



Award Winning Die Casting Alloy

Non-Heat Treated, 560 Aluminum



2008 Nissan GT-R Door Panel



- ❖ Nissan GT-R door casting was the largest vacuum die casting in the auto industry at over 0.5 square meters, yet with wall thickness of only 2-3mm.
- ❖ Weight of only 5.5kg per door, 35% less than conventional designs.
- ❖ Produced in Soest, Germany.
- ❖ PACE Award Finalist, 2009

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Many components cannot be subjected to a solution heat treatment because the high temperatures distort or bend the casting. Conventional alloys have limited ductility and crash worthiness in the F and T5 tempers. Faced with this problem, Alcoa developed a non-heat treatable die casting alloy. It was used for many years at their casting facility in Soest, Germany. The alloy is now commercially available, and has been registered with the Aluminum Association as 560 alloy. It is strengthened by a solid solution of Mg and Mn, and does not respond significantly to heat treatment. It is used in the as-cast condition (F temper).

Alloy	Si	Fe	Cu	Mn	Mg	Zn	Ti
560.0	0.25	0.2		1.10-1.40	2.80-3.60	0.05	0.15
560.1	0.25	0.15		1.10-1.40	2.85-3.60	0.05	0.15

The castings produced by Alcoa in Soest, Germany had an average tensile strength of 240 MPa and an average elongation of 15%. As of December 2009, the following vehicles used parts made with the alloy:

- ❖ Porsche 911 Turbo (door)
- ❖ Porsche 911/Boxter new (body component)
- ❖ Nissan GT-R (door, body component)
- ❖ Audi A8 (body component)
- ❖ Audi R8 Spider (body component)
- ❖ Jaguar XJ (body component)
- ❖ Jaguar XK (body component)
- ❖ Ferrari - all (body component)
- ❖ Ferrari F142 (door)
- ❖ Karmann, Bentley Continental GTC (roof structure component)

To compare with a conventional AlSi10MnMg alloy, test samples were cut from a specified location in the same casting, having a 3 mm wall thickness. The resulting tensile properties were:

Alloy	UTS (MPa)	Yield (MPa)	E (%)
560-F	268±6	153±3	20±3
AlSi10MnMg-T6	204±4	139±3	16±1.3