

HASTELLOY[®] C-22[®] alloy

Resistance to Pitting and Crevice Corrosion

HASTELLOY[®] C-22[®] alloy exhibits very high resistance to chloride-induced pitting and crevice attack, forms of corrosion to which the austenitic stainless steels are particularly prone. To assess the resistance of alloys to pitting and crevice attack, it is customary to measure their Critical Pitting Temperatures and Critical Crevice Temperatures in acidified 6 wt.% ferric chloride, in accordance with the procedures defined in ASTM Standard G 48. These values represent the lowest temperatures at which pitting and crevice attack are encountered in this solution, within 72 hours. For comparison, the values for 316L, 254SMO, 625, C-22[®] and C-276 alloys are as follows:

Alloy	Critical Pitting Temperature in Acidified 6% FeCl ³		Critical Crevice Temperature in Acidified 6% FeCl ³	
	°F	°C	°F	°C
316L	59	15	32	0
254SMO	140	60	86	30
625	212	100	104	40
C-276	>302	>150	131	55
C-22 [®]	>302	>150	176	80

Other chloride-bearing environments, notably Green Death (11.5% H₂SO₄ + 1.2% HCl + 1% FeCl₃ + 1% CuCl₂) and Yellow Death (4% NaCl + 0.1% Fe₂(SO₄)₃ + 0.021M HCl), have been used to compare the resistance of various alloys to pitting and crevice attack (using tests of 24 hours duration). In Green Death, the lowest temperature at which pitting has been observed in C-22[®] alloy is 120°C (considerably higher than that of C-276, i.e. boiling). In Yellow Death, C-22[®] alloy has not exhibited pitting, even at the maximum test temperature (150°C). The Critical Crevice Temperature of C-22[®] alloy in Yellow Death is 75°C (as compared with 60°C for C-276 alloy).