Safety Data Sheet (SDS) for Cold Gas Generator

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	CGG-Generator for Fire Suppression System
Synonyms:	Cold Gas Generator Exhaust, GCG Gas Mixture
Manufacturer/Distributor:	Sapfir Ltd. / Steinberg Trade & Trust GmbH & Co.KG
Address:	Elsastraße 1, 59320 Ennigerloh, Germany
Telephone Number:	+49 (0) 2525 962727
Mail:	info@tungus.de
Relevant Identified Uses:	Used as a component in a fire suppression system to generate inert gases upon activation

HAZARD IDENTIFICATION

Classification of the substance or Mixture:
- Pyrotechnic device.
- Pressurized gas-producing system.
- Gases produced by the generator include carbon monoxide, hydrogen and carbon dioxide which can pose health and environmental risks, though only small amounts are produced during operation

Signal Word: WARNING

Hazard Statements:
H220: Extremely flammable gas (Hydrogen).
H280: Contains gas under pressure, may explode if heated.
H332: Harmful if inhaled (Carbon Monoxide).
H335: May cause respiratory irritation.

Precautionary Statements:
P210: Keep away from heat, sparks, open flames and hot surfaces.
P250: Do not subject to mechanical shock.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312: Call a POISON CENTER or doctor if you feel unwell.

Other Hazards:
Gases generated during activation are released in small quantities and are expected to disperse quickly in large or well-ventilated spaces. The risk of harmful exposure is low under normal operating conditions

COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Concentration
Hydrogen (H_2)	1333-74-0	15.0%
Carbon Dioxide (CO_2)	124-38-9	30.4%
Oxygen (O_2)	7782-44-7	0.5%
Nitrogen (N_2)	7727-37-9	16.1%
Methane (CH_4)	74-82-8	2.9%
Water (H_2O)	7732-18-5	0.4%
Carbon Monoxide (CO)	630-08-0	34.0%
X-1	N/A	0,3%
X-2	N/A	0,2%
X-3	N/A	0,1%
X-4	N/A	0,1%

Note: X-components are unidentifiable components present in trace amounts.

FIRST AID MEASURES

Contact and exposure methods	**Procedure**
Inhalation:	Move to fresh air immediately. If not breathing, administer artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.
Skin Contact:	Wash exposed skin with soap and water. Remove contaminated clothing.
Eye Contact:	Flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.
Ingestion:	Not applicable; product is a gas.

SECTION 5: FIRE-FIGHTING MEASURES

The CGG is embedded in fire-extinguishing powder before activation, which minimizes any direct fire risks. In the event of pyrotechnic activation, only a small amount of gas is released, which disperses quickly, significantly reducing the potential for fire hazards. The gases produced (e.g. carbon monoxide, hydrogen and methane) are flammable but the quantity generated is minimal and there is minimal risk of ignition. The metal casing contains the pyrotechnic charge and failure of the device (such as a malfunction or misfire) typically does not leas to significant fire risks. Methane and hydrogen are also lighter than air and are expected to dissipate before reaching any potential fire source.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Ventilate the area. Allow gas to disperse.

SECTION 7: HANDLING

The Cold Gas Generator (CGG) is designed to function as part of a fire suppression system and should only be handled by trained personnel. Ensure that the system is installed and maintained according to manufacturer specifications to guarantee safe operation. Avoid exposing the CGG to strong mechanical impacts or other forces that could trigger accidental activation outside its intended use.

SECTION 8: PERSONAL PROTECTION

Personal Protective Equipment (PPE):
No special protective clothing is required under normal operating conditions

After the complete fire suppression system has been activated, fire-extinguishing powder is released into the environment. While this is unrelated to the Cold Gas Generator (CGG), entering the room shortly after activation is recommended only with appropriate personal protective equipment. Use safety goggles to protect eyes from dust and, if necessary, a particulate mask to avoid inhalation of fine powder. These precautions are advised until the room has been adequately ventilated to clear the extinguishing powder.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Component	OSHA PEL	ACGIH TLV
Carbon Monoxide (CO)	50 ppm	25 ppm
Hydrogen (H_2)	N/A	N/A
Carbon Dioxide (CO_2)	5000 ppm	5000 ppm
Nitrogen (N_2)	Simple Asphyxiant	Simple Asphyxiant
Methane (CH_4)	N/A	N/A

Engineering Controls:
No additional measures are required under normal conditions, if installed and used as intended.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: The Cold Gas Generator (CGG) is designed to remain stable and inert under normal storage and operating conditions. It will only activate upon receiving the appropriate electrical impulse as part of its intended use in fire suppression systems.
Chemical Stability: The CGG is chemically stable under normal conditions of use, handling, and storage. There are no known risks of spontaneous activation or degradation under recommended conditions.
Possibility of Hazardous Reactions: Hazardous reactions are not expected under normal conditions. Activation occurs in a controlled manner, releasing a small amount of gas, which disperses quickly and does not present significant hazards when used as designed.
Conditions to Avoid: Avoid unauthorized electrical impulses, which could trigger unintended activation.
Incompatible Materials: none known under normal use conditions.
Hazardous Decomposition Products: During activation, the CGG generates small amounts of gases such as carbon monoxide, hydrogen, and methane. These gases are produced in minimal quantities and are designed to dissipate quickly in well-ventilated environments.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute Toxicity: The CGG itself does not pose significant acute toxicity risks in its inert state. During activation, small amounts of carbon monoxide (CO), a toxic gas, are released. Exposure to high concentrations of CO in poorly ventilated areas can cause symptoms such as headaches, dizziness. However, the released quantities are minimal and designed to dissipate quickly in large, open spaces.
Skin Corrosion/Irritation: The CGG components are contained within a sealed metal casing and pose no risk of skin corrosion or irritation under normal handling conditions.
Serious Eye Damage/Irritation: No components of the CGG are expected to cause eye irritation

under normal handling and use.
Respiratory or Skin Sensitization: The CGG does not contain known sensitizers.
Carcinogenicity, Mutagenicity, Reproductive Toxicity: No components of the CGG are classified as carcinogenic, mutagenic, or toxic to reproduction.
Aspiration Hazard: The CGG poses no aspiration hazards as it does not release liquids or particulates under normal conditions.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity: The CGG is not designed to be released into the environment and, under normal use, has negligible ecological impact. The small amounts of gases produced during activation (e.g., CO_2, CO, hydrogen) are rapidly dispersed and do not significantly contribute to long-term ecological harm.
Persistence and Degradability: The gases released during activation (e.g., carbon monoxide and carbon dioxide) are naturally present in the environment and degrade or integrate into natural cycles.
Bioaccumulative Potential: No bioaccumulative substances are present in the CGG. The gases released (e.g., hydrogen, methane) do not bioaccumulate.
Mobility in Soil: The CGG is a sealed unit and does not release components into the soil under normal conditions. Gaseous by-products of activation are mobile in the atmosphere and disperse quickly.
Other Adverse Effects: Due to the minimal quantities of gases released and their rapid dispersion in open environments, the CGG is not expected to contribute to ozone depletion, global warming, or other significant ecological harm under normal use.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal of Product: The Cold Gas Generator (CGG) should be disposed of in accordance with local, regional, and national regulations. Used or activated CGGs are generally inert and can be treated as non-hazardous waste. Consult with relevant authorities for specific disposal guidelines.
Disposal of Unused Product: Unactivated CGGs should be disposed of as pyrotechnic or potentially hazardous waste due to the presence of the activation mechanism. Specialized disposal facilities for pyrotechnic materials may be required. Do not dispose of in household or general waste streams.
Packaging Disposal: Packaging materials can typically be recycled or disposed of as non-hazardous waste, provided they are free of residue. Follow local regulations for recycling.
Environmental Considerations: Avoid direct disposal of CGGs into the environment, as improper handling could pose localized risks.

SECTION 14: TRANSPORT INFORMATION

UN Number: UN 0323 (Articles, Pyrotechnic)
UN Proper Shipping Name: Pyrotechnic Article, Non-Flammable Gas Generator
Transport Hazard Class(es): Class 1.4S (Pyrotechnic Devices with Minimal Risk)
Packing Group: Not applicable (1.4S articles are exempt from packing group classification).
Environmental Hazards: The CGG does not pose significant environmental hazards under normal transport conditions.
Transport in Bulk According to Annex II of MARPOL and the IBC Code: Not applicable.
Additional Information: The CGG is classified as a 1.4S article, indicating it presents minimal

explosive hazard during transportation. Handle with care to avoid damage to the activation mechanism.

SECTION 15: REGULATORY INFORMATION

Safety, Health, and Environmental Regulations/Legislation Specific for the Substance or Mixture:

United States Regulations:
The CGG is subject to the requirements of the Occupational Safety and Health Administration (OSHA) under the Hazard Communication Standard (29 CFR 1910.1200).
Pyrotechnic components may be regulated under the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF).
Transport regulations comply with the U.S. Department of Transportation (DOT) and are classified under UN 0323 (1.4S Pyrotechnic Articles).

European Union Regulations:
The CGG is classified and labeled according to Regulation (EC) No 1272/2008 (CLP).
Pyrotechnic components are subject to Directive 2013/29/EU on the placing on the market of pyrotechnic articles.

Global Regulations:
The product complies with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).
Transport classification adheres to the International Air Transport Association (IATA), the International Maritime Dangerous Goods (IMDG) Code, and ADR regulations.

Chemical Safety Assessment:
A chemical safety assessment has not been conducted for this product as it is classified as an article rather than a substance or mixture.

SECTION 16: OTHER INFORMATION

Additional Notes:
This Safety Data Sheet (SDS) is intended to provide guidance on the safe handling, use, and disposal of the Cold Gas Generator (CGG). The information contained herein is accurate to the best of our knowledge at the time of preparation.

Abbreviations and Acronyms:
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
TLV: Threshold Limit Value
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
UN: United Nations

Revision Information:
This SDS has been updated to reflect additional details regarding stability, ecological impact, and regulatory compliance.

Disclaimer:
The information provided in this SDS is for informational purposes only and does not constitute

a warranty or guarantee of product performance. Users must evaluate the applicability of the information to their specific situations and ensure compliance with all relevant laws and regulations.