



Mechanical properties

Osprey Controlled Expansion Alloys Mechanical Properties (Metric)

		Alloy designation						
		CE17F	CE17MF	CE13F	C13MF	CE11F	CE9	CE7
Composition		Al-27%Si	Al-27%Si	Al-42%Si	Al-42%Si	Al-50%Si	Si-40%Al	Si-30%Al
Ultimate Tensile Strength	MPa	160	175	205	245	193	134	100
Yield Strength	MPa	110	105	147	198	189	-	129
Bend Strength (three point)	MPa	-	-	213	-	172	140	143
Young's Modulus	GPa	91.8	91.8*	101.9	101.9	121.4	123.5*	129.2
Rigidity Modulus	GPa	35.8	35.8*	42.4*	42.4*	48.6	49.3*	51.2
Poisson's Ratio		0.28	0.28*	0.27*	-	0.25	0.25*	0.26
Density	g/cc	2.6	2.6	2.55	-	2.51	2.46	2.42
Hardness	Hv	60	75 to 132**	-	-	-	-	-

* Calculated value

** Depending on condition



Thermal Properties

Osprey Controlled Expansion Alloys

Thermal Properties (Metric)

		Alloy designation					
		CE17F	CE17MF	CE13F	CE11F	CE9	CE7
Composition		Al-27%Si	Al-27%Si	Al-42%Si	Al-50%Si	Si-40%Al	Si-30%Al
Coefficient of Thermal Expansion	ppm/°C						
100K-200K		-	-	-	7.8	-	-
200K-300K		-	-	-	10.6	-	-
100K-300K		-	-	-	9.2	-	-
-60°C-200°C		-	-	-	11.6	-	7.6
Room Temperature		15.3	15.3	12.2	11.4	9.1	7.2
25-200°C		17.1	17.1	13.7	12.3	10.2	8.3
25-300°C		18.1	18.1	14.6	12.9	10.9	8.8
24-400°C		18.7	18.7	15.2	13.4	11.3	9.2
25-500°C		19	19	15.5	13.7	11.4	9.7
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*

* Calculated value