

HAYNES<sup>®</sup> HR-224<sup>®</sup> alloy

Physical Properties

Physical Property	British Units		Metric Units	
<b>Density</b>	RT	0.280 lb/in <sup>3</sup>	RT	7.72 g/cm <sup>3</sup>
<b>Melting Temperature</b>	2450-2510°F	-	1340-1380°C	-
<b>Electrical Resistivity</b>	RT	48.6 μohm-in	RT	123.5 μohm-cm
	200°F	49.0 μohm-in	100°C	125.2 μohm-cm
	400°F	50.2 μohm-in	200°C	127.5 μohm-cm
	600°F	51.1 μohm-in	300°C	130.0 μohm-cm
	800°F	52.0 μohm-in	400°C	131.7 μohm-cm
	1000°F	52.6 μohm-in	500°C	133.5 μohm-cm
	1200°F	52.8 μohm-in	600°C	134.0 μohm-cm
	1400°F	52.9 μohm-in	700°C	134.2 μohm-cm
	1600°F	53.0 μohm-in	800°C	134.5 μohm-cm
	1700°F	53.0 μohm-in	900°C	134.4 μohm-cm
	-	-	1000°C	135.4 μohm-cm
<b>Thermal Diffusivity</b>	RT	4.3 x 10 <sup>-3</sup> in <sup>2</sup> /sec	RT	27.5 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	200°F	4.5 x 10 <sup>-3</sup> in <sup>2</sup> /sec	100°C	29.5 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	400°F	5.0 x 10 <sup>-3</sup> in <sup>2</sup> /sec	200°C	32.1 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	600°F	5.4 x 10 <sup>-3</sup> in <sup>2</sup> /sec	300°C	34.5 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	800°F	5.8 x 10 <sup>-3</sup> in <sup>2</sup> /sec	400°C	37.2 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	1000°F	6.3 x 10 <sup>-3</sup> in <sup>2</sup> /sec	500°C	39.4 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	1200°F	6.7 x 10 <sup>-3</sup> in <sup>2</sup> /sec	600°C	42.0 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	1400°F	7.0 x 10 <sup>-3</sup> in <sup>2</sup> /sec	700°C	44.7 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	1600°F	7.0 x 10 <sup>-3</sup> in <sup>2</sup> /sec	800°C	44.9 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	1700°F	7.1 x 10 <sup>-3</sup> in <sup>2</sup> /sec	900°C	45.0 x 10 <sup>-3</sup> cm <sup>2</sup> /s
	-	-	1000°C	47.4 x 10 <sup>-3</sup> cm <sup>2</sup> /s
<b>Thermal Conductivity</b>	RT	69 Btu-in/ft <sup>2</sup> -hr-°F	RT	10.0 W/m-°C
	200°F	74 Btu-in/ft <sup>2</sup> -hr-°F	100°C	11.2 W/m-°C
	400°F	89 Btu-in/ft <sup>2</sup> -hr-°F	200°C	12.7 W/m-°C
	600°F	100 Btu-in/ft <sup>2</sup> -hr-°F	300°C	14.2 W/m-°C
	800°F	112 Btu-in/ft <sup>2</sup> -hr-°F	400°C	15.7 W/m-°C
	1000°F	123 Btu-in/ft <sup>2</sup> -hr-°F	500°C	17.1 W/m-°C
	1200°F	135 Btu-in/ft <sup>2</sup> -hr-°F	600°C	18.7 W/m-°C
	1400°F	142 Btu-in/ft <sup>2</sup> -hr-°F	700°C	20.3 W/m-°C
	1600°F	149 Btu-in/ft <sup>2</sup> -hr-°F	800°C	20.7 W/m-°C
	1700°F	149 Btu-in/ft <sup>2</sup> -hr-°F	900°C	21.1 W/m-°C
	-	-	1000°C	22.6 W/m-°C
	RT	0.112 Btu/lb-°F	RT	471 J/kg-°C

<b>Specific Heat</b>	200°F	0.117 Btu/lb-°F	100°C	492 J/kg·°C
	400°F	0.123 Btu/lb-°F	200°C	514 J/kg·°C
	600°F	0.128 Btu/lb-°F	300°C	532 J/kg·°C
	800°F	0.132 Btu/lb-°F	400°C	548 J/kg·°C
	1000°F	0.136 Btu/lb-°F	500°C	564 J/kg·°C
	1200°F	0.139 Btu/lb-°F	600°C	577 J/kg·°C
	1400°F	0.142 Btu/lb-°F	700°C	588 J/kg·°C
	1600°F	0.145 Btu/lb-°F	800°C	600 J/kg·°C
	1700°F	0.146 Btu/lb-°F	900°C	608 J/kg·°C
	-	-	1000°C	616 J/kg·°C
<b>Mean Coefficient of Thermal Expansion</b>	70-200°F	7.8 $\mu\text{in/in } ^\circ\text{F}$	25-100°C	$14.0 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-400°F	8.1 $\mu\text{in/in } ^\circ\text{F}$	25-200°C	$14.5 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-600°F	8.2 $\mu\text{in/in } ^\circ\text{F}$	25-300°C	$14.8 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-800°F	8.3 $\mu\text{in/in } ^\circ\text{F}$	25-400°C	$14.9 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-1000°F	8.3 $\mu\text{in/in } ^\circ\text{F}$	25-500°C	$14.9 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-1200°F	8.3 $\mu\text{in/in } ^\circ\text{F}$	25-600°C	$14.8 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-1400°F	8.9 $\mu\text{in/in } ^\circ\text{F}$	25-700°C	$15.3 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-1600°F	9.4 $\mu\text{in/in } ^\circ\text{F}$	25-800°C	$16.5 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	70-1700°F	9.7 $\mu\text{in/in } ^\circ\text{F}$	25-900°C	$17.2 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
	-	-	25-1000°C	$18.2 \times 10^{-6} \text{m/m}\cdot^\circ\text{C}$
<b>Dynamic Modulus of Elasticity</b>	RT	$28.5 \times 10^6 \text{psi}$	RT	197 GPa
	200°F	$27.5 \times 10^6 \text{psi}$	100°C	191 GPa
	400°F	$27.0 \times 10^6 \text{psi}$	200°C	186 GPa
	600°F	$26.2 \times 10^6 \text{psi}$	300°C	181 GPa
	800°F	$25.3 \times 10^6 \text{psi}$	400°C	176 GPa
	1000°F	$24.5 \times 10^6 \text{psi}$	500°C	170 GPa
	1200°F	$23.5 \times 10^6 \text{psi}$	600°C	164 GPa
	1400°F	$22.0 \times 10^6 \text{psi}$	700°C	158 GPa
	1600°F	$21.3 \times 10^6 \text{psi}$	800°C	152 GPa
	1800°F	$20.2 \times 10^6 \text{psi}$	900°C	146 GPa
-	-	1000°C	139 GPa	

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