Zapp 28 Slicklines/Wirelines Datasheet
Wire

Zapp is certified according to ISO 9001

Zapp 28
is a high-alloy austenitic stainless steel suitable for service in highly corrosive oil and gas environments.

The Grade is Characterized by

- Very good corrosion resistance in H2S, CO2 and chloride containing environments.
- Very good resistance to pitting owing to its high PRE* value of 38 minimum
- General corrosion comparable to or better than Alloy 825
- Tensile strength equivalent to ASTM 316
- Very good performance in elevated temperatures (geothermal wells)
- Entirely non-magnetic properties

* PRE, Pitting Resistance Equivalent = Cr + 3.3 Mo + 30N

Standards

- UNS: N08028
- EN Number: 1.4563
- EN Name: X1NiCrMoCu 31-27-4

Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	Cu
≤ 0.020	0.6	2.0	≤ 0.025	≤ 0.010	27.0	31.0	3.5	1.0

Forms of Supply
Zapp 28 slicklines are supplied cold drawn and degreased, on steel spools, in continuous lengths, without welds.

Product Program

Diameter		Breaking loads		Weight	
mm	in.	N	lbf	kg/1,000 m	lb/1,000 ft
2,083	0.082	5,109	1,149	27.5	18.4
2,337	0.092	6,431	1,446	34.6	23.2
2,667	0.105	8,377	1,883	45.0	30.2
2,743	0.108	8,862	1,992	47.6	32.0
3,175	0.125	11,872	2,669	63.8	42.8
3,810	0.150	17,096	3,843	91.4	61.27
4,064	0.160	19,451	4,373	103.8	69.60

Mechanical Properties

Zapp 28 is tested and certified in accordance with a minimum tensile strength. Proof strength is approximately 90 % of the tensile strength. Zapp 28 is able, therefore, to resist high loads without permanent set of the wire.

Proof strength $R_{p0.2}$		Tensile strength R_m	
MPa	ksi	MPa	ksi
≥ 1,350	≥ 200	≥ 1,500	≥ 220

Corrosion Resistance

Pitting

Zapp 28 has very good resistance to pitting because of high contents of chromium and molybdenum. Critical pitting temperatures (CPT) as a function of the chloride content and pH are presented in Figures 1 and 2.

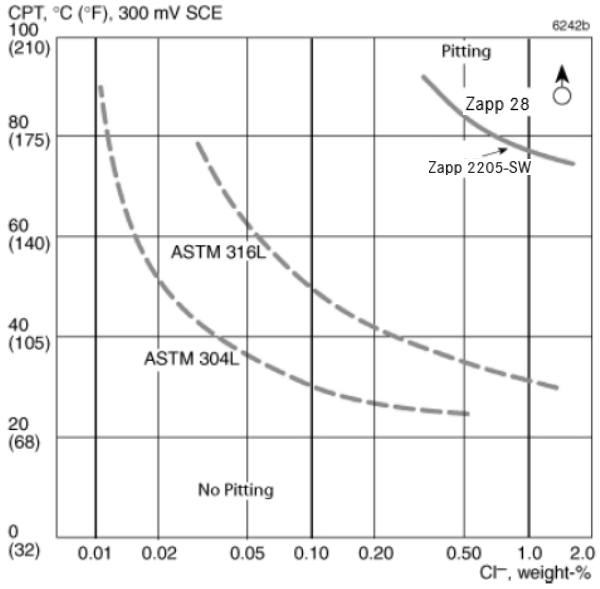
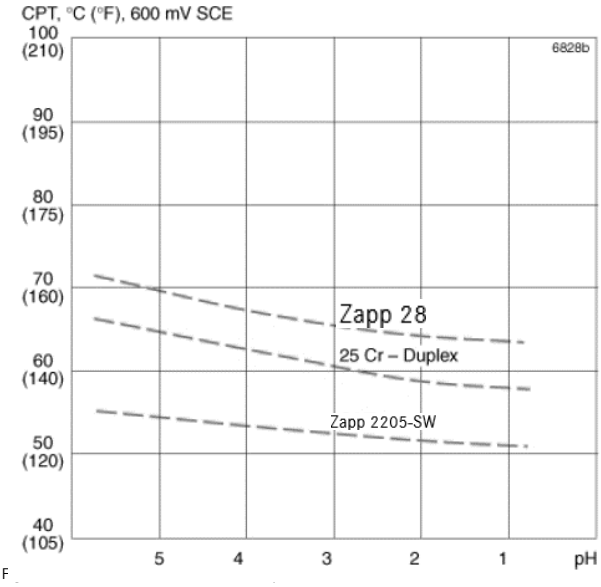


Figure 1. CPT for various alloys in neutral chloride solutions at 300 mV SCE.



Stress Corrosion Cracking (SCC) in Chloride Environments

The combination of stresses up to the proof strength and chlorides leads to a risk of stress corrosion cracking. In austenitic steels the increased nickel content together with an increased stability against pitting corrosion will lead to an increased resistance against stress corrosion cracking.

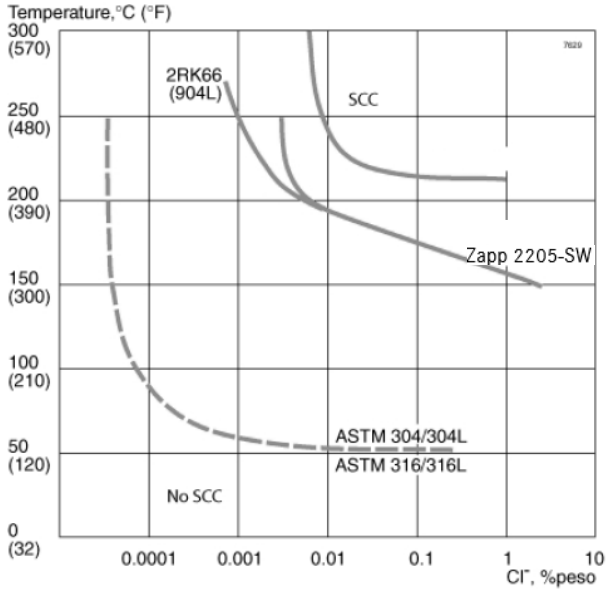


Figure 3. SCC resistance in oxygen-bearing (about 8 ppm) neutral chloride solutions. Testing time: 1,000 hours.

Applied strength equal to proof strength at testing time. The curve for AISI 304/304L and 316/316L is based on experimental data and practical experience. The data for the other grades are based on test results of tube material.

Stress Corrosion Cracking (SCC) in H_2S/Cl-Environment

Tensile specimens from cold-worked Zapp 28 and Zapp 2205-SW were tested in the NACE TM-01-77 type of environment, modified in that the temperature was increased to 90 °C (194 °F). At this temperature, 100 % H_2S at atmospheric pressure corresponds to 100 kPa (14.5 psi) NaCl varied up to 10 %.

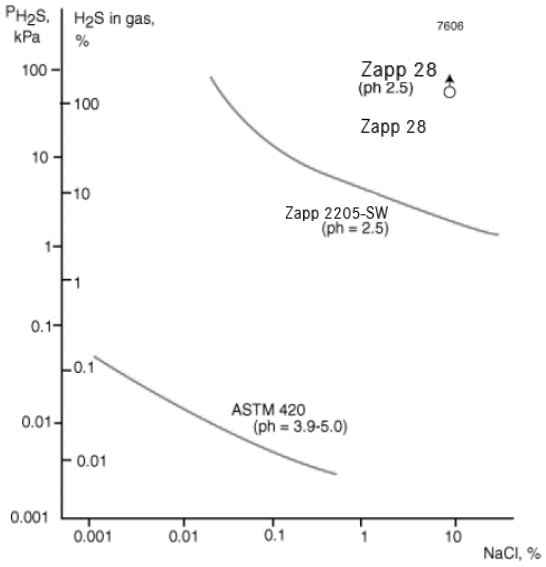


Figure 4. Constant-load SCC tests in acidified aqueous solution. Stress = 0.2 % proof strength at testing temperature, 90 °C (194 °F). Testing time 500 hours. Zapp 28 and Zapp 2205-SW tested in the cold worked condition. AISI 420 quenched and tempered.

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