

AGC-01 Negative Thermal Expansion Glass-Ceramic Blend

Prepared in accordance with Regulation (EC) No 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2020/878

Product code	Revision	Issue date	Language
AGC-01	Rev 1.0	12 September 2026	English

SECTION 1 Identification of the substance or mixture and of the company or undertaking

Product identifier	AGC-01 Negative Thermal Expansion Glass-Ceramic Blend (AGC-01)
Relevant identified uses	Ready-to-fire ceramic powder blend for components requiring negative or near-zero thermal expansion. Industrial, professional and research use only. Development material.
Uses advised against	Not for food, pharmaceutical, cosmetic or medical use. Not for consumer sale.
Details of the supplier of the safety data sheet	Sabancı University Faculty of Engineering and Natural Sciences Universite Caddesi No: 27, Orhanli-Tuzla, 34956 Istanbul, Türkiye Ekin.felek@strocera.com Manufacturing site: Sabancı University, Orhanli-Tuzla, 34956 Istanbul, Türkiye
Emergency telephone number	Türkiye National Poison Information Centre (UZEM): 114 (24 h) Outside Türkiye: contact the national poison centre of the country of use.

SECTION 2 Hazards identification

2.1 Classification of the substance or mixture

The product is not classified as hazardous according to Regulation (EC) No 1272/2008 (CLP), on the basis of the composition stated in Section 3.

2.2 Label elements

No hazard pictogram, signal word or hazard statement is required under CLP on the basis of the composition stated in Section 3.

Precautionary statements

P260 Do not breathe dust. · P280 Wear eye protection. · P284 In case of inadequate ventilation, wear respiratory protection.
(Advisory only.)

2.3 Other hazards

The product is a fine powder. Although not classified, airborne dust may cause mechanical irritation of the eyes and the upper respiratory tract. The classification given here rests on the identity of the boron-bearing additive stated in Section 3. Elemental boron carries no harmonised classification under CLP Annex VI. Several boron compounds, in particular borates, are classified as Repr. 1B (H360FD). If the additive is supplied or used in a borate form, the classification of the product and the content of Sections 2, 3, 8, 11 and 15 must be revised before issue. See Section 16.

SECTION 3 Composition and information on ingredients

Mixture. Alpha alumina matrix with a proprietary boron-bearing additive that produces the negative expansion behaviour.

Constituent	CAS No.	EC No.	Concentration (wt%)	Classification (CLP)
Aluminium oxide (alpha-Al ₂ O ₃)	1344-28-1	215-691-6	Major constituent	Not classified
Boron-bearing additive, expressed as boron	7440-42-8	231-151-2	Balance	Not classified (elemental boron)
Magnesium oxide	1309-48-4	215-171-9	< 0.5	Not classified

The exact identity, specification and proportion of the boron-bearing additive are proprietary to the supplier. The composition is declared on an elemental boron basis. The product contains no crystalline silica.

SECTION 4 First aid measures

General	Move the affected person away from the dust source. If symptoms persist, seek medical advice and show this safety data sheet.
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Inhalation	Move to fresh air and keep at rest in a position comfortable for breathing. Rinse the mouth and nose with water. Seek medical advice if coughing or respiratory discomfort continues.
Skin contact	Brush off the dry powder, then wash with soap and water. Do not rub. Seek medical advice if irritation persists.
Eye contact	Do not rub. Rinse cautiously with water for at least 15 minutes, holding the eyelids open. Remove contact lenses if present and easy to do. Seek medical advice if irritation persists, as the particles are abrasive and may cause mechanical injury to the cornea.
Ingestion	Rinse the mouth with water. Do not induce vomiting. Seek medical advice if a significant quantity has been swallowed.
Note to physician	Treat symptomatically. No specific antidote is known.

SECTION 5 Firefighting measures

Extinguishing media	The product is non-combustible. Use extinguishing media appropriate to the surrounding fire. Avoid high-pressure water jets and other methods that raise dust clouds.
Special hazards	The product does not burn and does not support combustion. No hazardous decomposition products are expected under fire conditions.
Advice for firefighters	No special measures are required for the product itself. Wear self-contained breathing apparatus and protective equipment appropriate to the surrounding fire.

SECTION 6 Accidental release measures

Personal precautions	Avoid raising dust. Wear the protective equipment specified in Section 8. Keep persons not wearing protective equipment away from the spill area. Ensure adequate ventilation.
Environmental precautions	Prevent entry into drains, surface water and groundwater. No significant environmental hazard is expected from the material itself.
Containment and cleaning	Do not dry sweep and do not use compressed air. Collect with a vacuum cleaner fitted with a HEPA filter, or by careful wet methods. Place the collected material in a labelled, closable container for disposal or recovery. Wash the area afterwards with water.
Reference	See Section 8 for exposure controls and Section 13 for disposal.

SECTION 7 Handling and storage

Handling	Handle in a way that minimises dust generation. Use local exhaust ventilation at transfer, weighing and screening points. Do not breathe dust. Keep containers closed when not in use. Avoid contact with eyes.
Hygiene	Do not eat, drink or smoke in the working area. Wash hands and exposed skin before breaks and at the end of work. Remove and wash contaminated clothing separately before reuse. Do not remove dust from clothing with compressed air.
Storage	Store in the original sealed container in a dry, well-ventilated place between 5 and 35 degrees Celsius, away from direct sunlight. Reseal immediately after use. No incompatible materials are known under normal storage conditions.
Specific end uses	Research, engineering testing and technical ceramic processing. See Section 1.2.

SECTION 8 Exposure controls and personal protection

8.1 Occupational exposure limits

Parameter	Limit value	Note
Aluminium oxide, inhalable fraction	10 mg/m ³ (8 h TWA)	General inert dust limit
Aluminium oxide, respirable fraction	4 mg/m ³ (8 h TWA)	General inert dust limit
Boron, elemental	No occupational exposure limit established	Limits exist for specific boron compounds; verify against the additive identity

No DNEL or PNEC values are established for the mixture.

8.2 Engineering controls

Use local exhaust ventilation at all points where dust may be released. Enclose transfer, weighing and blending operations where practicable. Provide eyewash facilities.

Respiratory protection	Not normally required where dust is controlled below the occupational exposure limit. Where the limit may be exceeded, use a filtering half mask of at least FFP2 (EN 149).
Hand protection	General-purpose work gloves.
Eye and face protection	Safety glasses with side shields (EN 166).
Skin and body protection	Standard work clothing. Change and wash contaminated clothing separately.

SECTION 9 Physical and chemical properties

Property	Value
Physical state	Solid, fine powder
Colour	White to off-white
Odour	Odourless
Odour threshold	Not applicable
pH	Not determined
Melting point	Not determined. The glassy phase softens on heating; behaviour above 800 degrees Celsius has not been established.
Boiling point	Not applicable
Flash point	Not applicable, inorganic solid
Evaporation rate	Not applicable
Flammability	Non-combustible
Explosive limits	Not applicable. The product is not a combustible dust.
Vapour pressure	Not applicable
Relative density	3.93 g/cm ³ (true density)
Bulk density	Approx. 0.80 g/cm ³ poured; approx. 1.30 g/cm ³ tapped
Solubility in water	Practically insoluble. The glassy phase may show limited hydrolytic attack in alkaline or steam environments at temperature.
Partition coefficient	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	Not determined below 800 degrees Celsius
Viscosity	Not applicable
Oxidising properties	None
Thermal expansion	Continuous negative expansion from 100 to 800 degrees Celsius; net coefficient adjustable to near zero
Particle size	Not determined
Specific surface area	Not determined

Particle characteristics are reported where relevant to the physical form of the product.

SECTION 10 Stability and reactivity

Reactivity	The product is not reactive under normal conditions of handling and storage.
Chemical stability	Stable under the recommended storage conditions.
Possibility of hazardous reactions	None known.
Conditions to avoid	Conditions that generate airborne dust.
Incompatible materials	None known under normal conditions of use. Strong hydrofluoric acid attacks silicate and oxide minerals.
Hazardous decomposition products	None known. The product does not decompose at ambient temperature.

SECTION 11 Toxicological information

Endpoint	Information
Acute oral toxicity	No data on the mixture. Not classified on the basis of the stated composition.
Acute dermal toxicity	No data on the mixture. Not classified.
Acute inhalation toxicity	No data on the mixture. Not classified.
Skin corrosion and irritation	Not classified. Prolonged contact with the dry powder may dry the skin mechanically.
Serious eye damage and irritation	Not classified. The particles may cause mechanical irritation of the cornea.
Respiratory or skin sensitisation	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	Not classified. The product contains no crystalline silica.
Reproductive toxicity	Not classified on the basis of elemental boron. This endpoint is the one most sensitive to the identity of the additive: borate compounds are classified Repr. 1B (H360FD) with a generic concentration limit of 0.3 per cent. Confirmation of the additive identity is required before this endpoint can be considered closed. See Section 16.
STOT single exposure	Not classified.
STOT repeated exposure	Not classified.
Aspiration hazard	Not classified.
Nanoform information	The product is not a nanoform.

SECTION 12 Ecological information

Toxicity	No aquatic toxicity data are available for the product. The constituents are inert inorganic minerals of low solubility and adverse effects on aquatic organisms are not expected at the concentrations arising from normal use.
Persistence and degradability	The product is inorganic and not biodegradable. Methods for determining biodegradability are not applicable.
Bioaccumulative potential	Not expected to bioaccumulate.
Mobility in soil	The product is a solid powder of low water solubility and is expected to remain in the soil matrix.
PBT and vPvB assessment	The product does not contain substances assessed as PBT or vPvB.
Endocrine disrupting properties	The product does not contain substances identified as having endocrine disrupting properties at a concentration of 0.1 per cent by weight or above.
Other adverse effects	None known.

SECTION 13 Disposal considerations

Waste treatment	Dispose of the product and its container in accordance with national and local regulations. Recovery or reuse is preferred where the application allows. Avoid generating dust during disposal operations.
Contaminated packaging	Empty containers may retain product residue. Handle empty containers as if they contained product. Dispose of or recycle in accordance with local regulations.
Waste code	The waste code is assigned by the user according to the origin of the waste and the applicable national waste list. For unused product a code under the mineral waste group is generally applicable.

SECTION 14 Transport information

UN number or ID number	Not applicable
UN proper shipping name	Not applicable
Transport hazard class	Not applicable
Packing group	Not applicable
Environmental hazards	Not a marine pollutant
Special precautions for user	None beyond the handling precautions in Section 7. Transport in closed, labelled containers, secured against movement and rupture.

Maritime bulk transport

Not applicable. The product is not carried in bulk under IMO instruments.

The product is not classified as dangerous goods under ADR, RID, ADN, IMDG or the IATA Dangerous Goods Regulations. A separate non-dangerous goods declaration is available on request for air and sea consignments.

SECTION 15 Regulatory information

Aluminium oxide is registered under REACH. The regulatory status of the boron-bearing additive depends on its identity and must be confirmed before placing on the European Union market; several borates appear on the REACH Candidate List of substances of very high concern. No chemical safety assessment has been carried out for this mixture.

SECTION 16 Other information**16.1 Revision**

This is revision 1.0 of this safety data sheet, issued on 12 September 2026. This is the first issue; no previous revision exists.

16.2 Abbreviations

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road. CAS: Chemical Abstracts Service. CLP: Regulation (EC) No 1272/2008 on classification, labelling and packaging. DNEL: Derived no-effect level. EC: European Community. IATA DGR: International Air Transport Association Dangerous Goods Regulations. IARC: International Agency for Research on Cancer. IMDG: International Maritime Dangerous Goods Code. PBT: Persistent, bioaccumulative and toxic. PNEC: Predicted no-effect concentration. REACH: Regulation (EC) No 1907/2006. RCS: Respirable crystalline silica. SDS: Safety data sheet. STOT RE: Specific target organ toxicity, repeated exposure. TWA: Time-weighted average. vPvB: Very persistent and very bioaccumulative.

16.3 Sources

Regulation (EC) No 1907/2006 (REACH) as amended. Regulation (EC) No 1272/2008 (CLP) as amended, including Annex VI harmonised classifications. Directive 2004/37/EC on carcinogens, mutagens and reprotoxic substances at work, Annex I. ECHA Guidance on the compilation of safety data sheets. IARC Monographs on the evaluation of carcinogenic risks to humans, Volume 100C. In-house X-ray diffraction, X-ray fluorescence, laser diffraction and scanning electron microscopy analyses carried out on the product.

16.4 Training

Persons handling the product should be instructed in the hazards described in Section 2, the exposure controls in Section 8 and the emergency procedures in Sections 4 and 6 before first use.

16.5 Disclaimer

The information in this safety data sheet relates only to the product named in Section 1 and to the composition stated in Section 3. It is given in good faith on the basis of the data available at the date of issue and does not constitute a specification or a warranty of any property. The user is responsible for assessing the suitability and safety of the product for the intended application and for compliance with the regulations in force at the place of use.