

EC Safety Data Sheet

BEGO Bremer Goldschlägerei Wilh. Herbst GmbH & Co.

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1. Product and company identification

Data on product

Name of product: **Aurofilm**

Data on manufacturer/supplier

Manufacturer/supplier: BEGO Bremer Goldschlägerei Wilh. Herbst GmbH & Co.
Street/P.O. box: Wilhelm-Herbst-Strasse 1
Nat. postal code/town: D-28359 Bremen
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2. Composition / information on components

Chemical characterization of specific substance

Designation	CAS No.	EC No.	EC Index No.
1-propanol	71-23-8	200-746-9	603-003-00-0

Component	Hazard symbols	R provisions	Total formula
1-propanol	F, Xi	R 11-41-67	C ₃ H ₈ O

Chemical characterization of product

Description: anionic detergents, dissolved in 1-propanol
Hazardous components: 1-propanol (n-propanol, 1-hydroxypropane, ethyl carbinol)

Component	Concentration	Hazard symbols	R provisions
1-propanol	60-80%	F, Xi	R 11-41-67

3. Possible risks

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Designation of hazards

Hazard identification: F easily inflammable
Xi irritating

Special indications of risk for people and environment

Easily inflammable. Risk of serious eye damage. Vapours may cause drowsiness and a dazed state.

Specific risks

Possible harmful impact on people and possible symptoms:

Processing vapours may irritate the respiratory tracts, skin and eyes. Skin contact and inhalation of aerosols/vapours of the preparation should be avoided. During work wear suitable protective clothing, safety gloves and safety goggles / face screen. Easily inflammable or explosive vapour-air mixtures may form due to evaporation during use.

4. First aid measures

General instructions

Take the person out of the danger zone while protecting oneself and lay him/her down. Remove clothing soaked or contaminated with the product immediately. Place injured person in a relaxed position and protect against hypothermia. In the event of contact with the eyes, rinse thoroughly with water and provide for medical treatment. In the case of an accident or indisposition, call in a physician at once (if possible, show this label and inform about measures taken). A medical expertise is necessary even if intoxication is merely suspected. Symptoms of intoxication may not appear until hours later; therefore, medical observation necessary for at least 48 hours.

After inhalation

In the event of inhalation, take the person out of the danger zone and remove to fresh air. In the case of shortness of breath, have person inhale oxygen. In the event of unconsciousness while breathing takes place, place person in a lateral recovery position. In case of cessation of breathing: carry out mouth-to-nose respiration or, if not possible, then mouth-to-mouth respiration. Keep respiratory tracts clear. In the event of cardiac arrest (lack of heartbeat, lack of pulse), carry out heart-lung resuscitation immediately. Ensuring vital functions (beating heart and independent breathing) has priority over all other measures. If consciousness is maintained, have person inhale deeply Dexamethason-21-isonicotinate (e.g. Auxiloson dosing aerosol spray) as far as possible: 4 sprays at the beginning, after that two additional sprays every five minutes until the first pack is empty. After that one spray every hour.

After skin contact

Remove wet clothing while protecting oneself. Rinse parts of the skin affected under running water for 10 minutes. If available, it is better to apply polyethylene glycol (e.g. Lutrol, PEG 400) and allow to react for several minutes, then rinse off with water. Provide for medical treatment. Do not use alcohol, benzene or other solvents under any circumstances. In the case of large-scale or long-lasting skin contamination, provide for medical treatment.

After eye contact

In the event of contact with the eyes, rinse eyes under running water with eyelids open for at least 15 minutes. Rinse from the inner to the outer corner of the eyes. Put on loose bandage. Consult a physician at once.

After swallowing

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Immediately have person drink plenty of water (at least 0.5 l) in small sips (dilution effect) while conscious. Give person activated carbon for medical use (3 tablespoons of activated carbon dispersed in a glass of water). Rinse mouth thoroughly with water, spit out liquid. Do not induce vomiting. If product is swallowed with subsequent vomiting, aspiration into the lungs may result, which can lead to chemical pneumonia or suffocation. In the case of spontaneous vomiting hold or place person's head in a low position to keep the respiratory tracts clear. Never administer cooking oil, castor oil, milk or alcohol. Provide for medical treatment.

Information for the physician

Symptoms of acute intoxication:

Vapours of the substance cause irritation on the mucous membranes of the eyes and of the respiratory tract. Reddening, flow of tears, blepharism, corneal clouding and/or salivation, burning sensation in the mouth, excruciating urge to cough, nausea and retrosternal pain are the characteristic symptoms. In the case of mucous membrane contact with the liquid contaminant, irritations of varying intensity occur. The systemic effect after inhalation/ingestion begins with dizziness, headache, nausea, vomiting. This prodromal stage leads, via confusion and intoxication, to paralysis of the central nervous system, either rapidly or after a delay depending on the dose, with reduced reflex, loss of muscle tone, clouding of consciousness, loss of vital regulation mechanisms, deep narcosis and risk of central respiratory paralysis.

Instructions for first aid

If necessary, rinse eyes affected, provide for specialized further medical treatment. Treat skin that has been contaminated intensively or for a long time using polyethylene glycol 400 and after allowing it to take effect for 10 minutes, rinse with water. In the case of intoxication through inhalation while the person is still conscious, administer glucocorticoid parenterally and as an aerosol at once. In the narcotic to asphyxial stage of intoxication absolute priority must be given to securing the circulatory and breathing function, followed by oxygen administration. For extremely severe forms consider application of a centrally effective alpha-sympathomimetic drug (e.g. Dopamin) or a central analeptic agent (Bemegrid / Pentetrazol / Methamphetamin). After oral ingestion while (still) conscious induce vomiting and subsequently instil activated carbon for a prolonged period. As of pre-narcotic stage, wash out stomach only through endotracheal intubation, followed again by administration of activated carbon and laxative. In every case further in-patient treatment; application of haemodialysis or other intensive toxin elimination method may be necessary. Monitoring of liver and kidney parameters, acid-base balance as well as circulatory, pulmonary and central nervous system function is urgently indicated.

5. Fire-fighting measures

Suitable extinguishing agents

CO₂, fire extinguishing powder or foam, or water spray jet. Adapt fire-fighting measures to surroundings. Suppress vapours with spray jet. Fight larger fire with water spray jet or alcohol-resistant foam.

Extinguishing agents unsuitable for safety reasons

Water in full jet.

Special risk due to substance or the product itself, its products of combustion or resulting gases, further information

The product is combustible. Vapours have a numbing effect, are heavier than air and spread on the ground. Ignition possible over large distance. Hazardous conflagration gases or vapours may form due to ambient fire. Cool nearby drums and containers immediately with water spray. In the event of fire, carbon monoxide, among other things, may be released.

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Special protective equipment for fire fighting

Use suitable breathing apparatus (self-contained device) that is independent of ambient air. Use protective clothing for fire-fighting so as to avoid skin and eye contact. Stay in the danger zone only with suitable impervious chemical protection suit.

Other instructions

Increase in pressure, danger of bursting and explosion when heated. Fire classification B (liquid or deliquescent substances). If possible, take containers out of danger zone. Eliminate sources of ignition. Watch out for flashback. Remain on side towards the wind. Only use explosion-proof and non-sparking equipment. Use solvent-resistant auxiliary equipment. Cool endangered containers with water spray jet. Suppress vapours with water spray jet. Avoid penetration of fire-fighting water in surface waters or groundwater.

6. Measures in the event of unintentional release

Personal precautionary measures

Clear danger zone. Warn those concerned in surrounding area. To eliminate the danger, the danger zone must only be entered while taking suitable protective measures (respiratory equipment, safety goggles, safety boots, safety gloves). Keep unprotected persons away. Increased risk of slipping due to leaking or spilt product. Keep away open flames, heat sources and other sources of ignition. Formation of explosive mixtures with air possible. Ensure very good ventilation. Avoid contact with substance. Do not pick up with unprotected hands. Avoid contact with skin, eyes and clothing. Do not inhale vapours/aerosols. Wear protective clothing in accordance with section 8 of this safety data sheet.

Environmental protection measures

Do not allow to enter subsoil/ground. Do not allow to enter sewer system / surface waters / groundwater. Hazard to drinking water only possible in case of penetration of very large amounts in subsoil and waterbodies. Notify authorities.

Cleaning/collection procedure

Wear rubber gloves. Use non-sparking tools. Collect with liquid-binding material (e.g. activated coal, clay mineral, diatomaceous earth, universal binder). Put leaky receptacles, residues and contaminated material in identified and sealable containers. Dilute small quantities with plenty of water and wash away. Clean wet surfaces immediately with plenty of water. If necessary, clean again and air thoroughly. Disposal as waste in accordance with section 13 of this safety data sheet.

7. Handling and storage

Handling – instructions for safe handling

Keep containers tightly sealed. Only use in well ventilated areas. Avoid contact with eyes and skin. Do not inhale gas/smoke/vapour/aerosol.

Handling – instructions regarding fire and explosion protection

The product is combustible. Vapour-air mixtures are explosive. Area with risk of explosion. Keep away from ignition sources (e.g. electrical equipment, open flames, heat sources and sparks). Extinguish all open flames, eliminate sources of ignition, avoid formation of sparks. Do not smoke. Avoid static charging and discharging: do not spray product, do not transfuse in free fall. Do not discharge in drains (risk of explosion). Prevent gases or vapours from entering other rooms that contain sources of ignition. Remote ignition through creeping vapours possible.

Storage – storeroom and container requirements

Keep under lock and key. Keep containers tightly sealed and store in a cool, dry and well ventilated place. Do not store together with very toxic, toxic, fire-promoting and spontaneously combustible substances as well as with easily inflammable solid substances. Keep away from direct sunlight and sources of heat and ignition. Do not smoke in storage area. Suitable material for containers/equipment: material, solvent-resistant. The floor should be tight, have no joints and be non-absorbent. VCI storage class: LGK 3 A (according to VCI concept), Inflammable liquid substances.

8. Exposure control and personal protective equipment

Components with workplace-related or biological limit values that must be monitored

Not applicable.

Limitation and monitoring of exposure

See section 7. No measures beyond that are necessary.

Personal protective equipment

Respiratory protection

Not necessary as long as product is used properly. Respiratory protection is necessary if vapours/aerosols occur and if there is increased concentration in the air.

Type of mask: full mask (DIN EN 136) or half-mask (DIN EN 140).

Respiratory protection filter: filter class A (organic gases), identification colour: brown.

Hand protection

Use solvent-resistant safety gloves made of nitrile rubber/nitrile latex (NBR, 0.35 mm), butyl rubber (butyl, 0.5 mm) or fluorocautchouc (0.4 mm) with at least 10 cm long sleeve. Check for leaks before using. Ensure skin protection. Preclean gloves while still worn on hands before removing them, then keep them in a well ventilated place. In case of continuous contact, do not wear gloves of polychloroprene (CR, 0.5 mm) for longer than 2 hours. Glove material of natural caoutchouc/natural latex (NR) and polyvinyl chloride (PVC) are not suitable. Fabric or leather gloves are entirely unsuitable.

Eye protection

Tightly sealing safety goggles with side protection and lenses made of safety glass. If contact of the eyes with liquids is possible, safety goggles with face screen are necessary. If eye-damaging vapours or aerosols may occur, the eyes are best protected with a full mask.

Body protection

Wear flame-retardant, antistatic protective work clothing. Protective aids for the body are to be selected depending on the concentration and amount of hazardous substance and according to the specific workplace. Pay attention to chemical resistance of the protective aids (suppliers).

General safety and hygienic measures

Avoid contact with eyes, skin and clothing. Do not inhale gases/vapours/aerosols. Remove contaminated and/or soaked clothing at once. Keep away from food. Do not eat, drink, smoke or take snuff during work. Wash hands before breaks and at the end of work. Preventive skin protection by means of protective skin ointment. Further suitable skin care measures according to code of practice "Skin protection" of the employer's liability insurance association (e.g. BG Chemie [employer's liability insurance association for chemical industry] No. M 042). Minimum standards for protective measures when handling working

substances are listed in TRGS 500 (Technical Rules for Hazardous Substances).

9. Physical and chemical properties

Appearance

State:	liquid
Colour:	colourless
Odour:	alcohol-like

Important data on health and environmental protection and on safety

Product:

Flash point:	20°C
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1-propanol:

pH value:	neutral
Flash point:	15°C
Explosion limits:	formation of explosive vapour-air mixtures possible
- lower	2.1% by vol. (50 g/m ³)
- upper	17.5% by vol. (440 g/m ³)
Vapour pressure:	19.3 hPa (20°C), 36 hPa (30°C), 112 hPa (50°C)
Relative vapour density:	2.08
Vapour saturation:	48 g/m ³ (20°C), 86 g/m ³ (30°C), 251 g/m ³ (50°C)
Density:	0.8035 g/cm ³ (20°C)
Dynamic viscosity:	2.75 mPas (20°C)
Melting temperature:	-126.2°C
Boiling point:	97.2°C (101.3 kPa)
Inflammation point:	412°C
Aqueous solubility:	completely mixable (20°C)

10. Stability and reactivity

Conditions to be avoided

No hazardous reactions given proper use and proper storage and handling. The product is stable. Do not heat. 1-propanol decomposes into propanol and hydrogen in heat at the Cu contact at 230°C, into propylene and water at aluminium oxide at 250-260°C. At 1150°C hydrogen, ethane, ethylene, ethine, propane, formaldehyde, propanol and carbon monoxide are created in the platinum tube. 1-propanol reacts strongly with alkaline metals at room temperature with development of hydrogen. Alkaline earth metals react in heat. All reactions are less vigorous than with ethanol and methanol. Strong reaction with strong oxidation agents.

Substances to be avoided

Alkaline metals; alkaline earth metals; strong oxidation agents; perchloric acid; permanganates; peroxides

Hazardous decomposition products

No decomposition is known given proper use. Decomposition products in event of fire are propanol, propane, propylene, ethane, ethylene, ethine, formaldehyde, carbon monoxide and hydrogen (see section 5).

Further information

The product is combustible and leads to risk of inflammation and/or generation of inflammable gases or

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vapours with air (with propanol vapour). The compound forms an explosive mixture with air.

11. Toxicological information

The product has an acutely irritating effect on the mucous membranes of the eyes and the respiratory organs as well as a chronic effect on the central nervous system. Sensitizing effects are not known. As a vapour and liquid predominantly local irritating effect. Slightly narcotic effect. The toxicity is somewhat higher than that of isopropanol.

Acute toxicity

No acute toxicity known given proper use.

1-propanol

LDL ₀ (oral, human):	5700 mg/kg
LD ₅₀ (oral, rat):	1870 mg/kg
LD ₅₀ (oral, mouse):	6800 mg/kg
LD ₅₀ (oral, rabbit):	2825 mg/kg
LD ₅₀ (dermal, rabbit):	4000 mg/kg
LD ₅₀ (inhalational, rat):	9.8 mg/l / 4 h

Primary irritating effect

1-propanol

Skin, rabbit	500 mg
Eye, rabbit	20 mg / 24 h

Specific symptoms in animal experiment

1-propanol

Skin irritation, rabbit:	local irritation
Bacterial mutagenicity:	Ames test: negative

Subacute to chronic toxicity

Repeated skin contact may lead to dermatitis. No sensitizing effect on humans (patch test).

Further toxicological information

After inhalation

Damage both through inhalation of (possibly warm) vapours and through unintentional swallowing may occur. Depending on amount ingested, symptoms are irritation of mucous membranes, coughing and shortness of breath, headache, dizziness, drowsiness, stupor, inebriation or unconsciousness. Liver and functional kidney disorders are rare.

After skin contact

Slight irritation. Has a degreasing effect on the skin. May lead to rough and chapped skin. Can be taken in through the skin (risk of skin resorption). Absorption via the skin leads to the same symptoms as after the inhalation of vapours.

After eye contact

Irritation. Risk of serious eye damage. Vapours not only cause irritation of the eyes, but also burning sensation, conjunctivitis and defects of the cornea (ulceration).

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After swallowing

Rapid resorption. Headache, dizziness, inebriation, unconsciousness, narcosis. After ingestion of larger amounts: respiratory paralysis, coma. Swallowing leads to the same symptoms as after inhalation of vapours.

After resorption

Monovalent aliphatic alcohols are eliminated at different speeds, primarily through oxidative degradation.

Organs affected

Central nervous system, liver

Further information

The product must be handled with the usual care in connection with chemicals.

12. Ecological information

Ecotoxic effects

Given proper handling and use, there is no fear of any ecological problems. Causes only little biological oxygen depletion. In diluted form degradation in biological treatment plants possible. Hazardous for drinking water if larger amounts enter the soil and/or waterbodies. Do not allow to enter waterbodies, sewer system or soil!

Biological effects – data for 1-propanol

Fish toxicity:	Pimephales promelas	LC ₅₀ = 4480 mg/l / 96 h
Daphnia toxicity:	Daphnia magna	EC ₅₀ = 3642 mg/l / 48 h
Algae toxicity:	Selenastrum capricorn.	IC ₀ = 1150 mg/l / 48 h
Bacterial toxicity:	activated sludge	EC ₅₀ > 1000 mg/l / 3 h
	Photobacterium phosph.	EC ₅₀ = 17700 mg/l / 5 min (Microtox test)
Protozoa toxicity:	Tetrahymen pyriformis	EC ₅₀ = 4168 mg/l / 48 h

Further ecological information – data for 1-propanol

Oxygen depletion:	theor. oxygen demand:	ThOD = 2.4 g/g
	chem. oxygen demand:	COD = 2.23 g/g
	biol. oxygen demand:	BOD ₅ = 73.0% of COD

Biological degradability

1-propanol is easily biodegradable (75% in 20 days).

Behaviour in the environment

Accumulation in organisms is not expected (low bioaccumulation potential).

Bioaccumulation: log P_{OW} = 0.25 (experimental)

Water hazard: WGK 1

13. Disposal considerations

Product

Uniform regulations on disposal of chemicals in the Member States of the EU do not exist. In Germany the requirement of recycling is stipulated by the Closed Substance Cycle and Waste Management Act. The waste producer has to differentiate between "wastes for recycling" and "wastes for disposal" and carry out waste determination according to defined rules. This determination is geared to the material characteristics and in particular to the origin of the wastes. Furthermore, additional special features regarding the

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implementation of disposal are regulated by the German *Länder*. It is recommended that contact be made with the authorities and/or waste management companies and further information be obtained on recycling or disposal.

Waste regulations according to Ordinance on the List of Wastes (AVV)

Due to the hazardous components, the wastes require special monitoring. Accountability for disposal.

Proposals for waste determination:

Waste group 07 01	Wastes from production, preparation, distribution and use of basic organic chemicals
Waste group 07 02	Wastes from production, preparation, distribution and use of plastics, synthetic rubber and synthetic fibres
Waste group 07 07	Wastes from production, preparation, distribution and use of fine chemicals and chemicals not otherwise specified
Waste group 16 05	Gases in pressure vessels and used chemicals
Waste key	Waste designation
07 01 04*	other organic solvents, washing liquids and mother liquors
07 02 04*	other organic solvents, washing liquids and mother liquors
07 07 04*	other organic solvents, washing liquids and mother liquors
16 05 08*	used organic chemicals that consist of hazardous substances or contain such substances

Packaging

Disposal according to provisions of the waste law. Packaging contaminated with the product is considered to be waste requiring special monitoring.

Waste key	Waste designation
15 01 10*	Packaging that contains residues of hazardous substances or is contaminated with hazardous substances.

If not expressly stipulated, non-contaminated packaging can be recycled without documentary proof.

14. Transport information

Overland transport: Road transport ADR/GGVSE and rail transport RID/GGVSE

UN no.:	1274
Designation of product:	n-PROPANOL (solution)
Class:	3
Classification code:	F1
Packaging group:	II
Hazard label:	3
Hazard identification no.:	33
Remark:	n-propanol is synonymous with 1-propanol

Inland shipping transport (ADNI/ADNR)

UN no.:	1274
Designation of product:	n-PROPANOL (solution)
Class:	3
Classification code:	F1
Packaging group:	II
Hazard label:	3

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Remark: n-propanol is synonymous with 1-propanol

Maritime shipping transport (IMDG code)

UN no.: 1274
Proper Shipping Name: n-PROPANOL (solution)
n-PROPYL ALCOHOL, NORMAL (solution)
Class: 3
Packaging group: II
EmS no.: 3-06
Marine pollutant: No
Hazard identification: 3
Remark: n-propanol is synonymous with 1-propanol

Air transport (ICAO-TI/IATA-DGR)

UN / ID no.: 1274
Designation of product: n-PROPANOL (solution)
n-PROPYL ALCOHOL, NORMAL (solution)
Proper Shipping Name: n-PROPANOL (solution)
n-PROPYL ALCOHOL, NORMAL (solution)
Class: 3
Packaging group: II
Hazard identification: flammable liquid (RFL)
Remark: n-propanol is synonymous with 1-propanol

Further information

The product is approved for postal delivery in accordance with the packaging and labelling regulations for hazardous substances in composite packaging with a maximum of 0.5 l in the inner packaging and a maximum of 2 l in the entire package.

15. Regulatory information

The product was classified according to the specifications of the Dangerous Substance Directive (EC Directive 67/548/EEC, Annex I). Hazard-determining component for labelling: 1-propanol (easily flammable, F; irritating, Xi).

Labelling according to EC directives

Hazard symbols:	F	Easily flammable
	Xi	Irritating
R provisions:	R 11	Easily flammable
	R 41	Risk of serious eye damage.
	R 67	Vapours may cause drowsiness and stupor.
S provisions:	S (2)	Must not get into hands of children (if designed for the general public).
	S 7	Keep containers tightly sealed.
	S 16	Keep away from ignition sources – do not smoke.
	S 24	Avoid contact with skin.
	S 26	In the event of contact with the eyes, rinse thoroughly with water at once and consult a physician.
	S 39	Wear safety goggles / face screen.
Small quantities:		If the packaging does not contain more than 125 ml, one may dispense with the specifications in the R and S provisions.

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German regulations

The national legal regulations must additionally be observed!

Employment restriction:	Comply with Section 22 of Youth Employment Protection Law (JarbSchG) and Section 5 of Maternity protection Guideline Regulation (MuSchRiV)!
Hazardous Incident Ordinance: (12. BImSchV)	Quantity thresholds for areas of operation according to Annex I No. 7b Section 1 subsection 1 clause 1: 5,000,000 kg Section 1 subsection 1 clause 2: 50,000,000 kg
Classification acc. to VbF:	VbF B
Clean Air Directive:	Organic substances as total carbon (except dust) according to 5.2.5 TA Luft (Clean Air Directive) Mass flow rate: ≤ 0.50 kg/h or Mass concentration: ≤ 50 mg/m ³
Water hazard class:	WGK 1 (low degree of water endangerment) classification of the components in accordance with Administrative Regulation on the Classification of Substances Hazardous to Waters (VwVwS), Annex 2 n-propanol (identification no. 176: WGK 1)

Other national regulations

Swiss toxin class: 4

Miscellaneous regulations, restrictions and prohibitory regulations

VCI storage class:	LGK3A – Flammable liquid substances.
BG-Chemie codes of practice:	M004 Irritating substances / caustic substances M017 Solvents M050 Handling harmful substances M051 Hazardous chemical substances
Application restrictions:	Aurofilm may be used exclusively for the designed purpose in the dental laboratory.

16. Other information

Data sheet issued by:	Material Development Department
Contact person:	Dr. Thomas Wiest
Reasons for change:	Complete revision
Revised on:	20.12.2002
Replaces issue dated:	22.11.1999

The data are based on the current level of our knowledge. They are intended in particular to describe our product with regard to the hazards related to its use and the safety precautions to be taken. They do not represent any guarantee of product and quality characteristics.