
GLASS FILLED POLYAMIDE 12 MATERIAL FOR USE WITH SELECTIVE LASER SINTERING MACHINES

The Material

Glass filled polyamide12 (PA12-GF) is a well known engineering plastic. It is used extensively in the medical and automotive field, and is a stalwart of the Additive Manufacturing (AM) industry. It is one of the most commonly used AM materials. This popularity comes from its ease of use, its reliability and the excellent dimensional stability and strength it provides to AM Laser Sintered (LS) components. Aben Europe provides a new blend of this material; LS-PA12GF, which possesses excellent material properties

Features

The LS-PA12GF material produces parts with excellent strength and stiffness. Components made in these materials exhibit properties which are in many ways similar to injection moulded glass filled polyamide. The material also gives a smoother surface finish than the natural LS-PA12 material. The presence of the glass fill material enables components made in LS-PA12GF to be operated at a higher temperature than LS-PA12. Parts can be machined, or can be fitted with metal inserts, and can generally be treated in a similar way to injection moulded polyamide components. They can also be finished in a variety of ways, including painting and plating. Components made in LS-PA12GF offer a quick route to completely functional plastic parts.

Applications

A wide range of applications are possible using this material. These include

- Components for mechanisms
- Plugs and sockets
- Impellers and Fans
- Parts to be used at elevated temperatures
- Product chassis
- Load bearing components
- Enclosures
- Parts likely to experience wear
- Jigs and fixtures
- Aids for Assembly
- Clips

Quality

Parts can be supplied with a Certificate of Conformity, for purposes of traceability. Aben Europe Ltd also offers a sample bar testing service, to provide customers with evidence of the quality of parts produced in each build.

Safety

The material is completely non-toxic, but as with all finely divided materials, the use of face masks or other breathing apparatus and protective clothing is recommended when finishing parts made from the material.

Technical Data

Please be aware that these figures are **typical values**. The precise values will depend upon the operating parameters of the machine on which the material is used.

Many of the properties listed below will be dependent on the laser power used to sinter the parts and the operating temperature of the LS machine. Some values will depend on the X, Y and Z orientation of the part in the machine. If highly specified material properties are required for your application, please contact us.

| General Properties of Sintered Parts | | |
|--------------------------------------|-------------------------------------|----------------------|
| ITEM | VALUE | UNITS |
| Density | 0.8 – 1.1 | g/cm ³ * |
| Moisture Absorption (24hrs) | 0.05 – 0.1 | % weight |
| Color | Light Grey/Beige | |
| Surface Finish | Slight roughness similar to 20 VDI* | |
| Porosity | Porosity present‡ | |
| | | |
| Tensile Modulus | 1500 – 1800 | N/mm ² *† |
| Ultimate Tensile Strength | 40 – 45 | N/mm ² *† |
| Elongation at break | 5.0 – 15.0 | % *† |
| Flexural Modulus | 1200 – 1300 | N/mm ² *† |
| Hardness – Shore D | 72 – 76 | |
| | | |
| Thermal Properties | | |
| Melting Point | 172 – 180 | °C |
| Recommended component temp range | 50 - 100 | °C |

All properties listed assume Aben Europe standard building conditions. Certain parameters, e.g. porosity, can be varied significantly by varying applied laser power. This parameter variability can be used to tailor material properties to particular applications.

* varies as a function of laser power and machine temperature

† will vary as a function of test direction (i.e. as a function of X, Y and Z build orientation)

‡ parts can be sealed as a post-processing operation or by use of multiple layer scans



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