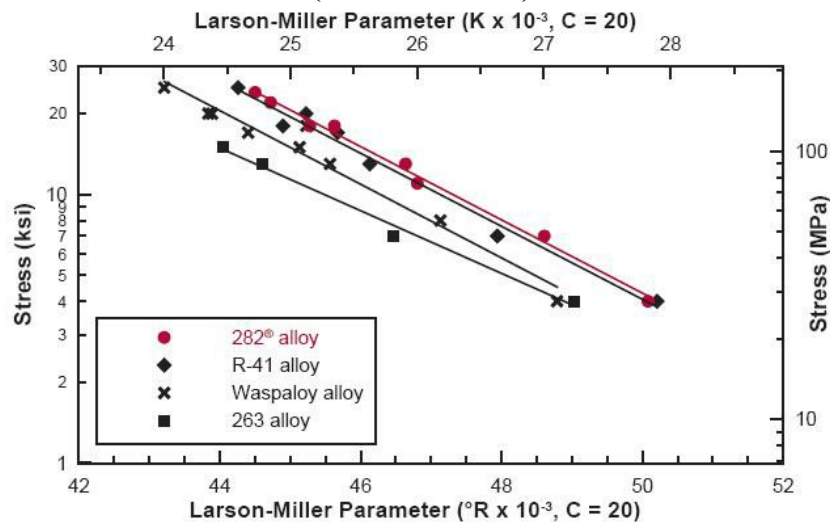


# HAYNES® 282® alloy

## Creep and Stress-Rupture Strength

HAYNES® 282® alloy possesses exceptional creep strength in the temperature range 1200-1700°F (649-927°C). For example, it has superior strength to 263 alloy at all temperatures in this range in terms of both 1% creep and rupture. Despite the exceptional fabricability of 282® alloy, it compares well to less fabricable alloys developed for high creep strength. For example, its rupture strength is equivalent to the well-known, but less fabricable, Waspaloy alloy at the lower temperatures in this range and actually has a distinct advantage at the higher end of the temperature range. In terms of 1% creep strength, 282® alloy is superior to Waspaloy alloy across the entire temperature range. At temperatures of 1500-1700°F (816-927°C), 282® alloy has creep strength equivalent to even that of R-41 alloy, an alloy developed for excellent creep strength, but notorious for poor fabricability.

**1% Creep Strength of Various Superalloys  
in the Temperature Range 1500-1700°F (816-927°C)  
(Sheet Products)**



### Comparative Creep-Rupture Properties of Gamma-Prime Strengthened Alloys\* (Sheet)

Property	Test Temperature		263		R-41		Waspaloy		282®	
	°F	°C	ksi	MPa	ksi	MPa	ksi	MPa	ksi	MPa
Stress-to-Produce 1% Creep in 100 h ksi (MPa)	1200	649	75	517	105	724	81	558	-	-
	1300	704	54	372	75	517	63	434	72	496
	1400	760	37	255	53	365	41	283	48	331
	1500	816	22	152	32	221	25	172	32	221
	1600	871	11	76	17	117	15	103	18	124
	1700	927	6	41	8	55	6	41	9	62
Stress-to-Produce 1% Creep in 1000 h ksi (MPa)	1200	649	58	400	84	579	67	462	79	545
	1300	704	41	283	59	407	46	317	53	365
	1400	760	25	172	34	234	28	193	35	241
	1500	816	12	83	18	124	16	110	21	145
	1600	871	6	41	9	62	7	48	10	69

	1700	927	3	21	5	34	3	21	<b>5</b>	<b>34</b>
Stress-to-Produce Rupture in 100 h ksi (MPa)	1200	649	77	531	110	758	92	634	-	-
	1300	704	60	414	85	586	75	517	<b>75</b>	<b>517</b>
	1400	760	42	290	63	434	53	365	<b>56</b>	<b>386</b>
	1500	816	25	172	39	269	32	221	<b>37</b>	<b>255</b>
	1600	871	14	97	23	159	19	131	<b>22</b>	<b>152</b>
	1700	927	7	48	13	90	10	69	<b>12</b>	<b>83</b>
Stress-to-Produce Rupture in 1000 h ksi (MPa)	1200	649	64	441	90	621	80	552	<b>80</b>	<b>552</b>
	1300	704	45	310	68	469	58	400	<b>56</b>	<b>386</b>
	1400	760	28	193	43	296	36	248	<b>38</b>	<b>262</b>
	1500	816	15	103	24	165	20	138	<b>23</b>	<b>159</b>
	1600	871	7	48	13	90	7	48	<b>12</b>	<b>83</b>
	1700	927	4	28	7	48	3	21	<b>6</b>	<b>41</b>

\*Age-hardened (263 alloy: 1472°F (800°C)/8h/AC, Waspaloy alloy : 1825°F (996°C)/2h/AC + 1550°F (843°C)/4h/AC + 1400°F (760°C)/16h/AC, R-41 alloy: 1650°F (899°C)/4h/AC, 282<sup>®</sup> alloy: 1850°F (1010°C)/2h/AC + 1450°F (788°C)/8h/AC)

#### Solution Annealed\* + Age Hardened\*\* 282<sup>®</sup> Sheet

Test Temperature			Approximate Initial Stress to Produce Specified Creep in:			
			100 h		1,000 h	
°F	°C	%	ksi	MPa	ksi	MPa
1200	649	0.5	-	-	78	538
		1	-	-	79	545
		Rupture	-	-	80	552
1300	704	0.5	70	483	51	352
		1	72	496	53	365
		Rupture	75	517	56	386
1400	760	0.5	46	317	33	228
		1	48	331	35	241
		Rupture	56	386	38	262
1500	816	0.5	30	207	18	124
		1	32	221	21	145
		Rupture	37	225	23	159
1600	871	0.5	17	117	9.0	62
		1	18	124	10	69
		Rupture	22	152	12	83
1700	927	0.5	8.3	57	4.2	29
		1	9.0	62	5.0	34
		Rupture	12	83	6.0	41
1800	982	0.5	3.6	25	-	-
		1	4.2	29	1.8	12

	Rupture	5.5	38	2.5	17
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\*2100°F (1149°C)

\*\*1850°F (1010°C)/2h/AC + 1450°F (788°C)/8h/AC

**Solution Annealed\* + Age Hardened\*\* 282<sup>®</sup> Plate**

Test Temperature			Approximate Initial Stress to Produce Specified Creep in:					
			100 h		1,000 h		10,000 h	
°F	°C	Creep %	ksi	MPa	ksi	MPa	ksi	MPa
1200	649	0.5	-	-	81	558	-	-
		1	-	-	82	565	-	-
		Rupture	-	-	85	586	64	441
1300	704	0.5	73	503	53	365	-	-
		1	75	517	55	379	-	-
		Rupture	80	552	61	421	45	310
1400	760	0.5	49	338	35	241	-	-
		1	50	345	36	248	-	-
		Rupture	57	393	41	283	27	186
1500	816	0.5	32	221	20	138	-	-
		1	34	234	22	152	-	-
		Rupture	38	262	25	172	14	97
1600	871	0.5	18	124	11	76	-	-
		1	19	131	12	83	-	-
		Rupture	23	159	14	97	8	55
1700	927	0.5	9.4	65	4.8	33	-	-
		1	10	69	5.2	36	-	-
		Rupture	13	90	7.0	48	3.7	26
1800	982	0.5	4.2	29	1.8	12	-	-
		1	4.6	32	2.0	14	-	-
		Rupture	6.2	43	3.6	25	-	-

\*2075°F (1135°C)

\*\*1850°F (1010°C)/2h/AC + 1450°F (788°C)/8h/AC

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