

Table 1 - Chemical composition of 3004 alloys used in the present work

Alloy ID	Elements (wt. %)				
	Mn	Mg	Fe	Si	Al
1F	1.28	1.16	0.10	0.25	Bal.
3F	1.26	1.16	0.31	0.26	Bal.
6F	1.24	1.18	0.58	0.25	Bal.

Table 2 - SEM-EDS results for the intermetallics shown in Figure 1

Alloy ID	Intermetallic	Elements (wt. %)				
		Mn	Fe	Si	Mg	Al
1F	A	12.85	6.76	6.77	0	70.62
	B	0	0	13.31	19.29	67.4
3F	C	11.74	10.34	0	0	77.92
	D	0	0	18.01	21.81	60.18
6F	E	11.44	13.22	0	0	75.34
	F	0	0	24.67	27.64	47.68

Table 3 - Evolution of intermetallic volume fraction in experimental alloys

Alloy ID	Dominant intermetallic	Volume fraction (vol. %)			
		Dominant		Mg ₂ Si	
		As-cast	375°C /48h	As-cast	375°C /48h
1F	α -Al(MnFe)Si	1.05 ± 0.32	1.25 ± 0.26	0.22 ± 0.11	0.21 ± 0.06
3F	Al ₆ (MnFe)	2.18 ± 0.41	2.51 ± 0.34	0.23 ± 0.05	0.21 ± 0.08
6F	Al ₆ (MnFe)	3.82 ± 0.65	4.21 ± 0.53	0.31 ± 0.08	0.27 ± 0.12

Table 4 Estimated concentration of Mn in solid solution (C_{Mn})
at as-cast and 648K (375°C)/48h conditions

Alloy ID	Concentration (wt. %)		ΔC
	As-cast	375 °C/48h	
1F	1.21	0.78	0.43
3F	1.17	0.65	0.52
6F	1.07	0.59	0.48

Table 5 - Characteristic of dispersoids in experimental alloys after 648K (375°C)/48h

Alloy ID	Dispersoids		Particle free zone (PFZ)
	Average equivalent diameter, nm	Volume fraction, Vol.%	Volume fraction, %
1F	74 ± 22	2.55 ± 0.72	25.6 ± 2.3
3F	52 ± 15	3.14 ± 0.58	19.7 ± 1.9
6F	61 ± 14	2.89 ± 0.65	30.1 ± 2.5