

MULTIMET[®] alloy

Tensile Data

Elevated temperature tensile tests for sheet were performed with a strain rate that is no longer standard. These results were from tests with a strain rate of 0.005 in./in./minute through yield and a crosshead speed of 0.5 in./minute for every inch of reduced test section from yield through failure. The current standard is to use a strain rate of 0.005 in./in./minute through yield and a crosshead speed of 0.05 in./minute for every inch of reduced test section from yield through failure.

Typical Short-Time Tensile Data, Wrought

Form	Condition	Test Temperature		Ultimate Tensile Strength		0.2% Offset Yield Strength		Elongation
		°F	°C	ksi	MPa	psi	MPa	
Sheet 0.052 in thick	Heat-treated at 2150°F, RAC	RT	RT	116.0	800	57	393	43
		1200	649	73.2	505	-	-	35
		1700	927	19.8	137	-	-	39
		1900	1038	10.0	69	-	-	34
Sheet 0.063 in thick	Heat-treated at 2150°F, RAC	RT	RT	118.1	814	58	400	49
		800	427	98.0	676	42	292	54
		1000	538	93.9	647	40	274	54
		1200	649	73.5	507	38	259	28
		1400	760	58.4	403	36	247	12
		1600	871	38.8	268	30	207	15
		1800	982	24.7	170	17	117	51
		2000	1093	13.0	90	8	58	38
		2100	1149	6.9	48	4	30	36
		2200	1204	4.8	33	3	21	29
		2300	1260	3.4	23	-	-	19
2350	1288	2.6	18	-	-	7		
Plate 1/2 in thick	Heat-treated at 2165°F, WQ	-108	-78	137.7	949	74	513	63
		-320	-196	190.2	1311	-	-	53
Forging, 21 in diameter x 3 1/4 in thick	Stress-relieved 2 h at 1200°F, AC	RT	RT	117.6	811	72	493	30
		1200	649	83.0	572	49	338	25
Forged Bar 1-2 in thick	Heat-treated at 2165°F, WQ	RT	RT	111.0	765	56	384	55*
Hot-Rolled Bar 1/2-2 in diameter	Heat-treated at 2165°F, WQ	RT	RT	111.3	767	54	372	57*
	Heat-treated at 2150°F, RAC	RT	RT	115.8	798	-	-	50
	reduced 5%	RT	RT	115.0	793	77	527	40

Hot-Rolled Bar 0.242 in diameter, Cold- Reduced	reduced 10%	RT	RT	124.0	855	103	709	35
	reduced 15%	RT	RT	135.2	932	123	845	24
	reduced 20%	RT	RT	147.5	1017	136	935	20
	reduced 25%	RT	RT	153.0	1055	143	986	15
	reduced 30%	RT	RT	159.5	1100	153	1051	12
	reduced 35%	RT	RT	174.5	1203	168	1160	10
	reduced 40%	RT	RT	178.5	1231	176	1214	10

RAC- Rapid Air-Cooled

WQ-Water Quenched

*Elongation in 1 in

RT= Room Temperature

Typical Short-Time Tensile Data, Weldments

Welding Method and Material	Condition	Test Temperature		Ultimate Tensile Strength		Yield Strength		Elongation
		°F	°C	ksi	MPa	ksi	MPa	%
SMAW, Sheet, 0.125 in	As-Welded	RT	RT	116.0	800	60.9	420	27
SMAW, Plate, 0.375 in		RT	RT	105.1	725	65.6	452	28
SMAW, Plate, 0.500 in		RT	RT	102.6	707	49.8	343	44
GTAW, Sheet, 0.125 in	As-Welded	RT	RT	108.2	746	60.5	417	22
GTAW, Plate, 0.250 in		RT	RT	111.4	768	65.0	448	21
GTAW, Plate, 0.375 in		RT	RT	105.9	730	60.4	416	19