SAFETY DATA SHEET

Zinc Shield 100

SECTION 1: IDENTIFICATION

Product identifier used on a label:	**Zinc Shield 100**
Product code:	5604
Recommended use of the chemical and restrictions on use:	Trivalent chromium passivate for surface finishing industry.
Chemical family:	Mixture.
Name, address and phone # of supplier:	Aqua Bond Inc. PO Box 63635, Toronto, ON, M1V 5K2 (416) 754-7211
24 Hr. Emergency phone #	**CANUTEC (613) 996-6666**

SECTION 2: HAZARDS IDENTIFICATION

Classification of the chemical: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:
SKIN CORROSION/IRRITATION – Category 1A
SERIOUS EYE DAMAGE/ EYE IRRITATION – Category 1
CORROSIVE TO METALS – Category 1
CARCINOGENICITY – Category 1B
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) – Category 1
TOXIC TO REPRODUCTION (Fertility) – Category 1B
GERM CELL MUTAGENICITY – Category 2
ACUTE TOXICITY (inhalation) – Category 3

Label elements:



Signal word: DANGER

Hazard statements:
H331 Toxic if inhaled.
H370 May cause damage to lungs and teeth through inhalation.
H314 Causes severe skin burns and eye damage.
H290 May be corrosive to metals.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H350 May cause cancer if ingested.
H360F May damage fertility.
H341 Suspected of causing genetic defects.

Precautionary statements:
P201+P202 Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P234 Keep only in original container.
P260 Do not breathe dust/fumes/gas/mist/vapours/spray.

P271 Use only outdoors or in well ventilated area.
P280 Wear protective gloves/ protective clothing/eye protection/face protection.
P284 Wear respiratory protection.
P272 Contaminated work clothing should not be allowed out of the workplace.
P270+ P264 Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
P308+P313 IF exposed or concerned: Get medical attention.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P301+P310+P330+P331 IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting.
P303+P361+P353+P363+P310 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician.
P305+P351+P338+P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
P391+P390 Collect spillage. Absorb spillage to prevent material damage.
P405 Store locked up.
P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards: THIS PRODUCT CONTAINS A FLUORIDE COMPOUND. SYMPTOMS MAY BE DELAYED. AVOID EXPOSURE. SEEK MEDICAL ATTENTION IMMEDIATELY IF EXPOSURE IS SUSPECTED.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/ mixture: Mixture

Ingredient name	**CAS Number**	**Concentration (%)**
Trivalent chromium compound	39380-78-4	5-25 %
Ammonium bifluoride	1341-49-7	1-5%
Citric acid	77-92-9	5-7%
Sodium nitrate	7631-99-4	10-25%
Cobalt sulphate	10026-24-1	0.1-1%

Concentrations are shown as ranges due to batch variation.

SECTION 4: FIRST-AID MEASURES

Description of first aid measures:

Ingestion Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in

	recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing. Follow company first aid procedures for fluoride exposure which may include having victim drink a 10% calcium gluconate solution with 8 to 10 oz. of water for dilution of material in stomach.
Inhalation	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that mists are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.
Skin contact	Get medical attention immediately. Call a poison center or physician. Rinse immediately contaminated clothing and skin with plenty of water. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Eye contact	Get medical attention immediately. Call a poison center or physician. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 30 minutes, keeping eyelids open. Chemical burns must be treated promptly by a physician. Washing eyes within several seconds of exposure is essential to minimize damage.

Most important symptoms and effects, both acute and delayed:
Causes serious eye damage. Adverse symptoms include pain, watering, redness. Causes severe burns. May cause allergic skin reaction. Symptoms include pain, irritation, redness, blistering. Fatal if inhaled. May cause asthma symptoms, breathing difficulties, wheezing. Harmful if swallowed. Corrosive to digestive tract and causes burns to tissue.
Indication of any immediate medical attention and special treatment needed:
Fluoride Compounds: SYMPTOMS MAY BE DELAYED: Clinical signs and symptoms may not appear for up to 24 hours. Concentrations as low as 2% may cause symptoms with prolonged skin contact. When exposure is suspected, immediate medical attention is critical to minimize damage May be fatal if absorbed through the skin, inhaled or ingested. Immediately contact emergency response personnel. Get medical attention immediately. In addition to the basic first aid procedures outlined below, it is highly recommended that emergency procedures be established by your company's physician, to be used in case of fluorine poisoning. This procedure may include the administration by qualified personnel of antidotes such as Aqueous Hyamine, Zephiran Chloride, or Calcium Gluconate Solutions for treating affected skin, as well as use of Pontocaine Hydrochloride Solution for eye application.

SECTION 5: FIRE-FIGHTING MEASURES
Extinguishing media:

Suitable	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable	None known.
Special hazards arising from the substance:	Oxidizing material. May intensify fire. In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous thermal decomposition products:	Carbon dioxide and carbon monoxide. Nitrogen and sulphur oxides. Metal oxides.
Special protective actions for fire-fighters:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
Environmental precautions:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods and materials for containment and cleaning up:	Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.
Special spill response procedures:	In case of transportation accident, contact CANUTEC (613) 996-6666.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling:	Put on appropriate personal protective equipment. Avoid exposure -obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Empty containers retain product residue and can be hazardous. Do not reuse container.
Conditions for safe storage:	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials, food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be resealed and kept upright. Do not store in unlabeled containers.
Incompatible materials:	Combustible materials, reducing agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters:

Exposure limits

Ingredient	**Exposure limits**
Trivalent chromium compound	**ACGIH TLV (United States, 4/2014). Notes: measured as Cr** TWA: 0.5 mg/m³, (measured as Cr) 8 hours. Form: Inorganic **NIOSH REL (United States, 10/2013).** TWA: 0.5 mg/m³, (as CR) 8 hours. **OSHA PEL (United States, 2/2013).** TWA: 0.5 mg/m³, (as Cr) 8 hours.
Sodium nitrate	**ACGIH** not listed. **OSHA** not listed.
Ammonium bifluoride	**OSHA PEL Z2 (United States, 2/2013).** TWA: 2.5 mg/m³ 8 hours. Form: Dust **ACGIH TLV (United States, 4/2014). Notes: as F** TWA: 2.5 mg/m³, (as F) 8 hours. **OSHA PEL (United States, 2/2013). Notes: as F** TWA: 2.5 mg/m³, (as F) 8 hours.
Citric acid	**OSHA** TLV not established
Cobalt sulphate	**OSHA PEL (United States, 1993). Notes: As Cobalt** TWA: 0.1 mg/m³ 8 hours. **NIOSH REL (United States, 2001). Notes: As Cobalt** TWA: 0.05 mg/m³ 10 hours. Form: Dust and fumes **ACGIH TLV (United States, 2003). Notes: As Cobalt** TWA: 0.02 mg/m³ 8 hours. Form: Inorganic

	ACGIH TLV (United States, 4/2014). Notes: as Co TWA: 0.02 mg/m³, (as Co) 8 hours. Form: Inorganic
Engineering controls:	Use with adequate ventilation to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Individual protection measures:	Eyes/face: Chemical splash goggles and face shield. Skin: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Respiratory: Wear appropriate respirator when ventilation is inadequate. Be sure to use a NIOSH approved respirator or equivalent.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquid. Dark green.
Odour:	Acidic.
Odour threshold:	Not available.
pH:	Less than 3.
Melting point:	Not available.
Freezing point:	Not available.
Initial boiling point and boiling range:	100°C (212°F)
Flash point:	Not applicable.
Evaporation rate:	Not available.
Flammability:	Not flammable.
Upper and lower flammability limits:	Not applicable.
Vapour pressure:	Not available.
Vapour density:	Not available.
Specific Gravity:	1.3 – 1.4
Solubility:	Soluble in water, hot or cold.
Partition coefficient n-octanol/water:	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	40°C 3cP (50 RPM, %25.0, Brookfield)

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability:	Stable.
Possibility of hazardous reactions:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid:	When exposed to combustible material, a fire may occur.

Incompatible materials:	Oxidizing materials, reducing agents, combustible substances, organic materials, acids, alkalis, metals.
Hazardous decomposition products:	Will not decompose under normal conditions.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on the likely routes of exposure:	SKIN AND EYES: yes INHALATION: yes INGESTION: yes
Potential health effects (acute):	EYE: Causes serious eye damage. Adverse symptoms may include pain, watering, redness. INHALATION: Fatal if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Fluoride compounds are extremely destructive to tissue of the mucous membranes and upper respiratory tract. Symptoms include: burning sensation, coughing, wheezing and breathing difficulties, and shortness of breath, headache, nausea or vomiting, pulmonary edema. Severe over-exposure can result in death. SKIN: Causes severe burns. May cause allergic reaction. Fluoride compounds are highly corrosive and readily penetrate the skin causing destruction of deep tissue layers, including bone. Pain may be delayed for up to 24 hours following exposure to concentrations of 1-50% and is often not reported until tissue damage is extreme. Concentrations greater than 50% cause immediate burning, redness and tissue damage. Without immediate medical attention, tissue destruction may continue for days and result in limb loss or death. The extent of burns depends on the concentration, temperature and duration of contact with the acid. INGESTION: Harmful if swallowed. Corrosive to the digestive tract. Causes burns. Can cause necrotic lesions, hemmhoragic gastritis, and pancreatitis.
Delayed and immediate effects, chronic effects from short and long term exposure:	Clinical signs and symptoms may not appear for up to 24 hours. Concentrations as low as 2% may cause symptoms with prolonged skin contact. When exposure is suspected, immediate medical attention is critical to minimize damage. Systemic fluoride toxicity can cause hypocalcemia, hypomagnesemia, hyperkalemia, pulmonary edema, metabolic acidosis, ventricular arrythmias and possible death.
Potential chronic health effects:	If sensitization occurs, a severe allergic reaction may occur even at very low levels.
Carcinogenicity:	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Classification:

Product	**OSHA**	**IARC**	**NTP**
Trivalent chromium compound	Not listed/not regulated	3	Not listed/not regulated
Ammonium bifluoride	Not listed/not	3	Not listed/not

	regulated		regulated
Sodium nitrate	Not listed/not regulated	2A	Not listed/not regulated
Cobalt sulphate	Not listed/not regulated	2B	Not listed/not regulated

Mutagenicity: Suspected of causing genetic defects.

Product	**Test**	**Experiment**	**Result**
Sodium nitrate	-	In vitro, mammalian	Equivocal

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: May have reproductive toxicity.

Product	**Maternal toxicity**	**Fertility**	**Developmental toxin**	**Species**	**Dose**	**Exposure**
Cobalt sulphate	-	Equivocal	-	Mouse-Male	Inh: 30mg/m3	6 hr/day

Sensitization: There are no data available on the mixture itself.

Toxicological effects:

Acute toxicity:

Product	**Result**	**Species**	**Dose**	**Exposure**
Trivalent chromium	LD50 oral	Rat	7760mg.kg	-
Sodium nitrate	LD50 oral	Rat	1267 mg/kg	-
Cobalt sulphate	LD50 oral	Rat	528 mg/kg	-
Ammonium bifluoride	LD50 oral	Rat	130 mg/kg	-
Citric acid	LD50 oral	Rat	6730 mg/kg	-

Acute toxicity estimate:

Route	**ATE value**
Oral	2365.7 mg/kg

Aspiration hazard: No data available.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Name	**Result**	**Species**	**Exposure**
Chrome sulphate	Acute LC50 0.03mg/L Fresh water	Daphnia- Daphnia magna	48 hours
Sodium nitrate	Acute LC50 323 mg/L Fresh water	Crustaceans-Hyalella azteca-adult	48 hours

Persistence and degradability: Not available.

Bioaccumulative potential: Not available.

Mobility in soil: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Dispose in accordance with all federal, state and local applicable regulations.

SECTION 14: TRANSPORT INFORMATION

	TDG
UN Number:	UN3093
UN proper shipping name:	Corrosive liquid, acidic, inorganic, N.O.S. (Trivalent chromium compound, ammonium bifluoride)
Transport hazard class:	8
Packing group:	ii
Environmental hazard:	No.
Special precautions for user:	**Transport within user's premises:** always transport in closed containers that are leak-free. Ensure that persons transporting the product know what to do in the event of a spill.

SECTION 15: REGULATORY INFORMATION

Canada inventory (DSL): All components are listed.

SECTION 16: OTHER INFORMATION

Revision date: May 17, 2024

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

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