SECTION 1.0 Identification of the hazardous chemical and of the supplier

1.1 1.Product identifier.

Product name	Nitrogen, Refrigerant Liquid.
Chemical formula	N_2
Related Information	EC No. 231-783-9 CAS No. 7727-37-9 Index No. NIL.
Synonyms	Liquid Nitrogen
Product Code & Packaging	LIN

1.2 Recommendation of usage.

General usage: Industrial and professional. Perform risk assessment prior to use. Purging. Laboratory use. Coolant agent. Use for manufacture of electronic/photovoltaic components. Contact supplier for more information on uses.

1.3 Supplier details;

Address:
Bee Hua Industrial Gases Sdn Bhd, (732043-D)
Lot PTD 31077 Jalan Hj. Saat,
Bt 14 ¾ Sg. Tiram,
81800 Ulu Tiram,
Johor Darul Tak'zim,
Malaysia.

Email:
enquiry@bhig.com.my , bhig.sb@outlook.com

Website:
www.bhig.com.my

Hotline:
1700-81-9994 / 07-8614042 / 07-8618042

1.4 Emergency contact;

999, please indicate your local (nearest) emergency. contact below (*For SDS placement at working area*)

Police Station	
Hospital / Ambulance	
Fire Department (BOMBA)	

SECTION 2.0 Hazard identification

2.1 Classification of substance and / or mixture.

Refrigerated Liquefied Gas Liquid WARNING H281 May cause cryogenic burns or injury.

2.2 Label elements.

Hazard pictogram

Signal word — WARNING

Hazard Statements — H281- Contains refrigerated gas; may cause cryogenic burns or injury.

Precautionary statements

- Prevent — P282 – Wear cold insulation glove / face protection.
- Response — P336+P315 – Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical treatment.
- Storage — P403 – Store in a well-ventilated place.

Other precaution statement

- Potential Health Effects

Inhalation	Asphyxiant in high concentrations.
Eye contact	No adverse effect.
Skin contact	No adverse effect.
Ingestion	Ingestion is not considered a potential route of exposure.

Aggravated Medical

- Condition — None

SECTION 3.0 Composition and information of the ingredients of the hazardous chemical

3.1 Substance.

Component / chemical name	Content	CAS No	EC No	Index No	Classification
Nitrogen	100%	7727-37-9	231-783-9	-	Refrigerated Liquid

Concentration is nominal. For the exact product composition, please refer to BHIG technical specifications.

SECTION 4.0 First-aid measures

4.1 Description of first-aid measures.

General	Remove victim to uncontaminated area wearing self-contained. breathing apparatus. Keep the victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Eye contact	Immediate flush eyes thoroughly with water for at least 15 minutes.
Skin contact	Frostbites, spray with water for at least 15 minutes. Apply a sterile

	dressing. Obtain medical assistance.
Ingestion	Ingestion is not considered a potential route of exposure.
Inhalation	Remove to fresh air. If breathing has stopped or is labored, Give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

4.2 Most important symptoms and effects, both acute and delayed.

Continuously exposure	In high concentrations may cause asphyxiation. Symptoms may include dizziness, salivation, nausea, vomiting and loss of mobility/consciousness. Victim may not be aware of asphyxiation.

4.3 Indication of immediate medical attention and special treatment needed.

Generally,	None

SECTION 5.0 Fire-fighting measures

5.1 Suitable extinguishing media.

General fire hazard	Water spray, fog.
Type of extinguishing	Water spay or fog. Dry powder, water, foam, carbon Specific hazards upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. The product is non-flammable and does not support combustion. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray.

5.2 Special advice on fire-fighting.

General	In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

5.3 Special protective equipment for fire-fighters.

Wear self-contained breathing apparatus for firefighting if necessary. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire-fighting in buildings and other structures. EN 137 Respiratory protective devices — Self-contained open-circuit compressed air breathing apparatus with full face mask — Requirements, testing, marking.

SECTION 6.0 Accidental release measure

6.1 Personal precautions, emergency procedures & personal protective equipment.

Clothing exposed to high concentrations may retain oxygen for 30 minutes or longer and become a potential fire hazard. Stay away from ignition sources. Evacuate personnel to safe areas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ventilate the area.

6.2 Environmental precautions.

Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.

6.3 Methods for cleaning up.

Liquid spillages can cause embrittlement of structural material. Ventilate the area.

6.4 Additional advice.

If possible, stop the flow of product. Increase ventilation to the release area and monitor concentrations.

SECTION 7.0 Handling and storage

7.1 Handling.

Safe use of the product

Only experienced and properly instructed people should handle the product. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your liquid supplier if in doubt. Do not smoke while handling products.

7.2 Storage of containers.

Observe all regulations and local requirements regarding storage of containers. Keep container below 50°C in a well-ventilated place. Containers should be stored in the vertical position and properly secured to prevent toppling. Stored containers should be periodically checked for general condition and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Containers should not be stored in conditions likely to encourage corrosion. Keep away from combustible materials.

7.3 Technical measures/Precautions.

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material.

SECTION 8.0 Exposure controls and personal protection

8.1 Control Parameters

Occupational Exposure Limits: None of the components have assigned exposure limits.

8.2 Individual protection measures, such as personal protective equipment.

General information	A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self-contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved.
Eye/face protection	Safety glasses recommended when handling the product..
Guideline	EN 166 Personal Eye Protection.
Skin protection	
Hand Protection	Wear working gloves while handling containers.
Guideline	EN 388 Protective gloves against mechanical risks.
Body protection	No special precautions.
Other	Wear safety shoes while handling containers.
Guideline	EN 345 Personal protective equipment - Safety footwear.
Respiratory Protection	Not required.
Thermal hazards	Cold insulation glove during transferring.
Hygiene measures	Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink, or smoke when using the product.
Environmental exposure Control	For waste disposal, see section 13 of the SDS.

SECTION 9.0 Physical and chemical properties

9.1 Information on basic physical and chemical properties.

Appearance	
Physical state at 20°C / 101.3kPa	Liquify gas.
Colour	Colourless liquid.
Odour	No odour warning properties.
Odour threshold	Odour threshold is subjective and inadequate to warn for overexposure.
pH value	Not applicable.
Molar mass [g/mol]	28
Melting point [°C]	-210
Boiling point [°C]	-196
Critical temperature [°C]	-147
Flash point [°C]	Not applicable for gases and gas-mixtures.
Evaporation rate (ether=1)	Not applicable for gases and gas-mixtures.
Flammability range [vol% in air]	Non-flammable.
Vapour pressure [20°C]	Not applicable.
Relative density, gas (air=1)	0.97

Relative density, liquid (water=1)	Not applicable
Solubility in water [mg/l]	20
Partition coefficient n-octanol/ water [log Kow]	Not applicable for inorganic gases.
Auto-ignition temperature [°C]	Not applicable.
Decomposition Temperature [°C]	Data is not available.
Viscosity at 20°C [mPa.s]	Not applicable.
Explosive Properties	Not applicable.
Oxidizing Properties	None

9.2 Other information.

Other data: Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10.0 Stability and reactivity

10.1 Reactivity;

No reactivity hazards other than the effects described in sub-sections below.

10.2 Chemical stability.

Stable under normal conditions.

10.3 Possibility of hazardous reactions.

None

10.4 Conditions to avoid.

None under recommended storage and handling conditions (see section 7).

SECTION 11.0 Toxicological information

11.1 Information on toxicological effects.

Acute toxicity	No known toxicological effects from this product.
Skin corrosion/irritation	No known effects from this product.
Serious eye damage/irritation	No known effects from this product.
Respiratory or skin sensitization	No known effects from this product.
Carcinogenicity	No known effects from this product.
Germ cell mutagenicity	No known effects from this product.
Reproductive toxicity	No known effects from this product.
STOT-single exposure	No known effects from this product.
STOT-repeated exposure	No known effects from this product.
Aspiration hazard	Not applicable for gases and gas-mixtures.

11.2 Information on possible routes of exposure.

Data is not available.

11.3 Early onset symptoms related to exposure.

Data is not available.

11.4 Delayed and immediate effects from exposure.

Data is not available.

11.5 Numerical measures of toxicity.

Data is not available.

SECTION 12.0 Ecological information

12.1 Toxicity.

Acute toxicity product
No ecological damage was caused by this product.

12.2 Persistence and degradability product.

The substance is naturally occurring.

12.3 Bio accumulative potential product.

The product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.

12.4 Mobility in soil product.

No ecological damage is caused by this product.

12.5 Results of PBT and vPvB assessment product.

Not classified as PBT or vPvB.

12.6 Other Adverse Effects.

No ecological damage caused by this product.

SECTION 13.0 Disposal information

13.1 Waste treatment method.
Waste from residues / unused Products

May vented to atmosphere in a well-ventilated area only. Contact supplier if guidance is required.

13.2 General information.

Do not discharge into any place where its accumulation could be dangerous. Vent to atmosphere in a well-ventilated place.

13.3 Disposal;

Do not dispose of any property belonging to BHIG without prior notice, and or acknowledgement.
Disposal procedures are according to MS ISO 10462 & MS 2239 latest revision and may be subject to local authority law.

SECTION 14.0 Transportation information

14.1 ADR;

Proper shipping name	NITROGEN, refrigerated liquid.
Class	2
Label (s)	2.2
UN/ID No	UN1066
ADR/RID Hazard ID no	20

14.2 IATA;

UN Number	UN 1066
Proper Shipping Name	NITROGEN, refrigerated liquid.
Transport Hazard Class(es)	
Class	2
Label(s)	2.2
Packing Group	–
Environmental hazards	Not applicable
Special precautions for user	–
Other information	
Passenger and cargo aircraft	Allowed.
Cargo aircraft only	Allowed

14.3 IMDG.

UN Number: UN 1072	
UN Proper Shipping Name	NITROGEN, refrigerated liquid.
Transport Hazard Class(es)	
Class	2
Label(s)	2.2
EmS No.	F-C, S-V
Packing Group	–
Environmental hazards	not applicable
Special precautions for user	–

14.4 RID

UN Number	UN 1066
UN Proper Shipping Name	NITROGEN, refrigerated liquid.
Transport Hazard Class(es)	
Class	2
Label(s)	2.2
Packing Group	–
Environmental hazards	not applicable
Special precautions for user	–

14.5 Further information.

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure the vehicle driver is aware of the potential hazards of the road and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact a BHIG customer service representative.

14.6 Labelling.

SECTION 15.0 Regulatory information

15.1 Safety, health, and environmental regulations / legislation specific for the substance or mixture.
National Regulations

a) Occupational Safety and Health Act 1994 and relevant regulations:
   i. Occupational Safety and Health (Classification, Labeling and Safety Data Sheet of Hazardous chemicals) Regulations 2013.
   ii. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) Regulations 2000

b) Environment Quality Act 1974 & regulations:
   i. Environment Quality (Clean Air) Regulations 2014
   ii. Environmental Quality (Scheduled Wastes) Regulations 2005

SECTION 16.0 Other information

16.1 OTHER INFORMATION
Ensure all national / local regulations are observed.

16.2 Training information.

Users of breathing apparatus must be trained. Ensure operators understand the hazard of nitrogen high pressure gas. Ensure operators understand the hazards.

16.3 Other information.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national / local. regulations are observed.

16.4 Preparation and revision of SDS.

Version	Date	Remark
00	01.07.2023	Initial Establishment of SDS – Dual Language
		Full revision according to Malaysia's ICOP CLASS 2014
01	01.01.2024	Revision update

16.5 References.

1. ILO Chemical Safety Card, ICSC:1198 - Nitrogen.
2. Certificate of Conformity - Bee Hua Industrial Gas Sdn Bhd

3. Emsley, John (1991). The Elements (second ed.). Oxford University Press. ISBN 0-19-855818-X
4. Cengel, Yunus A.; Boles, Michael A. (2002). Thermodynamics: An Engineering Approach (Fourth ed.). McGraw-Hill.p.824. ISBN 0-07-238332-1.
5. European Chemicals Agency (ECHA)
6. Japan National Institute of Technology and Evaluation (NITE)
7. Safety Data Sheet – Liquid Nitrogen

Prepared by — Mohd Junaidi Bin Mahadi
Jawatankuasa Keselamatan & Kesihatan
Quality, Environment, Safety & Health Committee (QESHCOM)
Bee Hua Industrial Gases Sdn. Bhd.

Reviewed by — Ir. Hj. Anuar Mohd. Moktar (OSHChem Consultancy)

This Safety Data Sheet has been established in accordance with the Occupational Safety and Health Act 1994 (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013, [P.U. (A) 310] enforced by the Department of Safety and Health Malaysia(DOSH) with and applies to all countries that have translated in their national laws. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. This is a Controlled Document which means any changes will be updated within BHIG internally, user / customer may request the latest copy, but the document received and use externally will not falls under clause 4.2.3 Quality Management System, documented information. Refer on the right side of the header for document revision and effective date. Users may proceed to contact BHIG for further information, regarding content of product and quality.

END

SEKSYEN 1.0 Pengenalan bahan kimia berbahaya dan pembekal

1.1 Pengenalan produk;

Nama produk	Nitrogen, Cecair Sejuk.
Formula kimia	N_2
Informasi berkaitan	EC No. 231-783-9 CAS No. 7727-37-9 Indeks No. NIL.
Sinonim	Nitrogen Cecair
Kod produk dan pembungkusan	LIN

1.2 Nasihat penggunaan;

Kegunaan: Perindustrian dan profesional. Lakukan penilaian risiko sebelum digunakan. Pembersihan. Penggunaan makmal. Ejen penyejuk. Penggunaan untuk pembuatan komponen elektronik / fotovoltaik. Hubungi pembekal untuk maklumat lanjut tentang kegunaan.

1.3 Maklumat pembekal;

Alamat:
Bee Hua Industrial Gases Sdn Bhd, (732043-D)
Lot PTD 31077 Jalan Hj. Saat,
Bt 14 ¾ Sg. Tiram,
81800 Ulu Tiram,
Johor Darul Tak'zim,
Malaysia.

Email:
enquiry@bhig.com.my , bhig.sb@outlook.com

Laman sesawang:
www.bhig.com.my

Telefon:
1700-81-9994 / 07-8614042 / 07-8618042

1.4 Talian kecemasan;

999, sila kenal pasti badan keselamatan terdekat dengan lokasi anda (*Jika SDS diletakan di tempat kerja*)

Balai Polis	
Hospital / Ambulan	
BOMBA	

SEKSYEN 2.0 Pengenalan bahaya

2.1 Klasifikasi bahan dan campuran;

Gas Cecair Sejuk Beku	Cecair	AMARAN	H281	boleh menyebabkan cedera kulit.

2.2 Unsur-unsur dalam label;

Piktogram bahaya

Kata isyarat — WARNING

Penyataan bahaya — H281 - Mengandungi gas cecair sejuk beku;. boleh menyebab kecederaan

Penyataan berjaga-jaga

- Elak — P282 – Gunakan sarung tangan pelindung sejuk & Pelindung muka.
- Tindak balas — P336+P315 – Cairkan ais beku dengan air biasa. Jangan gosok kawasan kulit. Dapatkan rawatan segera.
- Simpanan — P403 –Simpan di tempat pengudaraan yang baik.

Penyataan Berjaya-jaga tambahan

- Kebarangkalian tindak balas terhadap kesihatan

Pernafasan	Melemas jika kandungan ini tinggi dalam udara.
Terkena mata	Tiada kesan sampingan.
Terkena kulit	Tiada kesan sampingan.
Tertelan	Tidak berpotensi berlaku.

Perubatan sampingan

- Kondisi — Tiada.

SEKSYEN 3.0 Komposisi dan maklumat mengenai ramuan bahan kimia berbahaya

3.1 Bahan;

Component / chemical name	Content	CAS No	EC No	Index No	Classification
Nitrogen	100%	7727-37-9	231-783-9	-	Refrigerated Liquid

Kandungan nominal. Kandungan penuh, sila rujuk spesifikasi teknikal BHIG.

SEKSYEN 4.0 Langkah-langkah pertolongan cemas

4.1 Penerangan pertolongan cemas;

Am — Alihkan mangsa dari tempat kejadian.

Sentuhan mata	Tiada kesan sampingan mengikut rekod.
Sentuhan kulit	Tiada kesan sampingan mengikut rekod.
Tertelan	Tidak berpotensi berlaku.
Pernafasan / tersedut	Alihkan mangsa jauh dari kawasan yang terlibat.

4.2 Simptom dan kesan sampingan, akut atau jangka masa panjang;

Pendedahan berterusan	Dalam kepekatan yang tinggi boleh menyebabkan kesesakan nafas. Gejala-gejala yang mungkin berlaku termasuk pening, air liur, loya, muntah dan kehilangan mobiliti / kesedaran. Mangsa mungkin tidak menyedari kekurangan oksigen.

4.3 Petunjuk indikasi keperluan perubatan lanjut atau perubatan khas;

Am,	Tiada

SEKSYEN 5.0 Langkah-langkah pemadaman kebakaran

5.1 Pemadam kebakaran yang sesuai;

Risiko kebakaran am	Semburan air, kabus.
Jenis pemadam kebakaran	Semburan air. Serbuk kering, air, buih, karbon dioksida,
Risiko khusus	Jika terdedah kepada panas atau api, silinder akan mengeluarkan gas tanpa henti dan akan bertindak balas.. Produk ini tidak mudah terbakar dan tidak menyokong pembakaran. Alihkan produk, semburkan air dari kawasan selamat.

5.2 Nasihat pemadaman kebakaran;

Am	Gunakan langkah kawalan api yang sesuai untuk kebakaran di sekeliling tempat kejadian. Pendedahan kepada api dan suhu yang tinggi boleh menyebabkan silinder meletup. Sejukkan objek atau silinder berdekatan yang mudah terbakar. Elakkan bekas air semburan mencemari sistem parit dan buangan. Hentikan aliran gas jika boleh. Gunakan semburan air untuk hentikan kebakaran. Teruskan sembur air dari kawasan selamat bagi mengelak suhu silinder meningkat. Asingkan objek lain jauh dari tempat kebakaran jika boleh.

5.3 Pelindung keselamatan diri khas (PPE);

Gunakan alat bantuan pernafasan jika perlu. Gunakan alat pelindung diri termasuk kot kalis api, helmet, pelindung muka, sarung tangan, but getah, dan SCBA jika di tempat tertutup. Panduan: EN 469 Pakaian keselamatan kebakaran. Keperluan prestasi untuk pakaian pelindung untuk memadam kebakaran. EN 15090 Kasut keselamatan kebakaran. EN 659 Sarung tangan keselamatan kebakaran. EN 443 Helmet keselamatan kebakaran di dalam bangunan. EN 137 Alat bantuan pernafasan — SCBA, pakaian keselamatan lengkap dengan alat bantuan pernafasan — Keperluan, pemeriksaan dan label.

Maklumat tambahan — Sesetengah objek tidak mudah terbakar tetapi boleh menjadi mudah terbakar akibat pendedahan oksigen melebihi 23.5%. Baju keselamatan kebakaran juga tidak terkecuali.

SEKSYEN 6.0 Langkah-langkah pelepasan tidak sengaja

6.1 Langkah penjagaan diri, prosedur keselamatan dan alatan perlindungan keselamatan diri;

Pakaian yang terdedah dengan sumber oksigen tinggi selama 30 minit berpotensi untuk menjadi bahan mudah terbakar. Jauhkan dari punca api. Alihkan pekerja ke tempat selamat. Gunakan SCBA. Pastikan aliran udara di tingkatkan.

6.2 Langkah penjagaan alam sekitar;

Jangan buang ke mana-mana tempat yang tidak mempunyai aliran udara yang baik. Cegah kebocoran atau tumpahan dari menjadi lebih teruk jika selamat berbuat demikian.

6.3 Cara pembersihan;

Boleh menyebab kerosakan kepada bahan berstruktur. Buat pengaliran udara ke kawasan tersebut.

6.4 Nasihat tambahan;

Jika boleh, hentikan aliran gas. Tingkatkan pengaliran udara biasa dan lakukan pemerhatian kandungan udara.

SEKSYEN 7.0 Pengendalian dan penyimpanan

7.1 Pengendalian;

Hanya pengendali berpengalaman boleh mengendali produk. Produk ini perlu digunakan mengikut standard Higien industri. Gunakan peralatan yang sesuai. Hubungi pembekal cecair anda. Jangan merokok semasa proses pengendalian.

7.2 Tempat menyimpan silinder;

Elakkan kontena yang disimpan di tempat terbuka dari karat dan cuaca buruk. Kontena tidak harus disimpan di tempat yang mudah berkarat. Ia perlu di simpan secara berdiri (vertikal) dan di ikat bagi mengelakkan ia terjatuh. Diletakkan di kawasan kurang panas, dan beraliran udara baik, serta jauh dari punca api dan panas. Asingkan silinder penuh dan kosong. Pastikan suhu tempat simpanan di bawah 50°C (122°F). Pasang papan tanda "Dilarang Merokok dan Kebakaran Terbuka".

7.3 Kawalan teknikal / langkah berjaga-jaga;

Asingkan silinder di tempat simpanan mengikut kategori (mudah terbakar, toksik, dll) dan mengikut arahan pihak berkuasa tempatan.

SEKSYEN 8.0 Kawalan pendedahan dan perlindungan diri

8.1 Ukuran kejuruteraan;

Had pendedahan dibenarkan Tiada data.

8.2 Pelindungan individu, seperti alatan perlindungan keselamatan;

Maklumat am	Penilaian risiko perlu dijalankan dan di rekod bagi setiap kerja bagi mengenal pasti risiko penggunaan produk terhadap kesihatan serta keselamatan dan menetapkan jenis alat pelindung diri keselamatan yang sesuai yang perlu dipakai. Cadangan berikut harus dipertimbangkan. Letakkan self-contained breathing apparatus (SCBA) bagi tujuan menyelamat ketika kecemasan. Alat pelindung keselamatan diri perlu ditetapkan berdasarkan kerja yang dilakukan dan risiko yang mungkin berlaku.
Mata/pelindungan muka	Pakai pelindung mata berpiawaian EN 166 ketika mengendalikan gas.
Panduan	EN 166 Pelindung Mata Keselamatan.
Pelindungan kulit / badan;	
Pelindung tangan	Gunakan sarung tangan ketika pengendalian kontena .
Panduan	EN 388 Sarung tangan pelindung.
Pelindung badan	Tiada langkah khas.
Lain-lain	Pakai kasut keselamatan ketika mengendalikan silinder.
Panduan	EN 345 Alat pelindung diri keselamatan – Kasut keselamatan.
Pelindung pernafasan	Tidak diperlukan.
Bahaya kepanasan	Tiada langkah berjaga-jaga diperlukan.
Langkah kebersihan	Langkah-langkah pengurusan risiko khusus tidak diperlukan melangkaui kebersihan industri dan prosedur keselamatan yang baik. Jangan makan, minum atau merokok semasa menggunakan produk.

SEKSYEN 9.0 Sifat fizikal dan kimia

9.1 Informasi asas sifat fizikal dan kimia;

Rupa fizikal	
Keadaan fizikal (20°C / 101.3kPa)	Cecair gas.
Warna	Tiada.
Bau	Tiada.
Ambang bau	Ambang bau adalah subjektif dan tidak mencukupi untuk memberi amaran kepada pendedahan yang terlalu lama.
Nilai pH	Tidak berkenaan.
Jisim molar [g/mol]	28
Takat cair [°C]	-210
Takat didih [°C]	-196
Suhu kritikal [°C]	-147
Takat kilat [°C]	Tidak tertakluk ke atas gas dan gas campuran.
Kadar penyejatan (eter=1)	Tidak tertakluk ke atas gas dan gas campuran.
Tahap keboleh-bakaran	Tidak mudah terbakar.

[l% isi padu di udara]	
Tekanan wap [20°C]	Tidak berkenaan.
Ketumpatan relatif, gas (udara=1)	0.97
Ketumpatan relatif, cecair (air=1)	Tidak berkenaan
Kelarutan dalam air [mg/l]	20
Partition coefficient n-oktanol/ air [log Kow]	Tidak tertakluk ke atas gas bukan organik.
Suhu Cucuhan Auto [°C]	Tidak berkenaan.
Penguraian suhu [°C]	Tiada data.
Kelikatan pada 20°C [mPa.s]	Tidak berkenaan.
Sifat letupan	Tidak berkenaan
Sifat oksida	Tidak berkenaan

9.2 Maklumat lain;

Data lain — Gas/wap lebih berat cari udara. Ia mungkin akan memenuhi ruang di bahagian bawah silinder.

SEKSYEN 10.0 Kestabilan dan kereaktifan

10.1. Tindak balas;

Tiada bahaya reaktif selain yang diterangkan di sub-seksyen di bawah.

10.2. Kestabilan kimia;

Stabil di bawah keadaan biasa.

10.3 Kemungkinan tindak balas bahaya;

Tidak ada.

10.4 Keadaan untuk mengelak;

Tiada dalam keadaan penyimpanan dan pengendalian yang disyorkan (lihat seksyen 7).

SEKSYEN 11.0 Maklumat toksikologi

11.1 Maklumat tentang kesan toksik;

Toksik tentu	Tidak terdapat kesan toksik yang diketahui daripada produk ini.
Kakisan/kerengsaan kulit	Tiada kesan yang diketahui daripada produk ini.
Kerosakan/kerengsaan mata yang serius	Tiada kesan yang diketahui daripada produk ini.
Pemekaan pernafasan atau kulit.	Tiada kesan yang diketahui daripada produk ini.
Karsinogenik	Tiada kesan yang diketahui daripada produk ini.
Kemutagenan sel kuman	Tiada kesan yang diketahui daripada produk ini.
Ketoksikan pembiakan	Tiada kesan yang diketahui daripada produk ini.
STOT - pendedahan tunggal	Tiada kesan yang diketahui daripada produk ini.
STOT - pendedahan ulangan	Tiada kesan yang diketahui daripada produk ini.

Hazard aspirasi — Tidak berkenaan untuk gas dan campuran gas.

11.2 Maklumat mengenai kemungkinan laluan pendedahan;
Tiada data.

11.3 Tanda-tanda awal pendedahan;
Tiada data.

11.4 Kesan jangka pendek dan panjang pendedahan;
Tiada data.

11.5 Ukuran tahap ketoksikan;
Tiada data.

SEKSYEN 12.0 Maklumat ekologi

12.1 Ketoksikan;
Produk toksik akut
Tiada kesan kerosakan ekologi daripada bahan ini.

12.2 Keberterusan dan kedegrasian produk;
Tiada kesan kerosakan ekologi daripada bahan ini

12.3 Produk potensi akumulatif bio;
Tiada kesan kerosakan ekologi daripada bahan ini.

12.4 Mobiliti dalam produk tanah;
Tiada kesan kerosakan ekologi daripada bahan ini.

12.5 Hasil dari produk PBT dan vPvB;
Tidak diklasifikasi sebagai produk PBT dan vPvB.

12.6 Kesan lain;
Tiada kesan ekologi daripada bahan ini.

SEKSYEN 13.0 Maklumat pelupusan

13.1 Kaedah rawatan sisa buangan;
Sisa pembuangan / tidak diguna
Produk — Kemungkinan boleh dilepaskan ke udara yang mempunyai pengudaraan baik, hubungi pembekal jika perlukan maklumat lanjut.

13.2 Maklumat am;
Jangan keluarkan isi di tempat pengaliran udara tertutup. Keluarkan di tempat terbuka dan beraliran udara baik.

13.3 Pembuangan;

Jangan buang apa-apa hak milik BHIG tanpa notis, dan makluman BHIG. Prosedur pembuangan adalah mengikut MS ISO 10465 & MS 2239 semakan terkini, dan juga tertakluk kepada undang-undang pihak berkuasa tempatan.

SEKSYEN 14.0 Maklumat pengangkutan

14.1 ADR;

Nama penghantaran	NITROGEN, cecair sejuk.
Kelas	2
Label	2.2
No ID UN	UN1066
No ID bahaya ADR/RID	20

14.2 IATA;

Nombor UN	UN 1066
Nama penghantaran	NITROGEN, , cecair sejuk.
Kelas pengangkutan bahaya	
Kelas	2
Label	2.2
Kumpulan pembungkusan	–
Bahaya pada alam sekitar	Tidak berkenaan
Langkah pencegahan pengguna	–
Maklumat lain	
Kargo pesawat kargo / penumpang	Dibenarkan.
Pesawat kargo sahaja	Dibenarkan.

14.3 IMDG;

Nombor UN	UN 1066
Nama penghantaran UN	NITROGEN, , cecair sejuk.
Kelas bahaya pengangkutan	
Kelas	2
Label	2.2
No. EmS	F-C, S-V
Kumpulan pembungkusan	–
Bahaya alam sekitar	Tidak berkenaan.
Langkah khas pengguna	–

14.4 RID

No UN	UN 1066
Nama penghantaran UN	NITROGEN, , cecair sejuk.
Kelas bahaya pengangkutan	
Kelas	2
Label	2.2
Kumpulan pembungkusan	–

Bahaya alam sekitar	Tidak berkenaan
Langkah khas pengguna	–

14.5 Maklumat lanjut;

Elakkan dari menggunakan pengangkutan kenderaan di mana ruang beban tidak dipisahkan dari ruang pemandu. Pastikan pemandu kenderaan menyedari potensi bahaya produk dan mengetahui apa yang perlu dilakukan sekiranya berlaku kemalangan atau kecemasan. Maklumat pengangkutan tidak bertujuan untuk menyampaikan semua data pengawalseliaan spesifik yang berkaitan dengan bahan ini. Untuk maklumat pengangkutan lengkap, hubungi wakil perkhidmatan pelanggan BHIG.

14.6 Pelabelan;

SEKSYEN 15.0 Maklumat pengawalseliaan

15.1 Peraturan / perundangan Keselamatan, Kesihatan dan Persekitaran khusus untuk bahan atau campuran;
Peraturan Kebangsaan.

a. Akta Keselamatan dan Kesihatan Pekerjaan 1994 dan peraturan berkaitan.
   i. Keselamatan dan Kesihatan Pekerjaan (Pengelasan, Pelabelan dan Helaian Data Keselamatan Bahan Kimia Berbahaya) Peraturan 2013.
   ii. Keselamatan dan Kesihatan Pekerjaan (Penggunaan dan Piawaian Pendedahan Bahan Kimia Berbahaya kepada Kesihatan) Peraturan 2000.
b. Akta Kualiti Alam Sekitar dan Peraturan 1974.
   i. Peraturan Kualiti Udara (Udara Bersih) Peraturan 2014.
   ii. Kualiti Alam Sekitar (Sisa Berjadual) Peraturan 2005.

SEKSYEN 16.0 Maklumat lain

16.1 Maklumat lain
Pastikan peraturan kebangsaan / tempatan di ambil kira.

16.2 Maklumat latihan;

Pengguna alat pernafasan mesti dilatih. Pastikan pengguna memahami bahaya nitrogen gas bertekanan tinggi. Pastikan mereka faham bahaya tersebut.

16.3 Maklumat lain;

Sebelum menggunakan produk ini dalam sebarang proses baru atau percubaan, kajian kesesuaian bahan dan penyelidikan keselamatan menyeluruh perlu dijalankan. Pastikan pengudaraan udara yang mencukupi. Pastikan semua peraturan kebangsaan dan tempatan difahami.

16.4 Penyediaan dan semakan SDS.

Version	Date	Remark
00	01.07.2023	Initial Establishment of SDS – Dual Language
		Full revision according to Malaysia's ICOP CLASS 2014
01	01.01.2024	Revision update

16.5 Rujukan;

1. ILO Chemical Safety Card, ICSC:1198 - Nitrogen.
2. Certificate of Conformity - Bee Hua Industrial Gas Sdn Bhd
3. Emsley, John (1991). The Elements (second ed.). Oxford University Press. ISBN 0-19-855818-X
4. Cengel, Yunus A.; Boles, Michael A. (2002). Thermodynamics: An Engineering Approach (Fourth ed.). McGraw-Hill.p.824. ISBN 0-07-238332-1.
5. European Chemicals Agency (ECHA)
6. Japan National Institute of Technology and Evaluation (NITE)
7. Helaian Risalah Keselamatan – Cecair Nitrogen

Disediakan oleh — Mohd Junaidi Bin Mahadi
Jawatankuasa Keselamatan & Kesihatan
Quality, Environment, Safety & Health Committee (QESHCOM)
Bee Hua Industrial Gases Sdn. Bhd.

Disemak oleh — Ir. Hj. Anuar Mohd. Moktar (OSHChem Consultancy)

Risalah Data Keselamatan ini telah diterbitkan menurut Akta Keselamatan dan Kesihatan Pekerjaan 1994 (Klasifikasi, Pelabelan dan Helaian Data Keselamatan Kimia Berbahaya) 2013, [P. (A) 310] Jabatan Keselamatan dan Kesihatan Malaysia (DOSH) dengan dan terpakai kepada semua negara yang telah diterjemahkan dalam undang-undang negara mereka. Butiran yang diberikan dalam dokumen ini dipercayai betul pada masa ia diterbitkan. Walaupun maklumat teliti yang diyakini betul telah diambil dalam penyediaan dokumen ini, tiada liabiliti untuk kecederaan atau kerosakan yang terhasil daripada penggunaannya akan diterima. Ini adalah Dokumen Kawalan yang bermaksud perubahan yang akan dikemas kini dalam BHIG secara dalaman, pengguna / pelanggan boleh meminta salinan terkini, tetapi dokumen yang diterima dan digunakan secara luaran tidak akan terkandung di bawah fasal 4.2.3 Sistem Pengurusan Kualiti, maklumat didokumentasikan. Rujuk di sebelah kanan tajuk untuk semakan dokumen dan tarikh efektif. Pengguna boleh terus menghubungi BHIG untuk mendapatkan maklumat lanjut mengenai kandungan produk dan kualiti.

TAMAT