Safety Data Sheet **Boric Acid**

SAFEGUARD CHEMICAL CORPORATION
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1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name: QB-17, Boric Acid, Boric Acid Technical Grade, Boric Acid EPA Grade, Boric Acid Pharmaceutical Grade, Darkling Beetle Control.
Synonyms: Boracic Acid, Ortho Boric Acid
Recommended Use: Micronutrient for Agricultural Uses, Lubricants, Industrial Formulations

Manufactured For:	National Boraxx Co. 3690 Orange Place, #495 Cleveland, Ohio 44122
Telephone Number:	216 – 464 - 8680
Fax:	216 – 292 - 1033
Emergency Telephone:	800 – 292 - 8680

2. HAZARDS IDENTIFICATION

Classification: Reproductive Toxicity: Category 2

Signal Word: Warning

Health Hazard Pictogram:

Risk Phrase: Suspected of damaging fertility or unborn child.

Hazard Statements: May be harmful if swallowed. May cause mild respiratory irritation from inhaling high concentrations of dust. Avoid eye contact and prolonged skin contact.

Precautionary Statements: Obtain special instruction before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, eye protection. If exposed or concerned, get medical advice/attention. Store locked up. Dispose of contents/container to comply with local, state and federal regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion
Boric Acid	**10043-35-3**	**98-100 %**

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Water	**7732-18-5**	**+/- 2%**

4. FIRST AID MEASURES

For advice contact a Poison Information Center or a Doctor.

Inhalation: Remove to Fresh Air, If not Breathing, give artificial respiration. If breathing is difficult, give Oxygen, Get Medical Attention.
Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for 15 minutes. Get medical attention if irritation develops or persists. Wash clothing before reuse.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes lifting upper and lower eyelids occasionally. Get medical attention immediately.
Ingestion: Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

5. FIRE FIGHTING MEASURES

Hazards from Combustion Products: None, will not burn.

Precautions for Fire Fighters and Special Protective Equipment: Wear full protective clothing and NIOSH self-contained, self- breathing equipment with full face operated in the pressure demand or positive pressure mode.

Suitable Extinguishing Media: Use any means suitable for extinguishing surrounding fire.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures: Ventilate area of leak or spill. Wear appropriate personal protective equipment (see Sec. 8). Isolate hazard area. Keep unnecessary and unprotected personnel from entering.
Methods and materials for containment and Clean Up: Contain and recover material when possible. Pick up and place into a suitable container for reclamation or disposal using a method that does not generate dust. Do not flush to sewer.

7. HANDLING AND STORAGE

Conditions for safe storage: Keep in a well closed container at cold to warm conditions, 3 to 40°C or 36-104°F. Protect against physical damage. Paper/Plastic, Carbon steel or aluminum of dust and follow sound cleaning practices that will keep airborne particulates at a low level.
Precautions for safe Handling: Wash hands after handling this material. Avoid contact when skin is cut or abraded. Containers of this material may be hazardous when empty since they retain product residues. Observe all warnings and precautions for this product.
Container Disposal: Completely empty bags into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or, If allowed by state and local authorities, by burning. If burned, stay out of smoke. Observe all Federal, State and Local regulations concerning disposal of waste pesticide and containers.

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Formulators and Repackagers using this product as a Pesticide are responsible for obtaining EPA Registration for their product. (Refer to PR Notice 95-1 for the applicability of the Environmental Hazards statement to your product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Limits: Boric Acid is listed/regulated by OSHA, CA OSHA and ACGIH as "Particulate Not otherwise Classified" or "Nuisance Dust". OHSA PEL: 15 mg/m^3 total dust and 5 mg/m^3 respirable dust. ADGIH TLV: 10 mg/m^3

Ventilation System: A system of local and/or general exhaust should be used to keep employee exposures below the Airborne Exposure Limits. Local ventilation is preferred because it will control emissions of the contaminant at its source and prevents dispersion into general work areas. (Refer to ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices.)*

Personal Respirators (NIOSH Approved) When exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. For oil particles, use a NIOSH type R or P filter. For emergencies where exposure levels are not known, use a full-face positive-pressure, air supplied respirator.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick drench facilities in work areas.

Exposure Guidelines:

Product	ACGIV TLV	OSHA PEL
Boric Acid	**TWA 2mg/m^3 STEL 6mg/m^3**	**Total dust: 15mg/m^3** **Respirable Dust: 5mg/m^3**

Engineering controls:

Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. If inhalation risk exists: Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

Personal Protective Equipment:

Required: Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If excessive dust exists, wear dust mask/respirator meeting the requirements of NIOSH type 95. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	White Solid
Odor	Odorless
Odor Threshold	NA
pH	5.1 with 1% Solution
Solubility:	4.7% @ 20^{o}C
Specific Gravity:	1.43

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Relative Vapor Density (air=1) N/A

Flash Point	N/A	**Explosive Limits**	NA
Flammability Limits (%)	N/A	**Vapor Pressure**	NA
Autoignition Temp (^{O}C)	N/A	**Relative Density**	NA
Melting Point Range (^{O}C)	171^{o}C	**Solubility**	Water
pH	7.6 (10% Solution)	**Partition Coefficient**	NA
Boiling Point and Range	NA	**Autoignition Temp.**	NA
Flash Point	NA	**Decomposition Temp.**	NA
Evaporation Rate	NA	**Flammability**	NA

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal storage conditions. With moisture, boric acid can be corrosive to iron.

Conditions to avoid: Avoid dust generation. Avoid exposure to moisture.

Incompatible Materials: Strong reducing agents.

Hazardous Decomposition Products: Loses waters on increasing heat to yield Boric Anhydride (B_2O_3)

Hazardous Reactions: Reacts with strong reducing agents liberating flammable hydrogen gas.

11. TOXICOLOGICAL INFORMATION

No adverse health effects are expected if this product is handled in accordance with this Safety Data Sheet and the Product Label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Ingestion: No adverse effects are expected, however, large amounts may cause nausea and vomiting. Low acute oral toxicity: LD50 for Sprague-Dawley rats is 3,500-4,100 mg/kg of body weight.

Eye Contact: **M**ay be an eye irritant. Exposure to the dust may cause discomfort due to its particulate nature. May cause physical irritation to the eyes.

Skin Contact: Repeated or prolonged skin contact may lead to irritation. Low acute dermal toxicity: LD50 for rabbits is expected to be greater than 2,000 mg/kg of body weight (test conducted per 16 CFR 1500.41). Boric Acid is not absorbed through intact skin.

Inhalation: Breathing in dust may result in respiratory irritation. The doses administered in testing were many times in excess of those to which humans would normally be exposed.

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Long Term Effects: Animal feeding studies in rat, mouse and dog at high doses, have demonstrated effects on fertility and testes. The doses administered were many times in excess of those to which humans would normally be exposed.

Toxicological Data:

Oral LD50 (rat): >2550 mg/Kg Dermal LD50 (rabbit): >2000mg/Kg

Inhalation LC50 (rat): >2.0 mg/l

Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust.

Reproductive: Animal feeding studies with the chemically related boric acid in rat, mouse and dog at high doses have demonstrated effects on fertility and the testes. The doses administered were many times in excess of those which humans would normally be exposed. A human study of occupationally exposed Borate worker population showed no adverse reproductive effects. Animal studies indicate that Boric Acid reduces or inhibits sperm production, causes testicular atrophy, and when given to pregnant animals during gestation, may cause developmental changes.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA: Boron (B**)** is the element in boric acid which is used by convention to report borate product ecological effects. It occurs naturally in seawater at an average concentration of 5 mg B/L and generally occurs in freshwater at concentration up to 1 mg B/L. In dilute aqueous solution the predominant boron species present is undissociated boric acid.

Phytotoxidity: Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in higher quantities. Avoid contaminating waterways. Minimize releases of Boric Acid into the environment.

Environmental Fate Data;

Persistence/Degradation: Boron is naturally occurring and ubiquitous in the environment. Boric acid decomposes in the environment to natural borate.

Soil Mobility: Boric Acid is soluble in water and is leachable through normal soil.

The EC50 48 hour values for daphnia are over 100mg/l. This material may be toxic to aquatic life.

Boron occurs naturally in sea water at an average concentration of 5 mgB/l and fresh water at 1 mg/l or less. In laboratory studies the acute toxicity (96 hr LC50) for under-yearling Coho salmon in seawater was determined as 40 mg/L (added as Sodium metaborate). The minimum lethal Dose for minnows exposed to Boric Acid at 20C for 6 hours is 18-19,000 ml/l in distilled water, 19,000 to 19.500 in hard water.

Rainbow Trout:	24-day LC50 = 150 mg./B/L
	36-day NOEC-LOEC = o.75-1 mg/B/L
Goldfish:	7- day NOEC-LOEC = 26.5 mg/B/L
	3 day LC50 = 178 ml/B/L

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Bird Toxicity:	Dietary levels of 100 mg/kg resulted in reduced growth of female mallards. As little as 30 mg/Kg fed to mallard adults adversely affected the growth rate of offspring.
Invertebrate Toxicity:	Daphnids 48 hour LC50 = 133 mg/B/L 1 day NOEC-LOEC = 6-13 mg/B/L

Phytotoxicity: B is an essential micronutrient for healthy growth of plants. It can be harmful at higher quantities. Care should be taken to minimize the amount of B released to the environment.

Environmental Fate Data: Boron is naturally occurring and ubiquitous in the environment. This product decomposes in the environment to natural borates.

Soil Mobility: This product is soluble in water and is leachable through normal soil

LOG WATER/OCTANOL PARTITION COEFFICENT -1.09 @22^{O}C (based on boric acid)

13. DISPOSAL CONSIDERATIONS

Disposal methods:
Small quantities of Boric Acid can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements.
Boric Acid is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).

14. TRANSPORT INFORMATION

Road and Rail Transport: Not classified as Dangerous Goods by the DOT (USA) for transport by Road and Rail; NON-DANGEROUS GOODS.

Marine Transport: Not classified as Dangerous Good by the criteria of the International Maritime Dangerous Goods Code (IMDG) for transport by sea. NON-DANGEROUS GOODS

Air Transport: Not classified as Dangerous Goods by the criteria of International Air Transport Association (IATA). Dangerous Goods Regulations for transport by air; NON-DANGEROUS GOODS.

15. REGULATORY INFORMATION

Clean Air Act (Montreal Protocol) Boric Acid was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Chemical Inventory Listings: US EPA TSCA: 10043-35-3
Einecs: 215-540-4
Canadian DSL: 1303-96-4
South Korea: 9212-848

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Japanese MITI: (1)-69

SARA311/312	Acute" Yes chronic: Yes Fire: No Pressure: No reactivity: No (mixture/solid)
SARA Section 302 (RQ):	This material does not have an RQ.
Sara Section 302 (TPQ):	This material does not have an TPQ.
CDTA:	NO
Clean Air Act:	This material does not contain any hazardous air Pollutants, or Ozone depletors, or Class 2 Ozone depletors.
Clean Water Act;	Not listed as Toxic Pollutants or a Hazardous Substance under the CWA.
OSHA:	This product is not considered highly hazardous by OSHA.
Classification:	This material is slightly toxic according to the USA EPA and must be labeled with "Warning"
RCRA (40CFR 261	None Listed
TSCA	None Listed
Health and Safety Reporting list.	Not on List
Safe Drinking Water Act	Not Regulated and not listed as a hazardous substance
Occupational Exposure Limits:	Listed by OSHA, CAL OSHA, ACGIH as "particulate Not Otherwise Classified" or "Nuisance Dust"

International Agency for Cancer Research, NTP Annual Report on Carcinogens, OSHA Carcinogen: Not Listed

Hazard Category:	Low Toxicity
Risk Phrase (s):	N/A
Safety Phrase(s):	Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. KEEP OUT OF RREACH OF CHILDREN.
Poisons Schedule:	"Caution"

16. OTHER INFORMATION

This material is listed on the US TSCA Inventory as CAS# 10043-35-3.

Reason for re-issuance: Global Harmonization under the sponsorship of the United Nations.

If clarification or further information is needed, the user should contact their Quality Borate Representative or Quality Borate at the contacts on page 1.

NFPA Classification: Health 2, Flammability 0, Reactivity 0 (4= very serious,) = Minimal)

HMIS Classification: Blue: Acute Health = 2, Red Flammability = 0, Yellow Reactivity = 0

As of the issue date, this SDS, to the best of our knowledge summarizes the chemical, health, and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Quality Borate

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cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage assess and control the risks arising from its use of the material.

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