

SAFETY DATA SHEET

ENERGY SPRING NS MULTIX 15W-40 — Multigrade Engine Oil

Issued in accordance with Singapore Standard SS 586-3:2022 (16-section GHS format). This document supersedes all previous versions.

SECTION 1 - Identification of the substance / mixture and of the supplier

1.1 Product identifier	NS MULTIX 15W-40		
Product family	Multigrade crankcase engine oil, SAE 15W-40, containing a zinc dialkyldithiophosphate (ZDDP) anti-wear additive, calcium sulphonate detergent and alkylated phenol and amine antioxidants.		
Grade(s)	SAE 15W-40. Single grade; this sheet covers no other viscosity grade.		
Chemical identity	Mixture of highly refined mineral base oils and additives		
CAS number	Not applicable (mixture)		
1.2 Relevant identified uses	Crankcase lubricant for internal combustion engines, as specified by the engine manufacturer for an SAE 15W-40 multigrade oil. Refer to the product technical data sheet for the applicable API, ACEA or manufacturer specifications before the product is offered for any specific engine application. Industrial / professional and consumer use.		
Uses advised against	Any use other than that stated above. Not for use as a two-stroke engine oil, gear or axle oil, automatic transmission fluid, hydraulic fluid, turbine oil, fuel, solvent, cleaning agent or mould release agent, nor for any medicinal, food-contact or personal-care purpose. Not approved for incidental food contact (NSF H1). The mixture contains a branched dodecylphenol, which is classified as a Category 2 reproductive toxicant in its pure form, and a calcium alkyl sulphonate which is a skin sensitiser. Avoid unnecessary skin contact, and take these components into account when assigning tasks involving repeated or prolonged direct contact.		
1.3 Supplier of the safety data sheet	ENERGY SPRING PTE LTD 3 Temasek Avenue, #21-00 Centennial Tower Singapore 039190 Tel: +65 6993 9836 E-mail: info@energy-spring.sg Web: https://energy-spring.sg/		
Manufactured / blended by	Product supplied under a manufacturing agreement. Manufacturer details available from ENERGY SPRING PTE LTD on request.		
1.4 Emergency telephone number	ENERGY SPRING PTE LTD (office hours, Mon - Fri 09:00 - 18:00 SGT): +65 6993 9836 Singapore - emergency services (SCDF: ambulance and fire): 995 Singapore - Drug and Poison Information Centre (DPIC), Singapore General Hospital, 24-hour hotline: +65 6423 9119 Outside Singapore: contact the local emergency services or the national poison information centre for the country in which the incident occurs. Within the EU / EEA: 112.		
Product	SAE viscosity grade	Kin. viscosity at 40 / 100 °C, mm2/s	GHS classification
NS MULTIX 15W-40	SAE 15W-40	102.8 / 13.8	Aquatic Chronic 3; H412

SECTION 2 - Hazards identification

2.1 Classification of the substance or mixture	GHS classification (SS 586-2 / SS 586-3; CLP Regulation 1272/2008): Hazardous to the aquatic environment, long-term (chronic), Category 3 - H412 Health hazards: not classified. Physical hazards: not classified. Supplemental labelling: EUH208 applies. See 2.2.
Basis of the classification	H412 - chronic aquatic hazard. Derived by the summation method of SS 586-2 from the zinc dialkyldithiophosphate (Aquatic Chronic 2, below 0.9 % w/w), the PDDP (Aquatic Chronic 1, M = 10, below 0.1 % w/w) and the bis(nonylphenyl)amine (Aquatic Chronic 4, up to 2.5 % w/w). At the upper bound of each declared range: - Chronic 1: sum of (M x Chronic 1) = 0.99 %, against a 25 % threshold. Not met. - Chronic 2: (10 x M x Chronic 1) + Chronic 2 = 10.8 %, against a 25 % threshold. Not met. - Chronic 3: (100 x M x Chronic 1) + (10 x Chronic 2) + Chronic 3 = 108 %, against a 25 % threshold. Met. The mixture is therefore Aquatic Chronic 3; H412. No ecotoxicity testing has been carried out on the finished mixture; measured data would take precedence over the summation method. Hazard classes considered and not met: - Serious eye damage / eye irritation. The endpoint is assessed on the combined content of ingredients classified Eye Dam. 1 and Skin Corr. 1, against a generic concentration limit of 1 % w/w for Eye Irrit. 2 and 3 % w/w for Eye Dam. 1. The only such ingredients are the zinc dialkyldithiophosphate (below 0.9 % w/w) and the PDDP (below 0.1 % w/w), giving a combined content below 1.0 % w/w. Not met. - Skin corrosion / irritation. The zinc dialkyldithiophosphate (Skin Irrit. 2) below 0.9 % w/w and the PDDP (Skin Corr. 1C) below 0.1 % w/w give (10 x Skin Corr. 1) + Skin Irrit. 2 below 2 % w/w, against a 10 % threshold. Not met. - Reproductive toxicity. The PDDP carries the harmonised classification Repr. 1B; H360F and is held below 0.1 % w/w, against the 0.3 % generic concentration limit for a Category 1B reproductive toxicant. Not met. This limit is the reason the component is controlled at that level - see the concentration limits below. - Skin sensitisation. The calcium alkyl sulphonate (Skin Sens. 1B; H317) is specified below 1 % w/w, against the 1.0 % generic concentration limit. Not classified - but the supplemental statement EUH208 applies because the component is present at 0.1 % w/w or above. - Aspiration toxicity. The hydrotreated neutral oil stream is classified Asp. Tox. 1; H304 but is present at less than 10 % w/w, and the kinematic viscosity of the finished oil is 102.8 mm²/s at 40 °C, far above the 20.5 mm²/s cut-off. Not classified on either ground. - Carcinogenicity. The mineral base oil contains less than 3 % DMSO extract by IP 346. Not classified. - Acute toxicity, germ cell mutagenicity, STOT (single or repeated exposure), and all physical hazard classes: criteria not met.

2.2 Label elements

Pictogram	None required
Signal word	None required
Hazard statements	H412: Harmful to aquatic life with long lasting effects.
Supplemental information	EUH208: Contains benzenesulfonic acid, mono-C16-24-alkyl derivatives, calcium salts. May produce an allergic reaction. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin, resulting in disorders such as oil acne or folliculitis. Used engine oil may contain harmful impurities. Not classified as flammable, but will burn.
Precautionary statements	General: P101: If medical advice is needed, have product container or label on hand. P102: Keep out of reach of children. P103: Read carefully and follow all instructions. Prevention: P273: Avoid release to the environment. Disposal: P501: Dispose of contents and container to an approved waste disposal plant, in accordance with local regulations.
Recommended handling precautions	Not label elements. Good occupational practice for this product: P264: Wash hands thoroughly after handling. P280: Wear protective gloves and eye / face protection. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Concentration limits on which this classification depends	PDDP (phenol, dodecyl-, branched) is controlled below 0.1 % w/w. That single limit governs four separate outcomes, which is why it is set where it is: - 0.1 % w/w: the substance is on the REACH Candidate List of Substances of Very High Concern and is identified as an endocrine disruptor. At or above 0.1 % w/w the communication obligations of REACH Articles 31 and 33 apply, together with notification to the ECHA SCIP database, and the endocrine-disruptor identification must be declared in Sections 2.3 and 12.6. - 0.225 % w/w: the aquatic summation reaches Aquatic Chronic 2 - H411, adding the GHS09 pictogram and making the product a marine pollutant shipped as UN 3082, Class 9, packing group III. - 0.3 % w/w: the generic concentration limit for a Category 1B reproductive toxicant. At or above this figure the mixture classifies Repr. 1B - H360F, may damage fertility, requiring the GHS08 pictogram, the signal word DANGER and precautionary statements P201, P202, P280, P308 + P313 and P405. - 2.5 % w/w: the aquatic summation reaches Aquatic Chronic 1 - H410. The classification and label in this sheet are valid for product in which PDDP is below 0.1 % w/w. Above that figure this data sheet does not describe the product.
Further concentration limits	Combined Eye Dam. 1 and Skin Corr. 1 content, against the 1 % eye irritation limit. The zinc dialkyldithiophosphate is controlled below 0.9 % w/w and the PDDP below 0.1 % w/w, so their combined content stays below the 1.0 % w/w generic concentration limit. At or above 1.0 % w/w the mixture would classify Eye Irrit. 2 - H319, requiring the GHS07 pictogram and the signal word WARNING; at or above 3 % w/w, Eye Dam. 1 - H318 with GHS05 and DANGER. Calcium alkyl sulphonate against the 1 % skin sensitisation limit. Declared below 1 % w/w. At 1.0 % w/w or above the mixture would classify Skin Sens. 1; H317, requiring the GHS07 pictogram and the signal word WARNING.

2.3 Other hazards - used engine oil	The principal health hazard associated with this product in practice is not the fresh oil but the used oil. During service the oil becomes contaminated with combustion products, including polycyclic aromatic hydrocarbons, together with wear metals, fuel, water and oxidation products. Used engine oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Avoid skin contact with used oil. Brief or intermittent contact is not expected to have serious effects in humans provided the oil is thoroughly removed by washing with soap and water. Do not use solvents, petrol or abrasive cleaners to remove oil from the skin. Oil changes, filter changes and draining are the tasks where exposure occurs; gloves and eye protection are appropriate for all of them.
Hot material and hot drain oil	Engine oil is hot in service and drain oil may be at or near engine operating temperature. Allow the engine to cool before draining. Hot oil released under pressure from a sump plug, filter housing or oil line can cause scalding and eye injury; the eye irritation classification of this product makes eye protection particularly important during draining and filling.
Skin effects	Prolonged or repeated skin contact with the fresh product may cause defatting of the skin, leading to dryness, redness or dermatitis. The product contains a calcium alkyl sulphonate which is a skin sensitiser at higher concentrations; although the mixture is not classified as a sensitiser, EUH208 applies and an allergic skin reaction in susceptible individuals cannot be excluded.
Oil mist	Generation of mist, vapour or aerosol above the applicable occupational exposure limit (Section 8) may cause respiratory irritation. The occupational exposure limits for mineral oil mist in Section 8 apply to this product.
Slip hazard	Spillages produce slippery surfaces; clean up immediately.
PBT / vPvB	PBT: not applicable. vPvB: not applicable. No ingredient is considered to meet the PBT or vPvB criteria at 0.1 % or higher.

SECTION 3 - Composition / information on ingredients

Component	CAS / EC number	Approx. % w/w	GHS classification
Distillates (petroleum), hydrotreated heavy paraffinic*	CAS 64742-54-7 EC 265-157-1 Index 649-467-00-8	60 - 90	Not classified (see notes)
Lubricating oils (petroleum), C20-C50, hydrotreated neutral oil-based*	Not assigned	2.5 - < 10	Asp. Tox. 1; H304 (does not carry over to the mixture - see notes)
Phosphorodithioic acid, mixed O,O-bis(1,3-dimethylbutyl and iso-Pr) esters, zinc salts (ZDDP)	CAS 84605-29-8 EC 283-392-8	0.1 - < 0.9	Eye Dam. 1; H318 Skin Irrit. 2; H315 Aquatic Chronic 2; H411
Phenol, dodecyl-, branched / phenol, (tetrapropenyl) derivatives (PDDP)	CAS 74499-35-7 CAS 121158-58-5 EC 310-154-3 Index 604-092-00-9	0.1 - 2.5	Repr. 1B; H360F Skin Corr. 1C; H314 Eye Dam. 1; H318 Aquatic Acute 1; H400 (M = 10) Aquatic Chronic 1; H410 (M = 10) REACH Candidate List (SVHC); identified endocrine disruptor
bis(Nonylphenyl)amine	CAS 36878-20-3 EC 253-249-4	0.1 - 2.5	Aquatic Chronic 4; H413
Benzenesulfonic acid, mono-C16-24-alkyl derivatives, calcium salts	CAS 70024-69-0 EC 274-263-7	0.1 - < 1	Skin Sens. 1B; H317

- Substance / mixture: Mixture. Chemical nature: highly refined mineral base oils with a zinc dialkyldithiophosphate anti-wear additive, calcium sulphonate detergent, alkylated phenol and diarylamine antioxidants, and viscosity modifier.
- * The base oil fraction comprises two streams. The hydrotreated heavy paraffinic distillate is not classified; the hydrotreated neutral oil stream carries Asp. Tox. 1; H304.
- The highly refined mineral oil contains less than 3 % (w/w) DMSO extract when tested by IP 346. On that basis, and in accordance with Regulation (EC) 1272/2008 Annex VI Part 3 Note L, no carcinogen classification applies. The aspiration toxicity classification of the neutral oil stream does not carry over to the finished mixture: the stream is present below the 10 % threshold, and the kinematic viscosity of the finished oil is 102.8 mm²/s at 40 °C, well above the 20.5 mm²/s cut-off.

- The branched dodecylphenol carries an M-factor of 10 for chronic aquatic hazard. It is this component, and this M-factor, which decides the aquatic classification of the mixture, the presence of the GHS09 pictogram on the label, and whether the product is a marine pollutant for transport. Its declared range spans three outcomes. See the concentration limits in Section 2.
- The calcium alkyl sulphonate is present at 0.1 % or more, which triggers the supplemental labelling statement EUH208 even though the mixture is not classified as a skin sensitiser. It is declared below 1 % w/w; at 1.0 % or more the mixture would classify Skin Sens. 1; H317.
- Under SS 586-2 the eye endpoint is assessed on the combined content of ingredients classified Eye Dam. 1 and Skin Corr. 1. The zinc dialkyldithiophosphate (Eye Dam. 1) and the PDDP (Eye Dam. 1 and Skin Corr. 1C) are the only such ingredients, and their combined content is controlled below 1.0 % w/w, which is the generic concentration limit. See the concentration limits in Section 2.
- The PDDP component carries a harmonised classification in CLP Annex VI Part 3 under Index number 604-092-00-9, which is the classification shown. Both CAS numbers given resolve to EC number 310-154-3 and to that harmonised entry. Note that the reproductive toxicity classification is Category 1B (H360F, may damage fertility), for which the generic concentration limit in a mixture is 0.3 % w/w, not the 3 % applying to Category 2.
- PDDP is listed on the REACH Candidate List of Substances of Very High Concern as 'Phenol, alkylation products (mainly in para position) with C12-rich branched alkyl chains from oligomerisation, covering any individual isomers and/or combinations thereof (PDDP)', and is identified as having endocrine disrupting properties under REACH Article 59(1). Presence at 0.1 % w/w or above triggers the communication obligations of REACH Articles 31 and 33 and notification to the SCIP database. See Section 15.
- The remaining component classifications and aquatic M-factors are those declared by the component suppliers. The classification of the mixture in Section 2 is derived from them.
- Concentrations are shown as ranges to protect confidentiality or to reflect batch-to-batch variation. Where a range straddles a classification cut-off, the classification in Section 2 has been assigned on the worst case, and the cut-off is identified in the concentration limits in Section 2.
- There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

SECTION 4 - First aid measures

4.1 Description of first aid measures - General	Remove clothing soiled by the product without delay. Move affected persons into fresh air. In the event of serious problems, call a doctor or summon medical assistance urgently. Show this safety data sheet to the medical personnel in attendance.
Inhalation	Move the person to fresh air. Inhalation is not a likely route of exposure for this product under normal conditions of use. If breathing is difficult, give oxygen. If the person is not breathing, apply artificial respiration and obtain medical attention immediately. Seek medical treatment in the event of persistent complaints.
Skin contact	Remove contaminated clothing and shoes. Wash the affected area immediately with plenty of soap and water and rinse thoroughly. Do not use solvents, petrol or abrasive cleaners. If skin irritation continues, or if a rash develops, obtain medical advice. Launder contaminated clothing before reuse; discard contaminated leather articles. Hot product: cool the affected area immediately with cold running water for at least 15 minutes. Do not attempt to remove product adhering to the skin. Obtain medical attention for thermal burns. High-pressure injection injury: oil escaping under pressure from a pressurised lubrication circuit can penetrate the skin. Obtain medical attention immediately. Injuries may appear trivial at first but require urgent surgical treatment.
Eye contact	CLASSIFIED HAZARD - the product causes serious eye irritation. Rinse the open eye immediately with plenty of clean running water for at least 15 minutes, alternately lifting the upper and lower eyelids. Remove contact lenses if worn and easy to do, and continue rinsing. Avoid a strong water jet, because of the risk of corneal damage. Obtain medical advice if irritation persists after rinsing.
Ingestion	Do not induce vomiting. If the person is conscious, rinse the mouth with water and then give plenty of water to drink. Never give anything by mouth to an unconscious person. Obtain medical attention. Take the casualty to hospital and show this safety data sheet.
4.2 Most important symptoms and effects, both acute and delayed	Eyes: redness, watering, stinging and discomfort on contact; this is a classified effect and may be marked. Skin: dryness, redness or dermatitis after prolonged or repeated contact; thermal burns from hot product. An allergic skin reaction is possible in susceptible individuals (EUH208). Inhalation of mist: coughing or difficulty breathing at concentrations above the exposure limit in Section 8. Ingestion: nausea, vomiting, diarrhoea and irritation of the gastrointestinal tract.

4.3 Indication of any immediate medical attention and special treatment needed	Treat symptomatically. No specific antidote is required. Persistent eye symptoms after adequate irrigation warrant ophthalmological assessment, including fluorescein staining to exclude corneal injury. Aspiration of liquid into the lungs, although not a classified hazard for this product, may cause chemical pneumonitis and should be managed accordingly if it occurs; do not induce vomiting.
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SECTION 5 - Fire-fighting measures

5.1 Extinguishing media	Suitable: foam, dry chemical powder, carbon dioxide, water fog or water spray. Fight a larger fire with foam. Use extinguishing methods suitable to the surrounding conditions. Unsuitable: direct water jet, which may spread the fire.
5.2 Special hazards arising from the substance or mixture	This product is a combustible liquid with a high flash point (see Section 9); it does not readily ignite but will burn once heated above its flash point. A fine mist or spray released under pressure can ignite well below the flash point. Combustion or thermal decomposition produces a complex mixture of airborne solids, liquids and gases, highly dependent on combustion conditions, including carbon monoxide, carbon dioxide, sulphur dioxide, oxides of phosphorus and nitrogen, zinc and calcium compounds and unidentified organic compounds. Hydrogen sulphide may be released from the sulphur-containing additives in overheated product. Containers exposed to fire may rupture. Cool exposed containers with water spray.
5.3 Advice for fire-fighters	Wear full protective clothing and self-contained positive-pressure breathing apparatus. Collect contaminated fire-fighting water separately; it must not enter the sewage system or any watercourse. This is particularly important for this product, which is classified as very toxic to aquatic life with long lasting effects. See Section 7 for proper handling and storage.

SECTION 6 - Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Avoid contact with skin and eyes and avoid breathing any mist. Wear gloves, eye protection and protective clothing (see Section 8). Keep unprotected and non-essential persons away. Remove all sources of ignition and keep away from oxidising agents. Beware of hot product and of slippery surfaces and floors. Emergency responders: chemical-resistant gloves, goggles, protective clothing and antistatic, slip-resistant footwear.
6.2 Environmental precautions	PRIORITY - the product is classified as very toxic to aquatic life with long lasting effects. Prevent it from entering drains, sewers, soil, surface water or groundwater. Prevent spreading by damming in or with oil barriers. Do not allow the product to penetrate the ground. Collect spillage (P391). Inform the relevant authorities immediately if the product has entered the environment or a public sewer; a release of this product to surface water is reportable in most jurisdictions.
6.3 Methods and material for containment and cleaning up	Small spillages: absorb with a liquid-binding material such as sand, diatomite, acid binder, universal binder, sawdust or silica gel, and transfer to a labelled, closable container for disposal. Large spillages: dam the spill and recover the free product by pumping or with suitable physical means. Send contaminated materials to an approved collection or disposal facility. Marine spillage: apply the vessel's Shipboard Oil Pollution Emergency Plan (SOPEP) and report in accordance with MARPOL Annex I requirements.
6.4 Reference to other sections	See Section 7 for safe handling, Section 8 for personal protective equipment and Section 13 for disposal.

SECTION 7 - Handling and storage

7.1 Precautions for safe handling	Avoid contact with skin, eyes and clothing. Wear eye protection when decanting, filling, draining or changing filters: the product is classified as causing serious eye irritation. Do not breathe mist or vapour. Do not eat, drink or smoke in areas where the product is handled. Wash hands thoroughly after handling and before breaks. Avoid skin contact with used oil in particular - see Section 2. Keep away from foodstuffs, beverages and feed. Ensure adequate ventilation where there is any risk of vapours, mists or aerosols forming. Keep away from sources of ignition and flammable materials, and away from oxidising agents. Avoid the accumulation of static electricity; provide earthing and bonding for bulk transfer. Review all operations which have the potential to generate and accumulate an electrostatic charge and/or a flammable atmosphere - including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation and vacuum truck operations - and apply appropriate mitigating procedures.
7.2 Conditions for safe storage, including any incompatibilities	Store in a cool, dry, well-ventilated area in well-sealed receptacles, away from sources of heat, ignition and direct sunlight, and away from oxidising agents (see Section 10). Store away from foodstuffs. Keep out of the reach of children. Keep containers tightly closed and correctly labelled with the full GHS label. Prevent any seepage into the ground. Bund bulk and intermediate storage. Because the product is classified as very toxic to aquatic life with long lasting effects, secondary containment sized to the largest vessel is appropriate wherever storage is within reach of a drain or watercourse. Recommended storage temperature: 0 °C to 45 °C. Periods of exposure to high temperatures should be minimised and water contamination avoided. Container warning: containers are not designed to contain pressure. Do not use pressure to empty a container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid and/or vapour) and can be dangerous. Do not pressurise, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity or other sources of ignition; they may explode and cause injury or death. Empty containers should be completely drained, properly closed and promptly returned to a drum reconditioner or disposed of properly.
7.3 Specific end use(s)	Crankcase lubrication of internal combustion engines requiring an SAE 15W-40 multigrade oil. Refer to the product technical data sheet and to the engine manufacturer's recommendation for the applicable service classification and drain interval. No technical data sheet has been supplied for this product - see Section 1.

SECTION 8 - Exposure controls / personal protection

8.1 Control parameters — occupational exposure limits

Component / parameter	Source	TWA (8 h)	STEL / Ceiling
Oil mist, mineral	Singapore PEL (WSH Regulations)	5 mg/m ³	10 mg/m ³ (STEL)
Oil mist, mineral	ACGIH TLV	5 mg/m ³	10 mg/m ³ (STEL)
Oil mist, mineral	OSHA PEL (29 CFR 1910.1000)	5 mg/m ³	-
Distillates (petroleum), hydrotreated heavy paraffinic, CAS 64742-54-7	EU Indicative OEL (IOEL)	5 mg/m ³	-
Distillates (petroleum), hydrotreated heavy paraffinic, CAS 64742-54-7	UK WEL (EH40/2005)	5 mg/m ³	-

8.1 Control parameters - note	The occupational exposure limits for mineral oil mist above apply wherever mist or aerosol may be generated. Limits and standards are shown for guidance only. Follow applicable national regulations. No occupational exposure limit has been established for the zinc dialkyldithiophosphate, the dodecylphenol or the calcium sulphonate components; exposure to these should be minimised as far as reasonably practicable. No biological limit values have been established for this product. DNEL / PNEC: not determined for this mixture. Values for the registered components are available from ENERGY SPRING PTE LTD on request.
8.2 Exposure controls - general considerations	Consider the potential hazards of this material (Section 2), the applicable exposure limits, the job activities and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment, since protection is usually provided for a limited time or under certain circumstances only. For normal handling of a packaged engine oil at ambient temperature, engineering controls and respiratory protection are not generally required. That is not a substitute for an assessment of the actual task: draining hot oil, changing filters, bulk transfer, and any operation generating mist each warrant their own controls.
Engineering controls	Use the product in a well-ventilated area. Provide local exhaust ventilation where mist or vapour may be generated, and at bulk transfer and drain points. Provide eyewash facilities close to any area where the product is decanted, drained or filled - this is the practical consequence of the eye irritation classification. Insulate or guard hot surfaces and hot oil lines. Bund bulk storage.
Respiratory protection	Not normally required where ventilation is adequate. Where the oil mist concentration may exceed the exposure limit, wear an approved respirator fitted with an organic vapour / particulate filter (type A-P2). Use air-supplied or self-contained breathing apparatus for entry into tanks and confined spaces.
Hand protection	Impermeable hydrocarbon-resistant gloves conforming to EN ISO 374. Suitable materials include nitrile rubber, 4H (PE/EVAL), Viton and Silver Shield; confirm the material with the glove supplier for the actual task. Determined penetration times under EN 16523-1 are not measured under practical conditions, so a maximum wearing time of 50 % of the penetration time is recommended. Use heat-resistant gloves when handling hot oil. Replace gloves immediately if damaged or contaminated internally.
Eye protection	Safety glasses with side shields to EN 166 as a minimum. Wear chemical goggles or a face shield where splashing is possible - decanting, filling, draining and filter changes. Eye protection is recommended good practice for this product; it is not a label requirement, the mixture not being classified for eye effects (see Section 2).
Skin and body protection	Oil-resistant protective work clothing which prevents skin contact, and safety footwear. Store protective clothing separately from personal clothing. Avoid keeping oil-soaked rags or clothing in pockets.
Hygiene measures	Avoid prolonged and repeated contact with skin, particularly with used oil. Remove soiled and contaminated clothing immediately. Wash hands with soap and water before breaks, before eating, drinking or smoking, and at the end of work. Use a suitable skin cream after washing. Do not use solvents, petrol or abrasive cleaners to remove oil from the skin. Keep the product away from foodstuffs, beverages and feed.
Environmental exposure controls	Avoid release to the environment (P273). Prevent discharge to drains, surface water, groundwater and soil. Bund bulk storage and keep spill absorbent and containment equipment at transfer and drain points. See Sections 6, 12 and 13.

SECTION 9 - Physical and chemical properties

Physical state at 20 °C	Liquid
Appearance / colour	Brown

Odour	Characteristic mineral oil odour
Odour threshold	Not determined
pH	Not determined; not applicable to a non-aqueous product
Melting / freezing point	Not determined
Pour point	Refer to the product technical data sheet
Initial boiling point / range	Not determined
Flash point	228 °C (Cleveland open cup).
Evaporation rate	Not determined
Flammability (solid, gas)	Not applicable - liquid
Flammability (liquids)	Not classified as flammable, but will burn
Self-ignition	The product is not self-igniting
Auto-ignition temperature	Not determined
Decomposition temperature	Not determined; see Sections 5 and 10
Upper / lower flammability or explosive limits	Not determined
Explosive properties	The product does not present an explosion hazard
Oxidising properties	Not oxidising
Vapour pressure	Not determined; low, as expected for a mineral base oil blend
Vapour density (air = 1)	Not determined; > 1 expected
Density	0.88 g/cm ³
Relative density	Not determined
Solubility / miscibility in water	Not miscible
Solubility / miscibility - aliphatic hydrocarbons	Fully miscible
Solubility / miscibility - aromatic hydrocarbons	Fully miscible
Partition coefficient n-octanol/water	Not determined
Kinematic viscosity at 40 °C	102.8 mm ² /s. This is the property which decides the aspiration assessment in Section 2; it is well above the 20.5 mm ² /s cut-off.
Kinematic viscosity at 100 °C	13.8 mm ² /s, consistent with the SAE 15W-40 viscosity grade (SAE J300 requires 12.5 to below 16.3 mm ² /s for an SAE 40 grade at 100 °C)
Dynamic viscosity	Not determined
Viscosity index	Refer to the product technical data sheet
Other information - DMSO extract (mineral oil only), IP 346	< 3 % w/w
9.2 Other information	Low-temperature cranking and pumping viscosities (ASTM D5293 and D4684), sulphated ash, base number and high-temperature high-shear viscosity: refer to the product technical data sheet.

SECTION 10 - Stability and reactivity

10.1 Reactivity	No dangerous reaction known under conditions of normal use.
10.2 Chemical stability	Stable at ambient temperature and under conventional conditions of storage, handling and use. In service, oxidative and thermal degradation is accelerated by high bulk temperature, blow-by gases, fuel dilution, water contamination and catalytic wear metals; observe the engine manufacturer's drain interval.

10.3 Possibility of hazardous reactions	Hazardous polymerisation will not occur. No dangerous reactions known under normal conditions of storage and use.
10.4 Conditions to avoid	Heat, sparks, naked flame and other sources of ignition. Contact with oxidising agents. Prolonged exposure to high temperatures, which promotes oxidation and thermal decomposition. Release of the product as a fine spray or mist near a hot surface or ignition source.
10.5 Incompatible materials	Strong oxidising agents. Strong acids. The zinc dialkyldithiophosphate additive is mildly active towards yellow metals at elevated temperature, which is normal for an engine oil and is accounted for in engine bearing design, but prolonged storage in copper or brass vessels is not recommended.
10.6 Hazardous decomposition products	None under normal conditions of storage and use. On thermal decomposition or combustion the additive system will yield sulphur dioxide, oxides of phosphorus and nitrogen, zinc and calcium compounds, carbon monoxide, carbon dioxide and unidentified organic compounds; hydrogen sulphide may be released from the sulphur-containing additives in strongly overheated product. See Section 5. If decomposition is suspected, or if the product has been overheated, do not open the container; discontinue heating and secure the unit. Initiate emergency procedures, taking all necessary precautions to avoid exposure to noxious or flammable gases.

SECTION 11 - Toxicological information

11.1 Basis for assessment	Information given is based on data on the components and on the toxicology of similar products. No toxicological testing has been carried out on the finished mixture. Unless indicated otherwise, the data presented is representative of the product as a whole rather than for individual components.
Exposure routes	Eye and skin contact are the primary routes of exposure. Exposure may also occur by inhalation of oil mist, or following accidental ingestion.
Acute toxicity	Based on available data, the classification criteria are not met. Acute oral and dermal LD50 values for mineral oil lubricants of this type are above 5,000 mg/kg. Ingestion may result in nausea, vomiting or diarrhoea and irritation of the gastrointestinal tract.
Skin corrosion / irritation	Based on available data, the classification criteria are not met. The zinc dialkyldithiophosphate (Skin Irrit. 2) below 0.9 % w/w and the PDDP (Skin Corr. 1C) below 0.1 % w/w together fall well short of the 10 % w/w additivity threshold. Prolonged or repeated contact may nonetheless cause defatting, leading to dryness, redness, cracking or dermatitis, and can clog the pores of the skin, resulting in disorders such as oil acne or folliculitis.
Serious eye damage / eye irritation	Based on available data, the classification criteria are not met. The combined content of ingredients classified Eye Dam. 1 or Skin Corr. 1 - the zinc dialkyldithiophosphate below 0.9 % w/w and the PDDP below 0.1 % w/w - is held below the 1 % w/w generic concentration limit. Direct contact may still cause transient mechanical irritation, redness and watering.
Respiratory or skin sensitisation	Based on available data, the classification criteria are not met. The calcium alkyl sulphonate (Skin Sens. 1B; H317) is declared below 1 % w/w, against the 1.0 % generic concentration limit. Because it is present at 0.1 % or more, the supplemental statement EUH208 applies and an allergic skin reaction in susceptible individuals cannot be excluded. Respiratory sensitisation: criteria not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met. The mineral base oil is highly refined and contains less than 3 % DMSO extract by IP 346; on that basis no carcinogen classification applies (Note L). See the separate note on used oil below, which addresses a different question.

Reproductive toxicity	Based on available data, the classification criteria are not met. The PDDP component carries the harmonised classification Repr. 1B; H360F, may damage fertility, and is held below 0.1 % w/w against the 0.3 % generic concentration limit for a Category 1B reproductive toxicant. See the concentration limits in Section 2. Employers should nonetheless take this component into account when assessing tasks involving repeated or prolonged direct contact with the product.
STOT - single exposure	Based on available data, the classification criteria are not met.
STOT - repeated exposure	Based on available data, the classification criteria are not met. Mineral oil mists derived from highly refined oils are reported to have low acute and sub-acute toxicity in animals; effects at concentrations well above workplace exposure levels include lung inflammatory reaction, lipoid granuloma formation and lipoid pneumonia, while exposures at or near current workplace exposure levels produced no significant toxicological effects.
Aspiration hazard	Based on available data, the classification criteria are not met. The hydrotreated neutral oil stream (Asp. Tox. 1; H304) is present below the 10 % threshold, and the kinematic viscosity of the finished oil is 102.8 mm ² /s at 40 °C, far above the 20.5 mm ² /s cut-off. Ingestion of a large quantity followed by vomiting could nonetheless result in aspiration and chemical pneumonitis; do not induce vomiting.
Notes to physician	Treat symptomatically. No special measures are normally required. Persistent eye symptoms after adequate irrigation warrant ophthalmological assessment.
Additional information - used engine oil	Used engine oils may contain harmful impurities that have accumulated during use. During use in engines, contamination of the oil with low levels of cancer-causing combustion products occurs. Used engine oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used engine oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water. The concentration of such impurities depends on the service, and they may present risks to health and to the environment on disposal. All used oil should be handled with caution and skin contact avoided as far as possible.

SECTION 12 - Ecological information

12.1 Toxicity	CLASSIFIED: Aquatic Chronic 3 - H412, harmful to aquatic life with long lasting effects. The classification is derived by the summation method from the component data in Section 3; the arithmetic is set out in Section 2. Ecotoxicological data have not been determined for the finished product; the assessment rests on component data. Component data: - PDDP: Aquatic Acute 1; H400 (M = 10) and Aquatic Chronic 1; H410 (M = 10). The M-factor of 10 means this additive contributes ten times its own concentration to the chronic summation, and one hundred times it at the next category down, which is why it is controlled below 0.1 % w/w (Section 2). - Phosphorodithioic acid, mixed esters, zinc salt: Aquatic Chronic 2; H411, below 0.9 % w/w. - bis(Nonylphenyl)amine: Aquatic Chronic 4; H413. Acute aquatic hazard: the summation for Aquatic Acute 1 gives well under 25 %, so no acute aquatic classification applies. Where measured data is obtained for the finished mixture it takes precedence over the summation method.
12.2 Persistence and degradability	Not readily biodegradable. The major constituents are inherently biodegradable, but the product contains components which may persist in the environment. No specific data is available for this mixture.
12.3 Bioaccumulative potential	No data available for the mixture. Contains components with the potential to bioaccumulate. Partition coefficient n-octanol/water: not determined.
12.4 Mobility in soil	Liquid under most environmental conditions. Floats on water and does not mix with it. If it enters soil it will adsorb to soil particles and will not be mobile. Do not allow the product to penetrate the ground.

12.5 Results of PBT and vPvB assessment	PBT: not applicable. vPvB: not applicable. No ingredient is considered to meet the PBT or vPvB criteria at 0.1 % or higher.
12.6 Other adverse effects	Uncontrolled release of the product to the environment must be prevented. The product floats on water and does not mix with it; a spillage may form a layer on the water surface which can damage aquatic organisms through lack of oxygenation, in addition to the chronic toxicity of the additive components. Keep the product out of drains, watercourses and the sea. The product has no ozone depletion potential and is a mixture of non-volatile components which will not be released to air in significant quantities under normal conditions of use.

SECTION 13 - Disposal considerations

13.1 Waste treatment methods - product	Do not discharge into the sewerage system, surface water or the natural environment, and do not dispose of with household waste. Waste product may be disposed of in a suitable incinerator or recovered for re-refining, provided that national and local legislation is complied with. Recovery should be carried out by a licensed specialist waste contractor. Used engine oil should be treated as hazardous waste unless the waste holder's own assessment shows otherwise. In Singapore, used oil is a toxic industrial waste under the Environmental Public Health (Toxic Industrial Waste) Regulations and must be collected by a licensed toxic industrial waste collector. On board ship, retain in the waste oil tank and discharge only to an approved reception facility, in accordance with MARPOL Annex I. For supply into the EU: European waste catalogue code 13 02 05* - non-chlorinated engine, gearbox and mineral-based lubricating oils. Given the Aquatic Chronic 1 classification, hazardous property HP14 (ecotoxic) is to be considered in the waste classification.
Contaminated packaging	Empty containers retain product residue and their GHS labelling must remain legible until the container is cleaned. Drain thoroughly, close properly and return to a drum reconditioner or dispose of through an approved contractor. Packaging may be reused or recycled after cleaning. Do not cut, weld, drill or apply heat to empty containers (see Section 7). Consumer packs should be taken to a civic amenity or waste oil collection point, not placed in household waste.

SECTION 14 - Transport information

General	Not classified as a dangerous good for transport by any mode, and not a marine pollutant. An Aquatic Chronic 3 (H412) classification does not meet the criteria for UN 3082, environmentally hazardous substance, liquid, n.o.s., which requires Aquatic Acute 1 or Aquatic Chronic 1 or 2. See the concentration limits in Section 2, which identify the point at which this section would change. The description shown may not apply to all shipping situations. Consult the applicable dangerous goods regulations for additional description requirements and for mode-specific or quantity-specific shipping requirements.
14.1 UN number	Not applicable - not regulated (ADR, RID, IMDG, IATA, DOT)
14.2 UN proper shipping name	Not applicable - not regulated. Commercial description: lubricating oil.
14.3 Transport hazard class(es)	Not applicable - not regulated
14.4 Packing group	Not applicable - not regulated
14.5 Environmental hazards	Marine pollutant: No (IMDG Code). Not classified as environmentally hazardous for land transport (ADR / RID / ADN).
14.6 Special precautions for user	None applicable under the transport regulations. Keep separate from foodstuffs. Handle in accordance with Sections 6, 7 and 8.

Modal information	Sea (IMO / IMDG): lubricating oil; not regulated as dangerous goods. Air (ICAO / IATA): lubricating oil; not regulated as dangerous goods. Road / rail / inland waterway (ADR / RID / ADN): not regulated. United States (DOT): lubricating oil; not regulated as a hazardous material for transportation under 49 CFR.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable. Carriage of this product in bulk as cargo would fall under MARPOL Annex I (oil).

SECTION 15 - Regulatory information

15.1 Safety, health and environmental regulations specific to the product	Singapore: - Classification and labelling in accordance with SS 586-2 and SS 586-3. The product is classified Aquatic Chronic 3, H412. That classification requires no pictogram and no signal word; the label carries the hazard statement, the supplemental statement EUH208 and the precautionary statements listed in Section 2. Every endpoint has been assessed against the generic concentration limits and summation rules of SS 586-2; no substance-specific concentration limit has been relied on. - Workplace Safety and Health Act and subsidiary regulations - permissible exposure levels for mineral oil mist apply (Section 8). Employers should include the EUH208 sensitisation statement, the used-oil hazard in Section 2.3 and the PDDP content in their risk assessment. - Environmental Public Health (Toxic Industrial Waste) Regulations: used oil is a toxic industrial waste - see Section 13. - Environmental Protection and Management Act and subsidiary regulations: the aquatic classification is relevant to any trade effluent or discharge assessment. - Fire Safety Act and Fire Safety (Petroleum and Flammable Materials) Regulations: not applicable. International: - MARPOL 73/78 Annex I (oil) applies to discharge and to disposal of used oil. - IMDG Code: applicable - see Section 14. - IMO IBC Code: not applicable.
Notes for supply into the EU / EEA	Where EU legislation applies, the following are relevant and should be reviewed before export: - REACH Regulation 1907/2006 and Regulation (EU) 2020/878 (safety data sheet format). - CLP Regulation 1272/2008, including Note L for the base oil (DMSO extract < 3 %, IP 346). - Endocrine disruption. PDDP is identified as having endocrine disrupting properties under REACH Article 59(1) and against the criteria of Commission Delegated Regulation (EU) 2017/2100 and Commission Regulation (EU) 2018/605. Where it is present at 0.1 % w/w or above this is to be declared in Sections 2.3 and 12.6. Regulation (EU) 2023/707 additionally introduced hazard classes for endocrine disruption (ED HH, ED ENV) and for persistent, mobile and toxic properties (PMT, vPvM); these are to be assessed for the mixture before EU supply. - REACH Candidate List of Substances of Very High Concern: the PDDP component declared in Section 3 IS listed on the Candidate List, as 'Phenol, alkylation products (mainly in para position) with C12-rich branched alkyl chains from oligomerisation, covering any individual isomers and/or combinations thereof (PDDP)', EC 310-154-3 / CAS 74499-35-7. Where it is present in this mixture at 0.1 % w/w or above, the communication obligations of REACH Articles 31 and 33 apply and notification to the ECHA SCIP database is required. Article 33 obliges the supplier to inform recipients on request, within 45 days and free of charge. - REACH Annex XIV (Authorisation List) and Annex XVII (Restriction List): no component listed. Candidate List inclusion does not itself require authorisation, but it is the route to it, so the status of PDDP is to be monitored. - A Unique Formula Identifier (UFI) and a poison centre notification under CLP Article 45 / Annex VIII are required for a classified mixture placed on the EU market. - Directive 2012/18/EU (Seveso III), Annex I: no named substances contained. An Aquatic Chronic 3 classification does not fall within hazard category E1 or E2, which require Aquatic Acute 1 or Aquatic Chronic 1 or 2.

Chemical inventory status	The components of this product are listed on, or exempt from, the inventories of the European Union (REACH) and the United States (TSCA). Status on other national inventories is available from ENERGY SPRING PTE LTD on request for the territory of supply.
Other national provisions	United States - Clean Water Act (CWA): this material is classified as an oil under Section 311 of the CWA and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters, must be reported to the EPA National Response Center at (800) 424-8802. United States - OSHA: the product carries the occupational exposure limit for mineral oil mist. Note that the OSHA Hazard Communication Standard, 29 CFR 1910.1200, does not adopt the aquatic hazard classes, so H412 does not appear on a US label. United States - SARA 302/304, SARA 311/312, SARA 313 and CERCLA: no component identified above de minimis or reportable levels. Ozone-depleting substances (40 CFR 82, Clean Air Act): this material does not contain, nor was it directly manufactured with, any Class I or Class II ozone-depleting substances.
15.2 Chemical safety assessment	No chemical safety assessment has been carried out for this mixture.

SECTION 16 - Other information

Performance level	Refer to the product technical data sheet for the service classification and any engine manufacturer approvals. Performance claims are commercial statements and form no part of the hazard classification.
Revision date	12 September 2026
Revision number	Rev. 0
Reason(s) for revision	First issue by Energy Spring Pte Ltd.
Reference(s)	Singapore Standard SS 586-2:2022 and SS 586-3:2022 (classification, labelling and safety data sheets for hazardous chemicals and dangerous goods). CLP Regulation 1272/2008, Annex I Parts 3 and 4 (classification criteria and summation methods) and Annex VI Part 3 Note L. SAE J300 (engine oil viscosity classification). IP 346 (DMSO extract). IMDG Code and ADR / RID (transport). Composition, component classification and physical data derive from the component suppliers' data. Classification of the mixture carried out by the calculation (summation) and generic cut-off methods using substance data; no testing on the finished mixture.
Recommended uses and restrictions on use	See Section 1.
Full text of hazard statements referred to in Sections 2 and 3	H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H317: May cause an allergic skin reaction. H318: Causes serious eye damage. H319: Causes serious eye irritation. H360F: May damage fertility. H400: Very toxic to aquatic life. H410: Very toxic to aquatic life with long lasting effects. H411: Toxic to aquatic life with long lasting effects. H412: Harmful to aquatic life with long lasting effects. H413: May cause long lasting harmful effects to aquatic life. EUH208: Contains [name of sensitising substance]. May produce an allergic reaction.
Training	Suitable training on the safe handling and storage of this product should be given to employees on the basis of all the information in this safety data sheet, with particular attention to eye protection during decanting, filling and draining, to the avoidance of skin contact with used oil, and to the prevention of release to drains and watercourses.

Abbreviations and acronyms	ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; API - American Petroleum Institute; Aquatic Acute / Chronic - hazardous to the aquatic environment, short-term / long-term; Asp. Tox. - aspiration hazard; ASTM - American Society for Testing and Materials; CAS - Chemical Abstracts Service; CLP - Classification, Labelling and Packaging Regulation; DMSO - dimethyl sulphoxide; DNEL - derived no-effect level; EC / EINECS - European Community number / European Inventory of Existing Commercial Chemical Substances; ED HH / ED ENV - endocrine disruptor, human health / environment; EmS - Emergency Schedule (IMDG); EUH - supplemental EU hazard statement; Eye Dam. / Eye Irrit. - serious eye damage / eye irritation; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IBC - intermediate bulk container, or International Bulk Chemical Code; IMDG - International Maritime Dangerous Goods; LD50 - lethal dose 50 %; M-factor - multiplying factor for aquatic classification; PBT - persistent, bioaccumulative and toxic; PEL - permissible exposure level; PG - packing group; PMT / vPvM - persistent, mobile and toxic / very persistent and very mobile; PNEC - predicted no-effect concentration; REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals; Repr. - reproductive toxicity; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SAE - Society of Automotive Engineers; SCIP - database on substances of concern in products; Skin Irrit. / Skin Sens. - skin irritation / skin sensitisation; STEL - short-term exposure limit; STOT - specific target organ toxicity; SVHC - substance of very high concern; TWA - time-weighted average; UFI - unique formula identifier; vPvB - very persistent and very bioaccumulative; ZDDP - zinc dialkyldithiophosphate.
Note on the scope of this data sheet	This data sheet covers NS MULTIX 15W-40 only. It must not be used for any other viscosity grade or any other product in the NS MULTIX range. A different viscosity grade would require the aspiration assessment in Section 2 to be redone against the 20.5 mm2/s cut-off, and a different additive treat rate would require the whole of Section 2 to be recalculated.

This dossier supplements the technical notifications for use, but does not replace them. The information which it contains is based on our knowledge relating to the product in question on the date indicated.

The information is given in good faith. The user's attention is also drawn to the possible risks incurred if a product is employed for uses other than those for which it was designed.

This information dossier does not, under any circumstances, discharge the user from the obligation of being aware of, and of applying, all the texts which govern his sphere of activity. He shall be solely responsible for taking the precautions associated with the use which he makes of the product.

All the statutory provisions referred to are intended simply to assist the recipient in fulfilling the obligations incumbent upon him. This enumeration must not be considered to be exhaustive. The recipient must ensure that no other obligations are incumbent upon him, as a result of texts other than those cited, relating to the holding and handling of the product, for which he alone is responsible.

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