

**SAFETY DATA SHEET**

Safety Data Sheet According to No. 1907/2006/EC (REACH)

**C. Josef Lamy GmbH**Product Name: **Lamy 105074 schwarz, Füllhaltertinte**

Date Made out: 9 August, 2016

Date of Last Revision:

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**SECTION 1: Product and Company Identification**

*Product name:* **Lamy 105074 schwarz, Füllhaltertinte**

*Product utilisation:* Black fountain-pen ink

*Producer / Supplier:* **C. Josef Lamy GmbH**  
Tel.: +49-(0)6221 843182; fax: +49-(0)6221-843264  
E-mail: Reinhard.Probol@lamy.de  
Internet: <http://www.lamy.com>

*Person in charge:* Mr. Reinhard Probol  
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*Emergency phone:* Tel.: +49-(0)6221 843182

**SECTION 2: Hazards Identification**

- 2.1 General Information:** More than 90% of the ink consist of water, < 5% consist of a dye mixture, and < 3.5% of additives, none of which is hazardous according to Ordinance (EC) No. 1272/2008 (GHS). Another < 1.5% consist of an additive, which is irritating to eyes, and < 0,01% and < 0,005% of 2 biocides, which are skin-sensitizing. According to GHS-Ordinance these 2 biocides need not to be declared below 0.1%.
- 2.2 Classification and Labelling according to Ordinance (EC) No. 1272/2008 (GHS) linked to table 3.1 of annex VI:**  
None
- 2.3 Information pertaining to particular dangers to man and the environment:**
- Contact with the eyes, e. g. by rubbing the eyes with fingers contaminated with the ink, may in some cases result in eye irritation.
- The product is not combustible. The residue is combustible after complete evaporation of the water.

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

- 3.1 Chemical characterization:** Aqueous solution of a mixture of dyes, 3 additive compounds and 2 biocides (refer to SECTION 2.1).
- 3.2 Hazardous ingredients and Classification of the pure ingredients according to Ordinance (EC) No. 1272/2008 (GHS):**
- Name of compound:* **N-Methyldiethanolamine**  
*CAS-No.:* 105-59-9  
*EINECS-No.:* 203-312-7  
*Synonyms:* 2,2'-(Methylimino)diethanol; 2-(N-2-Hydroxyethyl-N-methylamino)ethanol; Bis(2-hydroxyethyl)methylamine; N-Methyl-2,2'-iminodiethanol; N-Methylaminodiglycol; Ethanol, 2,2'-(methylimino)bis-; Ethanol, 2,2'-(methylimino)di-
- Percentage by weight:* < 1.5

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Eye Irritation, Cat. 2; H319: Causes serious eye irritation



Signal Word: „Warning“

**3.3 Other ingredients:**

<i>Common or chemical name</i>	<i>CAS-No.</i>	<i>EINECS-No.</i>	<i>Chemical Nature</i>	<i>Percentage by weight</i>
<b>Water</b>	7732-18-5	231-791-2	omitted	> 90
<b>Glycerin</b> <i>Synonyms: glycerol; glycyol alcohol; 1,2,3-propanetriol; 1,2,3-trihydroxypropane</i>	56-81-5	200-289-5	trihydroxy sugar alcohol	< 3
<b>Propylene glycol</b> <i>Synonyms: Propan-1,3-diol; Trimethylenglykol; 1,3-Dihydroxypropan; 1,3-Propylenglykol</i>	57-55-6	200-338-0	dihydroxy alcohol	< 0.5
<b>Mixture of Azo dyes</b>	n/a	n/a	azo dyes	< 3.4
<b>Azo dye</b>	n/a	n/a	azo dye	< 0.11
<b>Other dye</b>	n/a	n/a	n/a	< 0.5

**SECTION 4: First Aid Measures**

**General information:** If used as intended, First Aid measures are not expected to be necessary. After ingestion of substantial amounts of the product or after incorporation, e.g. during the production and packaging of large quantities, the following First Aid Measures may be relevant:

**After inhalation of aerosols:**

If irritations of the respiratory tract occur, move the affected person immediately into the fresh air. If discomfort persists, call a physician. Note: This is relevant only for the inhalation of aerosols, as at room temperatures only water will evaporate in appreciable quantities.

**Skin: Eyes:**

Remove contaminated clothing and wash skin with soap and water. Rinse eyes for at least 15 minutes with plenty of water. Remove contact lenses if considered necessary. Seek medical attention if symptoms persist.

**Ingestion:**

If the patient is conscious he/she should rinse his/her mouth out with water, spit it out, and then drink large quantities of water. Do not induce vomiting. Seek medical attention if symptoms persist or if more than 100 ml is ingested.

**Instructions for the doctor:** None.

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**SECTION 5: Fire-Fighting Measures**

<i>General information:</i>	The product is not combustible. The organic residue is combustible only after the water has evaporated.
<i>Extinguishing agents:</i>	Determine according to surrounding materials.
<i>Special exposure hazards:</i>	Dependent on surrounding materials (refer also to SECTION 10).
<i>Special protective equipment for fire-fighters:</i>	Dependent on surrounding materials.
<i>Further notice:</i>	Do not allow water used for firefighting to enter either sewers or natural water bodies. Collect contaminated water separately.

**SECTION 6: Accidental Release Measures**

<i>Personal precautions:</i>	If aerosols are generated use a fine dust respirator (P2 or P3) or a ventilated breathing hood.
<i>Environmental precaution:</i>	Do not discharge the product into surface water, groundwater or soil.
<i>Cleaning-up methods:</i>	Withdraw large quantities. Take up the rest with liquid-adsorbent material (sand, clay, cat litter or other adsorbent material for water). Discharge contaminated material according to SECTION 13.

**SECTION 7: Handling and Storage**

<i>Handling:</i>	Avoid contact with skin and eyes.
<i>Notes for prevention of fire and explosion:</i>	Not applicable.
<i>Storage:</i>	Keep containers closed. Keep off of heat and sun. The additive N-Methyldiethanolamine is light sensitive. VCI storage class (Germany): 12.

**SECTION 8: Exposure Controls / Personal Protection**

<b>8.1 Technical Protection:</b>	Prevent generation of aerosols.
<b>8.2 Occupational Exposure Limits:</b>	
Glycerin	
- CAS-No.:	56-81-5
- Exposure limit value:	50 mg/m <sup>3</sup> (inhalable aerosol)
- Short term limit value:	100 mg/m <sup>3</sup> (inhalable aerosol: 15-minute average, 4 measurements at intervals of 1 hour)
- BLV:	None
- Origin:	Not a mandatory recommendation of the MAK-Commission of Germany
- Remarks:	C
- Year:	2016

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**Explanations:**

- **BLV:** Biological Limit Value
- **Short term limit values:** Exceeding factor X: Exposure may exceed the exposure limit value by the factor X for not longer than 15 minutes. Exceeding factor =X=: Exposure must never exceed the exposure limit value by more than the factor X (instantaneous value).  
(I): Category I: substances for which the exposure limit value is based on local effects or sensitizing substances.  
(II): Category II: substances effective by resorption.
- **Remarks:** H : Substances effective by resorption through skin  
S = Sensitizing substance  
Y or C: There is no teratogenic risk if the exposure limit value and the BLV are maintained.

**8.3 Personal Protection:**

- General information:** If the product is used as intended, no protection is necessary. Only if the product is handled in large amounts, - e.g. during production and packaging -, is personal protection necessary.
- Respiratory protection:** Fine-dust respirator if aerosols are generated.
- Hand protection:** If intensive contact with hands cannot be avoided use protective gloves tested according to DIN EN 374. Seek advice from the manufacturers of protective gloves. If gloves cannot be used for safety reasons (e. g. while working at rotating machines) use skin-protective barrier cream. Consult the company medical officer for the type of barrier cream to be used.  
Comment: In contrary to European ordinance 1907/2006/EC (REACH), it is not sufficient to specify only the protective glove material. The break-through-times are dependent not only on the material but also on the manufacturing technique. It is therefore essential to consult the manufacturers of protective gloves.  
For the product the following glove materials should be appropriate: natural rubber (latex) - NR (0.5 mm), chloroprene rubber - CR (0.5 mm), nitrile rubber (latex) - NBR (0.35 mm), butyl rubber (0.5 mm), fluororubber (0,4 mm), polyvinyl chloride - PVC (0.5 mm).
- Eye protection:** Safety glasses with side shield.
- Skin protection:** Use waterproof protective clothing and gumboots if contamination of clothing is possible.
- General protective measures:** Avoid contact with eyes and skin. Change contaminated clothing immediately.
- Industrial hygiene:** Wash hands after working with the product. Maintain standards of industrial hygiene. Do not eat, drink, smoke or take snuff at work.

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**SECTION 9: Physical and Chemical Properties****9.1 Appearance**

*Physical state:* Fluid  
*Colour:* Blue-black  
*Odour:* Sweetish

**9.2 Relevant Data for Safety and Health**

*Melting point/ range:* Not determined, but slightly below 0°C  
*Boiling point / range:* Not determined, but slightly above 100°C  
*Flash range:* No inflammation  
*Ignition temperature:* Not applicable  
*Autoignition temperature:* Not applicable  
*Explosive range:* Not applicable  
*Vapour pressure:* Close to that of water  
*Density:* 1.021 +/- 0.010 g/cm<sup>3</sup> at 23°C  
*Solubility in water:* Miscible  
*pH-value:* 7 - 9 (23°C)  
*Solubility in other solvents:* Not determined  
*Partition coefficient*  
*n-octanol/water:* Not determined  
*Dynamic viscosity:* 1.40 +/- 0,10 mPa s (20°C, Rheostress 1)

**SECTION 10: Stability and Reactivity**

*Thermal decomposition:* Not determined  
*Substances to be avoided:* Strong oxidizing agents, strong acids, acid anhydrides, acid chlorides  
*Dangerous reactions:* Vigorous reactions with the „substances to be avoided“  
*Hazardous decomposition products:* After evaporation of the water: carbon monoxide, carbon dioxide, and very small quantities of nitrous and sulfur oxides, hydrocyanic acid, organochlorides and metals or metal oxides.  
*Dangerous polymerizations:* None

**SECTION 11: Toxicological Information****11.1 Product:**

There are no studies on the toxicity of the product.

**11.1.1 Toxikokinetics, metabolism and distribution:**

Inhalation of aerosols is the main route of occupational exposure. Absorption of glycerin and propylene glycol through the skin is negligible due to dilution. Ingested glycerin and propylene glycol are highly resorbed. N-Methyldiethanolamine may be incorporated by contact with skin. It is rapidly metabolized and metabolites are excreted by urine with a half-life of a bit more than 30 hours (HSDB). There is no information about the other ingredients.

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**11.1.2 Toxicity:**

On the basis of the toxicity of the ingredients - as far as known - the following toxic effects are to be expected:

**Acute toxicity:**

Contact with eyes may induce eye irritation. With the intended use of the product no toxic symptoms can be expected.

**Acute oral toxicity:** LD<sub>50</sub> (rat, oral): > 2000 mg/kg  
**Acute inhalative toxicity:** No data available.  
**Acute dermal toxicity:** The ingredient glycerin may penetrate the skin, but causes only slight or no symptoms (GESTIS).

**After inhalation:** There are no records on the inhalation of aerosols. The vapour pressures of the ingredients other than water are negligible.

**After skin contact:** No irritation.

**After eye contact:** Irritation is possible.

**After ingestion:** Though the ingredients glycerin and propylene glycol are rapidly resorbed in the gastrointestinal tract, dysfunctions of the gastrointestinal tract can be expected only after the ingestion of large amounts.

**Toxic effects after repeated exposure (subacute to chronic toxicity):**

**Sensitization:** The ingredient N-methyldiethanolamine has a potential to induce allergic contact dermatitis based on animal experiments according to Magnusson and Kligman (HSDB). Besides the azo dye (refer to SECTON 11.2.5) no sensitization effects are known for the other ingredients.

**Mutagenicity:** No mutagenic effects are known.

**Cancer:** No carcinogenic effects are known. No ingredient is mentioned as carcinogenic in the TRGS 905 list.

**Reproductive toxicity:** No toxic effects on reproduction are known.

**Further information:** The product contains 2 biocides with concentrations of < 0,01% and < 0,005%, which are skin-sensitizing.

**Practical experience:** There are no reports of symptoms of poisoning after using or handling the product.

**11.2 For the pure ingredients the following data on acute toxicity are available:****11.2.1 N-Methyldiethanolamine:**

LD <sub>50</sub> (rat, oral):	1,950 mg/kg (GESTIS)
LD <sub>50</sub> (rabbit, dermal):	6,220 mg/kg (GESTIS)
LD <sub>50</sub> (male rat, percutaneous):	9.85 mL/kg (HSDB)
LD <sub>50</sub> (female rat, percutaneous):	10.90 mL/kg (HSDB)
LC <sub>50</sub> (rat, inhalative):	> 6.5 mg/m <sup>3</sup> / 6 h (HSDB)

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*Specific symptoms in animal experiments:**Eye irritation:* No irritation (MSDS of the supplier)*Skin irritation:* No irritation (MSDS of the supplier)*Sensitization:* Not sensitizing guinea pig (MSDS of the supplier)*Bacterial mutagenicity:* Ames-test (in vitro): negativ (MSDS of the supplier)*Cancer:* No carcinogenic effects are known.*Reproductive toxicity:* Female rat, dermal: at 1000 mg/kg no effects after 15 days (MSDS of the supplier).

## 11.2.2 Glycerin:

*LD<sub>50</sub> (rat, oral):* 12,600 mg/kg (IUCLID, GESTIS)*LD<sub>50</sub> (rabbit, dermal):* 18,700 mg/kg (IUCLID)*LD<sub>50</sub> (rabbit, dermal):* >10,000 mg/kg (GESTIS)*Specific symptoms in animal experiments:**Eye irritation:* No irritation (OECD 405 according to Merck)*Skin irritation:* No irritation (Merck)*Sensitization:* Patch-tests on humans with glycerin were negative (IUCLID).*Mutagenicity:* Ames-test in vitro with glycerin was negative (IUCLID).

## 11.2.3 Propylene glycol:

*LD<sub>50</sub> (rat, oral):* 20,000 mg/kg (GESTIS)*LD<sub>50</sub> (rabbit, dermal):* 20,800 mg/kg (GESTIS)*Specific symptoms in animal experiments:**Eye irritation:* Slight irritations (Merck)*Skin irritation:* Slight irritations (Merck)*Sensitization:* Experiences on humans are negative (Merck).*Mutagenicity:* Tests with mammal cells (in vitro) were negative (OECD 476 according to Merck). Animal tests were negative. Ames-test (bacterial mutagenicity) was negative (Merck).*Reproductive toxicity:* No toxic effects on reproduction are known. There was no influence on the reproduction and no teratogenic effects in animal tests (Merck).*Cancer:* No carcinogenic effects are known. Not carcinogenic in animal tests (Merck)

## 11.2.4 Mixture of azo dyes:

*LD<sub>50</sub> (rat, oral):* > 5,000 mg/kg (MSDS of the supplier)*Specific symptoms in animal experiments:**Eye irritation:* No irritation (MSDS of the supplier)*Skin irritation:* No irritation (MSDS of the supplier)

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<p><i>Bacterial mutagenicity:</i> Ames-test in vitro: negativ (MSDS of the supplier)  <i>Note:</i> The testings were carried out by the supplier for a similiar product.</p> <p><i>Cancer:</i> No carcinogenic effects are known (MSDS of the supplier and ancillary demand, because the identities of the azo dyes are not disclosed).</p> <p>11.2.5 Azo dye:</p> <p>LD<sub>50</sub> (rat, oral): &gt; 5,000 mg/kg (MSDS of a manufacturer)</p> <p><i>Specific symptoms in animal experiments:</i>  <i>Eye irritation:</i> Slight irritation (MSDS of a manufacturer)  <i>Skin irritation:</i> No irritation (MSDS of a manufacturer)</p> <p><i>Sensitization:</i> There is obviously some evidence that the dye has a sentizising potential when inhaled, but it is not classified as sentizising (MSDS of a manufacturer). There is no such indication in 3 other MSDS of suppliers.)</p> <p><i>Cancer:</i> No carcinogenic effects are known. This azo dye is not listed in "Industrievereinigung Farbstoffe und organische Pigmente" of 3 March 2001, which contains all azo dyes, which may decompose to cancerogenic amines according to TRGS 614.</p> <p>11.2.6 Other dye</p> <p>LD<sub>50</sub> (rat, oral): &gt; 5,000 mg/kg (MSDS of the supplier)</p> <p><i>Specific symptoms in animal experiments:</i>  <i>Eye irritation:</i> No irritation (HSDB, MSDS of the supplier)  <i>Skin irritation:</i> No irritation (HSDB, MSDS of the supplier)</p> <p><i>Mutagenicity:</i> There was no evidence of mutagenicity in animal experiments (HSDB).</p>	
<b>SECTION 12: Ecological Information</b>	
<p>12.1 Product:</p> <p><i>Ecotoxic effects:</i> There is no information on toxic effects.  <i>Ecotoxic data:</i> No ecological data are available for the product.</p> <p><i>Water Pollution Category, Germany (WGK):</i> Slightly water polluting (Water Pollution Category 1)</p> <p>12.2 <b>Pure ingredients:</b></p>	



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**12.2.1 N-Methyldiethanolamine:**

**Ecotoxic effects:** In ambient air N-methyldiethanolamine is degraded with a half-life of about 4 hours. It is estimated that N-methyldiethanolamine is very mobile in soil. N-Methyldiethanolamine was found to be non-biodegradable after 28 days during a standard batch test using activated sludge from a municipal wastewater treatment plant as inoculum. In a 40-day continuous flow experiment using activated sludge, the same solution containing N-methyldiethanolamine degraded >96% based on TOC which was probably due to the adaptation of the microorganisms to the test substance. Volatilization from water or soil is negligible due to low vapor pressure. Bioconcentration is low. (HSDB)

**Ecotoxic data:** There are no LC<sub>50</sub> data.

**Further information:**

**Biodegradation:** 70% / 28 days (MSDS of the supplier, but also refer to "Ecotoxic effects").

**BCF:** 3.2 (estimated, HSDB)

**Distribution log P(o/w):** -1.50 (HSDB)

**Water Pollution Category, Germany (WGK):** Slightly water polluting (Water Pollution Category 1). VwVwS annex 2, identification no.: 1588

**12.2.2 Glycerin:**

**Ecotoxic effects:** Readily biodegradable. No bioaccumulation expected.

**Ecotoxic data:**

**Fish toxicity:** Carassius auratus: LC<sub>50</sub>: > 5,000 mg/l / 24 h (Merck)

**Daphnia toxicity:** Daphnia magna: EC<sub>50</sub>: > 10,000 mg/l / 24 h (Merck)

**Bacterial toxicity:** Pseudomonas putida: EC<sub>5</sub>: > 10,000 mg/l / 16 h (Merck)

**Protozoa toxicity:** Entosiphon sulcatum: EC<sub>5</sub>: 3,200 mg/l / 72 h (Merck)

**Algae toxicity:** Scenedesmus quadricauda: IC<sub>5</sub>: > 10,000 mg/l / 7 d (Merck)

**Further information:**

**Biodegradation:** > 63% / 14 d (OECD 301C)  
 Decrease: DOC >70%, BOD >60%

**Distribution log P(o/w):** -1.76 (calculated, Merck)

**BOD:** 71% of TOD / 5 d (Merck)

**COD:** 95% of TOD (Merck)

**TOD:** 1.217 g/g (Merck)

**WGK (Water Pollution category, Germany):** 1 (slightly water polluting), VwVwS, annex 2, identification no.: 116

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**12.2.3 Propylene glycol:**

*Ecotoxic effects:* Readily biodegradable. No bioaccumulation is to be expected. (Merck)

*Ecotoxic data:*

*Fish toxicity:* Onchorhynchus mykiss: LC<sub>50</sub>: 51,600 mg/l / 98 h (OECD 203 according to Merck)  
*Daphnia toxicity:* Daphnia magna: EC<sub>50</sub>: 34,400 mg/l / 48 h (Merck)  
*Bacterial toxicity:* Photobacterium phosphoreum: EC<sub>50</sub>: 26,800 mg/l / 30 min (Merck)  
*Crustacean toxicity:* LC<sub>50</sub>: 1020 up to 18,300 mg/l (median: 5,120 mg/l) / 48 h GESTIS)

*Further information:*

*Biodegradation:* 87% - 92% /28 d (OECD 301C according to Merck)  
*BCF:* < 1 (calculated, Merck)  
*Distribution log P(o/w):* - 0.92 (experimental, Merck)

*Water Pollution Category, Germany (WGK):* Category 1 (Slightly water polluting). VwVwS Annex 3, , identification no.: 280

**12.2.4 Mixture of azo dyes:**

*Ecotoxic effects:* Not readily biodegradable.

*Ecotoxic data:*

*Fish toxicity:* LC<sub>50</sub>: > 100 mg/l / 98 h (MSDS of the supplier)  
*Bacterial toxicity:* Sewage sludge: EC<sub>50</sub>: > 100 mg/l / 3 h (OECD 209 according to MSDS of the supplier)

*Further information:*

*Biodegradation:* < 10% bzw. 22,56 / 5 d (MSDS of the supplier)  
*Distribution log P(o/w):* 0.69 (ChemID)

*Water Pollution Category, Germany (WGK):* Water polluting (Water Pollution Category 2). VwVwS annex 2, identification no.: 1492

**12.2.5 Azo dye:**

*Ecotoxic effects:* Readily biodegradable (MSDS of the supplier).

*Ecotoxic data:*

*Fish toxicity:* L. ides\*: LC<sub>50</sub>: 1.000 mg/l / 48 h (MSDS of a manufacturer)

\* Possibly meant: Leuciscus idus

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*Further information:*

*Degradability:* 22,56% / 5 d (MSDS of the supplier)

*Water Pollution Category, Germany (WGK):* Water polluting (Water Pollution Category 2). VwVwS annex 2, identification no.: 1492

## 12.2.6 Other dye:

*Ecotoxic effects:* Interferences in adapted biological sewage treatment plants are not to be expected with appropriate discharge of the dye at low concentration (MSDS of the supplier). Biotic degradation is low.

*Ecotoxic data:*

*Fish toxicity:* Poecilia reticulata: LC<sub>0</sub>: > 10.000 mg/l / 98 h (MSDS of the supplier)

*Bacterial toxicity:* Pseudomonas fluorescens: IC<sub>10</sub>: > 100 mg/l (MSDS of the supplier)

*Further information:*

*Biodegradation:* < 10% (MSDS of the supplier)

*Distribution log P(o/w):* 0.69 (ChemID)

*Water Pollution Category, Germany (WGK):* Water polluting (Water Pollution Category 2). VwVwS annex 2, identification no.: 1492

Do not allow the product to enter water supplies, waste water or soil.

**SECTION 13: Disposal Information**

**13.1 Product:** No hazardous waste. For disposal the product has not to be supervised. For industrial users the product should be pretreated to remove water previous to disposal.

Industrial users should dispose the product according to the following waste codes:

*Waste code:* 08 01 12

*Waste name:* waste paint and varnish other than those mentioned in 08 01 11\*

**13.2 Wastes contaminated by the product (adsorbent materials, protective clothing):**

*Waste code:* 15 02 03

*Waste name:* Adsorbent and filter materials, wipes and protective clothing with the exception of those included under waste code 15 02 02\*

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**13.3 Packing materials:****13.3.1 Glass**

*Waste code:* 15 01 07  
*Waste name:* Packing material made of glass

**13.3.2 Plastic:**

*Waste code:* 15 01 02  
*Waste name:* Packing material made of plastic

All waste codes and names in accordance with the European Waste Register Ordinance.

**SECTION 14: Transport Information**

The product is not classified under international transport regulations.

UN No. / CHIP Classification: Not classified as hazardous for freight purposes.

IMG-code	ADR / RID	ICAO / IATA
Not classified	Not regulated	Not regulated

Transportation by AIR, as a non-hazardous material under the current 57<sup>th</sup> edition 2016 of the IATA Dangerous Goods Regulation.

**SECTION 15: Regulatory Information**

**15.1** There are no safety reports available based on 1907/2006/EC (REACH).

**15.2 National Regulations Germany**

**15.2.1 StörfallV:** Not applicable

**15.2.2 TA-Luft:** Clause 5.2.5: Organic substances apart from particulate matter: max. mass concentration: 50 mg/m<sup>3</sup> or max. mass flow: 0.50 kg/h (calculated as total carbon)

**15.2.3 WHG (Water Pollution Category, Germany):** Water polluting (Water Pollution Category 2, refer to SECTION 12)

**15.2.4 VCI Storage Class:** 12

**15.2.5 Volatile components:** Water (VOC: 0%)

**15.3 Further regulations:** None

**SECTION 16: Other Information****Abbreviations:**

AOX: Adsorbable organohalogens  
 BCF: Bioconcentration factor  
 BOD: Biochemical oxygen demand

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ChemID: Database of the United States National Library of Medicine  
COD: Chemical oxygen demand  
DOC: Dissolved organic carbon  
EINECS: European Inventory of Existing Commercial Substances  
EPA: Environmental Protection Agency, USA  
GESTIS: Data base of Berufsgenossenschaftliches Institut für Arbeitsschutz, Germany  
HSDB: Hazardous Substances Data Bank (National Library of Medicine, USA)  
IC<sub>50</sub>: 50% of the maximal inhibitory concentration  
IUCLID: International Uniform Chemical Information Database  
LC<sub>50</sub>: Lethal Concentration for 50% of the tested animals  
LD<sub>50</sub>: Lethal Dose for 50% of the tested animals  
MAK: Maximale Arbeitsplatzkonzentration (maximum concentration in the workplace)  
Merck: Current MSDS of Merck, Darmstadt, Germany  
MSDS: Material Safety Data Sheet  
OECD: Organisation for Economic Cooperation and Development  
RTECS: Register of Toxic Effects of Chemical Substances  
StörfallV (Hazardous Incident Ordinance)  
TA Luft: Technische Anleitung Luft (Technical Instructions on Air Quality)  
TOC: Total organic carbon  
TOD: Theoretical oxygen demand  
TRGS: Technische Regel für Gefahrstoffe (Technical rules for hazardous substances, Germany)  
VCI: Verband der Chemischen Industrie e.V. (Association of the Chemical Industry, Germany)  
VOC: Volatile organic carbons  
VwVwS: Ordinance for water pollutant substances, Germany  
WHG: Wasserhaushaltsgesetz (German Federal Water Act)

**General information:**

As of the date of issuance, we are providing available information relevant to the handling of this material in the workplace. All information contained herein is offered in good faith in the belief that it is accurate. This material safety data sheet shall not be deemed to constitute or imply any warranty of any kind. In the event of an adverse incident associated with this material, this safety data sheet is not intended as a substitute for consultation with appropriately trained personnel (refer to section 1). Nor is this safety data sheet intended to be a substitute for any product literature which may accompany the finished product.