

Inspectorate Antwerp NV
 Romeynsweel 14
 2030 Antwerpen
 Belgium
 Tel: +32 (0)3 546 08 88
 Fax: +32 (0)3 546 08 80
 operations@inspectorate.be
 www.inspectorate.com



INSPECTORATE

Certificate of Analysis

PRODUCT: Transformer oil Lyra X
BATCH NO: T415-180206
BATCH REF NO: N2018/1670/LN2300
DELIVERED FROM: Shoretank 415
DATE BATCH: 06-februari-2018
LOCATION: LBC - Antwerp

Analysis from shoretank performed by Inspectorate Antwerp NV:

Analysis	Method	Unit	Results
Density at 15°C (vac.)	ASTM D4052 / ISO 12185	kg/dm ³	0.8596
Density at 20°C (vac.)	ASTM D4052 / ISO 12185	kg/dm ³	0.8565
Viscosity at 40°C	ASTM D445 / ISO 3104	mm ² /s	9.286
Flash point, PM	ASTM D93A / ISO 2719	°C	151
Colour ASTM	ASTM D1500		L 0.5
Neutralization value	ASTM D974 / IEC 62021	mgKOH/g	< 0.01
Inhibitor content	IEC 60666	% b.w..	0.40
Interfacial tension at 25°C	ASTM D971 / EN 14210	mN/m	49.3

Ag-corrosion	DIN 51353		pending
Cu-corrosion	ASTM D1275		pending
Corrosive sulphur	IEC 62535		pending

RECEIVER: ETD Transformatory a.s.
 Plzen-Doudleveck, Czech Republic
CONTAINER: RCLU 135495-7
N ORDER NO: AT 503982
C ORDER NO: 04/2018/2 P3
QUANTITY: 27.100 M.Ton
SEALS IN USE: 368331-32-33-34-36
REMARKS:
ANALYSIS: 21.00 Hrs. 06-februari-2018
DATE LOADING: 06-februari-2018
OUR REF: N2018- 02270
LAB REF: LN / 02796
 364451

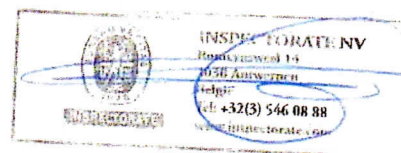
Results obtained by Inspectorate Antwerp NV on a representative sample after loading:

Analysis	Method	Unit	Results
Breakdown Voltage	IEC 60156	kV	59
Tan delta at 90°C	IEC 60247	decimals	0.0003
Water (Karl Fischer)	IEC 60814	ppm	8
Visual appearance	ASTM D4176		Clear&Bright, free from suspended matter

All test results in this CoA comply with specified limits in the corresponding Nynas AB Product Data Sheet (PDS).
 PCB compounds shall be none detectable, in accordance with methods ASTM D4059 or IEC 61619.
 For the latest PDS edition or for complete Nynas AB specifications regarding specific products, please visit www.nynas.com
 or contact your local sales contact.

Expire date / Shelf life,
 Provided the oil is stored in clean inert tanks at ambient temperatures below 40°C, in darkness, protected from exposure of moisture
 in any form, Nynas expect the oil to be within specification for minimum one year from the "DATE BATCH" as specified above.

Sign by Inspectorate Antwerp N.V. on behalf of Nynas AB
 Andy Beyers



Certified to ISO 9001
 Trade register Antwerp 333.309
 VAT nr. BE 0465 326 123

All services are rendered in accordance with Inspectorate Antwerp's General Terms and Conditions of Business, available on request.

Nytro Lyra X



SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	Nytro Lyra X
Product description	Insulating oil
Product type	Liquid.

1.2 Identified uses

Identified uses

Manufacture of substance- Industrial
 Distribution of substance- Industrial
 Formulation and (re)packing of substances and mixtures- Industrial
 Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.
 Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers.
 Use in formulations in lubricants- Industrial
 Use as lubricant in open and closed systems - Professional

1.3 Details of the supplier of the safety data sheet

Nynas AB	NYNAS-TECHNOL Handels-GmbH
P.O. Box 10700	Grieskai 16
SE-121 29 Stockholm	AUSTRIA
SWEDEN	A-8020 Graz
+46 8 602 12 00	+43 316 734 600
www.nynas.com	

e-mail address of person responsible for this SDS	ProductHSE@nynas.com
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1.4 Emergency telephone number

National advisory body/Poison Centre	
Telephone number	+44 (0) 1235 239 670
Hours of operation	24 hour service

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition	Mixture
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Classification according to Directive 1999/45/EC [DPD]

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

R52/53

Environmental hazards	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
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2.2 Label elements

Hazard symbol or symbols	
Indication of danger	
Risk phrases	R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety phrases	Not applicable.

2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII	No.
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Nytro Lyra X

SECTION 2: Hazards identification

Substance meets the criteria No.
for vPvB according to
Regulation (EC) No.
1907/2006, Annex XIII

SECTION 3: Composition/information on ingredients

Substance/mixture	Mixture	%	Classification		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	
Distillates (petroleum), hydrotreated light naphthenic	REACH #: 01-2119480375-34 EC: 265-156-6 CAS: 64742-53-6 Index: 649-466-00-2	50 - 100	Not classified.	Asp. Tox. 1, H304	-
Distillates (petroleum), hydrotreated light paraffinic	REACH #: 01-2119487077-29 EC: 265-158-7 CAS: 64742-55-8 Index: 649-468-00-3	0 - 50	Not classified.	Asp. Tox. 1, H304	-
Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based	REACH #: 01-2119474889-13 EC: 276-738-4 CAS: 72623-87-1 Index: 649-438-00-5	0 - 50	Not classified.	Asp. Tox. 1, H304	-
Distillates (petroleum), hydrotreated heavy paraffinic	REACH #: 01-2119484627-25 EC: 265-157-1 CAS: 64742-54-7 Index: 649-467-00-8	0 - 50	Not classified.	Asp. Tox. 1, H304	-
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	REACH #: 01-2119474878-16 EC: 276-737-9 CAS: 72623-86-0 Index: 649-482-00-X	0 - 30	Not classified.	Asp. Tox. 1, H304	-
2,6-di-tert-butyl-p-cresol	REACH #: 01-2119555270-46 EC: 204-881-4 CAS: 128-37-0	<0.4	N; R50/53 See Section 16 for the full text of the R-phrases declared above.	Aquatic Acute 1, H400 Aquatic Chronic 1, H410 See Section 16 for the full text of the H statements declared above.	[1] [2]

Annex I Nota L applies to the base oil(s) in this product. Nota L - The classification as a carcinogen need not apply if it can be shown that the substance contains less than 3 % DMSO extract as measured by IP 346.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

SECTION 4: First aid measures

Inhalation	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If casualty is unconscious and: If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Immediately obtain specialist medical assessment and treatment for the casualty.
Skin contact	Remove contaminated clothing and shoes. Wash with soap and water. Handle with care and dispose of in a safe manner. Seek medical attention if skin irritation, swelling or redness develops and persists. Accidental high pressure injection through the skin requires immediate medical attention. Do not wait for symptoms to develop.
Ingestion	Always assume that aspiration has occurred. Do not induce vomiting as there is high risk of aspiration. Never give anything by mouth to an unconscious person. Seek professional medical attention or send the casualty to a hospital. Do not wait for symptoms to develop.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	Eye contact may cause redness and transient pain.
Inhalation	Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness.
Skin contact	No known significant effects or critical hazards.
Ingestion	If viscosity <20,5 cSt, risk of aspiration. Aspiration hazard if swallowed. Can enter lungs and cause damage. Ingestion (swallowing) of this material may result in an altered state of consciousness and loss of coordination.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	Due to low viscosity there is a risk of aspiration if the product enters the lungs. Ingestion (swallowing) of this material may result in an altered state of consciousness and loss of coordination. Treat symptomatically.
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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media

Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture In a fire or if heated, a pressure increase will occur and the container may burst. This substance will float and can be reignited on surface water.

Hazardous combustion products

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H₂S, SO_x (sulfur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

5.3 Advice for firefighters

Special precautions for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. This material is harmful to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

SECTION 5: Firefighting measures

Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
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SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel	Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency. Stop leak if safe to do so. Avoid direct contact with the product. Stay upwind/keep distance from source. In case of large spillages, alert occupants in downwind areas.
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Eliminate all ignition sources if safe to do so. Spillages of limited amounts of product, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which will presumably limit the exposure to dangerous concentrations.

Note : recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken.

For emergency responders	Small spillages: normal antistatic working clothes are usually adequate.
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Large spillages: full body suit of chemically resistant and thermal resistant material should be used. Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Note : gloves made of PVA are not water-resistant, and are not suitable for emergency use. Safety helmet, antistatic non-skid safety shoes or boots. Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated.

Respiratory protection : A half or full-face respirator with filter(s) for organic vapours (and when applicable for H₂S) a Self Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

6.2 Environmental precautions

Water polluting material. May be harmful to the environment if released in large quantities. Prevent product from entering sewers, rivers or other bodies of water. If necessary dike the product with dry earth, sand or similar non-combustible materials. In case of soil contamination, remove contaminated soil and treat in accordance with local regulations. In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents.

If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities.

6.3 Methods and materials for containment and cleaning up

Small spill	Stop leak if without risk. Absorb spilled product with suitable non-combustible materials.
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Large spill	Large spillages may be cautiously covered with foam, if available, to limit vapour cloud formation. Do not use water jet. When inside buildings or confined spaces, ensure adequate ventilation. Transfer collected product and other contaminated materials to suitable containers for recovery or safe disposal.
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SECTION 6: Accidental release measures

6.4 Reference to other sections	See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.
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SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

General information	Obtain special instructions before use. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use and store only outdoors or in a well-ventilated area. Avoid release to the environment.
7.1 Precautions for safe handling	
Protective measures	Do not ingest. Avoid contact with skin. Avoid breathing fume/mist. Do not breathe vapour. Use personal protective equipment as required. Prevent the risk of slipping. Take precautionary measures against static discharge. Avoid splash filling of bulk volumes when handling hot liquid product. Use only bottom loading of tankers, in compliance with European legislation. Note: see section 8 for personal protective equipment and section 13 for waste disposal.
Advice on general occupational hygiene	Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash hands thoroughly after handling. Change contaminated clothes at the end of working shift.
7.2 Conditions for safe storage, including any incompatibilities	Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Storage installations should be designed with adequate bunds in case of leaks or spills. Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations. Use personal protective equipment as required. Store separately from oxidising agents. Recommended materials for containers, or container linings use mild steel, stainless steel. Not suitable : Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer. Keep only in the original container or in a suitable container for this kind of product. Keep containers tightly closed and properly labelled. Protect from sunlight. Empty containers may contain harmful, flammable/combustible or explosive residue or vapours. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters	
<u>Occupational exposure limits</u>	

Nytro Lyra X

SECTION 8: Exposure controls/personal protection

Product/ingredient name 2,6-di-tert-butyl-p-cresol	Exposure limit values GKV_MAK (Austria, 12/2011). TWA: 10 mg/m ³ 8 hour(s).
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Recommended monitoring procedures If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Derived effect levels

Product/ingredient name	Type	Exposure	Value	Population	Effects
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Predicted effect concentrations

No PECs available.

8.2 Exposure controls

Appropriate engineering controls Mechanical ventilation and local exhaust will reduce exposure via the air. Use oil resistant material in construction of handling equipment. Store under recommended conditions and if heated, temperature control equipment should be used to avoid overheating.

Individual protection measures

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location. Wash contaminated clothing before reuse.

Eye/face protection If potential exists for splashing, use goggles.

Skin protection

Hand protection Wear oil-resistant protective gloves (e.g. nitril rubber). PVC gloves. Neoprene gloves.

Body protection Wear protective clothing if there is a risk of skin contact. Change contaminated clothes at the end of working shift.

Other skin protection Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary.

Environmental exposure controls Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	Liquid.
Colour	Light yellow
Odour	Odourless/Light petroleum.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	-48°C
Initial boiling point and boiling range	>250°C
Flash point	Closed cup: >140°C [Pensky-Martens.]

SECTION 9: Physical and chemical properties

Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	160 Pa @ 100 °C
Vapour density	Not available.
Density	0,87 g/cm ³ [15°C]
Solubility(ies)	Insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	>270°C
Decomposition temperature	>280°C
Viscosity	Kinematic (40°C): 0,093 cm ² /s (9,3 cSt)
Explosive properties	Not available.
Oxidising properties	Not available.
DMSO extractable compounds for base oil substance(s) according to IP346	< 3%

SECTION 10: Stability and reactivity

10.1 Reactivity	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	Stable under normal conditions.
10.3 Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H ₂ S, SO _x (sulfur oxides) or sulfuric acid and unidentified organic and inorganic compounds.
10.4 Conditions to avoid	Oxidising agent.
10.5 Incompatible materials	Keep away from extreme heat and oxidizing agents.
10.6 Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including carbon monoxide, H ₂ S, SO _x (sulfur oxides) or sulfuric acid and unidentified organic and inorganic compounds.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Distillate (petroleum), hydrotreated light naphthenic	LC50 Inhalation Dusts and mists	Rat	>5,53 mg/l	4 hours
	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
Distillate (petroleum), Hydrotreated Light Paraffinic	LC50 Inhalation Dusts and mists	Rat	>5,53 mg/l	4 hours
	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
Distillates (petroleum), hydrotreated heavy	LC50 Inhalation Dusts and	Rat	>5,53 mg/l	4 hours

Nytro Lyra X

SECTION 11: Toxicological information

paraffinic 2,6-di-tert-butyl-p-cresol	mists LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-

Irritation/Corrosion

Skin Non-irritating to the skin.
Eyes Mild irritant.

Respiratory Not available.

Sensitiser

Skin Non-sensitiser to skin.

Carcinogenicity

Conclusion/Summary No carcinogenic effect.

Aspiration hazard

Potential acute health effects

Inhalation Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness.

Ingestion If viscosity <20,5 cSt, risk of aspiration. Aspiration hazard if swallowed. Can enter lungs and cause damage. Ingestion (swallowing) of this material may result in an altered state of consciousness and loss of coordination.

Skin contact No known significant effects or critical hazards.

Eye contact Eye contact may cause redness and transient pain.

Potential chronic health effects

Chronic effects No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Other information Not available.

Specific hazard

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Distillate (petroleum), hydrotreated light naphthenic	Acute IC50 >100 mg/l	Algae	48 hours
	Acute LC50 >100 mg/l	Fish	96 hours
Distillate (petroleum), Hydrotreated Light Paraffinic	Acute IC50 >100 mg/l	Algae	48 hours
	Acute LC50 >100 mg/l	Fish	96 hours
Distillates (petroleum), hydrotreated heavy paraffinic	Acute EC50 >100 mg/l	Fish	96 hours
	Acute IC50 >100 mg/l	Algae	48 hours
2,6-di-tert-butyl-p-cresol	Acute EC50 1440 ug/L Fresh water	Daphnia - Daphnia pulex - Neonate - <24 hours	48 hours
			48 hours

Conclusion/Summary The product contains environmentally hazardous components and is classified as harmful to the environment.

12.2 Persistence and degradability

SECTION 12: Ecological information

12.3 Bioaccumulative potential

Conclusion/Summary The product has a potential to bioaccumulate.

12.4 Mobility in soil

Mobility Insoluble in water.

12.5 Results of PBT and vPvB assessment

No.

No.

12.6 Other adverse effects

Spills may form a film on water surfaces causing physical damage to organisms.
Oxygen transfer could also be impaired.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal

Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended. This substance can be burned or incinerated, subject to national/local authorizations, relevant contamination limits, safety regulations and air quality legislation. Contaminated or waste substance (not directly recyclable): Disposal can be carried out directly, or by delivery to qualified waste handlers. National legislation may identify a specific organization, and/or prescribe composition limits and methods for recovery or disposal.

Hazardous waste

Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Packaging

Methods of disposal

The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions

SECTION 14: Transport information**International transport regulations**

This product is not regulated for carriage according to ADR/RID, ADN, IMDG, ICAO/IATA.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)Annex XIV - List of substances subject to authorisationSubstances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not applicable.

Other EU regulations

Europe inventory

All components are listed or exempted.

Austria

Limitation of the use of organic solvents

Permitted.

Nytro Lyra X

SECTION 15: Regulatory information

15.2 Chemical Safety Assessment This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Revision comments Not available.

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Asp. Tox. 1, H304

Aquatic Chronic 3, H412

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Asp. Tox. 1, H304 Aquatic Chronic 3, H412	Calculation method Calculation method

Full text of abbreviated H statements H304 May be fatal if swallowed and enters airways.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.
 H412 Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] Aquatic Acute 1, H400 AQUATIC TOXICITY (ACUTE) - Category 1
 Aquatic Chronic 1, H410 AQUATIC TOXICITY (CHRONIC) - Category 1
 Aquatic Chronic 3, H412 AQUATIC TOXICITY (CHRONIC) - Category 3
 Asp. Tox. 1, H304 ASPIRATION HAZARD - Category 1

Full text of abbreviated R phrases R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD] N - Dangerous for the environment

Date of printing 2013-02-13.

Date of issue/ Date of revision 2013-02-13.

Date of previous issue 2012-12-11.

Version 1.01

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Identification of the substance or mixture

Product definition	Mixture
Product name	Nytro Lyra X

Section 1 - Title

Short title of the exposure scenario	Use in formulations in lubricants- Industrial (2,6-di-tert-butyl-p-cresol)
List of use descriptors	<p>Identified use name: Use in formulations in lubricants- Industrial</p> <p>Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09</p> <p>Substance supplied to that use in form of: As such</p> <p>Sector of end use: SU03, SU10</p> <p>Subsequent service life relevant for that use: No.</p> <p>Environmental Release Category: ERC02</p> <p>Market sector by type of chemical product: PC17, PC24, PC25</p>
Environmental contributing scenarios	
Health Contributing scenarios	

Number of the ES	Not applicable.
Industry Association	Not applicable.
Generic exposure scenario	Not applicable.
Processes and activities covered by the exposure scenario	Covers the use of formulated lubricants within closed or contained systems including incidental exposures during material transfers, operation of machinery/engines and similar articles, equipment maintenance and disposal of wastes.
Additional information	Industrial

Section 2 - Exposure controls

Product Characteristics	<p>solid</p> <p>Melting/Freezing Point (°C): 69.8</p>
Concentration of substance in mixture or article	≤100%
Amounts used	Annual site tonnage (tonnes/year): 110 t/a
Frequency and duration of use	Continuous release.(d/a): 300
Environmental factors not influenced by risk management	<p>Local freshwater dilution factor: 10</p> <p>Receiving surface water flow is 18000 m³/d.</p> <p>Local marine water dilution factor: 100</p>
Other operational conditions of use affecting environmental exposure	Not applicable.
Technical conditions and measures at process level (source) to prevent release	<p>% Release fraction to wastewater from process (initial release prior to RMM): 0.2</p> <p>% Release fraction to air from process (initial release prior to RMM): 0.01</p> <p>% Release fraction to soil from process (initial release prior to RMM): 0</p>
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	<p>On-site wastewater treatment required.</p> <p>Ensure all waste water is collected and treated via a waste water treatment plant.</p> <p>Floors should be impervious, resistant to liquids and easy to clean.</p>
Organisational measures to prevent/limit release from site	Ensure operatives are trained to minimise exposure.
Conditions and measures related to municipal sewage treatment plant	Size of industrial sewage treatment plant (m3/d): 2000

Section 2 - Exposure controls

Conditions and measures related to external treatment of waste for disposal	No special measures are required. General information, See section 13 for waste disposal information.
Conditions and measures related to external recovery of waste	See section 13 for waste disposal information.

Contributing exposure scenario controlling worker exposure for 0:

Product Characteristics	Melting/Freezing Point (°C): 69.8
Concentration of substance in mixture or article	≤100%
Physical state	solid
Dust	Solid, medium dustiness.
Frequency and duration of use	Exposure duration per day: 8 h (full shift). Exposure duration per year: 230 d
Human factors not influenced by risk management	Respiratory (m ³ /d): 10
Other operational conditions affecting worker exposure	The product should be handled at room temperature.
Technical conditions and measures at process level (source) to prevent release	No special measures required.
Technical conditions and measures to control dispersion from source towards the worker	Handle only in a place with local exhaust ventilation (or other adequate ventilation).
Organisational measures to prevent/limit releases, dispersion and exposure	Ensure operatives are trained to minimise exposure.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	Wear protective clothing. See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website: Not available.

Exposure estimation and reference to its source - Environment: 2:

Exposure assessment (environment):	Used EUSES model.(v2.1).
Exposure estimation	Risk characterisation ratio (PEC/PNEC): <1

Exposure estimation and reference to its source - Workers: 1:

Exposure assessment (human):	Used ECETOC TRA model. (04/2010)
Exposure estimation	Risk characterisation ratio DNELs <1

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Environment	Not available.
Health	Not available.

Environment Not applicable.

Nytro Lyra X

Use in formulations in lubricants- Industrial (2,6-di-tert-butyl-
p-cresol)

Health

Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.
See Section 8 for information on appropriate personal protective equipment.

Identification of the substance or mixture

Product definition	Mixture
Product name	Nytro Lyra X

Section 1 - Title

Short title of the exposure scenario	Use as lubricant in open and closed systems- Professional (2,6-di-tert-butyl-p-cresol)
List of use descriptors	<p>Identified use name: Use as lubricant in open and closed systems - Professional</p> <p>Process Category: PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC11, PROC13</p> <p>Substance supplied to that use in form of: As such</p> <p>Sector of end use: SU22</p> <p>Subsequent service life relevant for that use: No.</p> <p>Environmental Release Category: ERC08a, ERC08d, ERC09a, ERC09b</p> <p>Market sector by type of chemical product: PC17, PC24</p>

Environmental contributing scenarios
Health Contributing scenarios

Number of the ES	Not applicable.
Industry Association	Not applicable.
Generic exposure scenario	Not applicable.
Processes and activities covered by the exposure scenario	Covers the use of formulated lubricants in closed and open systems including transfer operations, operation of engines and similar articles, reworking on reject articles, equipment maintenance and disposal of waste oil.
Additional information	Professional

Section 2 - Exposure controls

Product Characteristics	solid Melting/Freezing Point (°C): 69.8
Concentration of substance in mixture or article	≤2%
Amounts used	Annual site tonnage (tonnes/year): ≤0.16 t/a (Closed system) ≤0.03 t/a (open systems)
Frequency and duration of use	Continuous release.(d/a): 300
Environmental factors not influenced by risk management	Local freshwater dilution factor: 10 Receiving surface water flow is 18000 m³/d. Local marine water dilution factor: 100
Other operational conditions of use affecting environmental exposure	Not applicable.
Technical conditions and measures at process level (source) to prevent release	% Release fraction to wastewater from process (initial release prior to RMM): 0.2 % Release fraction to air from process (initial release prior to RMM): 0.01 % Release fraction to soil from process (initial release prior to RMM): 1
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil	On-site wastewater treatment required. Ensure all waste water is collected and treated via a waste water treatment plant. Floors should be impervious, resistant to liquids and easy to clean.
Organisational measures to prevent/limit release from site	Ensure operatives are trained to minimise exposure.
Conditions and measures related to municipal sewage treatment plant	Size of industrial sewage treatment plant (m³/d): 2000

Section 2 - Exposure controls

Conditions and measures related to external treatment of waste for disposal	No special measures are required. See section 13 for waste disposal information.
Conditions and measures related to external recovery of waste	See section 13 for waste disposal information.

Contributing exposure scenario controlling worker exposure for 0:

Product Characteristics	Melting/Freezing Point (°C): 69.8
Concentration of substance in mixture or article	≤2%
Physical state	solid
Dust	Solid, medium dustiness.
Frequency and duration of use	Exposure duration per year: 230 days Exposure duration per day: 8 h (full shift).
Human factors not influenced by risk management	Respiratory m ³ /d: 10
Other operational conditions affecting worker exposure	The product should be handled at room temperature. Lubricants (Closed system)
Technical conditions and measures at process level (source) to prevent release	No special measures required.
Technical conditions and measures to control dispersion from source towards the worker	Handle only in a place with local exhaust ventilation (or other adequate ventilation).
Organisational measures to prevent/limit releases, dispersion and exposure	Ensure operatives are trained to minimise exposure.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection	Wear protective clothing. See Section 8 of the safety data sheet (personal protective equipment).

Section 3 - Exposure estimation and reference to its source

Website: Not available.

Exposure estimation and reference to its source - Environment: 2:

Exposure assessment (environment):	Used EUSES model. (v2.1)
Exposure estimation	Risk characterisation ratio (PEC/PNEC): <1

Exposure estimation and reference to its source - Workers: 1:

Exposure assessment (human):	Used ECETOC TRA model.
Exposure estimation	Risk characterisation ratio DNELs <1

Section 4 - Guidance to Downstream User to evaluate if he works inside the boundaries set by the ES

Environment	Not available.
Health	Not available.

Environment	Not available.
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Date of issue/Date of revision	ES Revision date)
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15/16

Nytro Lyra X

Use as lubricant in open and closed systems- Professional
(2,6-di-tert-butyl-p-cresol)

Health

Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.
See Section 8 for information on appropriate personal protective equipment.

Nytro Lyra X

High performance insulating oil

An inhibited high-grade oil, Nytro Lyra X conforms to IEC 60296 Edition 4.0 – including the fulfilment of specific requirements for special applications. Developed and formulated to deliver strong resistance to oil degradation, Nytro Lyra X provides excellent oxidation stability for a longer transformer life with less maintenance.

Designed for heavy duty

This product has been specially developed for use in oil-filled electrical equipment – including power and distribution transformers, rectifiers, circuit breakers and switchgears.

Performance and benefits

Very good heat transfer. Thanks to low viscosity and viscosity index, this high grade offers extremely good heat transfer characteristics, ensuring heat is efficiently removed from core and windings.

Excellent oxidation stability. Developed and formulated to deliver superb resistance to oil degradation, this grade provides excellent oxidation stability for enhanced transformer life and minimum maintenance.

Very good low temperature properties. Naphthenic characteristics allow the transformer to start at the lowest possible temperature – without using pour point depressants.

High dielectric strength. This insulating oil both meets and exceeds the toughest demands on dielectric strength – when stored and handled correctly.

Product description

Nytro Lyra X fulfils the requirements for IEC 60296 Edition 4.0 fully inhibited oil. Nynas classify this product as a high grade.

Nytro Lyra X is rigorously analysed and passes the following corrosion tests:

- ASTM D1275 method B
- IEC 62535
- DIN 51353

In accordance with IEC 60296 Edition 4.0, all additives are declared.

There's more to us than this

We're delighted you chose one of our transformer oils. If you have any questions about other products and services, get in touch with your local Nynas contact. Besides top quality oils, we offer a wide range of services, including rapid delivery worldwide, sample analysis, training, seminars and much more. All you have to do is ask. Find out more at www.nynas.com



PROPERTY	UNIT	TEST METHOD	SPECIFICATION LIMITS		TYPICAL DATA
			MIN	MAX	
1 - Function					
Viscosity, 40°C	mm ² /s	ISO 3104		12.0	9.3
Viscosity, -30°C	mm ² /s	ISO 3104		1800	926
Pour point	°C	ISO 3016		-40	-48
Water content	mg/kg	IEC 60814		30	<20
Breakdown voltage					
- Before treatment	kV	IEC 60156	30		40-60
- After treatment	kV	IEC 60296	70		>70
Density, 20°C	kg/dm ³	ISO 12185		0.895	0.870
DDF at 90°C		IEC 60247		0.005	<0.001
2 - Refining/stability					
Appearance		IEC 60296	Clear, free from sediment		complies
Acidity	mg KOH/g	IEC 62021		0.01	<0.01
Interfacial tension	mN/m	EN 14210	40		50
Total sulphur content	%	ISO 14596		0.05	0.01
Corrosive sulphur		DIN 51353	non-corrosive		non-corrosive
Potentially corrosive sulphur		IEC 62535	non-corrosive		non-corrosive
Corrosive sulphur		ASTM D 1275 B	non-corrosive		non-corrosive
DBDS	mg/kg	IEC 62697-1		not detectable	not detectable
Antioxidant	wt %	IEC 60666	0.08	0.4	0.38
Metal passivator additives	mg/kg	IEC 60666		not detectable	not detectable
2-Furfural and related compounds content	mg/kg	IEC 61198		0.05	<0.05
Aromatic content	%	IEC 60590			5
3 - Performance					
Oxidation stability at 120°C,500 h		IEC 61125 C			
Total acidity	mg KOH/g			0.3	0.06
Sludge	wt %			0.05	<0.02
DDF at 90°C				0.050	0.020
4 - Health, safety and environment (HSE)					
Flash point, PM	°C	ISO 2719	135		152
PCA	wt %	IP 346		3	<3
PCB		IEC 61619	not detectable		not detectable

Nyro Lyra X is an inhibited insulating oil with extremely good electrical and excellent ageing properties meeting IEC 60296 Ed.4 (2012), special applications.

Severely Hydrotreated Insulating Oil
 Issuing date: 2012-04-01

