

MATERIAL SAFETY DATA SHEET (MSDS)

Booster Fluid BFL-I for SPIRFLAME®

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS Name: Isopropyl-Alcohol is the major content in the Booster fluid BF-I

Catalog Numbers: **BFL-I or SF/BFL-I #15074**

Synonyms: **Booster Fluid for SPIRFLAME®**
2-propanol, isopropanol, isopropyl alcohol, iso-propanol, iso-propyl alcohol, IPA, sec-propanol, dimethylcarbinol, propan-2-ol.

Company Identification: Spirig Advanced Tech. Inc. / see headline

For information, **USA 1-866-977-4744** office hours ET FAX 413-788-0490

For Information 1 866 977 4744

Emergency Number 1-800-535-5053 (Infotrac)

SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS

CAS#	Chemical Name	%	EINECS#	Hazardous
67-63-0	2-propanol, isopropanol	≤ 90	200-661-7	Yes
proprietary	Additives, various	< 7	proprietary	No
7732-18-5	Water	Balance	231-791-2	No

SECTION 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW **WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.**

SAF-T-Data (tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
 Flammability Rating: 3 - Severe (Flammable)
 Reactivity Rating: 2 - Moderate
 Contact Rating: 3 - Severe
 Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
 Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation: Inhalation of vapors irritates the respiratory tract. Exposure to high concentrations has a narcotic effect, producing symptoms of dizziness, drowsiness, headache, staggering, unconsciousness and possibly death.
 Ingestion: Can cause drowsiness, unconsciousness, and death. Gastrointestinal pain, cramps, nausea, vomiting, and diarrhea may also result. The single lethal dose for a human adult = about 250 mls (8 ounces).
 Skin Contact: May cause irritation with redness and pain. May be absorbed through the skin with possible systemic effects.
 Eye Contac: Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.
 Chronic Exposure: Chronic exposure may cause skin effects
 Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or impaired liver, kidney, or pulmonary function may be more susceptible to the effects of this agent.

SECTION 4 - FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion	Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact	Immediately flush skin with plenty of water for at least 15 minutes. Call a physician if irritation develops.
Eye Contact	Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

SECTION 5 - FIRE FIGHTING MEASURES

Fire

Flash point	12C (54F) CC
Autoignition temperatur	399C (750F)
Flammable limits in air	lcl: 2.0; uel: 12.7 % by volume. Listed fire data is for Pure Isopropyl Alcohol.

Explosion Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Contact with strong oxidizers may cause fire or explosion. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Fire Extinguishing Media Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8.

Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

SECTION 7 - HANDLING and STORAGE

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Small quantities of peroxides can form on prolonged storage. Exposure to light and/or air significantly increases the rate of peroxide formation. If evaporated to a residue, the mixture of peroxides and isopropanol may explode when exposed to heat or shock.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

Airborne Exposure Limits For Isopropyl Alcohol (2-Propanol)
-OSHA Permissible Exposure Limit (PEL): 400 ppm (TWA)
-ACGIH Threshold Limit Value (TLV): 200 ppm (TWA), 400 ppm (STEL), A4 - not classifiable as a human carcinogen.

Ventilation System A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved)

If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator.
WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are

recommended materials.

Eye Protection Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 9 -**PHYSICAL AND CHEMICAL PROPERTIES OF ISOPROPANOL**

Appearance Clear, colorless liquid
 Odor Rubbing alcohol
 Solubility Miscible in water
 Specific Gravity 0.79 @20C/4C
 pH No information found
 % Volatiles by volume 100 @ 21C (70F)
 Boiling Point 82C (180F)
 Melting Point -89C (-128F)
 Vapor Pressure 44 mm Hg @ 25C (77F)
 Vapor Density 2.1 (Air=1)
 Evaporation Rate 2.83 (Ether=1)
 Molecular Formula: CH₃ CH OH CH₃
 Molecular Weight:: 60.10

SECTION 10 -**STABILITY AND REACTIVITY**

Stability Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.

Hazardous Decomposition Products Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization Will not occur.

Incompatibilities Heat, flame, strong oxidizers, acetaldehyde, acids, chlorine, ethylene oxide, hydrogen-palladium combination, hydrogen peroxide-sulfuric acid combination, potassium tert-butoxide, hypochlorous acid, isocyanates, nitroform, phosgene, aluminum, oleum and perchloric acid.

Conditions to Avoid Heat, flames, ignition sources and incompatibles.

SECTION 11 -**TOXICOLOGICAL INFORMATION**

Oral rat LD50: 5045 mg/kg;
 skin rabbit LD50: 12.8 gm/kg;
 inhalation rat LC50: 16,000 ppm/8-hour; investigated as a tumorigen, mutagen, reproductive effector.
 Cancer List Isopropyl alcohol: NTP Carcinogen: Known: No; Anticipated: No;

SECTION 12 -**ECOLOGICAL INFORMATION**

Environmental Fate When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into water, this material may biodegrade to a moderate extent. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity The LC50/96-hour values for fish are over 100 mg/l. This material is not expected to be toxic to aquatic life.

SECTION 13 -**DISPOSAL CONSIDERATIONS**

Dispose of in a manner consistent with federal, state, and local regulations. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

SECTION 14 -**TRANSPORT INFORMATION**

Domestic (Land, D.O.T.)
 Proper Shipping Name ISOPROPANOL
 Hazard Class 3
 UN/NA UN 1219

Packing Group II
International (Water, I.M.O.)
 Proper Shipping Name ISOPROPANOL
 Hazard Class 3
 UN/NA UN 1219
 Packing Group II

IATA
 Shipping Name: ISOPROPANOL
 Hazard Class: 3
 UN/NA Number: UN 1219
 Packing Group: II

SECTION 15 - REGULATORY INFORMATION

Isopropyl Alcohol (67-63-0)

Chemical Inventory Status TSCA: Yes, EC: Yes, Japan: Yes, Australia: Yes
 - Part 1
 Chemical Inventory Status Korea: Yes, DSL (Canada): Yes, NDSL (Canada): No, Phil.: Yes
 - Part 2
 Federal, State & Internat. SARA 302: RQ: No, TPQ: No;
 Regulations - Part 1 SARA 313: List: Yes, Chemical Catg. No
 Federal, State & Internat. CERCLA: No, RCRA 261.33: No; TSCA 8(d): No
 Regulations - Part 2
 Chemical Weapons Convention No
 TSCA 12(b) No
 CDTA No
 SARA 311/312 Acute: Yes / Chronic: Yes / Fire: Yes / Pressure: No
 Reactivity No (Mixture / Liquid)
 Australian Hazchem Code 2[S]2
 Poison Schedule None allocated.
 WHMIS This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

SECTION 16 - ADDITIONAL INFORMATION

NFPA Rating Health: 1 Flammability: 3 Reactivity: 0
 Label Hazard Warning **WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION TO SKIN.**
 Label Precautions Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing.
 Label First Aid: If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
 MSDS Creation Date: 2/12/1995 Review Date: 04/20/2006 11/06/2008



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