

# MMC Characteristic

	MMC										Aluminum			Cast iron	Carbon steel	Stainless steel	Ceramics		
	Casting			Non Pressurized Infiltration					Squeeze Casting		AC8A T6	5052 H34	7075	FC250	S55C	SUS304	Al <sub>2</sub> O <sub>3</sub> 99.5%	AlN	SiC
	SA251	SA301	SA401	SS501	SS701	SS901	BS501	BS701	SA701	AA701									
Ceramics (vol%)	SiC			SiC			B <sub>4</sub> C		SiC	Al <sub>2</sub> O <sub>3</sub>									
	25	30	40	50	70	90	50	70	70	70									
Metal (vol%)	Al			Si					Al		Al	Al	Al	Fe	Fe	Fe			
	75	70	60	50	30	10	50	30	30	30									
Density (10 <sup>3</sup> kg/m <sup>3</sup> )	2.8	2.8	2.9	2.8	3.0	3.1	2.5	2.6	3.0	3.5	2.7	2.7	2.8	7.3	7.9	7.9	3.9	3.3	3.1
Flexural Strength (MPa)	-	-	-	300	300	300	220	200	340	300	-	-	-	-	-	-	450	350	500
Elastic modulus (GPa)	115	125	150	280	330	400	280	350	260	200	80	70	70	115	205	210	390	320	410
Poisson's ratio	0.29	0.29	0.29	0.20	0.20	0.20	0.20	0.24	0.20	0.26	-	-	-	-	-	-	0.24	0.29	0.16
Fracture toughness (MPa·m)	-	15	14	3	3	3	3	3	8	-	-	-	-	-	-	-	4	3	3
CTE (10 <sup>-6</sup> /K)	15	14	13	3	3	3	3	3	7	10	20.0	23.4	23.3	9.8	11.7	17.3	5.4	2.4	2.9
Thermal conductivity (W/m·K)	145	150	155	175	190	215	30	30	160	50	125	140	130	50	60	15	30	160	150
Specific heat (J/g·K)	-	0.8	0.9	0.8	0.7	0.7	0.6	0.7	0.6	0.7	-	-	-	-	-	-	0.8	0.7	0.7
Electrical conductivity (·cm)	-	-	-	2 × 10 <sup>-2</sup>	2 × 10 <sup>-2</sup>	1 × 10 <sup>-1</sup>	-	-	1 × 10 <sup>-5</sup>	4 × 10 <sup>-5</sup>	3 × 10 <sup>-6</sup>	-	-	-	-	-	>10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>6</sup>
Hardness	HB										121	68	150		183	< 187			
	HRB		90	93								35	180		90	83	HV 18GPa	HV 13GPa	HV 24GPa
	HRC																		