1. PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>Company:</th>
<th>REPSOL YPF Lubricantes y Especialidades, S.A.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial name:</td>
<td>REPSOL SINTÉTICO THOR 68</td>
</tr>
<tr>
<td>Chemical name:</td>
<td>Lubricant oil.</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>Synthetic lubricant oil for compressors.</td>
</tr>
<tr>
<td>Molecular formula:</td>
<td>Synthetic base stocks and additives.</td>
</tr>
<tr>
<td>CAS #:</td>
<td>NP</td>
</tr>
<tr>
<td>EC (EINECS)#:</td>
<td>NP</td>
</tr>
<tr>
<td>annex I (Dir. 67/548/EEC) #:</td>
<td>NP</td>
</tr>
</tbody>
</table>

Address: Glorieta del Mar Caribe N°1. 28043 Madrid
Tel#: 34 913489400
Fax#: +34 913483610
e-mail address: FDSRCPP@repsol.com

2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>PHYSICAL / CHEMICAL</th>
<th>TOXICITY (SYMPTOMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighter than water. It can obstruct sewers and water intakes.</td>
<td><strong>Inhalation</strong>: Short-term exposures to vapours and oil mists cause irritation of the respiratory tract. Long-term exposures can cause lung fibrosis preceded by broncho-pulmonary symptoms.</td>
</tr>
<tr>
<td>Combustible.</td>
<td><strong>Ingestion/Aspiration</strong>: Intestinal absorption is very low. Accidental intake of large amounts causes irritation of the gastrointestinal tract, nausea, vomiting and diarrhoea.</td>
</tr>
<tr>
<td><strong>Contact skin/eyes</strong>: Low skin percutaneous toxicity in short-term exposures. Long-term exposures produce smarting, redness, irritation and dermatitis due to defatting of the keratyn layer. Repeated exposure to vapours or liquid cause irritation.</td>
<td><strong>General toxic effects</strong>: Mild skin irritation and respiratory tract irritation are the most common effects.</td>
</tr>
</tbody>
</table>

3. COMPOSITION

**General composition**: Additivated lubricant oil. Complex combination based on synthetic esters and polyalphaolefins. Contains specific additives including antioxidants, copper passivator, anticorrosion, antiwearing and antifoaming agents.

<table>
<thead>
<tr>
<th>Dangerous components</th>
<th>Range %</th>
<th>Classification</th>
<th>S Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 4. FIRST-AID MEASURES

**Inhalation:** In case of inhalation remove the victim to fresh air. Administer oxygen if necessary. Call for medical attention.

**Ingestion/Aspiration:** Do not induce vomiting. If conscious have the victim drink water.

**Contact skin/eyes:** Flush with plenty of water and soap. Flush with plenty of water during at least 15 minutes. Call for medical aid.

**General measures:** Call for medical attention.

## 5. FIRE-FIGHTING MEASURES

**Extinguishing agents:** Foams, dry chemicals, CO\(_2\), water spray.

**Non suitable extinguishing agents:** Water applied directly may be ineffective due to dispersion of the material.

**Combustion products:** CO\(_2\), H\(_2\)O, CO (in defct of air), nitrogen oxides.

**Special measures:** Not required.

**Special hazards:** NP

**Protective equipment:** Heat-resistant suit and gloves. Self-contained breathing apparatus.

## 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions:** Hazard of physical fouling to coasts, soils, etc. due to low solubility and high viscosity of the oils. Avoid the material entering water intakes.

**Personal precautions:** Avoid prolonged contact with contaminated clothes or with the product and inhalation of vapours and mists.

**Cleanup methods:** Treat as an accidental oil spill or leak; Avoid dispersion of the material with mechanical barriers. Remove with physical or chemical treatment.

**Personal protection:** Suitable protective clothing, gloves and goggles should be worn during the clean up operation.

## 7. HANDLING AND STORAGE

**Handling:**

- **General precautions:** Avoid prolonged contact and inhalation of mists and vapours from heated oils. During transfer avoid contact with air, use pumps and connections properly earthed to prevent generation of electrostatic charges. The contaminated air should be filtered before discharge.

- **Specific conditions:** Safety goggles and gloves should be used. Do not weld or carry out any activity that could generate sparks in areas close to product storage. Do not weld in empty tanks without previous purging.

**Storage:**

- **Temperature and decomposition products:** NP

- **Dangerous reactions:** NP

- **Storage conditions:** Containers properly labelled and sealed, placed in cool and well ventilated areas. Do not smoke, weld or do any work which can produce flames or sparks in storage area.

- **Incompatible materials:** Strong oxidants.

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REPSOL SINTÉTICO THOR 68

**Rev.:** 1.0  **Date:** March 2\(^{nd}\) 2011  **Doc:** 33/3763/5D.02  2 de 5
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protection: 

Eye protection: Safety goggles to avoid splashes.

Respiratory protection: The product is slightly volatile at room temperature and does not present special risks. In presence of heated oils, wear protective masks to avoid vapour inhalation.

Skin protection: Gloves (polyethylene, polyvinyl chloride and neoprene; do not use neither natural nor butyl rubber)

Other protective equipment: Showers and eye-washers in the working area.

General precautions: Avoid prolonged contact and inhalation of mists and vapours from heated oils. Local exhaust ventilation should be installed to capture and remove emissions near to the point of generation.

Specific hygiene measures: Contaminated footwear should be discarded. Contaminated clothing should not be taken home for laundering. Regular changing of underwear is also important if penetration of outer clothing occurs. Disposable wipes should be used. Washing/Showering facilities with a non-solvent based skin cleaner, hot water and soap must be provided and used. Use skin reconditioning cream after work.

Exposure controls:

TLV/TWA (ACGIH): 5mg/m³ (Oil mist)
UK: OEL-TWA (COSHH): 5mg/m³; OEL-STE: 10mg/m³ (Oil mist)

9. PHYSICAL AND CHEMICAL PROPERTIES

| Appearance: | Amber liquid. |
| pH: | NP |
| Colour: | 1.5 (ASTM D-1500) |
| Odour: | Lube oil. |
| Boiling point: | NP |
| Melting/Freezing point: | -24 °C max. (ASTM D-97) |
| Flash point: | 240 °C (ASTM D-92) |
| Autoignition temperature: | NP |
| Explosive properties: | NP |
| Oxidizing properties: | NP |
| Vapour pressure: | < 0.1 mm Hg at 25 °C |
| Density: | 0.9324 g/cm³ typical at 15 °C |
| Surface tension: | NP |
| Viscosity: | 10.8 cSt (100 °C) Typical 68 cSt (40 °C) Typical |
| Vapour density: | NP |
| Partition coefficient (n-octanol/water): | NP |
| Water solubility: | Insoluble. |
| Solubility: | Organic solvents. |
| Other data: | Fire point: 270 °C min. (ASTM D-92) |

10. STABILITY AND REACTIVITY

Stability: Stable at room temperature.

Conditions to avoid: Exposure to open flames.

Materials to avoid: Strong oxidants.

Hazardous decomposition/combustion products: NP

Polymerization risk: NP

Conditions to avoid: NP
11. TOXICOLOGICAL INFORMATION

**Routes of exposure:** Contact with skin, eyes and inhalation. Ingestion is not frequent.

**Acute and chronic effects:** No malignant acute effects are known. Irritation by contact with liquid and prolonged inhalation of vapours or oil mists are the most common effects.

**Carcinogenicity:** NP

**Reproductive toxicity:** No evidences.

**Medical conditions which increase hazard to exposure:** Respiratory tract deficiencies and dermatological problems.

12. ECOLOGICAL INFORMATION

**Pollutant potential:**

*Persistence and degradability:* The material is oily and viscous and floats on water. It presents a high physical fouling potential, mainly in sea-spills; by contact destroys small aquatic organisms and makes living difficult for upper organisms, not allowing the sunlight to reach underlying marine ecosystems, affecting its normal development. It is not readily biodegradable.

*Mobility/bioaccumulative potential:* There are no data to indicate that the product is significantly bioaccumulated by aquatic organisms or incidence in the trophic food chain, although it may cause long-term adverse effects in the aquatic environment, due to its high physical fouling potential.

**Ecotoxicological effects:** Dangerous for aquatic life in high concentrations (spillages).

13. DISPOSAL CONSIDERATIONS

**Disposal methods (surplus):** Recycling and recovery of base oils when possible.

**Waste:** Liquids and solids from industrial process; do not attempt to clean containers since residue is difficult to remove; dispose in a safe way.

*Disposal:* Only in specific prepared and controlled areas. Avoid releasing waste oils to sewers because they can destroy water treatment plant microorganisms.

*Handling:* Labelled and sealed containers. Avoid direct contact with waste oils.

*Provisions:* Companies which recover, dispose, store, transport or handle waste should comply with Dir. 2008/98/EC on waste, or other local, national or community provisions.
14. TRANSPORT INFORMATION

Special precautions: Stable at room temperature and during transport. Store in cool well ventilated areas.

Additional information:

<table>
<thead>
<tr>
<th>UN Number: NP</th>
<th>ADR/RID: Not classified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard identification number: NP</td>
<td>IATA-DGR: Not classified</td>
</tr>
<tr>
<td>Proper shipping name: NP</td>
<td>IMDG: Not classified</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

CLASSIFICATION
NP

LABELLING
Symbols: NP

Phrases R
NP

Phrases S
NP

Other regulations: NP

16. OTHER INFORMATION

Data Bases consulted
EINECS: European Inventory of Existing Commercial Substances.
TSCA: Toxic Substances Control Act, US Environmental Protection Agency
RTECS: US Dept. of Health & Human Services

Legislation consulted
Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
Dir. 67/548/EEC about classification, labelling and packaging of dangerous substances (including amendments and adaptations in force).
Dir. 1999/45/EC about classification, labelling and packaging of dangerous preparations (including amendments and adaptations in force).
Dir. 91/689/EEC dangerous waste; Dir. 2008/98/EG waste management.
Royal Decree 363/95: Regulation about notification of new substances and classification, packaging and labelling of dangerous substances.
Royal Decree 255/2003: Regulation about classification, packaging and labelling of dangerous preparations.
European Agreement concerning the international carriage of dangerous goods by road (ADR).
Regulation on the international transport of dangerous goods on the railway. (RID)
International maritime code of dangerous goods. (IMDG)
International Air Transport Association (IATA) regulation pertaining to air shipment.

Glossary
CAS: Chemical Abstract Service
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists.
TLV: Threshold Limit Value
TWA: Time Weighted Average
STEL: Short-term Exposure Level
REL: Recommendable Exposure Limit
PEL: Permissible Exposure Limit
INSHT: Instituto Nal. de Seguridad e Higiene en el Trabajo
VLA-ED: Valor Limite Ambiental – Exposición Diaria
VLA-EC: Valor Limite Ambiental – Exposición Corta
LD_{50}: Lethal Dose Medium
LC_{50}: Lethal Concentration Medium
EC_{50}: Effective Concentration Medium
IC_{30}: Inhibitory Concentration Medium
BOD: Biological Oxygen Demand.
NP: Not Pertinent

The information given in this document has been compiled based on the best existing information sources, latest available knowledge and according to the current requirements on classification, packaging and labelling of hazardous substances. It does not imply the information is exhaustive or accurate in all cases. It is the user’s responsibility to determine the validity of the information contained in this Material Safety Data Sheet to apply depending on the case.