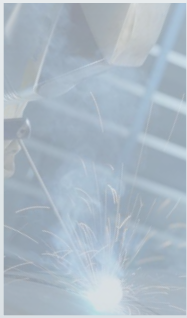




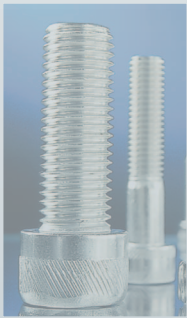
Thanks to a company history starting already 1873, Fagersta Stainless belongs to one of the world leading producers of stainless wire rod and wire. With customized chemistries the products fulfill everything from simple to high demanding applications.

Wire Rod

Welding



Cold Heading



Spring



High Temperature



Duplex



CHARACTERISTIC PROPERTIES FOR DUPLEX STEEL

Duplex steel is often characterized by:

- Good corrosion properties
- Good mechanical properties
- Good fatigue properties
- High resistance against abrasion
- Good welding properties

OUR DUPLEX STEEL GRADES

We offer a wide range of Duplex grades for many different applications i.e. cold heading, welding and bright wire for general applications. Our grades have tight chemistries and therefore equal properties from delivery to delivery.

EN. Nr	TYPE / AWS		FAGERSTA	C	Si	Mn	Cr	Ni	Mo	N	TS	CWH	Md30	PRE
				%	%	%	%	%	%	%	N/mm ²		Nohara	
1.4162		2101	R 617.10	0.030	0.70	5.00	21.50	1.50	0.30	0.220	730-830			28
1.4362		2304	R 630.10	0.015	0.45	0.95	22.50	4.70	0.25	0.110	680-780			26
1.4362		2304	R 630.21	0.015	0.45	0.95	22.50	4.70	0.25	0.110	680-780			26
1.4662		2209	R 646.21	0.013*	0.50	1.60	23.00	8.75	3.15	0.160	750-850			37
1.4462		2205	R 647.70	0.017	0.50	0.85	22.20	5.20	3.20	0.180	780-880			37
	312	29-9	R 656.70	0.100	0.40	1.85	30.35	9.20	0.34*	0.055	760-860			32

(Other grades from our standard range are displayed on the reverse side)

MECHANICAL PROPERTIES AND DEFORMATION HARDENING

Depending on what shape and wished tensile strength an end product shall have, the wire rod should have a specific ductility (formability) for the cold heading process and that it reaches a 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 x Mo + 25 x 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 our Duplex grades.

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

5.0

18.0

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.

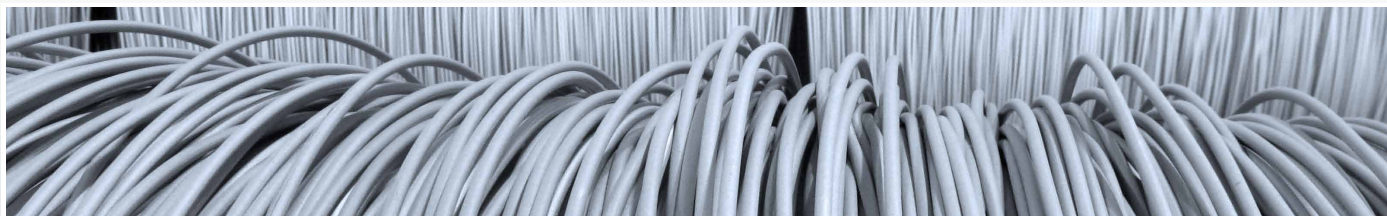
Surface classes: Class 3 is the standard class which has a max defect depth of 0.10 mm for dimensions ≤ 10 mm and 1% of the diameter for dimensions > 10 mm. Welding rod has class 2 (max 0.20).

PACKAGING METHODS

Coil weight: Appr. 1000 kg

Outer diameter: Max 1250 mm

Inner diameter: Max 950 mm



Structure	STEEL GRADES													CWH	Md30	PRE	USAGE							
	EN. Nr	TYPE / AWS	Designation	FAGERSTA													Nohara	°C	Welding	Cold heading	Spring	High temperature	Bright forming	Spoke
				C	Si	Mn	Cr	Ni	Mo	N	Others													
				%	%	%	%	%	%	%	%	%	%											
Ferritic		409 Cb		R 108.10	0.030	0.60	0.60	11.30	0.35	0.10*	0.040*	Nb 0.50				12	•							
	1.4512	409 Ti		R 109.11	0.030*	0.50	0.55	11.30	0.50*	0.10*	0.040*	Ti 0.75				12		•		•				
	1.4016	430		R 250.11	0.020*	0.30	0.70	16.40	0.30*	0.10*	0.030*					17		•			•			
	1.4016	430		R 250.17	0.050	0.40	0.50	16.80	0.30*	0.50*	0.050*					17						•		
	1.4016	430		R 250.30	0.020*	0.30	0.70	16.40	0.30*	0.10*	0.050					17		•				•		
		430 LCb		R 258.10	0.020*	0.40	0.50	18.20	0.30*	0.30*	0.024*	Nb 0.45				20	•							
		439 Ti		R 259.12	0.020*	0.70	0.70	17.50	0.25*	0.10*	0.025*	Ti 0.40				18	•							
	446		R 270.70	0.050	0.50	1.00	23.90	0.50*	0.54*	0.085					27									
Austenitic	1.4301	302		R 320.14	0.050	0.40	0.75	17.80	8.60	0.60*	0.035			120	-1	19		•						
	1.4301	304		R 350.19	0.030	0.40	1.50	18.20	8.20	0.60*	0.050*			108	9	20		•			•	•		
	1.4303	305		R 390.21	0.015*	0.40	0.55	17.70	11.20	0.60*	0.030*			91	-47	19		•						
	1.4307	304 L		R 350.20	0.025*	0.45	1.20	18.50	9.75	0.60*	0.030*			90	-25	20		•						
	1.4307	304 L		R 350.43	0.020*	0.50	1.15	18.30	8.50	0.60*	0.060*			93	2	20		•				•		
	1.4310	302		R 300.15	0.100	1.10	1.25	16.80	7.70	0.65	0.045			149	-5	20			•					
	1.4310	302		R 300.20	0.052	0.45	1.20	17.40	8.25	0.60*	0.050			128	4	19			•			•		
	1.4310	302		R 300.31	0.100	0.90	1.25	17.30	8.20	0.60*	0.030*			139	-8	19			•					
	1.4310	302		R 320.17	0.070	0.45	1.25	18.35	8.10	0.60	0.040			130	-10	20			•					
	1.4372	201		R 520.12	0.090	0.45	5.90	17.00	5.30	0.60*	0.070					20						•		
	1.4401	316		R 420.18	0.050	0.35	1.55	16.80	10.70	2.10	0.060*			102	-85	24			•					
	1.4404	316 L		R 425.10	0.020*	0.35	1.55	16.80	11.20	2.10	0.050*			92	-90	24			•			•		
	1.4436	316 L		R 440.10	0.030*	0.50	1.55	16.80	11.60	2.60	0.050*			91	-103	26			•					
	1.4539	385	904 L	R 840.70	0.015*	0.35	1.75	20.00	25.00	4.50	0.050	Cu 1.50					35	•			•			
	1.4541	321		R 359.10	0.030	0.50	1.15	17.80	9.20	0.60*	0.020*	Ti 0.35		94	5	19			•					
	1.4547		254 SMO	R 847.10	0.018*	0.35	0.45	19.90	17.90	6.10	0.200	Cu 0.70				44					•			
	1.4567	304 Cu	302 HQ	R 575.21	0.015*	0.40	0.55	17.90	9.70	0.40*	0.025*	Cu 3.50				19			•					
	1.4571	316 Ti		R 429.15	0.030*	0.40	1.75	16.60	10.60	2.10	0.030*	Ti 0.20		94	-58	24								
	1.4578	316 Cu		R 545.11	0.030*	0.35	0.55	17.00	10.80	2.20	0.040*	Cu 3.20				25			•					
	1.4828			R 323.10	0.045	1.95	1.20	19.30	11.70	0.60*	0.030			93	-130	21						•		
	1.4835		253 MA	R 327.10	0.075	1.60	0.50	21.00	10.20	0.30*	0.165	Ce 0.055				26						•		
				R 823.11	0.030*	2.70	1.75	23.50	19.40	0.60*	0.060*					26						•		
	1.4841	314		R 823.13	0.020*	2.25	1.75	24.30	20.70	0.50*	0.050*					26						•		
	1.4845	310 S		R 820.10	0.045	0.65	1.50	24.70	19.40	0.60*	0.050*					26						•		
	1.4864			R 860.10	0.030*	1.25	1.80	15.30	33.50	0.60*	0.070					18						•		
	1.4886	330		R 860.13	0.030*	1.25	0.75	18.50	34.50	0.50*	0.060*					21						•		
			Incoloy DS	R 863.13	0.030*	2.30	1.20	18.00	36.50	0.50*	0.070					21						•		
		330 Cb	35-19 Cb	R 868.11	0.025*	1.85	0.50	19.50	34.50	0.30*	0.060*	Nb 0.87				21						•		
		18 8 SiMn	307	R 526.18	0.070	0.90	6.90	19.10	8.80	0.30*	0.045					21			•					
		18 8 SiMn	307	R 526.70	0.080	0.87	7.00	18.20	8.00	0.34*	0.060*	S 0.009				20			•					
	19 12 3 Nb	ER 318		R 448.11	0.040	0.40	1.80	19.30	11.60	2.60	0.040	S 0.011	Nb 0.62			29			•					
	19 12 3 SiNb	ER 318 Si		R 448.12	0.035	0.75	1.35	18.90	11.80	2.70	0.050	S 0.011	Nb 0.65			28			•					
	19 12 3 L	ER 316 L		R 466.10	0.015*	0.40	1.75	18.30	12.20	2.60	0.040	S 0.010				27			•					
	19 12 3 L	E 316 L		R 466.70	0.018*	0.12	1.75	18.40	11.45	2.65	0.040	S 0.011				28			•					
	19 12 3 L	ER 316 L		R 466.71	0.018*	0.40	1.75	18.60	12.30	2.60	0.030	S 0.010				28			•					
	19 12 3 LSi	ER 316 LSi		R 466.72	0.023*	0.90	1.80	18.35	12.25	2.60	0.050	S 0.011				28			•					
	19 13 4 L	ER 317 L		R 476.25	0.020*	0.40	1.50	18.80	13.70	3.60	0.050	S 0.010				31			•					
	19 9 NbSi	ER 347 Si		R 358.16	0.035	0.85	1.30	19.40	9.80	0.30*	0.040	S 0.010	Nb 0.60			21			•					
	19 9 Nb	ER 347		R 358.22	0.050	0.47	1.80	19.60	9.20	0.30*	0.030	S 0.009	Nb 0.60			21			•					
	19 9 H	ER 308		R 326.12	0.050	0.40	1.80	20.25	9.25	0.30*	0.050	S 0.010				23			•					
	19 9 L	ER 308 L		R 366.10	0.015*	0.40	1.80	19.70	10.20	0.20*	0.050	S 0.011				21			•					
	19 9 L	ER 308 L		R 366.19	0.020*	0.20*	1.80	19.90	10.10	0.24*	0.050					21			•					
	19 9 L	E 308 L		R 366.70	0.012*	0.12	1.80	20.00	10.00	0.10*	0.040	S 0.008				21			•					
	19 9 L	ER 308 L		R 366.71	0.023*	0.40	1.80	19.70	10.10	0.30*	0.055	S 0.011				22			•					
	19 9 LSi	ER 308 LSi		R 366.72	0.023*	0.90	1.80	19.85	10.35	0.30*	0.065	S 0.011				22			•					
23 12 L	ER 309 L		R 806.20	0.018*	0.42	1.80	23.50	13.70	0.30*	0.080	S 0.010				26			•						
23 12 LSi	ER 309 LSi		R 806.24	0.025*	0.90	1.60	23.30	13.80	0.30*	0.120	S 0.010				27			•						
23 12 2 L	309 LMo	P5	R 816.10	0.015*	0.37	1.50	21.50	15.00	2.70	0.060					31			•						
25 20	E 310		R 826.20	0.100	0.45	1.75	25.90	20.80	0.30*	0.060*					27			•						
25 20	ER 310		R 826.70	0.120	0.40	1.75	25.90	20.80	0.30*	0.060*					27			•						
Duplex	1.4162		2101	R 617.10	0.030	0.70	5.00	21.50	1.50	0.30	0.220	Cu 0.30			28						•			
	1.4362		2304	R 630.10	0.015	0.45	0.95	22.50	4.70	0.25	0.110	Cu 0.20			26									
	1.4362		2304	R 630.21	0.015	0.45	0.95	22.50	4.70	0.25	0.110	Cu 0.20			26									
	1.4662		2209	R 646.21	0.013*	0.50	1.60	23.00	8.75	3.15	0.160					37			•					
	1.4462		2205	R 647.70	0.017	0.50	0.85	22.20	5.20	3.20	0.180					37								
	312	29-9	R 656.70	0.100	0.40	1.85	30.35	9.20	0.34*	0.055			</											