

WIRE ROD FOR WELDING

Thanks to a company history starting already 1873, Fagersta Stainless belongs to one of the world leading producers of stainless wire rod and wire. With customized chemistries the products fulfill everything from simple to high demanding applications.

STANDARD STEEL GRADES FOR WELDING

Our grades have tight chemistries and therefore equal properties from delivery to delivery.

We recommend following of our standard grades:

OPTIMUM WIRE ROD FOR WELDING

To get best possible properties for welding wire rod, these parameters are important:

- Tight chemistry for identical properties
- Mechanical properties and deformation hardening
- Corrosion properties
- Surfaces
- Dimension tolerances

Grade family	Marcegaglia name	Fagersta	EN	ASTM		PRE	CWH	Typical chemical composition, % by mass					
				TYPE	UNS			C	Cr	Ni	Mo	N	Others
F	409/4512	R108.10	-	409CB	-	11	-	0.03	11.3	0.35	-	-	Nb
F	409Ti/4512	R109.11	1.4512	409TI	-	11	-	0.025	11.3	-	-	-	-
F	430Nb/4511	R258.10	1.4511	430Nb	-	19	-	0.01	18.2	-	-	-	-
F	430NbTi/4016	R258.13	18 LNbTi	-	-	18	-	0.015	18.2	-	-	-	Ti, Nb
A	4551	R358.16	1.4551 / 19 9 NbSi	347Si	S34788	21	-	0.035	19.4	9.8	-	0.04	Nb
A	4551	R358.22	19 9 Nb	347	-	20	-	0.05	19.6	9.2	-	0.03	Nb
A	347H/4550	R358.22	-	347H	-	20	-	0.05	19.6	9.2	-	0.03	Nb
A	308L/4316	R366.10	1.4316 / 19 9 L	308L	S30883	21	-	0.01	19.7	10.2	-	0.05	S
A	308LSi/4316	R366.72	1.4316 / 19 9 Lsi	308L	S30888	21	-	0.015	19.85	10.35	-	0.065	S
A	318/4576	R448.11	1.4576 / 19 12 3 Nb	318	-	29	-	0.04	19.3	11.6	2.6	0.04	S
A	318Si/4576	R448.12	19 12 3 NbSi	-	-	28	-	0.035	18.9	11.8	2.7	0.05	S
A	316L/4430	R466.10	19 12 3 L	316L	-	28	-	0.01	18.3	12.2	2.6	0.04	S
A	316LSi/4430	R466.20	1.4430 / 19 12 3 LSi	316LSi	S31688	28	-	0.01	18.3	11.8	2.6	0.04	-
A	317L	R476.25	18 15 3 L	317L	-	31	-	0.01	18.8	13.7	3.6	0.05	S
A	16-8-2	R516.30	42584	-	-	20	-	0.05	15.5	8.5	1.2	0.04	-
A	307L	R526.10	18 8 Mn	307	-	17	-	0.035	17.3	7.8	-	-	-
A	307Si	R526.70	18 8 SiMn	307	-	18	-	0.08	18.2	8	-	-	S
D	2209	R646.21	22 9 3 N L	2209	S39209	35	-	0.01	23	8.75	3	0.16	Al
D	2594	R647.73	25 9 4 NL	2594	-	42	-	0.01	25.1	9.5	4	0.25	Al
D	2307	R656.20	23 7 NL	2307	-	27	-	0.01	24	8	-	0.14	-
D	2504	R656.30	25 4	-	-	26	-	0.07	25.3	4.5	-	-	-
D	312	R656.70	29 9	312	-	32	-	0.1	30.35	9.2	-	0.055	Al
A	309L/4332	R806.20	1.4332 / 23 12 L	309L	S30983	25	-	0.01	23.5	13.7	-	0.08	S
A	309LSi/4332	R806.24	1.4332 / 23 12 L Si	309L	S30988	25	-	0.02	23.3	13.8	-	0.12	S
A	309LSi/4332	R806.42	1.4332 / 23 12 L Si	309L	S30988	25	-	0.015	23.5	13.6	-	0.08	-
A	309LNb4332	R806.45	23 12 L Nb	309LNb	-	25	-	0.01	23.9	12.6	-	0.04	Al, Nb
A	309Si/4332	R806.72	22 12 H	-	-	23	-	0.09	23.3	12.75	-	0.055	-
A	309LMo/4459	R816.10	23 12 2 L	-	-	31	-	0.01	21.45	15	2.7	0.06	-
A	310S/4845	R826.70	25 20	310	-	26	-	0.12	26	20.8	-	-	-
A	904L	R840.70	20 25 5 C L	385	N08904	36	-	0.01	20	25	4.5	0.05	Cu
A	Alloy 825	R906.10	-	Alloy 825	-	33	-	0.01	22.3	43	3.2	-	Cu, Ti

Grade families: F = ferritic, A = austenitic, D = duplex





MECHANICAL PROPERTIES AND DEFORMATION HARDENING

Depending on end-product's shape and required tensile strength, the wire rod should have specific ductility (formability) for the cold heading process and specific level of deformation hardening. Following methods of measurement are used regarding deformation hardening:

- **CWH-factor** "Cold Work Hardening Factor", a matrix consisting of C, Cr and Ni contents. The factor varies between 80 – 150 and increases with increasing deformation hardening in the steel.
- **Md30**: the temperature (°C) at which 30% true elongation (about 25% area reduction) makes 50% of the austenitic phase transform to deformation martensite. A higher temperature means higher deformation hardening in the steel.

CORROSION

PRE (Pitting Resistance Equivalent = $Cr + 3.1 \times Mo + 25 \times N$) is a factor comparing properties of different chemistries with regards to pitting and crevice corrosion in corrosive environments. A higher value means better resistance. In the table above, PRE is shown for the grades we recommend for welding.

SURFACES

- | | |
|-----------------------------|------------|
| • Direct cooling (DK) | ASTM 10-13 |
| • "In line"-annealing (DST) | ASTM 5-8 |
| • Pit furnace (SG) | ASTM 3-6 |

Our standard procedure is to supply the wire rod in pickled condition.

DIMENSIONS

Standard: 5 – 18 mm (.197" - .709") in increments of 0.5 mm (.020")
(MOQ:s for some dimensions)

Tolerance: 5.0 – 10.0	+/-0.15
>10.0 – 18.0	+/-0.20

Ovality: max 60% of the total tolerance span

Surface classes: Class 3 is the standard class which has a max defect depth of 0.10 mm for dimensions ≤ 10 mm and 1% of the diameter for dimensions > 10 mm. Welding rod has class 2 (max 0.20).

PACKAGING METHODS

Coil weight: appr. 1000 kg - **Outer diameter:** max 1250 mm - **Inner diameter:** max 950 mm