Thames River Chemical, 905-681-5353 (Phone), 905-681-5377 (Fax)
5230 Harvester Road, Burlington, Ontario, L7L 4X4

Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name **Boric Acid**
Synonyms **boracic acid, orthoboric acid, boron trihydroxide**
CAS# **10043-35-3**
Europe EC# **233-139-2**
Product Uses **component of "fracking" fluids, fire-retardant in fabrics, weather-proofing wood, ant poison, high temperature (borosilicate) glass, soldering/brazing flux, & others**

In an Emergency:
Canada **Call CANUTEC (collect)** **(613) 996-6666**
U.S.A. **Call CHEMTREC** **(800) 424-9300**

2. HAZARDS

GHS Class (Category) ***reproductive toxin (1B)***
Signal Words ***DANGER****

Hazard Statements *ingestion* may damage fertility (H360)*

Canada – WHMIS Key: **D 2A***
B 2 *– Flash Point <38°C,* ***B 3*** *– Flash Point >38°C & <93°C*
D 1 *– Immediately Toxic,* ***D 2*** *– Chronic Toxicity*
C – *Oxidising Substance,* ***E -*** *Corrosive*

** **NOTE:** Reduces male fertility, but only on repeated ingestion – not a route of industrial exposure. Probably doesn't warrant the signal word "DANGER" or the D 2A WHMIS classification.*

3. COMPOSITION

	%	TWAEV / TLV mg/m³	LD_{50} (mg/kg) ORAL	LD_{50} (mg/kg) SKIN	LC_{50} mg/m³ INHALATION
Boric Acid	100%	2	>2000	>2000*	>2000*

** No mortality at this dose.*

4. FIRST AID

SKIN: Brush off. Then wash with soap & water. Remove contaminated clothing & do not reuse until laundered.
EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION: Remove from contaminated area promptly. ***CAUTION: Rescuer must not endanger himself!*** If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this non-toxic substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5 FLAMMABILITY & FIRE FIGHTING

Flash Point	cannot burn
Autoignition Temperature	cannot burn
Flammable Limits	cannot burn
Combustion Products	boric anhydride & water
Firefighting Precautions	as for materials sustaining fire; firefighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

6. SPILL PROCEDURES

Leak Precaution	not applicable – solid material
Handling Spill	ventilate contaminated area; sweep, hovel, & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store away from heat which can cause decomposition.

Avoid generating or breathing product dust. If dust forms in handling, install adequate ventilation to satisfy limits given below. Avoid prolonged contact with skin & wash work clothes frequently. An eye bath must be available near the workplace.

8. EXPOSURE CONTROL

Ontario TWAEV	2mg/m^3	Ontario STEV	not listed
ACGIH TLV	2mg/m^3	ACGIH STEL	6mg/m^3
OSHA PEL	2mg/m^3	OSHA STEL	not listed
Ventilation	if dust is raised in handling, install sufficient exhaust ventilation to control airborne titre to above limits		
Hands	no special protective gloves required; leather gloves may be worn		
Eyes	safety glasses with side shields – *always protect the eyes*		
Clothing	no special protective clothing required; wear overalls with long-sleeves		

9. PHYSICAL PROPERTIES

Odour & Appearance	white odourless powder
Odour Threshold	not known – odourless
Vapour Pressure	not known, essentially zero – *water vapour appears at 100°C as BH_3O_3 starts to decompose*
Evaporation Rate (*Butyl Acetate = 1*)	not known – *not volatile*
Vapour Density (air = 1)	not applicable – no vapour
Boiling Range	~300°C / ~572°F – *boiling can only be measured in a sealed system to inhibit decomposition*
Melting Point	168-170°C / 334-338°F – *melting can only be measured in a sealed flask due to decomposition*
Density	1.435kg/litre (15°C / 58°F) – *also given as 1.517kg/litre (14°C / 57°F)*
Water Solubility	47g/litre (20°C)
Also soluble in	ethanol, glycerol & probably other polar solvents
Log $P_{o/w}$ (Octanol/H_2O partition)	-0.717
Viscosity	not applicable – *solid material*
pH	5.1 (0.1 molar solution)
Molecular Weight	62grams/mole

10. STABILITY / REACTIVITY

Dangerously Reactive With	not known
Also Reactive With	none known
Stability	stable; will not polymerize
Decomposes in Presence of	heat above 100°C / 212°F
Decomposition Products	boric anhydride & water
Sensitive to Mechanical Impact	no

11 TOXICITY

Effects, Acute Exposure

Skin Contact	little to no effect on intact skin (*some reports of mild irritation*); may irritate broken skin
Skin Absorption	slight; no toxic effects likely by this route – *apparently absorbed through abraded skin*
Eye Contact	dust may be a mechanical irritant for a short time; saturated solution not irritating to eyes (*some reports of mild irritation*)
Inhalation	dust is probably not an irritant
Ingestion	no symptoms known (*but induces vomiting in dogs*) – *not a route of industrial exposure*

Effects, Chronic Exposure

General	chronic ingestion at 0.05% of diet no effect in rats; 0.175% atrophied testis plus reduced kidney & liver weight in rats; the 0.525% dose killed all rats by 6 weeks – *not a route of industrial exposure*
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans; *reproductive toxin (reduced male fertility) in rodents on ingestion*
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD_{50} (oral)	2500, 2660 & 5140mg/kg (rat), 3450mg/kg (mouse)
LD_{50} (skin)	>2000mg/kg (rabbit) – *no mortality at this dose*
LC_{50} (inhalation)	>2000mg/m^3 (rat) – *no mortality at this dose*

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	not a bioaccumulator
Biodegradation	not known to biodegrade
Abiotic Degradation	not known to degrade abiotically; not sensitive to ultraviolet
Mobility in soil, water	water soluble; probably moves readily in soil & water
Aquatic Toxicity	
LC_{50} (Fish, 72hr)	1020mg/litre (Carassius auratus), 1260mg/litre (Ictalurus punctatus – 120hr)
EC_{50} (Crustacea, 24hr)	658-875mg/litre (Daphnia magna)
EC_{50} (Algae)	58mg/litre *stimulates* growth of: Agmenellum quadriplicatum, Cyclotella cryptica, Duniella tertiolecta, Phaeodactylum tricornutum & Skeletonema costatum; at 270-590mg/litre growth of the above is depressed
EC_{50} (Bacteria)	not known – 10mg/litre is toxic to activated sludge cultures

13. DISPOSAL

Waste Disposal	**do not flush to sewer**, no recommendation – allow a hazardous waste specialist deal with waste boric acid
Containers	**Drums** should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. **Pails** must be vented and thoroughly dried prior to crushing and recycling. **IBCs** (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. ***Never cut, drill, weld or grind on or near this container, even if empty***

14. TRANSPORT

Canada TDG	**PIN**	**UN- not regulated for transport**
AND	**Shipping Name**	**not regulated for transport**
U.S.A. 49 CFR	**Class**	**not regulated for transport**
	Packing Group	**not regulated for transport**
Marine Pollutant		***not a marine pollutant***
ERAP		**not required**

15. REGULATIONS

Canada DSL	**on inventory**
U.S.A. TSCA	**on inventory**
Europe EINECS	**on inventory**

U.S.A. Regulations:

Allowable Tolerances: An exemption from the requirement of a tolerance is established for residues of the pesticidal chemical boric acid and its salts, borax (sodium borate decahydrate), disodium octaborate tetrahydrate, boric oxide (boric anhydride), sodium borate and sodium metaborate, in or on raw agricultural commodities when used as an active ingredient in insecticides, herbicides, or fungicides preharvest or postharvest in accordance with good agricultural practices. Residues of boric acid are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: sequestrant. Limit: none.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 2 mg/cu m (inhalable fraction); 15 min Short Term Exposure Limit (STEL): 6 mg/cu m (inhalable fraction). /Borate compounds, inorganic/ A4; Not classifiable as a human carcinogen. /Borate compounds, inorganic/

Federal Drinking Water Guidelines: EPA 600 ug/L /Boron/

State Drinking Water Guidelines: California 1000ug/L /Boron/ New Hampshire 630ug/L /Boron/ Maine 1,400ug/L /Boron/ Minnesota 1,000ug/L /Boron/ Wisconsin 960ug/L /Boron/

FIFRA Requirements: Residues of boric acid are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Use: sequestrant. Limit: none. An exemption from the requirement of a tolerance is established for residues of the pesticidal chemical boric acid and its salts, borax (sodium borate decahydrate), disodium octaborate tetrahydrate, boric oxide (boric anhydride), sodium borate and sodium metaborate, in or on raw agricultural commodities when used as an active ingredient in insecticides, herbicides, or fungicides preharvest or postharvest in accordance with good agricultural practices. Based on the reviews of the generic data for the active ingredients of boric acid and its sodium salts, the Agency has sufficient information on the health effects of boric acid and its sodium salts and their potential for causing adverse effects in fish and wildlife and the environment. Therefore, the Agency concludes that products containing boric acid and its sodium salts for all uses are eligible for reregistration. The Agency has determined that boric acid and its sodium salts, labeled and used as specified in the RED document, will not pose unreasonable risks or adverse effects to humans or the environment. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their continued use. Under this pesticide reregistration program, EPA examines newer health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether the use of the pesticide does not pose unreasonable risk in accordance to newer saftey standards, such as those described in the Food Quality Protection Act of 1996. Borax is found on List A, which contains most food use pesticides and consists of the 194 chemical cases (or 350 individual active ingredients) for which EPA issued registration standards prior to FIFRA '88. Case No: 0024; Pesticide type: insecticide, fungicide herbicide; Registration Standard Date: 11/01/85; Case Status: RED Approved 9/93; OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) document .; Active ingredient (AI): boric acid; Data Call-in (DCI) Date(s): 2/16/94; AI Status: OPP has completed a Reregistration Eligibility Decision (RED) for the case/AI.

FDA Requirements: Boric acid is an indirect food additive for use only as a component of adhesives. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: boric acid is included in topical acne drug products; dandruff/seborrheic dermatitis/psoriasis drug products; skin protectant drug products; astringent drug products; fever blister and cold sore treatment drug products; insect bite and sting drug products; poison ivy, poison oak, poison sumac drug products; ophthalmic anti-infective drug products; diaper rash drug products; and antiseptic drug products.

16. PREPARATION INFORMATION

Prepared for Thames River Chemical by Peter Bursztyn, (705) 734-1577
With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available
Preparation Date: ***November 2010*** *Revision Date***:** ***November 2013***

Please ensure that this MSDS is given to, and explained to people using this product.