Magnesium Hydroxide

Flame Retardants · **CAS 1309-42-8** · **Grade HD-9021 / HD-0822 / H36-7**

1. PRODUCT DESCRIPTION

Magnesium hydroxide [$Mg(OH)_2$] represents the next generation of eco-friendly flame retardants, replacing toxic antimony/halogen systems. Upon heating to 340-490°C, it undergoes endothermic decomposition [$Mg(OH)_2 \rightarrow MgO + H_2O$], absorbing 1450 J/g while releasing 31 wt% water vapor. This dual action cools the polymer substrate and dilutes flammable gases, suppressing ignition. Unlike aluminum hydroxide (decomposes at 220°C, interfering with PE processing at 180-200°C), $Mg(OH)_2$'s higher decomposition temperature allows trouble-free extrusion. In flame tests, it enables UL94 V-0 rating (self-extinguishing within 10 seconds) at 55-65 wt% loading, with smoke density index <100 (vs >400 for halogenated systems). The residual MgO char layer acts as a thermal barrier.

2. TYPICAL PROPERTIES

Columns: **HD-9021 · HD-0822 · H36-7** — values are per grade.

PROPERTY	TYPICAL VALUE
Base	`Synthetic / Synthetic / Natural brucite`
Process	`Precipitated, ground, surface-treated / Precipitated, ground, surface-treated / Ore ground`
MDH content, % min	`99 / 99 / –`
MgO content, % min	`– / – / 60`
CaO, % max	`0.1 / 0.1 / 3`
SiO_2, % max	`0.1 / 0.1 / 7`
Fe_2O_3, % max	`0.005 / 0.005 / 2.0`
Moisture, % max	`0.5 / 0.5 / 2.0`
Loss on ignition, %	`≈30.0`
Whiteness (R457), min	`96 / 96 / 88`
Particle size D50, μm	`1–2 / 1–2 / 3–3.8`
Decomposition, °C	`340–450`
Max service temperature, °C	`300`
Distinguishing feature	`Water resistance, high strength / Dispersion, high elongation at break / Natural mineral, cost-efficient`

Typical values, not a purchase specification. A batch-specific Certificate of Analysis is issued for every shipment. Confirm acceptance limits for your application with us before ordering.

3. MATERIAL CONSTANTS

PROPERTY	VALUE	SOURCE
True density	`2.36 g/cm³`	Literature value
Decomposition onset	`330–340 °C`	TGA (ISO 11358)
Heat absorption	`≈ 1,450 J/g`	DSC (ISO 11357)
Water released	`≈ 31 wt%`	From LOI

4. TYPICAL APPLICATIONS AND KEY PROPERTIES

- High Decomposition Temp (340-490°C) compatible with PE/PP processing
- 31% Water Release (cools substrate + dilutes combustible gases)
- Ultra-low Smoke (<100 DSR vs >400 for halogen FRs)
- Zero Halogen/Antimony (meets railway/subway fire safety EN 45545)

5. HANDLING NOTES

- **Drying.** Dry to ≤ 0.2 % before processing; ≤ 0.15 % for film grades. 105 °C for 2–4 h, do not exceed 150 °C.
- **Loading.** Flame-retardant performance is reached at high loading (typically 55–65 wt% in EVA/PE); confirm with your own compound trials.
- **Temperature.** Keep the melt below 200 °C — decomposition begins above 300 °C.
- **Safety.** Dust mask and eye protection when handling powder. See the SDS for full information.

6. PACKAGING AND STORAGE

ITEM	DETAIL
Packaging	25 kg PP woven bag with PE liner; larger packaging on request
Storage	Cool, dry, sealed — keep away from acids and moisture
Shelf life	24 months in unopened original packaging
Loading port	Tianjin (Xingang) / Qingdao

7. REGULATORY STATUS

ITEM	STATUS
REACH SVHC	Base material screened — no SVHC above 0.1 % w/w (SGS SHAEC2008188708). Treated grades can be tested on request.
RoHS (EU) 2015/863	Base material compliant (SGS NGBEC25004227002 / CZXEC1900477942). Treated grades on request.
Quality system	ISO 9001:2015 — certificate 21726Q00302R001, valid to 2029-04-15