

Safety Data Sheet

acc. to OSHA HCS

Printing date 03/04/2020



Reviewed on 03/04/2020

1 Identification

- **Product identifier**
- **Trade name: REFLECON® tarnish-11-HC**
Aerosol
- **Application of the substance / the mixture** Anti-reflection agent for optical 3D-metrology
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
MR Chemie GmbH
Nordstr. 61-63
59427 Unna (Germany)
Tel. +49 (0)2303 95151 0
Fax: +49 (0)2303 95151 10
post@mr-chemie.de
www.mr-chemie.de
- **Information department:**
MR Chemie GmbH, Dep. safety data sheets, Tel.: +49/(0)2303/95151-38, QS@mr-chemie.de
- **Emergency telephone number:**
24h- Emergency Contact Phone Number For Chemical Emergency, Spill, Leak, Fire, Exposure or Accident (WISAG FMO Cargo Service GmbH & CO.KG)
Call Day or Night within USA and Canada: 1 800 424 9300
Outside USA and Canada: 001 703 527 3887
In-Country Emergency Number for:
Germany: 0800-181-7059
China: 4001 204937 (Mandarin)
Hong Kong: 800 968 793 (Cantonese)
India: 000 800 100 7141 (Hindi)
South Africa: 0 800 983 611 (English)

2 Hazard(s) identification

- **Classification of the substance or mixture**
Flam. Aerosol 1 H222 Extremely flammable aerosol.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

- **Label elements**
- **GHS label elements**
The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**
 
GHS02 GHS07
- **Signal word** Danger
- **Hazard-determining components of labeling:**
2-Propanol
- **Hazard statements**
Extremely flammable aerosol.
Causes serious eye irritation.
May cause drowsiness or dizziness.
- **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.

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Use only outdoors or in a well-ventilated area.

Wear eye protection / face protection.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Call a poison center/doctor if you feel unwell.

If eye irritation persists: Get medical advice/attention.

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **HMIS-ratings (scale 0 - 4)**

HEALTH	2	Health = 2
FIRE	4	Fire = 4
REACTIVITY	3	Reactivity = 3

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

106-97-8	butane	30 - 40%
74-98-6	propane	30 - 40%
67-63-0	2-Propanol	20 - 30%

· **Propellant:** Propane-Butane

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

4 First-aid measures

· **Description of first aid measures**

· **General information:** Immediately remove any clothing soiled by the product.

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

· **After eye contact:**

Rinse opened eye for several minutes under running water. Then consult a doctor.

· **After swallowing:** Not relevant - aerosol can.

· **Information for doctor:**

Grease with skin-cream to restore fat film in order to prevent skin inflammation.

· **Most important symptoms and effects, both acute and delayed**

No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

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5 Fire-fighting measures

- **Extinguishing media**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture**
In case of fire, the following can be released:
Carbon monoxide (CO)
- **Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

· PAC-1:

106-97-8	butane	5500* ppm
74-98-6	propane	5500* ppm
67-63-0	2-Propanol	400 ppm

· PAC-2:

106-97-8	butane	17000** ppm
74-98-6	propane	17000** ppm
67-63-0	2-Propanol	2000* ppm

· PAC-3:

106-97-8	butane	53000*** ppm
74-98-6	propane	33000*** ppm
67-63-0	2-Propanol	12000** ppm

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
Do not spray on a naked flame or any incandescent material.
Keep ignition sources away - Do not smoke.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C, i.e. electric lights. Do not pierce or burn, even after use.

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- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in a cool location.
Observe official regulations on storing packagings with pressurized containers.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Protect from heat and direct sunlight.
- **Recommended storage temperature:** 5 - 45°C, 41 - 113 °F
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**

· Components with limit values that require monitoring at the workplace:

106-97-8 butane

REL	Long-term value: 1900 mg/m ³ , 800 ppm
TLV	Short-term value: 2370 mg/m ³ , 1000 ppm (EX)

74-98-6 propane

PEL	Long-term value: 1800 mg/m ³ , 1000 ppm
REL	Long-term value: 1800 mg/m ³ , 1000 ppm
TLV	refer to Appendix F in TLVs&BEIs book; D, EX

64-17-5 ethanol

PEL	Long-term value: 1900 mg/m ³ , 1000 ppm
REL	Long-term value: 1900 mg/m ³ , 1000 ppm
TLV	Short-term value: 1880 mg/m ³ , 1000 ppm

· DNEL (Derived No Effect Level) for the general population

64-17-5 ethanol

Oral	Long term - systemic effects, general population	87 mg/kg bw/day (general population)
Dermal	Long term - local effects, general population	206 (general population)
Inhalative	Acute- local effects, general population	950 mg/m ³ (general population)
	Long term - systemic effects, general population	114 mg/m ³ (general population)

- **Additional information:** The lists that were valid during the creation were used as basis.

· Exposure controls

· Personal protective equipment:

- **General protective and hygienic measures:** Wash hands before breaks and at the end of work.

· Breathing equipment:

Filter AX-P2

Use suitable respiratory protective device in case of insufficient ventilation.

· Protection of hands:

Check the permeability prior to each renewed use of the glove.

For the protection against chemicals in areas with heightened risk of injury (mechanical hazard) no recommendation for a suitable glove material can be given.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

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- **Material of gloves**

Nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.5 mm

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- **Penetration time of glove material**

Supplier for suitable protection gloves:

ASD ArbeitsSicherheit Dortmund

Torstr. 101 - 37355 Niederorschel OT Rüdigershagen

Tel.: 02301 / 919543 - Fax: 02301 / 9453893

E-Mail: m.schnellhardt@t-online.de - <http://www.arbeitssicherheitdortmund.de>

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**



Tightly sealed goggles

- **Body protection:** Protective work clothing

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form:	Aerosol
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Color:	Colorless
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Odor:	Like alcohol
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Odor threshold:	Not determined.
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pH-value:	Not determined.
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- **Change in condition**

Melting point/Melting range:	Undetermined.
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Boiling point/Boiling range:	Not applicable, as aerosol.
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Flash point:	-80 °C (-112 °F) grundlag: drivmiddel
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Flammability (solid, gaseous):	Not applicable.
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Ignition temperature:	365 °C (689 °F)
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Decomposition temperature:	Not determined.
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Auto igniting:	Product is not selfigniting.
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Danger of explosion:	Product is not explosive. However, formation of explosive air/vapor mixtures are possible. Not determined.
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- **Explosion limits:**

Lower:	1.5 Vol %
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Upper:	15 Vol %
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Vapor pressure at 20 °C (68 °F):	8,300 hPa (6.200 mm Hg) Basis: propellant
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· Density:	Basis: active substance
· Relative density	Not determined.
· Vapor density	Not determined.
· Evaporation rate	Not applicable.
· Solubility in / Miscibility with Water:	Not miscible or difficult to mix.
· Partition coefficient (n-octanol/water):	Not determined.
· Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Organic solvents:	91.9 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
Danger of bursting of the aerosol can during overheating
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

106-97-8 butane

Inhalative	LC50/4 h	658 mg/l (rat)
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64-17-5 ethanol

Oral	LD50	7,060 mg/kg (rat)
Inhalative	LC50/4 h	20,000 mg/l (rat)

- **Primary irritant effect:**
- **on the skin:** Based on available data, the classification criteria are not met.
- **on the eye:** Based on available data, the classification criteria are not met.
- **Additional toxicological information:**

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

67-63-0	2-Propanol	3
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- **NTP (National Toxicology Program)**

None of the ingredients is listed.

- **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

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12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
Eliminate the pure, unchanged substance in accordance with local regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Waste disposal key:**
For this product no waste key number can be specified, because only the intended purpose permits an allocation. The waste key number is to be specified in arrangement with the regional waste disposal.
The indications for Waste key reflect the pure unmodified product and are only a recommendation.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|--|--|
| <ul style="list-style-type: none"> · UN-Number · DOT, ADR, IMDG, IATA | UN1950 |
| <ul style="list-style-type: none"> · UN proper shipping name · DOT · ADR · IMDG · IATA | Aerosols, flammable
1950 AEROSOLS
AEROSOLS
AEROSOLS, flammable |
| <ul style="list-style-type: none"> · Transport hazard class(es) · DOT | <div style="text-align: center;">  </div> |
| <ul style="list-style-type: none"> · Class | 2.1 |

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Aerosol**

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· **Label** 2.1

· **ADR**



· **Class** 2.5F Gases
· **Label** 2.1

· **IMDG, IATA**



· **Class** 2.1
· **Label** 2.1

· **Packing group**
· **DOT, ADR, IMDG, IATA** Void

· **Environmental hazards:** Not applicable.

· **Special precautions for user** Warning: Gases
· **Hazard identification number (Kemler code):** -
· **EMS Number:** F-D,S-U
· **Stowage Code** SW1 Protected from sources of heat.
SW22 For AEROSOLS with a maximum capacity of 1 litre: Category A. For AEROSOLS with a capacity above 1 litre: Category B. For WASTE AEROSOLS: Category C, Clear of living quarters.
SG69 For AEROSOLS with a maximum capacity of 1 litre:
Segregation as for class 9. Stow "separated from" class 1 except for division 1.4.
For AEROSOLS with a capacity above 1 litre:
Segregation as for the appropriate subdivision of class 2.
For WASTE AEROSOLS:
Segregation as for the appropriate subdivision of class 2.

· **Segregation Code**

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

· **Transport/Additional information:**

· **ADR**
· **Excepted quantities (EQ)** Code: E0
Not permitted as Excepted Quantity

· **IMDG**
· **Limited quantities (LQ)** 1L
· **Excepted quantities (EQ)** Code: E0
Not permitted as Excepted Quantity

· **UN "Model Regulation":** UN 1950 AEROSOLS, 2.1

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15 Regulatory information

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

· **Section 355 (extremely hazardous substances):**

None of the ingredient is listed.

· **Section 313 (Specific toxic chemical listings):**

67-63-0 | 2-Propanol

· **TSCA (Toxic Substances Control Act):**

All components have the value ACTIVE.

· **Hazardous Air Pollutants**

None of the ingredients is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

· **Carcinogenity categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**

67-63-0 | 2-Propanol

A4

· **MAK (German Maximum Workplace Concentration)**

None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**

2-Propanol

· **Hazard statements**

Extremely flammable aerosol.

Causes serious eye irritation.

May cause drowsiness or dizziness.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

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Do not spray on an open flame or other ignition source.
 Pressurized container: Do not pierce or burn, even after use.
 Avoid breathing dust/fume/gas/mist/vapors/spray
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Wear eye protection / face protection.
 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 Call a poison center/doctor if you feel unwell.
 If eye irritation persists: Get medical advice/attention.
 Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.
 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **National regulations:**
- **Water hazard class:** Water hazard class 2 (Self-assessment): hazardous for water.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

- **Relevant phrases** The wording of the listed risk phrases are those of the individual raw materials.
- **Recommended restriction of use**
Existing national and local laws concerning chemicals are to be considered.
- **Department issuing SDS:**
MR Chemie GmbH, Dep. safety data sheets, Tel.: +49/(0)2303/95151-38
- **Contact:**
MR Chemie GmbH, Dep. safety data sheets, Tel.: +49/(0)2303/95151-38, QS@mr-chemie.de
- **Date of preparation / last revision** 03/04/2020 / -
- **Abbreviations and acronyms:**
 ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association
 ACGIH: American Conference of Governmental Industrial Hygienists
 EINECS: European Inventory of Existing Commercial Chemical Substances
 ELINCS: European List of Notified Chemical Substances
 CAS: Chemical Abstracts Service (division of the American Chemical Society)
 HMIS: Hazardous Materials Identification System (USA)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 PBT: Persistent, Bioaccumulative and Toxic
 vPvB: very Persistent and very Bioaccumulative
 NIOSH: National Institute for Occupational Safety
 OSHA: Occupational Safety & Health
 TLV: Threshold Limit Value
 PEL: Permissible Exposure Limit
 REL: Recommended Exposure Limit
 Flam. Aerosol 1: Aerosols – Category 1
 Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
 STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
- *** Data compared to the previous version altered.**