SDS

In compliance with HCS/HazCom 2012

HBK
HOTTINGER BRÜEL & KJÆR

SAFETY DATA SHEET

Product: FS01

Revision: 00 | Date: 8/23/2021 | Pages: 1 /17

1 - IDENTIFICATION

Product identifier	FS01
Recommended use of the chemical and restrictions on use	Adhesive
Company	Hottinger Brüel & Kjaer
Address	19 Bartlett st. Marlborough, MA 01590
Telephone number	+1.508.804.3268
Emergency telephone number	Chemtrec: 1-800-424-9300. International: 1-703-527-3887
E-mail	support@hbm.com

2 - HAZARDS IDENTIFICATION

Classification of the chemical	Flammable liquids – Category 2 Skin sensitization – Category 1 Serious eye damage/eye irritation – Category 2A Specific target organ toxicity – Single exposure – Category 3
Signal word	DANGER
Hazard statement(s)	H225 Highly flammable liquid and vapour. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H336 May cause drowsiness or dizziness.
Symbol(s)	
Precautionary statement(s)	**PREVENTION** P210 Keep away from heat, hot surfaces, sparks, open flames, and other sources. No smoking.

P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosions-proof electrical, ventilating, lighting equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves, protective clothing, eye protection, face protection, hearing protection.

RESPONSE

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370 + P378 In case of fire: Use water jet or fog, chemical powder, carbon dioxide (CO_2) to extinguish.

STORAGE

P403 + P233 Store in well-ventilated place. Keep container tightly closed.

DISPOSAL

P501 Dispose of contents and container in accordance with current regulations.

Classification system adopted	Hazard Communication Standard (HCS) 29 CFR: 1910.1200 - Appendix A. Adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations, 8 ed.
Other hazards which do not result in classification	The product has no other hazards.

3 – COMPOSITION / INFORMATION ON INGREDIENTS

MIXTURE

Impurities and stabilizing additives contributing to the hazard (%m):

Components	Concentration %	Number CAS	GHS classification*
Propan-2-ol; isopropyl alcohol; isopropanol	80 – 90%	67-63-0	H225; H319; H336
Rosin; colophony	10 – <15%	8050-09-7	H317
Adipic acid	1 – <5%	124-04-9	H318; H402
Azelaic acid	1 – <3%	123-99-9	H315; H319

* Hazard statements are described in section 16.

4 - FIRST-AID MEASURES

Inhalation	Remove victim to fresh air and keep at rest in a comfortable position for breathing. Monitor respiratory function. If you feel unwell, contact a POISON CENTER or doctor. Take this SDS.
Skin contact	Wash exposed skin with enough soap and water to remove the material, if necessary, take a shower. Contact a POISON CENTER or doctor immediately. Take this SDS.
Eye contact	Rinse with plenty of water, keeping the eyelids open to eliminate all the product. If using contact lenses, remove them if it is easy. Continue rinsing. If necessary, contact a POISON CENTER or a doctor. Take this SDS.
Ingestion	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Rinse victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place the patient on the left side (if possible upwards) to keep the airway open and prevent aspiration. Keep the patient silent and maintain normal body temperature. Consult a POISON CENTER or doctor. Take this SDS.

Most important symptoms and effects, acute and delayed	Exposure to the product may cause allergic skin reactions with dermatitis and itching. The product may cause eye irritation with watering, redness and burning. Inhalation of the product can cause narcotic effects with drowsiness and dizziness.
Indication of any immediate medical attention and special treatment needed	Avoid contact with the product when helping the victim. Exposure treatment should be directed towards the control of the patient's symptoms and clinical condition. In case of contact with the skin, do not rub the affected area.

5 - FIRE-FIGHTING MEASURES

Extinguishing media	Suitable: Compatible with water jet or fog, alcohol resistant foam, chemical powder, carbon dioxide (CO_2). Not suitable: Direct water jets.
Specific hazards arising from the chemical product	Extremely dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or match and cigarette flames, welding operations, pilot lights and electric motors. May accumulate static charge by flow or agitation. Vapors of heated liquid may ignite by static discharge. Vapors may be denser than air and tend to accumulate in low or confined areas such as manholes and basements. They can travel long distances, causing the flame to recede or new fires in open and confined environments. Containers may explode if heated. Combustion of the chemical or its packaging can form irritating and toxic gases such as monoxide and carbon dioxide.
Specific extinguishing methods	If material is on fire or involved in fire: Submerge with water. Cool all affected containers with plenty of water. Approach fire against wind to avoid hazardous vapors and toxic decomposition products. Use large amounts of water in containers involved in fire. If necessary, use water spray to cool fire-exposed containers. Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

6- ACCIDENTAL RELEASE MEASURES

Personal precautions	Prevent sparks or flames. Do not smoke. Do not touch damaged containers or spilled material without wearing suitable clothing. Avoid exposure to the product. Stay away from low areas, with the wind behind you. Use personal protective equipment as described in section 8.
Protective equipment	Wear PPE complete with safety glasses, protective gloves, suitable protective clothing, and closed shoes.
Emergency procedures	In case of large leaks, where exposure is large, it is recommended to use respiratory protection with a filter against vapors. Evacuate the area within a radius of at least 300 meters. If the tank or cargo is involved in the fire, isolate the area within a radius of 800 meters in all directions. Keep unauthorized persons away from the area. Stop the leak if it can be done without risk.
Environmental precautions	Prevent spilled product from reaching water courses and sewage system.
Methods and materials for containment	Containment techniques may include bunding, covering of drains and capping procedures.
Methods and materials for cleaning up	Use water mist or vapor suppressing foam to reduce the dispersion of the vapors. Use natural barriers or containment of spillage. Collect spilled product and place in appropriate containers. Adsorb the remaining product with dry sand, earth, vermiculite, or other inert material. Place the adsorbed material in appropriate containers and remove them to a safe place. For disposal, proceed according to Section 13 of this SDS.

7- HANDLING AND STORAGE

Precautions for safe handling	Handle in a ventilated area or with a general local ventilation / exhaust system. Avoid formation of vapors. Avoid exposure to the product. Avoid contact with incompatible materials. Ground all equipment. Use explosion-proof electrical equipment and

Conditions for safe storage, including any incompatibilities	lighting. Ground the lines and equipment used during the transfer to reduce the possibility of a fire or explosion initiated by a static spark. Use personal protective equipment as described in section 8. Wash hands and face thoroughly after handling and before eating, drinking, smoking, or going to the bathroom. Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas. Keep away from heat, sparks, open flames, and hot surfaces. - Do not smoke. Keep container tightly closed. Ground the container vessel and the receiver of the product during transfers. Only use anti-sparking tools. Avoid the accumulation of electrostatic charges. Use electrical equipment, ventilation, and lighting explosion proof. Incompatible with oxidizing agents. Recommended Packaging: similar to original packaging.

8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Permissible concentration

Occupational exposure limit

Chemical or common name	TLV – TWA (ACGIH, 2021)	PEL – TWA (OSHA, 2019)	REL – TWA (NIOSH, 2019)
Propanol A4	TWA 200 ppm STEL 400 ppm	400 ppm (ST) 500 ppm	400 ppm (ST) 500 ppm
Adipic acid	5 mg/m³	N.E.	N.E.
Resin acids*	0.001 mg/m³(I)	N.E.	N.E.

A4: Not classified as a human carcinogen
Propanol: IDLH (NIOSH, 2010): 2.000 ppm [10% LEL].
I: Inhalable particulate matter
*DSEN: Dermal sensitization

	*RSEN: Respiratory sensitization ST: Short Term Exposure Limit N.E. Not established
Biological limit	ACGIH - BEI (2021): Isopropyl Alcohol: Acetone in urine: 40 mg/L (End of shift at the end of the working week).
Appropriate engineering controls	Promote direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce exposure to product. Keep atmospheric concentrations of the chemical agent below the indicated occupational exposure limits.

Individual protection measures, such as personal protective equipment

Respiratory protection	Respiratory protection with filter against organic vapors or mist in case of exposure to the product. Based on occupational exposure limits and inhalation hazards of the product, a risk assessment should be performed to properly define respiratory protection in view of the conditions of product use.
Hand protection	Nitrile protective gloves.
Eye protection	Safety glasses with side shields.
Skin and body protection	Suitable safety clothing and closed shoes. The material used should be waterproof. Wear anti-static footwear and clothing.
Special precautions	Not established.

9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance (physical state, color, etc.)	Liquid amber.
Odour	Not relevant.

Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Boiling point, initial boiling, and boiling range	82.4°C.
Flashpoint	12 °C.
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	43 hPa.
Vapour density	Not available.
Relative density	0.831 g/cm³.
Solubility(ies)	Not available.
n-octanol/water partition coefficient	Not available.
Auto-ignition temperature	420°C.
Decomposition temperature	Not established.
Odour threshold	Not established.
Evaporation rate	Not available.
Flammability	Not established.
Viscosity	Not available.
Other information	Not available.

10 - STABILITY AND REACTIVITY

Reactivity and Chemical stability	Product is stable under normal conditions of temperature and pressure.

Possibility of hazardous reactions	May react dangerously in contact with incompatible materials.
Conditions to avoid	Elevated temperatures. Ignition sources, contact with incompatible materials and humidity.
Incompatible materials	Incompatible with oxidizing agents.
Hazardous decomposition products	Decomposition of product may generate toxic gases such as CO, CO_2.

11 - TOXICOLOGICAL INFORMATION

Acute toxicity	The product is not expected to present acute oral, dermal or inhalation toxicity. Propanol: LD_{50} (oral, rats): > 2,000 mg/kg. LD_{50} (oral, rats): 5045 mg/L. LC_{50} (rats, inhalation): >20 mg/L. LD_{50} (dermal, rabbits): > 2,000 mg/kg. LD_{50} (dermal, rabbits): 12,800 mg/kg. Rosin; colophony: LD_{50} (oral, rats): > 2,000 mg/kg. LD_{50} (dermal, rats): > 2,000 mg/kg. Adipic acid: LD_{50} (oral, rats): > 5,000 mg/kg. LD_{50} (dermal, rats): > 5,000 mg/kg. LC_{50} (inhalation, rats): 7,700 mg/m³. Azelaic acid: LD_{50} (oral, rats): 15,800 mg/kg. LC_{50} (inhalation, rats, 4h): > 0.162 mg/L. LD50 (dermal, rabbits): > 2,000 mg/kg .
Skin irritation/corrosion	The product is not expected to cause skin irritation. Propanol: Studies conducted with rabbits did not show the potential to

	irritate the skin of animals.
Eye damage/irritation	The product may cause eye irritation with watering, redness and burning. Propanol: Test conducted with rabbits (OECD 405) showed that the product causes eye irritation in the rabbits tested. Adipic acid: Rabbit eye irritation test (OECD 405) caused serious eye irritation.
Respiratory or skin sensitization	Exposure to the product may cause allergic skin reactions with dermatitis and itching. Rosin: Tests show that the compound causes skin sensitization.
Reproductive cell mutagenicity	The product is not classified as mutagenic. Propanol: Ames (Salmonella typhimurium) test: Result: negative. Mutagenicity, in vitro HGPRT test in Chinese hamster ovary: result: negative. Mutagenicity, in vitro cell transformation assay in hamster embryos: Result: negative. Mutagenicity, in vitro mouse bone marrow micronucleus test: Result: negative. Mutagenicity, in vitro sister chromatid exchange assay in Chinese hamster V79 fibroblasts: Result: negative. Azelaic acid: In vitro gene mutation study in bacteria - OECD Guideline 471 (Bacterial Reverse Mutation Assay) negative.
Carcinogenicity	The product is not expected to cause cancer. Propanol: Propanol is classified by ACGIH as group A4 - Not classified as a human carcinogen.

Reproductive toxicity	Propanol is classified as IARC as group 3 – Not classified as a human carcinogen. The product is not expected to cause reproductive toxicity. Propanol: Reproductive/developmental toxicity test 0 – 1200 mg/kg orally in rats during pregnancy. Result: maternal and fetal toxicity at high doses; no teratogenicity occurred at any dose tested. Reproductive/developmental toxicity test 1000 mg/kg/day orally, rats. Result: Non-teratogenic. Reproductive/developmental toxicity test in rabbits, 1200 mg/kg/day orally. Result: Non-teratogenic. Reproductive/developmental toxicity test in rats, 2500 – 10000 ppm via inhalation during pregnancy. Outcome: maternal toxicity, fetal toxicity, and skeletal malformations at high doses; no teratogenicity at low dose.
Specific target organ toxicity – single exposure	Inhalation of product vapors can cause narcotic effects with drowsiness, dizziness, headache, fatigue, and nausea.
Specific target organ toxicity – repeated exposure	The product is not expected to cause specific target organ toxicity through repeated exposure.
Aspiration hazard	It is not expected that the product presents aspiration hazard.

12 - ECOLOGICAL INFORMATION

Environmental effects, behavior, and fate of the product

Ecotoxicity	The product is not harmful to aquatic organisms. Propanol: LC_{50} (*Rasbora heteromorpha*, 96h): 1,400 mg/L. LC_{50} (*Crangon crangon*, 48h): 4,200 mg/L. LC_{50} (*Pimephales promelas*, 96h): 9640 mg/L. LC_{50} (*Daphnia magna*, 24h): > 10,000 mg/L. Adipic acid: LC_{0} (*Danio rerio*, 96h): > 1000 mg/L.

	EC_{50} (*Daphnia magna*, 48h): 46 mg/L. CE_{50} (*Pseudokirchnerella subcapitata*, 72h): 59 mg/L. NOEC (*Pseudokirchnerella subcapitata*, 21 d): 6.3 mg/L. Azelaic acid: LC_{50} (*Oryzias latipes*, 96h): > 16 mg/L. NOEC (Fish, 28d): 6.4 mg/L. NOEC (Fish, 28d, mortality): 2 mg/L. EC_{50} (*Daphnia magna*, 48h): > 21 mg/L. NOEC (*Daphnia magna*, 21d): 0.2 mg/L. EC_{50} (*Pseudokirchnerella subcapitata*, 72h): > 67 mg/L.
Persistence and degradability	The product is expected to be non-persistent and rapidly degraded. Azelaic acid: Biodegradability: 86% in 30 days. Presents low bioacumulative potencial in aquatic organisms. Propanol: Log kow: 0.05 at 25°C.
Bioaccumulative potential	Azelaic acid: BCF: 225. Adipic acid: Log kow: 0.081.
Mobility in soil	Not available.
Other adverse effects	There are not known adverse environmental effects of the product.

13 - DISPOSAL CONSIDERATIONS

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated	Must be disposed of as hazardous waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product. Keep product residues in their original containers and properly closed. Disposal should be in accordance with the regulations for the product.

packaging	Do not reuse empty containers. These may contain product residues and should be kept closed and sent for appropriate disposal as established for the product.

14 - TRANSPORT INFORMATION

International regulations	
Land	UN – "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations DOT - U.S. Department of Transportation
UN number	1219
UN proper shipping name	ISOPROPANOL (ISOPROPYL ALCOHOL)
Transport hazard class(es)	3
Subsidiary risk	NA
Packing group	II
Sea	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN number	1219
UN proper shipping name	ISOPROPANOL (ISOPROPYL ALCOHOL)
Transport hazard class(es)	3
Subsidiary risk	NA
Packing group	II
Environmental hazards	Product is not considered a marine pollutant..
EmS	F-E, S-D
Air	IATA – International Air Transport Association Dangerous Goods Regulation (DGR)
UN number	1219
UN proper shipping name	ISOPROPANOL (ISOPROPYL ALCOHOL)
Transport hazard class(es)	3

Subsidiary risk	NA
Packing group	II
Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006. - International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.
Special precautions	There is no need of special precautions.

15 - REGULATORY INFORMATION

Safety, health, and environmental regulations/legislation specific for the substance or mixture	International Labor Organization C170 Chemicals Convention, from June 25th, 1990: Occupational Safety and Health – Toxic Substances and Agents. Hazard Communication Standard (HCS) 29 CFR: 1910.1200 - Appendix A, B, C, D, E, F. GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS). 8. rev. ed. U.S. Federal Regulations: United States inventory (TSCA): Propanol is listed. Rosin is listed. Adipic acid is listed. Azelaic acid is listed. California Proposition 65: Ingredients are not listed.

16 - OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the

handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS elaborated in August 2021.

Hazard statements described in section 3:
H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H402 Harmful to aquatic life.

Abbreviations:
ACGIH – American Conference of Governmental Industrial Hygienists
BCF – Bioconcentration Factor
CAS – Chemical Abstracts Service
LE_{50} – Efective concentration 50%
LC_{50} – Lethal Concentration 50%
LD_{50} – Lethal Dose 50%
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit

TLV – Threshold Limit Value

TWA – Time Weighted Average

Bibliographic references:

ACGIH. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Cincinnati-USA, 2021.

ECHA. EUROPEAN CHEMICAL AGENCY. Available in: <https://echa.europa.eu/>. Access in: Aug. 2021.

ECHEM. The Global Portal to Information on Chemical Substances OECD. Available in: <https://www.echemportal.org/echemportal/substancesearch/substancesearch_execute.action>. Access in: Aug. 2021.

EPA. United States Environmental protection Agency. Comptox. Available in: < https://comptox.epa.gov>. Access in: Aug. 2021.

GHS. Globally Harmonized System of Classification and Labelling of Chemicals. 8. rev. ed. New York: United Nations, 2019.

IARC. INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available in: <http:/monographs.iarc.fr/ENG/Classication/index.php>. Access in: Aug. 2021.

NIOSH. NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available in: <http:/www.cdc.gov/niosh/>. Access in: Aug. 2021.

NJ. STATE OF NEW JERSEY - Department of Health. Available in:

<http:/nj.gov/health/eoh/rtkweb/odispubr.shtml>. Access in: Aug. 2021.

SDS. Safety Data Sheet. FS01. Revision No: 1,4 - Replaces version: 1,3. Revision date: 18.03.2021.

TOXNET. TOXICOLOGY DATA NETWORKING. ChemIDplus Lite. Available in: <http:/chem.sis.nlm.nih.gov/>. Access in: Aug. 2021.