



# Osprey Controlled Expansion Alloys

Table of Properties (metric)

	Alloy designation					
	CE17	CE17M	CE13	CE11	CE9	CE7
Composition	Al-27%Si	Al-27%Si	Al-42%Si	Al-50%Si	Si-40%Al	Si-30%Al
<b>Thermal Properties</b>						
Coefficient of thermal expansion	ppm/°C					
100K-200K				7.8		
200K-300K				10.6		
100K-300K				9.2		
-60C-200°C				11.6		7.6
Room Temperature	16.0	16.0	12.8	11.0	9.0	7.4
25-200°C	17.0	17.0	13.6	12.7	9.9	8.3
25-300°C	17.7	17.7	14.4	13.1	10.5	8.5
25-400°C	17.5	17.5	15.0	13.7	10.8	8.2
25-500°C	16.8	16.8	15.2	14.4	10.1	7.7
Thermal Conductivity	W/m.K					
At -100°C						180
At -50°C						140
At -0°C						125
At 25°C	177.4	146.8	160	149	129.4	120
At 50°C						110
At 100°C				132*	125*	110
At 200°C	151.2	146.5		122*	108*	100
At 300°C				115*	98*	88
At 400°C				105*	90*	80
At 500°C				105*	85*	75
Specific Heat	J/kg°C					
	846.3	767.25	820*	794*	780*	785*

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### Mechanical Properties

Ultimate Tensile Strength	MPa	160	220	176	138	134	100
Yield Strength	MPa	110	152	155	125	N/A	N/A
Bend Strength (three point)	MPa	210		213	172	140	143
Young's Modulus	GPa	91.8	91.8*	106.8	121.4	123.5*	129.2
Rigidity Modulus	GPa	35.8	35.8*	42.4*	48.6	49.3*	51.2
Poissons Ratio		0.28	0.28*	0.27*	0.25	0.25*	0.26
Density	g/cc	2.60	2.60	2.55	2.51	2.46	2.42
Fracture Toughness	kN/(mm <sup>3/2</sup> )						0.19
Hardness	Hv	56.5	83.6				255

\* Calculated Value

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