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
  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.

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"

Technical transfer

- Tobata Seisakusho Co., Ltd.

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