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SECTION: 1. Identification

1.1. Product identifier

Trade name/designation : TIMREX® HSAG and TIMREX® CyPbrid

1.2. Identified uses

Main use category : Professional uses; Industrial use

Use of the substance/preparation : Electrical and thermal conductive additive; Friction modifier; Carbon carrier; Lubricant; Refractory

1.3. Supplier

Company : Imerys Graphite & Carbon Switzerland Ltd.
Strada Industriale 12
6743 -Bodio, Switzerland
Telephone +41 91 873 20 10
Telefax: +41 91 873 20 19
[E-mail: graphiteandcarbon.ch@imerys.com](mailto:graphiteandcarbon.ch@imerys.com)

1.4. Emergency telephone number

: Within USA and Canada: 1-800-424-9300 / Outside USA and Canada: +1 703-741-5970 (collect calls accepted)

SECTION: 2. Hazard(s) identification

2.1. Hazard classification

GHS-US classification : Not classified

OSHA hazard category : Combustible dust

2.2. Label elements

Signal word (GHS-US) : Warning

Hazard statements (GHS-US) : May form combustible dust concentrations in air

Symbols : Not applicable

Precautionary statements (GHS-US) : Not applicable

2.3. Other hazards

Other hazards which do not result in classification : Carbon monoxide and/or carbon dioxide may be present. Carbon monoxide is an odorless and colorless poisonous gas. Ensure space is properly ventilated. Move to fresh air immediately if you experience nausea, headaches, dizziness, or drowsiness. Review Annex to Safety Data Sheet for complete handling and storage instructions.

SECTION: 3. Composition/Information on ingredients

Substance name	CAS No.	%	GHS classification
Graphite	7782-42-5	> 99.5	Not classified

SECTION: 4. First-aid measures

4.1. Description of first-aid measures

Inhalation : Remove person to fresh air and keep comfortable for breathing.

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Ingestion : Rinse mouth thoroughly with water. If conscious, give the victim plenty of water to drink.

Skin contact : Take off contaminated clothing.
Wash skin thoroughly with soap and water.

Eye contact : Immediately rinse with water for several minutes.

Additional advice : First aider: Pay attention to self-protection.
Use personal protective equipment as required (see Section 8).
Never give anything by mouth to an unconscious person or to a person with cramps.
If symptoms persist, consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Notes to physician: Intoxication; CO - Carbon monoxide.
Use self-contained respiratory apparatus for rescue and maintenance work in storage vessels.

4.2. Symptoms and effects

Inhalation : Inhalation of dust may cause irritation of the respiratory system. High concentration of vapors may induce nausea, headaches, dizziness, or drowsiness.

Skin contact : Contact with dust may cause mechanical irritation or drying of the skin.

Eye contact : Dust contact with the eyes can lead to mechanical irritation.

Chronic symptoms : May cause damage to lungs through prolonged or repeated exposure via inhalation. May cause damage to central nervous system.

4.3. Immediate medical attention and special treatment

If unconscious, place in recovery position and seek medical advice. Artificial respiration and/or oxygen may be necessary.

SECTION: 5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, alcohol resistant foam, dry extinguishing powder, carbon dioxide

Unsuitable extinguishing media : Strong water jet

5.2. Special hazards

Fire hazard : Non-flammable.

Specific hazards : Potential dust explosion hazard. May release harmful fumes/gases. May release carbon dioxide and/or carbon monoxide.

5.3. Advice for fire-fighters

: Evacuate personnel to a safe area.
Fire-fighters should use special protective equipment.
In case of fire, wear self-contained breathing apparatus.
Use water spray or fog for cooling exposed containers.
Do not allow run-off from fire-fighting to enter drains or water courses.
Dispose of waste in accordance with local environmental regulations.
Avoid dust formation.
Knock down/dilute dust cloud with water spray.
Contain the extinguishing fluids by bunding.

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SECTION: 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Evacuate personnel to a safe area.
Stay upwind/keep distance from source.
Provide adequate ventilation.
Use personal protective equipment as required (see Section 8).
Do not breathe dust.
Avoid contact with skin, eyes and clothing.
Avoid dust formation.
Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
Take precautionary measures against static charges.

For emergency responders : Ensure procedures and training for emergency decontamination and disposal are in place.
Wear recommended personal protective equipment (see Section 8).

6.2. Environmental precautions

Do not allow product to enter into surface water or drains. Notify authorities if product enters sewers or public waters.

6.3. Spill clean up methods

: Stop leak if safe to do so. Dam up the solid spill. Take up mechanically (sweeping, shoveling) and collect in suitable container for disposal. For large spills, scoop solid spill into closing containers. This material and its container must be disposed of in accordance with local regulations. Avoid dust formation. Knock down dust with water spray jet.

SECTION: 7. Handling and storage

Review Annex to Safety Data Sheet for complete handling and storage instructions. Do not handle or store product until all safety precautions have been read and understood.

7.1. Precautions for safe handling

Handling :

- Potential dust explosion hazard. May release harmful fumes/gases. May release carbon dioxide and/or carbon monoxide.
- Provide adequate ventilation.
- Use personal protective equipment as required (see Section 8).
- Do not breathe dust.
- Avoid contact with skin, eyes, and clothing.
- Take precaution to avoid mixing with incompatible materials (see Section 10).
- Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time).
- Do not allow contact with soil, surface, or ground water.

Avoid dust formation.
Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking near product.
Take precautionary measures against static charges.

Do not enter in closed warehouse without respirator or without assurance of safe atmosphere in the space.

Define the storage area and vehicle traffic routes clearly.
Put up clear signs indicating that carbon monoxide may be present.

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Monitor personal carbon monoxide intake.

Hygiene measures

- : Keep good industrial hygiene.
- Wash hands before breaks and immediately after using the product.
- When using do not eat, drink, or smoke.
- Keep away from food, drink, and animal feeding stuffs
- Remove contaminated clothing.
- Keep work clothes separate.

7.2. Conditions for safe storage

Technical measures
dioxide.

: May form hazardous gas/vapor mixtures of carbon monoxide and/or carbon

- Carbon monoxide
- Carbon dioxide

However, with good ventilation gases/vapors dissipate to very low levels.

Vapors are heavier than air and may spread along floors.

Carbon monoxide and oxygen monitoring is recommended if used or stored in a confined space.

In closed storage facilities (e.g., bulk storage tanks, containers, drums) toxic gases/vapors may form in high concentrations.

Ensure adequate ventilation, especially in confined areas.

Storage

: Keep in a dry, cool, and well-ventilated place.
Do not store near or with any of the incompatible materials listed in Section 10.

Packaging materials

: Keep/store only in the original container.

SECTION: 8. Exposure controls/Personal protection

8.1. Control parameters

Graphite (7782-42-5)		
ACGIH	ACGIH TWA (mg/m ³)	2 mg/m ³ (all forms except graphite fibers-respirable fraction)
IDLH	US IDLH (mg/m ³)	1250 mg/m ³
NIOSH	NIOSH REL (TWA) (mg/m ³)	2,5 mg/m ³ (natural-respirable dust)
OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (synthetic-total dust) 5 mg/m ³ (synthetic-respirable fraction)
Québec	VEMP (mg/m ³)	2 mg/m ³ (containing no Asbestos and <1% Crystalline silica, except Graphite fibres-respirable dust)

Exposure limits for CO and CO₂ according to OSHA, NIOSH and ACGIH

Agency	CO (ppm)	CO ₂ (ppm)
OSHA (PEL)	50	5000
NIOSH (PEL)	35	5000
ACGIH (TLV – TWA)	25	5000

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8.2. Exposure controls

Engineering measures : Provide adequate ventilation using organizational measures to prevent/limit releases, dispersion, and exposure.

Apply measures to prevent dust explosions.
Ensure equipment is adequately grounded.

8.3. Personal protective equipment (PPE)

Respiratory protection : Wear a half-face (EN 140) or a full-face (EN 136) dust mask. Filter type: B/P.
Wear appropriate breathing apparatus if air renewal not sufficient to maintain dust/vapor under TLV.
In the absence of exposure data, assume that this exposure level will be exceeded during the use of this product.

Hand protection : Wear chemically resistant gloves (tested to EN374).

Eye protection : Wear side shield safety glasses (EN166).

Body protection : Wear suitable protective clothing.

Thermal hazard protection : Not required for normal conditions of use.
Use dedicated equipment.

Environmental exposure controls : Do not allow contact with soil, surface, or ground water.
Comply with local environmental protection regulations.

SECTION: 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance : Solid
Color : Grey to black
Odor : Odorless
Odor threshold: : No data available
pH : No data available
Melting point/freezing point : > 3000 °C OECD 12
Initial boiling point and boiling range : No data available
Flash point : Not applicable (solid)
Evaporation rate : No data available
Upper/lower flammability or explosive limits : No data available
Vapor pressure : Solid whose melting point is >3000°C
Vapor density : No data available
Density : ≈ 2,2 g/cm³ DIN 51901
Relative density : No data available
Water solubility : < 0,001 g/l
Solubility in different media : No data available
Partition coefficient n-octanol/water : No data available
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Viscosity : Not applicable (solid)

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Explosive properties : Potential dust explosion hazard
Oxidizing properties : Not applicable

9.2. Other information

Other information : Dust explosion class 1.
Minimum ignition energy (MIE) >1J.
Minimum ignition temperature of a 5 mm dust layer (glowing temperature) >500°C.
Maximum explosion pressure 7.6bar.
Maximum rate of pressure rise 270bar/s.

Additional information : See Annex to the Safety Data Sheet.

SECTION: 10. Stability and reactivity

Unstable on exposure to air.
Air contact may form hazardous compounds and result in the release of carbon monoxide and/or carbon dioxide. Risk of dust explosion.
Exposure to high concentrations of carbon monoxide may cause asphyxiation. Symptoms may include loss of mobility/consciousness.
Victim may not be aware of asphyxiation.
If a container leaks into confined storage space, oxygen may be depleted and cause asphyxiation.
Oxygen detectors should be used.

For additional information, see the Annex to the Safety Data Sheet.

SECTION: 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified
Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory/skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

For further information on the symptoms related to the physical, chemical, and toxicological characteristics, see Section 4.

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SECTION 12: Ecological information

The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product waste: : Do not allow contact with soil, surface, or ground water.
Dispose of empty containers and wastes in accordance with local regulations.

Refer to supplier for information on recovery/recycling.
Recycling is preferred to disposal or incineration.
If recycling is not possible, eliminate in accordance with local waste disposal regulations.

Contaminated packaging : Handle contaminated packages in the same way as the substance itself.
Dispose of contaminated materials in accordance with local regulations.

SECTION 14: Transport information

Not classified as dangerous under transport regulations. For additional information, see the Annex to the Safety Data Sheet.

SECTION: 15. Regulatory information

15.1. U.S. federal regulations

Graphite (7782-42-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

15.2.1. CANADA

Graphite (7782-42-5)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification: Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

15.2.2. National regulations

Graphite (7782-42-5)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on INSQ (Mexican national Inventory of Chemical Substances)

Listed on Turkish inventory of chemicals

15.3. U.S. state regulations

Graphite (7782-42-5)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male
No	No	No	No

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Carbon monoxide (630-08-0)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male
No	Yes	No	No

Carbon dioxide (124-38-9)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male
No	No	No	No

Graphite (7782-42-5)

- U.S. - Idaho - Occupational Exposure Limits - Mineral Dusts
- U.S. - Idaho - Occupational Exposure Limits - TWAs
- U.S. - Massachusetts - Right To Know List
- U.S. - Michigan - Occupational Exposure Limits - TWAs
- U.S. - Minnesota - Hazardous Substance List
- U.S. - Minnesota - Permissible Exposure Limits - TWAs
- U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
- U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
- U.S. - New Jersey - Right to Know Hazardous Substance List
- U.S. - New York - Occupational Exposure Limits - Mineral Dusts
- U.S. - New York - Occupational Exposure Limits - TWAs
- U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
- U.S. - Oregon - Permissible Exposure Limits - Mineral Dusts
- U.S. - Oregon - Permissible Exposure Limits - TWAs
- U.S. - Pennsylvania - RTK (Right to Know) List
- U.S. - Tennessee - Occupational Exposure Limits - TWAs
- U.S. - Texas - Effects Screening Levels - Long Term
- U.S. - Texas - Effects Screening Levels - Short Term
- U.S. - Vermont - Permissible Exposure Limits - TWAs
- U.S. - Washington - Permissible Exposure Limits - STELs
- U.S. - Washington - Permissible Exposure Limits - TWAs
- U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
- U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
- U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
- U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet

SECTION: 16. Other information

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Abbreviations and acronyms

: ABM = Algemene beoordelingsmethodiek
ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin
ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route
CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC
IATA = International Air Transport Association
IMDG = International Maritime Dangerous Goods Code
LEL = Lower Explosive Limit/Lower Explosion Limit
UEL = Upper Explosion Limit/Upper Explosive Limit
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
BTT = Breakthrough time (maximum wearing time)
DMEL = Derived Minimal Effect level
DNEL = Derived No Effect Level
EC50 = Median Effective Concentration
EL50 = Median effective level
ErC50 = EC50 in terms of reduction of growth rate
ErL50 = EL50 in terms of reduction of growth rate
EWC = European waste catalogue
LC50 = Median lethal concentration
LD50 = Median lethal dose
LL50 = Median lethal level
NA = Not applicable
NOEC = No observed effect concentration
NOEL: no-observed-effect level
NOELR = No observed effect loading rate
NOAEC = No observed adverse effect concentration
NOAEL = No observed adverse effect level
N.O.S. = Not Otherwise Specified
OEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
PNEC = Predicted No Effect Concentration
Quantitative structure-activity relationship (QSAR)
STOT = Specific Target Organ Toxicity
TWA = time weighted average
VOC = Volatile organic compounds
WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)

NFPA-code

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.
NFPA fire hazard : 1 - Must be preheated before ignition can occur.
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability : 0 Minimal Hazard
Physical : 0 Minimal Hazard
Personal Protection : E

This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

DISCLAIMER OF LIABILITY To the best of our knowledge, the information contained in this SDS is accurate. However, the information is provided without any warranty, express or implied, regarding its accuracy or correctness. The conditions or

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methods of handling, storage, use, or disposal of the product are the sole responsibility of the user. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

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ADDITIONAL INFORMATION TO THE STABILITY AND REACTIVITY PROPERTIES

1. Emission of gaseous substances in an open/permeable container.

This product can generate emissions of carbon monoxide (CO) and/or carbon dioxide (CO₂). The emission rate as - *gram/ton_{graphite}/day* - given below (Tab 1) are from measurements of gas generated within a sealed container filled with graphite, with an initial atmospheric pressure of air in both constant volume or constant pressure condition over a period of 28 days.

Table 1. Maximal CO and CO₂ release during the storage test of CyPbrid and HSAG at 22 ±2°C.

	Non-ventilated, constant volume (no additional supply of oxygen)	Non ventilated, constant pressure (no additional supply of oxygen)	Ventilated, atmospheric pressure (constant supply oxygen)
CyPbrid and HSAG			
• CO	Max 0.60 g/ton/d	Max 0.56 g/ton/d	No data available
• CO ₂	Max 5 g/ton/d	Max 30 g/ton/d	No data available

The CO and CO₂ release from CyPbrid and HSAG are measured during a long-lasting (over 28 days) real-life experiment. The CO and CO₂ data are shown in Table 2.

Table 2. Maximal CO and CO₂ concentration released during the storage test measured in a real-life experiment.

	Non-ventilated, constant volume (no additional supply of oxygen)	Non ventilated, constant pressure (no additional supply of oxygen)	Ventilated, atmospheric pressure (constant supply oxygen)
CyPbrid and HSAG			
• CO	2300 ppmv	1000 ppmv	< 1 ppmv
• CO ₂	17000 ppmv	10500 ppmv	No data available

To conclude, the limit value (PEL - OSHA) is 50 ppmv, which means a person shall not be exposed to the atmosphere in the non-ventilated containment. To keep the concentration below the limit value (PEL), a typical minimal industrial ventilation rate exchange of 5 - 10 air exchanges per hour of the containment is recommended.

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Table 3. Exposure limits for CO and CO2 according to OSHA, NIOSH and ACGIH

Agency	CO (ppm)	CO ₂ (ppm)
OSHA (PEL)	50	5000
NIOSH (PEL)	35	5000
ACGIH (TLV – TWA)	25	5000

More accurate estimation of gas concentrations in containment are available from the manufacturer Imerys, upon request.

2. Precautions

2.1. Storage precautions

HSAG and CyPbrid can emit gaseous invisible substances and ambient oxygen is typically depleted.

Emitted gases are immediately diluted by the air in the containment and are eliminated with ventilation air. The gases emitted at normal indoor temperature include carbon-monoxide (CO), carbon-dioxide (CO₂) and negligible amounts of other gases like methane and nitrogen oxide, typically below the normal air content.

If HSAG or CyPbrid are stored in bulk, or in bags in an unventilated space with less than 5 - 10 air exchange per hour, the concentration of emitted gases, or the oxygen depletion, may pose a health threat for humans present in the containment and precautions should be taken.

For large enclosed storages, entry should be prohibited by means of secured lock and a well-established written approval process for entry. Entry shall be allowed only AFTER ventilation has been concluded and measurement with gas meter has confirmed safe atmosphere in the space. Alternatively, use self-contained breathing apparatus when entering space. In this case, always make sure backup personnel are in the immediate vicinity monitoring the entry. Label points of entry to enclosed storage areas containing HSAG or CyPbrid with “Carbon Monoxide Risk Area, Ventilate Thoroughly Before Entry”.

2.1.1. Non-ventilated warehouse

In all cases, a non-ventilated storage room is not recommended. Even in the case of non-permeable packaging, the risk of rupture by incidents is present. If a ventilated storage is not possible, both room

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monitoring and personal monitoring for oxygen and carbon monoxide are mandatory. In case of alarm, people can enter only using adequate PPE (Personal Protective Equipment) for carbon monoxide. In case of depleted oxygen levels, a self-contained breathing apparatus must be worn before entering the storage. Alternatively, the door can be maintained open until the oxygen level will be back to the normal level.

To conclude, the use of a non-ventilated room is discouraged.

2.1.2. Ventilated warehouse

In the case of continuous ventilation at a rate of 5-10 air exchange per hour of the empty volume, no risk should be detected. However, personal monitoring is still recommended, in the case of ventilation failure. This is valid for any kind of packaging, including bulk open containers.

2.2. Transportation precautions

2.2.1. Surface transport

Small amounts in pallet by truck

There is a short turnover term and small amount of CyPbrid product from the factory to the client. Due to the factors of short delivery time and small amount, the risk of release of significant concentrations of carbon monoxide is minimal, excluding the cases of using paper bags or the rupturing of bags. In the latter instance, the concentrations of carbon monoxide/carbon dioxide might be significant and personal monitoring for CO and effective PPE are required when opening the truck, e.g., for inspection purposes. Opening of the truck doors is allowed only after reading this SDS, including the Annex.

Opening of the truck doors requires a person to be equipped with a personal CO monitoring device and suitable PPE available in case of alarm. In any case, opening of the doors at the entrance for at least 10 minutes should be sufficient to exchange the internal air and to allow a safe emptying of the truck.

The use of paper bags are not recommended for the transport of small amounts of CyPbrid by truck.

Container by truck

Container transport by truck is usually over a longer period of time, with a considerable amount of CyPbrid product.

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Due to the high amount of product transported in a sealed container, the risks of release of significant amounts of carbon monoxide and/or carbon dioxide are minimal, except when using paper bags or in the case of ruptured packaging. In the latter instance, the concentrations of carbon monoxide/carbon dioxide might be significant and personal monitoring for CO and effective PPE are required when opening the container, e.g., for inspection purposes.

Opening of the container doors is allowed only after reading this SDS, including the Annex.

Opening of the container doors requires a person to be equipped with a personal CO monitoring device and have suitable PPE available in case of alarm. In any case, opening of the doors at the entrance for at least 10 minutes should be sufficient to exchange the internal air and to allow a safe emptying of the container.

Container by ship

The transport time can be very long (weeks to months), with potential high fluctuations in temperature.

Due to the high amount of product transported in a sealed container, the risks of release of significant amounts of carbon monoxide and/or carbon dioxide are minimal, except when using paper bags or in the case of ruptured packaging. In the latter, the concentrations of carbon monoxide/carbon dioxide might be significant and personal monitoring for CO and effective PPE are required when opening the container, e.g., for inspection purposes.

Opening of the container doors is allowed only after reading this SDS, including the Annex.

Opening of the container doors requires a person to be equipped with a personal CO monitoring device and have suitable PPE available in case of alarm. In any case, opening of the doors at the entrance for at least 10 minutes should be sufficient to exchange the internal air and to allow a safe emptying of the container.

2.2.2. Air transport (small amounts)

The risks of rupturing the packaging and gas generation are high during air transportation and are mitigated only by the short time of the transport (less than 24 hours). For this reason, we strongly recommend using only the composite bag (PE-Al-PE) and the HDPE drum to reduce the risk to a minimal level

2.3. Handling Precautions

2.3.1. Opening of the container at arrival

Opening of the container doors is allowed only after reading this SDS, including the Annex.

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Opening the container doors requires a person to be equipped with a personal CO monitoring and have suitable PPE available in case of alarm. In any case, opening of the doors at the entrance for at least 10 minutes should be sufficient to exchange the internal air and to allow a safe emptying of the container.

2.3.2. Internal logistic

Internal logistic is linked with the room ventilation. If there is no ventilation present in the storage or even in temporary storage rooms, see section 2.1.1. for precaution guidelines. In all the cases of loading the warehouse, picking up the product from the warehouse, reorganizing the available space in the warehouse, or in any other case like cleaning, inspection, pest control, etc., personal monitoring is mandatory, and the appropriate PPE should be available.

2.4. Use

The risk is minimal, given the short time required to open the bags and transfer the products.

2.5. CO-intoxication and prevention

Carbon monoxide: carbon monoxide is highly toxic gas. It binds with the hemoglobin in the blood to form carboxyhemoglobin, which cannot take part in normal oxygen transport and greatly reduces the blood's capability to transport oxygen to vital organs such as the brain. In high concentrations, carbon monoxide may cause asphyxiation. Symptoms may include loss of mobility/consciousness. The victim may not be aware of asphyxiation.

Carbon dioxide is primarily hazardous by means of replacing the air and thereby depriving the space of oxygen.

If HSAG or CyPbrid is not handled or stored in accordance with the recommendations in Section 7 of the SDS, the risk of harmful exposure increases, particularly exposure to concentration of CO higher than the PEL (Section 8.1). Oxygen detectors should be used. In case of exposure, it is important to quickly remove the victim from the contaminated area. Unconscious persons should immediately be given oxygen and artificial respiration. The administration of oxygen at an elevated pressure has shown to be beneficial, as has treatment in a hyperbaric chamber. If the victim is unconscious, place in recovery position and seek medical advice.

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3. Emission of gaseous substances from sealed, impermeable containers

If the product is received in sealed, impermeable packaging (plastic, or multilayer plastic-aluminum), no risk of CO or CO₂ emission is expected, excluding the risk of ruptured or defect containers (see 1.1). Ventilation is no longer a requirement if concentration levels are monitored using a standard room gas analyzer.
