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Press Release

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Friedenstrasse 107-109 D-42699 Solingen
Phone: +49 (212) 65 80 300 / Fax: +49 (212) 65 80 310
✉ info@item-international.com
www.item-international.com

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The alloy used in our aluminium Profiles

What exactly are the Profiles in our MB Building Kit System made of? What characteristics does the alloy have? What standards form the basis of the manufacture of our Profiles?

These are typical questions often posed when someone needs more specific details of the mechanical properties of Profile constructions or their reaction to different temperatures. For this reason, we have decided to shed a little light on the matter and, in this way, to explain some of these terms.
Let's start with the material designation itself: the description AlMgSi 0.5 F25 is the name of a wrought aluminium alloy. No less than 98% of the alloy is made up of aluminium itself. Key elements included in the alloy are magnesium and silicon - making up around 0.5% each. In addition, the elements iron, copper, manganese and zinc are present in the alloy in quantities of around 0.1% each. These elements have a positive effect on the corrosion properties of the alloy and the metallurgical processes that take place during heat treatment. The F25 at the end describes the tensile strength of the material when it is supplied (R_m = 245 N/mm²). This additional rating is crucial since the base material itself normally only has a much lower tensile strength.
This designation, then, describes the chemical composition of the alloy and is extremely common, particularly in Germany. However, with regard to the latest conventions in technical standards, it is actually not valid any longer. Within the context of international standardisation, which also covers materials, our alloy is now referred to as EN AW-6060 or EN AW-6063 T66 in the DIN EN 573-3 and EN 755-2 standards. The two types of alloys mentioned above differ only in minor details, mainly in the proportions of iron and magnesium they contain. The crucial factor, however, is not the chemical composition to three places of decimals but rather the heat treatment performed on the Profiles after pressing. This operation induces metallurgical processes which have a decisive effect on the mechanical properties of the finished Profile. For example, the tensile strength R_m (this is the point at which the material will break), the yielding point $R_{p0.2}$ (the upper limit for mechanical load), the hardness and breaking elongation are directly dependent on the duration and temperature of the hardening process. These mechanical properties determine the strength of the joints and the maximum permissible tensions from bending loads. For this reason, every delivery of Profiles is accompanied by a manufacturer's certificate confirming the strength of the Profiles, which is an integral part of our agreement with the supplier. It is interesting to note that the effect achieved by the hardening process is also reversible. If hardened Profiles are subjected over a longish period to temperatures in excess of 100°C, the tensile strength characteristics will be altered. The diffusion processes will modify the molecular structure of the aluminium and it becomes "softer". The material's state is therefore absolutely crucial.

The details of the modulus of elasticity, shear modulus and linear heat expansion are on a different level, however. These ratings apply to aluminium materials generally irrespective of the way the base material has been treated.

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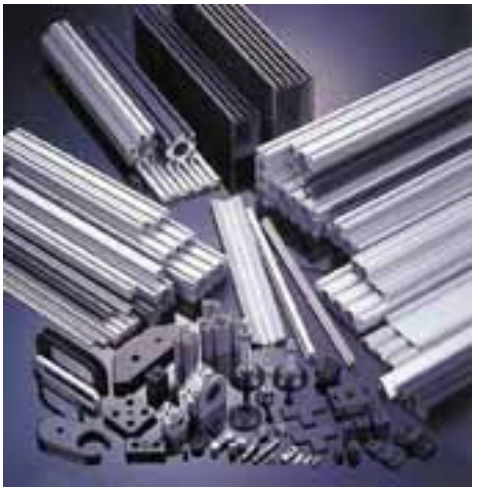

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