





Date : 01/06/2016

Revision : 1

Ref : F-06-OPT/22

FIRST AID KIT INVENTORY

Vessel Name :SC PAILIN..... Year:.....2023.....

Port of Registry:BANGKOK, THAILAND.....

| S.No | First Aid Kit Items | Quantity | Expiry Date | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sep | Oct | Nov | Dec |
|------|-----------------------------|----------|-------------|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| 1. | ALCOHOL 70% 60ML | 1 BTL | 06.01.24 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 2 | POVIDONE – IODINE 10 ML | 1 BTL | 17.12.23 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 3 | PARACETAMOL 500 ML | 2 Pack | 20.05.27 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 4 | PLASTER | 20 | 06.07.25 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 5 | EYE PAD | 3 | 16.10.2024 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 6 | ABSORBENT COTTON WOOL 50 GM | 2 PC | - | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 7 | STERILE GAUZE SWABS 2"x2" | 3 PACK | 04.09.24 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 8 | STERILE GAUZE SWABS 4"x4" | 3 PACK | 20.08.23 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 9 | ADHERSIVE TABE | 1 ROLLS | 18.04.26 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 10 | CPR KIT | 1 PC | - | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 11 | GLOVE | 1 PC | - | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 12 | Scissors | 1 PC | - | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 13 | Triangular Bandages | 1 PC | - | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| 14 | DIMENHYDRINATE | 2 PC | 18.08.23 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | |
| | | | | | | | | | | | | | | | |
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เรือสนับสนุน-3.5 รายการเวชภัณฑ์สำหรับการปฐมพยาบาล และการรักษาพยาบาลในเบื้องต้น

Date / Rank / Initial Jan- Dec 2023 / Second officer /

ภาคผนวกเรือสับสนุน-4

เรือสับสนุน SC Winter

Prepare by : Second Engineer Date : 25-Apr-23

Inspected by : Chief Engineer Date : 25-Apr-23

Ship Name : SC WINTER Month : Apr-23

| Ship Name: SC WINTER (AZIMUTH THRUSTER STARBOARD) (CRITICAL EQUIPMENT) | | | | | Total running hrs. Previous M. run. Hrs. 27177.3 Run. Hrs. from prev. M. 26957.8 219.5 | | |
|--|---------------------|--|-----------|--------------|---|-------------------|--------------------|
| Equipment Code รหัสอุปกรณ์ | Job Code รหัสงาน | Job Name / Description ชื่องาน | RH/P | Last M. date | Last M. Hours | R/H (NEXT DUE) | Remark หมายเหตุ |
| SW001-01-001 | AT 1001 | Motor cooling water leak test. | MONTH | 18-Apr-2023 | | 18-May-2023 | |
| SW001-01-001 | AT 1002 | Motor earth brush clean. | MONTH | 18-Apr-2023 | | 18-May-2023 | |
| SW001-01-001 | AT 1003 | Inspected Transmission Coupling | MONTH | 18-Apr-2023 | | 18-May-2023 | |
| SW001-01-001 | AT 1004 | Cooling water analysis and dosed chemical. | MONTH | 18-Apr-2023 | | 18-May-2023 | |
| SW001-01-001 | AT 1005 | Motor bearing greasing. | 6 MTHS | 19-Mar-2023 | | 15-Sep-2023 | |
| SW001-01-001 | AT 1006 | Lub. Oil analysis. | 6 MTHS | 24-Jan-2023 | | 23-Jul-2023 | |
| SW001-01-001 | AT 1006 | Changed Lub. Oil system (Meropa 100) | - | 8-Apr-2021 | 18570.5 | 8606.8 | 2500 LTRS |
| SW001-01-001 | AT 1007 | Lub. Oil cooler clean. | 6 MTHS | 9-Feb-2023 | | 8-Aug-2023 | |
| SW001-01-001 | AT 1008 | FW. Cooler clean. | 6 MTHS | 31-Mar-2023 | | 27-Sep-2023 | |
| SW001-01-001 | AT 1009 | Filter element replace. | Yearly | 2-May-2022 | | 2-May-2023 | |
| SW001-01-001 | AT 1010 | Check hydraulic pressure / adjust if required | 2.5 Years | 8-Apr-2021 | | 7-Oct-2023 | |
| SW001-01-001 | AT 1011 | Check installation of flexible coupling. | 2.5 Years | 8-Apr-2021 | | 7-Oct-2023 | |
| SW001-01-001 | AT 1012 | Replaced filling plug/breather. | 2.5 Years | 8-Apr-2021 | | 7-Oct-2023 | |
| SW001-01-001 | AT 1013 | Propeller inspection and polishing. | 5 Years | 3-Apr-2021 | | 2-Apr-2026 | |
| SW001-01-001 | AT 1014 | Check seal input shaft, steering tube & propeller shaft. | 5 Years | 3-Apr-2021 | | 2-Apr-2026 | |
| SW001-01-001 | AT 1015 | Check condition of gear / inspection hatches. | 5 Years | 3-Apr-2021 | | 2-Apr-2026 | |
| SW001-01-001 | AT 1016 | Replace zinc anodes of propeller hub. | 5 Years | 3-Apr-2021 | | 2-Apr-2026 | |
| SW001-01-001 | AT 1017 | Check function of pump / pressure alarm switch. | 5 Years | 3-Apr-2021 | | 2-Apr-2026 | |
| SW001-01-001 | AT 1018 | Check Azimuth critical equipment spare | Month | 18-Apr-2023 | | 18-May-2023 | |
| SW001-01-001 | AT 1018 | REPLACE ZINC ANODE S.W COOLER ALL UNIT | 250 | 19-Mar-2023 | 26891.6 | 285.7 | |

ภาคผนวกเรือสโนว์สุน-4.2

ใบรับรองต่าง ๆ ของเรือสโนว์สุน SC Winter

Certificate No. [REDACTED]

SPECIAL PURPOSE SHIP SAFETY CERTIFICATE

(This Certificate shall be supplemented by a Record of Equipment (Form SPS))

Issued in compliance with the provisions of the
Code of Safety for Special Purpose Ships, 2008
as adopted by Resolution MSC.266(84)
under the authority of the Government of

Kingdom of Thailand
(Name of the State)

by American Bureau of Shipping

| Particulars of Ship | | | |
|---|---|-------------------------|--|
| Name of Ship | Distinctive Number or Letters | Port of Registry | Gross Tonnage |
| SC WINTER | HSB 6251 | Bangkok | 2332 |
| Ship's Special Purpose | Sea areas in which ship is certified to operate (regulation IV/2) | IMO Number ¹ | Date on which keel was laid ² |
| OFFSHORE SUPPORT AND FIRE FIGHTING VESSEL | A1, A2 and A3 | 9753064 | 25 November 2014 |

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the requirements of Regulations 1.6 of the Code.
- 2 That the survey showed that:
 - 2.1 the ship complied with the provisions of the Code as regards:
 - 2.1.1 the structure, main and auxiliary machinery, boilers and other pressure vessels; and
 - 2.1.2 the watertight subdivision arrangements and details;
 - 2.2 the ship complied with the provisions of the Code as regards structural fire protection, fire safety system and appliances, and fire control plans;
 - 2.3 the life-saving appliances and the equipment of the lifeboats, liferafts and rescue boats were provided in accordance with the provisions of the Code;
 - 2.4 the ship was provided with a line-throwing appliance and radio installations used in life-saving appliances in accordance with the provisions of the Code;
 - 2.5 the ship complied with the provisions of the Code as regards radio installations;
 - 2.6 the functioning of the radio installations used in life-saving appliances complied with the provisions of the Code;
 - 2.7 the ship complied with the provisions of the Code as regards shipborne navigational equipment, means of embarkation for pilots and nautical publications;

¹ In accordance with the IMO Ship Identification Number Scheme, adopted by resolution A117(00).
² Date on which keel was laid or ship was at a similar stage of construction or, where applicable, date on which work for a conversion or alterations or modification of a major character was commenced.

Certificate No. [REDACTED]

2.8 the ship was provided with lights, shapes, means of making sound signals and distress signals, in accordance with the provisions of the Code and the International Regulations for Preventing Collisions at Sea in force; and

2.9 in all other respects, the ship complied with the relevant provisions of the Code.

3. That an Exemption Certificate has / ~~has not~~ been issued.

4. That the ship has / ~~has not~~ been provided with Certificates issued under the 1974 SOLAS Convention, as amended.

This certificate is valid until 05 June 2026

Completion date of survey on which this certificate is based: 20 April 2021

Issued at Songkhla, Thailand
(Place of issue of Certificate)

21 May 2022
(Date)

(Surveyor, American Bureau of Shipping)



3 Delete as appropriate

**ENDORSEMENT FOR ANNUAL SURVEYS RELATING TO HULL, MACHINERY
AND EQUIPMENT REFERRED TO IN SECTION 2.1 OF THIS CERTIFICATE**

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant requirements of the Code.

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: Songkhla, Thailand
 Date: 21 May 2022

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____



**ENDORSEMENT FOR ANNUAL AND PERIODICAL SURVEYS RELATING TO LIFE-SAVING
EQUIPMENT AND OTHER EQUIPMENT REFERRED TO IN SECTIONS
2.2, 2.3, 2.4, 2.6, 2.7, 2.8 AND 2.9 OF THIS CERTIFICATE**

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant requirements of the Code.

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: Songkhla, Thailand
 Date: 21 May 2022

Annual / Periodical³ Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____

Annual / Periodical³ Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____

Annual Survey: _____
 Signed: _____
 (Surveyor, American Bureau of Shipping)
 Place: _____
 Date: _____



ENDORSEMENT FOR PERIODICAL SURVEYS RELATING TO RADIO
INSTALLATIONS REFERRED TO IN SECTION 2.5 OF THIS CERTIFICATE

THIS IS TO CERTIFY that, at a survey required by 1.6 of the Code, the ship was found to comply with the relevant requirements of the Code.

Periodical Survey: _____

Signed: _____
(Surveyor, American Bureau of Shipping)

Place: Songkhla, Thailand

Date: 21 May 2022

Periodical Survey: _____

Signed: _____
(Surveyor, American Bureau of Shipping)

Place: _____

Date: _____

Periodical Survey: _____

Signed: _____
(Surveyor, American Bureau of Shipping)

Place: _____

Date: _____

Periodical Survey: _____

Signed: _____
(Surveyor, American Bureau of Shipping)

Place: _____

Date: _____

ENDORSEMENT FOR THE EXTENSION OF THE CERTIFICATE

The ship complies with the relevant provisions of the Code, and this certificate should, in accordance with 1.7.3, be accepted as valid until _____

Signed: _____
(Surveyor, American Bureau of Shipping)

Place: _____

Date: _____



Certificate No.:

INTERNATIONAL OIL POLLUTION PREVENTION CERTIFICATE

(This Certificate shall be supplemented by a Record of Construction and Equipment)

Issued under the Provisions of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and as amended, (hereinafter referred to as "the Convention") under the authority of the Government of

Kingdom of Thailand
(name of state)

by American Bureau of Shipping

| Particulars of Ship | Name of Ship | Distinctive Number or Letters | Port of Registry |
|---|--------------|---|------------------|
| | SC WINTER | HSB 6251 | Bangkok |
| Gross Tonnage ¹ a) According to footnote ² b) According to footnote ³ | | Maximum Deadweight of Ship (metric tons) ⁴ | IMO Number |
| 2332 | | | 9753064 |

Type of Ship¹:

Oil-Tanker

Ship other than an oil tanker with cargo tanks coming under Regulation 2(2) of Annex I of the Convention
Ship other than any of the above

THIS IS TO CERTIFY:

- That the ship has been surveyed in accordance with Regulation 6 of Annex I of the Convention;
- That the survey shows that the structure, equipment, systems, fittings, arrangement and material of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the applicable requirements of Annex I of the Convention.

This Certificate is valid only when Supplement Form B issued at _____
on 08 August 2021 is attached.

This certificate is valid until 05 June 2026 ⁵ subject to surveys in accordance with Regulation 6 of Annex I of the Convention.

Completion date of the survey on which this certificate is based: 20 April 2021
Issued at Songkhla, Thailand on _____
(Place of Issue of Certificate)



Surveyor, American Bureau of Shipping

- Delete as appropriate
- The above gross tonnage has been determined in accordance with the International Convention on Tonnage Measurement of Ships, 1969.
- The above gross tonnage has been determined in accordance with the International Convention on Tonnage Measurement of Ships, 1969.
- For oil tankers.
- Insert the date of expiry as specified by the Administration in accordance with regulation 10.1 of Annex I of the Convention. The day and the month of date corresponds to the anniversary date as defined in regulation 1.2.7 of Annex I of the Convention, unless amended in accordance with regulation 10.8 of Annex I of the Convention.

Certificate No.:

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that, at a survey required by Regulation 6 of Annex I of the Convention, the ship was found to comply with the relevant requirements of the Convention.

Annual Survey:

Signed:

Place:

Date:

(Surveyor, American Bureau of Shipping)

Songkhla, Thailand

21-May-2022

Annual / Intermediate¹ Survey:

Signed:

Place:

Date:

(Surveyor, American Bureau of Shipping)

Annual / Intermediate¹ Survey:

Signed:

Place:

Date:

(Surveyor, American Bureau of Shipping)

Annual Survey:

Signed:

Place:

Date:

(Surveyor, American Bureau of Shipping)



¹ Delete as appropriate

ANNUAL / INTERMEDIATE SURVEY IN ACCORDANCE WITH REGULATION 10.8.3

THIS IS TO CERTIFY that, at an annual / intermediate¹ survey in accordance with Regulation 10.8.3 of Annex I of the Convention, the ship was found to comply with the relevant provisions of the Convention.

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____

ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN 5 YEARS
WHERE REGULATION 10.3 APPLIES

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with Regulation 10.3 of Annex I of the Convention, be accepted as valid until _____

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____

ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN COMPLETED
AND REGULATION 10.4 APPLIES

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with Regulation 10.4 of Annex I of the Convention, be accepted as valid until _____

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____

ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF
SURVEY OR FOR A PERIOD OF GRACE WHERE REGULATION 10.5 OR 10.6¹ APPLIES

This Certificate shall, in accordance with regulation 10.5 /10.6¹ of Annex I of the Convention, be accepted as valid until _____

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____



ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE
WHERE REGULATION 10.8 APPLIES

In accordance with Regulation 10.8 of Annex I of the Convention, the new anniversary date is _____

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____

In accordance with Regulation 10.8 of Annex I of the Convention, the new anniversary date is _____

Signed: _____
(Surveyor, American Bureau of Shipping)
Place: _____
Date: _____





Material Safety Data Sheet

R-404A

| 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION | | |
|---|---|----------|
| PRODUCT NAME: | R-404A | |
| DISTRIBUTOR: | National Refrigerants, Inc. 661 Kenyon Avenue Bridgeton, New Jersey 08302 | |
| IN CASE OF EMERGENCY CALL: CHEMTREC: 1-800-424-9300 | | |
| FOR MORE INFORMATION CALL: (Monday-Friday, 8:00am-5:00pm) 1-800-262-0012 | | |
| 2. COMPOSITION / INFORMATION ON INGREDIENTS | | |
| INGREDIENT NAME | CAS NUMBER | WEIGHT % |
| Pentafluoroethane (HFC-125) | 354-33-6 | 44 |
| 1,1,1-Trifluoroethane (HFC-143a) | 420-46-2 | 52 |
| 1,1,1,2-Tetrafluoroethane (HFC-134a) | 811-97-2 | 4 |
| Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons. | | |
| 3. HAZARDS IDENTIFICATION | | |

EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

- SKIN:** Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.
- EYES:** Liquid contact can cause severe irritation and frostbite. Mist may irritate.
- INHALATION:** R-404A is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.



R-404A

- INGESTION:** Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.
- DELAYED EFFECTS:** None known.
- Ingredients found on one of the OSHA designated carcinogen lists are listed below.
- | INGREDIENT NAME
No ingredients listed in this section | NTP STATUS | IARC STATUS | OSHA LIST |
|--|------------|-------------|-----------|
|--|------------|-------------|-----------|
- 4. FIRST AID MEASURES**
- SKIN:** Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.
- EYES:** Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.
- INHALATION:** Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give epinephrine (adrenaline).
- INGESTION:** Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.
- ADVICE TO PHYSICIAN:** Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

- FLASH POINT:** Gas, not applicable per DOT regulations
FLASH POINT METHOD: Not applicable
- AUTOIGNITION TEMPERATURE:** <750°C
- UPPER FLAME LIMIT (volume % in air):** None*
- LOWER FLAME LIMIT (volume % in air):** None*
*Based on ASHRAE Standard 34 with match ignition
- FLAME PROPAGATION RATE (solids):** Not applicable
- OSHA FLAMMABILITY CLASS:** Not applicable

EXTINGUISHING MEDIA: Use any standard agent — choose the one most appropriate for type of surrounding fire (material itself is not flammable)

EYE PROTECTION:

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH-approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH-approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES

| INGREDIENT NAME | ACGIH TLV | OSHA PEL | OTHER LIMIT |
|---------------------------|-----------|----------|---------------------|
| Pentafluoroethane | None | None | *1000 ppm TWA (8hr) |
| 1,1,1-Trifluoroethane | None | None | *1000 ppm TWA (8hr) |
| 1,1,1,2-Tetrafluoroethane | None | None | *1000 ppm TWA (8hr) |

* = Workplace Environmental Exposure Level (AIHA)

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV: 3 ppm ceiling

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---------------------------------|---|
| APPEARANCE: | Clear, colorless liquid and vapor |
| PHYSICAL STATE: | Gas at ambient temperatures |
| MOLECULAR WEIGHT: | 120 |
| CHEMICAL FORMULA: | CHF ₂ CF ₃ , CH ₃ CF ₃ , CH ₂ FCF ₃ |
| ODOR: | Faint ethereal odor |
| SPECIFIC GRAVITY (water = 1.0): | 1.08 @ 21.1°C (70°F) |
| SOLUBILITY IN WATER (weight %): | Unknown |
| pH: | Neutral |
| BOILING POINT: | -47.8°C (-54.0°F) |
| FREEZING POINT: | Not Determined |
| VAPOR PRESSURE: | 182.9 psia @ 70°F 370.9 psia @ 130°F |
| VAPOR DENSITY (air = 1.0): | 3.43 |
| EVAPORATION RATE: | >1 |
| % VOLATILES: | 100 |
| FLASH POINT: | Not applicable |

COMPARED TO: CCl₄ = 1

(Flash point method and additional flammability data are found in Section 5.)

UNUSUAL FIRE AND EXPLOSION HAZARDS:

R-404A is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING:

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

R-404A should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

STORAGE RECOMMENDATIONS:

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.



R-404A

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

The product is stable.
Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.

INCOMPATIBILITIES:

(Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surfaces (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminum, magnesium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS:

Halogens, halogen acids and possibly carbonyl halides.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

HFC-125: LC₅₀: 4 hr. (rat) - > 800,000 ppm / Cardiac Sensitization threshold (dog) 75,000 ppm
HFC-143a: LC₅₀: 4hr. (rat) - > 540,000 ppm / Cardiac Sensitization threshold (dog) > 250,000 ppm
HFC-134a: LC₅₀: 4hr. (rat) - > 500,000 ppm / Cardiac Sensitization threshold (dog) > 80,000 ppm

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

HFC-125: Tetrogenic NOEL (rat and rabbit) – 50,000 ppm
Subchronic inhalation (rat) NOEL - ≥ 50,000 ppm / Chronic NOEL – 10,000 ppm
HFC-143a: Tetrogenic NOEL (rat and rabbit) – 50,000 ppm
Subchronic inhalation (rat) NOEL - ≥ 50,000 ppm
HFC-134a: Tetrogenic NOEL (rat and rabbit) – 40,000 ppm
Subchronic inhalation (rat) NOEL – 50,000 ppm / Chronic NOEL – 10,000 ppm

OTHER DATA:

HFC-125, HFC-134a: Not active in four genetic studies
HFC-143a: Not active in two genetic studies

12. ECOLOGICAL INFORMATION

Degradability (BOD):

R-404A is a gas at room temperature; therefore, it is unlikely to remain in water.

Octanol Water Partition Coefficient:

Unknown for mixture



R-404A

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?

If yes, the RCRA ID number is:

Not a hazardous waste.
Not applicable.

OTHER DISPOSAL CONSIDERATIONS:

Disposal must comply with federal, state, and local disposal or discharge laws. R-404A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Refrigerant gas R 404A

US DOT HAZARD CLASS: 2.2

US DOT PACKING GROUP: Not applicable

US DOT ID NUMBER: UN3337

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Components listed on the TSCA inventory

OTHER TSCA ISSUES: None

SARA TITLE III / CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME

No ingredients listed in this section

SARA / CERCLA RQ (lb.)

SARA EHS TPO (lb.)

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: IMMEDIATE PRESSURE

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME

No ingredients listed in this section

COMMENT



R-404A

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

| INGREDIENT NAME | WEIGHT % | COMMENT |
|---------------------------------------|----------|---------|
| No ingredients listed in this section | | |

ADDITIONAL REGULATORY INFORMATION:

R-404A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

WARNING: Contains Pentafluoroethane (HFC-125), 1,1,1-trifluoroethane, tetrafluoroethane, greenhouse gases which may contribute to global warming. **Do not vent** to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

WHMIS CLASSIFICATION (CANADA):

This product has been evaluated in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

FOREIGN INVENTORY STATUS:

EU – EINECS # 2065578 – HFC-125
2069965 – HFC-143a
223770 – HFC-134a

16. OTHER INFORMATION

CURRENT ISSUE DATE: December, 2008
PREVIOUS ISSUE DATE: August, 2007

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0
ANSI / ASHRAE 34 Safety Group – A1

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

Toxicity information per PAFT Testing

17. DISCLAIMER

National Refrigerants, Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other methods or use of the product and of the information referred to herein are beyond the control of National Refrigerants. National Refrigerants expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.

MSDS: R-404A
Current Issue Date: December, 2008

MATERIAL SAFETY DATA SHEET
"READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET
BEFORE HANDLING OR DISPOSING OF PRODUCT"

32807 URSA MARINE 15W-40

1. PRODUCT AND COMPANY NAME

PRODUCT CODE AND NAME

32807 URSA MARINE 15W-40

DESCRIPTION

Engine Oil

COMPANY

CHEVRON NATIONAL LUBRICANTS LTD.

Alexandra Road

Dublin 1

Ireland

Tel : +353(0) 1 856 0080

Fax: +353(0) 1 856 0156

Emergency Phone Number : 0044(0)18 65 407 333

E-mail : sales@tnl.ie

2. COMPOSITION/INFORMATION ON INGREDIENTS

| Name | % Wt | CAS No. | EC No. |
|---|---|------------|-----------|
| Distillates (petroleum), solvent-dewaxed heavy paraffinic | 60 - 100 | 64742-65-0 | 265-169-7 |
| Polyolefin polyamine succinimide polyol | < 3 | CBI | POLYMER |
| R 53 | May cause long-term adverse effects in the aquatic environment. | | |
| Calcium long chain alkyl phenate sulphide | < 2 | 90480-91-4 | 291-829-9 |
| R 53 | May cause long-term adverse effects in the aquatic environment. | | |
| Zinc alkyldithiophosphate | < 1,3 | 68649-42-3 | 272-028-3 |
| Xi R 41 | Risk of serious damage to eyes. | | |
| N R 51/53 | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. | | |

(IP 346 DMSO extract < 3%)

3. HAZARDS IDENTIFICATION

Product classification

Product is not classified as dangerous according to Directive 1999/45/EC.

Acute effects of exposure to man

Inhalation

Vapours or mist in unusually high concentrations, as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Skin contact

This product contains a material that is a potential skin sensitiser. Prolonged and repeated contact with this product may cause an allergic skin reaction in sensitive, exposed persons.

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Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. May cause minimal irritation, experienced as temporary discomfort. No adverse effects expected. If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhoea may occur.

Chronic effects of exposure to man
Medical conditions aggravated by exposure

Effects of exposure to the environment

4. FIRST AID MEASURES

Route of exposure

Inhalation

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or symptoms persist. Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists. Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists. Do not induce vomiting. Get medical attention. Never give anything by mouth to an unconscious or convulsing person.

Skin contact

Eye contact

Ingestion

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use water fog, dry powder, foam or carbon dioxide. Use water to cool fire-exposed containers. If a leak or spill has not ignited, use water fog to disperse the vapours and to provide protection for personnel attempting to stop the leak. Water jet

Extinguishing media which must not be used for safety reasons
Special exposure hazards arising from the substance or preparation itself, combustion products, resulting

None

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gases
Special protective equipment for firefighters

The nature of special protective equipment required will depend upon the size of the fire, the degree of confinement of the fire and the natural ventilation available. Fire-resistant clothing and self-contained breathing apparatus is recommended for fires in confined spaces and poorly-ventilated areas. Full fire-proof clothing is recommended for any large fires involving this product. In case of fire - Always call the fire brigade. Small fires, such as those capable of being fought with a hand-held extinguisher, can normally be fought by a person who has received instruction on the hazards of flammable liquid fires. Fires that are beyond that stage should only be tackled by people who have received hands-on training. Ensure escape paths available.

6. ACCIDENTAL RELEASE MEASURES

Procedures in case of accidental release or leakage

Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent liquid or runoff from entering waterways and sewer systems.

7. HANDLING AND STORAGE

Handling

Avoid prolonged or repeated contact with skin. Avoid breathing vapours. Keep containers closed when not in use. Store at ambient temperature. For intended product uses please refer to the Product Information Leaflet (PIL)

Storage

Specific use (s)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection

Airborne concentrations should be kept to lowest levels possible. If vapour or mist is generated, use approved respirator as appropriate.

Supplied air respiratory protection should be used for cleaning large spills or upon entry into tanks, vessels, or other confined spaces. Exposed employees should exercise reasonable personal cleanliness. This includes cleansing exposed skin areas several times daily with soap and water, and laundering or dry

Hand and skin protection

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| | |
|---------------------------------------|--|
| <u>Eye protection</u> | cleaning soiled work clothing. Chemical type goggles or face shield recommended to prevent eye contact. |
| <u>Exposure limit for the product</u> | Oil mist, mineral (excluding metalworking fluids) : TWA : 5 mg/m3 ; STEL : 10 mg/m3 |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-----------------------------------|--------------------------|
| <u>Appearance</u> | Clear liquid |
| <u>Odour</u> | Mineral oil |
| <u>Flash point (ASTM D92), °C</u> | 216 - 230 |
| <u>Relative density</u> | 0.88 kg/l @ 15 °C |
| <u>Viscosity</u> | 99,7 - 109 mm2/s @ 40 °C |

10. STABILITY AND REACTIVITY

| | |
|---|---|
| <u>Materials to avoid</u> | Strong oxidising agents. |
| <u>Hazardous decomposition products</u> | Oxides of carbon, aldehydes and ketones, combustion products of sulphur and phosphorus. |

11. TOXICOLOGICAL INFORMATION

| | |
|-----------------------------------|---|
| <u>Acute</u> <u>Inhalation</u> | High concentrations of vapours or mist are likely to be irritating to the respiratory tract and may cause nausea, dizziness, headaches and drowsiness. This product contains a material that is a potential skin sensitiser. Prolonged and repeated contact with this product may cause an allergic skin reaction in sensitive, exposed persons. Slightly irritating to the skin. Unlikely to cause more than transient stinging or redness if accidental eye contact occurs. Unlikely to cause harm if accidentally swallowed in small doses, though larger quantities may cause nausea and diarrhoea. Repeated skin contact may cause a persistent irritation or dermatitis. |
| <u>Skin contact</u> | |
| <u>Eye contact</u> | |
| <u>Ingestion</u> | |
| <u>Chronic</u> | |

12. ECOLOGICAL INFORMATION

| | |
|--------------------------------------|--|
| <u>Mobility</u> | Spillages may penetrate the soil causing ground water contamination. |
| <u>Persistence and degradability</u> | According to EC criteria : Not readily |

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| | |
|-----------------------------------|---|
| <u>Potential to bioaccumulate</u> | biodegradable Not determined. WGK=2 |
|-----------------------------------|---|

13. DISPOSAL CONSIDERATIONS

| | |
|-----------------|---|
| <u>Disposal</u> | Dispose in accordance with local laws and regulations governing disposal of waste oil. EWC-Nr : 13 02 05 |
|-----------------|---|

14. TRANSPORT INFORMATION

| | |
|-----------|---------------|
| transport | Not regulated |
|-----------|---------------|

15. REGULATORY INFORMATION

| | |
|---|--|
| <u>Classification/Labelling information</u> | Under the criteria of Directive EEC/67/548 (dangerous substances) and EEC/1999/45 (dangerous preparations) : Not classified Contains Calcium long chain alkaryl sulphonate . May produce an allergic reaction. |
|---|--|

16. OTHER INFORMATION

| | |
|--|---|
| <u>other information</u> | Used motor oils from gasoline engines have been shown to cause skin cancer when repeatedly applied to mouse skin without any effort to remove the material between applications. There is no evidence of a causal relationship between skin cancer inhumans and exposure to used motor oil. Xi R 41 Risk of serious damage to eyes. N R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R 53 May cause long-term adverse effects in the aquatic environment. 2, 9 |
| <u>Full text of risk phrases</u> | |
| <u>Changes were made in sections :</u> | : 07/01/2004 |

All information contained in this Material Safety Data Sheet and, in particular, the health and safety and environmental information is accurate to the best of our knowledge and belief as at the date of issue specified. However, the Company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information.

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The provision of this Material Safety Data Sheet is not intended, of itself, to obviate the need for all users to satisfy themselves that the product described is suitable for their individual purposes and that the safety precautions and environmental advice are adequate for their individual purposes and situation. Further, it is the user's obligation to use this product safely and to comply with all applicable laws and regulations concerning the use of the product.

The company accepts no responsibility for any injury, loss or damage, consequent upon any failure to follow the safety and other recommendations contained in this Material Safety Data Sheet, nor from any hazards inherent in the nature of the material, nor from any abnormal use of the material.

"Data sheet prepared by Chevron Energy Technology Company

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