

HAYNES<sup>®</sup> 188 alloy

Physical Properties

Physical Property	British Units		Metric Units	
<b>Density</b>	RT	0.324 lb/in <sup>3</sup>	RT	8.98 g/cm <sup>3</sup>
<b>Melting Temperature</b>	2400-2570°F	-	1315-1410°C	-
<b>Electrical Resistivity</b>	RT	39.6 μohm-in	RT	101.0 μohm-m
	200°F	40.3 μohm-in	100°C	103.0 μohm-m
	400°F	41.5 μohm-in	200°C	105.0 μohm-m
	600°F	42.7 μohm-in	300°C	107.7 μohm-m
	800°F	43.8 μohm-in	400°C	110.5 μohm-m
	1000°F	44.7 μohm-in	500°C	112.7 μohm-m
	1200°F	45.6 μohm-in	600°C	114.8 μohm-m
	1400°F	46.1 μohm-in	700°C	116.4 μohm-m
	1600°F	46.5 μohm-in	800°C	117.5 μohm-m
	1800°F	46.7 μohm-in	900°C	118.3 μohm-m
	2000°F	46.8 μohm-in	1000°C	119.1 μohm-m
<b>Specific Heat</b>	RT	0.096 Btu/lb-°F	RT	12.1 J/kg·°C
	200°F	0.101 Btu/lb-°F	100°C	423 J/kg·°C
	400°F	0.106 Btu/lb-°F	200°C	444 J/kg·°C
	600°F	0.112 Btu/lb-°F	300°C	465 J/kg·°C
	800°F	0.117 Btu/lb-°F	400°C	486 J/kg·°C
	1000°F	0.122 Btu/lb-°F	500°C	502 J/kg·°C
	1200°F	0.127 Btu/lb-°F	600°C	523 J/kg·°C
	1400°F	0.131 Btu/lb-°F	700°C	540 J/kg·°C
	1600°F	0.136 Btu/lb-°F	800°C	557 J/kg·°C
	1800°F	0.140 Btu/lb-°F	900°C	573 J/kg·°C
	2000°F	0.145 Btu/lb-°F	1000°C	590 J/kg·°C
<b>Thermal Conductivity</b>	RT	72 Btu-in/ft <sup>2</sup> -hr-°F	RT	10.4 W/m-°C
	200°F	84 Btu-in/ft <sup>2</sup> -hr-°F	100°C	12.2 W/m-°C
	400°F	100 Btu-in/ft <sup>2</sup> -hr-°F	200°C	14.3 W/m-°C
	600°F	112 Btu-in/ft <sup>2</sup> -hr-°F	300°C	15.9 W/m-°C
	800°F	125 Btu-in/ft <sup>2</sup> -hr-°F	400°C	17.5 W/m-°C
	1000°F	138 Btu-in/ft <sup>2</sup> -hr-°F	500°C	19.3 W/m-°C
	1200°F	152 Btu-in/ft <sup>2</sup> -hr-°F	600°C	21.1 W/m-°C
	1400°F	167 Btu-in/ft <sup>2</sup> -hr-°F	700°C	23.0 W/m-°C
	1600°F	174 Btu-in/ft <sup>2</sup> -hr-°F	800°C	24.8 W/m-°C
	1800°F	189 Btu-in/ft <sup>2</sup> -hr-°F	900°C	25.5 W/m-°C
	2000°F	204 Btu-in/ft <sup>2</sup> -hr-°F	1000°C	27.6 W/m-°C
	RT	4.5 x 10 <sup>-3</sup> in <sup>2</sup> /sec	RT	29.2 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	200°F	5.0 x 10 <sup>-3</sup> in <sup>2</sup> /sec	100°C	32.7 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	400°F	5.6 x 10 <sup>-3</sup> in <sup>2</sup> /sec	200°C	36.5 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	600°F	6.0 x 10 <sup>-3</sup> in <sup>2</sup> /sec	300°C	38.7 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	800°F	6.4 x 10 <sup>-3</sup> in <sup>2</sup> /sec	400°C	40.8 x 10 <sup>-3</sup> cm <sup>2</sup> /s

<b>Thermal Diffusivity</b>	1000°F	$6.7 \times 10^{-3} \text{ in}^2/\text{sec}$	500°C	$43.5 \times 10^{-3} \text{ cm}^2/\text{s}$
	1200°F	$7.1 \times 10^{-3} \text{ in}^2/\text{sec}$	600°C	$45.7 \times 10^{-3} \text{ cm}^2/\text{s}$
	1400°F	$7.6 \times 10^{-3} \text{ in}^2/\text{sec}$	700°C	$48.2 \times 10^{-3} \text{ cm}^2/\text{s}$
	1600°F	$7.6 \times 10^{-3} \text{ in}^2/\text{sec}$	800°C	$50.4 \times 10^{-3} \text{ cm}^2/\text{s}$
	1800°F	$8.0 \times 10^{-3} \text{ in}^2/\text{sec}$	900°C	$50.4 \times 10^{-3} \text{ cm}^2/\text{s}$
	2000°F	$8.4 \times 10^{-3} \text{ in}^2/\text{sec}$	1000°C	$53.0 \times 10^{-3} \text{ cm}^2/\text{s}$
<b>Mean Coefficient of Thermal Expansion</b>	75-200°F	$6.7 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-100°C	$12.1 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-400°F	$7.1 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-200°C	$12.7 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-600°F	$7.3 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-300°C	$13.1 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-800°F	$7.6 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-400°C	$13.5 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-1000°F	$7.7 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-500°C	$13.9 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-1200°F	$8.2 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-600°C	$14.3 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-1400°F	$8.5 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-700°C	$15.0 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-1600°F	$8.8 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-800°C	$15.5 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
	75-1800°F	$9.1 \times 10^{-6} \text{ in/in/}^\circ\text{F}$	25-900°C	$16.0 \times 10^{-6} \text{ m/m/}^\circ\text{C}$
-	-	25-1000°C	$16.5 \times 10^{-6} \text{ m/m/}^\circ\text{C}$	
<b>Dynamic Modulus of Elasticity</b>	RT	$33.7 \times 10^6 \text{ psi}$	RT	232 GPa
	200°F	$32.9 \times 10^6 \text{ psi}$	100°C	226 GPa
	400°F	$31.8 \times 10^6 \text{ psi}$	200°C	220 GPa
	600°F	$30.8 \times 10^6 \text{ psi}$	300°C	213 GPa
	800°F	$29.5 \times 10^6 \text{ psi}$	400°C	206 GPa
	1000°F	$28.6 \times 10^6 \text{ psi}$	500°C	198 GPa
	1200°F	$27.1 \times 10^6 \text{ psi}$	600°C	189 GPa
	1400°F	$25.6 \times 10^6 \text{ psi}$	700°C	180 GPa
	1600°F	$24.0 \times 10^6 \text{ psi}$	800°C	171 GPa
	1800°F	$22.2 \times 10^6 \text{ psi}$	900°C	160 GPa
	2000°F	$20.2 \times 10^6 \text{ psi}$	1000°C	150 GPa
<b>Dynamic Shear Modulus</b>	RT	$13.0 \times 10^6 \text{ psi}$	RT	90 GPa
	400°F	$12.5 \times 10^6 \text{ psi}$	100°C	88 GPa
	600°F	$12.0 \times 10^6 \text{ psi}$	200°C	86 GPa
	800°F	$11.4 \times 10^6 \text{ psi}$	300°C	83 GPa
	1000°F	$10.9 \times 10^6 \text{ psi}$	400°C	80 GPa
	1200°F	$10.3 \times 10^6 \text{ psi}$	500°C	76 GPa
	1400°F	$9.7 \times 10^6 \text{ psi}$	600°C	73 GPa
	1600°F	$9.0 \times 10^6 \text{ psi}$	700°C	69 GPa
	1800°F	$8.3 \times 10^6 \text{ psi}$	800°C	65 GPa
	2000°F	$7.5 \times 10^6 \text{ psi}$	900°C	61 GPa
-	-	1000°C	56 GPa	
<b>Poisson's Ratio</b>	RT°F	0.3	RT	0.30
	200°F	0.29	100°C	0.29
	400°F	0.27	200°C	0.27
	600°F	0.29	300°C	0.29
	800°F	0.29	400°C	0.29
	1000°F	0.31	500°C	0.30
	1200°F	0.32	600°C	0.31

	1400°F	0.32	700°C	0.32
	1600°F	0.33	800°C	0.32
	1800°F	0.33	900°C	0.33
	2000°F	0.34	1000°C	0.33

RT = Room Temperature