SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

Product Identifier:	Vappro SRB-X
Other means of identification:	Broad Spectrum High Performance Biocide
Recommended use and restriction on use:	For industrial use, only
Manufacturer's Name:	MAGNA INTERNATIONAL PTE LTD
Address:	10H, Enterprise Road, Singapore 629834
Phone:	(65) 6786-2616, or (65) 6786-2631
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Revision date:	15 January 2015

SECTION II – HAZARDS IDENTIFICATION

GHS CLASSIFICATION:
Met. Corr. 1 Corrosive to metals
Acute Tox. 3 (oral) Acute toxicity
Acute Tox. 3 (Inhalation - mist) Acute toxicity
Skin Corr./Irrit. 1B Skin corrosion/irritation
Eye Dam./Irrit. 1 Serious eye damage/eye irritation
Resp. Sens. 1 Respiratory sensitization
Skin Sens. 1 Skin sensitization

GHS LABEL ELEMENTS SYMBOL(S)

SIGNAL WORDS:
Danger

GHS HAZARDS STATEMENTS:
H290 May be corrosive to metals.
H331 Toxic if inhaled.
H301 Toxic if swallowed.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H314 Causes severe skin burns and eye damage.

GHS PRECAUTIONARY STATEMENTS:
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P260 Do not breathe dust or mist.
P260 Do not breathe mist or vapour.
P284 [In case of inadequate ventilation] wear respiratory protection.
P270 Do not eat, drink or smoke when using this product.
P264 Wash with plenty of water and soap thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P234 Keep only in original container.

RESPONSE:
P310 Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P341 + P311 IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P352 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P362 + P364 Take off contaminated clothing and wash before reuse.
P390 Absorb spillage to prevent material damage.
STORAGE:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P406 Store in corrosive resistant/… container with a resistant inner liner.
DISPOSAL:
P501 Dispose of contents/container to hazardous or special waste collection point.

SECTION II – COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name:	Weight %:	CAS#
Glutaraldehyde and Magna proprietary mixture	40-50	Mixture

SECTION IV – FIRST AID MEASURES

Inhalation
Remove person to an uncontaminated area. Administer oxygen if necessary. If a cough or other respiratory symptoms develop, consult medical personnel. If breathing has stopped, administer CPR.
Skin Contact
Wash affected area with soap and water. If redness, itching or a burning sensation develops, get medical attention. Wash clothing before reuse.
Eye Contact
Immediately flush with plenty of water for at least 15 minutes. Make sure to flush under eyelids. If redness, itching or a burning sensation develops, have eyes examined and treated by medical personnel.
Ingestion
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

SECTION V – FIRE FIGHTING MEASURES

Suitable Fire-extinguishing media
Foam (alcohol-resistant foam), powder, and carbon dioxide are effective fire-extinguishing agents.
Specific hazards arising from the chemical
Water Spray (Fog); Dry Chemical; or Foam may be used where product is stored.
Special protective actions for fire fighters
Firemen should wear self-contained breathing apparatus and protective clothing when fighting chemical fires.

SECTION VI – ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Evacuate area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Only trained and properly protected personnel must be involved in clean-up operations. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions
Spills or discharge to natural waterways is likely to kill aquatic organisms. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION VII – HANDLING AND STORAGE

Precautions for safe handling
Keep out of reach of children. Keep away from heat, sparks and flame. Do not get in eyes, on skin, on clothing. Avoid breathing vapor. Do not swallow. Avoid prolonged or repeated contact with skin. Keep container closed. Use with adequate ventilation. Wear goggles, protective clothing and butyl or nitrile gloves. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform

similar operations on or near empty containers. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
Do not spray or aerosolize the undiluted form of the product. Full personal protective equipment (including skin covering and full-face SCBA respirator) is required for dilutions or mixtures of the product used in a spray application.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed when not in use. Store in dry, cool, well-ventilated area away from incompatibles. Do not store in: Aluminum. Carbon steel, Copper. Mild steel. Iron.

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits:

0.05 ppm

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. Local exhaust ventilation may be necessary for some operations. Lethal concentrations may exist in areas with poor ventilation.

Individual protection measures

Eye/face protection: Use chemical goggles. Chemical goggles should be consistent with EN 166 or equivalent. If exposure causes eye discomfort, use a full-face respirator. Use a full-face respirator when material is heated or when aerosols/mists are generated. Eye wash fountain should be located in immediate work area.

Skin protection

Hand protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Butyl rubber. Examples of acceptable glove barrier materials include: Nitrile/butadiene rubber ("nitrile" or "NBR"). When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. Glove thickness alone is not a good indicator of the level of protection a glove provides against a chemical substance as this level of protection is also highly dependent on the specific composition of the material that the glove is fabricated from. The thickness of the glove must, depending on model and type of material, generally be more than 0.35 mm to offer sufficient protection for prolonged and frequent contact with the substance. As an exception to this general rule it is known that multilayer laminate gloves may offer prolonged protection at thicknesses less than 0.35 mm. Other glove materials with a thickness of less than 0.35 mm may offer sufficient protection when only brief contact is expected. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Safety shower should be located in immediate work area. Use chemical protective clothing resistant to this material, when there is any possibility of skin contact. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly. Items which
cannot be decontaminated, such as shoes, belts and watchbands, should be removed and disposed of properly.

Respiratory protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. This product is a respiratory irritant. If discomfort is experienced ventilation is not adequate and an approved full face air-purifying respirator is recommended. If vapors are strong enough to be irritating to the nose, or eyes, the OEL is probably being exceeded. Special ventilation or respiratory protection may be required. For operations such as spraying and other conditions such as emergencies where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus. For

emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply.
Use the following CE approved air-purifying respirator: Full-face Organic vapor cartridge with a highly toxic particulate pre-filter, type AP3.

ECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance Physical State	Liquid
Color	Clear
Odour	Pungent Odour
Odour Threshold	No test data available
pH	3 – 5
Melting Point	Not applicable
Freezing Point	Estimate -18°C
Boiling Point	>100°C
Flash Point	80°C (Closed Cup)
Evaporation Rate	No test data available
Flammability (solid, gas)	Not applicable
Upper explosive limit	No test data available
Lower explosive limit	No test data available
Vapour Pressure	2 kPa @ 20°C
Relative Vapour Density	1.1 @ 20°C
Relative Density	1.129 @ 20°C
Solubility	100%
Partition coefficient: n-octanol/water	No data available
Dynamic Viscosity	15.4 cP @ 20°C
Auto-ignition Temperature	385°C @ 1004 hPa

SECTION X – STABILITY & REACTIVITY

Reactivity
No data Available.
Chemical stability
Stable under normal temperature and pressure.
Possible of hazardous reaction
Polymerization will not occur.
Conditions to avoid
Active ingredient decomposes at elevated temperature.
Incompatible materials
Avoid contact with: Amines, Ammonia, Strong acids, Strong bases, Strong oxidisers. Avoid contact with metal such as: Aluminium, Carbon Steel, Copper, Iron, Mild Steel.
Hazardous decomposition products
Normal combustion products including CO, CO_2 and other.

SECTION XI – TOXICOLOGICAL INFORMATION

Acute Toxicity
Acute oral Toxicity
Moderate toxicity if swallowed. Swallowing may result in irritation or burns of the mouth, throat, and gastrointestinal tract. Swallowing may result in gastrointestinal irritation or ulceration. Excessive exposure may cause: headache, dizziness, anesthetic effects, drowsiness and unconsciousness. Other central nervous system effects.

For the 50% aqueous solution:

LD50, rat, 200 mg/kg

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts.
For the 50% aqueous solution:
LD50, rabbit, male and female, > 2,000 mg/kg

Acute inhalation toxicity
Vapor may cause severe irritation of the upper respiratory tract (nose and throat). Vapor from heated material or mist may cause serious adverse effects, even death. Asthma-like symptoms may occur in people prone to respiratory disorders or other allergies. Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest.
LC50, rat, female, 4 Hour, dust/mist, 0.28 mg/l
LC50, rat, male, 4 Hour, dust/mist, 0.35 mg/I

Skin corrosion/irritation
Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.
Serious eye damage/eye irritation
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Vapor may cause eye irritation experienced as mild discomfort and redness.
Sensitization
For the active ingredient(s):
Skin contact may cause an allergic skin reaction in a small proportion of individuals. Has caused allergic skin reactions when tested in guinea pigs.
Has demonstrated the potential for contact allergy in mice.
May cause allergic respiratory response in a small proportion of individuals.
Specific Target Organ Systemic Toxicity (Single Exposure) Contains component(s) that may cause damage to organs. Route of Exposure: Oral
Target Organs: Eyes, Central nervous system
May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory system
Specific Target Organ Systemic Toxicity (Repeated Exposure)
Repeated skin contact may result in absorption of amounts which could cause death.
May cause nausea and vomiting.
Carcinogenicity
No carcinogenicity was seen in rats or in mice.
Teratogenicity
For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Reproductive toxicity
Contains component(s) which did not interfere with reproduction in animal studies.
Mutagenicity
For the component(s) tested: In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were predominantly negative.
Aspiration Hazard
Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

SECTION XII – ECOLOGICAL INFORMATION

Ecotoxicity
Acute toxicity to fish
Material is very toxic to aquatic organisms (LC50/EC50/IC50 below 1 mg/l in the most sensitive species).
LC50, Cyprinodon variegatus (sheepshead minnow), 96 Hour, 32 mg/l

Acute toxicity to aquatic invertebrates

LC50, copepod Acartia tonsa, semi-static test, 48 Hour, 3 mg/l

Acute toxicity to algae/aquatic plants
ErC50, Desmodesmus subspicatus (Scenedesmus subspicatus), 72 Hour, 0.6 mg/l
NOEC, Desmodesmus subspicatus (Scenedesmus subspicatus), 72 Hour, Growth rate inhibition, 0.025 mg/l

Chronic toxicity to aquatic invertebrates
NOEC, water flea Daphnia magna, flow-through test, 21 d, number of offspring, 0.12 mg/1

Persistence and degradability
Biodegradability: 10-day Window: Pass
Biodegradation: 73 %
Exposure time: 9 d
Method: OECD Test Guideline 301A or Equivalent

Bioaccumulative potential
Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient: n-octanol/water(log Pow): -0.333 Measured

Mobility in Soil
Potential for mobility in soil is high (Koc between 50 and 150).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient(Koc): 120 - 500 Estimated.

Results of PBT and vPvB assessment
This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Other adverse effects
This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

SECTION XIII – DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

SECTION XIV – TRANSPORT INFORMATION

Classification for ROAD and Rail transport:
Proper shipping name CORROSIVE LIQUID, TOXIC, N.O.S.
UN number UN 2922
Class 8 (6.1)
Packing group II

Classification for SEA transport (IMO-IMDG):
Proper shipping name CORROSIVE LIQUID, TOXIC, N.O.S.
UN number UN 2922
Class 8 (6.1)
Packing group II
Marine pollutant

Classification for AIR transport (IATA/ICA0):

Proper shipping name Corrosive liquid, toxic, n.o.s.
UN number UN 2922
Class 8 (6.1)
Packing group II

SECTION XV – REGULATORY INFORMATION

Label
Classification and labeling have been performed according to regulations.
Hazard symbol and Indication of danger
T Toxic
R-phrase(s)
R23/25 Toxic by inhalation and if swallowed.
R34 Causes burns.
R68/20/21/22 Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
R42/43 May cause sensitization by inhalation and skin contact.
S-phrase(s)
S23 Do not breathe vapour.
526 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
328 After contact with skin, wash immediately with plenty of water.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S38 In case of insufficient ventilation, wear suitable respiratory equipment.
545 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
560 This material and its container must be disposed of as hazardous waste.

SECTION XVI – OTHER INFORMATION

Full text of the R-phrases given in Section 2

Ril Highly flammable.
R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R23/25 Toxic by inhalation and if swallowed.
R34 Causes burns.
R39/23/24/25 Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R42/43 May cause sensitisation by inhalation and skin contact.
R50 Very toxic to aquatic organisms.

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H.M.I.S: Hazardous Materials Identification System
CAS#: Chemical Abstracts Service Number
ACGIH: American Conference of Governmental Industrial Hygienists
OSHA: Occupational Safety and Health Administration
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: recommended exposure limit
TWA8: The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
N.A: Not applicable
N/E: Not establish
N.D: Not determine
C: Ceiling (The concentration that should not be exceeded during any part of the working exposure).