MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**Dynaflow® Flux**
Version #	03
Issue date	09-June-2011
Revision date	12-Sept-2014
Supersedes date	23-July-2014
CAS #	Mixture
MSDS Number	0134
Product use	Metal brazing operations.
Manufacturer information	
Manufacturer/Supplier	Harris Products Group 4501 Quality Place Mason, Ohio 45040 US custservmason@jwharris.com
Telephone number	513-754-2000
Emergency Telephone Numbers	1-888-609-1762 (US, Canada, Mexico only) Please quote 333988

2. Hazards Identification

Physical state	Solid.
Appearance	White paste.
Emergency overview	CAUTION May cause eye burns. Prolonged or repeated contact with the product may irritate the skin. Causes digestive tract burns. Dust is irritating to the eyes and respiratory tract. Fatal if swallowed. Harmful by inhalation and in contact with skin. May cause mild central nervous system effects. Possible adverse reproductive and developmental effects.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	May cause eye burns. Risk of serious damage to eyes.
Skin	Prolonged or repeated contact with the product may irritate the skin. Harmful if absorbed through the skin. Hydrogen fluoride, a possible decomposition product, is extremely corrosive and a poison by all routes of entry. Hydrogen fluoride can penetrate the skin and produce burns, which may not be immediately painful or visible; the burns impact the lower layers of skin and bone tissue. Hydrogen fluoride exposures involving 20 percent of the body or more can be fatal through systemic fluoride poisoning.
Inhalation	Harmful by inhalation. Dust irritating to respiratory tract. May cause mild central nervous system effects. Prolonged inhalation may be harmful.
Ingestion	Harmful if swallowed. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
Target organs	Skin. Bone. Kidneys.
Chronic effects	Can cause adverse reproductive effects - such as birth defects, miscarriages, or infertility. Sterility. Prolonged overexposure to fluorides may increase fluoride content of bones and teeth, and may result in fluorosis, and brittleness of bones. Prolonged or repeated contact may dry skin and cause dermatitis. Edema. Kidney injury may occur. Refer to Section 11 Toxicological Information for more details.
Signs and symptoms	Contact with this material may cause burns to the eyes. Symptoms include itching, burning, redness, and tearing of eyes. Prolonged or repeated contact with the product may cause irritation of skin. Edema. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

Potential environmental effects The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Potassium difluorodihydroxyborate	85392-66-1	> 40
Potassium fluoride	7789-23-3	20 - 30
Methanol	67-56-1	1 - 3

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures

Eye contact Immediately rinse eyes with water. Remove any contact lenses, and continue flushing eyes with running water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get immediate medical attention.

Skin contact Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. A 2.5 pct calcium gluconate gel applied topically after skin has been thoroughly washed will help reduce severity of symptoms. Get medical attention if irritation develops and persists.

Inhalation Remove person from contaminated area to fresh air. Apply artificial respiration if needed. Call a physician if symptoms develop or persist.

Ingestion Do NOT induce vomiting. Immediately rinse mouth and drink a cupful of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

General advice Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties The product is not flammable.

Extinguishing media

Suitable extinguishing media Use fire-extinguishing media appropriate for surrounding materials. Water spray, foam, dry powder or carbon dioxide.

Protection of firefighters

Protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away. Avoid inhalation of dust from the spilled material. Wear protective clothing as described in Section 8 of this MSDS. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods for containment Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. Local authorities should be advised if significant spillages cannot be contained.

Methods for cleaning up Should not be released into the environment. Prevent product from entering drains. Do not allow material to contaminate ground water system.

Large Spills: Sweep up and place into a proper container for disposal. Avoid the generation of dusts during clean-up.

Small Spills: Wipe up spilled material and place in a suitable container for disposal.

Never return spills in original containers for re-use. Following product recovery, flush area with water. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste. For waste disposal, see Section 13 of the MSDS.

Other information Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling

Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Avoid inhalation of dust and fumes. Avoid contact with skin and eyes. Wear appropriate personal protective equipment (See Section 8). Do not get this material on clothing. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Avoid release to the environment.

Storage

Store in tightly closed original container in a dry, cool and well-ventilated place. Store in a closed container away from incompatible materials. Do not store in container made of glass or silicate-based material. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3	
Methanol (CAS 67-56-1)	STEL	250 ppm	
	TWA	200 ppm	

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Fluorides (CAS 16984-48-8)	PEL	2.5 mg/m3
Methanol (CAS 67-56-1)	PEL	260 mg/m3
		200 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3	Dust.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3
Methanol (CAS 67-56-1)	STEL	328 mg/m3
		250 ppm
	TWA	262 mg/m3
		200 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3	
Methanol (CAS 67-56-1)	STEL	250 ppm	
	TWA	200 ppm	

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3	
Methanol (CAS 67-56-1)	STEL	250 ppm	
	TWA	200 ppm	

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3	
Methanol (CAS 67-56-1)	STEL	250 ppm	
	TWA	200 ppm	

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3
Methanol (CAS 67-56-1)	STEL	328 mg/m3
		250 ppm
	TWA	262 mg/m3
		200 ppm

Mexico. Occupational Exposure Limit Values

Components	Type	Value
Fluorides (CAS 16984-48-8)	TWA	2.5 mg/m3
Methanol (CAS 67-56-1)	STEL	310 mg/m3
		250 ppm
	TWA	260 mg/m3
		200 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Fluorides (CAS 16984-48-8)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*
Methanol (CAS 67-56-1)	15 mg/l	Methanol	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines

Canada - Alberta OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Canada - British Columbia OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Canada - Manitoba OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Canada - Ontario OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Canada - Quebec OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Canada - Saskatchewan OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Mexico OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

US - California OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

US - Tennesse OELs: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation
Methanol (CAS 67-56-1) Can be absorbed through the skin.

US. NIOSH: Pocket Guide to Chemical Hazards
Methanol (CAS 67-56-1) Can be absorbed through the skin.

US. OSHA Table Z-1-A (29 CFR 1910.1000)
Methanol (CAS 67-56-1) Can be absorbed through the skin.

Engineering controls Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of dust. Shower, hand and eye washing facilities near the workplace are recommended.

Personal protective equipment

Eye / face protection	Wear safety glasses with side shields (or goggles).
Skin protection	Chemical resistant clothing is recommended.
Respiratory protection	Use a respirator when local exhaust or ventilation is not adequate to keep exposures below the TLV. In a confined space a supplied respirator may be required. Selection and use of respiratory protective equipment should be in accordance with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.
Hand protection	Wear protective gloves (i.e. latex, nitrile, neoprene).
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance	White paste.
Physical state	Solid.
Form	Paste.
Color	White.
Odor	Odorless.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Boiling point	Not available.
Melting point/Freezing point	Not available.
Solubility (water)	Moderate.
Specific gravity	1.5 - 1.7
Flash point	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Auto-ignition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Strong acids. Halogenated compounds. Silicate-based materials.
Hazardous decomposition products	Hydrogen fluoride, fluorine-, boron- and potassium-containing compounds.

11. Toxicological Information

Toxicological data

Components	Species	Test Results
Potassium difluorodihydroxyborate (CAS 85392-66-1)		
Acute		
Dermal		
LD50	No data available	
Oral		
LD50	Rat	744 mg/kg

Components	Species	Test Results
Methanol (CAS 67-56-1)		
Acute		
Dermal		
LD50	Rabbit	15800 mg/kg
Inhalation		
LC50	Rat	64000 mg/l, 4 Hours
Oral		
LD50	Rat	5628 mg/kg
Potassium fluoride (CAS 7789-23-3)		
Acute		
Oral		
LD50	Rat	245 mg/kg

Sensitization Not classified.

Acute effects May cause eye burns. Prolonged or repeated contact with the product may irritate the skin Dust irritates the respiratory system, and may cause coughing and difficulties in breathing. Fatal if swallowed. Harmful if inhaled or absorbed through skin. May cause mild central nervous system effects.

Local effects May cause eye burns. Prolonged or repeated contact with the product may irritate the skin. Causes respiratory tract irritation.

Chronic effects Prolonged exposure may cause chronic effects. May cause damage to the kidneys. Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death. Methanol:
Human exposure to methanol may result in illness, systemic poisoning, blindness, optic nerve damage, and perhaps death after being ingested, absorbed through the skin or inhaled. Death due to cardiac or respiratory failure has been reported in some cases from consumption of as little as 30 mls.

Subchronic effects Kidney injury may occur.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

ACGIH Carcinogens

Potassium difluorodihydroxyborate (CAS 85392-66-1)	A4 Not classifiable as a human carcinogen.
Potassium fluoride (CAS 7789-23-3)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Potassium fluoride (CAS 7789-23-3)	3 Not classifiable as to carcinogenicity to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Epidemiology No epidemiological data is available for this product.

Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Reproductive effects Possible reproductive hazard.

Teratogenicity May cause birth defects. Avoid exposure to women during early pregnancy.

Symptoms and target organs May cause eye burns. Prolonged or repeated contact with the product may irritate the skin. Symptoms include itching, burning, redness, and tearing of eyes. Itching, redness, burning of skin. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Target organs: Skin. Bones. Kidney.

Further information Symptoms may be delayed.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
Potassium difluorodihydroxyborate (CAS85392-66-1)			
Aquatic			
Fish	LC50	Brachydinio rerio	750 mg/l, 96 hours
Methanol (CAS 67-56-1)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	> 10000 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	> 100 mg/l, 96 hours

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Large amounts of the product may affect the acidity (pH-factor) in water with possible risk of harmful effects to aquatic organisms.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Aquatic toxicity Not classified.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulation / accumulation

Bioaccumulative potential

Octanol/water partition coefficient log Kow

Methanol (CAS 67-56-1)	-0.77

Mobility in environmental media The product is partly soluble in water. May spread in the aquatic environment.

13. Disposal Considerations

Disposal instructions Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information

DOT Product not regulated as Dangerous Good

IATA Product not regulated as Dangerous Good

IMDG Product not regulated as Dangerous Good

TDG Product not regulated as Dangerous Good

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Methanol (CAS 67-56-1)

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Methanol (CAS 67-56-1)	1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Methanol (CAS 67-56-1)	Listed.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Methanol: 5000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

Drug Enforcement Administration (DEA) (21 CFR 1308.11-15) Not controlled

Canadian regulations This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS status Controlled

WHMIS classification D2B - TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Methanol (CAS 67-56-1) Listed.

Potassium fluoride (CAS 7789-23-3) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Methanol (CAS 67-56-1) Listed.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Methanol (CAS 67-56-1) Listed: March 16, 2012 Developmental toxin.

US. Massachusetts RTK - Substance List

Methanol (CAS 67-56-1) Listed.

US. New Jersey Worker and Community Right-to-Know Act

Methanol (CAS 67-56-1)
Potassium fluoride (CAS 7789-23-3)

US. Pennsylvania Worker and Community Right-to-Know Law

Methanol (CAS 67-56-1)
Potassium fluoride (CAS 7789-23-3)

Mexico regulations This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings
Health: 3*
Flammability: 0
Physical hazard: 0

NFPA ratings

Disclaimer The information in the sheet was written based on the best knowledge and experience currently available.

Prepared by Not available.