

A POLYAMIDE 12 MATERIAL USED WITH SELECTIVE LASER SINTERING

Background

Polyamide 12 (PA12) is a well known plastic normally used for the injection moulding of parts intended for engineering applications. A finely divided form of this material can be used with the ALM technology know as selective laser sintering to produce strong accurate parts.

Features

This material enables parts to be produced which have strength approaching those of injection mouldings. They are accurate, offer excellent chemical and moisture resistance and can be used over a wide temperature range. Of all the non-metallic ALM materials available, this one gives the best performance when prototypes are needed to give a close mimic to polyamide target materials. The mechanical properties are so good and exhibit such stability, that components made in this material are now frequently being used for production applications.

Benefits

Parts are accurate and strong, and can be machined, for example parts can be tapped or can carry metal inserts if required, and can be treated in a similar way to injection moulded polyamide components. They can also be finished in a variety of ways, including being painted and even fuel proofed. Components made in LS-PA12 offer a quick route into completely functional plastic parts.

Applications

LS-PA12 finds a great many applications in the prototyping as well as the production environment. A wide range of industries, including aerospace, automotive, medical, environmental, defence and electrical goods are already wide users of this material. A list is given below of a few of the many applications to which LS-PA12 parts can be put.

Prototyping	Production
Enclosures	Clips and stands
Frames	Enclosures
Plugs and sockets	Bobbins and formers
Fans, impellers	Jigs and Fixtures e.g. for drilling
Piping and air ducting	Assembly aids
Product chassis, cases and load bearing components	
Complex pipes and tubes	

LS PA12 Plastic ALM material

Technical Data

Please be aware that these figures are **typical values**. At CRDM we are continually striving to improve the accuracy of our data and the repeatability of our machines

Many of the properties listed below will be dependant on the laser power used to sinter the parts and 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

Density	0.8 – 1.1 g/cm ³ *
Moisture Absorption (24hrs)	0.05 – 0.1%
Colour	White
Surface finish	Light grainy finish (post processing available)
Porosity	Typical pore size 35 microns *‡

Mechanical Properties

Tensile Modulus	1500 – 1800 N/mm ² *†
Ultimate Tensile Strength	40 – 45 N/mm ² *†
Elongation at break	10 – 20% *†
Flexural Modulus	1200 – 1300 N/ mm ² *†
Hardness – Shore D	72 – 76

Thermal Properties

Melting Point	172 -180 °C
Recommended temp range	-50 – 100 °C

All properties listed assume 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 parts to particular applications.

* *varies as a function of laser power*

† *will vary as a function of test direction (ie as a function of X, Y and Z build orientation)*

‡ *parts can be sealed as a post-processing operation*

CRDM Ltd
Unit D, Wycombe Sands
Lane End Road
High Wycombe
HP12 4HH

www.crdm.co.uk
T 08450 514900
E crdm@crdm.co.uk

