Safety data sheet

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

1.1. Product identifier

Efka® PL 5646

Chemical name: 1,2-Cyclohexanedicarboxylic acid, diisononyl ester
CAS Number: 166412-78-8
REACH registration number: 01-0000017810-74-0001, 01-0000017810-74

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Coating raw material for industrial applications

1.3. Details of the supplier of the safety data sheet

Company: BASF SE
67056 Ludwigshafen
GERMANY

Contact address: BASF plc
PO Box 4, Earl Road, Cheadle Hulme,
Cheadle, Cheshire
SK8 6QG, UNITED KINGDOM

Telephone: +44 161 485-6222
E-mail address: product-safety-north@basf.com

1.4. Emergency telephone number

International emergency number:
Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture
According to Regulation (EC) No 1272/2008 [CLP]

No need for classification according to GHS criteria for this product.

**2.2. Label elements**

Globally Harmonized System, EU (GHS)

The product does not require a hazard warning label in accordance with GHS criteria.

**2.3. Other hazards**

According to Regulation (EC) No 1272/2008 [CLP]

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

See section 12 - Results of PBT and vPvB assessment.

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**SECTION 3: Composition/Information on Ingredients**

**3.1. Substances**

**Chemical nature**

1,2-Cyclohexanedicarboxylic acid, diisononyl ester  
CAS Number: 166412-78-8  
EC-Number: 431-890-2

**3.2. Mixtures**

Not applicable

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**SECTION 4: First-Aid Measures**

**4.1. Description of first aid measures**

Remove contaminated clothing.

If inhaled:
If difficulties occur after vapour/aerosol has been inhaled, remove to fresh air and seek medical attention.

On skin contact:
Wash thoroughly with soap and water.
On contact with eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open.

On ingestion:
Rinse mouth and then drink plenty of water.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms: No significant symptoms are expected due to the non-classification of the product.

4.3. Indication of any immediate medical attention and special treatment needed
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media
Suitable extinguishing media:
carbon dioxide, dry powder, water spray, foam

5.2. Special hazards arising from the substance or mixture
The product is combustible. Cool endangered containers with water-spray.

5.3. Advice for fire-fighters
Special protective equipment:
Wear a self-contained breathing apparatus.

Further information:
Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.
Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures
Handle in accordance with good industrial hygiene and safety practice.

6.2. Environmental precautions
Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up
Pick up with suitable absorbent material. Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections
SECTION 7: Handling and Storage

7.1. Precautions for safe handling
Ensure thorough ventilation of stores and work areas.

7.2. Conditions for safe storage, including any incompatibilities
Further information on storage conditions: Containers should be stored tightly sealed in a dry place.

7.3. Specific end use(s)
For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Components with occupational exposure limits

No occupational exposure limits known.

8.2. Exposure controls
Personal protective equipment
Respiratory protection:
Respiratory protection not required.

Hand protection:
Chemical resistant protective gloves (EN 374) nitrile rubber (NBR) - 0.4 mm coating thickness
Manufacturer's directions for use should be observed because of great diversity of types. Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):
Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:
Body protection must be chosen based on level of activity and exposure.

General safety and hygiene measures
Handle in accordance with good industrial hygiene and safety practice.
### SECTION 9: Physical and Chemical Properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form</strong></td>
<td>liquid</td>
</tr>
<tr>
<td><strong>Colour</strong></td>
<td>colourless</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>almost odourless</td>
</tr>
<tr>
<td><strong>Odour threshold</strong></td>
<td>not determined</td>
</tr>
<tr>
<td><strong>pH value</strong></td>
<td>not applicable, of very low solubility</td>
</tr>
<tr>
<td><strong>Pour point</strong></td>
<td>-54 °C</td>
</tr>
<tr>
<td><strong>Boiling temperature</strong></td>
<td>approx. 394 °C (1,013 hPa) Cannot be distilled without decomposition at normal pressure.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>224 °C</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Value can be approximated from Henry's Law Constant or vapor pressure</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>not readily ignited</td>
</tr>
<tr>
<td><strong>Lower explosion limit</strong></td>
<td>As a consequence of the thermal decomposition behavior (see Thermal decomposition) it is not possible to determine meaningful figures expressed in units of volume-% when applying the standard DIN EN 1839 for determination of the lower explosion limit. Based on a theoretical assessment, it can be assumed that the vapours and decomposition products released from this liquid may form explosible mixtures upon mixing with air at concentrations (\geq 40 \text{ g/Nm}^3) (temperature of mixture 20°C) or (\geq 33 \text{ g/Nm}^3) (temperature of mixture 200°C).</td>
</tr>
</tbody>
</table>
The lower explosion point of the substance/mixture has been determined. The explosion point describes the temperature of a flammable liquid at which the concentration of the saturated vapour mixed with air equals the lower explosion limit.

As a consequence of the thermal decomposition behaviour (see Thermal decomposition) the determination of the lower explosion point according to standard DIN EN 15794 does not generate a globally meaningful value.

Upper explosion limit:

As a consequence of the thermal decomposition behavior (see Thermal decomposition) it is not possible to determine the upper explosion limit according to standard DIN EN 1839.

Vapour pressure: < 0.000001 hPa (20 °C) (Directive 92/69/EEC, A.4)
Density: 0.944 - 0.954 g/cm³ (20 °C) (DIN 51757)
Relative vapour density (air): not determined
Solubility in water: < 0.02 mg/l (25 °C) (Directive 92/69/EEC, A.6)
Solubility (qualitative) solvent(s): organic solvents soluble
Self ignition: The substance does not initiate an exothermic reaction under test conditions. Test type: Self-ignition at high temperatures. (Method: other)
Temperature: 20 °C not self-igniting Test type: Spontaneous self-ignition at room-temperature.
Thermal decomposition: When exposed to high temperatures over a long period of time, formation of outgassing flammable decomposition products may occur.
Viscosity, dynamic: 44 - 60 mPa.s (20 °C)
The value was determined by calculation from the detected kinematic viscosity.

Explosion hazard: not explosive
Fire promoting properties: not fire-propagating

9.2. Other information

pKA:

Adsorption/water - soil: log KOC: 6.59
Adsorption to solid soil phase is expected.

Surface tension: not applicable

Grain size distribution: The substance / product is marketed or used in a non solid or granular form.

Molar mass: 424.66 g/mol

SECTION 10: Stability and Reactivity

10.1. Reactivity

Corrosion to metals: No corrosive effect on metal.
Formation of flammable gases: Remarks: Forms no flammable gases in the presence of water.

10.2. Chemical stability
The product is stable if stored and handled as prescribed/indicated.

10.3. Possibility of hazardous reactions
Reacts with strong oxidizing agents.

No hazardous reactions if stored and handled as prescribed/indicated.

10.4. Conditions to avoid
No special precautions other than good housekeeping of chemicals.

10.5. Incompatible materials
Substances to avoid:
strong oxidizing agents

10.6. Hazardous decomposition products
Hazardous decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:
Virtually nontoxic after a single ingestion. Virtually nontoxic after a single skin contact.

Experimental/calculated data:
LD50 rat (oral): > 5,000 mg/kg (OECD Guideline 423)
LD50 rat (dermal): > 2,000 mg/kg (OECD Guideline 402)

Irritation

Assessment of irritating effects:
May cause slight irritation to the skin. Not irritating to the eyes.

Experimental/calculated data:
Skin corrosion/irritation rabbit: Slightly irritating. (OECD Guideline 404)
Serious eye damage/irritation rabbit: non-irritant (OECD Guideline 405)

Respiratory/Skin sensitization

Assessment of sensitization:
Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:
Guinea pig maximization test guinea pig: Non-sensitizing. (OECD Guideline 406)

Germ cell mutagenicity

Assessment of mutagenicity:
No mutagenic effect was found in various tests with bacteria, microorganisms and mammalian cell culture. The substance was not mutagenic in studies with mammals.

Carcinogenicity

Assessment of carcinogenicity:
In long-term animal studies in which the substance was given in high concentrations by feed, a carcinogenic effect was not observed.

Reproductive toxicity

Assessment of reproduction toxicity:
The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:
No indications of a developmental toxic / teratogenic effect were seen in animal studies.

Specific target organ toxicity (single exposure)

Assessment of STOT single:
Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:
Effects on the kidney of male rats were detected after repeated exposure. These effects are specific for the male rat and are known to be of no relevance to humans.

Aspiration hazard

not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:
There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:
LC50 (96 h) > 100 mg/l, Brachydanio rerio (OECD 203; ISO 7346; 84/449/EEC, C.1, static)
Tested above maximum solubility. The details of the toxic effect relate to the nominal concentration.

Aquatic invertebrates:
EC50 (48 h) > 100 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)
The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An eluate has been tested.

Aquatic plants:
EC50 (72 h) > 100 mg/l (growth rate), Scenedesmus subspicatus (OECD Guideline 201, static)
The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An eluate has been tested.

Microorganisms/Effect on activated sludge:
EC20 (180 min) > 1,000 mg/l, activated sludge, domestic, aerobic (DIN EN ISO 8192-OECD 209-88/302/EEC,P. C, aquatic)

Chronic toxicity to aquatic invertebrates:
No observed effect concentration (21 d) >= 0.021 mg/l, Daphnia magna (OECD Guideline 211, semistatic)
The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. Limit concentration test only (LIMIT test).

Soil living organisms:
LC50 (14 d) > 1,000 mg/kg, Eisenia fetida (OECD Guideline 207, artificial soil)
The details of the toxic effect relate to the nominal concentration.

Terrestrial plants:
No observed effect concentration (20 d) > 1,000 mg/kg, Avena sativa (OECD Guideline 208)
No observed effect concentration (21 d) > 1,000 mg/kg, Brassica napus (OECD Guideline 208)
No observed effect concentration (21 d) > 1,000 mg/kg, Vicia sativa (OECD Guideline 208)

12.2. Persistence and degradability
Assessment biodegradation and elimination (H2O):
Biodegradable.

Not readily biodegradable (by OECD criteria).

Elimination information:
90 - 100 % CO2 formation relative to the theoretical value (60 d) (OECD 301B; ISO 9439; 92/69/EEC, C.4-C) (aerobic, activated sludge, domestic, non-adapted)

70 - 80 % CO2 formation relative to the theoretical value (28 d) (OECD 301B; ISO 9439; 92/69/EEC, C.4-C) (aerobic, activated sludge, domestic, adapted)

12.3. Bioaccumulative potential
Bioaccumulation potential:
Bioconcentration factor: 189 (30 d), Brachydanio rerio (OECD Guideline 305 E)
Accumulation in organisms is not to be expected.

12.4. Mobility in soil
Assessment transport between environmental compartments:
Adsorption in soil: Following exposure to soil, adsorption to solid soil particles is probable, therefore contamination of groundwater is not expected.

12.5. Results of PBT and vPvB assessment
The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative).
12.6. Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

12.7. Additional information

Other ecotoxicological advice:
Do not release untreated into natural waters.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Must be disposed of or incinerated in accordance with local regulations.
A waste code in accordance with the European waste catalog (EWC) cannot be specified, due to dependence on the usage.

The UK Environmental Protection (Duty of Care) Regulations (EP) and amendments should be noted (United Kingdom).

Contaminated packaging:
Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

SECTION 14: Transport Information

Land transport

ADR

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<td>UN proper shipping name:</td>
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<tr>
<td>Transport hazard class(es):</td>
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<td>Packing group:</td>
<td>Not applicable</td>
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<tr>
<td>Environmental hazards:</td>
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<td>Special precautions for user</td>
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RID

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<td>Not applicable</td>
</tr>
<tr>
<td>Transport hazard class(es):</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Inland waterway transport

ADN

UN number: Not classified as a dangerous good under transport regulations
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

Sea transport

IMDG

UN number: Not classified as a dangerous good under transport regulations
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known

Air transport

IATA/ICAO

UN number: Not classified as a dangerous good under transport regulations
UN proper shipping name: Not applicable
Transport hazard class(es): Not applicable
Packing group: Not applicable
Environmental hazards: Not applicable
Special precautions for user: None known
14.1. UN number
See corresponding entries for “UN number” for the respective regulations in the tables above.

14.2. UN proper shipping name
See corresponding entries for “UN proper shipping name” for the respective regulations in the tables above.

14.3. Transport hazard class(es)
See corresponding entries for “Transport hazard class(es)” for the respective regulations in the tables above.

14.4. Packing group
See corresponding entries for “Packing group” for the respective regulations in the tables above.

14.5. Environmental hazards
See corresponding entries for “Environmental hazards” for the respective regulations in the tables above.

14.6. Special precautions for user
See corresponding entries for “Special precautions for user” for the respective regulations in the tables above.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code
Regulation: Not evaluated
Shipment approved: Not evaluated
Pollution name: Not evaluated
Pollution category: Not evaluated
Ship Type: Not evaluated

SECTION 15: Regulatory Information
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

The data should be considered when making any assessment under the Control of Substances Hazardous to Health Regulations (COSHH), and related guidance, for example, 'COSHH Essentials' (United Kingdom).

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

15.2. Chemical Safety Assessment

Product is not classified as hazardous.
SECTION 16: Other Information

Assessment of the hazard classes according to UN GHS criteria (most recent version)

Skin Corr./Irrit. 3

If you have any queries relating to this MSDS, its contents or any other product safety related questions, please write to the following e-mail address: product-safety-north@basf.com

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.