

# HASTELLOY<sup>®</sup> C-276 alloy

## Selected Corrosion Data

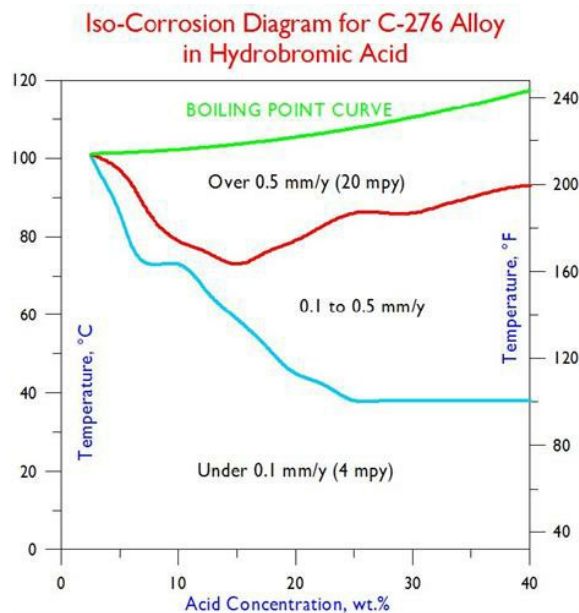
### Hydrobromic Acid

Conc. Wt.%	50°F	75°F	100°F	125°F	150°F	175°F	200°F	225°F	Boiling
	10°C	24°C	38°C	52°C	66°C	79°C	93°C	107°C	
2.5	-	-	-	-	-	-	-	-	0.13
5	-	-	-	-	-	0.01	0.15	-	0.78
7.5	-	-	-	-	0.01	0.14	0.73	-	-
10	-	-	-	-	0.02	0.51	0.89	-	-
15	-	-	-	0.01	0.34	0.57	-	-	-
20	-	-	<0.01	0.25	0.37	0.51	-	-	-
25	-	-	0.11	0.20	0.29	0.45	0.75	-	-
30	-	-	0.12	0.20	0.28	0.44	0.75	-	-
40	-	-	0.08	0.13	0.21	0.30	0.53	-	-

All corrosion rates are in millimeters per year (mm/y); to convert to mils (thousandths of an inch) per year, divide by 0.0254.

Data are from Corrosion Laboratory Jobs 15-02, 27-02, and 37-02.

All tests were performed in reagent grade acids under laboratory conditions; field tests are encouraged prior to industrial use.



### Hydrochloric Acid

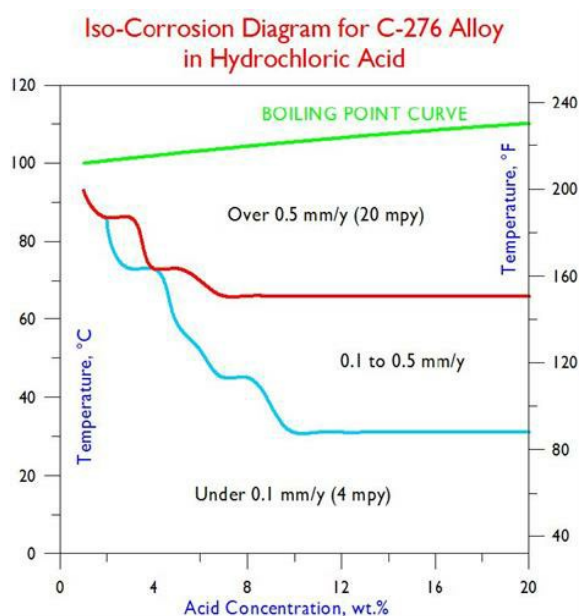
Conc. Wt.%	50°F	75°F	100°F	125°F	150°F	175°F	200°F	225°F	Boiling
	10°C	24°C	38°C	52°C	66°C	79°C	93°C	107°C	
1	-	-	-	-	-	-	-	-	0.33
1.5	-	-	-	-	-	-	-	-	0.70
2	-	-	-	-	0.01	0.02	0.57	-	1.26

2.5	-	-	-	-	-	0.03	0.89	-	1.86
3	-	-	-	-	0.01	0.42	1.18	-	2.34
3.5	-	-	-	-	-	0.57	1.26	-	2.43
4	-	-	-	-	0.02	0.67	1.37	-	2.92
4.5	-	-	-	-	0.37	0.68	1.72	-	3.34
5	-	-	-	0.02	0.31	0.75	1.25	-	3.63
7.5	-	-	0.03	0.31	0.53	0.94	-	-	-
10	-	-	0.17	0.32	0.46	1.18	-	-	-
15	-	-	0.19	0.33	0.54	1.21	-	-	-
20	-	-	0.14	0.29	0.55	1.10	-	-	-

All corrosion rates are in millimeters per year (mm/y); to convert to mils (thousandths of an inch) per year, divide by 0.0254.

Data are from Corrosion Laboratory Jobs 8-95, 11-95, 18-95, 36-95, 3-96, 9-96, 16-96, and 25-96.

All tests were performed in reagent grade acids under laboratory conditions; field tests are encouraged prior to industrial use.



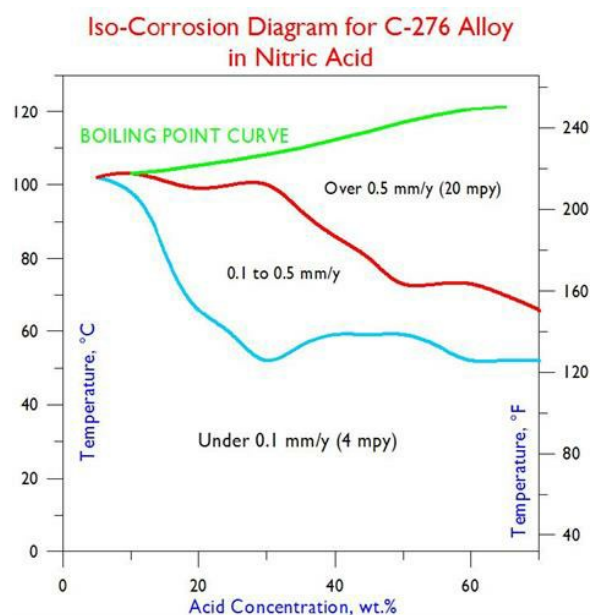
### Nitric Acid

Conc. Wt.%	50°F	75°F	100°F	125°F	150°F	175°F	200°F	225°F	Boiling
	10°C	24°C	38°C	52°C	66°C	79°C	93°C	107°C	
10	-	-	0.01	-	0.03	-	0.06	-	0.26
20	-	-	-	-	0.09	-	0.16	-	0.66
30	-	-	0.02	-	0.14	0.17	0.41	-	1.52
40	-	-	-	0.05	0.20	0.38	0.88	-	4.42
50	-	-	0.04	0.07	0.30	0.65	1.51	-	-
60	-	-	0.06	0.10	0.42	0.82	2.03	-	18.42
65	-	-	-	-	0.41	-	2.53	-	22.12
70	-	-	0.06	-	0.46	1.12	2.62	-	-

All corrosion rates are in millimeters per year (mm/y); to convert to mils (thousandths of an inch) per year, divide by 0.0254.

Data are from Corrosion Laboratory Jobs 1-74 and 19-97.

All tests were performed in reagent grade acids under laboratory conditions; field tests are encouraged prior to industrial use.



### Phosphoric Acid

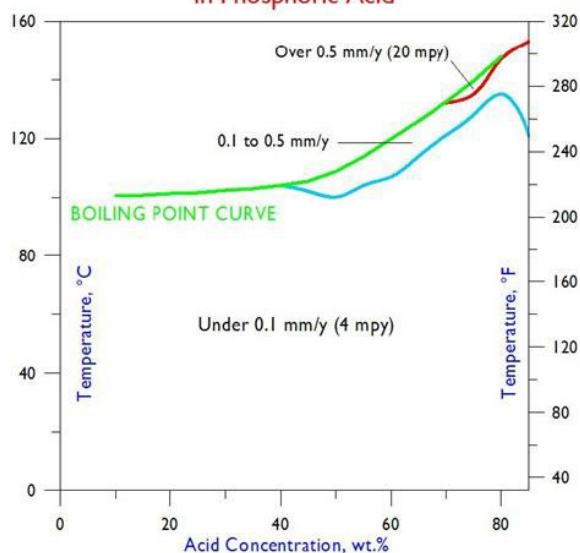
Conc. Wt.%	125°F	150°F	175°F	200°F	225°F	250°F	275°F	300°F	Boiling
	52°C	66°C	79°C	93°C	107°C	121°C	135°C	149°C	
50	-	-	0.01	0.02	-	-	-	-	0.18
60	-	-	0.01	0.02	0.08	-	-	-	0.28
70	-	-	0.01	0.02	0.08	0.08	-	-	0.13
75	-	-	-	-	-	-	-	-	1.29
80	-	-	0.01	0.02	-	0.09	0.12	-	0.31
85	-	-	-	-	-	0.09	0.17	0.29	1.68

All corrosion rates are in millimeters per year (mm/y); to convert to mils (thousandths of an inch) per year, divide by 0.0254.

Data are from Corrosion Laboratory Jobs 19-95 and 64-96.

All tests were performed in reagent grade acids under laboratory conditions; field tests are encouraged prior to industrial use.

### Iso-Corrosion Diagram for C-276 Alloy in Phosphoric Acid



### Sulfuric Acid

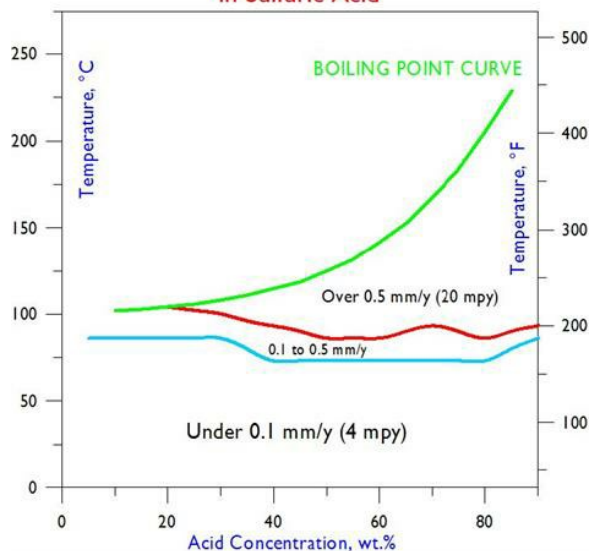
Conc. Wt.%	75°F	100°F	125°F	150°F	175°F	200°F	225°F	250°F	275°F	300°F	350°F	Boiling
	24°C	38°C	52°C	66°C	79°C	93°C	107°C	121°C	135°C	149°C	177°C	
1	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	0.03	0.14	-	-	-	-	-	0.18
20	-	-	-	-	0.05	0.40	-	-	-	-	-	0.49
30	-	-	-	-	0.06	0.42	-	-	-	-	-	0.83
40	-	-	-	-	0.19	0.48	1.02	-	-	-	-	1.87
50	-	-	-	0.02	0.26	0.62	1.13	2.33	-	-	-	3.64
60	-	-	-	0.02	0.30	0.67	1.03	2.87	-	-	-	13.08
70	-	-	-	0.05	0.16	0.50	1.06	13.68	-	-	-	-
80	-	-	-	0.04	0.14	0.60	2.73	5.66	-	-	-	-
90	-	-	-	0.03	0.05	0.46	1.64	4.79	-	-	-	-
96	-	-	-	-	0.04	0.18	0.95	-	-	-	-	-

All corrosion rates are in millimeters per year (mm/y); to convert to mils (thousandths of an inch) per year, divide by 0.0254.

Data are from Corrosion Laboratory Jobs 8-95, 11-95, 18-95, 43-95, 9-96, 15-96, and 20-96.

All tests were performed in reagent grade acids under laboratory conditions; field tests are encouraged prior to industrial use.

**Iso-Corrosion Diagram for C-276 Alloy  
in Sulfuric Acid**



**Reagent Grade Solutions, mm/y**

Chemical	Conc.	100°F	125°F	150°F	175°F	200°F	Boiling
		38°C	52°C	66°C	79°C	93°C	
Acetic Acid	99	-	-	-	-	-	<0.01
Chromic Acid	10	-	-	0.13	-	-	-
	20	-	-	0.53	-	-	-
Formic Acid	88	-	-	-	-	-	0.04
Hydrobromic Acid	2.5	-	-	-	-	-	0.13
	5	-	-	-	-	-	0.78
	7.5	-	-	0.01	0.14	-	-
	10	-	-	0.02	0.51	-	-
	15	-	0.01	0.34	0.57	-	-
	20	<0.01	0.25	0.37	0.51	-	-
	25	0.11	0.20	0.29	0.45	-	-
	30	0.12	0.20	0.28	0.44	-	-
	40	0.08	0.13	0.21	0.30	-	-
Hydrochloric Acid	1	-	-	-	-	-	0.33
	1.5	-	-	-	-	-	0.70
	2	-	-	0.01	0.02	-	-
	2.5	-	-	-	0.03	-	-
	3	-	-	0.01	0.42	-	-
	3.5	-	-	-	0.57	-	-
	4	-	-	0.02	0.67	-	-
	4.5	-	-	0.37	0.68	-	-
	5	-	0.02	0.31	0.75	-	-
	7.5	0.03	0.31	0.53	0.94	-	-
	10	0.17	0.32	0.46	1.18	-	-
	15	0.19	0.33	0.54	1.21	-	-
	20	0.14	0.29	0.55	1.10	-	-

<b>Hydrofluoric Acid*</b>	5	-	0.34	-	-	-	-
	10	-	0.41	-	-	-	-
	20	-	0.48	-	-	-	-
<b>Nitric Acid</b>	10	-	-	0.03	-	0.06	0.26
	20	-	-	0.09	-	0.16	0.66
	30	-	-	0.14	0.17	0.41	-
	40	-	-	0.20	0.38	0.88	-
	50	-	-	0.30	0.65	1.51	-
	60	-	-	0.42	0.82	2.03	-
	65	-	-	0.41	-	2.53	-
	70	-	-	0.46	-	2.62	-
<b>Phosphoric Acid</b>	50	-	-	-	0.01	0.02	-
	60	-	-	-	0.01	0.02	-
	70	-	-	-	0.01	0.02	-
	75	-	-	-	-	-	-
	80	-	-	-	0.01	0.02	-
	85	-	-	-	-	-	-
<b>Sulfuric Acid</b>	10	-	-	-	0.03	0.14	0.18
	20	-	-	-	0.05	0.40	0.49
	30	-	-	-	0.06	0.42	0.83
	40	-	-	-	0.19	0.48	-
	50	-	-	0.02	0.26	0.62	-
	60	-	-	0.02	0.30	0.67	-
	70	-	-	0.05	0.16	0.50	-
	80	-	-	0.04	0.14	0.60	-
	90	-	-	0.03	0.05	0.46	-
	96	-	-	-	0.04	0.18	-

\*Hydrofluoric acid can also induce internal attack of nickel alloys; these values represent only external attack.