

SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier

Trade name: **Booster Fluid BFL-I** (#15074) / Isopropyl alcohol
INDEX-No.: 603-117-00-0
CAS-No.: 67-63-0
EC-No.: 200-661-7

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

Use of the substance: Additive for hydrogen gas for microflame generators SPIRFLAME®, Quantity around 0,5 liters per generator

1.3 Details of the supplier of the safety data sheet

Company: Dipl. Ing. Ernest Spirig
Hohlweg 1
8640 Rapperswil
Switzerland, www.spirig.com
Phone: +41 55 222 6900
Fax: +41 55 222 6969
Responsible person: phone: +41 55 222 6900, Email: info@spirig.com

1.4 Emergency telephone number Spirig: phone: +41 (0) 55 / 222 6900

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according regulation (EC) 1272/2008

| Hazard Class | Hazard Category | Target Organs | Hazard Statements |
|--|-----------------|---------------|-------------------|
| Flammable liquids | Category 2 | --- | H225 |
| Serious eye damage / eye irritation | Category 2 | --- | H319 |
| Specific target organ toxicity - single exposure | Category 3 | --- | H336 |

For the full text of the H-Statements mentioned in this Section, see Section 16.

Most important adverse effects

Human Health: Chronic exposure damages the brain and the central nervous system. May cause drowsiness or dizziness. Causes serious eye irritation.
Physical and chemical hazards: Flammable liquid and vapor. To be stored as flammable liquid.
Potential environmental effects: According to available data, this product is not harmful to the environment.

2.2 Label elements

Labeling according to Regulation (EC) No 1272/2008



Signal word: **Danger**
Hazard statements: H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements

Prevention: P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response: P304 + P340 IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
Storage: P403 + P233 + P235 Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Hazardous components, which must be listed on the label: Isopropyl Alcohol

2.3 Other hazards

For Results of PBT and vPvB assessment see section 12.5.
No other information is available.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

| Hazardous Components | Amount [%] | Classification (Regulation (EC) No 1272/2008) | |
|---|------------|---|----------------------|
| | | Hazard class / Hazard category | Hazard statements |
| Isopropyl Alcohol INDEX-No.: 603-117-00-0 CAS-No.: 67-63-0 EC-No.: 200-661-7 Registration: 01-2119457558-25-xxxx | 93 | Flam. Liq.2 Eye Irrit. 2 STOT SE3 | H225 H319 H336 |
| Additives | 7% | No hazardous component | |

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General advice: Take off all contaminated clothing immediately.
 If inhaled: Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position. Consult a physician after significant exposure.
 In case of skin contact: Wash off immediately with soap and plenty of water. If skin irritation persists, call a physician.
 In case of eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. Consult an eye specialist immediately.
 If swallowed: Rinse mouth with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. If a person vomits when lying on his back, place him in the recovery position. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Eye irritation, Can cause redness, tearing, pain and weakness of vision.

Effects: See Section 11 for more detailed information on health effects and symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
 Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting: Highly flammable, vapors may form explosive mixtures with air. Vapors are heavier than air and may spread along floors. Flash back possible over considerable distance.

Hazardous combustion products: Carbon monoxide, Carbon dioxide (CO2)

5.3 Advice for firefighters

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus. Wear personal protective equipment.

Further information: Cool closed containers exposed to fire with water spray. Heating will cause a pressure rise - with risk of bursting. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment. Keep people away from and upwind of spill/leak. Provide adequate ventilation. Keep away from heat and sources of ignition. Avoid contact with skin and eyes. Do not breathe gas/fumes/vapor/spray.

6.2 Environmental precautions

Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities. Avoid subsoil penetration. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Further information: Treat recovered material as described in the section "Disposal considerations".

6.4 Reference to other sections

See Section 1 for emergency contact information.
 See Section 8 for information on personal protective equipment.
 See Section 13 for waste treatment information.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling:

Keep container tightly closed. Use personal protective equipment. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

Hygiene measures: Keep away from food, drink and animal feeding stuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:

Keep in an area equipped with solvent resistant flooring. Suitable materials for containers: Mild steel; Stainless steel; Unsuitable materials for containers: Aluminium

Advice on protection against fire and explosion:

Combustible liquid. Keep away from sources of ignition - No smoking. Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Take measures to prevent the build up of electrostatic charge. Use only in an area containing explosion proof equipment.

Fire-fighting class: Highly flammable and extremely fast burning down; Flp < 21°C

Further information on storage conditions:

Keep tightly closed in a dry and cool place. Keep in a well-ventilated place. Keep away from heat. Store in cool place.

Advice on common storage:

Keep away from food, drink and animal feeding stuffs. Incompatible with oxidizing agents. Do not store together with oxidizing and self-igniting products.

German storage class: 3 Flammable liquids

7.3 Specific end use(s)

Additive for hydrogen gas for microflame generators SPIRFLAME®, Quantity around 0,5 liters per generator

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Other occupational exposure limit values

Additional information: Contains no substances with occupational exposure limit values.

Component: Isopropanol CAS-Nr. 67-63-0
Derived no Effect Level (DNEL) / Derived Minimal Effect Level (DMEL)

| | | |
|------|---|------------------|
| DNEL | Workers, Long-term – systemic effects, skin contact | 888 mg/kg bw/day |
| DNEL | Workers, Long-term – systemic effects, inhalation | 500 mg/m3 |
| DNEL | Consumers, Long-term – systemic effects, skin contact | 319 mg/kg bw/day |
| DNEL | Consumers, Long-term – systemic effects, inhalation | 89 mg/m3 |
| DNEL | Consumers, Long-term – systemic effects, ingestion | 26 mg/kg bw/day |

Predicted No Effect Concentration (PNEC)

| | |
|-------------------------------|----------------|
| Fresh water: | 140,9 mg/l |
| Marine water: | 140,9 mg/l |
| Intermittent releases: | 140,9 mg/l |
| Sewage treatment plant (STP): | 2251 mg/l |
| Sediment: | 552 mg/kg d.w. |
| Soil: | 28 mg/kg |
| Secondary poisoning: | 160 mg/kg food |

8.2 Exposure controls

Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

Personal protective equipment

Respiratory protection: Advice: In case of insufficient ventilation, wear suitable respiratory equipment. Use respirator with appropriate filter if vapors or aerosol are released. Respirator with a vapor filter (EN 141) Recommended Filter type: A In case of intensive or longer exposure use self-contained breathing apparatus.

Hand protection: Advice: Protective gloves complying with EN 374. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Protective gloves should be replaced at first signs of wear.

| | |
|--------------------|--------------|
| Material | Butyl-rubber |
| Break through time | >= 8h |
| Glove thickness | 0,5 mm |

Eye protection: Advice: Safety glasses with side-shields conforming to EN166

Skin and body protection: Advice: Solvent resistant protective clothing

Environmental exposure controls

General advice: Avoid subsoil penetration.

If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Form: liquid
Color: colorless

| | |
|---|--|
| Odor: | alcohol-like |
| Odor threshold: | no data available |
| pH: | neutral |
| Melting point/range: | -89,5 °C |
| Boiling point/range: | 82 °C |
| Flash point: | -12 °C (closed cup) |
| Evaporation rate: | no data available |
| Flammability (solid, gas): | no data available |
| Lower Explosion limit: | 2 Vol-% |
| Upper Explosion limit: | 12 Vol-% |
| Vapor pressure: | at 20 °C: 48 hPa |
| Relative Vapor density: | 2 |
| Density: | at 20°C: 0,785 g/cm ³ |
| Water solubility: | completely miscible |
| Partition coefficient: n-octanol/water: | log Kow 0,05 (OECD Test Guideline 107, literature value) |
| Auto-ignition temperature: | 425°C |
| Thermal decomposition: | no data available |
| Viscosity, dynamic: | 2,43 mPa.s. (at 20°C) |
| Explosivity: | Product is not explosive. Formation of explosive air/vapor mixtures is possible. |
| Oxidizing properties: | not oxidising |

9.2 Other information

Molecular weight: 60,10 g/mol

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Advice: No decomposition if stored and applied as directed.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions: Exothermic reaction with strong acids. Incompatible with oxidizing agents.

10.4 Conditions to avoid

Conditions to avoid: Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid: Strong-oxidizing agents, Strong acids, Aldehydes, Amines, alkalis, alkanolamines

10.6 Hazardous decomposition products

Under fire conditions: Carbon oxides

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

| Component | Isopropanol | CAS-Nr. | 67-63-0 |
|--------------------------------|-----------------|------------------------|--|
| Acute Toxicity: | Oral: | LD50: | 5840 mg/kg (rat, OECD Test Guideline 401) |
| | Inhalation: | LC50: | > 25 mg/l (rat; 6h, vapour, OECD Test Guideline 403) |
| | Dermal: | LD50: | 13900 mg/kg (rabbit, OECD Test Guideline 402) |
| Irritation: | Skin: | | No skin irritation (OECD Test Guideline 404) |
| | Eyes: | | Degreases the skin which may cause dry and rough. Prolonged or repeated skin contact may result in dermatitis. Eye irritation (OECD Test Guideline 405) Splashes in eyes may cause strong pain. Vapour acts irritant. |
| Sensitisation: | | | not sensitizing (Buehler Test; Dermal; Guinea pig) (OECD Test Guideline 406) |
| CMR Effects | CMR Properties: | Carcinogenicity: | Based on available data, the classification criteria are not met. |
| | | Mutagenicity: | In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects |
| Carcinogenicity | NOEL | Reproductive toxicity: | No effects on or via lactation Based on available data, the classification criteria are not met. |
| | | | 5.000 ppm, (negative, Mouse, male and female) (Inhalation; 0, 500, 2500, 5000 ppm; 78 weeks; Frequency of treatment: 5 days/week) (OECD Test Guideline 451) |
| Genotoxicity in vitro: Result: | | | negative (Bacterial Reverse Mutation Test; Salmonella typhimurium; with and without metabolic activation) (OECD Test Guideline 471) negative (In vitro gene mutation study in mammalian cells; CHO negative (In vitro gene mutation study in mammalian cells; CHO |
| Genotoxicity in vivo: Result: | | | negative (In vivo micronucleus test; Mouse, male and female) (intraperitoneal;) (OECD Test Guideline 474) |
| Teratogenicity | NOAEL maternal: | | 400 gm/kg bw/day |
| | | NOAEL develop.: | 400 gm/kg bw/day (Rat, Sprague-Dawley) (Oral) (OECD Test Guideline 414) No adverse effects |
| Reproductive toxicity | NOAEL Parent: | | 853 gm/kg bw/day (One-Generation Reproduction Toxicity Study; Rat, wistar, male and female) (Oral) (OECD Test Guideline 415) |

NOAEL Parent: No negative effects.
500 gm/kg bw/day
(Two-generation reproductive toxicity; Rat, Sprague-Dawley, male and female) (Oral) (OECD Test Guideline 416)
No negative effects.

Specific Target Organ Toxicity
Single exposure Inhalation: Target Organs: Central nervous system
May cause drowsiness or dizziness.
Repeated exposure: Remark: Oral and inhalation repeated exposure studies demonstrated target organ effects in male rats (kidney) and male and female mice (thyroid) by mechanisms of action that are not relevant to humans

Other toxic properties: Aspiration hazard: Aspiration hazard if swallowed - can enter lungs and cause damage.
Aspiration may cause pulmonary oedema and pneumonitis

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Component Isopropanol CAS-Nr. 67-63-0
Acute Toxicity: Fish: LC50: 9640 mg/l (Pimephales promelas; 96 h) (flow-through test; OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates: LC50: 9714 mg/l (Daphnia magna; 24 h) (static test; OECD Test Guideline 202)
Algae: EC50: >100 mg/l (scenedesmus quadricauda; 72 h)
Bacteria: EC50: >100 mg/l (Bacteria), no harming action

12.2. Persistence and degradability

Component Isopropanol CAS-Nr. 67-63-0
Persistence: Transformation due to hydrolysis not expected to be significant. Transformation due to photolysis not expected to be significant.
Biodegradability: Result: 53 % (aerobic; domestic sewage; Related to: O2 consumption; Exposure Time: 5 d)(Directive 67/548/EEC, Annex V, C.5)
Readily biodegradable

12.3 Bioaccumulative potential

Result: log Kow 0,05
Bioaccumulation is not expected.

12.4 Mobility

Water: The product is water soluble
Soil: Mobile in soils

12.5 Results of PBT and vPvB assessment

Result: This substance is not considered to be persistent, bioaccumulating nor toxic (PBT),. This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Additional ecological information: No information

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains.

Contaminated packaging

Empty contaminated packaging thoroughly. They can be recycled after thorough and proper cleaning. Packagings that cannot be cleaned are to be disposed of in the same manner as the product. Do not burn, or use a cutting torch on, the empty drum. Risk of explosion.

European Waste Catalogue Number:

No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number 1219

14.2 UN proper shipping name
ADR/RID: ISOPROPANOL
IMDG, IATA: ISOPROPANOL

14.3 Transport hazard class(es)

| | Class | Labels | Classification code | Hazard identification number | Tunnel restriction code / EmS |
|------|-------|--------|---------------------|------------------------------|-------------------------------|
| ADR | 3 | 3 | F1 | 33 | D/E |
| RID | 3 | 3 | F1 | 33 | - |
| IMDG | 3 | 3 | | | F-E, S-D |
| IATA | 3 | 3 | | | |

14.4 Packaging group II (ADR, RID, IMDG, IATA)

14.5 Environmental hazards

Environmentally hazardous according to ADR: no
Environmentally hazardous according to RID: no
Marine Pollutant according to IMDG-Code: no

14.6 Special precautions for user

Note: not applicable

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG: not applicable

SECTION 15: REGULATORY INFORMATION

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

National regulations - Switzerland

VOC (CH): Tariff number: ex 2905.1290

EU. REACH: Annex XVII, Marketing and Use Restrictions (Regulation 1907/2006/EC), Listed Point Nos.: 40; Listed

National regulatory information

CPID: 295252-49
Threshold quantity MAO : 20.000kg (2015 determined by law SR814.012 Ann.1 ch 4)
Ordinance protection of air: LRV (CH): chapter 72 – class 3

USA

NFPA Hazard Rating: Health: 1 (Slightly Hazardous), Flammability: 3 (Highly Flammable), Reactivity: 0 (Stable)



Notification status – Isopropanol:

| Regulatory list | Notification | Notification number |
|-----------------|--------------|---------------------|
| AICS | Yes | |
| DSL | Yes | |
| EINECS | Yes | 200-661-7 |
| IECSC | Yes | |
| PICCS (PH) | Yes | |
| TSCA | Yes | |

15.2 Chemical Safety Assessment

No data available

SECTION 16: OTHER INFORMATION

Additional information

Full text of H-Statements referred to under sections 2 and 3:

H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Reason for the last update: General update: May 11, 2023 (version 01-2023)

Made: 11.12.1998

The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.