

**SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY**

**1.1 Product identifier**

Trade name: **Booster Fluid BFL-MK (#15076) / Methyl ethyl keton**  
INDEX-No.: 603-002-00-2  
CAS-No.: 78-93-3  
EC-No.: 201-159-0  
Registration number: 01-2119457290-43-0002

**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: See section 11 for toxicological information. No further information available.  
Physical and chemical hazards: See section 9 for physicochemical information., No further information available.  
Potential environmental effects: See section 12 for environmental information. No further information available

**2.2 Label elements**

**Labeling according to Regulation (EC) No 1272/2008**



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

**Precautionary statements**

Prevention: P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P233 Keep container tightly closed.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
Response: P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.  
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
Storage: P403 + P235 Store in a well-ventilated place. Keep cool.  
**Additional Labeling:** EUH066 Repeated exposure may cause skin dryness or cracking.

**Hazardous components, which must be listed on the label: Methyl ethyl ketone**

**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
<b>Methyl ethyl ketone</b> INDEX-No.: 606-002-00-3 CAS-No.: 78-93-3 EC-No.: 201-159-0 Registration: 01-2119457290-43-xxxx	93	Flam. Liq.2 Eye Irrit. 2 STOT SE3	H225 H319 H336
<b>Additives</b>	7%	No hazardous component	

For the full text of the R-phrases mentioned in this Section, see Section 16.  
 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: Remove from exposure, lie down. Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Take off all contaminated clothing immediately. Consult a physician.  
 If inhaled: Remove to fresh air. Obtain medical attention. If unconscious place in recovery position and seek medical advice.  
 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 a physician.  
 If swallowed: Clean mouth with water and drink afterwards plenty of water. If swallowed, do not induce vomiting – seek medical advice.

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

Symptoms: No information available  
 Effects: No information available

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

Treatment: Treat symptomatically. No further information available.

**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. Hazardous decomposition products formed under fire conditions. Carbon oxides

**5.3 Advice for firefighters**

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus. Wear appropriate body protection (full protective suit)  
 Further information: Cool closed containers exposed to fire with water spray. 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**

Ensure adequate ventilation. This material and its container must be disposed of as hazardous waste. 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**

For personal protection see section 8.

**SECTION 7: HANDLING AND STORAGE**

**7.1 Precautions for safe handling**

Advice on safe handling:

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with the skin and the eyes. Keep container tightly closed. Provide sufficient air exchange and/or exhaust in workrooms. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

Hygiene measures: Take off all contaminated clothing immediately. Do not breathe gas/fumes/vapor/spray. Avoid contact with the skin and the eyes. 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.

**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;  
Keep away from heat and sources of ignition. Keep in a dry, cool and well-ventilated place.

Advice on protection against fire and explosion:

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

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: Store in accordance with the particular national regulations.

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**

Component:	Methyl ethyl ketone	CAS-Nr. 78-93-3
<b>Other occupational exposure limit values</b>		
EU ELV, short term exposure limit (STEL):	300 ppm, 900 mg/m3	indicative
EU ELV, Time weighted average (TWA):	200 ppm, 600 mg/m3	indicative

SUVA If in compliance with the OEL and BEL values, then there should be no risk of reproductive damage.

SUVA, short term exposure limit (STEL):	200 ppm, 590 mg/m3
SUVA, Skin designation:	Can be absorbed through the skin.
SUVA, Time weighted average:	200 ppm, 590 mg/m3

**8.2 Exposure controls**

**Appropriate engineering controls**

Refer to protective measures listed in sections 7 and 8.

**Personal protective equipment**

Respiratory protection: Use respirator with appropriate filter if vapors or aerosol are released. Recommended Filter type: A  
Hand protection: Wear suitable gloves. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.

Material	Butyl-rubber
Break through time	>= 60min
Glove thickness	0,5 mm

Eye protection: Tightly fitting safety goggles

Skin and body protection: impervious clothing

**Environmental exposure controls**

General advice: 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.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

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

Form:	liquid
Color	colorless
Odor:	acetone-like
Odor threshold:	no data available
pH:	not applicable
Melting point/range:	-86 °C
Boiling point/range:	79 - 81 °C

Flash point:	-6 °C (closed cup)
Evaporation rate:	no data available
Flammability (solid, gas):	Formation of explosive air/vapor mixtures is possible.
Lower Explosion limit:	1,8 Vol-%
Upper Explosion limit:	11,5 Vol-%
Vapor pressure:	at 20 °C: 101 hPa
Relative Vapor density:	2,5
Density:	at 20°C: 0,805 g/cm <sup>3</sup>
Water solubility:	at 20°C: 271 g/l
Partition coefficient: n-octanol/water:	log Kow 0,29
Auto-ignition temperature:	514°C
Thermal decomposition:	Can be distilled at normal pressure without decomposition
Viscosity, dynamic:	0,40 mPa.s. (at 20°C)
Explosivity:	Formation of explosive air/vapor mixtures is possible.
Oxidizing properties:	no data available

## 9.2 Other information

Molecular weight: 72,11 g/mol

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 Reactivity

Advice: No information available

### 10.2 Chemical stability

No decomposition if stored and applied as directed. No further information available.

### 10.3 Possibility of hazardous reactions

Hazardous reactions: Incompatible with oxidizing agents

### 10.4 Conditions to avoid

Conditions to avoid: Heat, flames and sparks.  
Thermal decomposition: Can be distilled at normal pressure without decomposition.

### 10.5 Incompatible materials

Materials to avoid: Oxidizing agents

### 10.6 Hazardous decomposition products

No information available.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

Other toxic properties:

Repeated dose toxicity: Liver injury may occur. Danger of serious damage to health by prolonged exposure.  
Further information: Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. Chronic exposure may cause dermatitis. Irritating to eyes and respiratory system.

### Component Methyl ethyl ketone CAS-Nr. 78-93-3

Acute Toxicity:	Oral:	LD50: 2054 mg/kg (rat, male, OECD 423) LD50: 2328 mg/kg (rat, female, OECD 423)
	Inhalation:	LC50: 34,5 mg/l (rat; 4h)
Irritation:	Dermal:	LD50: 6400 – 8000 mg/kg (rabbit)
	Skin:	Mild skin irritation (rabbit)
Sensitisation:	Eyes:	Severe eye irritation (rabbit)
		not sensitizing (guinea pig) (Maximisation Test)

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

#### Component Methyl ethyl ketone CAS-Nr. 78-93-3

Acute Toxicity:	Fish:	LC50: 3220 mg/l (Pimephales promelas; 96 h)
	Toxicity to daphnia and other aquatic invertebrates:	EC50: 5091 mg/l (Daphnia magna; 48 h)
	Algae:	EC50: 4300 mg/l (scenedesmus quadricauda; 168 h)
	Bacteria:	EC5: 1150 mg/l (Pseudomonas putida; 16h)

### 12.2. Persistence and degradability

#### Component Methyl ethyl ketone CAS-Nr. 78-93-3

Biodegradability: Result: >70% readily biodegradable

**12.3 Bioaccumulative potential**

Result: Does not bioaccumulate.

**12.4 Mobility in soil**

Result: No information available

**12.5 Results of PBT and vPvB assessment**

Result: No information available

**12.6 Other adverse effects**

Additional ecological information: Do not flush into surface water or sanitary sewer system.

**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 remaining contents. Risk of explosion. Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of as unused product. Dispose of in accordance with local regulations.

**SECTION 14: TRANSPORT INFORMATION**

**14.1 UN number** 1193

**14.2 UN proper shipping name**

ADR/RID: ETHYL METHYL KETONE  
IMDG, IATA: ETHYL METHYL KETONE

**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**

Labeling according to 5.2.1.8 ADR: no  
Labeling according to 5.2.1.8 RID: no  
Labeling according to 5.2.1.6.3 IMDG: no  
Classification as environmentally hazardous according to 2.9.3 IMDG: no  
Classified as "P" according to 2.10 IMDG: 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): Methyl ethyl ketone, ex. 2914.1200

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

**National regulatory information**

SZID: 295225-33  
Threshold quantity MAO : 20.000kg (list with substances and preparations (BAFU, 2006))  
Ordinance protection of air: LRV (CH): chapter 72 – class 3 3

**USA**

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

**Notification status – Methyl Ethyl Ketone:**



Regulatory list	Notification	Notification number
AICS	Yes	
DSL	Yes	
INV (CN)	Yes	
EINECS	Yes	200-659-6
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.

**Full text of R-phrases referred to under sections 2 and 3:**

R11	Highly flammable.
R36	Irritating to eyes
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

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

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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.