

HASTELLOY[®] C-22HS[®] alloy

Tensile Properties of Cold-worked Material

Average Room Temperature Tensile Properties of Bar
(Cold-worked in the Range 43-47%)

Condition	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Reduction of Area
	ksi	MPa	ksi	MPa	%	%
Cold-worked Bar	198.0	1365	203.5	1403	16.7	64.2

Room Temperature Tensile Properties of Bar as a Function of Diameter and Percentage Cold-work

Bar Diameter* Cold-work			Room Temperature Tensile Properties				
			0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation
in	mm	%	ksi	MPa	ksi	MPa	%
0.5	12.7	43	191.1	1317	196.5	1355	18.2
0.75	19.1	44	204.7	1411	210.0	1448	15.5
1.0	25.4	44	188.3	1298	193.8	1336	17.6
1.25	31.8	46	205.2	1415	210.9	1454	15.4
1.567	39.8	37	184.2	1270	192.7	1329	17.4
2.0	50.8	47	207.5	1431	212.0	1462	13.0
2.375	60.3	54	181.4	1251	190.5	1313	21.2
2.5	63.5	49	180.0	1241	183.7	1267	18.2
3.62	91.9	42	192.3	1326	197.3	1360	14.0

*Averages from duplicate test samples

Room and Elevated Temperature Tensile Properties of 0.5 in Diameter Cold-worked (43%) Bar

Test Temperature		0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Reduction of Area
°F	°C	ksi	MPa	ksi	MPa	%	%
RT	RT	195.1	1345	200.4	1382	18.0	65.2
400	204	181.8	1254	182.6	1259	14.6	63.1
500	260	181.0	1248	181.1	1249	14.1	60.8

Room and Elevated Temperature Tensile Properties of 2.375 in Diameter Cold-worked (54%) Bar as a Function of Orientation (Longitudinal and Transverse)

Test Temperature		Orientation	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Reduction of Area
°F	°C		ksi	MPa	ksi	MPa		
RT	RT	Longitudinal	181.4	1251	190.5	1313	21.2	71.1
		Transverse	156.6	1080	183.0	1262	18.8	60.9
350	177	Longitudinal	160.2	1105	166.6	1149	18.5	72.2
		Transverse	138.3	954	160.9	1109	16.1	59.6
450	232	Longitudinal	156.1	1076	163.1	1125	18.3	72.2
		Transverse	139.0	958	156.7	1080	14.8	59.3

Average Room Temperature Tensile Properties of Tube (Cold-worked in the Range 52-53%)

Condition	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation
	ksi	MPa	ksi	MPa	%
Cold-worked Tube	187.3	1291	195.0	1345	15.1

Room and Elevated Temperature Tensile Properties of Cold-worked Tube (3.5 in Diameter by 0.43 in Wall Thickness) (52-53%) as a Function of Orientation (Longitudinal and Transverse)

Test Temperature		Orientation	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation	Reduction of Area
°F	°C		ksi	MPa	ksi	MPa		
RT	RT	Longitudinal	166.0	1145	180.4	1244	18.8	69.5
		Transverse	156.3	1078	175.8	1212	29.2	63.6
400	204	Longitudinal	149.3	1029	157.6	1087	16.8	68.7
		Transverse	143.2	987	155.1	1069	25.8	64.8
500	260	Longitudinal	147.6	1018	154.2	1063	16.5	67.1
		Transverse	138.0	951	151.4	1044	24.8	60.9
600	316	Longitudinal	144.9	999	151.5	1045	16.9	66.4
		Transverse	135.7	936	147.5	1017	25.5	62.3

Values are averages from 10 tests

RT= Room Temperature

Statistical Temperature De-rating C-22HS[®] Cold-worked Tubing

