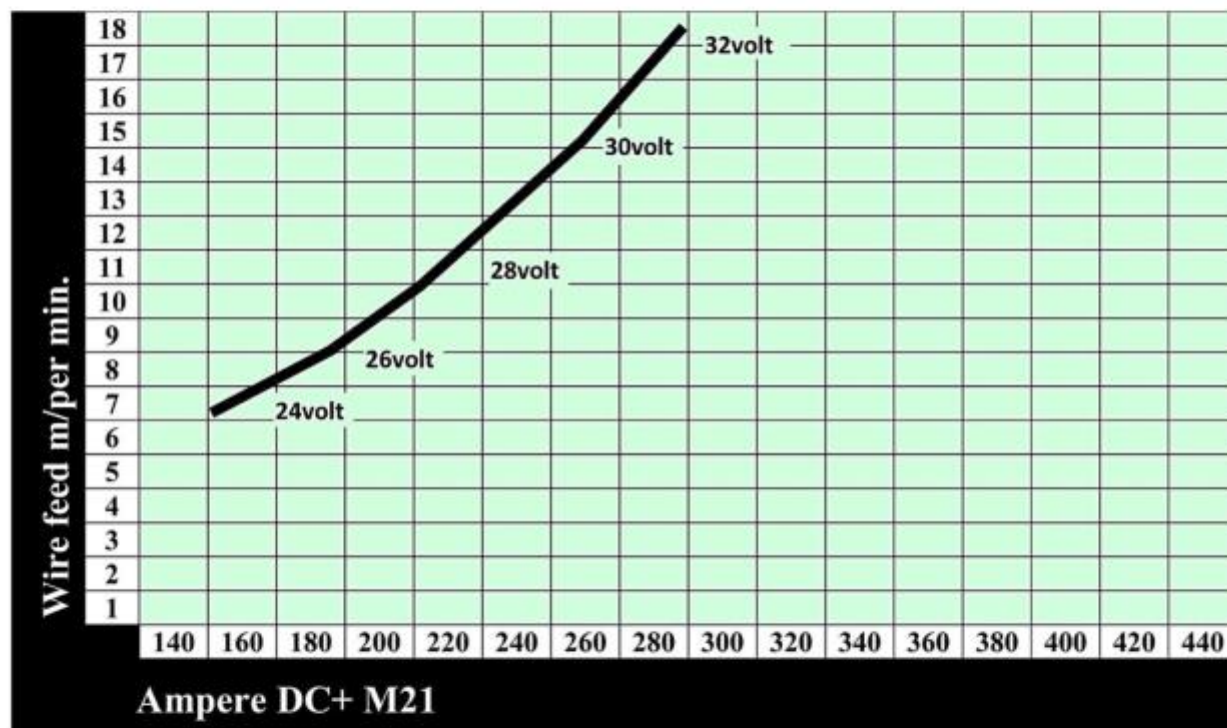
## Welding parameters

Example:

Wire feed m/per min.	Volt	Ampere
6,0	24 - 25	140 - 150
8,0	26 - 27	170 - 175
10,5	28 - 29	200 - 210
14,5	29 - 30	245 - 250
18,0	31 - 32	275 - 280

Wire stick out approx. 15-20mm

## Guidance values NST 316LT/309LT/309MoL $\varnothing$ 1,2mm



The variation of wire stick out changes the ampere readings.

A shorter stick out gives a higher reading, and a longer stick out gives you a lower reading.

Example: 5mm shorter/longer stick out gives a variation of approx. 20 ampere.

Be aware that a welding machines volt meter is not always exact, and often gives a higher reading than the actual welding arc voltage, this is mainly because of the voltage drop in welding cables.

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