

# MATERIAL SAFETY DATA SHEET

## REVACIL

**MAREVA INC.**  
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### 1 - IDENTIFICATION OF THE SUBSTANCE :

CHEMICAL NAME & SYNONYMS: Poly(imino imido carbonylimino hexamethylene Biguanide)  
Chlorhydrate  
USUAL NAME : Poly (Hexamethylene Biguanide Hydrochloride)  
COMPOSITION : 20 % water solution - PHMB  
TRADE NAME : **REVACIL sanitizer and algistat**  
USE : Cationic sanitizer, used for the treatment of swimming pool water.  
DESCRIPTION: Light blue liquid with a slight odor.  
CAS NO. : 91403-50-8

### 2 - PHYSICAL DATA :

pH at 68F / 20°C( pure product) : 4.0 to 5.0  
TEMPERATURES : - Boiling Point: 215.6 to 221 F (102 to 105°C)  
- Freezing Point: 28.4 to 24,8F (-2 to -4°C)  
- Decomposition of the active material 608 F (320 °C)  
FLASH POINT : not applicable  
EXPLOSIVITY : not applicable  
VOLUME MASS : 1030 to 1050 kg/m<sup>3</sup>  
DINAMIC VISCOSITY : 1.2. 10<sup>-3</sup> Pa.s  
SOLUBILITY : - soluble in water in all proportions  
- other solvents : aliphatic alcohols (overall with short carbonated chains) as well as glycol.  
- Not soluble in hydrocarbons.  
OTHER PROPERTIES : - Complexes with most of metallic cations (Fe, Cu, Ni,...)  
- Its cationic nature makes it totally incompatible with anionic products formation of a white precipitate).  
- The active substance is easily oxydable (chlorinated derivative, ozone, ..)

### 3 - HAZARDOUS INGREDIENTS

Chemical Name.	CAS N°	BY WEIGHT (%)	OSHA PEL	Health hazards*
Poly(hexamethylene biguanide hydrochloride)	91403-50-8	Approximately 20	Not listed	Harmful (methemoglobin former), irritant (eye, skin, respiratory, skin sensitizer)
Water		Approximately 80	Not listed	none
Blue dye		Less than 0.01	Not listed	
Perfume		Less than 0.01	Not listed	

\*(as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200):

Ingredient not precisely identified are proprietary or non hazardous.

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#### 4 - FIRE AND EXPLOSION HAZARD DATA

SPECIFIC DANGERS None, the product is not flammable nor explosive.

EXTINCTION MEANS Not applicable, use media suitable for surrounding fire.

SPECIAL EQUIPMENT Self contained breathing apparatus with full faceplace and protective clothing if involved in a fire of other materials.

UNUSUAL FIRE & EXPLOSION HAZARDS Not known

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#### 5 - HEALTH HAZARD DATA

PHYS.-CHEMICAL DANGERS No spontaneous reaction nor incompatibility likely to provoke a violent reaction.

EYE CONTACT Irritant to eyes

SKIN CONTACT The product may be irritant to skin in case of prolonged contact.  
SYMPTOMS : red blotches with irritation of the contaminated zones.

NHALATION In case of atomising of the product only, causes cough and leaves bitter taste in mouth.

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#### 6 - EMERGENCY AND FIRST AID PROCEDURE

SKIN CONTACT Remove contaminated clothing. Wash material off the skin with copious amount of soap and water. If irritation persists, consult a physician

EYE CONTACT Immediately flush with copious amounts of water for at least 15 minutes and have eyes examined and treated by medical personnel.

INGESTION DO NOT induce vomiting. Give one or two glasses of neutral liquid (water or milk) to drink and refer victim to medical personnel. (Never give anything by mouth to an unconscious person.)

INHALATION Remove person to fresh air. Rinse mouth with water.If cough or other respiratory symptoms develop, consult medical personnel.

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#### 7 – TOXICOLOGICAL INFORMATION

Limited toxicity data are available on this specific product, this health hazard assessment is based on the results of screening tests.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT:	The concentrated material induced severe irritation in rabbit eye studies, but dilution of 5 % or less were non irritating
SKIN CONTACT:	This concentrated material induced moderate skin irritation in a 24-hour rabbit dermal irritation test. Dilution of 5 % or less were not irritating on rat skin. A 10 % solution of this material induced skin sensitization in human patch tests. Dermatitis and allergic skin reactions can develop on human skin after repeated/prolonged contact with 10 % solution or with higher concentration of this material.
SKIN ABSORPTION	The acute dermal LD 50 in rabbit is greater than 2 ml/Kg in rabbits. Relative to other materials, this product is practically non toxic by skin penetration. Systematically concentrations are unlikely to be absorbed through the skin in man.
INGESTION	The acute oral LD 50 in rat is 2.5 to 2.7 g/Kg. Relative to other materials, a single dose of this product is slightly toxic by ingestion. Irritation of the mouth, pharynx, esophage and stomach may develop following ingestion.
INHALATION	<p>This product does not pose a vapor inhalation hazard, but repeated and/or prolonged aerosol exposures are potentially hazardous. Rats exposed to 0.25 mg/m<sup>3</sup> as an, aerosol for six hours per day, 5 day a week for three weeks developed methemoglobinemia, eye and respiratory irritation and pnemonitis. No adverse respiratory effects were observed at 0.025 mg/m<sup>3</sup> in air. The effects were more severe at higher concentrations. If aerosol exposure is limited and good industrial hygiene is practiced, the potential hazards associated with aerosol exposure will not be expressed.</p> <p>The symptoms of methemoglobinemia includes cyanosis (blue-tinged skin), euphoria, headache, flushed face, light-headedness, ataxis, weakness, rapid heart beat, labored breathing, nausea, vomiting and mental confusion. Hypertension, blindness, liver and kidney injury can result after extreme exposure.</p>
OTHER EFFECTS OF OVER EXPOSURE	PHMB, the active ingredient in this product, when administered to mice at very high doses, induced an increased incidence of cancer in mice. Under the conditions of anticipated use of this product, PHMB does not represent a risk to man.
CARCINOGENIC	no
MUTAGENIC	no
TERATOGENIC	no

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**8 - REACTIVITY DATA**

STABILITY	The product is stable between 50F (10°C) and 167F (75°C).
REACTIVITY	No reaction spontaneous nor incompatibility susceptible of generating a violent reaction.

#### HAZARDOUS DECOMPOSITION PRODUCTS

Combustion products of dry material: carbon dioxide, carbon monoxide, nitrogen oxide, ammonia, halogen, halogen acids, possible trace of carbonyl halide.

HAZARDOUS POLYMERIZATION Will not occur.

INCOMPATIBILITY (materials to avoid): Chlorine, Bromine, Ozone, Copper, silver, sodium hydroxide, most metal

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### 9 - SPILL, LEAKAGE & DISPOSAL PROCEDURES

STEP TO BE TAKEN in case material is released or spilled:

Wear skin, eye and respiratory protection during cleanup. Contain spill and keep out of sewers and drains. Soak up liquid with absorbent and shovel into waste container. Cover container and remove from work area.

DISPOSAL METHOD: Discarded product is not a hazardous waste under RCRA, 40 CFR 261. However, this material is toxic to fish. Do not contaminate waterways by cleaning of equipment or by disposal of waste. To deactivate this material, adjust pH of solution to 6.8 - 7.0. Add 5% solution of sodium hypochlorite (household bleach), 5 parts sodium hypochlorite solution to one part Revacil. Let stand for 48 hours. Dilute deactivated solution with plenty of water and discharge to a sewer serviced by a wastewater treatment facility.

CONTAINER DISPOSAL: Empty container retains product residue. Observe all hazards precautions. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product. Remove all product residue and puncture or otherwise destroy empty container before disposal.

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### 10 - SPECIAL PROTECTION DATA

TLV or suggested control value

No TLV assigned. Minimize exposure in accordance with good hygiene practice. Exposure to the aerosol should be reduced or eliminated.

VENTILATION Use local exhaust if aerosol is generated.

RESPIRATORY PROTECTION If needed, use MSHA\_NIOSH approved respiratory equipment with high efficiency filter combined with cartridge approved for ammonia and methylamine

PROTECTIVE CLOTHING Prevent skin contact. Use impervious gloves. Depending upon conditions of use, additional protection may be required such as apron, arm covers of full body suit.

EYE PROTECTION Prevent eye contact. Wear chemical goggles.

Other protective equipment Eyewash station and safety shower in work area.

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## 11- SPECIAL PRECAUTIONS DATA

**HANDLING**                      Precaution to be taken in handling or storing. Prevent skin and eye contact. Avoid breathing aerosols. Normal chemical handling and storage. Do not generate aerosol unless such can be fully contained such as in a closed system.

**STORAGE**  
Température :                      Maintain at a temperature > 6 °C (42.8 F), if not the product becomes cloudy and precipitates (gelatinous white solid at the bottom of the container). It becomes clear again and keeps all its properties after a long heating time with strong shaking.

Materials recommended : polyethylene, polypropylene, PVC, inoxydable steels.

Materials not advisable : metallic materials (Cu, Fe, Zn, black steels,...), as well as some types of rubber.

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## 12- REGULATORY INFORMATION

**TRANSPORTATION INFORMATION**  
This material is not a hazardous material and is not regulated by the D.O.T.

**TSCA**                                All ingredients are on the TSCA Chemical Substance Inventory. (Toxic Substances Control Act), Regulation, 40 CFR 710)

**CERCLA and SARA**              This product does not contain any chemicals subject to the reporting requirements of SARA Section 313. (Regulation, 40 CFR 355, 370 and 372).

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The above information is based on the present state of our knowledge of the product at the time of the up-dating. It is given in good faith, no warranty is implied with respect to the quality or the specification of the product. The user must satisfy himself that the product is entirely suitable for his purpose.

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