

HAVAR[®] CORROSION TEST DATA



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- Samples from heat 305992 at 0.045" thick in strand annealed condition
- Evaluation showed strip to be HRB 91, ASTM grain size 6
- Weld beads placed on annealed strip via EB welding at International Beam Welding Corp.



Technical Data

ENVIRONMENT	TEMPERATURE	TEST DURATION, HR	SAMPLE CONDITION	CORROSION RATE		COMPARATIVE DATA	
				MILS/YEAR	MM/YEAR	316L MILS/YEAR	C-276 MILS/YEAR
10% H ₂ SO ₄	150°F	96	Unwelded	1.01	0.03		
		96	Welded	0.99	0.03		
	boiling	96	Unwelded	9.79	0.25	850 - 2400	20 - 30
		96	Welded	10.28	0.26		
96% H ₂ SO ₄	150°F	96	Unwelded	29.91	0.76		
		96	Welded	33.04	0.84		
	boiling	96	Unwelded	273.76	6.96	560	>200
		96	Welded	267.16	6.79		
86% H ₃ PO ₄	150°F	96	Unwelded	1.02	0.03	1000	20
		96	Welded	1.02	0.03		
10% H ₃ PO ₄	boiling	96	Unwelded	2.15	0.05		
		96	Welded	1.60	0.04		
1% HCl	boiling	96	Unwelded	237.79	6.05		0.2 - 2
		96	Welded	248.69	6.32		
5% HCl	68°F	96	Unwelded	4.42	0.11		
		96	Welded	4.65	0.12		
50% NaOH	boiling	96	Unwelded	7.49	0.19		2 - 4
		96	Welded	7.55	0.19		
65% HNO ₃	boiling	240	Unwelded	336.30	55	11	450
		240	Welded	296.39	55		

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EVALUATION	TEMPERATURE, °F	TEST DURATION, HR	SAMPLE CONDITION	CORROSION BEHAVIOR
Pitting in Mixed Acid-Chloride (1)	122	24	Unwelded and Welded	No Pitting; Uniform Attack with corrosion rate of 17 mils/year
FeCl ₃ Pitting by ASTM G-48 Method A	68	72	Unwelded	Resistant to pitting ↓
	-	-	Welded	
	104	72	Unwelded	
	-	-	Welded	
	140	72	Unwelded	
	-	-	Welded	
FeCl ₃ Crevice Corrosion by ASTM G-48 Method B	68	72	Unwelded	Severe Crevice Attack ↓
	-	-	Welded	
	104	72	Unwelded	
	-	-	Welded	
	140	72	Unwelded	
	-	-	Welded	
Seawater	86	720	Unwelded	No Pitting or General Attack
	-	-	Welded	No Pitting or General Attack
Seawater Crevice Corrosion	86	720	Unwelded	Perforation at Crevice Site
	-	-	Welded	Perforation at Crevice Site
Sulfide Stress Cracking by NACE MR0175	-	-	35 HRC max.	Acceptable for use in Sour Environments
Pitting or Crevice Corrosion of Surgical Implants by ASTM F-746 (2)	98.6	-	600 grit polish + passivation	Critical Crevice Potential greater than +0.8 V (SCE)

Notes: (1) - Mixed acid-chloride: 11.5% H₂SO₄ + 1.2% HCl + 1% CuCl₂ + 1% FeCl₃
 (2) - Electrolyte: 0.9% NaCl in distilled water, pH = 7.0