



# **HexMC<sup>®</sup> User Guide**

# HexMC<sup>®</sup> GUIDE

## 1. Introduction

This guide has been compiled to introduce HexMC<sup>®</sup> to potential users. It will explain the benefits of using HexMC<sup>®</sup>, how it is processed, the properties of the material and potential applications.

## 2. Benefits of HexMC<sup>®</sup>

### Why use HexMC<sup>®</sup>?

The lower weight and higher specific properties that composite materials offer over metals are well documented.

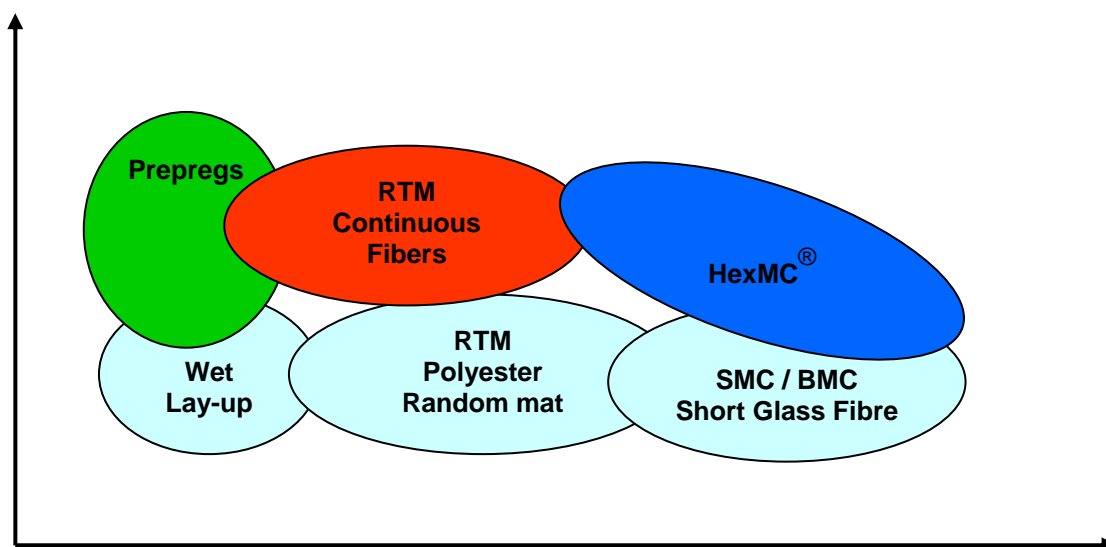
HexMC<sup>®</sup> enables composite parts to be manufactured for:

- Applications where complex 3-D shapes limit the use of typical fibre reinforced matrices/reinforced laminated composites ;
- Parts with abrupt change of cross-sectional thickness ;
- Applications where co-curing of elements is desired, i.e.: metal inserts or mixing with other materials, etc... ;
- Use with automated production process similar to SMC moulding ;
- Production of parts with zero material waste.

### HexMC<sup>®</sup> versus other technologies

The position of HexMC<sup>®</sup> technology, in terms of performance and production volumes, is compared to other fabrication processes below.

#### Performance



Rate of Production

## Product presentation

- [Epoxy](#) sheet moulding compound made of :
  - [Carbon high strength](#)
  - Bundles of 50 x 8 mm
  - 2000 gsm
  - 460 mm width
- Fibre volume content close to [60 %](#)
- [Fast curing](#) epoxy system



Roll of HexMC<sup>®</sup> material



HexMC<sup>®</sup> material

### 3. How to use HexMC<sup>®</sup> ?



HexMC<sup>®</sup> is ideal for the production of high volume components. Within industrial production facilities, high mechanical performance and high consistency can be achieved.

- For high volume production, the use of metallic moulds is necessary due to the high pressures and high temperatures required for shaping and curing HexMC<sup>®</sup>.

Moulds are typically made of carbon steel. The surface can be nickel or chrome plated for optimum surface finish.

Mould design and technology are quite the same as for Sheet Moulding Compound processing.



- HexMC<sup>®</sup> is delivered in rolls. It is sufficiently pliable and tacky to be cut, stacked or rolled to form a mould "charge". The charge is placed inside the compression mould. Under temperature and pressure, the material flows and fills the mould, and then cures.

- Depending on the specific part to be moulded, the moulding pressure is between 50 and 150 bars at a temperature between 110°C and 125°C.

- The exact curing conditions are dependant on tool and part design. Typical cure cycle is 15 minutes at 120°C. According to part thickness, cure time can be adapted with the following rule: 1 mm more equal 1 minute more (ex: 20 min @ 120°C for 15 mm, 30 min @ 120°C cure cycle for 25 mm and above) .

For thicker parts, it is possible to keep a similar cure time and to complete polymerisation/cure by post-curing.

- HexMC<sup>®</sup> can be combined with a prepreg and/or laminate to increase the strength and stiffness of the part. Similar techniques can be used to meet specific cosmetic requirements.

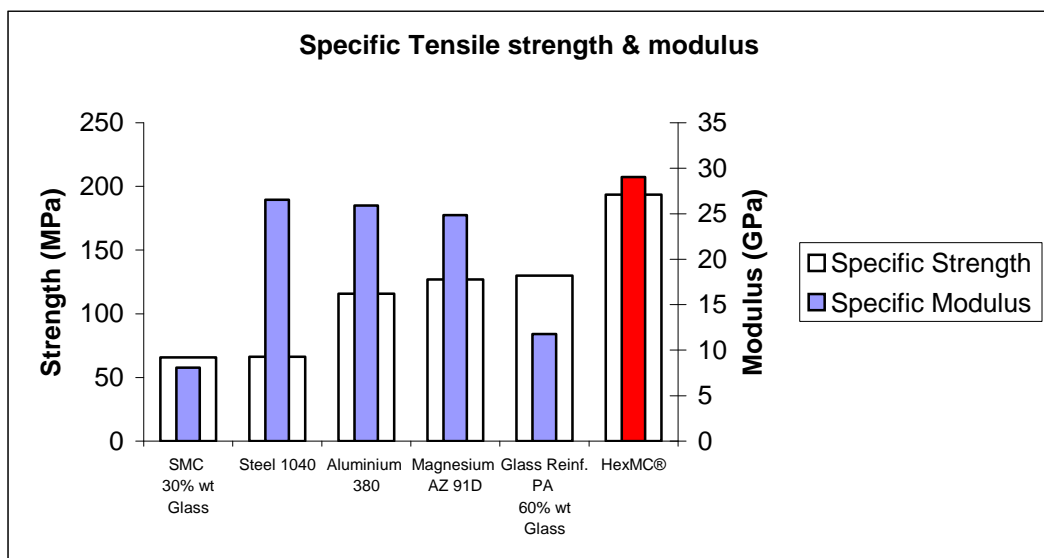
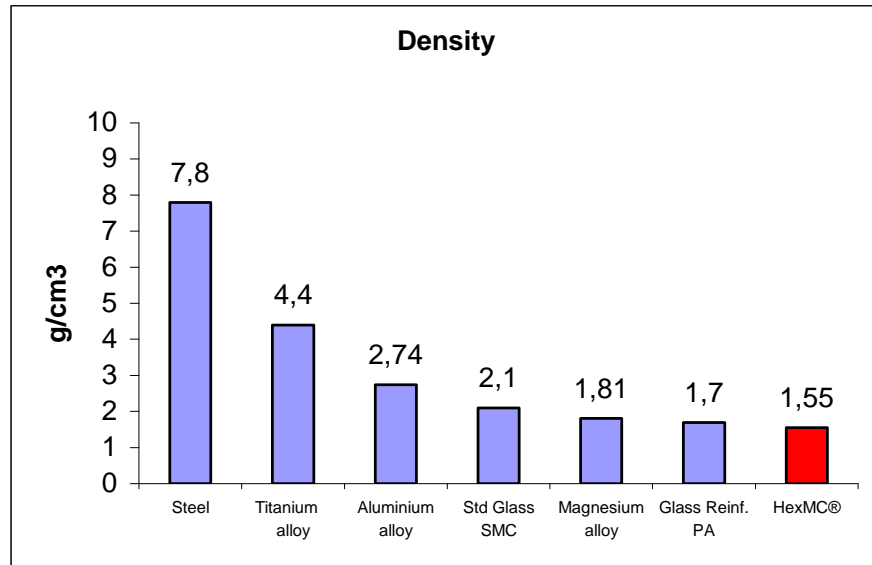
- HexMC<sup>®</sup> is formulated with an internal release agent, so the mould only needs to be coated with release every 5 parts (depending on part shape and mould design).

- Hexcel's Applications Technology group, with offices in Europe and in the USA, can support customers and provide expert advice on HexMC<sup>®</sup> in the following areas:

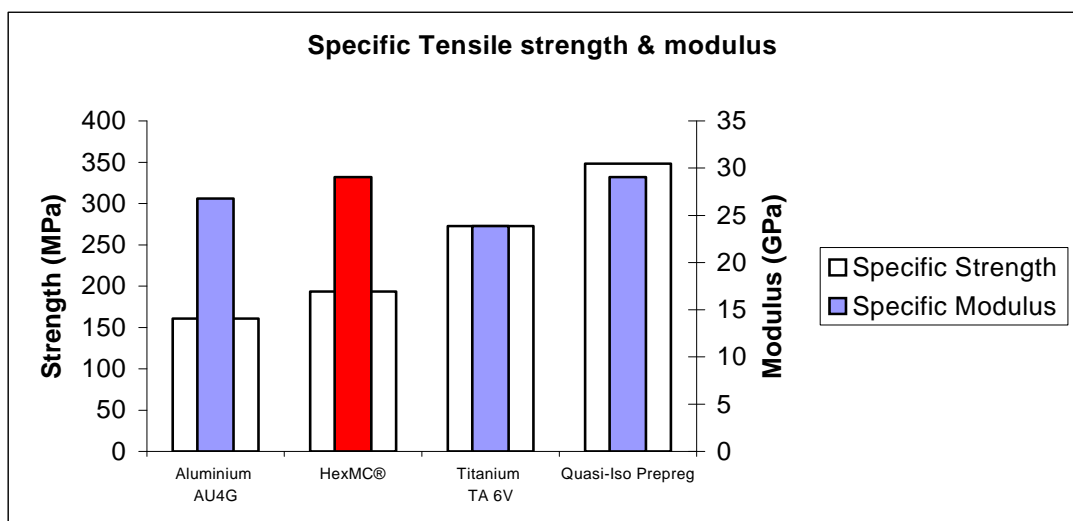
- ✓ Designing of parts and moulds
- ✓ Mechanical and physical testing of HexMC<sup>®</sup> for specific requirements
- ✓ Customizing of moulding process
- ✓ Customizing of pre and past moulding steps

## 4. Mechanical properties

HexMC<sup>®</sup> properties compared to castable metals, mouldable reinforced plastic and medium strength steel.



HexMC<sup>®</sup> compared to aerospace grade metals and a quasi-isotropic carbon/epoxy laminates.



Note : For more information, a specific product data sheet has been issued on the HexMC<sup>®</sup>/C/2000/R1A

For further information, please contact your nearest sales office, or visit our website at [www.hexcel.com](http://www.hexcel.com)

**Australia**

Suite 2, 86 Grimshaw Street  
Greensborough, Victoria 3088  
Tel: **61** 3 9432 7100  
Fax: **61** 3 9432 7200

**China**

D2101, Shanghai Everbright  
Conference & Exhibition  
Center  
80 Cao Bao Road  
Shanghai 200235  
Tel: **86** 21 64836741  
Fax: **86** 21 64836744

**Japan**

4F Yokohama YS Nishiguchi Bldg  
2-25-1 Tsuruya-cho  
Kanagawa-ku Yokohama 221-0835  
Tel **81** 45 290 0866  
Fax **81** 45 314 0852

**USA**

900 Main Street South  
Building 1, Suite 202  
Southbury, CT 06488  
Tel: **1** 203 267 1414  
Fax: **1** 203 267 1561

**Austria**

Industriestrasse 1  
A-4061, Pasching  
Tel: **43** (0)7229 7720  
Fax: **43** (0)7229 772299

**France**

Z1 La Plaine, B.P.27 Dagneux  
01121 Montluel CEDEX  
Tel :**33** (0)4 72 25 26 27  
Fax: **33** (0)4 72 25 27 30

**Spain**

Bruselas, 10 - 16  
Polig. Ind. "Ciudad de Parla"  
28980 Parla, Madrid  
Tel: **34** 91 664 4900  
Fax: **34** 91 698 4914

**USA**

2350 Airport Freeway, Suit 550  
Bedford, TX 76022-6027  
Tel: **1** 817 315 3939  
Fax: **1** 817 571 8629

**Belgium**

Rue Trois Bourdons, 54  
B-4840 Welkenraedt  
Tel: **32** 87 307 411  
Fax: **32** 87 882 895

**Germany**

Sophie-Scholl-Weg 22  
21684 Stade  
Tel: **49** 4141 7879-00  
Fax: **49** 4141 7879-01

**United Kingdom**

Ickleton Road, Duxford, Cambridge  
CB22 4QD  
Tel: **44** (0)1223 833141  
Fax: **44** (0)1223 838808

**Brazil**

Av. J. Guilhermino, 474/72  
S.J.Campos, SP 12210-130  
Tel: **55** 12 3941 2242  
Fax: **55** 12 3923 1186

**Italy**

Via San Cristoforo, 44  
21047 Saronno (VA)  
Tel: **39** 02 96709082  
Fax: **39** 02 9600809

**USA**

11711 Dublin Blvd.  
Dublin, CA 94586-2832  
Tel: **1** 925 551 4900  
Fax: **1** 925 828 7765