

Non-combustible Magnesium Alloy

Features of non-combustible magnesium alloy

Traditional images of magnesium alloy, easy to flammable at low ignition temperature, is now overturned.



Lightest

Lightest among practical alloys with a specific gravity of 1.8, about 2/3 of aluminum alloy and 1/4 of steel.

Vibration absorption (attenuation capacity)

Having the largest vibration absorption (attenuation capacity) among practical metals, vibration and noise can be successfully reduced.
Attenuation capacity: 267 times of Al (in case of pure Mg)

Specific strength & Specific rigidity

Possible to produce lighter-weight products for the same specification due to its higher specific strength/rigidity compared with aluminum alloy and steel.

Cutting performance

As its cutting resistance is about 1/2 of aluminum alloy and 1/5 of mild steel, reduction of process time and extension of tools lifetime are possible.

Non-combustible magnesium alloy products

- Ingot
- Billets for extrusion processing
- Sand casting
- Metal mold casting
- Die-casting

Applications of non-combustible magnesium alloy

As a structural material

Interior member of high-speed trains



The N700 Shinkansen

Photo: website of Central/West JR



Image
The world's first magnesium alloy usable in railroad vehicle.

Taking advantage of its light-weight and high specific strength/rigidity, it is in practical use as a shelf support.

As a functional material

Magnesium air battery (negative-electrode material)

Magnesium air battery has not been realized because of problems including the short lifetime due to self-discharge (a reaction not by battery reaction), ignition risks and high costs. In this project, we are working for the production technique of alloy with high-efficiency and ignition-inhibition features realizing thinner plate thickness and lower costs.

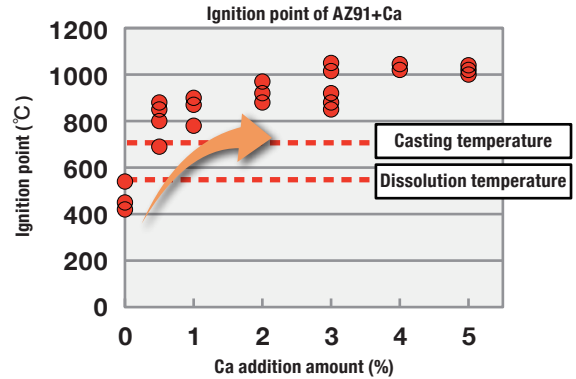
2013-2015 METI Strategic Foundational Technology Improvement Support Operation (Supporting Industry Project)

R&D organizations: Kitakyushu Foundation for the Advancement of Industry, Science and Technology (management body), Tobata Seisakusho Co., Ltd., Furukawa Battery Co., Ltd., Fuji Light Metal Co., Ltd., National Institute of Advanced Industrial Science and Technology

Non-combustible

[Ignition point of non-combustible magnesium alloy is higher than 900°C]
Ignition point of general alloy is near melting point (about 600°C).

Rise of ignition point after Ca added



Easy to handle in melting and casting processes

- No need for flux and inactive gas(SF₆) that has a high global warming potential (Global warming potential: 23,900 times of CO₂) ⇒ Environmentally friendly
- No need for a special facility.
- Existing aluminum melting facility can be used.

Easy cutting and processing

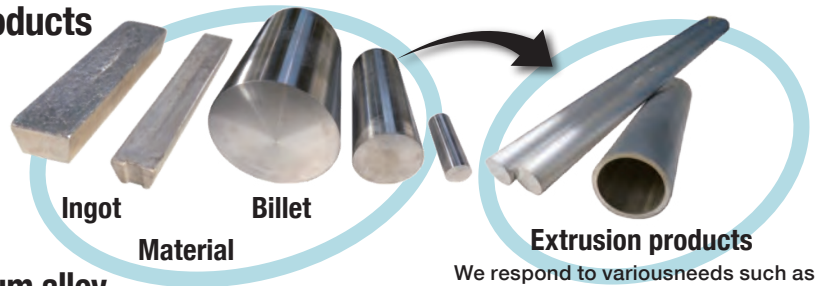
- Dry processing is possible.
- Easy to handle chips after cutting.
- It is possible to recycle chips.

Seeds development by National Institute of Advanced Industrial Science and Technology (Patented)

- Patent-3318606 "Production of calcium-containing magnesium alloy casting"
- Patent-3030338 "Production of high strength Non-combustible magnesium alloy"



Tobata Seisakusho Co., Ltd.



We respond to various needs such as small-lot, test products, etc.