SAFETY DATA SHEET

REGEN

Revision Date: December 12, 2024

SECTION 1: IDENTIFICATION OF SUBSTANCE / MIXTURE	
Product Name:	Regen: Heavy Duty Acid Cleaner
Product Type:	Liquid
Recommended Use:	Greenhouse and irrigation line cleaner. Specialty chemical formula for removing minerals, algae staining, whitewash sunblock coatings.
Restrictions on use:	Use only with food crops and industrial application. Use in Non-potable Water Only.
Manufacturer Name:	Future Harvest Development LTD.
Manufacturer Address:	725 Evans Crt, Kelowna BC, V1X 6G4, Canada
Manufacturer Phone Number:	250-491-0255
Email Address of Competent Person Responsible for the SDS:	loren@futureharvest.com
Emergency Phone Number/ 24-Hour Number:	**For Transportation Emergencies:** Canutec 613-996-6666 **Emergency Response Services:** Chemtrec 800-424-9300

SECTION 2: HAZARD IDENTIFICATION	
Physical Hazards:	CORROSIVE TO METALS - Category 1
Health Hazards:	ACUTE TOXICITY – DERMAL – Category 2 ACUTE TOXICITY – ORAL – Category 2 ACUTE TOXICITY – INHALATION – Category 4 SKIN CORROSION/ IRRITAITON – Category 1 EYE DAMAGE/ IRRITATION – Category 1 STOT-SE – Category 3 CARCINOGENICITY – Category 1
Symbol:	
Signal Word:	**DANGER**

Hazard Statement(s):	H290 May be corrosive to metals. H300 + H310 Fatal if swallowed or in contact with skin. H332 Harmful if inhaled. H314 Causes severe skin burns and eye damage. H351 Suspected of causing cancer. H335 May cause respiratory irritation.
Precautionary Statement(s):	
Prevention:	P234 Keep only in original packaging. P262 Do not get in eyes, on skin, or on clothing. P271 Use only outdoors or in a well-ventilated area. P260 Do not breath fume/ gas/ mist/ vapours/ spray. P264 Wash hands and any affected area thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P271 Use only outdoors or in a well-ventilated area. P203 Obtain, read and follow all safety instructions before use.
Responses:	P390 Absorb spillage to prevent material-damage. P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P302 + P352 IF ON SKIN: Wash with plenty of water. P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P301 + P302 + P304 + P316 IF SWALLOWED, ON SKIN OR INHALED: Get emergency medical help immediately. P361 + P364 Take off immediately all contaminated clothing and wash it before reuse. P321 Specific treatment (see supplemental first aid information on this label). P305 + P354 + P338 + P317 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical help. P319 Get medical help if you feel unwell. P318 If exposed or concerned, get medical advice.
Storage:	P406 Store in a corrosion resistant container with a resistant inner liner. P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.
Disposal:	P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: COMPOSITION / IDENTIFICATION ON INGREDIENTS

Ingredient	Approx. Wt.%	CAS Number
Sulphuric Acid	10-30	7664-93-9
Hydrofluoric Acid	5-10	7664-39-3
Alkyl (C10-16) Benzenesulfonic Acid	5-10	68584-22-5

SECTION 4: FIRST-AID MEASURES

General Information:	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.
Inhalation:	Immediately remove the affected victim to fresh air. If symptoms persist, obtain medical attention. As soon as possible repeatedly have the casualty deeply breath a glycocortioid inhalation spray in. Mouth to mouth resuscitation is not recommended.
Skin Contact:	Flood area with cool water for at least 20 minutes. Make sure water doesn't flow onto another part of the person's body or onto you. Don't use a strong stream of water, if possible. As you flush the burn (not before), remove jewelry or articles of clothing with chemical on them, unless they're stuck to the person's body. Don't try to neutralize the burn with acid or alkali. This could cause a chemical reaction that worsens the burn. Apply calcium gluconate gel (2.5%) generously and rub it in gently even if there is no pain. Rinse with water then apply again. Continue this treatment until pain has disappeared. If calcium gluconate gel is not available, apply compresses soaked with 10% calcium gluconate solution. Call a physician to the site of the accident.
Eye Contact:	**DANGER OF BLINDNESS!** Have the person immediately rinse the eye or eyes under a faucet, in a gentle shower, or with a clean container of water. Keep the person's face so that the injured eye is down and to the side. Avoid spraying a high-pressure water stream into the eye or eyes. Flush with lukewarm water for 15 to 30 minutes. For severe burns, continue flushing until you see a doctor or you arrive in an emergency room. The person should keep the eye open as wide as possible. Wash the person's hands thoroughly to make sure no chemical is still on them. Flush the eye to remove contact lenses. If they do not come out, try to gently remove them AFTER flushing. Do not rub the eye or place a bandage over the eye. While waiting for medical care, have the person wear sunglasses to decrease light sensitivity.
Ingestion:	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Drink plenty of water. Immediate medical attention is required. Remove from exposure, lie down. Clean mouth with water and drink afterwards plenty of water. Call a physician or poison control centre immediately. When directed by physician, give orally either 1% aqueous calcium gluconate solution, milk or calcium/ magnesium containing anti-

	acid. Such solutions can be beneficial but also may be problematic if they induce vomiting.
Self-Protection of the First Aider:	Remove all sources of ignition. Ensure that first aid personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.
Most Important Symptoms/ Effects, Acute and Delayed:	**Ingestion:** May be fatal if swallowed. Can cause severe burning of the mouth, throat and stomach. Perforation of the digestive system may occur. Systemic fluoride toxicity has occurred following digestion. Symptoms such as nausea, vomiting, abdominal pain, reduced heartbeat and blood pressure, shortness of breath have been reported. In some cases, death occurred in less than one hour following ingestion. Ingestion is not a typical route of occupational exposure. **Inhalation:** Harmful if inhaled. Low concentrations can cause irritation of the nose, throat, eyes and respiratory tract. Higher concentrations can cause severe burns to the throat, airways and lungs. Fluid accumulation in the lungs and irregular heartbeat has lead to deaths within hours following inhalation and, in some cases, concurrent skin contact with unknown concentrations of HF. With serious exposures, throat irritation, coughing, chest pain, nausea and perhaps some difficulty breathing may be experienced during exposure. **Eyes and skin:** May be fatal if absorbed through skin and penetration may continue for several days. Hydrofluoric acid is extremely corrosive and can cause very deep and excruciatingly painful burns and tissue loss. Burns from solution may take up to 24 hours to become apparent. Pain is greater than expected for the skin involvement and is described as severe deep and throbbing. Burns are swollen, hot and painful, then develop white or yellowish areas and blistering, with deep ulceration and destruction of tissue, which tends to heal slowly. Direct contact can cause severe and irreversible corrosive injury with possible corneal scarring and blindness.
If irritation occurs or persists, get medical attention.	

SECTION 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:	Water fog, alcohol foam, or dry chemical.
Unsuitable Extinguishing Media:	None known.
Flammability:	Not flammable. Not combustible. When in contact with water, may generate sufficient heat to ignite combustible materials.
Flash Point:	Not flammable. Not combustible.
Special Firefighting Procedures:	Directing a solid stream of water into a hot burning liquid can cause frothing and spread the fire. Wear NIOSH/MSHA approved, self-contained breathing apparatus for firefighting situation. Use water spray to cool all nearby fire exposed surfaces.

Unusual Fire/ Explosion Hazards:	Risk of explosion in contact with potassium, sodium, cyanogen fluoride, potassium permanganate, metals (produce flammable hydrogen gas), methanesulfonic acid, nitric acid + glycerin.
Hazardous Decomposition Products:	Hydrogen fluoride, hydrogen chloride, oxides of carbon, hydrocarbons.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Environmental Protection Precautions:	Do not release to the environment or water source.
Steps to be Taken in Case Material is Released or Spilled:	Wear protective equipment. Absorb into inert mineral absorbent ("floor dry"). Wash Down floor. Flush area with water if appropriate. Keep material away from sewers. Reuse if possible, otherwise dispose recovered material in accordance with all local, Provincial or Federal regulations.

SECTION 7: HANDLING AND STORAGE

Precautions to be Taken in Handling and Storage:	Use good industrial hygiene. Do not get in eyes, on skin or on clothing. Avoid breathing dust. Store in a cool, dry place away from incompatibles. Keep container closed when not in use. Keep out of reach of children. Store at temperatures below 30°C and above 5°C. Do not store in metal containers. Prolonged storage may cause product to cake and become damp from atmospheric moisture. Do not add water to this product. The proper way is to add this product slowly to the surface of cold water and agitate while they disperse. Do not enter a storage tank or container that has contained this product, even if it appears empty.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

EXPOSURE LIMITS:					
OSHA (OEL): Not available.	**ACGIH TLV:** Not available.		**Other exposure limit:** Not available.		
Hydrogen Fluoride					
CAS No.:	7664-39-3				
Regulation:	**NIOSH**		**OSHA**		**OHSR**
Type of Listing:	REL-TWA	REL-TWA C	IDLH	PEL-TWA	TLV-STEL C
Value:	3 ppm	6 ppm	30 ppm	3 ppm	2 mg/m^3

Sulphuric Acid				
CAS No.:	7664-93-9			
Regulation:	**NIOSH**		**OSHA**	**OHSR**
Type of Listing:	REL-TWA	IDLH	PEL-TWA	REL-TWA
Value:	1 mg/m^3	15 mg/m^3	1 mg/m^3	1 mg/m^3

INDIVIDUAL PROTECTION MEASURES / PERSONAL PROTECTIVE EQUIPMENT	
Appropriate Engineering Controls:	Good general ventilation.
Skin Protection:	**Hand Protection:** Non-permeable gloves (rubber, nitrile) recommended. **Other Skin Protection:** Rubber apron. Rubber boots.
Eye and Face Protection:	Safety glasses with face shield.
Respiratory Protection:	**Up to 30 ppm:** Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern. **Emergency or planned entry into unknown concentrations or IDLH conditions:** Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus. **Escape:** Any air-purifying, full-facepiece respirator (gas mask) with a chin- style, front- or back-mounted canister providing protection against the compound of concern. Any appropriate escape-type, self-contained breathing apparatus
Other Protective Equipment:	Eye wash, safety shower and full protective clothing recommended in the immediate work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear, yellow liquid.
Odour:	Mildly acidic odour. No added fragrance.
Odour threshold:	Not available.
pH:	2.5-3.5
Melting point/Freezing point:	Not available.

Initial boiling point and boiling range:	Not available.
Flash Point:	Not available.
Evaporation Rate (Water=1):	Not available.
Flammability:	Not flammable.
Upper/Lower flammability or explosive limits:	Not available.
Vapour pressure:	Not available.
Vapour density:	Not available.
Relative density/Specific gravity (Water = 1):	1.09 @ 20°C
Solubility(ies):	Soluble in water.
Partition coefficient: n-octanol/water:	Not available.
Auto-ignition temperature:	Not flammable.
Decomposition temperature:	Not available.
Viscosity:	Not available.
VOCs%:	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	Not available.
Chemical stability:	Stable under normal storage conditions.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Temperatures above 30°C and below 5°C. Avoid contact with incompatible materials.
Incompatibility:	Alkalis, strong oxidizing agents, arsenic trioxide, phosphorus pentoxide, ammonia, calcium oxide, sodium hydroxide, sulfuric acid, vinyl acetate, ethylenediamine, acetic anhydride, organic materials, most common metals (will react to produce flammable Hydrogen gas), rubber, leather, carbonates, sulfides, cyanides, oxides of silicon (especially glass), concrete, silica, fluorine. Will also react with steam or water to produce toxic fumes.
Hazardous Decomposition Products:	Hydrogen fluoride, hydrogen chloride, oxides of carbon, hydrocarbons.

SECTION 11: TOXICOLOGICAL INFORMATION

Likely routes of exposure:	Inhalation, skin absorption (liquid), ingestion (solution), skin and/or eye contact.
Symptoms:	**SKIN CONTACT:** Redness, blisters. Bone changes.

	EYE CONTACT: Serious irritation, tearing, vision impairment. **INHALATION:** Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury. Can cause severe burns to mouth, esophagus and stomach. **INGESTION:** May cause irritation and nausea.
Acute Toxicity Estimates:	**LD_{50} Oral ATE = 5-50 mg/kg** 0% of the mixture consists of ingredient(s) of unknown acute oral toxicity. **LD_{50} Dermal ATE = 50-200 mg/kg** 0% of the mixture consists of ingredient(s) of unknown acute dermal toxicity. **LD_{50} Inhalation ATE: 10-20 mg/L** >50% of the mixture consists of ingredient(s) of unknown acute inhalation toxicity.
Skin Sensitization:	Data available on components indicates no potential skin sensitization.
Germinal Cell Mutagenicity:	**For Hydrogen Fluoride (CAS# 7664-39-3):** Cytogenetic analysis – Inhalation, rat – 1mg/ m^3/ 6H/ 24D (intermittent) CYGEDX Cytology and Genetics
Reproductive Toxicity:	Data available on components indicates no potential reproductive toxicity.
Carcinogenicity:	This product in liquid form is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA. However, the mist of this product is considered as IARC Category 1 carcinogen: Strong inorganic acid mists containing sulphuric acid (CAS# 7664-93-9)
Aspiration Hazard:	Data available on components indicates no potential aspiration hazard.
STOT-SE:	5-10% of the mixture consists of ingredient(s) of potential STOT-SE hazard.
STOT-RE:	Data available on components indicates no potential STOT- RE hazard.

SECTION 12: ECOLOGICAL INFORMATION	
Toxicity to Fresh Water Algae:	Not available.
Toxicity to Fish Species:	**Sulphuric Acid (CAS# 7664-93-9):** LC_{50} (Brachydanio rerio) 500 mg/L, Exposure Time: 96h, Test Type: static
Toxicity to Aquatic Invertebrates:	Not available.
Persistence and degradability:	Not available.

Bioaccumulation:	Not available.
Inherently Toxic to the Environment:	Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Recommended Waste Disposal Methods:	Reuse if possible. Otherwise dispose recovered material in accordance with all local, Provincial or Federal regulations.

SECTION 14: TRANSPORT INFORMATION

Canadian TDG UN Number:	3264
UN Proper Shipping Name:	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (sulphuric acid, hydrofluoric acid)
Transport Hazard Class(es):	8
Packing Group:	II
Environmental Hazards:	Not available.
Special Precautions for User:	Not available.
Additional Information:	**Explosive Limit and Limited Quantity Index:** 1 Litre **Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index:** 1 Litre

SECTION 15: REGULATORY INFORMATION

Inventory / Ingredients	DSL/ NDSL	NPRI	TSCA
Sulphuric Acid (CAS# 7664-93-9)	Listed on the DSL	Listed	Listed, Active
Hydrofluoric Acid (CAS# 7664-39-3)	Listed on the DSL	Listed	Listed, Active
Benzenesulfonic acid, mono-C10-16- alkyl derivatives., Sodium Salts (CAS# 68081-81-2)	Listed on the DSL	Not listed	Listed, Active

Hydrofluoric Acid (CAS# 7664-39-3) is subjected to the reporting of a release in section 18 of the Environmental Emergency Regulations, 2019 if it meets the minimum concentration of 50% (mass/mass) and is not part of exclusions in 2(2).

In addition, facilities will have to report quantities on site or/and create and bring into effect an environmental emergency plan for their site, if they meet certain conditions in the Environmental Emergency Regulations, 2019 and have a minimum of 0.45 tonnes on site.

For further information, please consult the Environmental emergencies website.

SECTION 16: OTHER INFORMATION

ACRONYM LIST	
ACGIH	American Conference of Governmental Industrial Hygienists
ATE	Acute Toxicity Estimate
C	Ceiling Limit – The maximum exposure limit
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
DSL/NDSL	Domestic Substances List/ Non-domestic Substance List
EC_{50}	Half maximal effective concentration
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life or Health
iT_E	Inherently Toxic to the Environment
LC_{50}	Lethal concentration, 50%
LD_{50}	Lethal dose, 50%
MSHA	Mine Safety and Health Administration
N/A	Not Applicable
NIOSH	The National Institute for Occupational Safety and Health
N.O.S.	Not Otherwise Specified
NPRI	National Polluant Release Inventory
NTP	National Toxicology Program
OHSR	Occupational Health & Safety Regulation
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulative and Toxic
PEL	Permissible Exposure Limit
PNOC	Particulates not otherwise classified
PMCC	Pensky-Martens Closed Cup
P_{OW}	Partition Coefficient Octanol: Water
REL	Recommended Exposure Limit
SDS	Safety Data Sheets
STEL	Short-Term Exposure Limit
STOT – SE	Specific Target Organ Toxicity – Single Exposure
STOT – RE	Specific Target Organ Toxicity – Repeated Exposure
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act Chemical Substance

TWA	Time-Weighted Average
UN	United Nations
VOCs	Volatile Organic Compounds
WEL	Workplace Exposure Limit
WEEL	Workplace Environmental Exposure Limit
WHMIS	Workplace Hazardous Materials Information System

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