



## FREQUENTLY ASKED QUESTIONS: MgCarbonit<sup>91</sup>

This newly developed magnesium alloy is characterized by its fire-retardant, self-extinguishing property and its excellent castability. This makes it an optimal choice for the aerospace and automotive industries, which look for lighter metal solutions.

### How Does MgCarbonit<sup>91</sup> Work?

MgCarbonit<sup>91</sup> incorporates carbon nano particles into calcium- and yttrium-added magnesium alloys. This addition increases mechanical strength and castability, making the alloys at the same time higher strength and more flame resistant. Unlike other castable alloys that often compromise mechanical properties, MgCarbonit<sup>91</sup> maintains these properties similar to those of the widely used MgAZ91 alloy. By using an optimal small amount of carbon nano particles, calcium and yttrium, MgCarbonit<sup>91</sup> effectively balances enhanced flame resistance with strong mechanical performance.



IATF 16949 certified facility



Certified flame resistant as per SAE AS8049C standards

# What Are the Technical Specifications of MgCarbonit<sup>91</sup>?

## Mechanical Properties

| Characteristics     | Value                  |
|---------------------|------------------------|
| Tensile Strength    | 220 MPa                |
| Yield Strength      | 155 MPa                |
| Elongation at Break | 4.5%                   |
| Density             | 1.80 g/cm <sup>3</sup> |
| Modulus             | 45 GPa                 |
| Poisson's Ratio     | 0.3                    |

## Composition

| Elements |    |    |    | Value |
|----------|----|----|----|-------|
| Mg       | Al | Zn |    | ~99%  |
| Ca       | Y  | C* |    | ~1%   |
| Mn       | Fe | Cu | Ni | Trace |

\*Carbon introduced during the thixomolding process

## Properties

| Benefits              | Application   |
|-----------------------|---|
| Self-extinguishing    | Flame retardant, Ignition point above melting point   |
| Domestic Availability | USA and EU  |
| Strong                | Yield and UTS within 10% of constituent commodity alloys. High strength-to-weight ratio.  |
| Made for SSIM         | Carbon mixing process in-line with semi-solid injection molding processes   |
| Superior Castability  | Big tonnage compatible, clean mold release and improved die life. Excellent casting properties. Good heat transfer characteristics. |
| Ultra-lightweight     | 33% lighter than aluminum alloys. Good mechanical properties.   |
| Shielding             | Provides electromagnetic interference (EMI) and radio frequency interference (RFI) shielding  |
| Material              | Fully recyclable, Non-magnetic  |

## What are the applications of MgCarbonit<sup>91</sup>?

- ✓ Vehicle Structures and Airframes
- ✓ Wheels
- ✓ Robotics
- ✓ Battery Housings / Enclosures
- ✓ Consumer Displays
- ✓ Seatbacks
- ✓ Display Housings
- ✓ Table Arms
- ✓ Footrests

## What industries can benefit from MgCarbonit<sup>91</sup>?

- ✓ Consumer
- ✓ Medical
- ✓ Defense
- ✓ Automotive
- ✓ Aerospace

To learn more about our diverse portfolio and our expertise in materials, injection molding and manufacturing, visit [phillipsmedisize.com/non-medical](https://phillipsmedisize.com/non-medical).

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