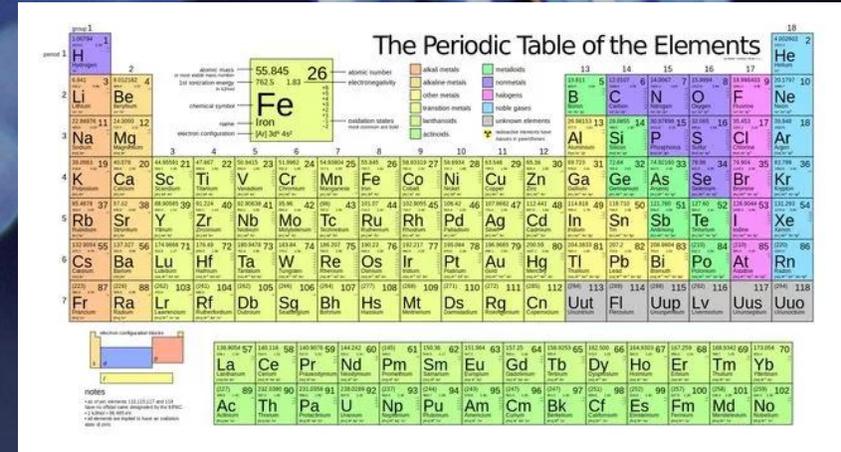


Stainless Steel Wire Ropes

It's all about Chemistry



The Periodic Table of the Elements

This image shows a standard periodic table of elements. The element Iron (Fe) is highlighted in a yellow box. The table includes element symbols, atomic numbers, and names. A legend on the right side of the table categorizes elements into groups such as alkali metals, alkaline earth metals, transition metals, noble gases, and others. The lanthanide and actinide series are shown at the bottom of the table.

- Steel is an metal alloy made of Iron and Carbon => subject to rust
- Stainless steel is more elaborate alloy with some other elements which will prevent or, better said, delay the corrosion
 - Chromium
 - Nickel
 - Molybdenum



Elements Analysis

C for CARBON

increases the tensile strength, improves the ductility (ability to deform under stress without breaking). The presence of the carbon content can't be too high in a Stainless steel alloy as it would then thwart the chromium effect.

Ch for CHROMIUM

plays a crucial role in the corrosion resistance especially when it exceeds 11,5%. Being generally present in a proportion of around 18% in the « marine quality » stainless steel (A4, 316), chromium reacts with oxygen and forms a natural very passive protecting layer preventing oxidation and rust creation. It's called the passivation layer.



Elements Analysis

Ni for NICKEL

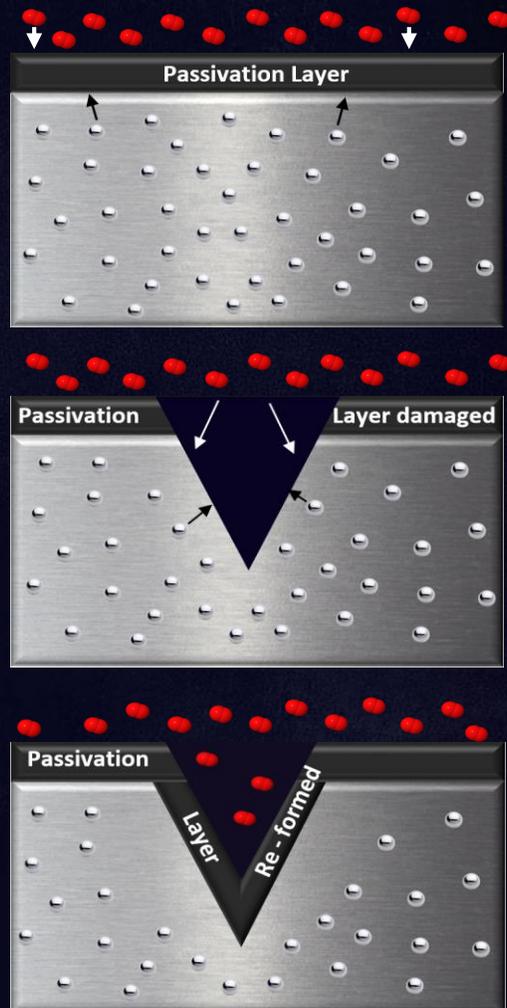
present at around 10% in the « alimentary » stainless steel (A2, 304) and normally around 12% in the « marine » stainless steel (A4, 316), increases the malleability/flexibility and the resistance to metal distortion and chocks. It also better resists to heat treatment (welding, ...).

Mo for MOLYBDENUM

is added to the « marine quality » stainless steel alloy (A4, 316), approximately 2%, increases the passivation layer stability created by the chromium. Thanks to molybdenum, the creeping will be reduced and the resistance to pitting corrosion, crevice corrosion and stress corrosion in corrosive environments such as saline environment will be better. Just like Nickel, it also offers a better resistance to high temperatures treatments like welding...



Passivation Process



In order for the wire rope to better resist corrosion, it's of the uttermost importance that the passivation layer is uniformly created. In order for this to happen, one has to pay attention to properly dry clean the surface and remove any metal particle or grease => hence the oxygen can mix with Chromium atoms and form that invisible protective layer. If damaged the passivation layer will be automatically reformed maybe not in the ideal initial conditions. If the wire rope is too frequently damaged, the wire rope will lack Chromium preventing the proper re-formation of the passivation layer => the wire rope will rust as any other steel

Mill Certs

Marine quality wire rope

convertir les documents au format Word ou Excel.

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Inspection Certificate DATE OF ISSUE: 2017-08-31

DESCRIPTION	STAINLESS STEEL WIRE ROPE		GRADE	AISI 316		
MILL CERT. NO.	AC2-201708R-0073	Construction	1x19	Lay	R.L	
P.O NO.	28-170176	DIAMETER	8.0000 mm			
INVOICE NO.	F177065/01 (F177065-05)	Length	1,000 M			
CONTRACTOR	CABLERIES	QUANTITY	6,360.00 KGS (20 REELS)			
CUSTOMER	CABLERIES	Specification	BUYER'S SPEC			

CHEMICAL COMPOSITION

Chemical Comp.(%)	C	Si	Mn	P	S	Ni	Cr	Mo		
KHTX00194	0.0600	0.4400	1.1400	0.0350	0.0020	10.6300	16.6200	2.0600		

Industrial quality wire rope

Mill Test Certificates DATE OF ISSUE: 2016-11-11

MILL CERT. NO	79-160226A	GRADE	AISI 316		
P.O NO	79-160226	Construction	1x19	Lay	RHL
INVOICE NO	79-160204B/226A	DIAMETER	8.00 mm		
CONTRACTOR	CABLERIES NAMJROISES S.A.	LENGTH	1000 M		
CUSTOMER	CABLERIES NAMJROISES S.A.	QUANTITY	1920.00 KGS (6 REELS)		
MILL CERT. NO	79-160226A	Specification	EN 12385-4		

CHEMICAL COMPOSITION

Chemical Comp. (%)	C	Si	Mn	P	S	Ni	Cr	Mo
	0.0560	0.4500	0.8300	0.0320	0.022	10.12	16.45	2.05



Decision making

As there are many shades of S/S (cfr attachment), each one being differentiated by its chemical alloy, it's very important to properly select which one is better suited to the intended use.

Rost-, säure- und hitzebeständige Stähle Aciers inoxydables et réfractaires Stainless and heat resisting steels															
No.	Norm		Unified Numbering System	Analyse					Analyse					Composition Sonstige Autres - Others	Deutsche Stoff-Nr. Norme allemande German Standard No. ~
	SAE	AISI		C	Si	Mn	P	S	Cr	Mo	Ni	Cu	%		
			UNS	%	%	%	≦ %	%	%	%	%	%	%	%	
14	30304	304	\$ 30400	≦ 0,08	≦ 1,00	≦ 2,00	0,045	≦ 0,030	18,0-20,0	-	8,00-10,5	-	-	1.4301	
15	-	304 Cu	\$ 30430	≦ 0,08	≦ 0,75	≦ 2,00	0,045	≦ 0,030	17,0-19,0	-	8,00-10,0	3,00-4,00	-	-	
16	-	304 H	\$ 30409	0,04-0,10	≦ 1,00	≦ 2,00	0,040	≦ 0,030	18,0-20,0	-	8,00-11,0	-	-	1.4948	
17	30304 L	304 L	\$ 30403	≦ 0,03	≦ 1,00	≦ 2,00	0,045	≦ 0,030	18,0-20,0	-	8,00-12,0	-	-	1.4306	
18	-	304 LN	\$ 30453	≦ 0,03	≦ 1,00	≦ 2,00	0,045	≦ 0,030	18,0-20,0	-	8,00-12,0	-	N 0,10-0,16	1.4311	
19	-	304 N	\$ 30451	≦ 0,08	≦ 1,00	≦ 2,00	0,045	≦ 0,030	18,0-20,0	-	8,00-10,5	-	N 0,10-0,16	-	
20	30305	305 (L)	\$ 30500	≦ 0,12 (≦ 0,08)	≦ 1,00	≦ 2,00	0,045	≦ 0,030	17,0-19,0	-	10,5-13,0	-	-	1.4303	
21	-	(307)	-	≦ 0,15	≦ 1,00	3,75-4,75	0,045	≦ 0,030	19,0-22,0	-	9,00-10,5	-	-	-	
22	30308	308	\$ 30800	≦ 0,08	≦ 1,00	≦ 2,00	0,045	≦ 0,030	19,0-21,0	-	10,0-12,0	-	-	1.4303	
23	30309	309	\$ 30900	≦ 0,20	≦ 1,00	≦ 2,00	0,045	≦ 0,030	22,0-24,0	-	12,0-15,0	-	-	1.4828	
24	30309 S	309 S	\$ 30908	≦ 0,08	≦ 1,00	≦ 2,00	0,045	≦ 0,030	22,0-24,0	-	12,0-15,0	-	-	1.4833	
25	-	(309 SCb)	\$ 30940	≦ 0,08	≦ 1,00	≦ 2,00	0,040	≦ 0,030	22,0-24,0	-	12,0-15,0	-	Cb 10 x C ≦ 1,10	-	
26	30310	310	\$ 31000	≦ 0,25	≦ 1,50	≦ 2,00	0,045	≦ 0,030	24,0-26,0	-	19,0-22,0	-	-	1.4841	
27	30310 S	310 S	\$ 31008	≦ 0,08	≦ 1,50	≦ 2,00	0,045	≦ 0,030	24,0-26,0	-	19,0-22,0	-	-	1.4845	
28	30314	314	\$ 31400	≦ 0,25	1,50-3,00	≦ 2,00	0,045	≦ 0,030	23,0-26,0	-	19,0-22,0	-	-	1.4841	
29	30316	316	\$ 31600	≦ 0,08	≦ 1,00	≦ 2,00	0,045	≦ 0,030	16,0-18,0	2,00-3,00	10,0-14,0	-	-	1.4401/1.4436	
30	-	(316 Cb)	\$ 31640	≦ 0,08	≦ 1,00	≦ 2,00	-	-	16,0-18,0	2,00-3,00	10,0-14,0	-	Cb ≧ 10 x C	1.4580	
31	-	316 F	\$ 31620	≦ 0,08	≦ 1,00	≦ 2,00	0,200	≧ 0,100	17,0-19,0	1,75-2,50	12,0-14,0	-	-	-	
32	-	316 H	\$ 31609	0,04-0,10	≦ 1,00	≦ 2,00	0,040	≦ 0,030	16,0-18,0	2,00-3,00	10,0-14,0	-	-	1.4919	
33	30316 L	316 L	\$ 31603	≦ 0,03	≦ 1,00	≦ 2,00	0,045	≦ 0,030	16,0-18,0	2,00-3,00	10,0-14,0	-	-	1.4404/1.4435	

