



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

March 22, 2022

Coleen Gerber
Scientist
PeroxyChem, LLC
2005 Market Street, Suite 3200
Philadelphia, PA 19103

Subject: PRIA Label Amendment – Addition of Medical Waste Treatment Use and Amended Sources for Formulation
Product Name: VigorOx 15/23 Antimicrobial Agent
EPA Registration Number: 65402-8
Received Date: 12/11/2020
Action Case Number: 00216881

Dear Coleen Gerber:

The application referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, is acceptable under FIFRA Section 3(c)(7)(B), subject to the following conditions:

1. You must submit and/or cite all data required for registration/reregistration/registration review of your product under FIFRA when the Agency requires all registrants of similar products to submit such data.
2. You are required to comply with the data requirements described in the DCI Order identified below:
 - Hydrogen Peroxide: GDCI-000595-1127
 - Peroxyacetic acid: GDCI-063201-1125

You must comply with all of the data requirements within the established deadlines. If you have questions about the Generic DCI Order listed above, you may contact the Chemical Review Manager in the Antimicrobial Division's Reevaluation Branch:
<https://www.epa.gov/pesticide-contacts/contacts-office-pesticide-programs-antimicrobials-division>

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. Pursuant to 40 CFR 156.10(a)(6), you must submit one (1) copy of the final printed labeling before you release the product for shipment with the new labeling. In accordance with 40 CFR 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved

labeling. “To distribute or sell” is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR 152.3.

Please note that the record for this product currently contains the following CSFs:

- Basic CSF dated 09/02/2021
- Alternate CSF 1 dated 09/02/2021
- Alternate CSF 2 dated 09/02/2021

Should you wish to add/retain a reference to the company’s website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the Agency. See FIFRA section 2(p)(2). If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) lists examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product’s label, claims made on the website may not substantially differ from those claims approved through the registration process, FIFRA section 12(a)(1)(B). Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA’s Office of Enforcement and Assurance.

Your release for shipment of the product constitutes acceptance of these conditions. If you fail to satisfy these data requirements, EPA will consider appropriate regulatory action including, among other things, cancellation under FIFRA section 6(e). If you have any questions, please contact Perri Moeller by phone at (202) 566-0813, or via email at moeller.perri@epa.gov.

Sincerely,



Steven Snyderman, Product Manager 33
Regulatory Management Branch II
Antimicrobials Division (7510P)
Office of Pesticide Programs

Enclosure: Stamped Final Label and User Manual

VIGOROX® 15/23 Antimicrobial Agent

EPA Reg. No. 65402-8
EPA Est. 65402-NY-001, 65402-OK-001,
60156-IL-001, 65402-TN-001

For Industrial Use Only

ACTIVE INGREDIENTS:
Peroxyacetic Acid 15%
Hydrogen Peroxide 23%
OTHER INGREDIENTS: 62%
TOTAL: 100%

KEEP OUT OF REACH OF CHILDREN DANGER

[**Note to Reviewer:** In accordance with 40 CFR 156.68(d), all first aid statements, as prescribed, will appear on the front panel of the product label.]

Note to the reviewer: Bracketed statements will only be present on split-label products with agriculture uses.

[Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)]

VigorOx® 15/23 Antimicrobial Agent is a disinfectant for regulated medical waste is only for use in conjunction with the Technopath Clinical Diagnostics USA, Inc. ENVETEC® 200 Series System.

VigorOx® 15/23 Antimicrobial Agent is for biofouling and slime control in

- Recirculating process and cooling water systems
- Pulp and paper mill systems
- Coating preservation
- Dispersed pigment preservation

VigorOx® 15/23 Antimicrobial Agent is for use in wastewater and sewage effluent treatment in public and private treatment facilities.

VigorOx® 15/23 Antimicrobial Agent is for use in the reduction of algae growth in wastewater and sewage treatment facilities' effluent water and related processing equipment, including on filters and equipment walls.
(Not for Use in CA)

VigorOx® 15/23 Antimicrobial Agent is for use in the treatment of ultra filtration and reverse osmosis (RO) membranes and their associated distribution systems.

VigorOx® 15/23 Antimicrobial Agent is for use in agricultural water and irrigation systems, including greenhouses.

VigorOx® 15/23 Antimicrobial Agent is for use in oilfield and gas-field well operations.

 **EVONIK** and **VIGOROX®** are trademarks of Evonik Active Oxygens, LLC



Manufactured by:
Evonik Active Oxygens, LLC
a subsidiary of Evonik Corporation
2005 Market St Ste 3200
Philadelphia PA 19103-7014

Net Contents: Gallons lbs

First Aid	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
If in eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
If swallowed	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.	
EMERGENCY TELEPHONE NUMBERS (24 HOURS)	
MEDICAL: COLLECT 303-389-1409	
CHEMTREC: 800-424-9300	
OTHER: COLLECT 716-879-0400	

Precautionary Statements Hazards to Humans and Domestic Animals DANGER

Corrosive, causes eye and skin damage. Harmful if swallowed. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Wash thoroughly with soap and water after handling. Do not breathe vapor or spray mist. Do not enter an enclosed area without proper respiratory protection.

Physical or Chemical Hazards

Strong oxidizing agent. Mix only with water. At temperatures exceeding 156°F, decomposition occurs releasing oxygen. The oxygen released could initiate or promote combustion of other materials.

[**Note to the reviewer:** The following statement will only be present on labeling with regulated medical waste use.
Wear a chemical resistant apron, face shield, and nitrile gloves.]

Note to the reviewer: The following bracketed statements will only be present on split-label products with agriculture uses.

Personal Protective Equipment (PPE)

Handlers who may be exposed to the undiluted product through mixing, loading, application, or other tasks must wear: coveralls over long-sleeved shirt and long pants, rubber gloves, chemical resistant footwear plus socks, and protective eyewear (goggles or face shield).

Handlers who may be exposed to the diluted product during application or other tasks must wear: long-sleeved shirt, long pants, socks, and shoes.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow the manufacturer's instructions for cleaning/maintaining

PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

This pesticide is toxic to birds, mammals, fish, aquatic invertebrates, shrimp, clams, and oysters. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. In developing the NPDES permit, restrictions on the release of waters containing this product during low-flow periods and/or mixing zones, especially during maximum discharge should be considered.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. [Do not apply this product in a way that will contact workers or persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.]

Note to the reviewer: The following bracketed statements will only be present on split-label products with agriculture uses.

[Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about Personal Protective Equipment (PPE), restricted-entry interval, and notification to workers. The requirements in this box only apply to the uses of this product that are covered by the Worker Protection Standard.

A Restricted-Entry-Interval of zero (0) hours is required for VigorOx® 15/23 Antimicrobial Agent in agricultural or horticultural uses.

Keep unprotected persons out of treated areas until sprays have dried.

Non-Agricultural Use Requirements

The requirements in this box apply to uses of the product that are **not** within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Keep unprotected persons out of treated areas until sprays have dried.]

Regulated Medical Waste (Not for Use in CA)

VigorOx 15/23 Antimicrobial Agent is a disinfectant for regulated medical waste for use in conjunction with the Technopath Clinical Diagnostics USA, Inc. ENVETEC® 200 Series System.

Use VigorOx 15/23 Antimicrobial Agent only with the ENVETEC® 200 Series System processor to treat regulated medical waste in hospitals, medical/surgical/dental clinics, laboratories, biomedical research facilities, nursing homes, blood banks, and dialysis clinics.

Use VigorOx 15/23 Antimicrobial Agent with the ENVETEC® 200 Series System according to the Operator and Maintenance Manual. Follow directions indicated on the Operator Interface Panel of the ENVETEC® 200 Series System.

1. Add disinfectant - Place one sealed 20 liters container of VigorOx 15/23 Antimicrobial Agent on the chemical spill tray. Press Step 1 – Container in position. Wait for Step 1 indicator to turn green.
2. Filling the disinfectant into the machine - Wear a chemical resistant apron, face shield, and nitrile gloves. Remove the VigorOx 15/23 Antimicrobial Agent container cap. Remove the fill lance from the processor holder. Insert the processor fill lance into the container. Press Step 2 – Fill lance in position. Wait for Step 2 indicator to turn green.
3. Transfer of VigorOx 15/23 Antimicrobial Agent from the container to the processor tank, Press Step 3 – Start transfer pump. Wait for Step 3 indicator to turn green.
4. When complete transfer of VigorOx 15/23 Antimicrobial Agent is indicated on the control panel, Press Stop Pump. Remove the fill lance from the container and return to holder.
5. Remove the empty VigorOx 15/23 Antimicrobial Agent container from the chemical spill tray and dispose according to product labeling.
6. Follow the operating prompts displayed on the Operator Interface Panel to start the medical waste disinfection cycle. The ENVETEC® 200 Series System automatically dispenses 600 cc (ml) of

disinfectant per treatment. A complete disinfection cycle is 20 minutes. One 20 liters container of VigorOx 15/23 Antimicrobial Agent disinfects 28 cycles of medical waste.

Biofouling Control in Pulp and Paper Mill Systems

For use in the manufacture of paper and paperboard intended for food and non-food contact.

VigorOx® 15/23 Antimicrobial Agent can be used to control bacterial, fungal and yeast growth in pulp, paper and paperboard mills.

1. Pre-clean severely fouled systems before initial treatment with VigorOx® 15/23 Antimicrobial Agent. Refer to the plant operations manual for directions for cleaning severely fouled systems. Add the product directly to the system and do not mix with any other chemicals or additives. Contamination with other chemicals could result in product decomposition.
2. Add the VigorOx® 15/23 Antimicrobial Agent at a point in the system where it is mixed uniformly with the pulp, e.g., the beater, hydropulper, fan pump, broke pump etc.
3. **Intermittent feed method:** Apply 0.5 lb to 1.2 lb (7 to 16 fluid ounces) of VigorOx® 15/23 Antimicrobial Agent per ton (dry basis) of pulp or paper produced for two to three hours every eight-hour shift. Maintain a concentration that provides adequate control. This will provide 37.5-90 ppm of peroxyacetic acid and 57.5-138 ppm of hydrogen peroxide. Daily rate could change depending on the severity of the biofouling.
4. **Continuous feed method:** Initially, use the intermittent feed method to achieve control. When control is accomplished, apply VigorOx® 15/23 Antimicrobial Agent continuously at the rate determined adequate for intermittent control. Then reduce the rate of addition to the lowest level sufficient to maintain control. Depending on the severity of the biofouling, control usually can be maintained using a continuous rate of 0.2 to 1.2 lb (2.6 to 16 fluid ounces) of VigorOx® 15/23 Antimicrobial Agent solution per ton (dry basis) of pulp or paper produced on a continuous basis. This will provide 15-90 ppm of peroxyacetic acid and 23-138 ppm of hydrogen peroxide.

Control of Slime Forming Bacteria in Recirculating Cooling Water Systems (Cooling Towers, Evaporative Condensers) and Non-Food Contact Water Systems (Pulp and Paper Mill Water Systems).

VigorOx® 15/23 Antimicrobial Agent is for use in treating raw (make-up) and process waters, closed and opened loop systems such as heat exchanges, wet scrubbers, cooling towers, evaporative condensers and recirculating industrial process waters, such as pulp and paper mill water systems.

1. Pre-clean severely fouled systems before adding the VigorOx® 15/23 Antimicrobial Agent solution. Refer to the system operation manual for directions to clean severely fouled systems. Add the product directly to the system and do not mix with any other chemicals or additives. Contamination with other chemicals could result in product decomposition.
2. Add the VigorOx® 15/23 Antimicrobial Agent solution at a point in the system where uniform mixing and even distribution will occur.
3. **Intermittent feed method:** When the system is noticeably fouled, apply 0.8 to 1.2 lb (10 to 16 fluid ounces) of VigorOx® 15/23 Antimicrobial Agent solution per 1000 gallons of water in the system (provides 15-23 ppm of peroxyacetic acid and 23-35 ppm of hydrogen peroxide). Repeat until control is achieved. When microbial control is evident, add 1.0 lb (14 fluid ounces) of the solution per 1000 gallons of water in the system every day, or as needed, to maintain control. The daily dose rate could vary depending upon the severity of the biofouling.
4. **Continuous feed method:** Initial dose – When the system is just noticeably fouled, apply 0.8 to 1.2 lb (10 to 16 fluid ounces) of VigorOx® 15/23 Antimicrobial Agent solution per 1000 gallons of water in the system. When microbial control is achieved, start adding VigorOx® 15/23 Antimicrobial Agent solution continuously at a rate of 1.0 lb (14 fluid ounces) per 1000 gallons of water (provides 17 ppm peroxyacetic acid and 26 ppm of hydrogen peroxide). Then reduce the rate of addition to a level sufficient to maintain control. The dose rate may have to be adjusted to account for losses due to blowdown and evaporation. Add 1.4 fluid ounces of VigorOx® 15/23 Antimicrobial Agent for every 100 gals of make-up water.

Control of Bacteria and Fungi in Dispersed Pigments

VigorOx® 15/23 Antimicrobial Agent can be used to control bacteria and fungi in the manufacture and storage of dispersed pigments used in paint and paper production such as kaolin clay, titanium dioxide, calcium carbonate, calcium sulfate, barium sulfate, magnesium silicate and kieselguhr.

Apply 0.2 to 1.2 lb (2.6 to 16 fluid ounces) of VigorOx® 15/23 Antimicrobial Agent solution to each 1,000 lb (454 Kg) of fluid. This will provide 200 to 1200 ppm of product (30 to 180 ppm of peroxyacetic acid and 46 to 275 ppm of hydrogen peroxide).

For Treatment of Sewage and Wastewater Effluents in Treatment Plants

Use VigorOx® 15/23 Antimicrobial Agent to treat sewage and wastewater effluent related to public and private treatment plants. VigorOx® 15/23 Antimicrobial Agent may be used to reduce algae growth* in wastewater and sewage treatment effluent water and related processing equipment, including on filters and equipment walls. Apply VigorOx® 15/23 Antimicrobial Agent directly to the effluent or with an appropriate activator such as hydrogen peroxide or other technology. Apply VigorOx® 15/23 Antimicrobial Agent to effluent water discharged from primary, secondary or tertiary treatments; or to effluent water discharged from trickle bed or percolating fluidized bed filters. The application rate for individual facilities will depend on the degree of bioloading of the effluent stream to be discharged and the local microbial discharge limit and the Dilution Factor (DF) for the receiving stream. Adjust application rate to meet the need of the individual facility. (*Not for Use in CA)

1. Add VigorOx® 15/23 Antimicrobial Agent to effluent water at a concentration of 0.5 to 45 ppm peroxyacetic acid.
2. Use an appropriate peroxyacetic acid test kit analyzer to ensure that the maximum amount of peroxyacetic acid that can be discharged (1 ppm) is not exceeded unless otherwise specified below in paragraph 3. Contact your Evonik Active Oxygens, LLC representative for assistance establishing treatment regimes.
3. THE FOLLOWING DISCHARGE INSTRUCTIONS DO NOT APPLY TO CALIFORNIA - The maximum amount of peroxyacetic acid that can be discharged is:
 - i. 0.09 * DF, when DF ≥ 12 and
$$DF = \frac{\text{plant effluent discharge} + \text{receiving stream 7Q10}}{\text{plant effluent discharge}}$$
where 7Q10 is the minimum average 7-day flow expected to occur once every 10 years for the receiving stream; or
 - ii. 1 ppm if the 7Q10 is unknown or DF < 12

Batch Treatment of Non-Public Health Pathogens in Ultra-Filtration and Reverse Osmosis (RO) Membranes

VigorOx® 15/23 Antimicrobial Agent is for use in the treatment of ultra filtration, medical and non-medical institutional/industrial reverse osmosis (RO) membranes and their associated distribution systems. This product is not for use in kidney dialysis reprocessing equipment.

This product has been shown to be an effective treatment when tested. This product may not totally eliminate all vegetative microorganisms in reverse osmosis membranes and their associated piping systems due to their construction and/or assembly, but can be relied upon to reduce the number of microorganisms to acceptable levels when used as directed. Check with equipment manufacturer for membrane compatibility with VigorOx® 15/23 Antimicrobial Agent.

1. Remove biological or organic fouling from the membrane or other parts of the system with an appropriate cleaner.
2. Flush the system with RO permeate or similar quality water.
3. Remove mineral deposits with an acidic cleaner prior to treating the membranes.
4. Flush the system with RO permeate or similar quality water.
5. Prepare an appropriate volume of 1% solution of the product (6.4 fl. oz. per 5 gallons of water). This will provide 1745 ppm of peroxyacetic acid and 2676 ppm hydrogen peroxide.
6. Fill the entire water circuit to be sanitized with the dilute solution and allow the solution to reach a minimum of 20°C (69°F).

- Recirculate the dilute solution of VigorOx® 15/23 Antimicrobial Agent for a minimum of 10 minutes.
- Allow membrane elements to soak in the solution for a minimum of 20 minutes.
- Rinse the RO system and test for residuals to ensure that there is less than 3 ppm peroxygen. Residuals can be reduced by diverting product water to drain.

Batch Treatment of Piping Systems Associated with RO Membranes

- Isolate incompatible equipment from piping system. This includes activated carbon filters and ion exchange equipment. Turn off power to ultraviolet light units.
- Estimate total volume of water contained in the system (tanks, rinse stations and piping). Prepare an appropriate volume of 1.0 to 1.5% VigorOx® 15/23 Antimicrobial Agent solution by adding 1.0 to 1.5 gallons of the product for every 100 gallons of solution prepared. Use RO permeate or similar quality water for dilution. This will provide 1745-2618 ppm peroxyacetic acid and 2676-4014 ppm hydrogen peroxide.
- Recirculate the dilute VigorOx® 15/23 Antimicrobial Agent solution through the system for a minimum of 4 hours. Process usage valves should be opened and closed to expose internals to the VigorOx® 15/23 Antimicrobial Agent solution.
- Completely drain the system of dilute VigorOx® 15/23 Antimicrobial Agent solution. Thoroughly rinse the system by filling with RO permeate or similar quality water and recirculate before drainage. Repeat the process until test for residuals indicates there is less than 3 ppm peroxygen.

Agricultural and Horticultural Uses

A Restricted-Entry-Interval of zero (0) hours is required for VigorOx® 15/23 Antimicrobial Agent in agricultural or horticultural uses. This product should not be mixed or combined with any pesticides or fertilizers. Upon soil contact, the diluted product decomposes rapidly to oxygen, carbon dioxide and water. This product may be harmful to fish if exposed on a continuous basis at concentrations greater than 1 ppm of active peracetic acid. Meter VigorOx® 15/23 Antimicrobial Agent into pressurized pipes using a plastic or stainless-steel injection/backflow device installed upstream from the equipment to ensure thorough mixing prior to application. For open bodies of water, allow adequate mixing prior to product flow entering any body of water. If open pouring of this product is required, pour product close to the surface of the water as possible to reduce odor and exposure.

Treatment of Agricultural and Irrigation Water Systems

Use VigorOx® 15/23 Antimicrobial Agent to control sulfides, odor, slime, and algae in sand filters, humidification systems, storage tanks, ponds, reservoirs, canals. Apply VigorOx® 15/23 Antimicrobial Agent at 15 to 75 fluid ounces per 10,000 gallons of water. This provides 2 ppm to 10 ppm peroxyacetic acid. Repeat dose as necessary to maintain control. For prevention of algae, some systems may require continuous low level dosing during warm, sunny periods (2 ppm to 5 ppm peroxyacetic acid).

Drip Irrigation Systems

Use VigorOx® 15/23 Antimicrobial Agent to clean slime and algae from drip system filters, tapes and emitters, meter VigorOx® 15/23 Antimicrobial Agent at 7.5 to 15 fluid ounces per 1,000 gallons. This provides 10 ppm to 20 ppm peroxyacetic acid. Use this product at the recommended dose for a minimum of 30 minutes during normal irrigation cycles. After irrigation cycle, discontinue use, and do not flush the lines.

Greenhouses

Use VigorOx® 15/23 Antimicrobial Agent to suppress/control algae and slime formations in and around greenhouses. For normal use in various process, irrigation or sprinkler water systems, VigorOx® 15/23 Antimicrobial Agent may be used at 1:40,000 to 1:5,000 dilutions, providing 4 ppm to 33 ppm of peroxyacetic acid. Heavily fouled systems, such as evaporative coolers or irrigation/drip lines may need shock doses of up to 100 ppm as peroxyacetic acid (1:1,600 dilution).

Continuous/Intermittent Addition to Minimize the Accumulation of Biological Matter Between Intermittent Treatment of Non-Public Health Pathogens Episodes in Piping Systems Associated with RO Membranes.

- Add VigorOx® 15/23 Antimicrobial Agent, as received or diluted, continuously to the feed water stream between system treatment episodes, to aid in minimizing the regrowth/accumulation of biological matter. The peroxygen residual in the system that is effective will vary with the design and usage characteristics of the system. Adjust the addition rate of VigorOx® 15/23 Antimicrobial Agent or the solution and periodically monitor residual peroxygen so that the desired effect is obtained.
- For continuous addition do not exceed 20 ppm VigorOx® 15/23 Antimicrobial Agent (0.1 fl. oz. per 40 gallons of water). This will give 3.4 ppm peroxyacetic acid and 5.2 ppm hydrogen peroxide.
- For intermittent feed do not exceed 2000 ppm VigorOx® 15/23 Antimicrobial Agent (10 fl. oz. per 40 gallons of water). This will give 341 ppm peroxyacetic acid and 523 ppm hydrogen peroxide.

For antimicrobial use with aqueous treatment fluids in subterranean oilfield and gas-field well operations such as well drilling, formation fracturing, productivity enhancement and secondary recovery.

Use VigorOx® 15/23 Antimicrobial Agent to control of slime forming and spoilage bacteria, yeast and fungi and anaerobic sulfate reducing bacteria, *Desulfovibrio vulgaris*, that lead to reservoir souring and metal corrosion.

This product must be introduced through a closed mixed/loading and delivery transfer system equipped with a metering device that is appropriate for its intended uses.

Drilling Muds, Fracturing Fluids, Well Squeezed Fluids

For the preservation of drilling muds, workover and completion fluids and other product susceptible to contamination, pre-mix with the fluid or add directly at the point of use at 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) as required. Depending on the severity of the contamination, initial application can be added up to 755 fluid ounces per 1000 gallons of water (1029.4 ppm of Peroxyacetic acid and 1578.4 ppm of Hydrogen Peroxide).

Flooding, Injection and Produced Water

For Water Flooding operations, add initially at 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) and repeat until control is achieved. Subsequent treatment can be continued on a weekly basis or as required.

Injection wells associated with gas storage systems can be treated up to 102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide when diluted in the formation water. Any additional top-up water should be treated as required.

For hydrostatic systems, apply 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) depending on the water quality and the duration of the shut-in.

Pipeline and Tank Maintenance

For microbial control in water-bottoms in crude and refined hydrocarbon storage tanks, piping and transportation systems: Apply 3.75 fluid ounces per 1000 gallons of water (5.1 ppm of Peroxyacetic acid and 7.8 ppm of Hydrogen Peroxide) to 75.5 fluid ounces per 1000 gallons of water (102.9 ppm of Peroxyacetic Acid and 157.8 ppm of Hydrogen Peroxide) in the aqueous phase, directly injected into the water-bottom, pipeline or may be added to the hydrocarbon phase. Apply treatment daily or monthly for both storage and transportation systems as needed.

Note: May cause bleaching of treated surfaces

Note: Before using VigorOx® 15/23 Antimicrobial Agent to sanitize metal surfaces, test the diluted solution on a small area to determine compatibility.

In all applications always prepare a new solution daily to ensure effectiveness. Do not re-use solutions. Dispose of unused solution.

STORAGE AND DISPOSAL

STORAGE: NEVER RETURN VigorOx® 15/23 Antimicrobial Agent TO THE ORIGINAL CONTAINER AFTER IT HAS BEEN REMOVED.

Avoid all contaminants, especially dirt, caustic, reducing agents, and metals. Contamination and impurities will reduce shelf life and can induce decomposition. In case of decomposition, isolate container, douse container with cool water and dilute with large volumes of water.

Avoid damage to containers. Keep container closed at all times when not in use. Keep container out of direct sunlight. To maintain product quality, store at temperatures below 86°F. At temperatures exceeding 156°F, decomposition occurs releasing oxygen. The oxygen released could initiate or promote combustion of other materials. Do not store on wooden pallets.

Procedure for Leak or Spill

Stop leak if this can be done without risk. Shut off ignition sources; no flames, smoking, flares, or spark producing tools. Keep combustible and organic materials away. Flush spilled material with large quantities of water. Undiluted material should not enter confined spaces.

DISPOSAL

Pesticide Disposal: If material has been spilled, an acceptable method of disposal is to dilute with at least 20 volumes of water followed by discharge into suitable treatment system in accordance with all local, state, and Federal environmental laws, rules, regulations, standards, and other requirements. Because acceptable methods of disposal may vary by location, regulatory agencies should be contacted prior to disposal.

VigorOx® 15/23 Antimicrobial Agent which is to be discarded should be disposed of as hazardous waste after contacting the appropriate local, state, or Federal agency to determine proper procedures.

Container Handling

Nonrefillable containers less than 5 gallons. Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Nonrefillable containers greater than or equal to 5 gallons. Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Empty drums are not returnable to Evonik Active Oxygens, LLC unless special arrangements have been made. Dispose of drums in accordance with local, state, and Federal regulations.

All Refillable containers. Refillable container. Refill this container with this pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Return to Evonik Active Oxygens, LLC for reuse.

A note to the reader: the NSF Logo may only be used on the VigorOx® WWT II product label.

[VigorOx® WWT II is an [National Sanitation Foundation] [NSF] listed product.]



Orthodox Kosher Certified



(Optional Background Images)



4879-0086-2998, v. 2



Envetec 200 Series Operator & Maintenance Manual



One day all waste will be treated this way

www.envetec.com



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1. OVERVIEW

1.1. About The Product

The Envetec 200 Series offers a holistic, self-contained configuration with system mechanisms for thorough treatment, comprehensive mechanical destruction, and major volume reduction of potentially infectious medical waste. The Envetec 200 Series has been specifically designed to ease the burden and to streamline handling and treatment of potentially biohazardous medical waste, whilst simultaneously reducing the costs associated with its removal and destruction. Upon completion of a treatment cycle, the resulting shredded and treated waste is ready for disposal in receptacles intended for treated regulated medical waste (RMW). The Envetec 200 Series efficiently processes regulated medical waste (RMW) on-site at the RMW generator facility, either at the point of generation or at a remote waste treatment centre. This operator & maintenance manual, utilized in conjunction with an appropriate training course, will acquaint and educate personnel in the proper implementation of operational procedures and in activating routine preventative maintenance processes. Qualified and trained technical personnel will address more technical issues that fall outside of the procedures covered in this operator & maintenance manual.





1.2. About This Operator & Maintenance

Goal of Training:

The main goal of the EnveteC 200 Series operator & maintenance manual is to instruct and educate the appropriate staff at the on-site facility on how to become an **effective** operator of this bespoke equipment for treatment, mechanical destruction, and major volume reduction of potentially infectious medical waste. On completion of this manual and in conjunction with appropriate training you will be able to clearly and fully understand:

- **Proper safety protection and procedures.**
- **How to start the unit.**
- **How to operate the unit.**
- **How to shut down the unit**
- **How to add VigorOx 15/23 chemical agent.**
- **How to respond to normal error messages.**

1.3. Safety Warning

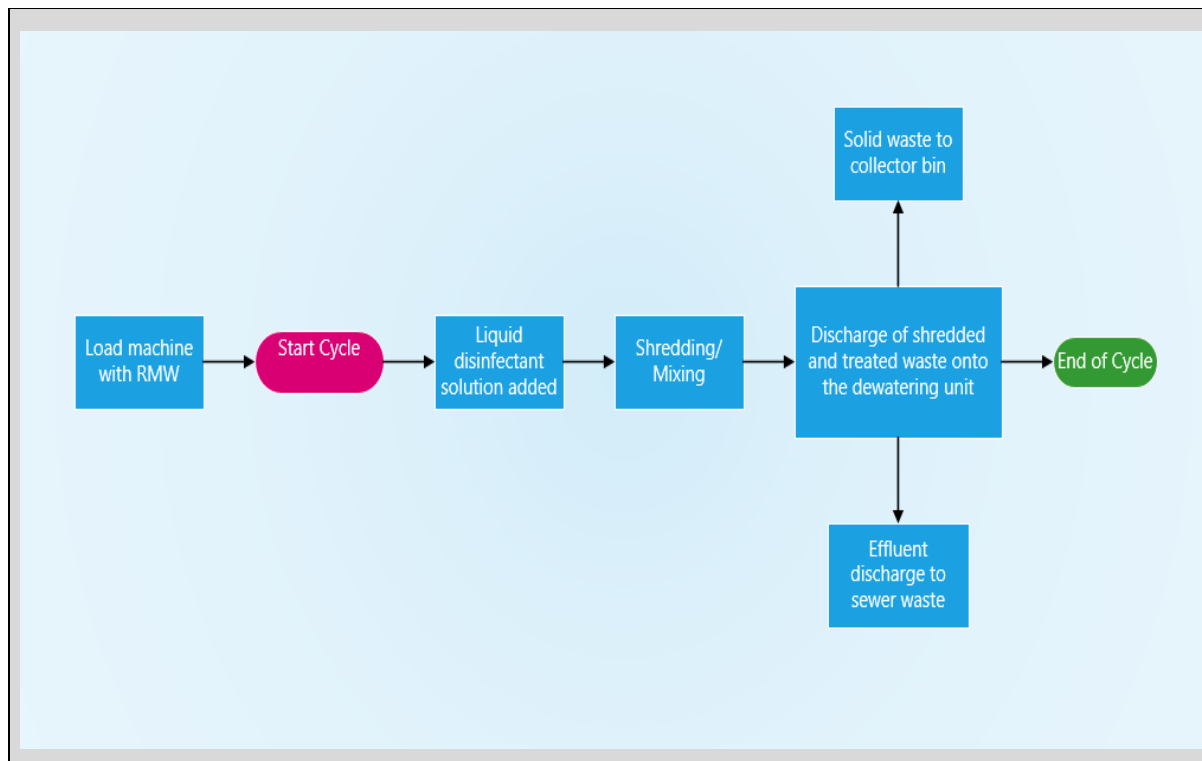
The EnveteC 200 Series is an electromechanically operated device that must only be operated by members of staff that are trained in its use. Improper use or use by individuals who have not been properly trained may lead to the following:

- **Chemicals Burns**
- **Electrical Shock**
- **Crush / Catch Injuries**
- **Biohazard Contamination**

TAKE NOTE OF ALL WARNING AND INFORMATION MESSAGES THROUGHOUT THIS MANUAL

1.4. Theory of Operation

The Envetec 200 Series efficiently treats and reduces in volume regulated medical waste (RMW). Regulated medical waste is comprehensively destroyed through a proprietary mechanical shredding process; hence the waste is rendered sterile and unusable. The thorough treatment, comprehensive mechanical destruction, and volume reduction of regulated medical waste is completed in a seven step process as detailed in **Section 1.5**.



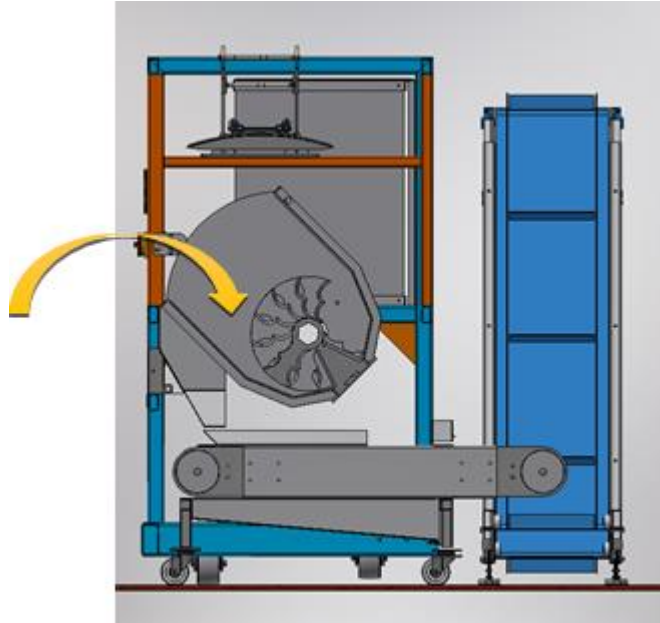
The chemical agent, VigorOx 15/23, simultaneously treats regulated medical waste as the shredding and mixing process is occurring. The mixing phase ensures thorough treatment of all surface areas through comprehensive mixing of VigorOx 15/23 with the shredded medical waste material, and is completed after a validated twelve minute dwell time. A standard cycle time is circa twenty minutes.

Operators must refer to the most recent label for VigoxOx 15/23 Antomicrobial Agent.

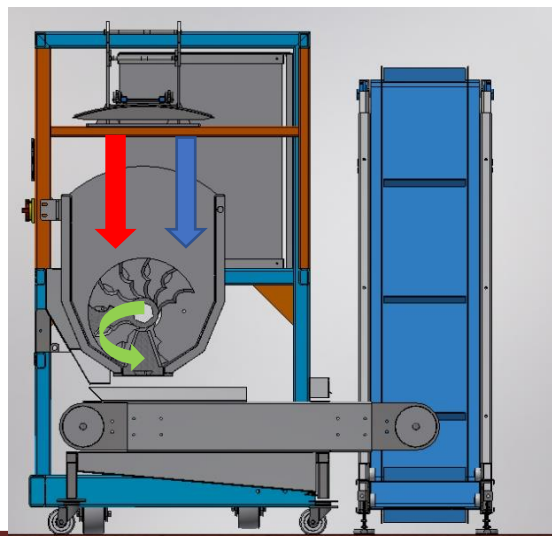
1.5. Seven Stages of the EnveteC 200 Series Treatment Process:

1. Loading of the EnveteC 200 Series with regulated medical waste.

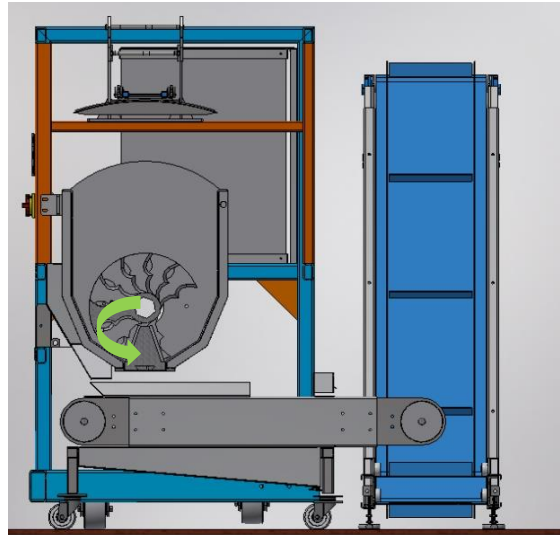
The operator places the untreated waste into the receiver.



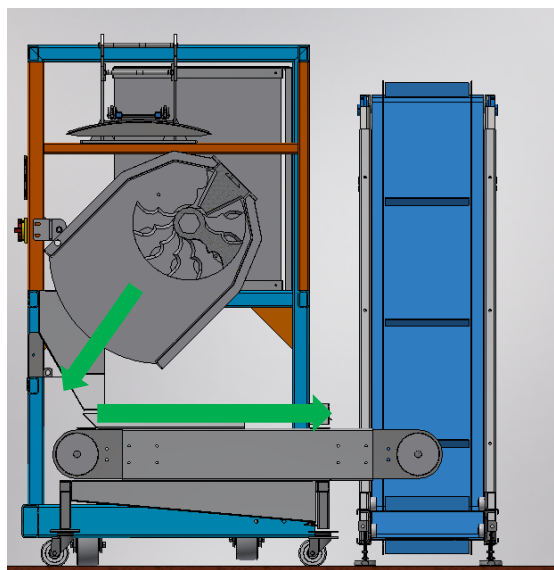
2. Injection of the VigorOx 15/23 Antimicrobial Agent into the processing chamber and subsequent dilution with water during the treatment process. Operators must refer to the most recent label for VigorOx 15/23 Antimicrobial Agent.



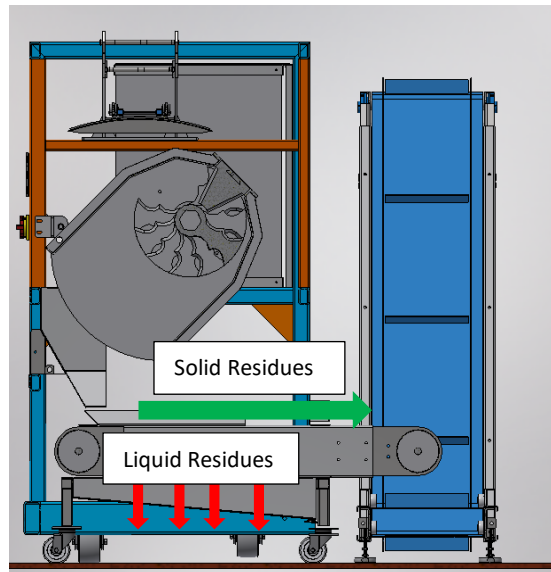
3. Thorough mechanical destruction and mixing of the regulated medical waste via the Envetec 200 Series to comprehensively expose all of the shredded regulated medical waste particles surface area to the VigorOx 15/23 Antimicrobial Agent.



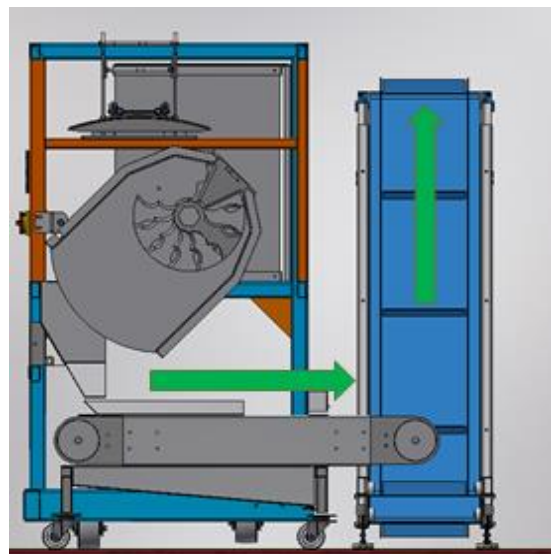
4. Discharging of the treated, shredded solid and liquid waste materials from the main unit into the mechanical dewatering unit.



5. Automatic separation of the solid treated waste particles from the liquid residues.



6. Disposal of the treated, solid shredded materials into regular domestic garbage bags in a designated domestic garbage container.



7. Discharge of the separated, free liquids into a sewer drain connection of the facility.

1.6. Types of Allowable Waste



The Envetec 200 Series processes multiple types of Regulated Medical Waste. The waste receiver can be loaded with untreated Regulated Medical Waste not exceeding 40 gallons or 3 red bags filled to 2/3 of their capacity, with the regulated medical waste material generally not exceeding circa 20% organic matter content. In practice, the work-flow typically involves treating three, 2/3 full red bags or a combination of smaller red bags combined with multiple rigid plastic sharps containers. **It is important to note that best practice for correct functional operation and preservation of the unit is to ensure a diverse mix of regulated waste medical materials combined with not overloading the Envetec 200 Series.**



The Envetec 200 Series treats a wide range of infectious medical waste with the capacity to treat up to 40 gallons or 3 red bags filled to 2/3 of their capacity

of regulated medical waste per cycle. The list of treatable waste medical types includes, but is not limited to the following:

- ❖ Syringes
- ❖ Plastic tubes of different diameters
- ❖ Polyethylene bags
- ❖ Glass blood tubes/sample containers
- ❖ Latex gloves
- ❖ Non-woven cloth
- ❖ Suction canisters
- ❖ Needles
- ❖ Small metal parts (i.e. scalpel blades)
- ❖ Test tubes and bottles
- ❖ Wooden spatulas
- ❖ Polyethylene containers including sharps containers
- ❖ Blood and blood byproducts

Selected types of waste that are **unsuitable** for treatment include the following:

- ❖ Regular uncontaminated garbage
- ❖ Bottles from dispensed medicines
- ❖ Dialysis sets - blood lines, IV tubes, plastic bags, etc.
- ❖ Any volume of radioactive waste
- ❖ Anatomically recognizable body parts
- ❖ Any amount of chemotherapy classified as Non-RCRA empty (provided that the local waste water regulations allow for trace chemotherapeutic waste to be discharged to the drain).
- ❖ Sterile packaging

Bio-Medical Waste Segregation Chart

Category	Type of Waste
<p>YELLOW</p> 	<ul style="list-style-type: none"> • Post Operative Body Parts • Placenta • Plaster of Paris (POP) • Pathological Waste • Cotton Waste • Dressing Materials • Beddings • Body Fluid Contaminated Paper and Cloth • Face Mask, Cap • Cytotoxic, Expired & Discarded Medicines • Microbiology, Biotechnology Lab Waste
<p>RED</p> 	<ul style="list-style-type: none"> • Syringe with out needles • I.V. Set • Catheters • Gloves • Urine Bag • Dialysis Kit • IV Bottles
<p>WHITE (Translucent)</p> 	<ul style="list-style-type: none"> • Needles • Syringes with fixed needles • Blades • Scalpels <p><small>* Use 1% Hypo Chloride Solution for disinfecting Glass & Metal Sharps</small></p>
<p>BLUE</p> 	<ul style="list-style-type: none"> • Glass <ul style="list-style-type: none"> - Broken Glass - Ampoules - Lab Slides • Metals <ul style="list-style-type: none"> - Nails - Metallic Body Implants - Scissors <p><small>* Use 1% Hypo Chloride Solution for disinfecting Glass & Metal Sharps</small></p>

1.7. Recommended Load Amounts

- 40 gallons or 3 red bags filled to 2/3 of their capacity



-
- **DO NOT OVERFILL RECEIVER**
 - **DO NOT EXCEED THE MAXIMUM WEIGHTS AND VOLUMES**
-

Typical Loads

- 1 No. Sharps containers + 2 No. red bag mixed loads weighing less than 100lbs (45kg) total.
- 3 No. red bag mixed loads filled to 2/3rd of their capacity
- 1 No. 5 US gallon (25 litre) reusable waste bins
- Multiple smaller sharps containers.

Typical loads will vary depending upon location.

1.8. Processing Of Other Waste Types

1.8.1. Sharps only

When processing sharps containers ensure that the container is placed on top of the pre-shred teeth within the receiver.

1.8.2. Comingled load/RMW waste bags

Comingled loads can be processed. Ensure receiver is not overloaded.



1.9. Unit Diagram

The Envetec 200 Series consists of two distinct subsystems: (1) the destruction and treatment subsystem, and (2) the solids and liquid mechanical separator subsystem. The picture below shows the entire Envetec 200 Series with both subsystems connected.



1.10. Safety Inspection

- Only authorized personnel who have completed the EnveteC 200 Series Operator Training Course and have demonstrated competence in operating the EnveteC 200 Series are permitted to use the unit.
- The operator must be familiar with all areas of the Operator & Maintenance Manual before using the EnveteC 200 Series.
- All operators should refer to the policies set up by their facility for handling chemicals.
- Operators must refer to the most recent label for VigorOx 15/23 Antimicrobial Agent.
- Personal Protective Equipment (PPE) is required when operating the EnveteC 200 Series (see VigorOx 15/23 SDS for specific PPE requirements). Personnel should also follow their facility's policy for appropriate PPE and procedural guidelines already in place concerning the handling of infectious medical waste.
- Keep the machine area clean and dry; remove any moisture or liquids from the floor if present. This will allow for the detection of either water or chemical leaks.
- Leave enough empty space around the machine for access to the machine and easy operator movement.
- Only authorized EnveteC 200 Series technicians are permitted to service the electrical and mechanical parts of the machine.
- Ensure that untreated medical waste is in a separate area of the room from the disinfected, treated waste. This will prevent cross contamination.

1.11. Personal Protective Equipment (PPE)

WARNING: Operators must refer to the most recent label for VigorOx 15/23 Antimicrobial Agent. Furthermore pay proper attention to safety, including wearing the appropriate Personal Protective Equipment (PPE).

Refer to the PPE Placard for more information.





Please review your specific facility guidelines and applicable state regulations to become familiar with the specific guidelines and policies. It is important to maintain personal safety while operating the Envetec 200 Series and in handling medical waste. Personnel handling the infectious medical waste and utilizing the Envetec 200 Series for treatment of waste must follow the standard Personal Protective Equipment (PPE) requirements. The minimal PPE required for use of the Envetec 200 Series is described in this section. Different levels of use of the system require different levels of protection. Below are the recommended PPE as defined by Envetec.

- For filling of the VigorOx 15/23 chemical into the machine, the minimal requirement is to wear a chemical resistant apron, face shield, and nitrile gloves.
- For operation of the Envetec 200 Series, the minimal requirement is latex gloves and safety glasses.
- For handling of the shredded and treated bagged waste please adhere to the following:
 - Collect the waste in puncture resistant containers, with a liner bag sufficient to be carried from its top without tearing.
 - Do not place hands underneath the bag when depositing the bag into the landfill dumpster.
 - Use needle stick resistant gloves with an ISEA rating of at least level 5 and a nitrile over-glove when handling the treated waste.
 - Handle the treated waste by the handle of the puncture resistant waste containers and not by the bag, when depositing the bag into the solid waste dumpster.



DO NOT HANDLE CONTAMINATED MATERIAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI AND BACTERIA.

Your facility may have supplemental requirements to these which should be followed. Please follow your facilities requirements if supplemental personal protection is required other than the minimum requirements stated above.



DO NOT HANDLE CONTAMINATED MATERIAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI AND BACTERIA.

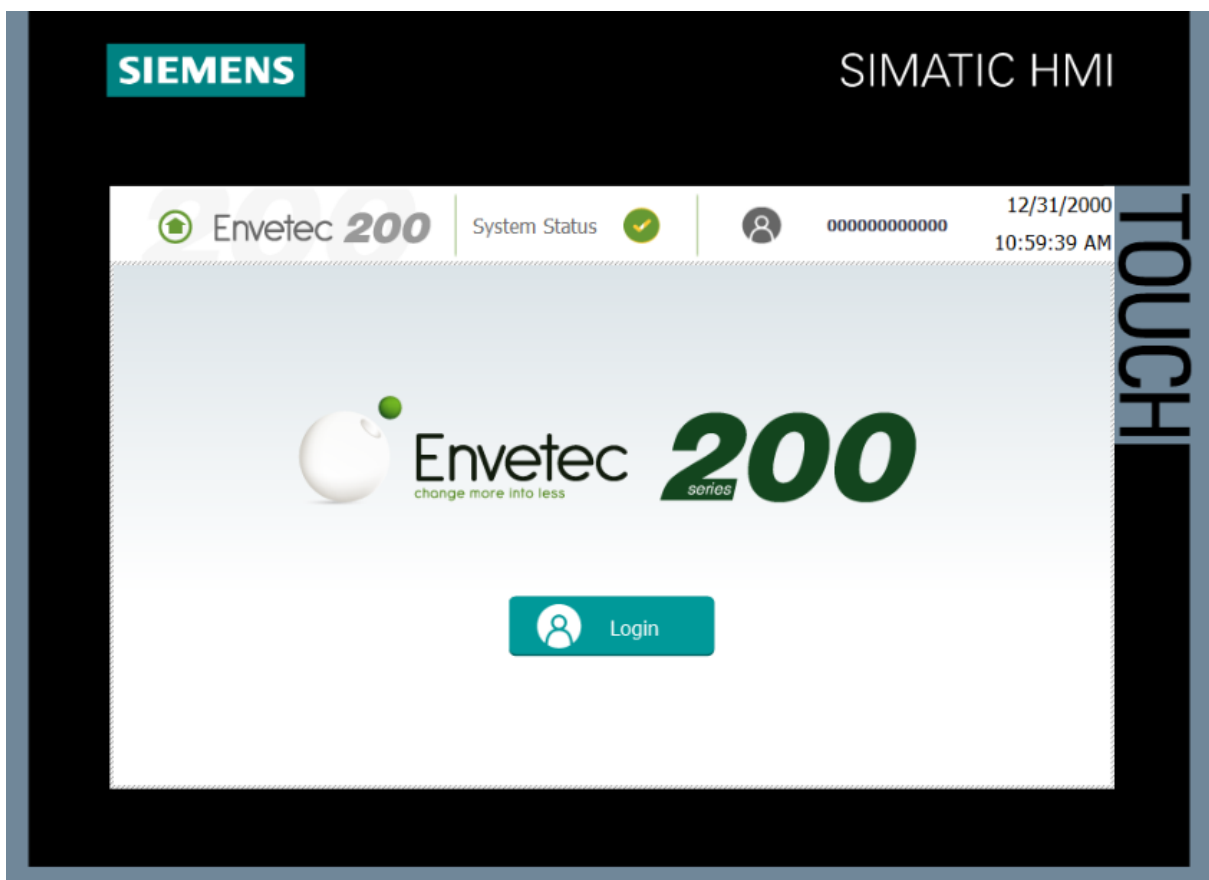


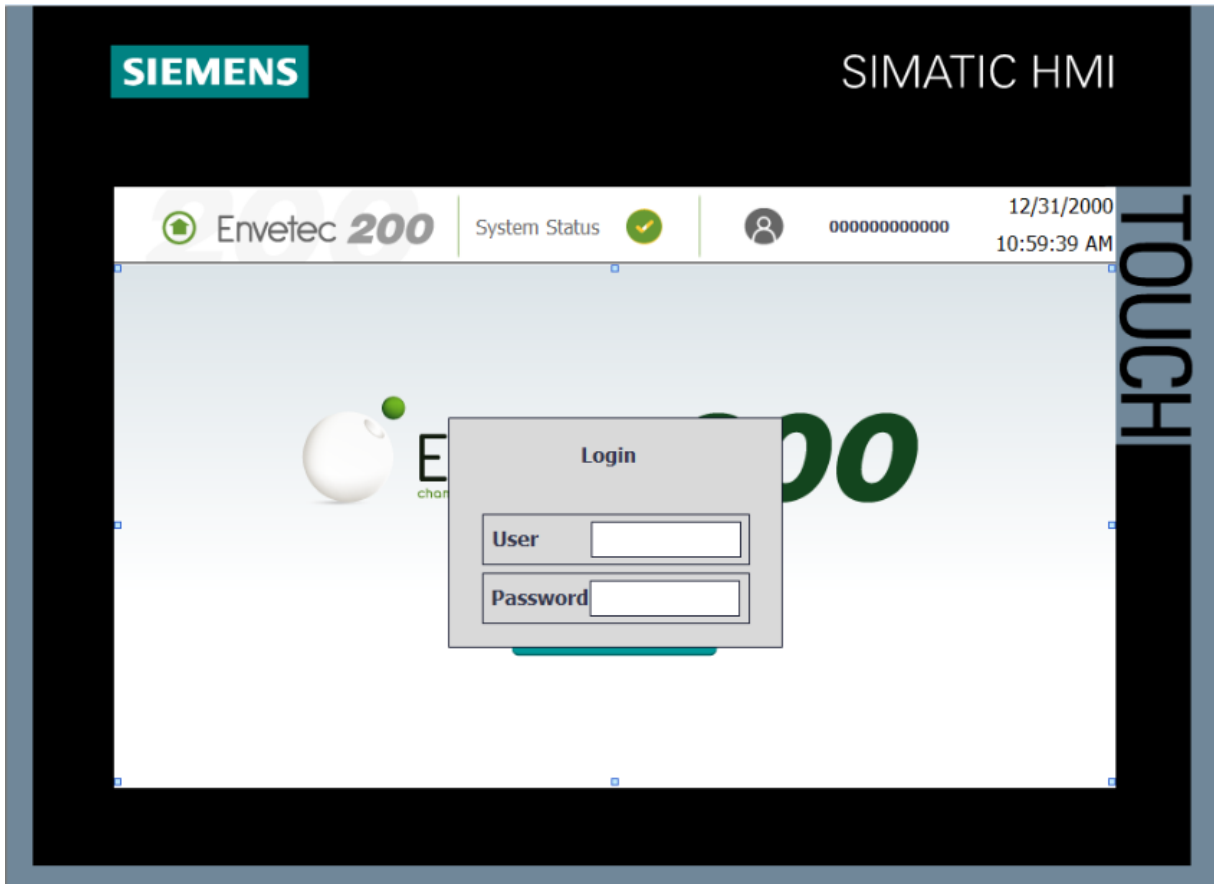
2. OPERATING INSTRUCTIONS

2.1. Understanding the Operator Interface Panel

The Envetec 200 Series has been designed so that the operator can easily load and run the unit. The operator interface screens consist of the following:

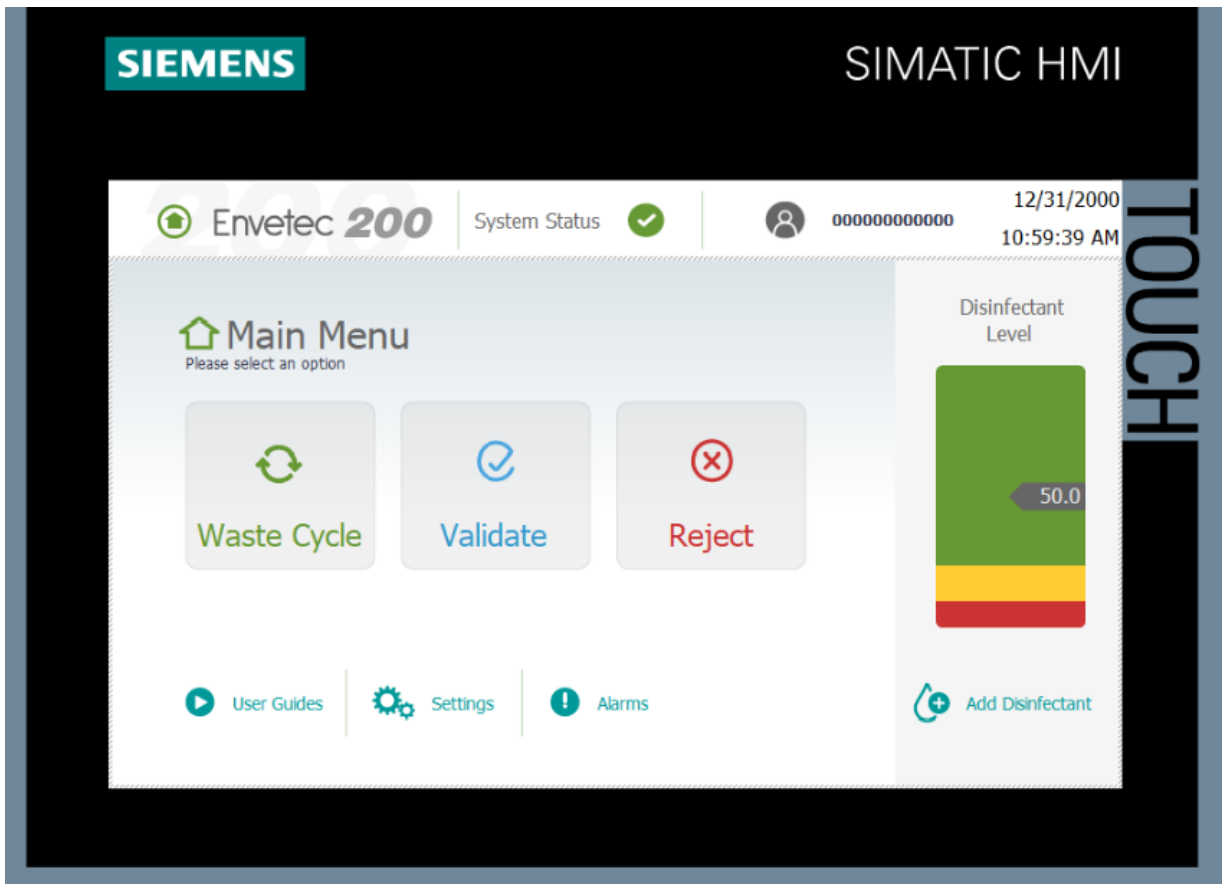
2.1.1. Start Screens



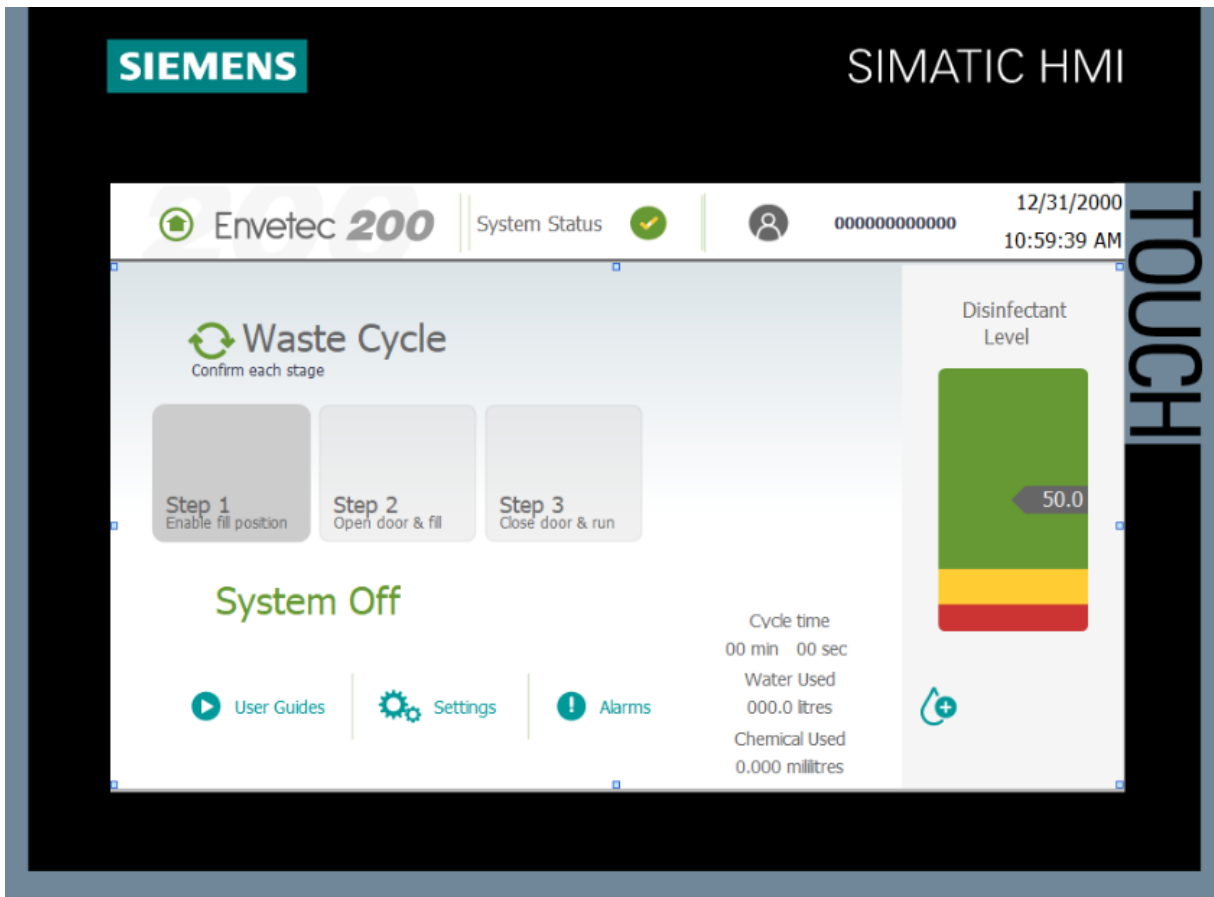




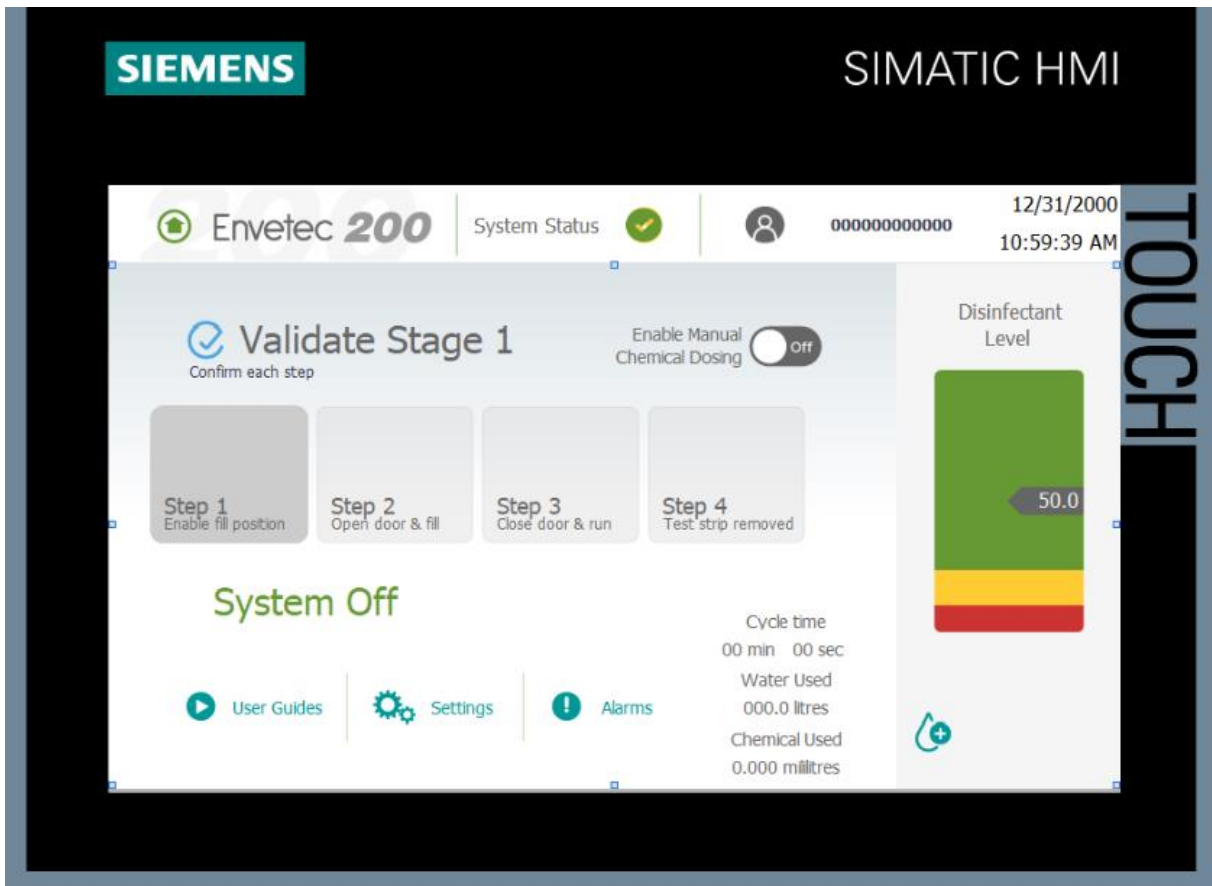
2.1.2. Main Menu Screen



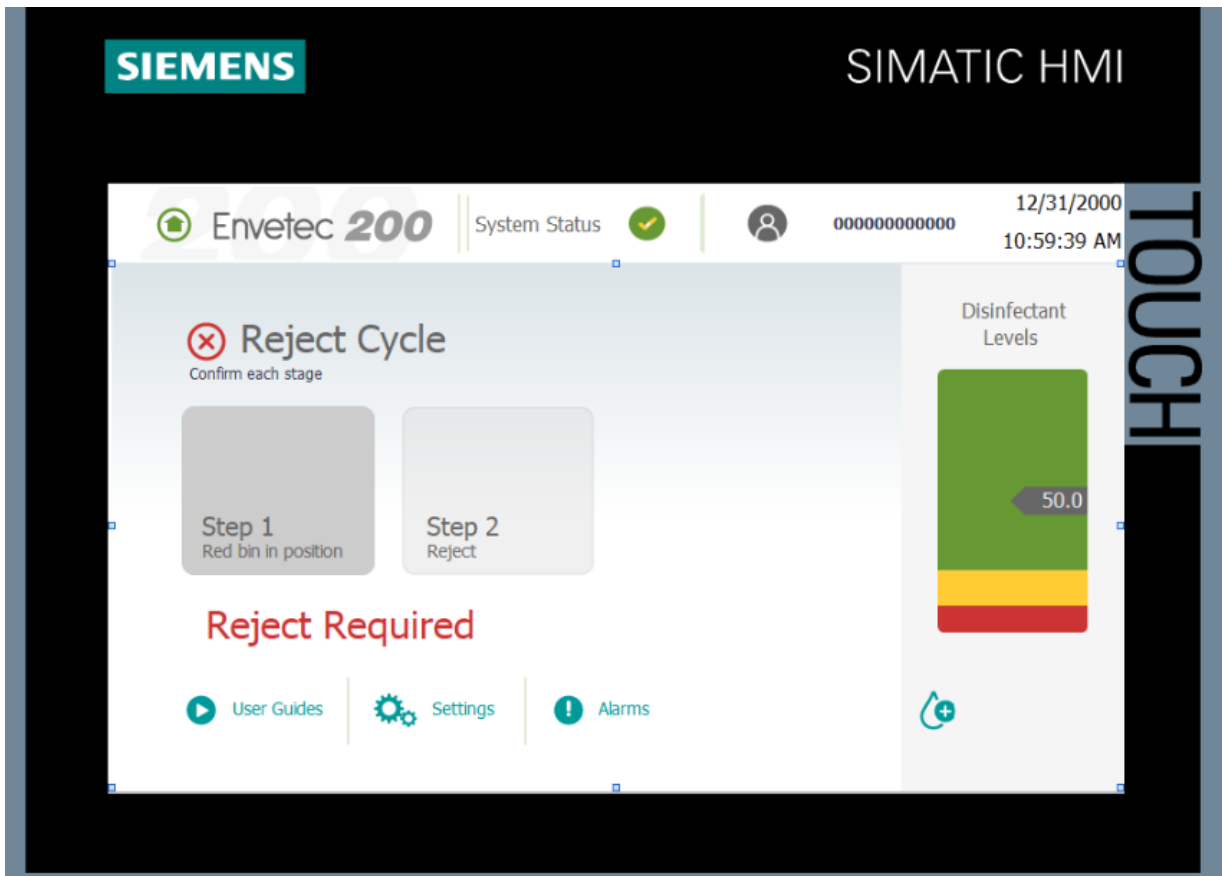
2.1.3. Waste Cycle Screen



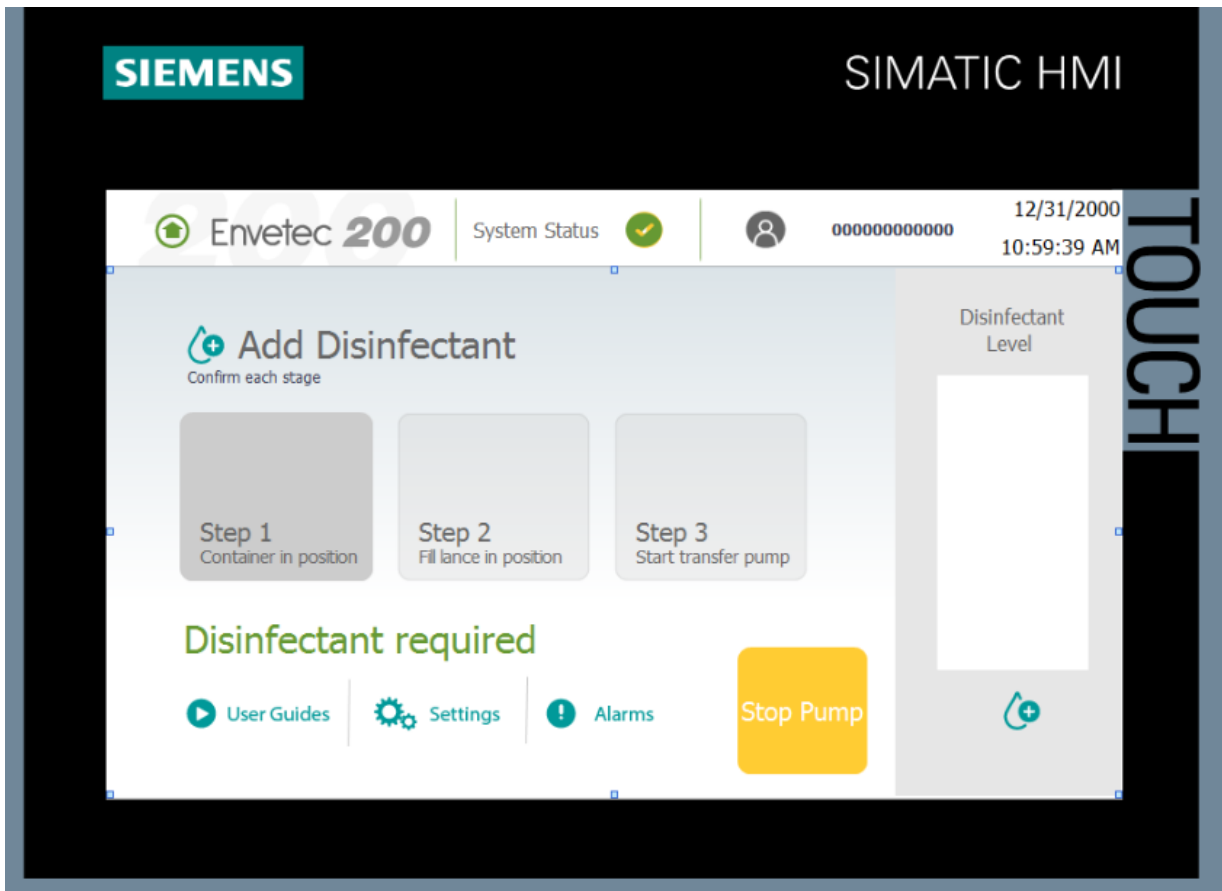
2.1.4. Validation Cycle Screen



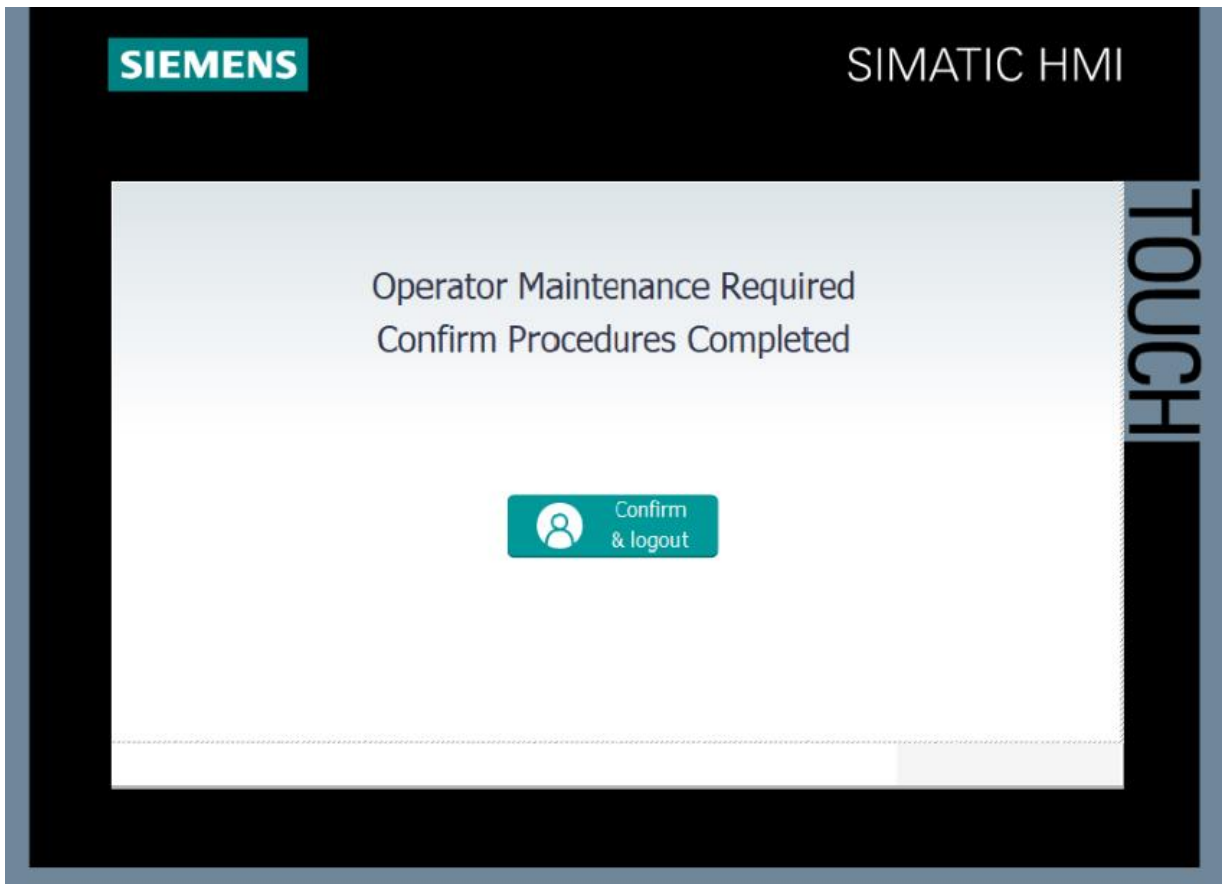
2.1.5. Reject Cycle Screen



2.1.6. Add Disinfectant Screen

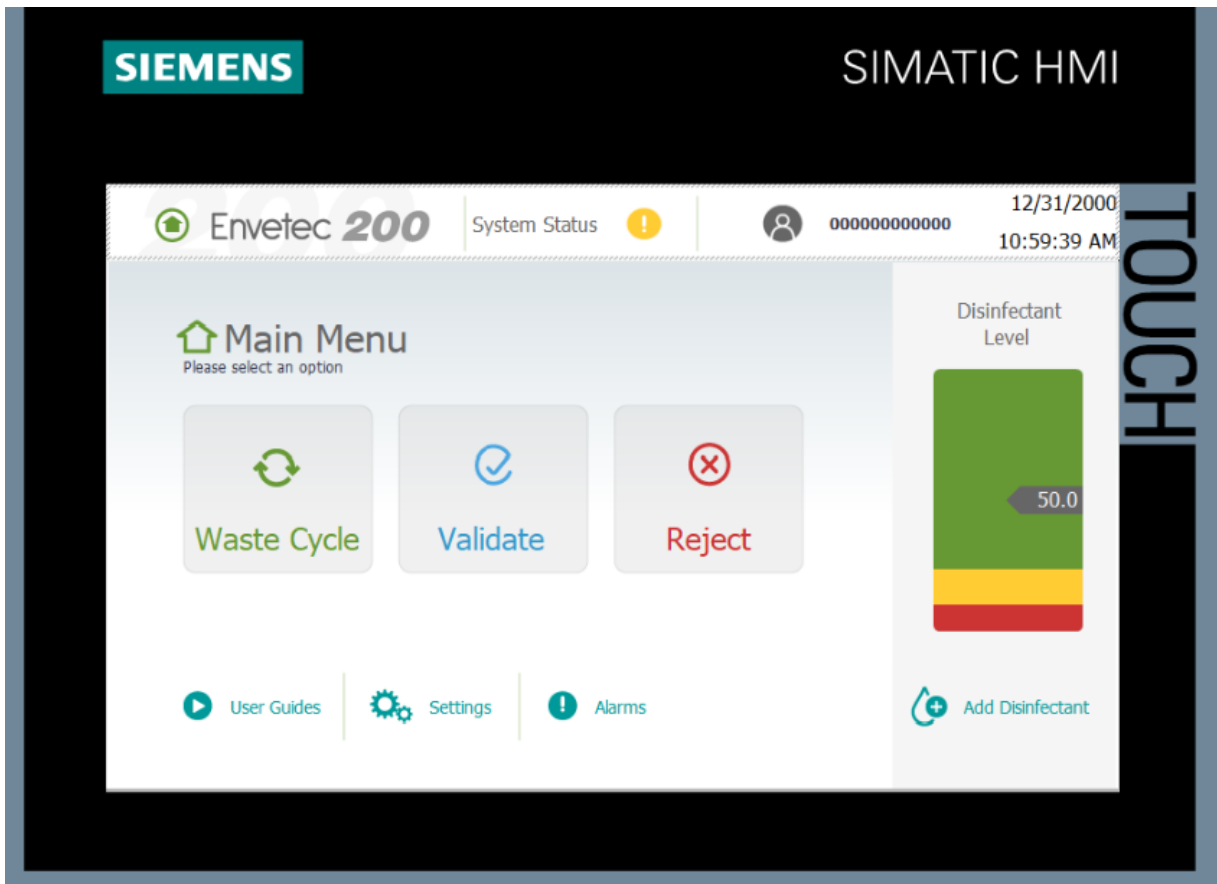


2.1.7. Operator Maintenance Required Screen

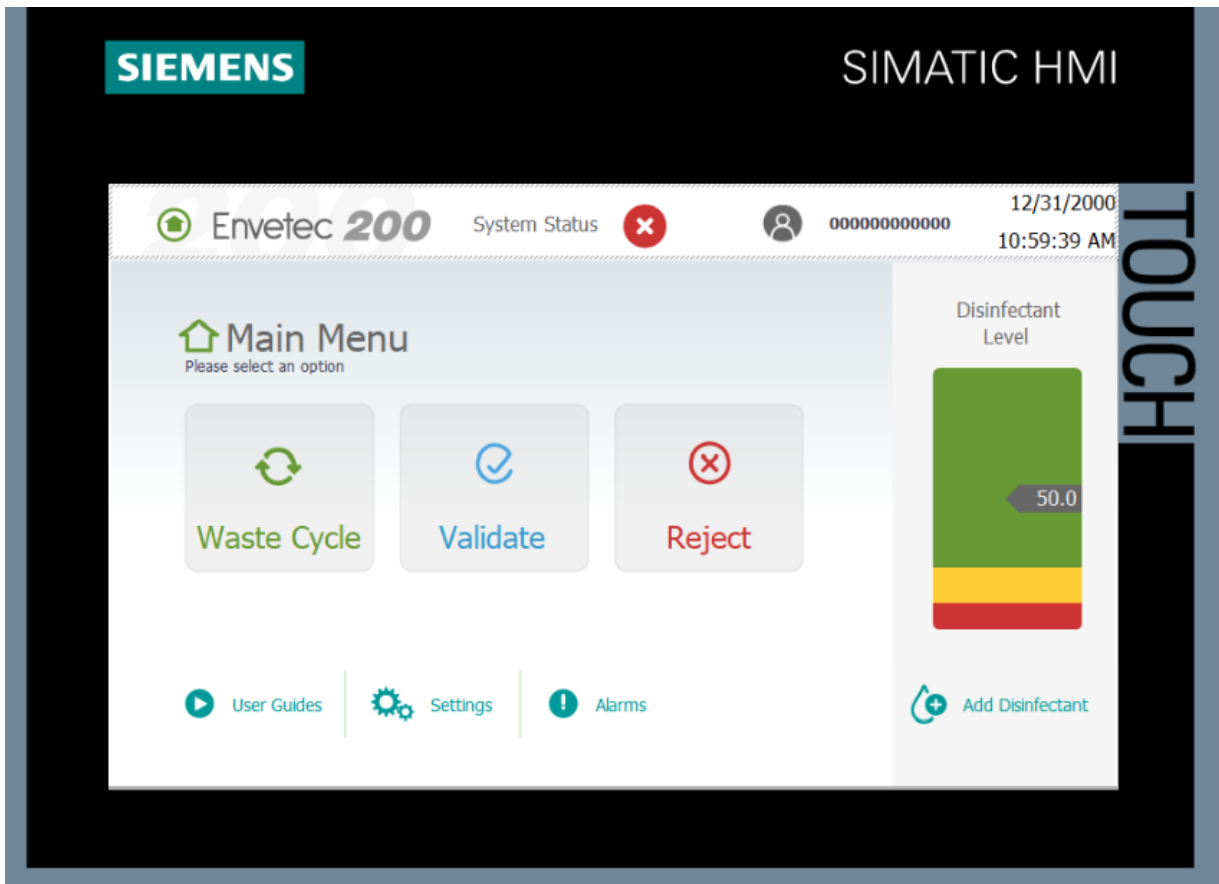




2.1.8. System Status Warning Screen



2.1.9. System Status Alarm Screen



2.2. The Electrical Power Supply Isolation Switch

The installation of Envetec 200 Series will require an electrical power supply isolation switch that provides an electrical feed to the system.



THE SYSTEM REQUIRES A SAFETY BREAKER, WHICH IS RECOMMENDED TO BE TESTED ON A MONTHLY BASIS. OPERATING THE SYSTEM WITH A DEFECTIVE SAFETY BREAKER CAN RESULT IN ELECTRICAL SHOCK HAZARDS. FAILURE TO OBSERVE THIS PRECAUTION CAN RESULT IN SEVERE BODILY INJURY OR LOSS OF LIFE.

2.3. Envetec 200 Series – Start of Day

At the beginning of each operating day, the following steps must be performed:

- Ensure that the waste bin is empty and/or replace the waste bag, if required.
- **Ensure** the water valve is in the **OPEN position**. Check for leaks on the floor around the unit.
- Ensure the pressure gauge is reading at least **60 psi /4 bar.**



Operating the system without adequate water pressure will result in failure of the system to operate efficiently.

- Turn **ON** the mains power at electrical power supply isolation switch.





- The **FAULT / RESET** button will now be illuminated. This button must be pressed to bring the unit online when first powering up.

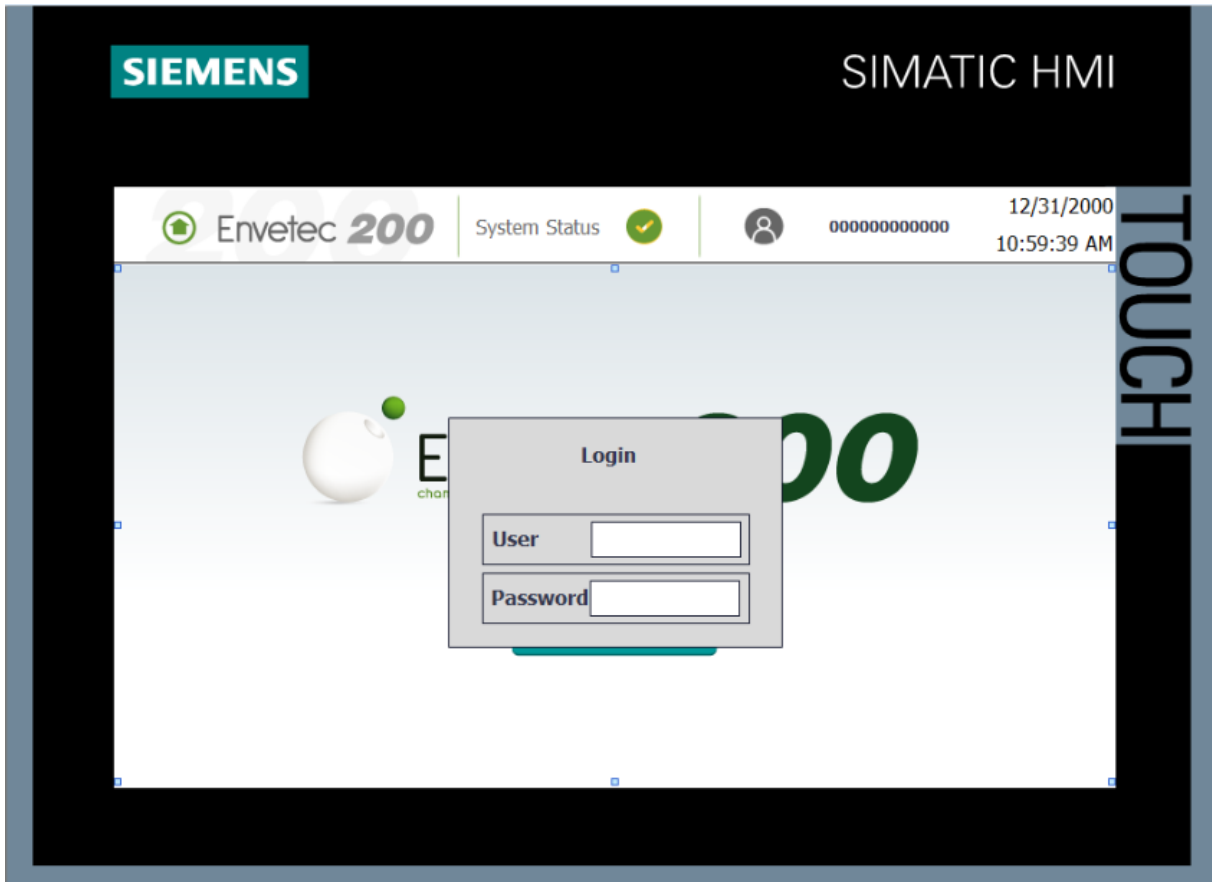


- On power up this screen will be displayed.



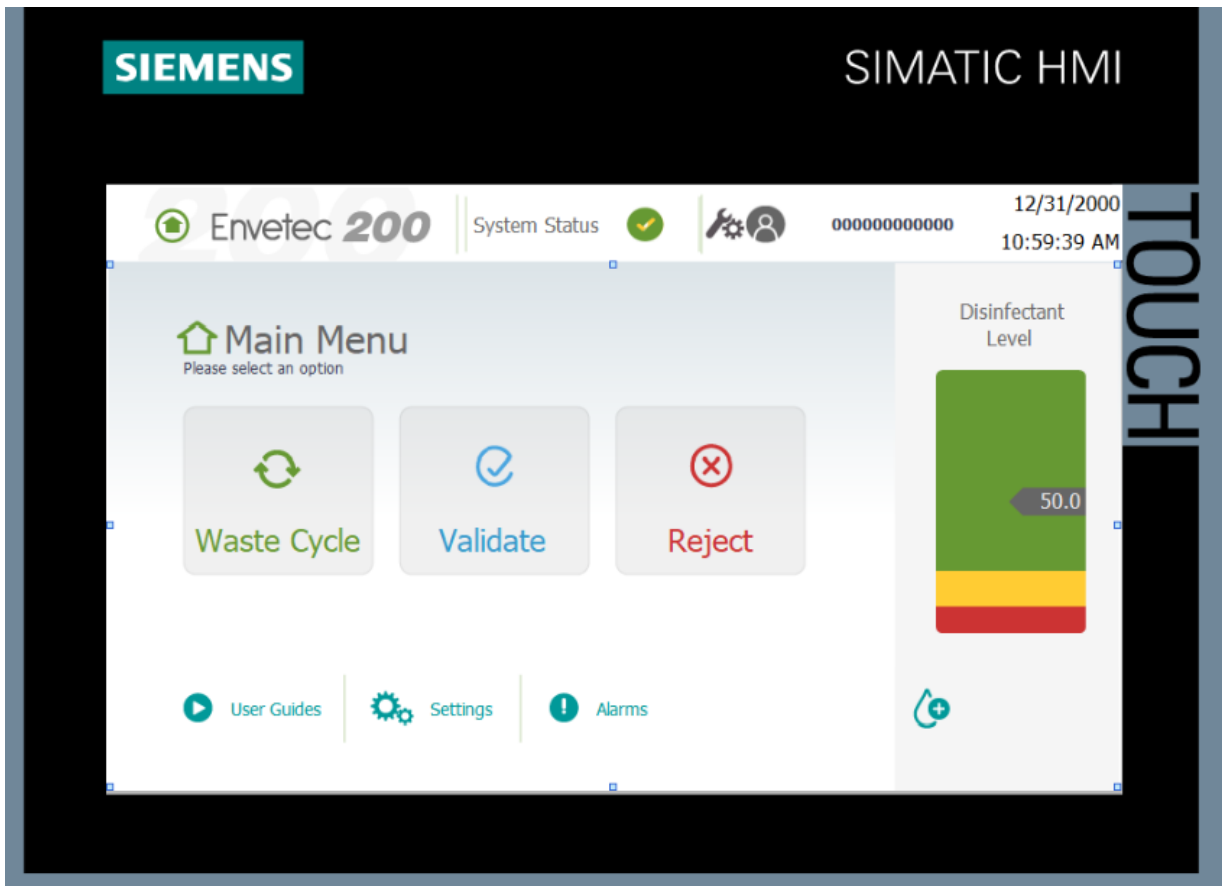


- Once the operator presses “Login”, this screen will be displayed prompting the operator to input their user name and password.





- Once the operator has logged in, the Main Menu screen will be displayed.



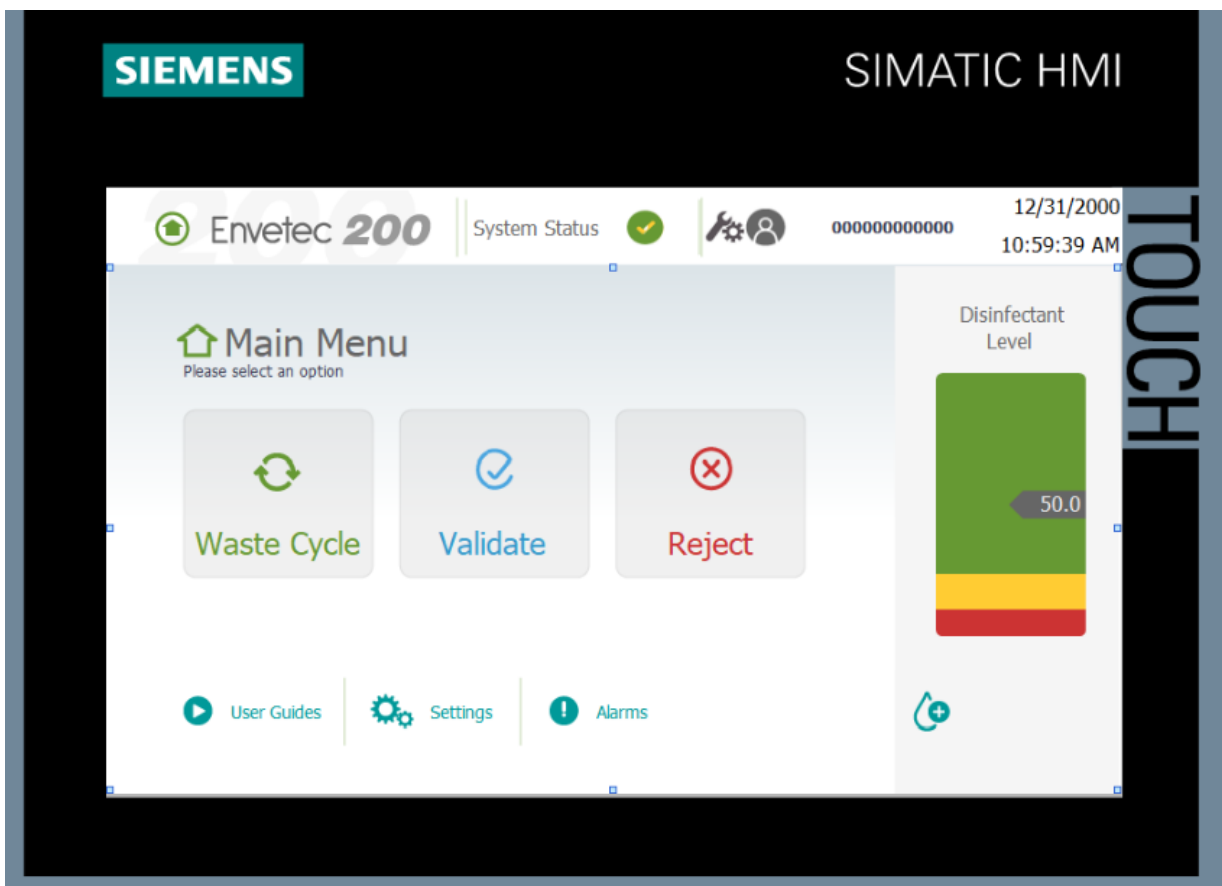
The Envetec 200 Series is now ready for operation.



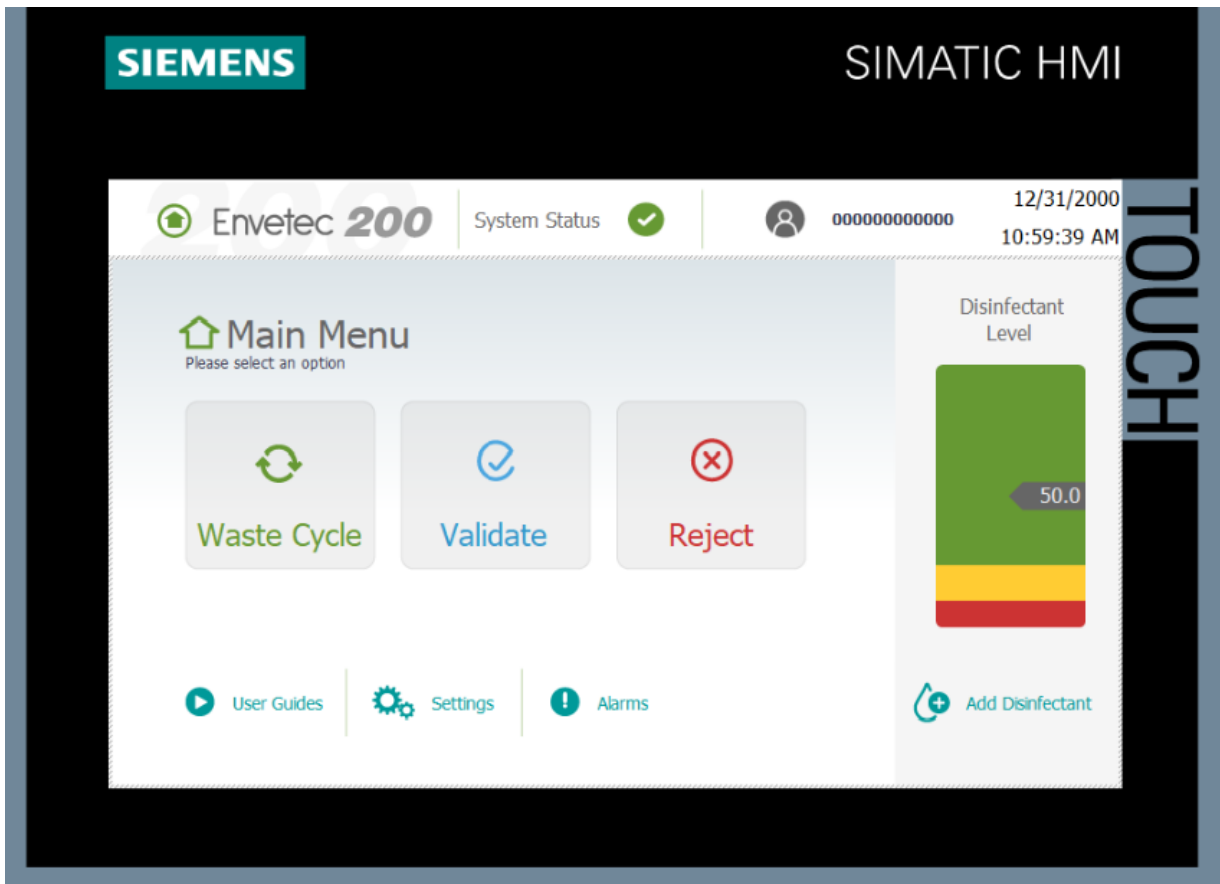
2.4. Understanding the Envetec 200 Series Treatment Cycles

The Envetec 200 Series has been pre-programmed with a number of treatment cycles. Each cycle has been specially designed for a specific purpose as outlined below.

- **Waste Cycle** – This is a pre-programmed cycle for the treatment of Laboratory Regulated Medical Waste streams containing listed items.
- **Validate** - This a pre-programmed cycle for the routine validation and efficacy testing of the Envetec 200 series system.
- **Reject** - This is a pre-programmed cycle for the rejection of the contents of the receiver, as required.

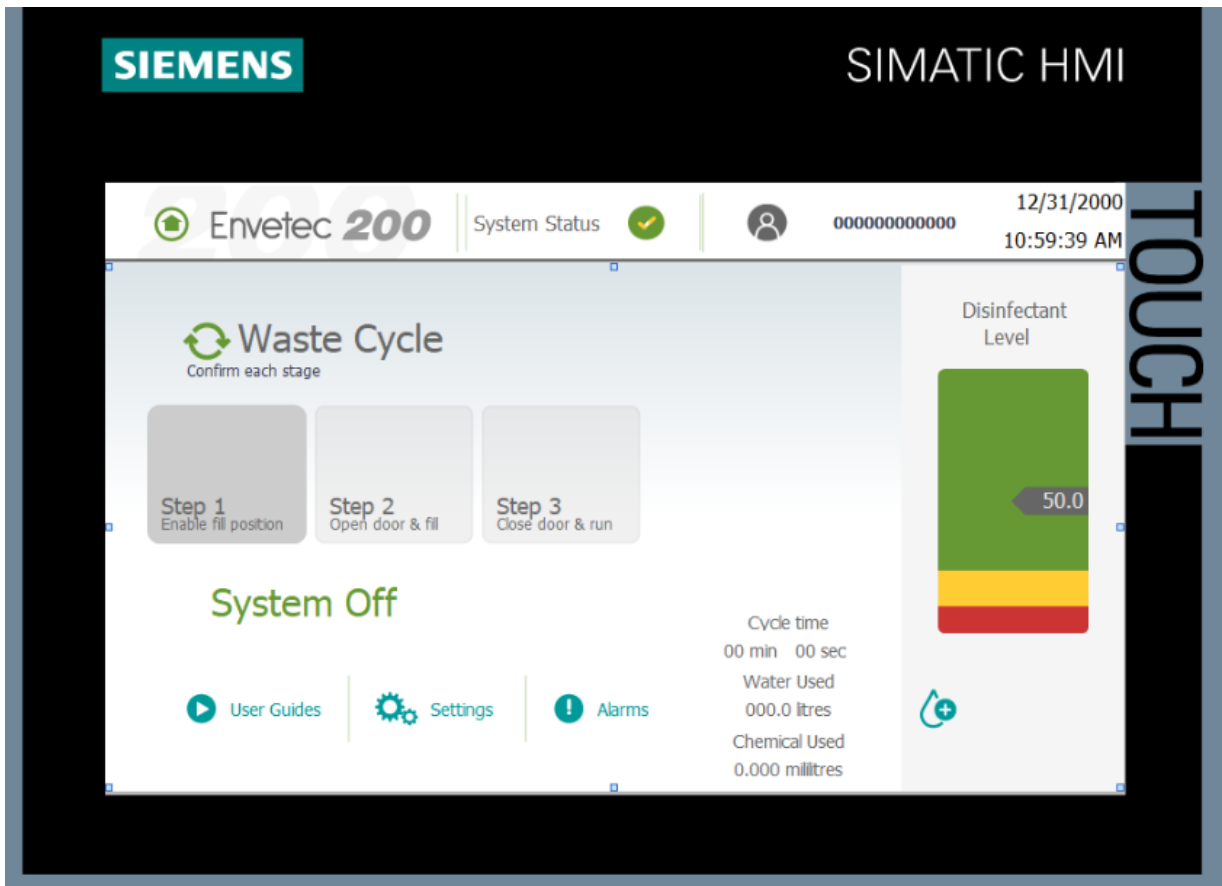


2.5. Loading & Running the Envetic 200 Series Cycles



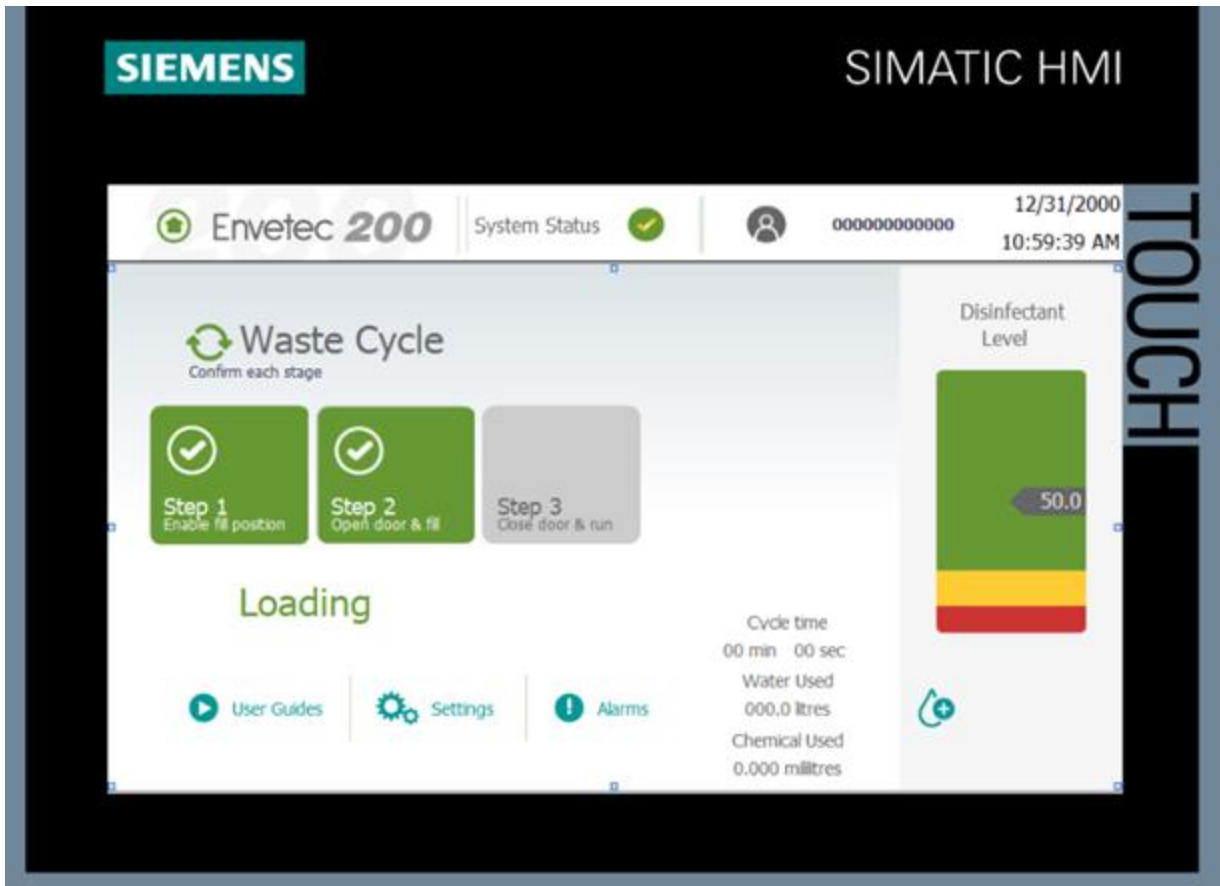
- Select “Waste Cycle” on HMI Screen.

2.5.1. Waste Cycle





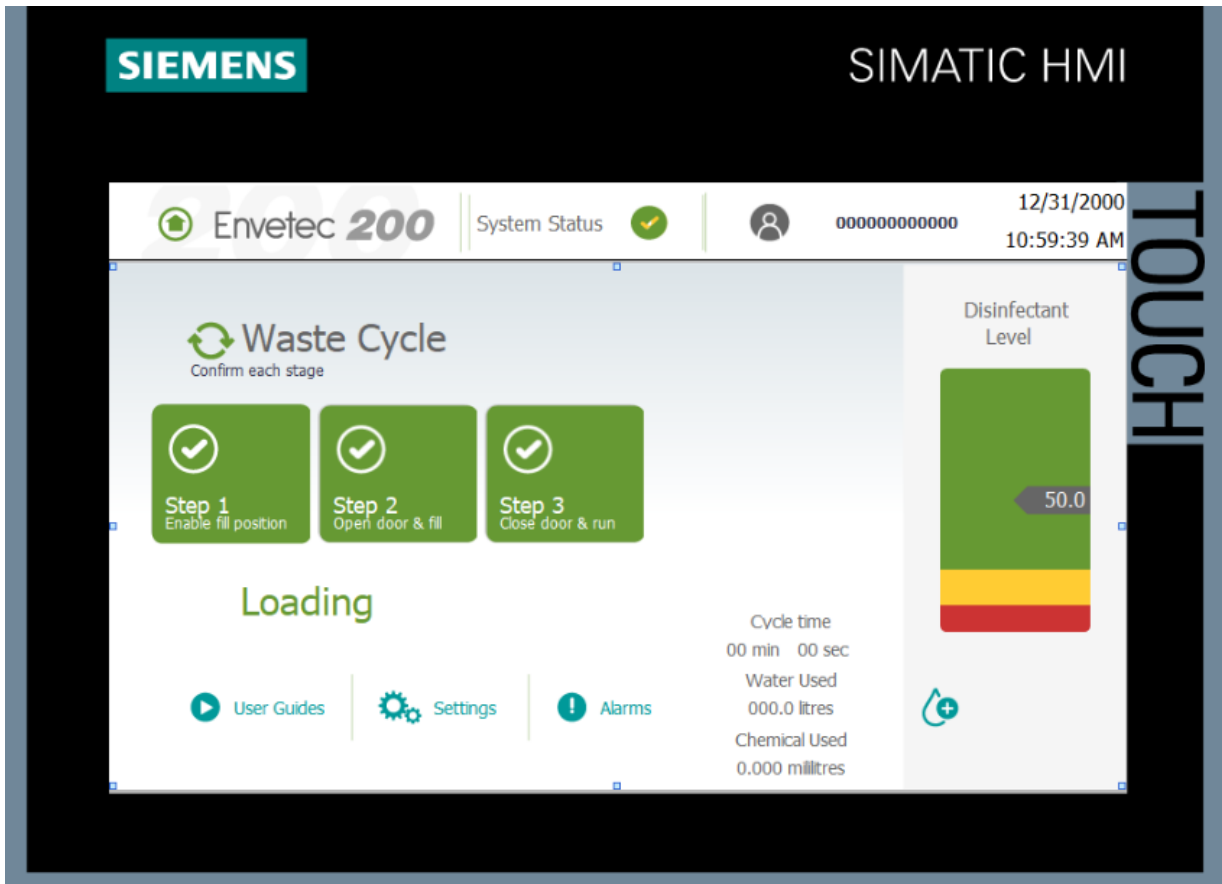
- Press “Step 1” and wait for “Step 1” indicator to turn green. This enables the shred vessel to rotate to the fill position.



- Press “Step 2” and wait for “Step 2” indicator to turn green. This unlocks the loading bay door.
- Open door and correctly load receiver with waste to be treated. Ensure that the receiver is **not** overloaded and close door.

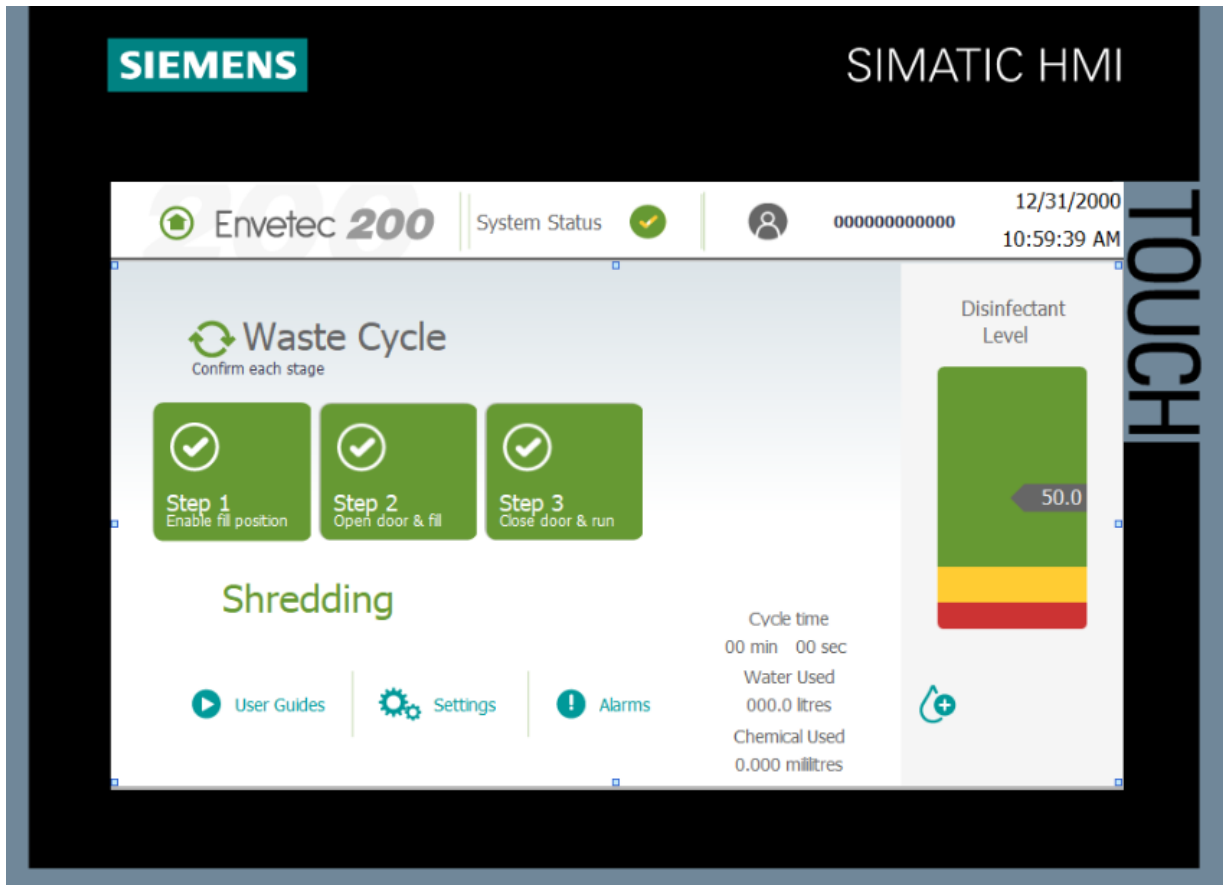


DO NOT HANDLE MEDICAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THIS PRECAUTION CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI, AND BACTERIA.



- Press “Step 3”; this confirms loading bay door has been correctly closed and commences the **Waste Cycle**.

- **Dynamic Shred Stage**



- This screen is displayed during the dynamic shred stage.

In rare cases when the shredder blades cannot macerate the loaded material, as may occur with an extremely heavy load of textiles or an object that is simply too thick to be cut, the unit will attempt to shred the load for a maximum of forty-five minutes. If the load sensor still detects too much resistance, the machine will trip a safety relay to prevent damage to the cutters, and the message **REJECT LOAD** will be displayed on the HMI screen. Press **REJECT BUTTON** and confirm placement of a regulated medical waste (RMW) container under the conveyor discharge. Enable **REJECT CYCLE** on the HMI.

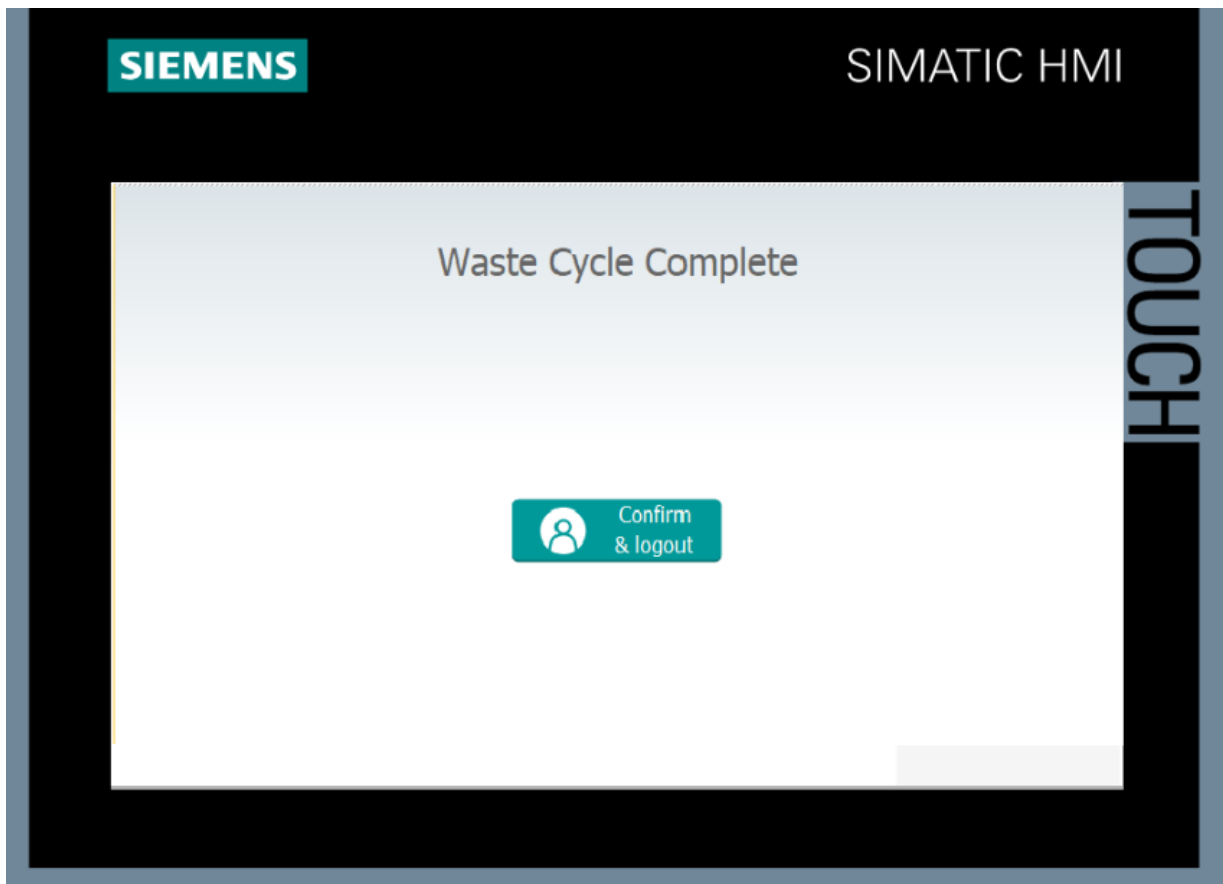
- **Empty and Wash Stage**



- This screen is displayed whilst emptying the treated waste load.



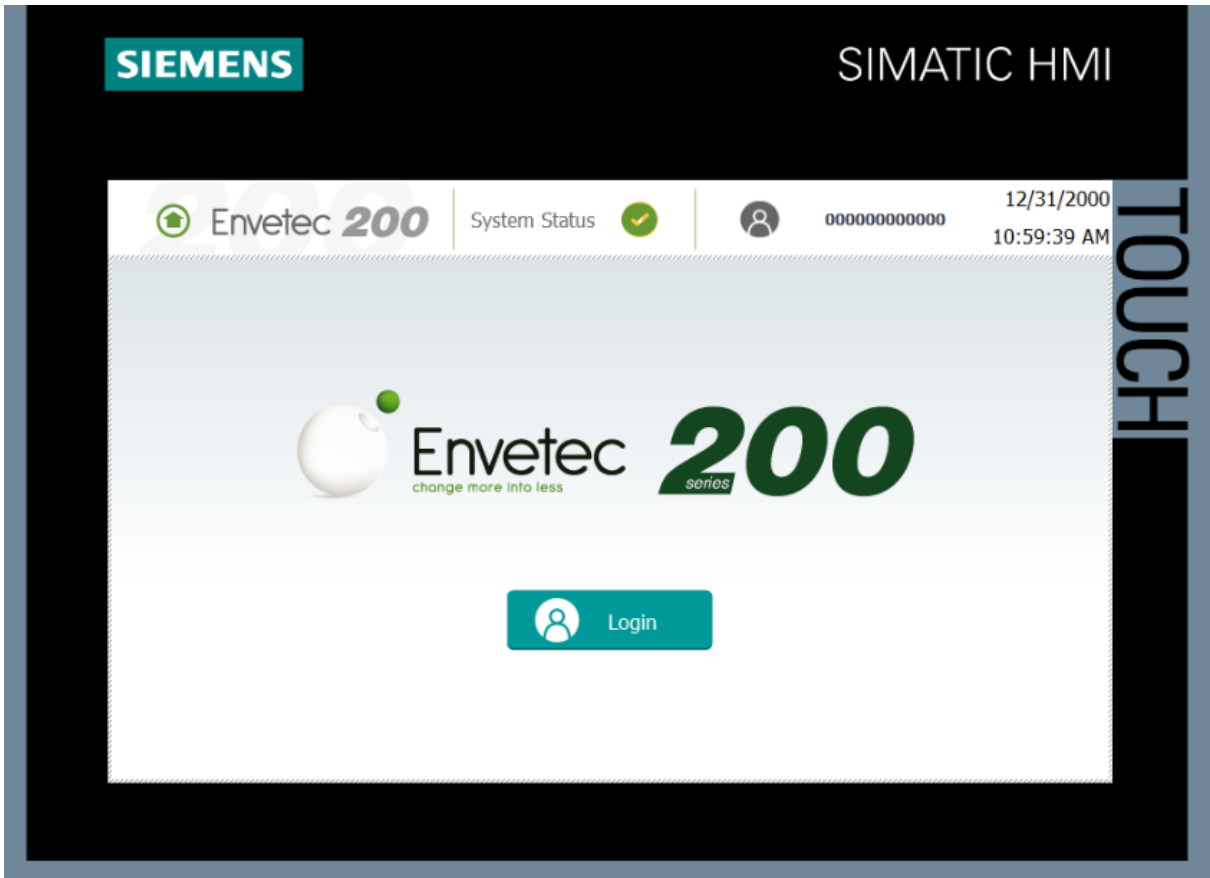
- This screen is displayed during the receiver washing stage after emptying the treated waste load.



- The screen above will be displayed on completion of a successful cycle. The operator must press the “Confirm & logout” button to return to the start screen.

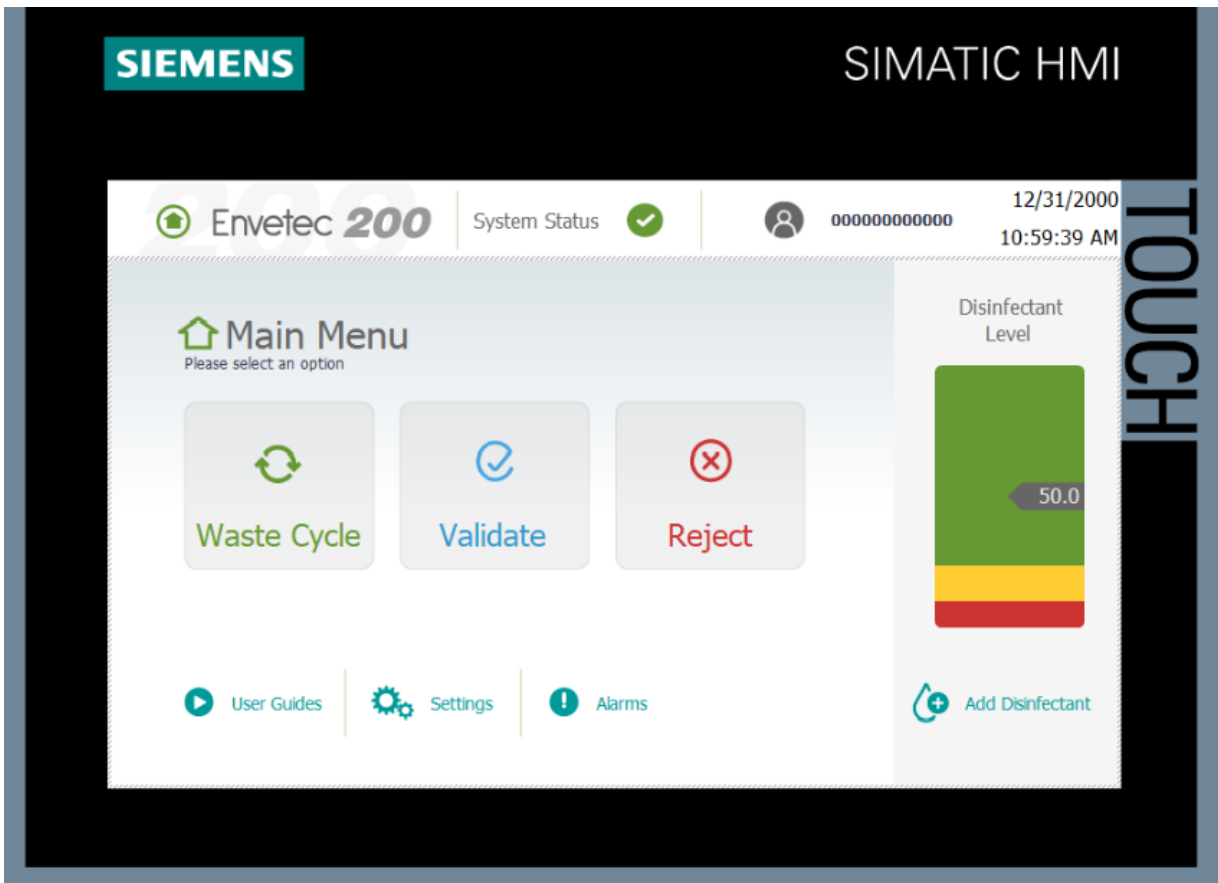


At the end of a successfully completed cycle, the HMI will return to the start screens.

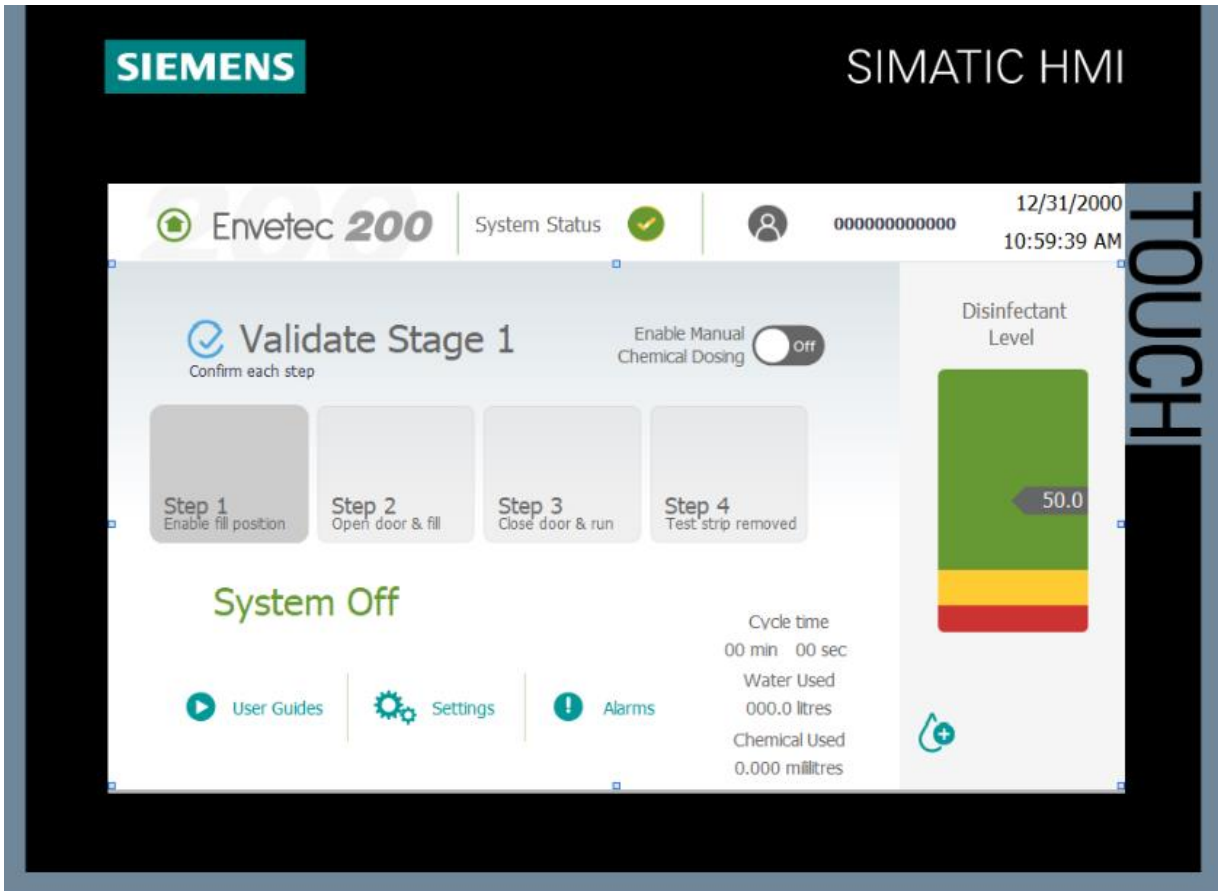


The Envetec 200 Series is now ready to start the next cycle.

2.5.2. Validate

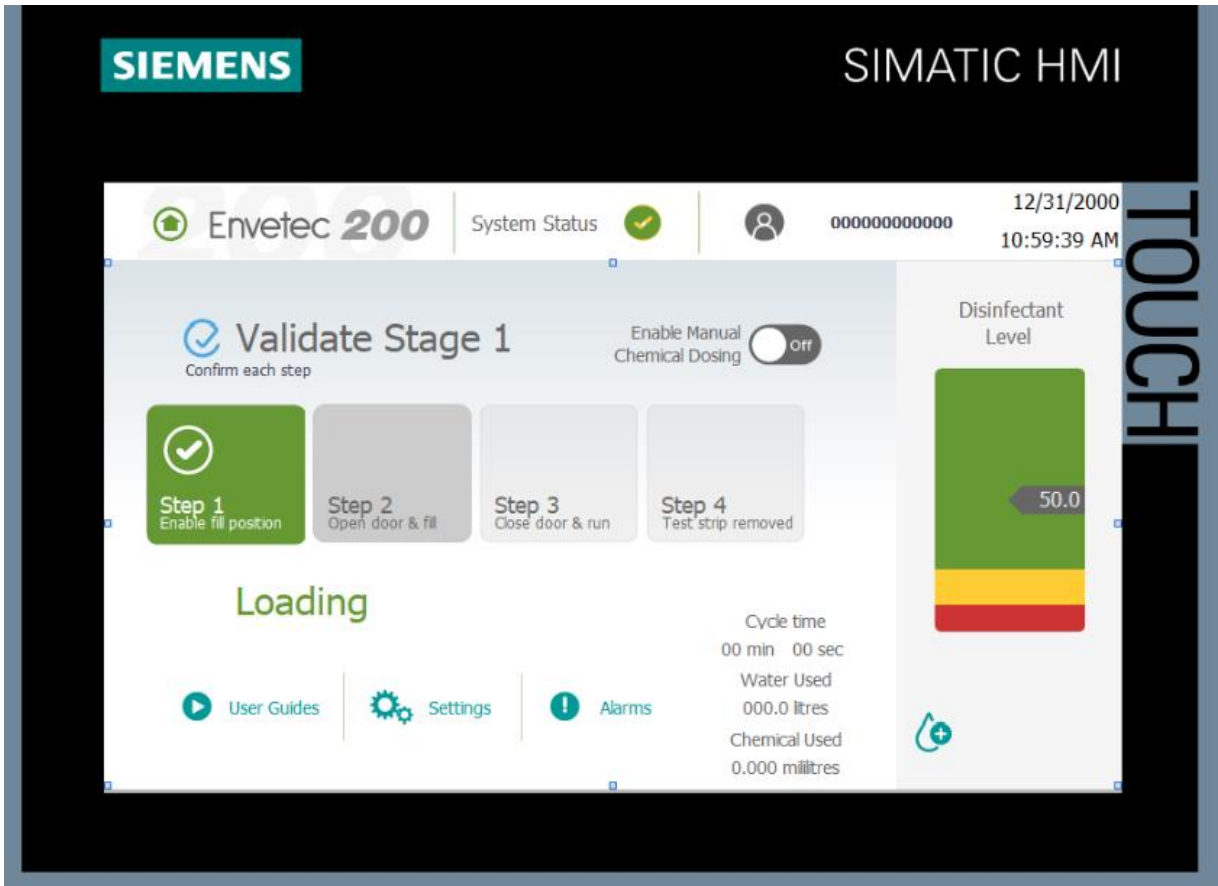


- Select “Validate” on HMI Screen.

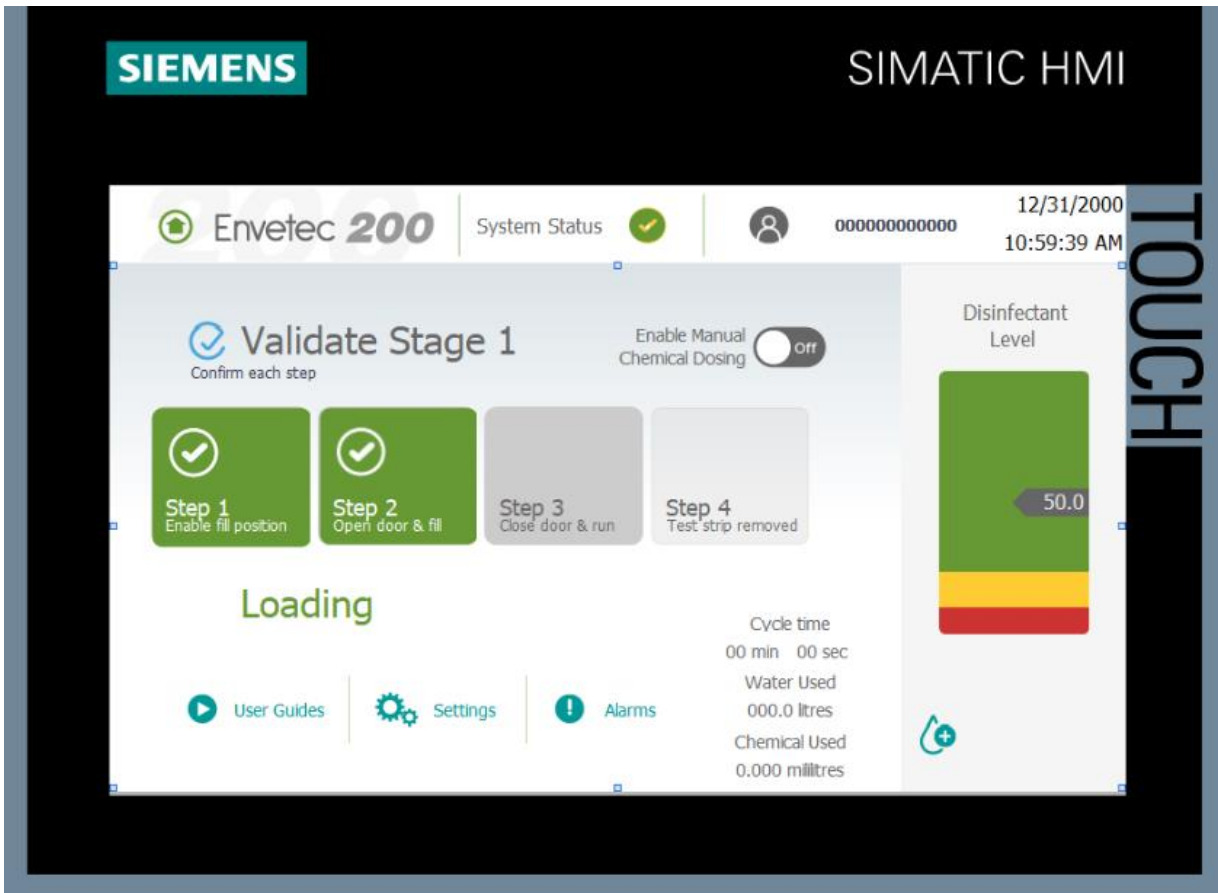


Note: Automatic chemical dosing can be selected to “ON” or “OFF” using the “Enable Manual Chemical Dosing” button, as required for Validation purposes if manual dosing is a requirement.

- Press “Step 1” and wait for “Step 1” indicator to turn green. This enables the receiver to rotate to the loading position.



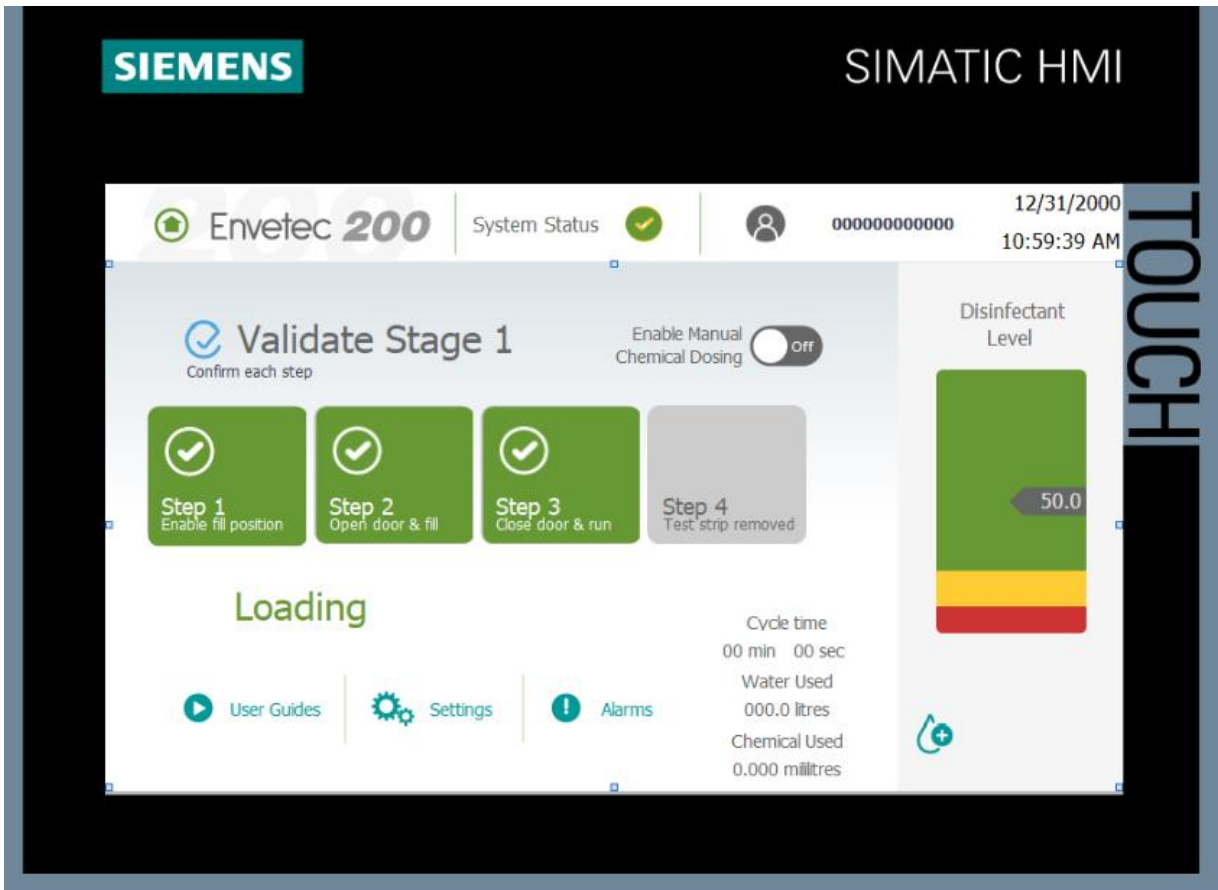
- Press “Step 2” and wait for “Step 2” indicator to turn green. This unlocks the loading bay door and the validation rear access door.
- Open validation rear access door, remove Tri-clover port blanks and install the validation testing manifold as per the validation protocol.



- Close the validation rear access door.
- Open the loading bay door and correctly load receiver with waste to be treated. Ensure that the receiver is **not** overloaded.
- Close the loading bay door.

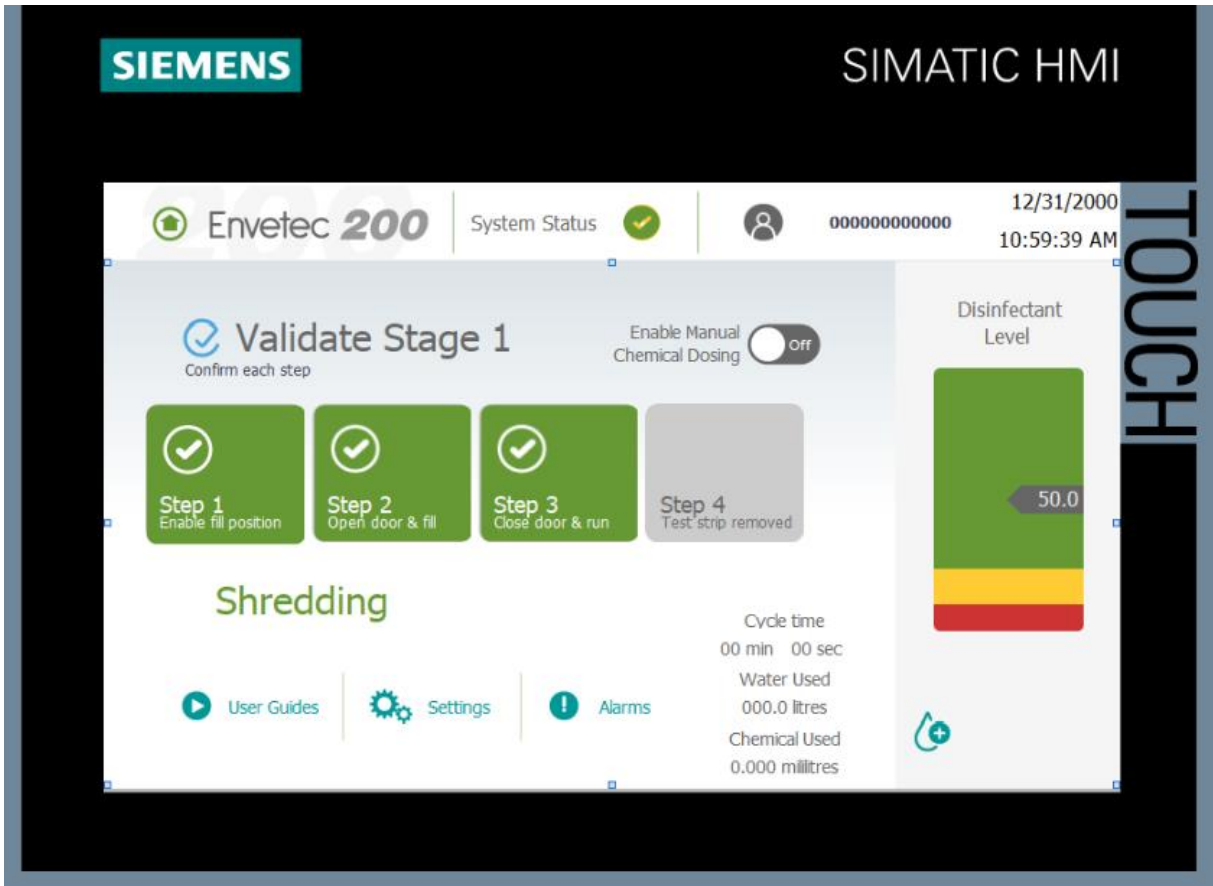


DO NOT HANDLE MEDICAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THIS PRECAUTION CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI, AND BACTERIA.



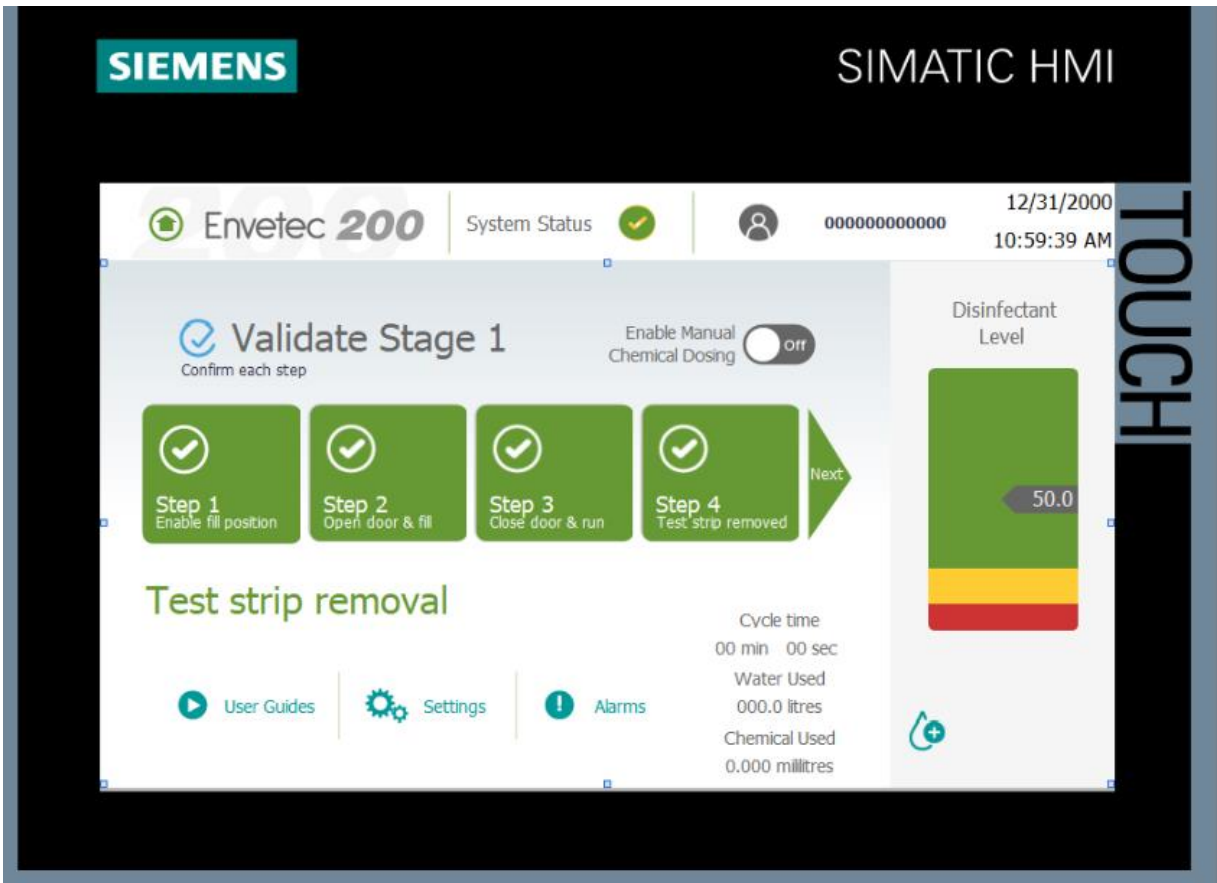
- Press “Step 3” and wait for “Step 3” indicator to turn green. This confirms that the previous steps have been correctly completed and initiates validation cycle.

- **Dynamic Shred Stage**



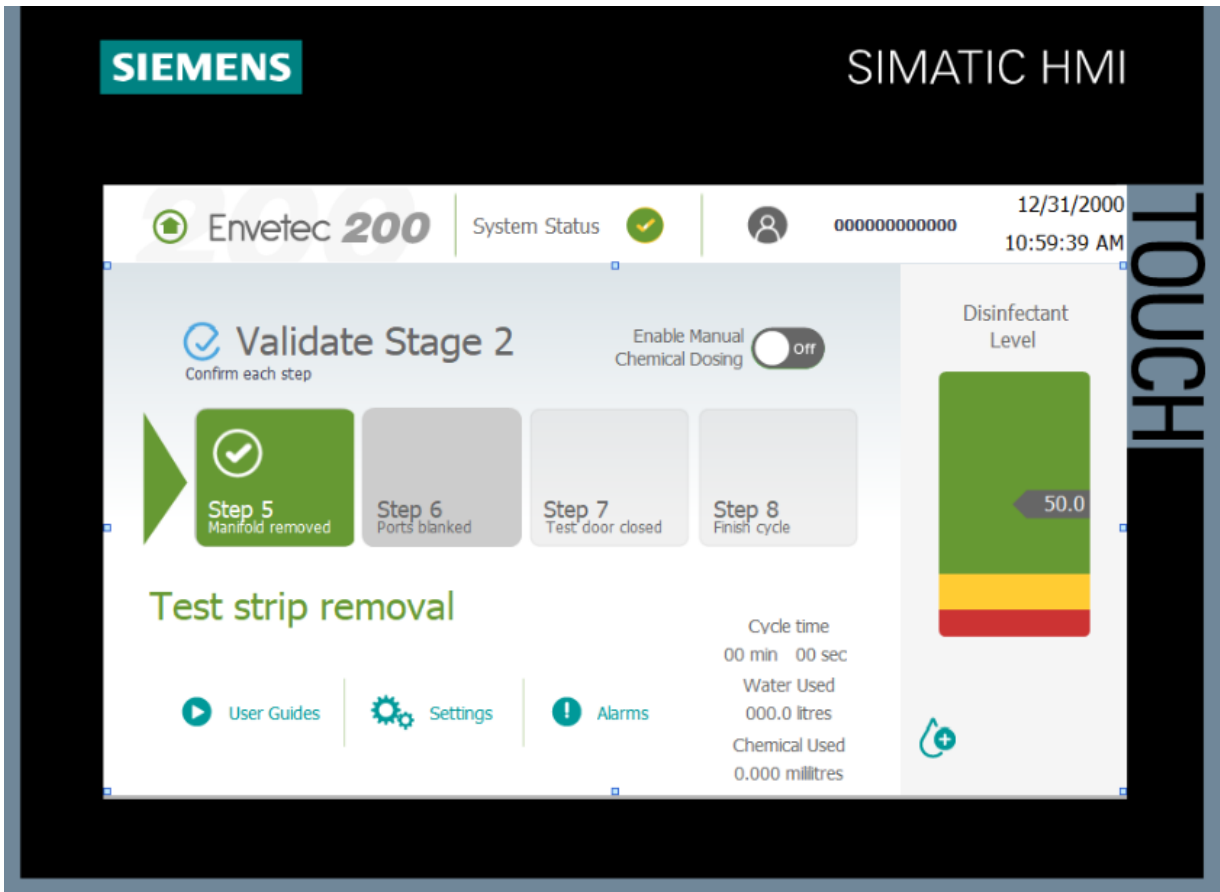
- This screen is displayed during the dynamic shred stage.
- After twelve minutes, the shredding will cease and the receiver will rotate to the loading position, automatically unlocking both doors to allow the validation testing manifold to be removed and the Tri-clover ports to be blanked.
- Once this operation is complete, ensure that the doors are closed and confirm on the HMI screen by pressing “Step 4”, “Next”, “Step 5”, “Step 6”, “Step 7”, and “Step 8” as illustrated in the following HMI screenshots.
- The machine will now complete the dynamic shredding and discharging of the now treated waste and return to the start screen on successful completion of the cycle.

- **Test Strip Removal Screen**



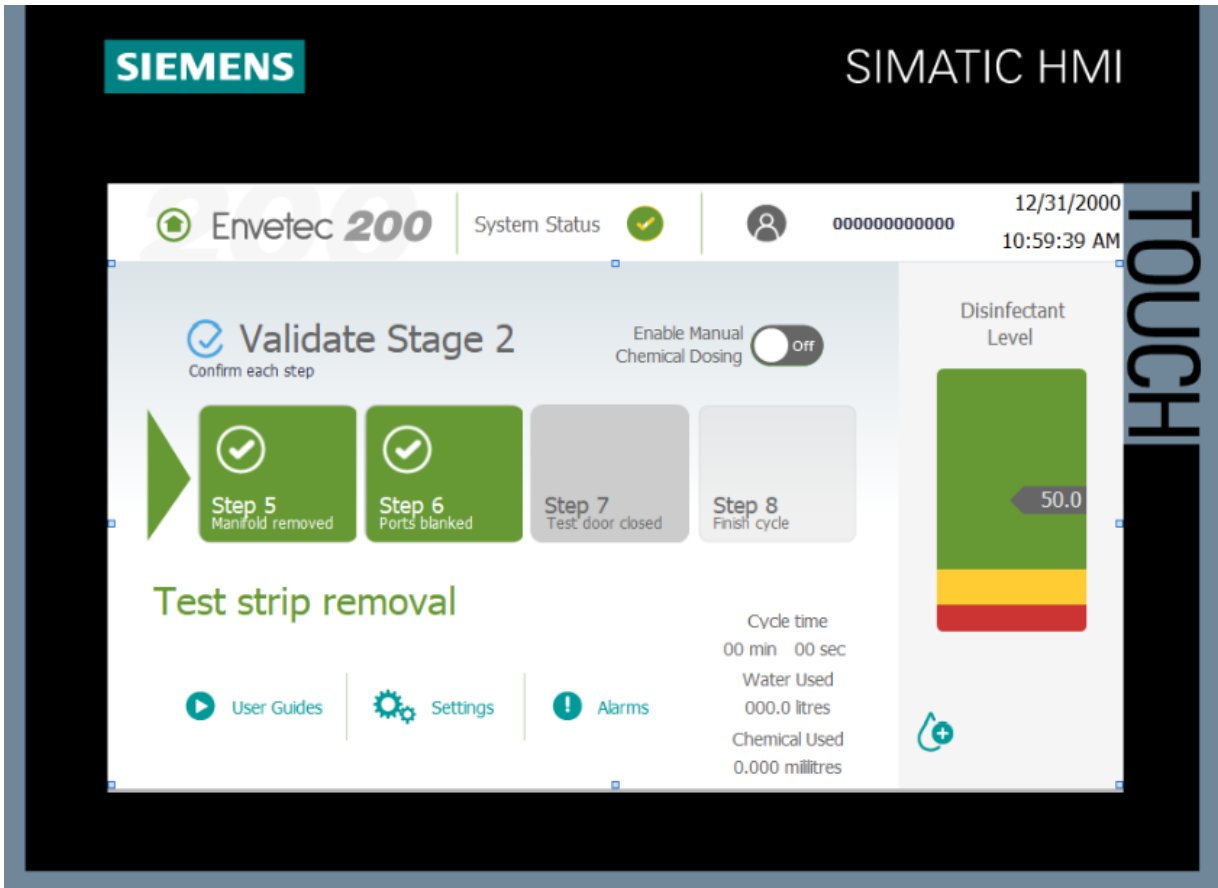
- This screen is displayed for confirmation of test strip removal.

- **Manifold Removal Screen**



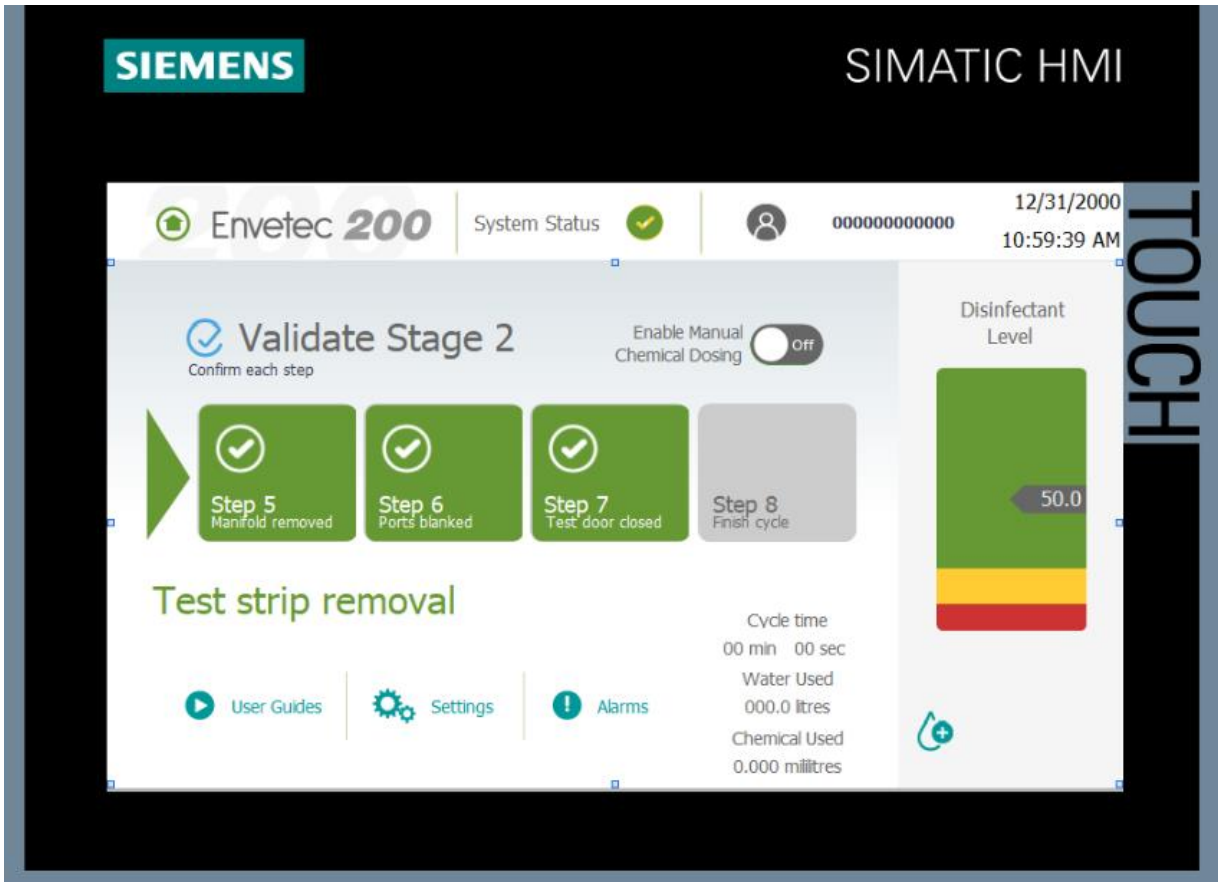
- This screen is displayed for confirmation of manifold removal.

- **Ports Blanked Screen**



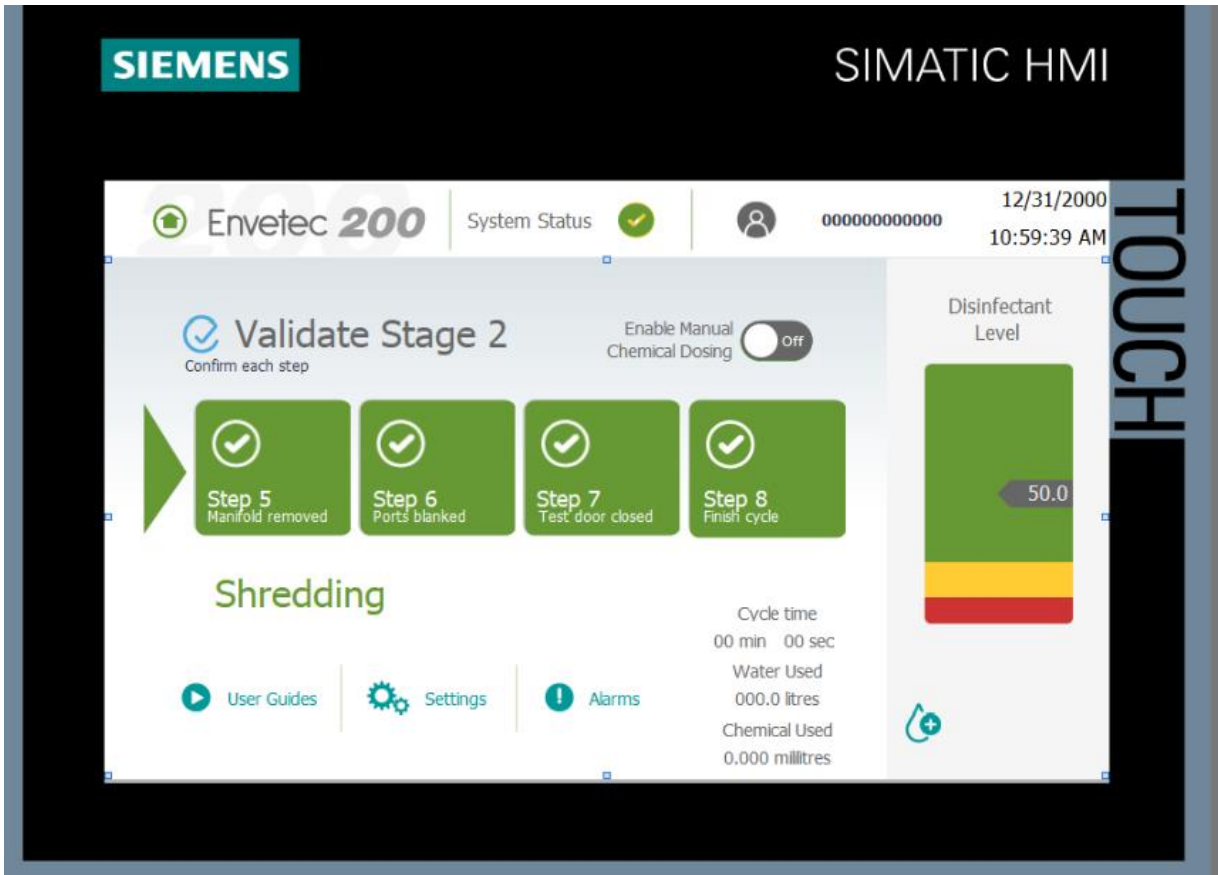
- This screen is displayed for confirmation of ports blanked.

- Test Door Closed Screen



- This screen is displayed for confirmation of closure of test doors.

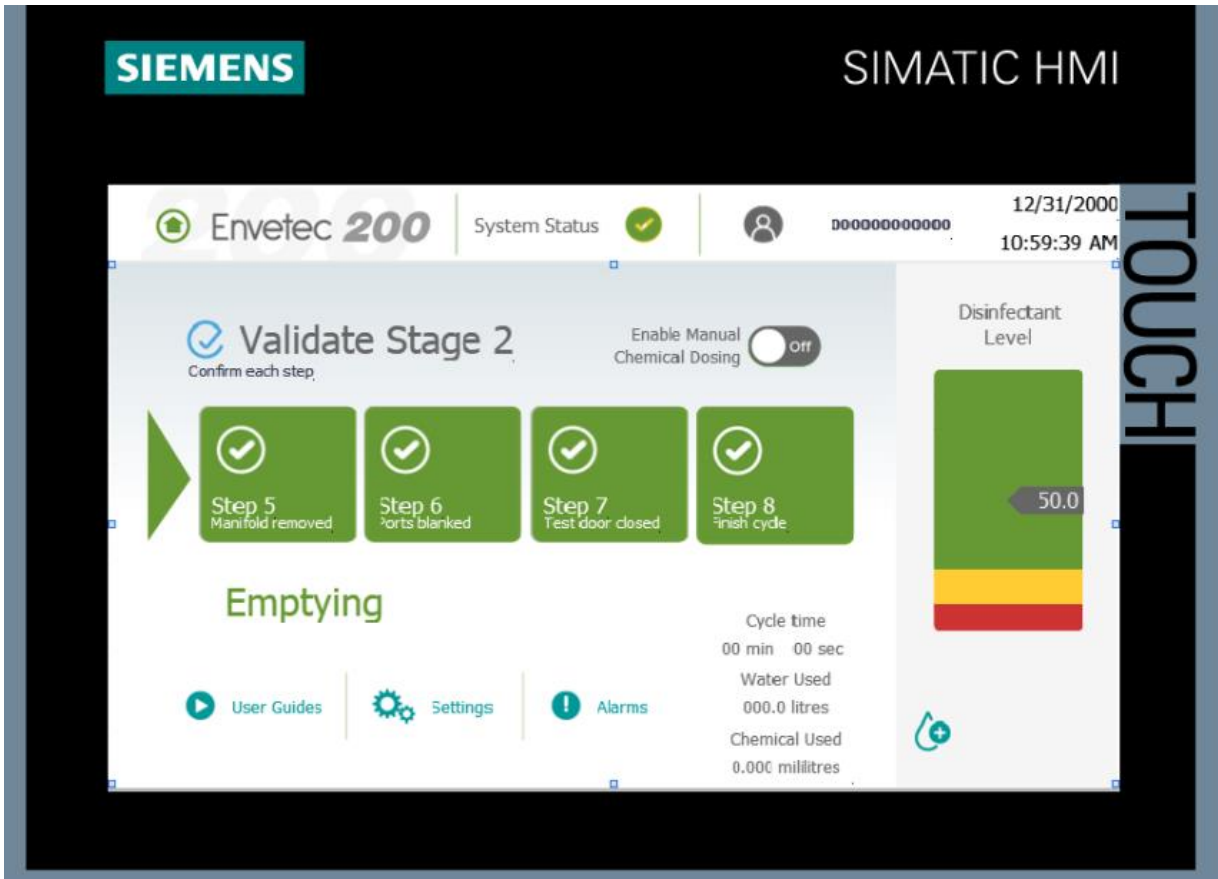
- **Completion of Dynamic Shred Stage**



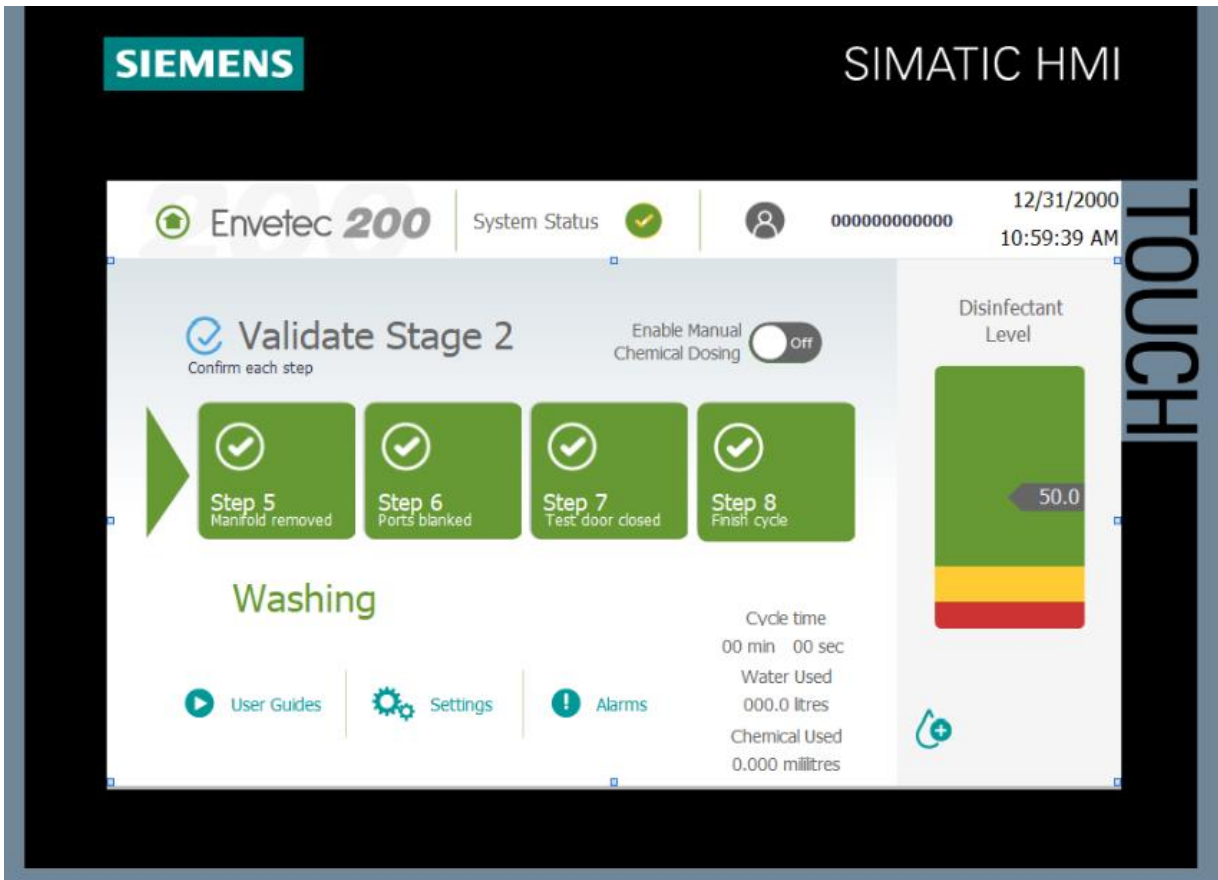
- On pressing “Step 8”, this screen is displayed during the completion of the dynamic shredding stage.

In rare cases when the shredder blades cannot macerate the loaded material, as may occur with an extremely heavy load of textiles or an object that is simply too thick to be cut, the unit will attempt to shred the load for a maximum of forty five minutes. If the load sensor still detects too much resistance, the machine will trip a safety relay to prevent damage to the cutters, and the message **REJECT LOAD** will be displayed on the HMI screen. Press **REJECT BUTTON** and confirm placement of a regulated medical waste (RMW) container under the conveyor discharge. Enable **REJECT CYCLE** on the HMI.

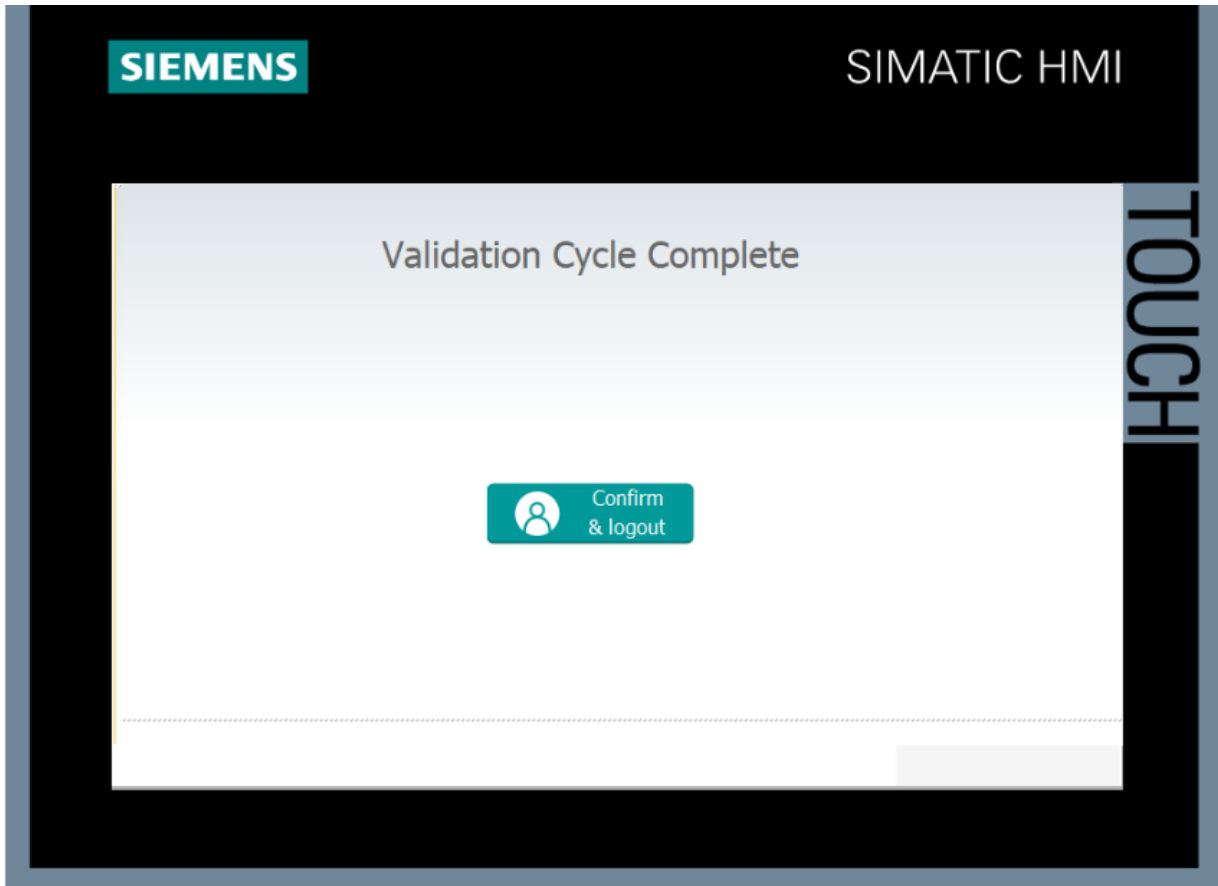
- Empty and Wash Stage



- This screen is displayed whilst emptying the treated waste load.



- This screen is displayed during the receiver washing stage after emptying the treated waste load.



- The screen above will be displayed on completion of a successful cycle. The operator must press the “Confirm & logout” button to return to the start screen.

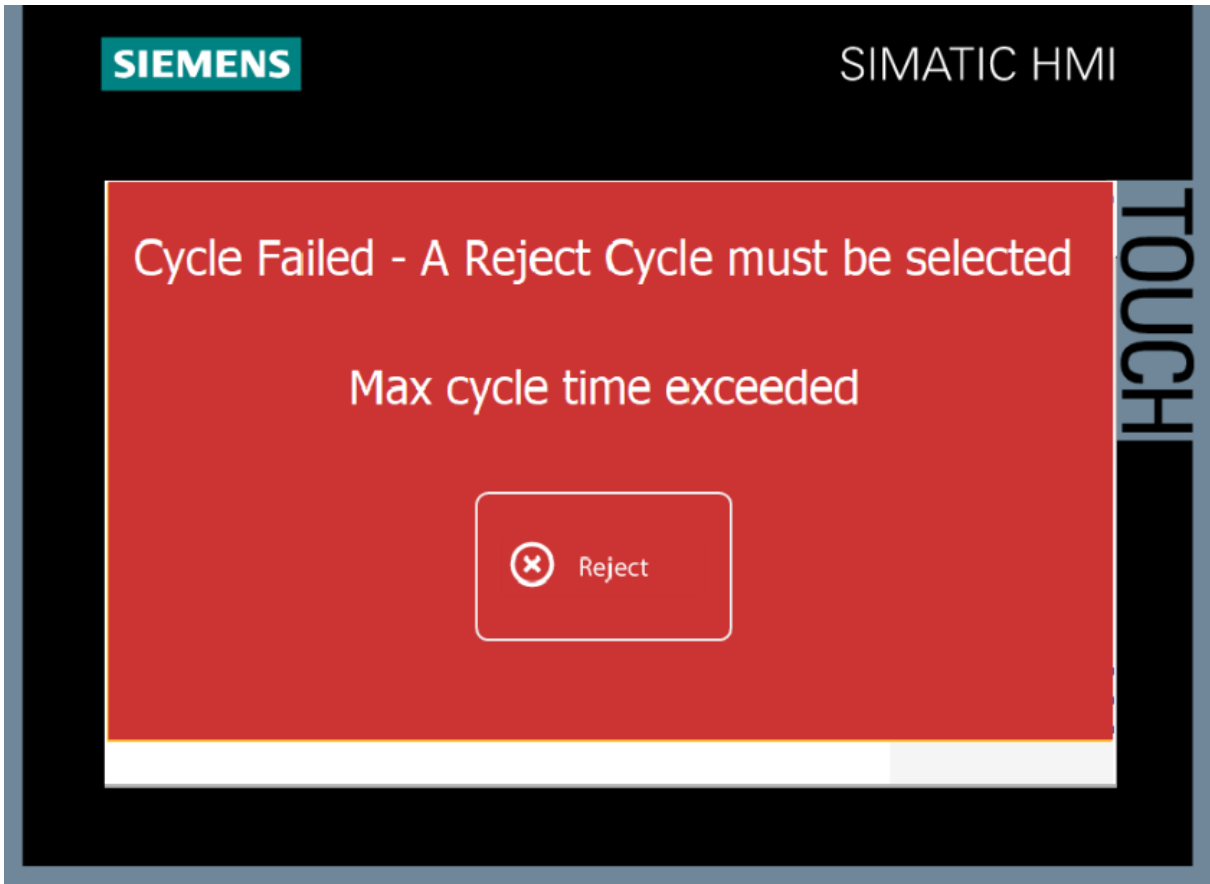


At the end of a successfully completed cycle, the HMI will return to the start screens.



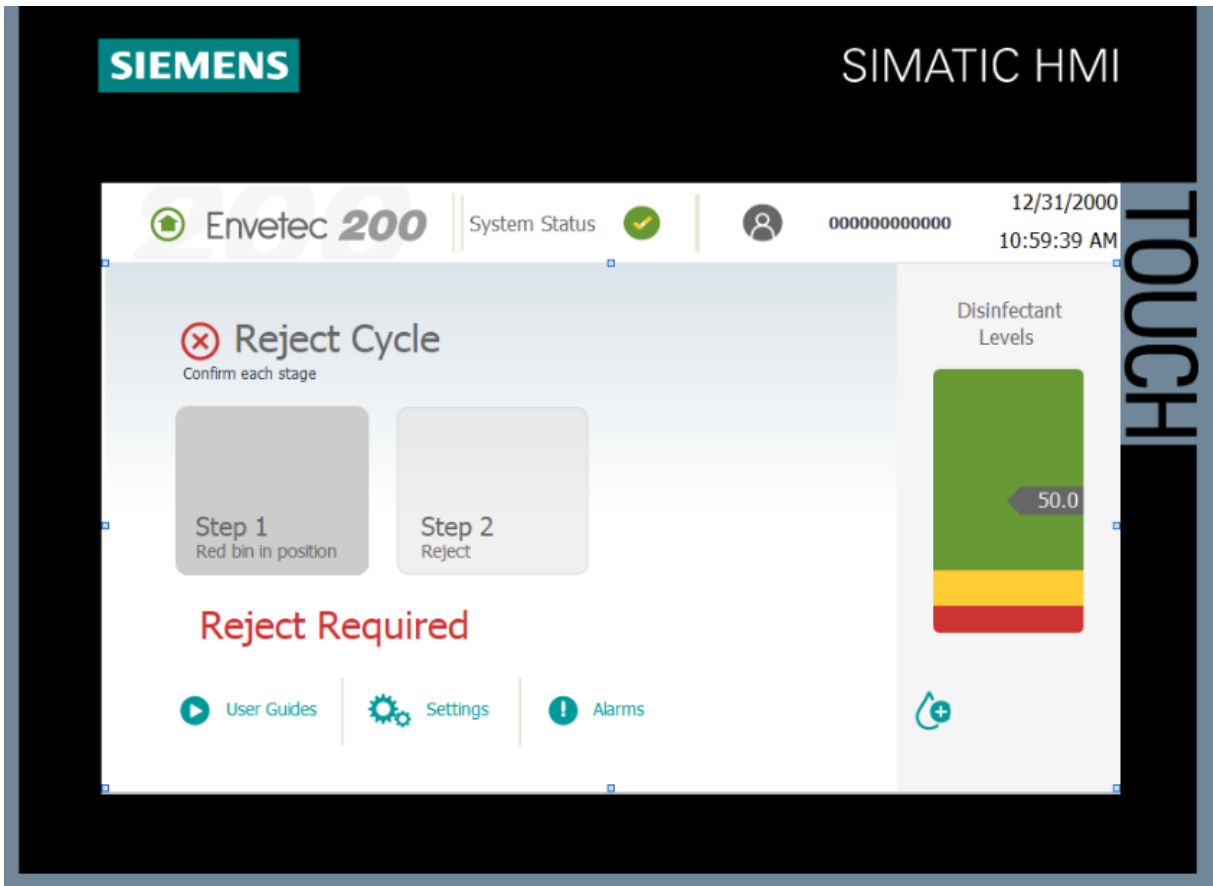
The Envetec 200 Series is ready to start the next cycle.

2.5.3. Reject

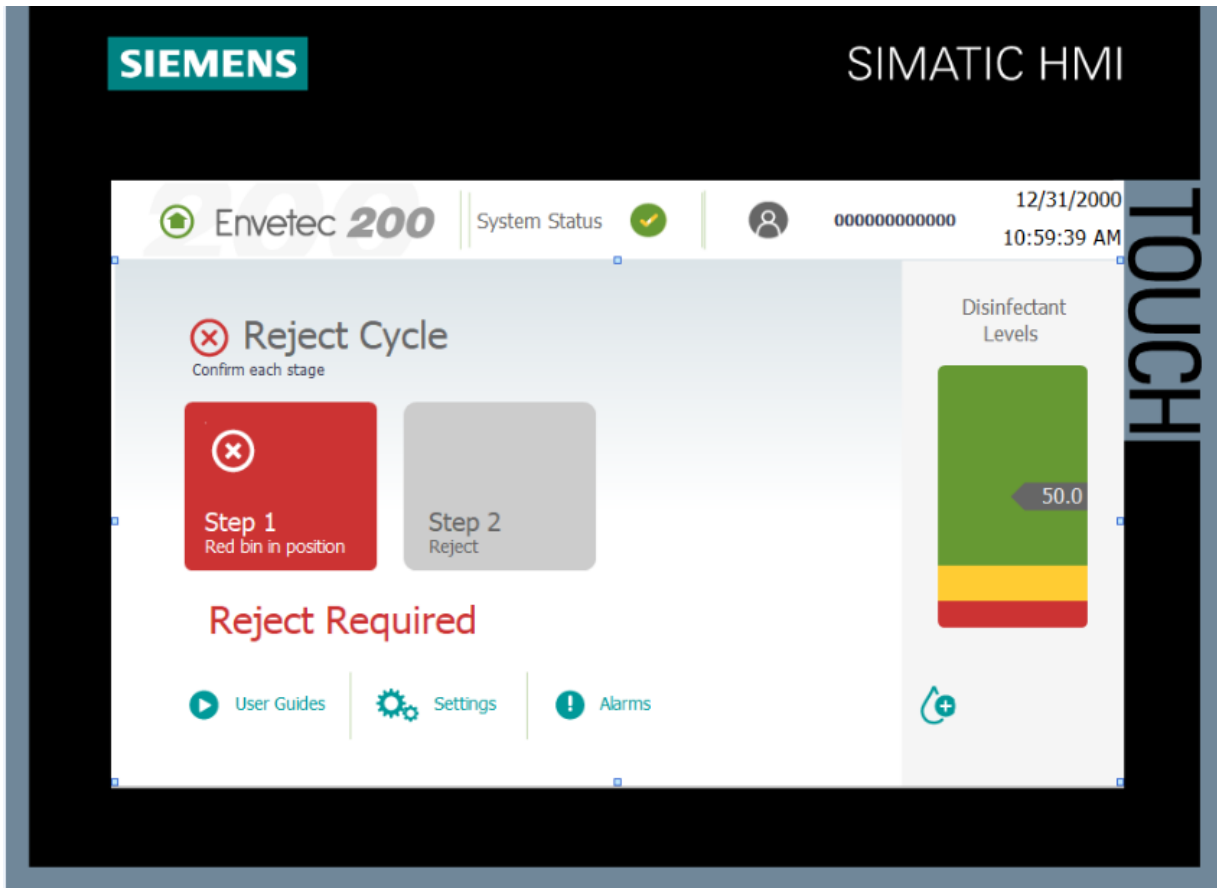


In the event of a cycle failure, the above screen will be displayed to indicate that the treatment cycle has failed and therefore is unable to be completed. In this scenario, the waste load must be rejected by carrying out the following instructions.

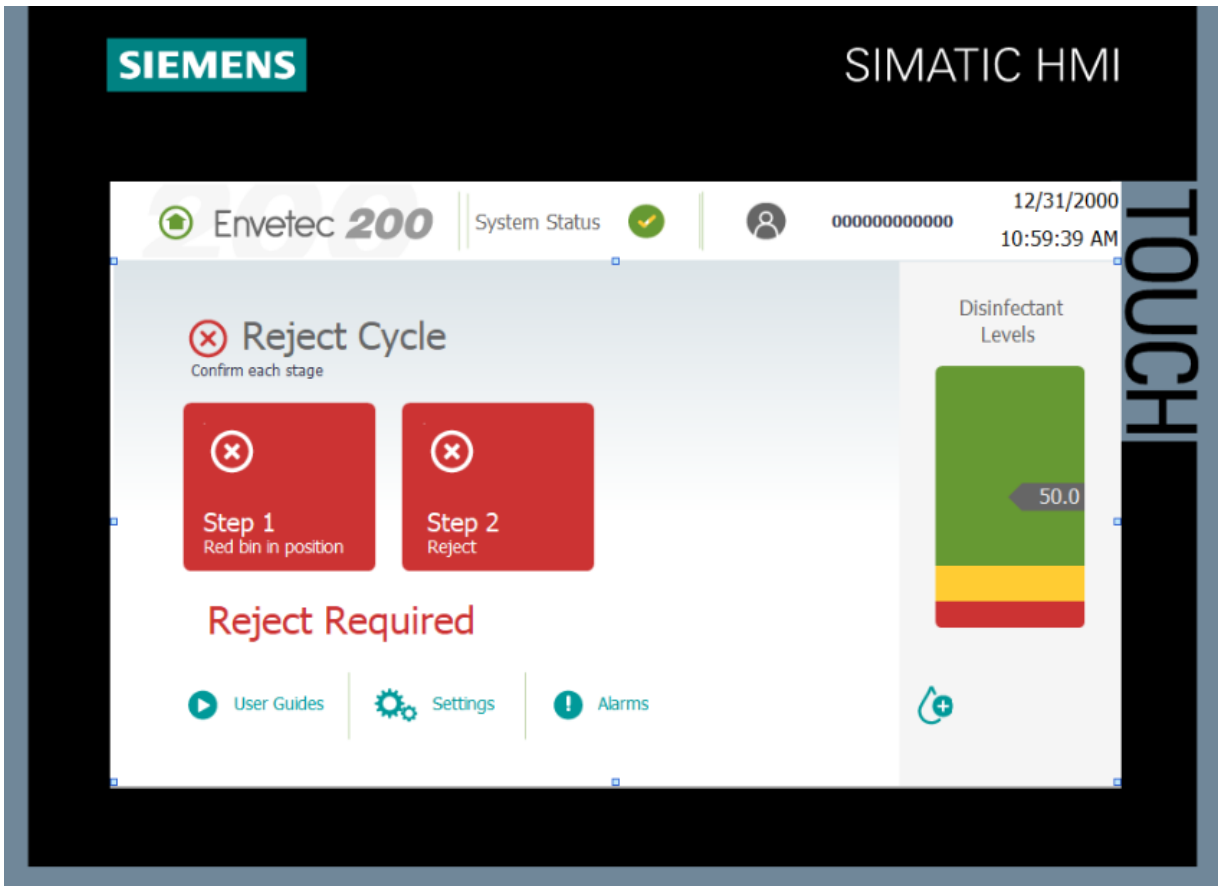
- Press the reject button on “Cycle Failed” screen, which will take the operator to the screen below.



- Remove general waste bin and position a red RMW waste bin at the conveyor discharge chute. Confirm this action by pressing “Step 1” and wait for “Step 1” indicator to turn red.

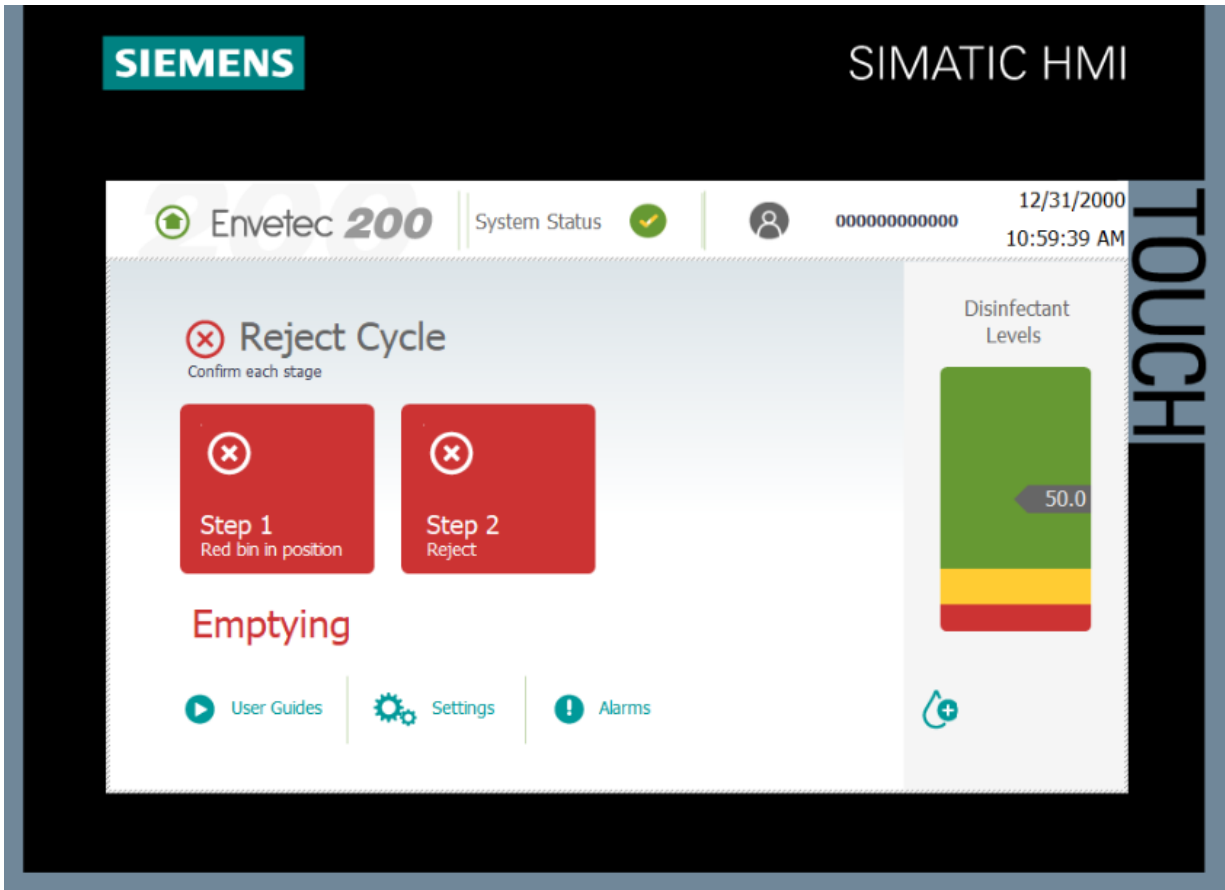


- Press “Step 2” and wait for “Step 2” indicator to turn red. This enables the receiver to rotate and empty and transfer contents of the rejected load into the red RMW waste bin.



- This screen is displayed whilst the receiver is rotating, emptying and transferring the contents of the rejected load into the red RMW waste bin.

- Empty and Wash Stage

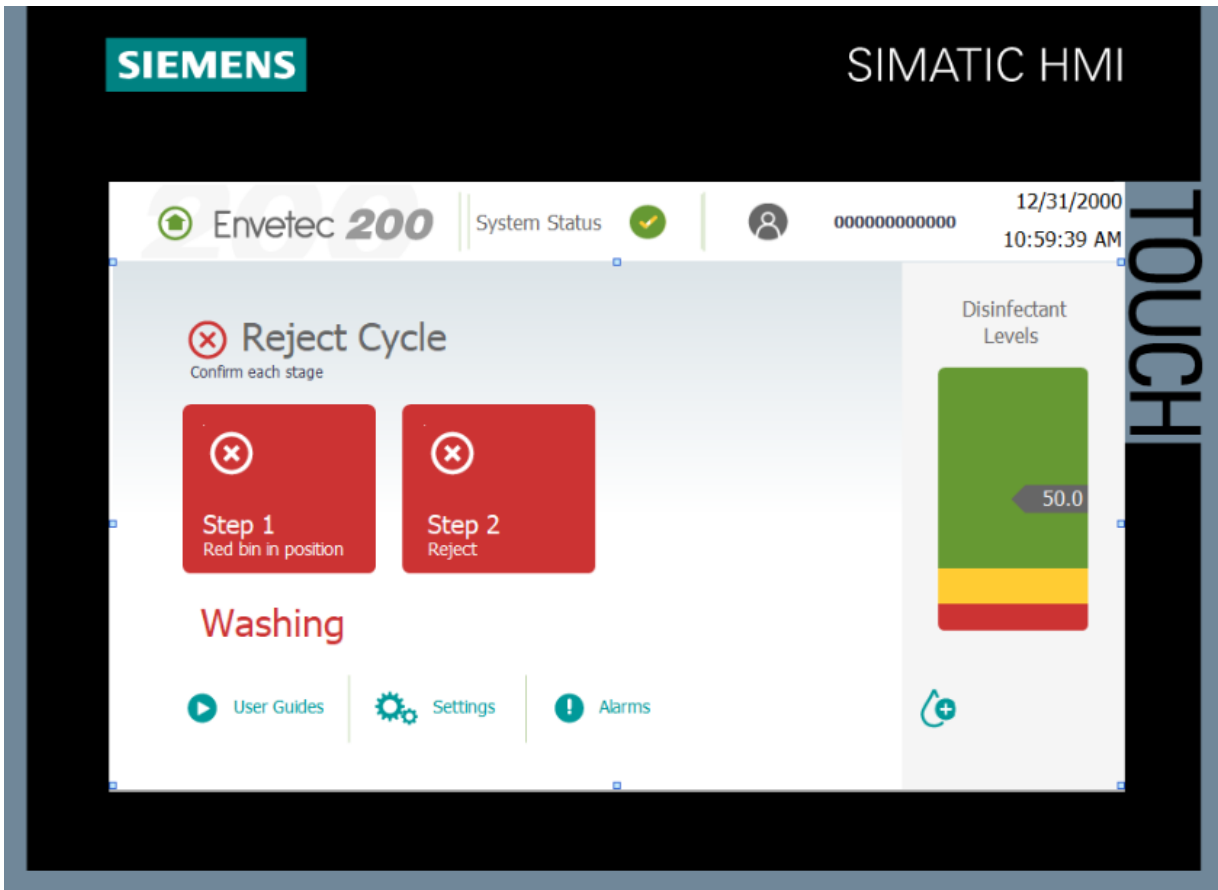


- Confirm all rejected waste has cleared the conveyors and has been discharged into the red RWM waste bin.

Note: Carry out an inspection of the de-watering conveyor belt to ensure that all rejected waste has cleared from the conveyor. It may be necessary to manually remove any waste that has not cleared from the conveyor. Appropriate PPE **MUST** be worn for this type of operation

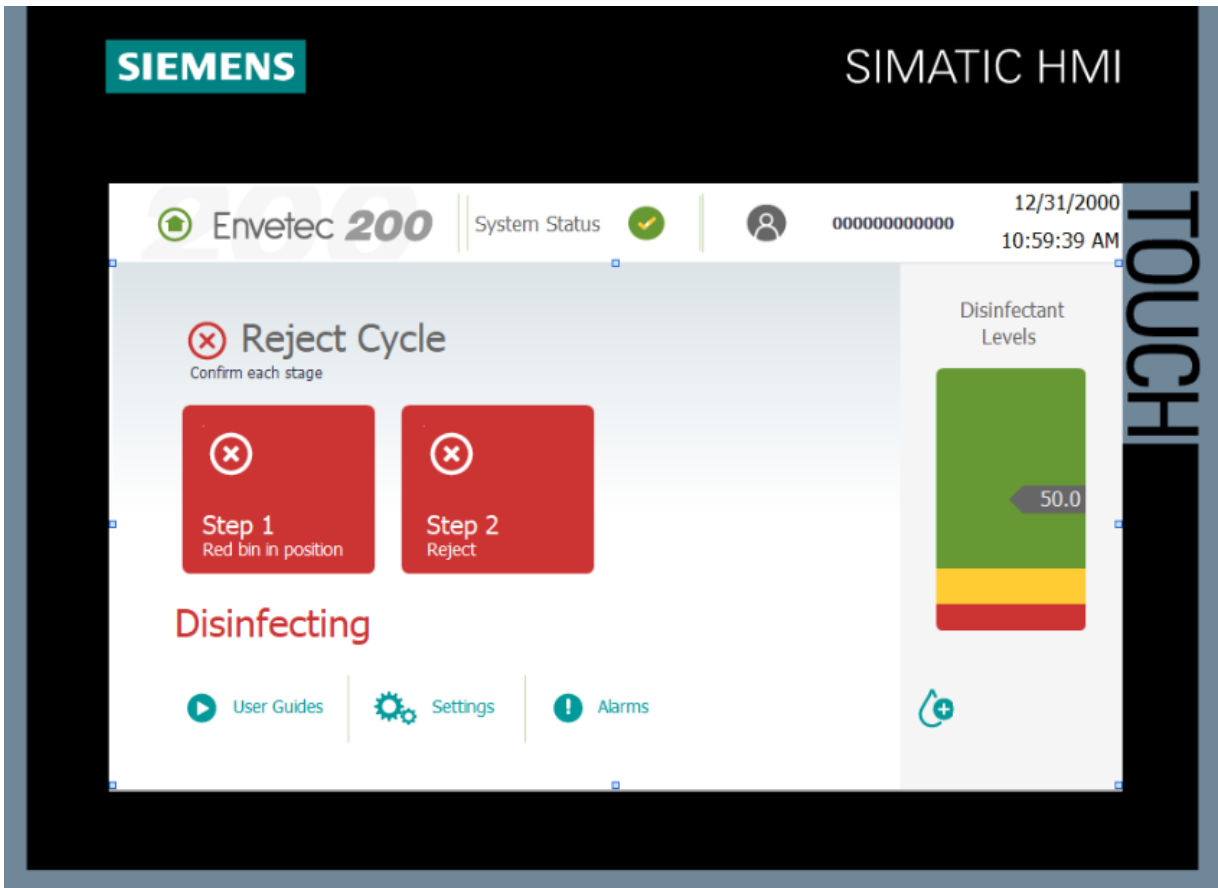


DO NOT HANDLE MEDICAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THIS PRECAUTION CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI, AND BACTERIA.

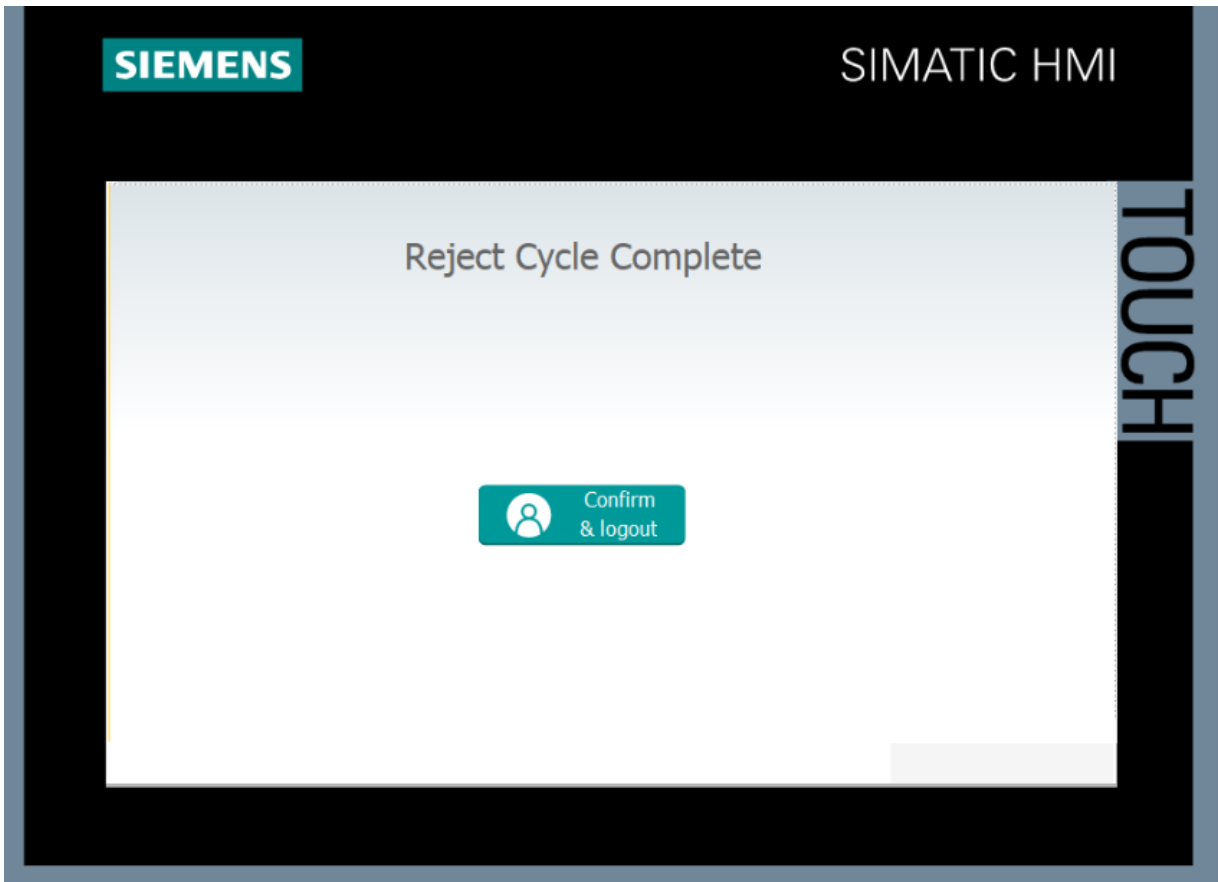


- This screen is displayed during the receiver washing stage after emptying the rejected waste load.

- **Disinfecting Stage**



- This screen is displayed during the receiver disinfection stage after emptying and washing. This disinfection stage ensures that the receiver has been fully treated for subsequent, normal operation.



- The screen above will be displayed on completion of a successful cycle. The operator must press “Confirm & logout” button to return to the start screen.

At the end of a reject cycle, the HMI will return to the start screens.



- The red waste RMW bin must be removed and be replaced by a general waste bin. The contents of the rejected waste load can then either be checked by an appropriately trained person to determine the root cause of the cycle failure or can be disposed of via alternative, appropriate methods.



DO NOT HANDLE MEDICAL WASTE WITHOUT THE USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE). FAILURE TO OBSERVE THIS PRECAUTION CAN RESULT IN EXPOSURE TO HAZARDOUS GERMS, FUNGI, AND BACTERIA.

The Envetec 200 Series is ready to start the next cycle.

2.6 Shutting Down the Envetic 200 Series – End of Shift

- At the end of the day, using an approved germicidal cleaning solution sprayed onto a cloth until damp (**not soaked or dripping**) or, using IPA wipes, clean down the loading bay door surfaces and adjacent areas including the HMI and buttons. All potentially contaminated surfaces with which the operator or waste may have come into contact should also be appropriately cleaned.

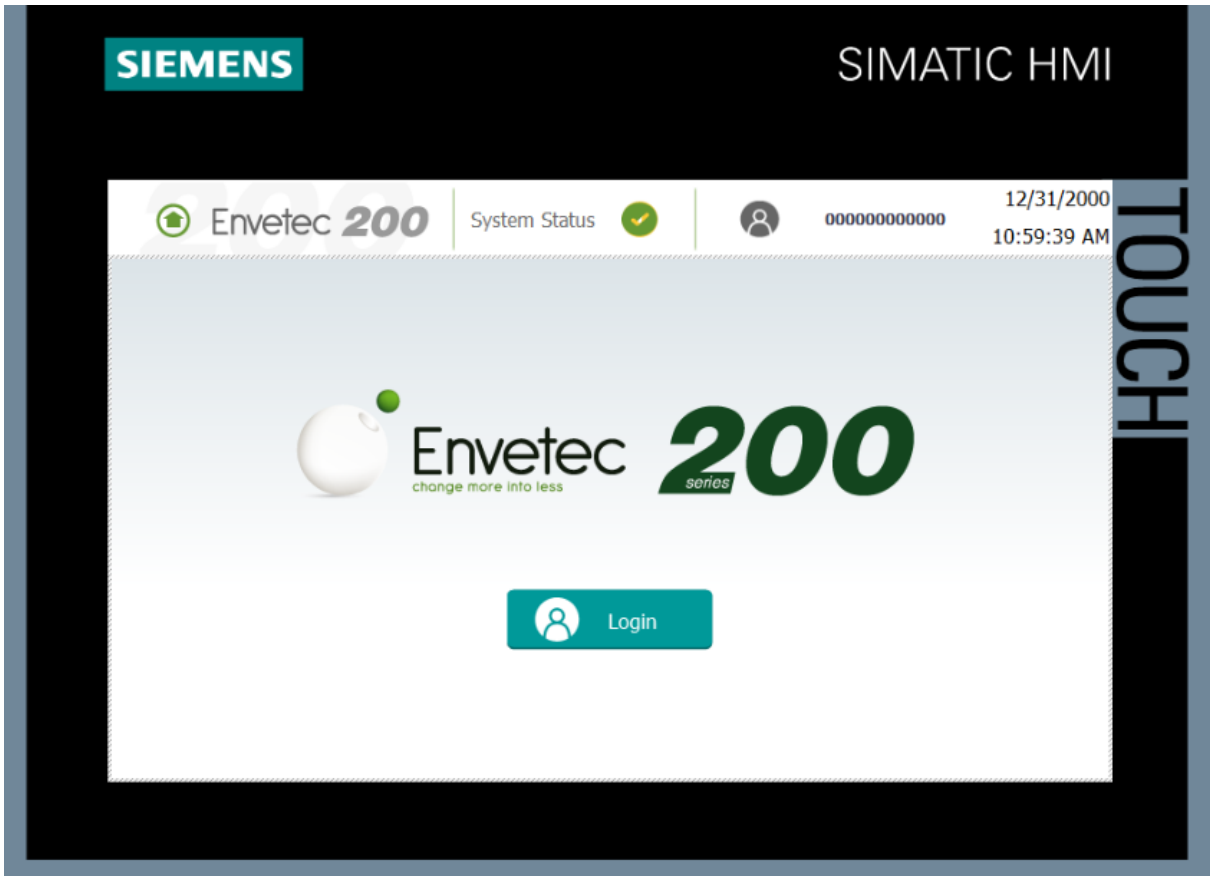


- Dewatering unit to be cleaned using a wet vac to remove water and debris particulates from the drip tray and surrounding areas.



- All filters to be rinsed /cleaned, using wet vac and appropriate cleaning methods.





Before attempting to shut down the Envetec 200 Series, ensure that the last cycle is finished and the HMI is displaying the start screen.

- Empty the waste bin and replace the waste bag.
- **CLOSE** the main valve to the water supply.





2.7. Running Cycles – PLACARD

This section will be updated as placards are issued for the Envetec 200 Series System

3. MAINTENANCE

WARNING: Pay proper attention to safety, including wearing the appropriate Personal Protective Equipment (PPE). If waste cannot be removed safely, contact Envetec 200 Series Technical Support.

Refer to Section 1.11

3.1 Conduct Scheduled Preventative Maintenance

3.1.1 Helpful Maintenance Tips:



- Establish a productive and effective work environment.
- Inspect the area for safety.
- Clean up any debris, mop up or wet vac any observed water.
- Keep the material to be treated in a separate area of the room from the treated shredded material.
- Familiarize yourself with the location of the consumable items such as VigorOx 15/23®, facility approved disinfection cleaning agents, disposable wipes, domestic trash liners, PPE, etc.
- Re-stock depleted work area consumables as necessary.

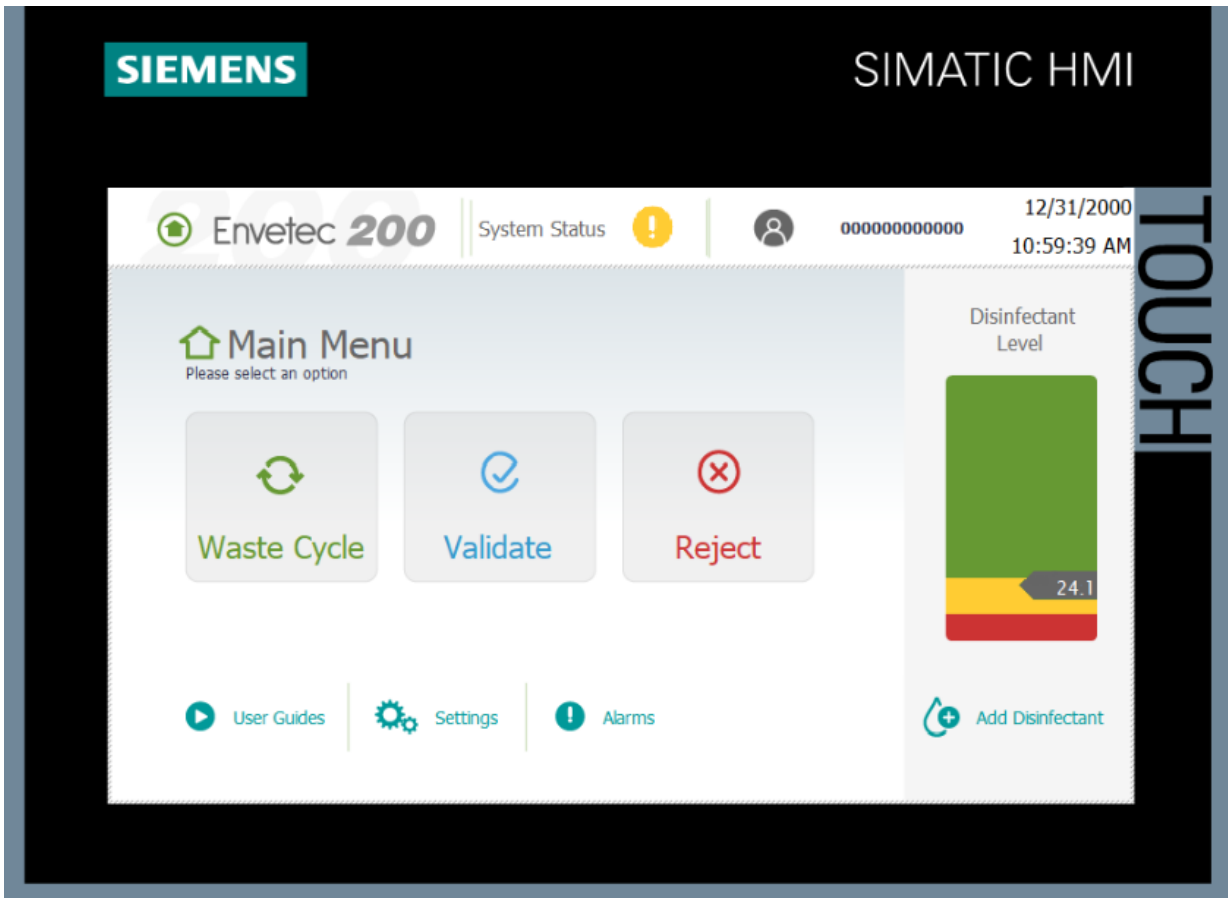


3.2 Addition of Disinfectant (VigorOx 15/23)

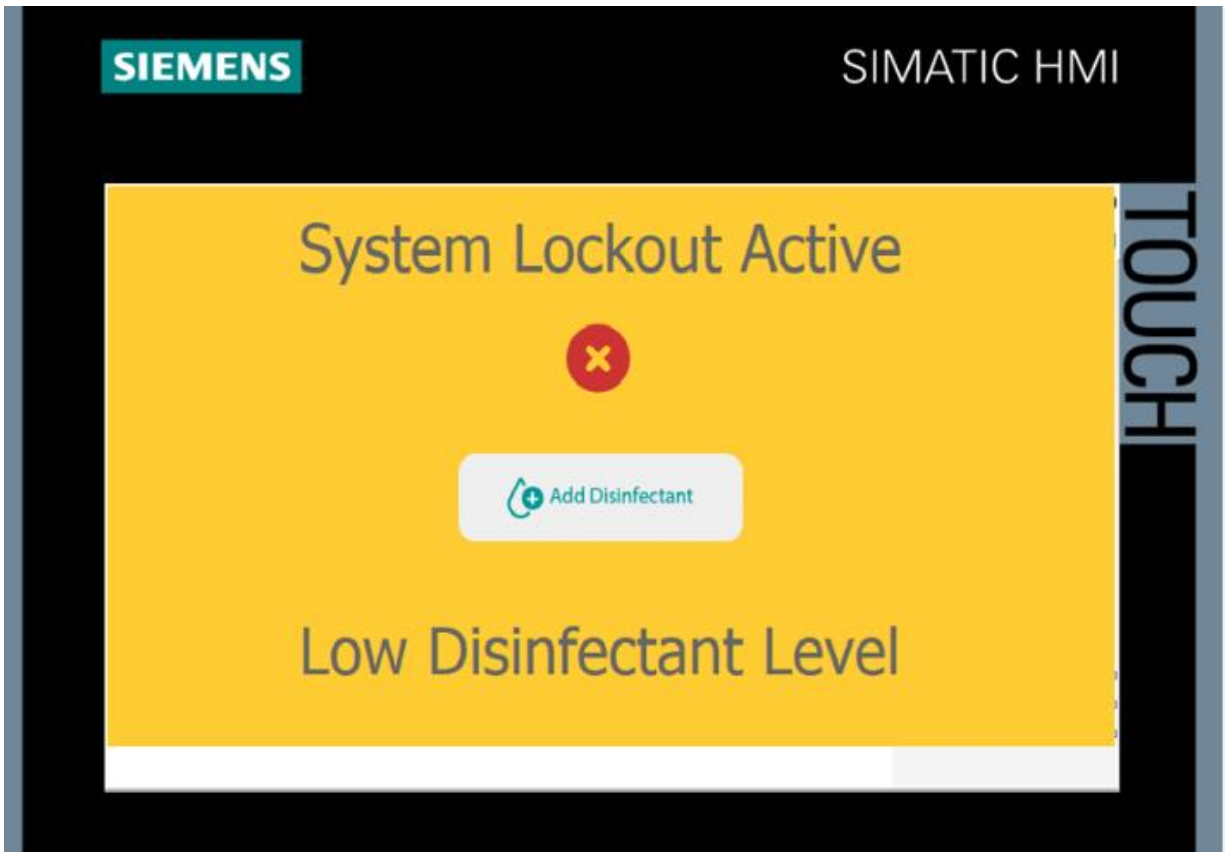
Please refer to the most recent label for VigorOx 15/23 Antimicrobial Agent.

The Envetec 200 Series must be filled with VigorOx 15/23 in order to operate. The display on the control panel will indicate **ADD DISINFECTANT** when the machine must be refilled. If the machine is not refilled when indicated, the system will automatically shut down and prevent further operation. VigorOx 15/23 is supplied in 5 US gallon (20 liter) containers.

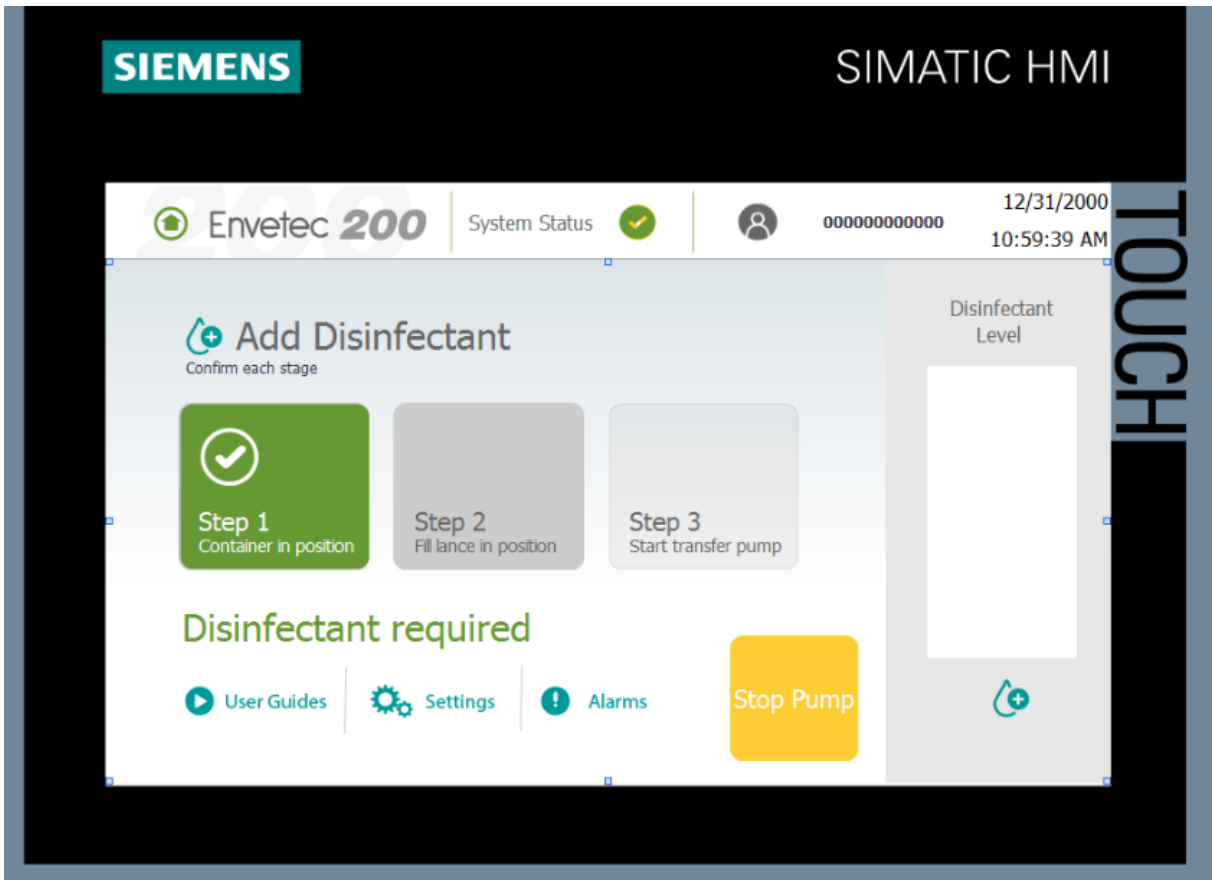
When the disinfectant tank level indicator drops into the amber zone, the operator will be prompted to add disinfectant into the Envetec 200 Series. This prompt will be in the form of “Add Disinfectant” appearing below the disinfectant level indicator and the system status icon will change from  to .



The following screen will be displayed if disinfectant is not added when prompted and the level indicator falls into the red zone. The Envetec 200 Series has been programmed to prevent inadvertent depletion of the internal disinfectant tank.



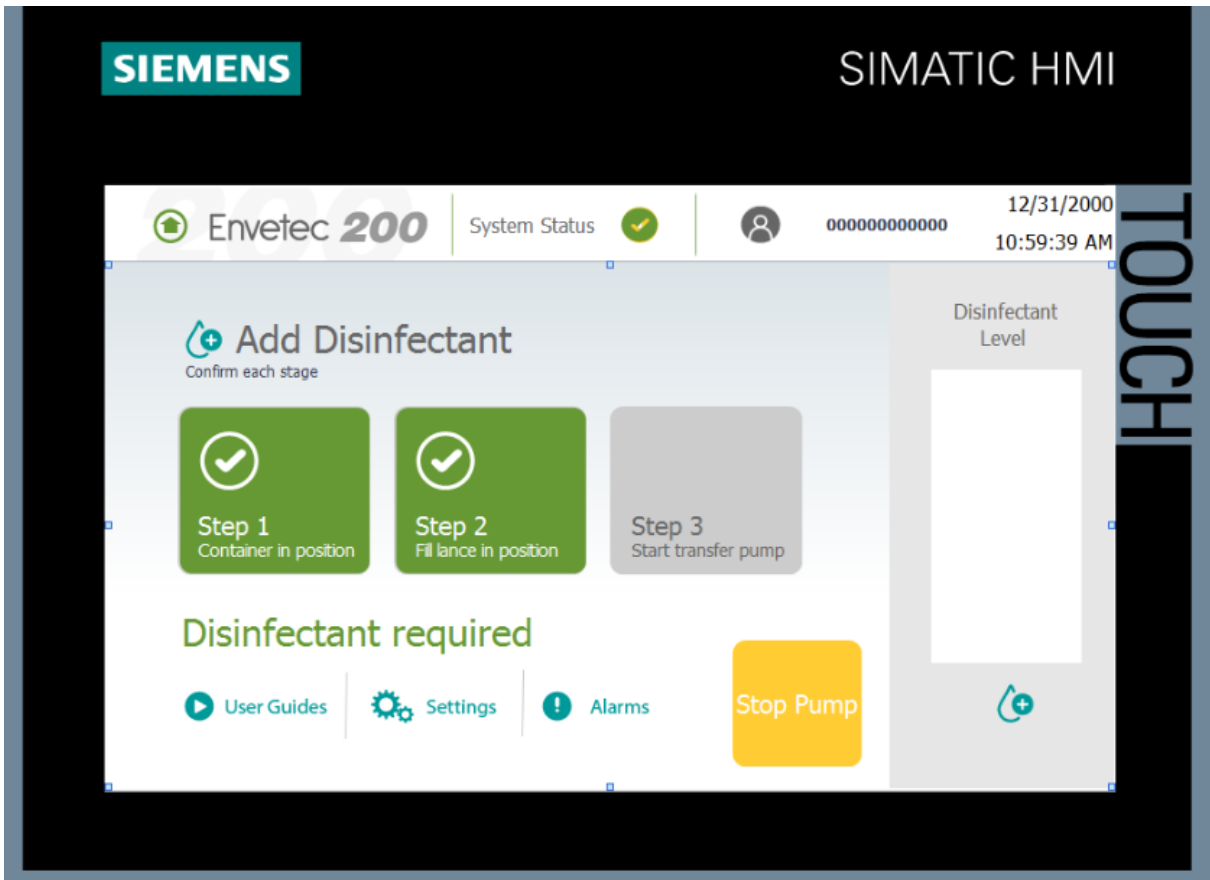
- To replenish the internal disinfectant tank, press “Add Disinfectant” when displayed under the disinfectant level indicator or in the “System Lockout Active” screen.



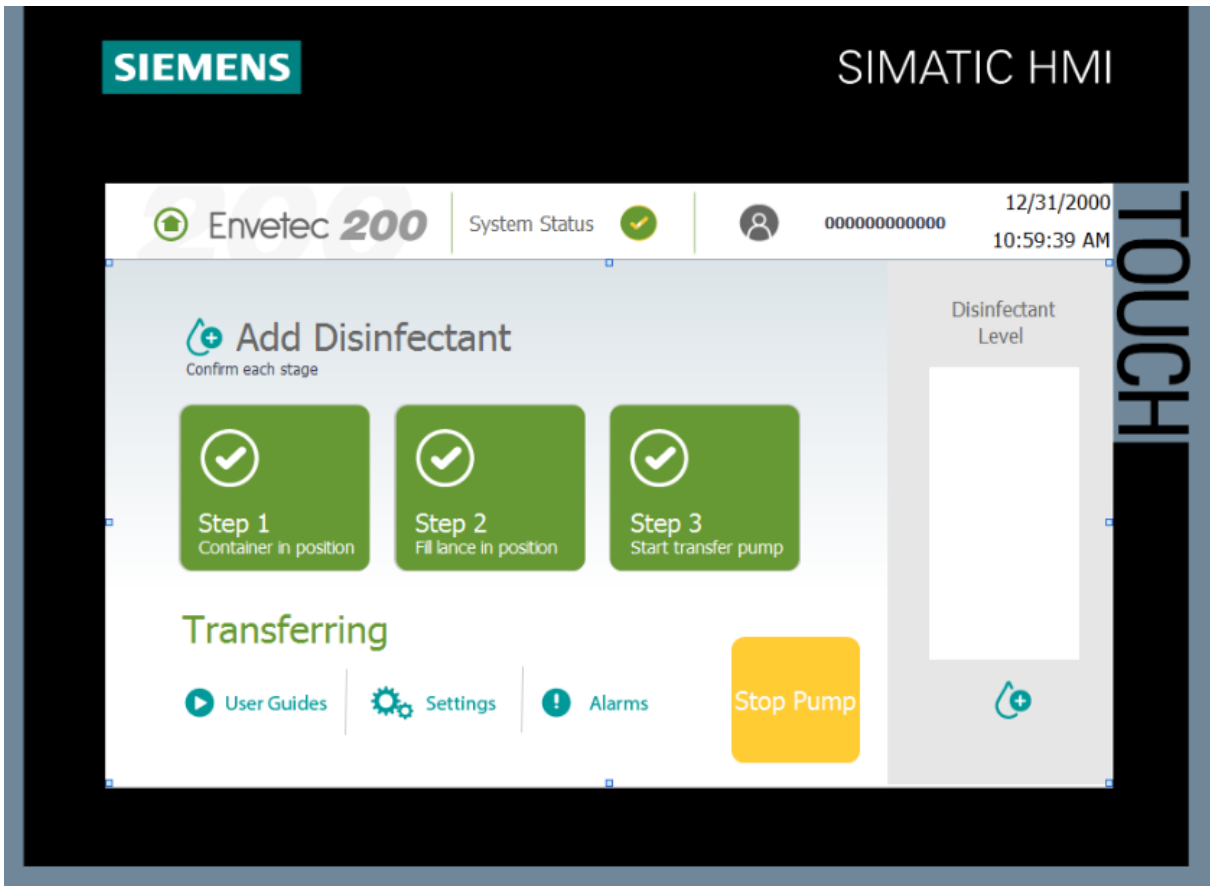
- Once the container of disinfectant is in position on the chemical spill tray, press “Step 1” and wait for “Step 1” indicator to turn green.



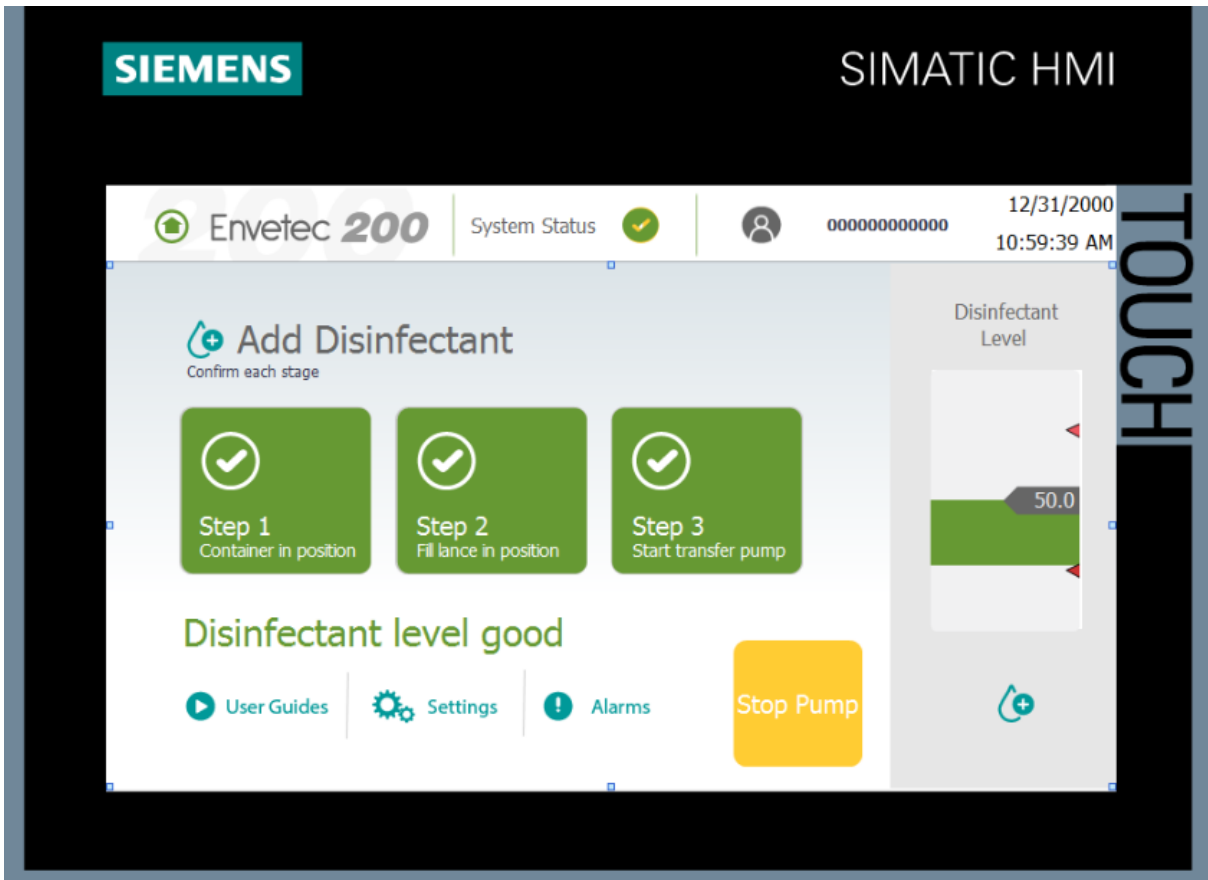
- For filling of the VigorOx 15/23 Antimicrobial Agent into the machine, the minimal requirement is to wear a chemical resistant apron, face shield, and nitrile gloves. Please refer to the most recent label for VigorOx 15/23 Antimicrobial Agent.



- Wearing the appropriate PPE, remove the cap from the VigorOx 15/23 container and insert the filling lance, press “Step 2” and wait for “Step 2” indicator to turn green.



- Press “Step 3” and wait for “Step 3” indicator to turn green. This starts the transfer pump and initiates the transfer of VigorOx 15/23 from the container into the internal tank.



- Once the disinfectant tank has been filled to the required level which may take one or more containers, press “Stop Pump”.
- Remove the fill lance from the VigorOx 15/23 container and place it back into its holder.

Note: The empty VigorOx 15/23 containers can be disposed of by following either of the two methods listed below:

- 1) Triple rinse thoroughly with water and route container for recycling
- 2) Disposal by using the Envetec 200 Series

⚠ WARNING

Appropriate PPE **MUST** be worn for both of these methods



For leak, fire, or accident emergencies, call;

CHEMTREC:

Emergency Response Hotline

1-800-424-9300 (U.S.A.)

1-703-527-3887 (All other Countries)

1-303-389-1409 (Medical – U.S. – Call Collect)

3.3 Operator's Maintenance Schedule

NOTE: Machine maintenance is a critical task and must be carried out on a routine basis. Failure to do so may result in improper waste processing and possible damage to the unit.

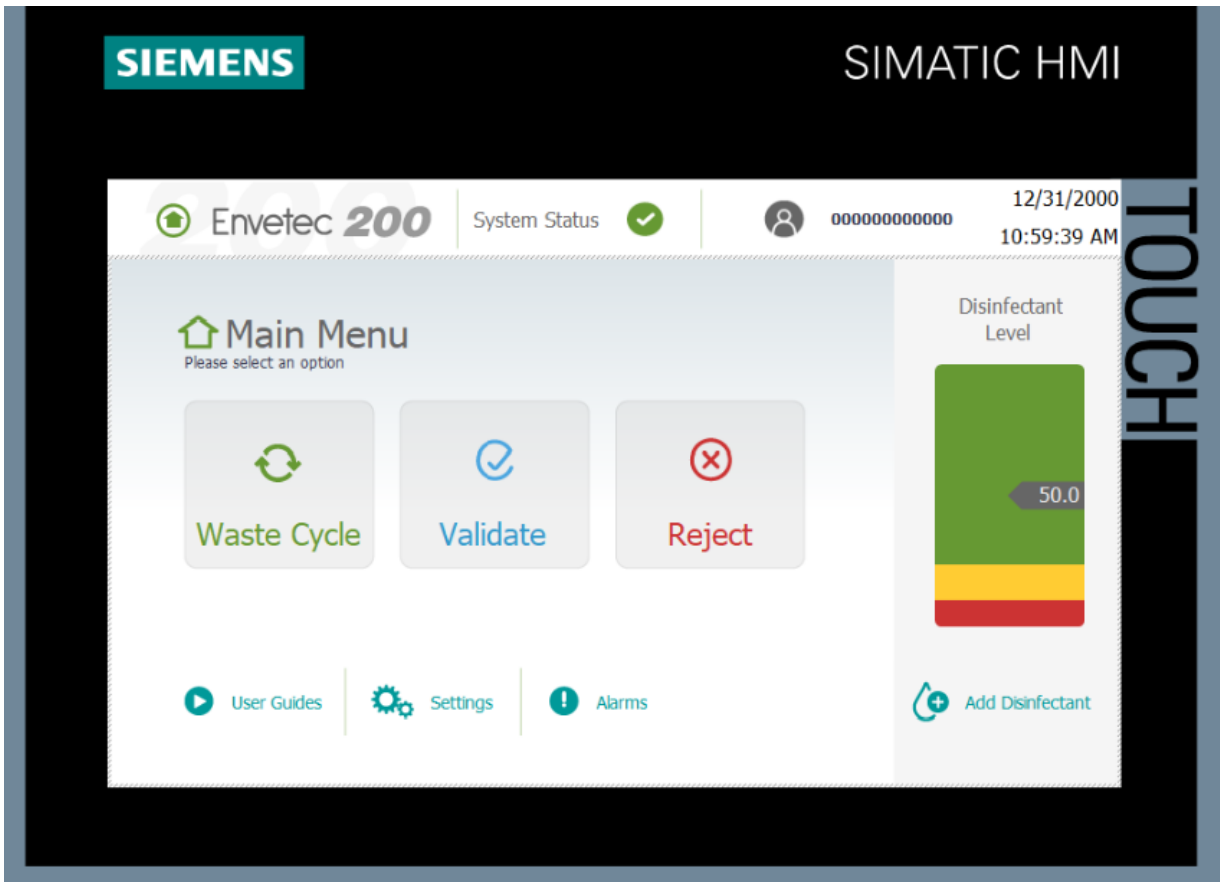
3.3.1 Main and Dewatering Units Maintenance

- Daily
- Weekly

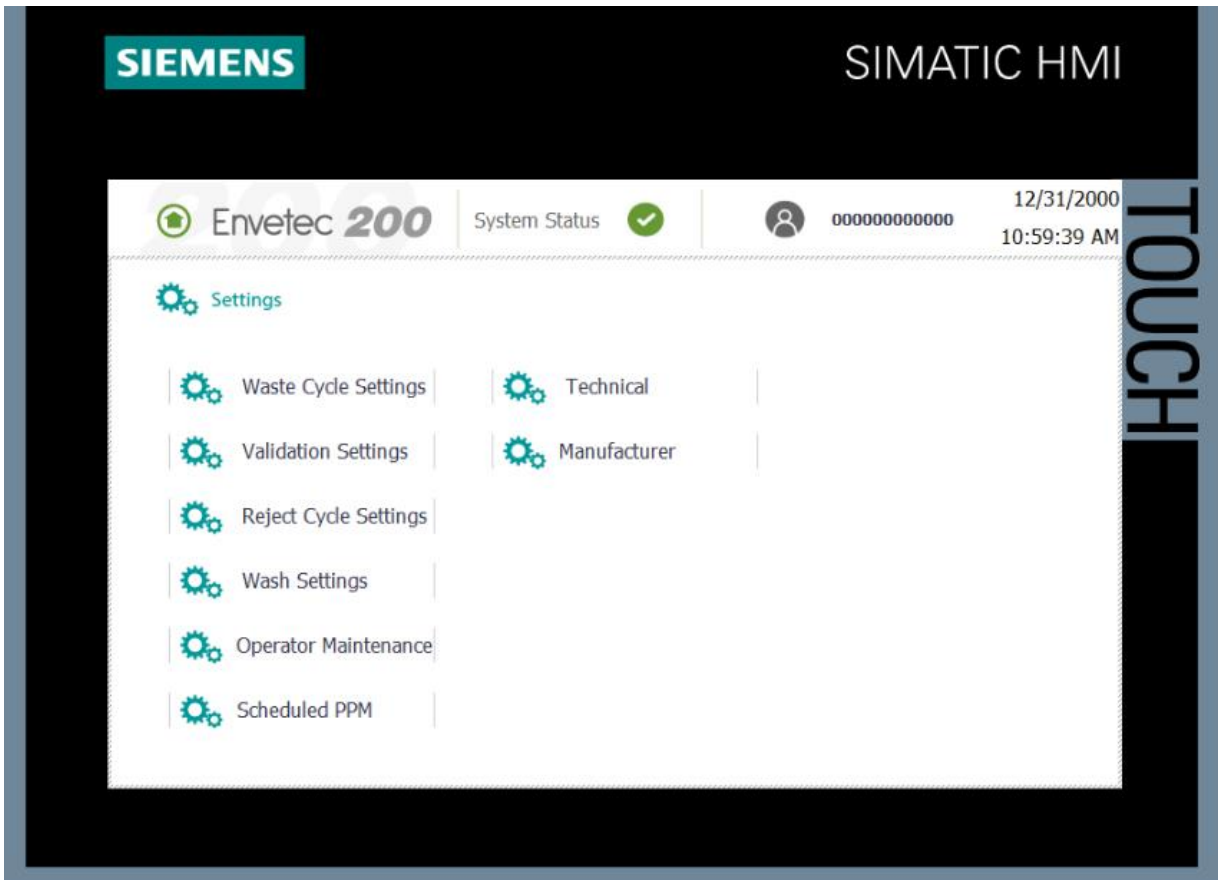
Refer to Appendix 4.8

3.3.2 Operator Maintenance

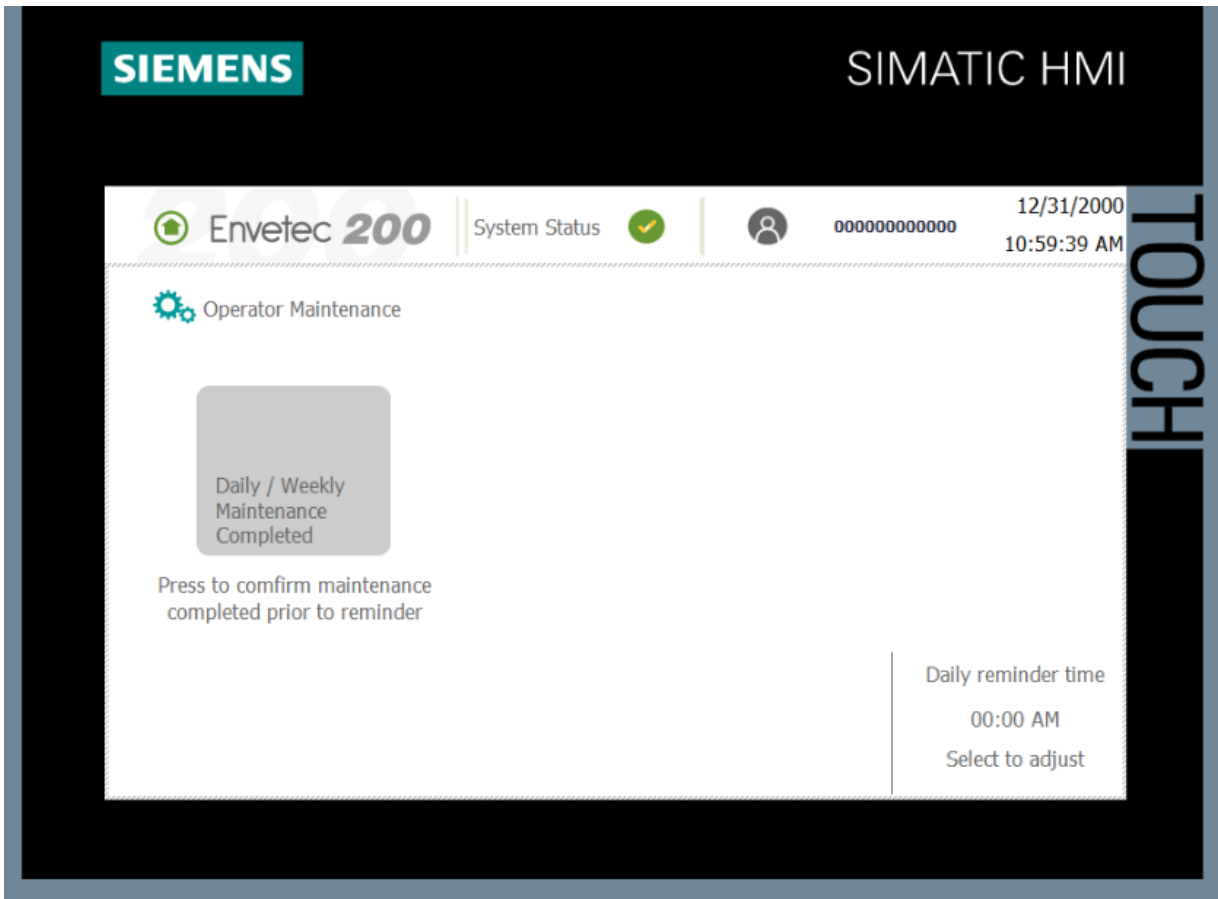
It is the responsibility of the operator to ensure that the daily and weekly maintenance tasks are performed correctly in accordance with the preventative maintenance schedule (**Refer to Appendix 4.8**). Verification of these tasks is also the responsibility of the operator and is achieved by performing the following steps;



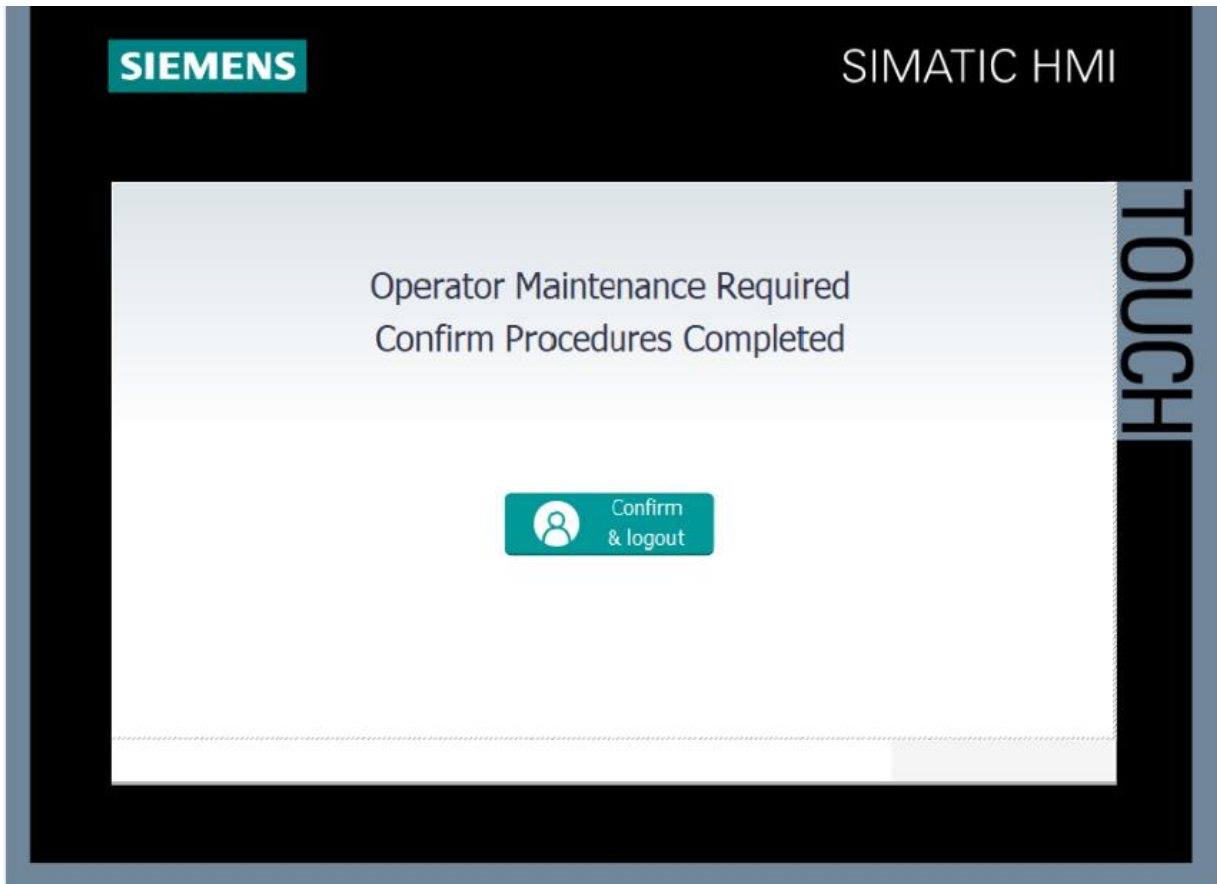
- Press “Settings” on the main menu screen to enter the “Settings Menu” screen.



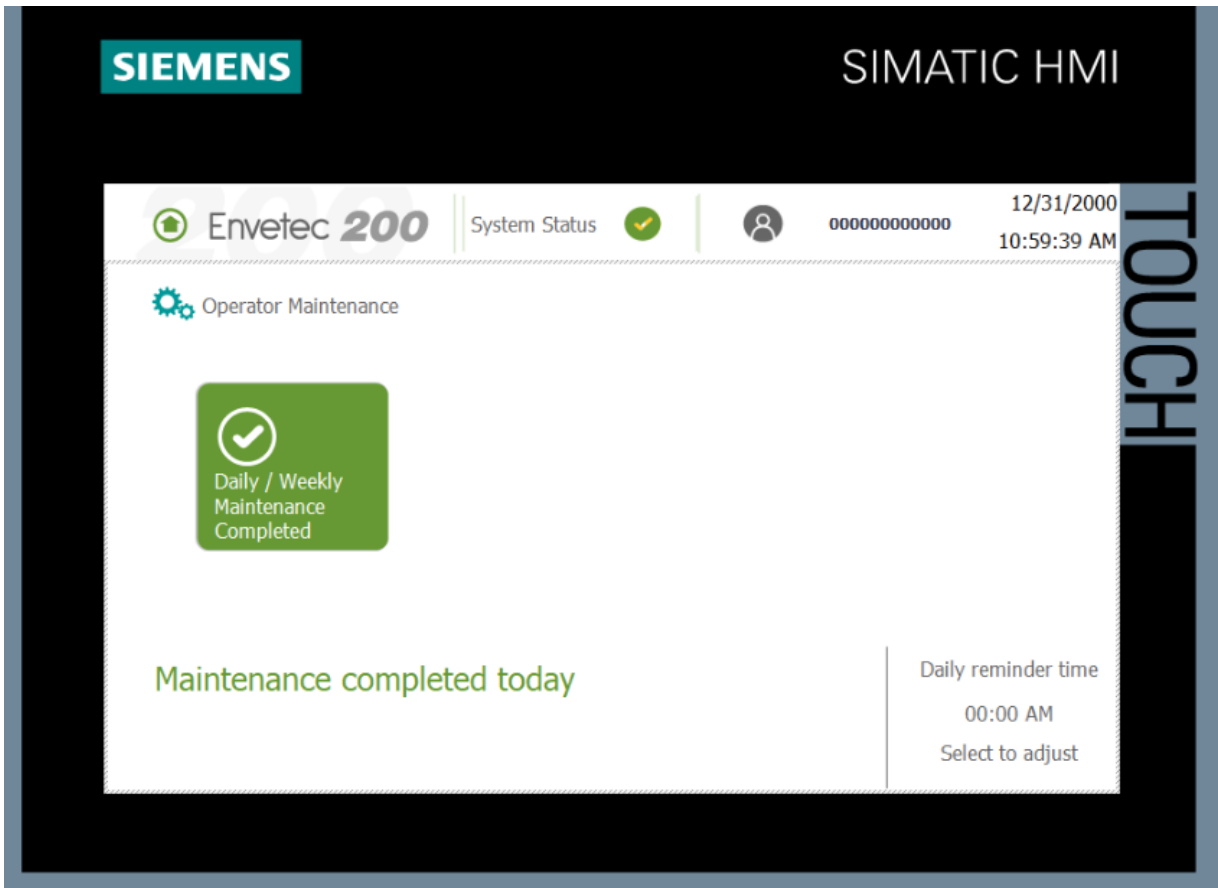
- Select “Operator Maintenance” from the “Settings” menu.



- On completion of “Daily / Weekly” maintenance, firstly press the “Daily / Weekly Maintenance Completed” button.



- Press “Confirm & Logout” button. This confirms that the operator maintenance has been completed and will then return to the start screen.





- If after navigating to the above screen, the “Daily / Weekly Maintenance Completed” button is green and the text “Maintenance completed today” is displayed, this indicates that no operator maintenance is currently required.

3.4 Technician Level Maintenance



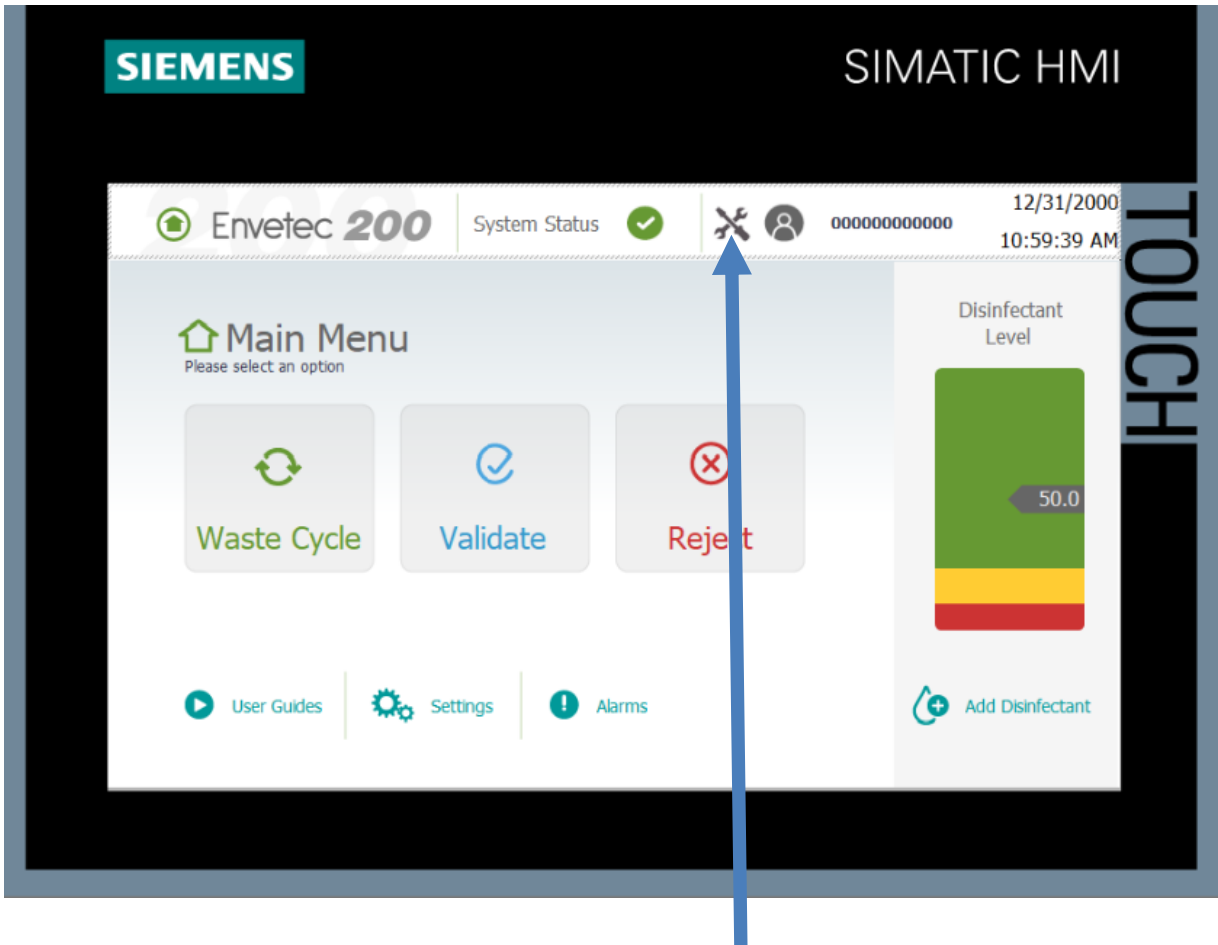
ONLY qualified Envetec 200 Series trained technicians should perform maintenance tasks that are not part of operator daily and weekly maintenance routines.


Operators are advised to contact their area-specific designated Envetec 200 Series technician in this regard when scheduled maintenance is due, or when an unusual or problematic operation is observed. This is indicated on the HMI title bar by the use of the  icon.

Maintenance tasks are tracked by the unit's internal process which records the number of machine cycles completed as well as other significant data for the overall upkeep of the Envetec 200 Series. When scheduled, periodic maintenance is required to be performed, the  icon will appear on the HMI display, alerting the user.

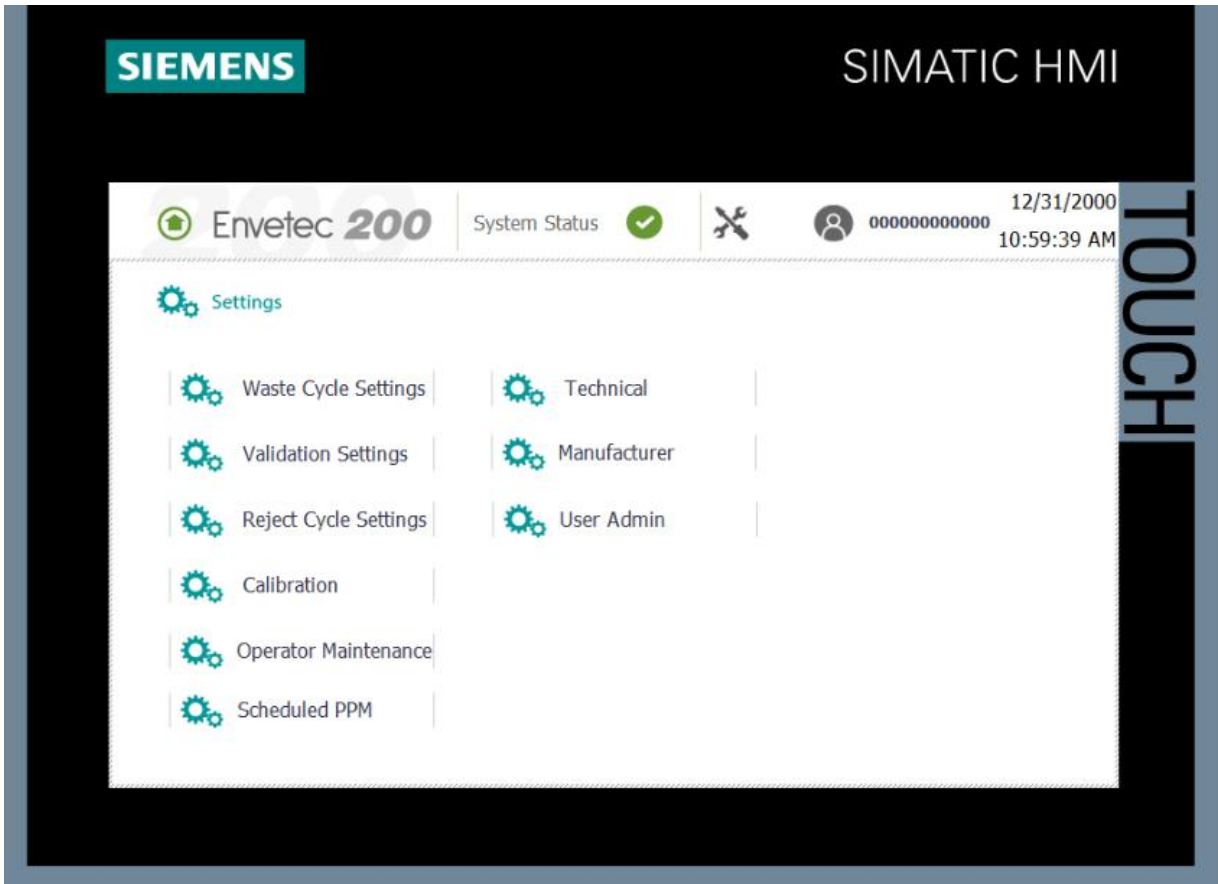
Please refer to the contact numbers available through your designated facility area coordinator, as well as to the ones listed in this operator and maintenance manual.

The enclosure panels **should NEVER be removed** from the unit by any person except by an authorized and qualified Envetec 200 Series trained technician.

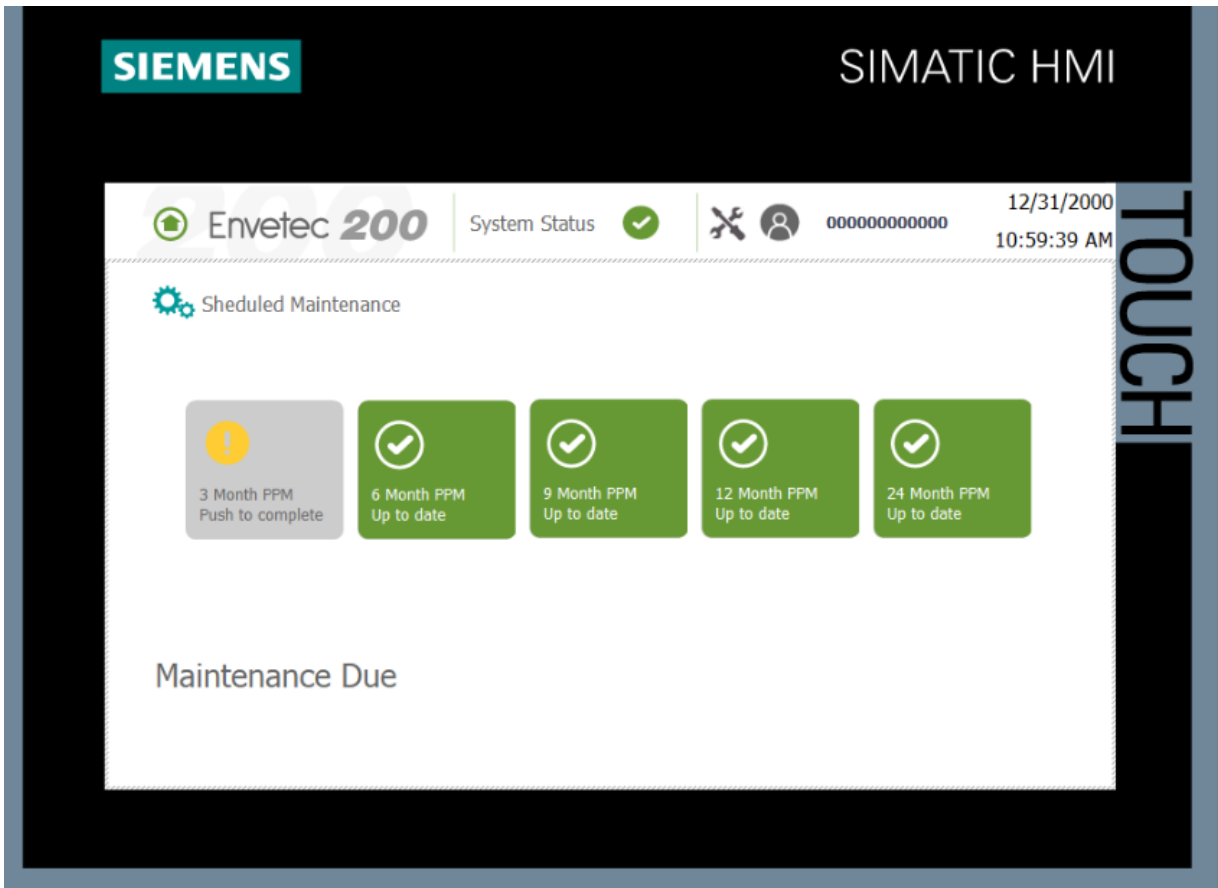


The Envetec Series 200 has varying levels of scheduled preventative maintenance tasks as detailed in **Appendix 4.8**. The technician level maintenance is intended for service engineers and technicians who have been trained and authorised to service the machine. When scheduled preventative maintenance is required, it will be indicated on the HMI screen by the use of the  icon as indicated above.

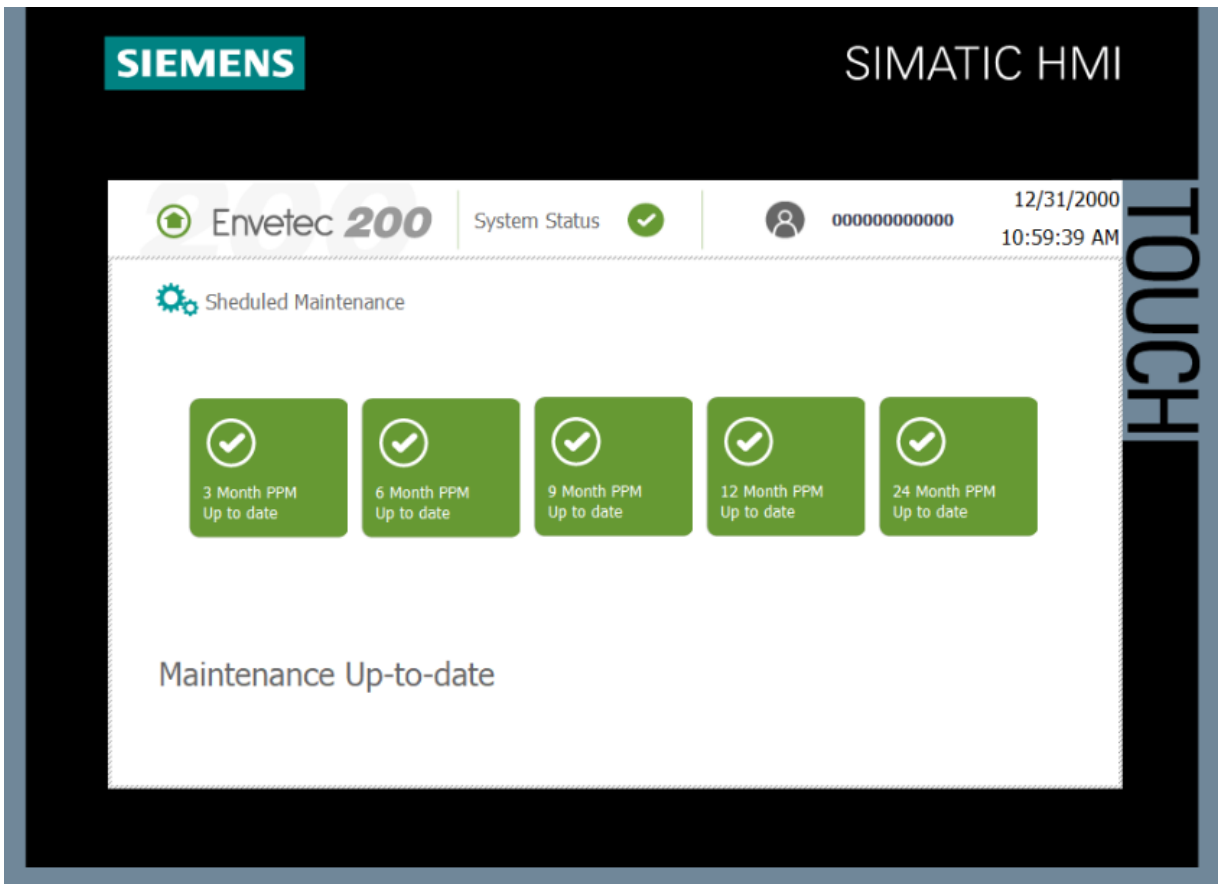
- Press “Settings” on the main menu screen to enter the “Settings Menu” screen.




- Select “Technical” from the “Settings” menu.

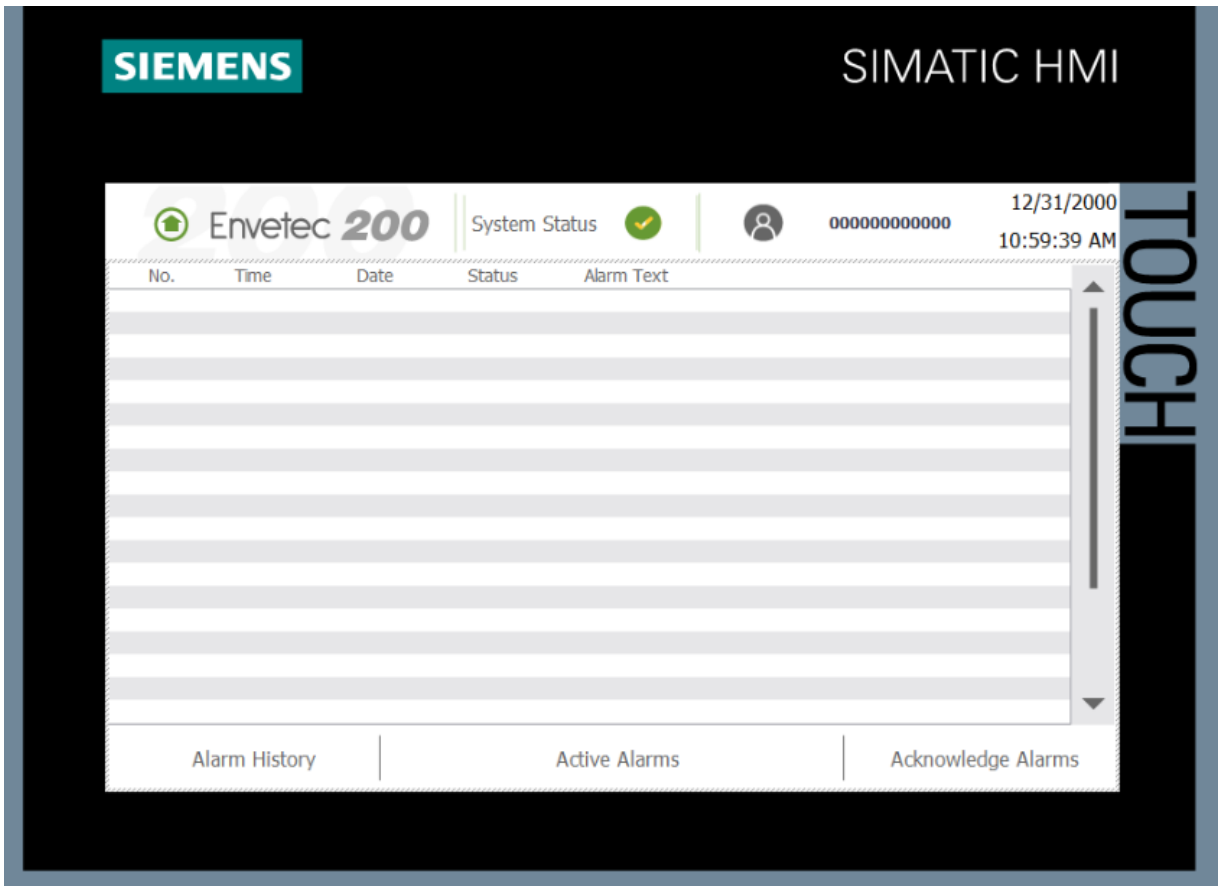



- The “scheduled maintenance” screen will indicate which periodic maintenance is now due to be performed.

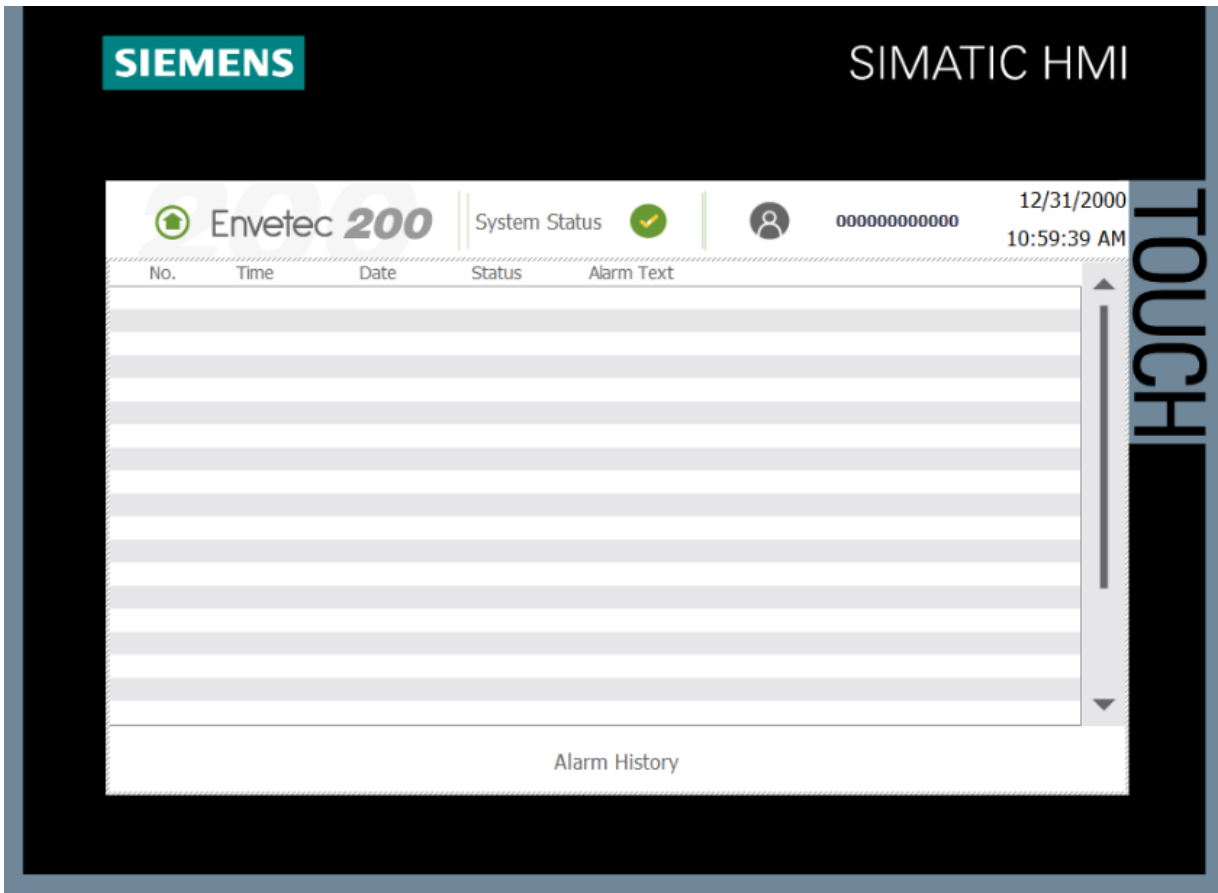


- Only service engineers and technicians who have been trained and authorised to service the machine can press and confirm that the scheduled periodic maintenance has been completed.
- Once pressed, the scheduled periodic maintenance due button will turn green.
- Now press  icon to return to the start screen.

Note: A non-technical level login will not permit this operation.



- The above screen shows the “Active Alarms” screen; any active alarm will be listed on this screen. This screen can be accessed by  pressing the icon when it is displayed on the HMI title bar.



- The above screen shows the “Alarm History” screen; a list of previous system alarms will be listed on this screen. This screen can be accessed by pressing the “Alarm History” tab at the bottom of the screen.

3.5 Trouble Shooting

3.5.1 Identifying Faults

During a cycle, if the internal sensors of the Envetic 200 Series detect a problem, the machine will automatically stop and an error specific message will be displayed on the HMI, as illustrated in the following tables.

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
1	E Stop Pressed	Yes	ESTOP Pressed	System will not run	Emergency Stop Button Pressed on either of the buttons on the machine.	Once the reason for the button being activated, the root cause addressed. Reset the button by pulling the button out. The reset button beside the HMI will illuminate once the system can be reset. Press to reset and the system will reactivate after a time delay.	Operator
2	MB1 Trip	Yes	Shredder Motor Overload Trip	System will not run	Motor Breaker to Shredder Motor tripped.	Reset Breaker, if fault reoccurs call Tech Support.	Authorised Technician
3	MB2 Trip	Yes	Rotational Motor Overload Trip	System will not run	Motor Breaker to Rotational Motor tripped.	Reset Breaker, if fault reoccurs call Tech Support.	Authorised Technician
4	MB3 Trip	Yes	Drain Bed Motor Overload Trip	System will not run	Motor Breaker to Drain Conveyor Motor tripped.	Reset Breaker, if fault reoccurs call Tech Support.	Authorised Technician
5	MB4 Trip	Yes	Inclined Motor Overload Trip	System will not run	Motor Breaker to Inclined Conveyor Motor tripped.	Reset Breaker, if fault reoccurs call Tech Support.	Authorised Technician
6	GF5 Fuse Blown	Yes	ESTOP Pressed	System will not run	Emergency Stop Button Pressed on either of the buttons on the machine.	Replace Fuse, if problem persists call Tech Support	Authorised Technician
7	GF6 Fuse Blown	Yes	Multiple Alarm Messages	System will not run	Digital Input Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician
8	GF7 Fuse Blown	Yes	Multiple Alarm Messages - Fill Door & Inspection Door	System will not run	Door Lock Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
9	GF8 Fuse Blown	Yes	Multiple Alarm Messages - Water Solenoids	System will not run	Water Solenoid Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician
10	GF25 Fuse Blown	Yes	Lid Actuator Fault	System will not run	Lid Actuator Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician
11	GF26 Fuse Blown	Yes	Left Locking Pin Actuator Fault	System will not run	Left Locking Pin Actuator Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician
12	GF27 Fuse Blown	Yes	Right Locking Pin Actuator Fault	System will not run	Right Locking Pin Actuator Fuse Blown	Replace Fuse, if problem persists call Tech Support	Authorised Technician
13	DF1 Trip	Yes	Solution Transfer Pump Overload Trip	Unable to fill chemical into chamber	Chemical fill pump overload or short circuit	Reset fuse, if problem persists call Tech Support	Authorised Technician
14	DF2 Trip	Yes	Lid Actuator Fault	System will not run	Linear actuator lid overload or short circuit	Reset fuse, if problem persists call Tech Support	Authorised Technician
15	DF3 Trip	Yes	Left Locking Pin Actuator Fault	System will not run	Left Linear actuator locking pin overload or short circuit	Reset fuse, if problem persists call Tech Support	Authorised Technician
16	DF4 Trip	Yes	Right Locking Pin Actuator Fault	System will not run	Right Linear actuator locking pin overload or short circuit	Reset fuse, if problem persists call Tech Support	Authorised Technician
17	DF5 Trip	Yes	Vibration Sensor Trip	System will not run	Mechanical Shaft Issue	Investigate damage on shaft. If parts are damaged call technical support	Authorised Technician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
18	DF6 Trip	Yes	ESTOP Pressed	System will not run	Safety circuit short circuit	Reset fuse and reset safety circuit, if problem persists call Tech Support	Authorised Technician
19	DF7 Trip	Yes	Multiple Alarm Messages / 24V DC Supply Fault	System will not run	Digital input circuit short circuit	Investigate damage on remote sensors, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
20	DF9 Trip	Yes	Fill Door Failed Lock Alarm	System will not run	Fill Door Locks damaged or short circuit	Investigate damage on door locks, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
21	DF10 Trip	Yes	Fill Door Failed Unlock Alarm	System will not run	Fill Door Locks damaged or short circuit	Investigate damage on door locks, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
22	DF11 Trip	Yes	Inspection Door Failed Lock Alarm	System will not run	Inspection Door Lock damaged or short circuit	Investigate damage on door locks, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
23	DF12 Trip	Yes	Inspection Door Failed Unlock Alarm	System will not run	Inspection Door Lock damaged or short circuit	Investigate damage on door locks, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
24	DF13 Trip	Yes	Water Main Solenoid Fault	System will not run	Water Main Solenoid damaged or short circuit	Investigate damage on solenoid coil, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
25	DF14 Trip	Yes	Water Fill Solenoid Fault	System will not run	Water Fill Solenoid damaged or short circuit	Investigate damage on solenoid coil, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
26	DF15 Trip	Yes	Water Spray Solenoid Fault	System will not run	Water Spray Solenoid damaged or short circuit	Investigate damage on solenoid coil, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
27	DF16 Trip	Yes	Water Drain Bed Solenoid Fault	System will not run	Water Drain Bed damaged or short circuit	Investigate damage on solenoid coil, if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
28	DF17 Trip	Yes	Lid Limit Switch Fault	System will not run	Lid Limit Switch Fault, Lid has not reached its home position.	Investigate damage scissor link if none are found to be damaged, reset. If parts are damaged call technical support	Authorised Technician
29	DF18 Trip	Yes	Solution Level Sensor Fault	System will not run	Solution Level Sensor out of range	Investigate cable to sensor. If parts are damaged call technical support	Authorised Technician
30	DF19 Trip	Yes	Ambient Temperature Sensor Fault	System will not run	Temperature Sensor out of range	Investigate cable to sensor. If parts are damaged call technical support	Authorised Technician
31	DF20 Trip	Yes	Water Flow Meter Sensor Fault	System will not run	Flow Sensor out of range	Investigate cable to sensor. If parts are damaged call technical support	Authorised Technician
32	DF21 Trip	Yes	Solution Pulse Meter Fault	System will not run	Flow Sensor out of range	Investigate cable to sensor & solution pipe work. If parts are damaged call technical support	Authorised Technician
33	DF22 Trip	Yes	Water Flow Fault	System will not run	Water Flow Restricted	Investigate solenoid cables & water pipe work. If parts are damaged call technical support	Authorised Technician
34	DF23 Trip	Yes	Solution Transfer Pump Flow Fault	System will not run	Solution Transfer Flow Restricted	Investigate pump & solution transfer pipe work. If parts are damaged call technical support	Authorised Technician
35	DF24 Trip	Yes	Water Pressure Sensor Fault	System will not run	Water Pressure Sensor Fault	Investigate pressure transducer. If parts are damaged call technical support	Authorised Technician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
36	DF25 Trip	Yes	Vessel Rotational Sensor Fault	System will not run	Vessel Rotational Sensor Fault	Investigate encoder. If parts are damaged call technical support	Authorised Technician
37	DF26 Trip	Yes	Supply Voltage L1 - L2 Voltage High	System will not run	Supply Voltage L1 - L2 Voltage High	Call Qualified Electrician	Authorised Electrician
38	DF27 Trip	Yes	Supply Voltage L2 - L3 Voltage High	System will not run	Supply Voltage L2 - L3 Voltage High	Call Qualified Electrician	Authorised Electrician
39	DF28 Trip	Yes	Supply Voltage L3 - L1 Voltage High	System will not run	Supply Voltage L3 - L1 Voltage High	Call Qualified Electrician	Authorised Electrician
40	DF29 Trip	Yes	Supply Voltage L1 - L2 Voltage Low	System will not run	Supply Voltage L1 - L2 Voltage Low	Call Qualified Electrician	Authorised Electrician
41	DF30 Trip	Yes	Supply Voltage L2 - L3 Voltage Low	System will not run	Supply Voltage L2 - L3 Voltage Low	Call Qualified Electrician	Authorised Electrician
42	DF31 Trip	Yes	Supply Voltage L3 - L1 Voltage Low	System will not run	Supply Voltage L3 - L1 Voltage Low	Call Qualified Electrician	Authorised Electrician
43	DF32 Trip	Yes	Current Usage L1 High	System will not run	Current Usage L1 High	Call Qualified Electrician	Authorised Electrician
44	DF33 Trip	Yes	Current Usage L2 High	System will not run	Current Usage L2 High	Call Qualified Electrician	Authorised Electrician
45	DF34 Trip	Yes	Current Usage L3 High	System will not run	Current Usage L3 High	Call Qualified Electrician	Authorised Electrician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
46	Water Pressure Low	Yes	Water Pressure Low Alarm	System will not run	Not enough water pressure for the system to run effectively.	Ensure Water supply is turned on and at the correct supply pressure.	Operator/ Local Facilities Technician
47	Chemical Tank low	Yes	Solution Low Level Alarm	System will not run	The chemical reserve tank is critically low level.	Follow procedure on screen to add solution to the internal tank. Once the appropriate level is achieved the system will run.	Authorised Technician
48	Chemical Tank low	Yes	Solution Low Level Alarm	System will run	The chemical reserve tank is at a low level.	Follow procedure on screen to add solution to the internal tank. Once the appropriate level is achieved the system will run.	Authorised Technician
49	Lid Actuator Fail	Yes	Lid Actuator Fault	System will not run	The lid of the shredder chamber will not activate	Call technical support	Authorised Technician
50	Locking Actuator Fail	Yes	Left Locking Pin Actuator Fault / Right Locking Pin Actuator Fault	System will not run	The locking pins will not activate	Call technical support	Authorised Technician
51	Vibration Sensor Activated	Yes	Vibration Sensor Trip	System will not run	Loose equipment on the system.	Investigate for loose equipment, acknowledge alarm and restart.	Authorised Technician
52	VSD1 Fault	Yes	Shredder Motor VSD Fault	System will not run	Fault with the motor, fault with teeth in chamber, i.e. broken tooth, solid material in chamber.	The VSD will reset 3 times before locking out. If locked out call tech support.	Authorised Technician
53	VSD2 Fault	Yes	Rotational Motor VSD Fault	System will not run	Fault with the motor or VSD. Rotational Motor	Reset VSD, if fault reoccurs call Tech Support.	Authorised Technician

No.	Fault	HMI Indication	Message Displayed	Effect Of Fault	Possible Cause	Remedy	Handled By
54	VSD3 Fault	Yes	Drain Bed Motor VSD Fault	System will not run	Fault with the motor or VSD. Drain bed conveyor motor	Reset VSD, if fault reoccurs call Tech Support.	Authorised Technician
55	VSD4 Fault	Yes	Inclined Motor VSD Fault	System will not run	Fault with the motor or VSD. Inclined conveyor motor.	Reset VSD, if fault reoccurs call Tech Support.	Authorised Technician
56	OL1 Fault	Yes	Macerator Pump Overload Trip	System will not run	Fault with the motor. Saniflo unit.	Reset O/L, if fault reoccurs call Tech Support.	Authorised Technician
57	OL2 Fault	Yes	Solution Transfer Pump Overload Trip	System will not run	Fault with the motor. Chemical dose pump motor.	Reset O/L, if fault reoccurs call Tech Support.	Authorised Technician
58	DF35 Trip	Yes	Machine High Temperature Alarm	System will not run	Ambient Temperature High	Check Ventilation, if fault reoccurs call Tech Support.	Authorised Technician
59	DF36 Trip	Yes	Water High Flow Rate Alarm	System will not run	Water Flow Rate too high	Check machine for water leaks & call Tech Support.	Authorised Technician
60	DF37 Trip	Yes	Water Low Flow Rate Alarm	System will not run	Water Flow Rate too low	Check machine supply pressure & water pipework for restrictions for water leaks & call Tech Support.	Authorised Technician

3.5.2 Resetting Faults

- Once the fault has been rectified appropriately, the **FAULT/RESET** button can then be pressed to acknowledge/reset the fault warning.





3.6 System Logs

The Envetec 200 Series records every cycle and error code; this data is stored automatically. Envetec can download this data and provide a report to the facility manager or we can provide software for the facility manager to read the data directly from the machine.

4 APPENDIX

4.1 Unit Specification/System Requirements

PHYSICAL SPECIFICATIONS				
<i>Subject to design modifications</i>				
	Dimensions (Metric)			
	Main Unit	Separator	Max Dimension (combined if applicable)	Overall footprint Required (main unit & separator)
	Millimeters (mm)	Millimeters (mm)	Millimeters (mm)	Sq. Metres
Height	1,882	1,882	1,882	N/A
Length	2,450	2,946	3,380	N/A
Depth	1,055	920	1,975	N/A
Footprint	N/A	N/A	N/A	6.0
Gross Weight (Kgs)	1500	700	2,300	
Gross Weight (Tonnes)			2.30	
	Dimensions (Imperial)			
	Main Unit	Separator	Combined	Overall footprint on floor (main unit & separator)
	Inches	Inches	Inches	Sq. Ft.
Height	74.1	74.0	74.1	N/A
Length	96.5	116.0	133.1	N/A
Depth	41.5	36.2	77.8	N/A
Footprint	N/A	N/A	N/A	64.58
Gross Weight (Lbs)	3,300	1,540	5,060	
Gross Weight (US Tons)			2.53	

INPUT SPECIFICATIONS	
Water consumption per cycle	13.2 US Gallons (50 Litres) – <i>Subject to final calibration and cycle program adjustments</i>
Electrical consumption / cycle	<p>Maximum electrical consumption will be 3 kWhr units of Electricity (Note that this may vary depending on site conditions that are outside of our control).</p> <p><i>Per cycle consumption metrics to be confirmed which Technopath will confirm in due course</i></p>
VigorOx Chemical Antimicrobial Agent	600 mls diluted with process water – Set during machine validation – Subject to final calibration and cycle program adjustments
PRE-INSTALLATION ENABLEMENTS	
<ul style="list-style-type: none"> • <i>Prior to positioning the system, a level concrete floor should be finished with a waterproof seal. The unit should be positioned centrally in order to facilitate access for operators and maintenance personnel.</i> • <i>Adequate plumbing, electrical and drainage specifications must be met before the system can run.</i> 	
<p>Electricity</p> <p><i>Note: If a 3-phase 480V supply is not available, a transformer will be required. Input voltage (will be site Specific); Output Voltage = 460 Volts, 60Hz, 10kVa</i></p>	<ul style="list-style-type: none"> • North America: 3-phase 5-wire connection (6 mm² / 10 AWG), 480 volts, 60Hz • 1 x Digital residual current circuit-breaker, 40A, 4p, 300mA, type G/BFQ • 1 x Wall mounted 63 amp isolator switch; • Two wall mounted single phase double sockets (for maintenance purposes)
<p>Information Technology</p> <p><i>The Envetec system features an optional stand-alone independent GSM connection to overcome local network firewall/security restrictions at the site. Will be compliant with FCC and all other regulatory requirements</i></p>	<ul style="list-style-type: none"> • GSM signal strength within the treatment room to be tested in advance in order to optimise the hardware configuration required. • Preference is to utilise the T Mobile (Sprint) network if available. The signal may need to be augmented with an external antenna linked by CAT V cable. • Wall mounted fixed line connection (RJ45 Ethernet and voice) connection box to be installed in the treatment room as back-up/failover and for voice telephone extension.

Water supply	<p>$\frac{3}{4}$-inch supply line with a minimum supply pressure of 4Bar/60 psi, minimum flow rate of 8 US Gallons p/min (30L p/min).</p> <p><i>A separate water tank and water booster pump (with an expansion vessel and pressure switch) may be required to meet these requirements depending on the site.</i></p> <p>A wall mounted potable water tap with a hose connection for routine machine maintenance is also strongly recommended.</p>
Water quality	Potable water between 6.5 and 8.5 pH
Drain	110mm Diameter (4in.) sewer drain at floor level
Floor	The floor surface should be tiled, painted (epoxy, non-slip) or waterproofed with a heavy-duty sealer.
MISCELLANEOUS	
Ventilation	<p>Natural ventilation will normally be sufficient. If the system is to be situated in an enclosed treatment room, an extraction fan will be required.</p> <p>Similar number of air changes per hour should apply within the treatment room as pertains to a laboratory/hospital soiled/trash chute treatment area (6 - 10 changes per hour); per OSHA Guidelines</p>
Noise level	Under normal operating conditions, the system will not exceed OSHA guidelines (85 dba); levels in excess of 85 dba will necessitate ear protection to be worn by operators
Vibration	Will be below OSHA standards
Heat	Minimal – system operates at ambient temperature
Vapors	Minimal but required to be situated in a ventilated area.
Environmental	System must be located indoors and maintained at normal ambient temperatures 40°F - 95°F (4°C - 35°C)

4.2 Right-to-Know for VigorOx 15/23

Health & Safety Transparency

VigorOx 15/23 in its concentrated form is considered a hazardous chemical by OSHA and the Air Contaminants Regulation, and by the American Conference of Governmental Hygienists. It is not considered to be carcinogenic.

Concerning VigorOx 15/23

PRECAUTIONARY STATEMENTS

Hazardous to Humans and Domestic Animals

Caustic. Causes eye and skin irritation. Avoid contact with eyes. Do not get into eyes, on face, on clothing. Wear goggles or face shield and rubber gloves when handling. After handling with soap and water. After handling, do not breathe vapor or spray mist. Do not enter an enclosed area without proper protection.

Prevent Air Contaminant Release - Strong oxidizing agent. May react with other hazardous materials. Avoid contact with other hazardous materials. Vaporize/boil off or scrub with water. Vaporize/boil off or scrub with water.

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VigorOx[®] 15/23

Antimicrobial Agent

Active Ingredients:	Peracetic acid, 15%	KEEP OUT OF REACH OF CHILDREN DANGER
Inert Ingredients:	Hydrogen peroxide, 23%	
Total:	100%	

STORAGE AND DISPOSAL

STORAGE

Store in original container. Avoid contact with acids, alkalis, oils, greases, organic materials, and amines. Store in a cool, dry place. Avoid contact with other oxidizing agents. Store in a cool, dry place. Avoid contact with other oxidizing agents.

DISPOSAL

Dispose of in accordance with local, state, and federal regulations. Do not discharge into sewer system. Do not discharge into sewer system. Do not discharge into sewer system.

PERACETIC ACID

Peracetic acid is a strong oxidizing agent and may react with other hazardous materials. Avoid contact with other hazardous materials. Vaporize/boil off or scrub with water. Vaporize/boil off or scrub with water.

KEEP OUT OF REACH OF CHILDREN DANGER

- Recirculating process and cooling water systems
- Pump and pump seal systems
- Cooling preservation
- Dispersed pigment preservation

STORAGE AND DISPOSAL

Store in original container. Avoid contact with acids, alkalis, oils, greases, organic materials, and amines. Store in a cool, dry place. Avoid contact with other oxidizing agents. Store in a cool, dry place. Avoid contact with other oxidizing agents.

USE SIDE PANEL FOR PRECAUTIONARY STATEMENTS

Manufactured by:
PeroxyChem
2006 Market Street, Suite 3200
Philadelphia, PA 19103

VigorOx 15/23 is a Peracetic acid-based disinfectant. As with most chemical disinfectants, these compounds can cause harm to the human body if not used with caution.

Peracetic acid is considered a dermal and respiratory irritant, and it should be used as directed by OSHA and Product Labeling Guidance. The Envetec 200 Series Operator & Maintenance Manual instructs the user on how to safely handle the disinfectant and prevent exposure. The treatment process incorporates the addition of water in the cycle.





4.3 Safety Data Sheet (SDS) VigorOx 15/23 Antimicrobial Agent

SAFETY DATA SHEET VigorOx 15/23 Antimicrobial Agent



SAFETY DATA SHEET
VigorOx® 15/23 Antimicrobial Agent

SDS # : 79-21-0-27-1
Revision date: 2021-09-24
Format: NA
Version: 1.12



1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier.

Product Name	VigorOx® 15/23 Antimicrobial Agent
EPA Registration Number	65402-8
CAS-No	79-21-0
Synonyms	Peracetic Acid; Ethaneperoxic Acid; Peroxyacetic Acid; Acetyl Hydroperoxide.

Recommended use of the chemical and restrictions on use.

Recommended Use:	Recirculating process and cooling water system
Restrictions on Use	Use as recommended by the label.

Manufacturer/Supplier.

PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
267/422-2400 (General Information)
sdsinfo-pco@evonik.com (E-Mail General Information)

Emergency telephone numbers.

For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)
+1 303/ 389-1409 (Medical - U.S. - Call Collect)

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2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)


Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 4
Acute toxicity - Inhalation (Vapors)	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Organic Peroxide	Type F
Flammable liquids	Category 4
Corrosive to Metals	Category 1

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Danger

Hazard Statements
 H314 - Causes severe skin burns and eye damage
 H302 - Harmful if swallowed
 H312 - Harmful in contact with skin
 H332 - Harmful if inhaled
 H335 - May cause respiratory irritation
 H242 - Heating may cause a fire
 H227 - Combustible liquid
 H290 - May be corrosive to metals



Precautionary Statements - Prevention

- P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
- P260 - Do not breathe mist, vapours or spray
- P271 - Use only outdoors or in a well-ventilated area
- P264 - Wash face, hands and any exposed skin thoroughly after handling
- P270 - Do not eat, drink or smoke when using this product
- P234 - Keep only in original packaging
- P240 - Ground/bond container and receiving equipment
- P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- P220 - Keep away from clothing and other combustible materials

Precautionary Statements - Response

- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P310 - Immediately call a POISON CENTER or doctor
- P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
- P363 - Wash contaminated clothing before reuse
- P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing



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P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P310 - Immediately call a POISON CENTER or doctor
P370 + P378 - In case of fire: Use water for extinction

Precautionary Statements - Storage

P410 + P403 - Protect from sunlight. Store in a well-ventilated place
P411 + P235 - Store at temperatures not exceeding 50 °C/ 122 °F. Keep cool
P420 - Store separately

Precautionary Statements - Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

No hazards not otherwise classified were identified.

Other Information

Supplemental information

Do not store on wooden pallets. Avoid damage to containers. In case of decomposition: isolate container, douse container with cool water and dilute with large volumes of water. In case of leak or spill: Stop leak if this can be done without risk. Flush area with large quantities of water. Undiluted material should not be allowed to enter confined spaces. Clean up spills promptly to prevent material damage. Risk of decomposition by heat or by contact with incompatible materials

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No	Weight %
Water	7732-18-5	45
Hydrogen Peroxide	7722-84-1	23
Acetic Acid	64-19-7	16
Peracetic Acid	79-21-0	15
Sulfuric Acid	7664-93-9	1

4. FIRST AID MEASURES

Eye Contact	In case of eye contact, remove contact lenses and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.
Skin Contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.
Inhalation	Move to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.
Ingestion	Clean mouth with water and afterwards drink plenty of water. Do NOT induce vomiting. Call a physician or poison control center immediately.
Most important symptoms and effects, both acute and delayed	Liquid and mist are corrosive (causing burns); direct contact could cause irreversible damage to eyes including blindness and/or irreversible destruction of skin tissue. Vapor/mist will irritate nose, throat and lungs but will usually subside when exposure ceases.
Indication of immediate medical attention and special treatment needed, if necessary	This product can be corrosive to skin, eyes and mucous membranes. Consideration should be given to careful endoscopy as stomach or esophageal burns, perforations or strictures may occur. Careful gastric lavage with an endotracheal tube in place should be considered. Observation may be warranted. Treatment is controlled removal of exposure



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followed by symptomatic and supportive care.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Water. Cool containers with flooding quantities of water until well after fire is out.
Unsuitable extinguishing media	Chemical type extinguishers are not effective with peracetic acid or hydrogen peroxide.
Specific Hazards Arising from the Chemical	Decomposes under fire conditions to release oxygen that intensifies the fire.
Explosion data	
Sensitivity to Mechanical Impact	Not sensitive.
Sensitivity to Static Discharge	Not sensitive.
Protective equipment and precautions for firefighters	Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing, gloves and eye/face protection. For personal protection see Section 8.
Other	For further clean-up instructions, call PeroxyChem Emergency Hotline number listed in Section 1 "Product and Company Identification" above.
Environmental Precautions	Prevent material from entering into soil, ditches, sewers, waterways, and/or groundwater. See Section 12, Ecological Information for more detailed information.
Methods for Containment	Control runoff and isolate discharged material for proper disposal. Do not allow material to enter storm or sanitary sewer system.
Methods for cleaning up	Hydrogen peroxide is an ingredient in this product; completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on combustible materials such as paper, fabrics, leather or wood can cause the material to ignite and result in a fire. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling	Handle product only in closed system or provide appropriate exhaust ventilation. Drums - Empty as thoroughly as possible. Triple rinse drums before disposal. Avoid contamination; impurities accelerate decomposition. Never return product to original container.
Storage	Store in original container. Do not stored near reducing agents, fuels or other non-compatible materials. Keep in a dry, cool and well-ventilated place. Keep away from direct sunlight. Keep away from heat and sources of ignition i.e., steam pipes, radiant heaters, hot air vents or welding sparks. Storage temperatures must not exceed product SADT or 50 °C, whichever is lower. From a quality perspective, lower storage temperatures are recommended to maintain product assay. Use first in, first out storage system. Do not stack carboys more than two high, and NEVER double-stack pallets of carboys. Containers must be vented. Shelf life for 5-gallon carboys is 6 months. Shelf life for other types of packaging is one year.
Packaging material	Do not store in metal containers.
Incompatible products	Strong reducing agents; Combustible materials; Heavy metals

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
Acetic Acid 64-19-7	STEL: 15 ppm TWA: 10 ppm	TWA: 10 ppm TWA: 25 mg/m ³	IDLH: 50 ppm TWA: 10 ppm TWA: 25 mg/m ³ STEL: 15 ppm STEL: 37 mg/m ³	Mexico: TWA 10 ppm Mexico: TWA 25 mg/m ³ Mexico: STEL 15 ppm Mexico: STEL 37 mg/m ³
Sulfuric Acid 7664-93-9	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³	IDLH: 15 mg/m ³ TWA: 1 mg/m ³	Mexico: TWA 0.2 mg/m ³
Hydrogen Peroxide 7722-84-1	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³	IDLH: 75 ppm TWA: 1 ppm TWA: 1.4 mg/m ³	Mexico: TWA 1 ppm
Peracetic Acid 79-21-0	STEL: 0.4 ppm	-	-	-
Chemical name	British Columbia	Quebec	Ontario TWA/EV	Alberta
Acetic Acid 64-19-7	TWA: 10 ppm STEL: 15 ppm	TWA: 10 ppm TWA: 25 mg/m ³ STEL: 15 ppm STEL: 37 mg/m ³	TWA: 10 ppm STEL: 15 ppm	TWA: 10 ppm TWA: 25 mg/m ³ STEL: 15 ppm STEL: 37 mg/m ³
Sulfuric Acid 7664-93-9	TWA: 0.2 mg/m ³	TWA: 1 mg/m ³ STEL: 3 mg/m ³	TWA: 0.2 mg/m ³ thoracic	TWA: 1 mg/m ³ STEL: 3 mg/m ³
Hydrogen Peroxide 7722-84-1	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³	TWA: 1 ppm	TWA: 1 ppm TWA: 1.4 mg/m ³
Peracetic Acid 79-21-0	-	-	STEL: 0.4 ppm	-

Appropriate engineering controls

Engineering measures Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Individual protection measures, such as personal protective equipment

- Eye/Face Protection** Tightly fitting safety goggles. Face-shield.
- Skin and Body Protection** Rubber or neoprene footwear. Impervious clothing materials such as rubber, neoprene, nitrile or polyvinyl chloride. Wear liquid proof rubber or neoprene gloves. Hydrogen peroxide is an ingredient in this product; completely submerge hydrogen peroxide contaminated clothing or other materials in water prior to drying. Residual hydrogen peroxide, if allowed to dry on combustible materials such as paper, fabrics, leather or wood can cause the material to ignite and result in a fire.
- Hand Protection** Rubber/latex/neoprene or other suitable chemical resistant gloves. Wash the outside of gloves with soap and water prior to removal. Inspect regularly for leaks.
- Respiratory Protection** If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
- Hygiene measures** Clean water should be available for washing in case of eye or skin contamination. Remove and wash contaminated clothing before re-use. Do not eat, drink or smoke when using this



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product.

General information

Protective engineering solutions should be implemented and in use before personal protective equipment is considered.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear, colorless liquid
Physical State	Liquid
Color	Colorless
Odor	stinging, Pungent, vinegar-like
Odor threshold	No information available
pH	< 1.0 @ 20 °C 2.78 @ 20 °C (1% solution)
Melting point/freezing point	-49 °C / -56 °F
Boiling Point/Range	108 °C / 226 °F (with decomposition)
Flash point	Closed cup: 68 °C Open Cup: No measurable flash point up to 100° C Fire Point: No fire point. This material will not sustain a flame > 1.0 (n-butyl acetate=1)
Evaporation Rate	Substance does not burn but will support combustion
Flammability (solid, gas)	
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	22 mm Hg @ 20°C (68°F)
Vapor density	No information available
Density	9.7 lb/gal @ 25 °C
Specific gravity	1.16 @ 25 °C
Water solubility	completely soluble
Solubility in other solvents	No information available
Partition coefficient	log Pow = -0.52 @ 25 °C
Autoignition temperature	251 - 254 °C
Decomposition temperature	> 55 °C (SADT)
Viscosity, kinematic	No information available
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	Strong oxidizer
Other Information	
Molecular weight	No information available



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10. STABILITY AND REACTIVITY

Reactivity	Reactive and oxidizing agent. Organic peroxide.
Chemical Stability	Stable under recommended storage conditions. Contamination or heat could initiate decomposition.
Possibility of Hazardous Reactions	May produce explosive reactions with Acetic Anhydride.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks. Temperatures above 50-C or SADT, whichever is lower.
Incompatible materials	Strong reducing agents; Combustible materials; Heavy metals.
Hazardous Decomposition Products	Acetic acid and oxygen that supports combustion.

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral	LD50 Rat = 50 -500 mg/kg/bw (35% Peracetic acid) LD50 rat = 1026-1780 mg/kg/bw (15% Peracetic acid)
LD50 Dermal	LD50 rat = 185-3622 mg/kg/bw (2.6-6.11% Peracetic acid) LD50 Rat = 1957 mg/kg/bw (15% Peracetic acid) LD50 rat = 1147 mg/kg/bw (5% Peracetic acid)
LC50 Inhalation	LD50 rat = >2000 mg/kg/bw (Peracetic acid 0.15%-0.89%) LC50 (4-hr) Rat = 4080 mg/m ³ (5% Peracetic acid) (aerosol)
Serious eye damage/eye irritation	Corrosive. Risk of serious damage to eyes.
Skin corrosion/irritation	Corrosive to skin. Severely irritating (rabbit).
Sensitization	Did not cause sensitization on laboratory animals.

Information on toxicological effects

Symptoms	Liquid and mist are corrosive and can cause burns, direct contact could cause irreversible damage to eyes including blindness and/or irreversible destruction of skin tissue. Vapor/mist will irritate the nose, throat and lungs, but will usually subside when exposure ceases. The severity of the effects depends in the concentration and dose.
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic toxicity	Repeated inhalation of the mist may cause inflammation of the upper respiratory tract, chronic bronchitis and etching of the dental enamel.
Carcinogenicity	Did not show carcinogenic effects in animal experiments. Topical applications do not produce skin tumors. Not recognized as carcinogenic by Research Agencies (IARC, NTP, OSHA, ACGIH).
Mutagenicity	This product is not recognized as mutagenic by Research Agencies. Did not show mutagenic effects in animal experiments.



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Reproductive toxicity This product is not recognized as reprotox by Research Agencies. No toxicity to reproduction in animal studies.

STOT - single exposure May cause respiratory irritation.
STOT - repeated exposure Not classified.

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Peracetic Acid (79-21-0)				
Active Ingredient(s)	Duration	Species	Value	Units
Peracetic Acid 15%	96 h LC50	Oncorhynchus mykiss (rainbow trout)	0.53	mg/L
Peracetic Acid 5%	96 h LC50	Bluegill sunfish	1.1	mg/L
Peracetic Acid	33 d NOEC	Brachydanio rerio	0.00225	mg/L
Peracetic Acid 5%	96 h LC50	Oncorhynchus mykiss (rainbow trout)	1.6	mg/L
Peracetic Acid 5%	48 h EC50	Daphnia magna	0.73	mg/L
Peracetic Acid 12.5%	48 h EC50	Mytilus edulis	0.27	mg/L
Peracetic Acid 15%	21 d NOEC	Daphnia magna	0.05	mg/L
Peracetic Acid 5%	72 h EC50	Selenastrum capricornutum	0.16	mg/L
Peracetic Acid 5%	120 h EC50	Selenastrum capricornutum	0.18	mg/L
Peracetic Acid 5%	72 h NOEC	Selenastrum capricornutum	0.061	mg/L
Peracetic Acid	3 h EC50	Respiration inhibition test (OECD 209)	5.1	mg/L

Persistence and degradability Peracetic acid is completely miscible with water. Aqueous solutions of peracetic acid hydrolyze to acetic acid and hydrogen peroxide. Product is biodegradable.

Bioaccumulation Based on its low octanol-water partition coefficient and its rapid degradation in the environment, this product is not bioaccumuable.

Mobility Peracetic acid released in the environment will partition almost exclusively (>99%) to the water compartment. Only a minor part (<1%) will remain in the atmosphere, where it is expected to undergo rapid decomposition with a half life of 22 minutes. The fate of peracetic acid in the environment is mainly determined by its degradation.

Other Adverse Effects None known.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261). If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance.

US EPA Waste Number D001; D002.



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Contaminated Packaging Do not rinse returnable containers or receptacles not intended for other uses. Non-returnable containers that held this material should be cleaned by triple-rinsing prior to recycle or disposal. Dispose of in accordance with local regulations. Empty remaining contents. Clean container with water.

14. TRANSPORT INFORMATION

DOT

UN/ID no UN3109
Proper Shipping Name ORGANIC PEROXIDE TYPE F, LIQUID (<=17% Peracetic Acid with <=26% Hydrogen Peroxide)
Hazard class 5.2
Subsidiary class 8
Reportable Quantity (RQ) Hazardous Substance/RQ: Not applicable

TDG

UN/ID no UN3109
Proper Shipping Name ORGANIC PEROXIDE TYPE F, LIQUID (<=17% Peracetic Acid with <=26% Hydrogen Peroxide)
Hazard class 5.2
Subsidiary class 8
Packing Group II

ICAO/IATA

Air regulation permit shipment of peracetic acid in non-vented containers for Air Cargo Only aircraft, as well as for Passenger and Cargo aircraft. HOWEVER, all peracetic acid containers are vented and therefore, air shipments of peracetic acid are not permitted. IATA air regulations state that venting of packages containing oxidizing substances is not permitted for air transport.

IMDG/IMO

UN/ID no UN3109
Proper Shipping Name ORGANIC PEROXIDE TYPE F, LIQUID (<=17% Peracetic Acid with <=26% Hydrogen Peroxide)
Hazard class 5.2
Subsidiary Hazard Class 8
Marine Pollutant When shipped by vessel, this material meets the definition of an environmentally hazardous substance.

OTHER INFORMATION

Protect from physical damage. Material is shipped in 5 gal. (45 lb.), 30 gal. (250 lb.) and 55 gal. (495 lb.) vented linear (not cross-linked) polyethylene containers, as well as linear (not cross-linked) polyethylene IBC's (330 gal.). Do not ship on wooden pallets.

15. REGULATORY INFORMATION

U.S. Federal Regulations

Clean Air Act (CAA) - Accidental Release Prevention

Peracetic acid is listed as a Regulated Toxic Substance at 40 CFR 68.130. Pursuant to the threshold determination provisions for mixtures at 40 CFR 68.155(b)(1), the partial pressure of peracetic acid in VigorOx products (up to 35% solutions) are less than 10 mm Hg at 25°C, and thus the product, as sold, is not subject to the threshold determination under the Risk Management Planning regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical name	CAS-No	Weight %	SARA 313 - Threshold Values %
Sulfuric Acid - 7664-93-9	7664-93-9	1	1.0
Peracetic Acid - 79-21-0	79-21-0	15	1.0



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SARA 311/312 Hazard Categories

This product has the following hazards that are reportable under The Emergency Planning and Community Right-to-Know rule (EPCRA Tier II):

- Flammable/combustible material
- Organic Peroxide
- Corrosive to Metals
- Acute toxicity
- Serious eye damage/eye irritation
- Skin corrosion/irritation
- Specific Target Organ Toxicity (STOT) - Single Exposure

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Acetic Acid 64-19-7	5000 lb			X
Sulfuric Acid 7664-93-9	1000 lb			X

CERCLA/EPCRA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Response Compensation and Liability Act (CERCLA) or as an extremely hazardous substance (EHS) under the Emergency Planning and Community Right to Know Act (EPCRA) / Superfund Amendments and Reauthorization Act (SARA).

Chemical name	CERCLA Hazardous Substances RQs (40 CFR 302.4)	SARA Sec 304 Extremely Hazardous Substance RQ (40 CFR 355 Appendix A)	SARA Section 302 EHS Threshold Planning Quantity (40 CFR 355)
Hydrogen Peroxide 7722-84-1		1000 lb	1000 lb
Acetic Acid 64-19-7	5000 lb		
Peracetic Acid 79-21-0		500 lb	500 lb
Sulfuric Acid 7664-93-9	1000 lb	1000 lb	1000 lb

Hydrogen Peroxide RQ is for concentrations of > 52% only

FIFRA INFORMATION

EPA Registration Number 65402-8

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

DANGER

Corrosive, causes irreversible eye damage and skin burns. May be fatal if inhaled. Harmful if swallowed or absorbed through skin. Strong oxidizing agent. This pesticide is toxic to birds, mammals, fish and aquatic invertebrates.

US State Regulations

U.S. State Right-to-Know Regulations

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This product contains the following substances regulated under state Right-to-Know laws:

Chemical name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Hydrogen Peroxide	X	X	X		
Acetic Acid	X	X	X		X
Peracetic Acid	X	X	X	X	X
Sulfuric Acid	X	X	X	X	X

California Proposition 65

This product does not contain any Proposition 65 chemicals

CANADA

Environmental Emergencies

Chemical name	Canada - Environmental Emergencies - Part 1 Substances - Substances Likely to Explode - Minimum Threshold Quantities	Canada - Environmental Emergencies - Part 1 Substances - Substances Likely to Explode - Minimum Mixture Concentrations	Canada - Environmental Emergencies - Part 2 Substances - Substances Hazardous When Inhaled - Minimum Threshold Quantities	Canada - Environmental Emergencies - Part 2 Substances - Substances Hazardous When Inhaled - Minimum Mixture Concentrations
Hydrogen Peroxide 7722-84-1			3.40 tonnes Minimum quantity (I2-011)	52
Acetic Acid 64-19-7			5.80 tonnes Minimum quantity (I2-002)	95
Peracetic Acid 79-21-0			4.50 tonnes Minimum quantity (I2-004)	10

Note: Peracetic acid is exempt from Environmental Emergency Regulations SOR/2003-307 requirements per List of Substances Section 2(b) as it is a component of a mixture and its partial pressure in the mixture is less than 10 mm Hg. In addition the concentrations of the Hydrogen Peroxide and Acetic Acid in the mixture are below their minimum concentrations.

Canadian National Pollutant Release Inventory

Chemical name	Canada - 2017 NPRI (National Pollutant Release Inventory)
Acetic Acid 64-19-7	Part 4 Substance
Peracetic Acid 79-21-0	Part 1, Group A Substance
Sulfuric Acid 7664-93-9	Part 1, Group A Substance

International Inventories

Chemical name	TSCA (United States)	DSL (Canada)	EINECS/EL INCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)	NZIoC (New Zealand)
Hydrogen Peroxide 7722-84-1	X	X	231-765-0	X	X	X	X	X	X
Acetic Acid 64-19-7	X	X	200-580-7	X	X	X	X	X	X
Peracetic Acid 79-21-0	X	X	201-186-8	X	X	X	X	X	X
Sulfuric Acid 7664-93-9	X	X	231-639-5	X	X	X	X	X	X

All ingredients are directly listed on the active TSCA Inventory

Mexico

Mexico - Grade

Moderate risk, Grade 2



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16. OTHER INFORMATION

NFPA	Health Hazards 3	Flammability 1	Stability 2	Special Hazards OX
HMIS	Health Hazards 3	Flammability 1	Physical hazard 2	Special precautions H

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0
Special Hazards: OX = Oxidizer. Protection = H (Safety goggles, gloves, apron, the use of supplied air or SCBA respirator is required in lieu of a vapor cartridge respirator)

Uniform Fire Code Organic Peroxide: Class 4--Liquid

Revision date: 2021-09-24

Revision note SDS sections updated: 7.

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End of Safety Data Sheet

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VigorOx 15/23 Contact Information

It is important to have an adequate supply of consumables on hand. Envetec suggests a minimum of 1-month supply at all times available for usage. Normally, an automatic inventory shipment re-supply system will be put into place. However, if manual re-ordering is necessary please contact customer support noted below:

Email: customerservice@technopathusa.com

Phone: 1-888-235-3597

4.4 Certification of Training for Operators

TECHNICAL TRAINING CHECKLIST FOR Envetec 200 Series OPERATORS

Subject	Trainee Signature	Instructor Signature	N/A	Date
Overview of Envetec 200 Series system				
Health & safety brief (Envetec 200 Series & VigorOx 15/23)				
Use of PPE when handling concentrated disinfectant				
Location of water shut-off valve				
Location of water pressure gauge				
Proper minimum incoming water pressure (60 psi / 4 Bar)				
Location of the sediment filter for the facility water supply (If fitted)				
Location of electrical supply Isolator switch and Residual Current Circuit Breaker (RCCB)				
Power-up of Envetec 200 Series system				
Overview of HMI and operator login				
Surface disinfection (daily) of exterior panels of system				
Degreasing of waste receiver (daily)				
Cleaning of loading bay access panel and hinge (daily)				
Wet vac of dewatering unit conveyor drip tray (daily)				
Wet vac of spilt treated waste in room (daily)				
Preparing treated waste containers with 2 mil waste bags				
Inspection for leaks around system (daily)				
Opening of shredder loading bay door				
Loading of red bags into waste receiver				
Loading of sharps containers as a comingled waste load with red bags				
Closing of shredder loading bay door				
Start treatment cycle				
Resetting system after a power failure				
Resetting system after a recoverable process fault				
Reject cycle procedure				
Disposal of treated waste into compactor/dumpster in accordance with local landfill regulations				
Inspecting & cleaning dewatering system filters				
End of day shut-down of water and electricity				

Trainee Name: _____

Instructor Name: _____



4.5 Letter of Acceptance

Envetec 200 Series Acceptance Certification

ENVETEC SYSTEM INFORMATION		
ENVETEC MODEL:	Envetec 200 Series	SERIAL NUMBER:

CUSTOMER INFORMATION
CUSTOMER NAME:
CONTACT NAME:

CERTIFICATION OF ACCEPTANCE	
The undersigned hereby certifies that Envetec has installed an Envetec 200 Series at the customer's facility, as specified above, and the machine is functioning according to all of the expectations set forth in the customer's purchasing or leasing agreement.	
For Customer:	
Printed Name: _____	Title: _____
Signature: _____	Date: _____

Envetec 200 Series Installation Technician and Trainer



Contact: customerservice@technopathusa.com PH: 1-888-235-3597

4.6 Handover Documents

These documents are unique to each EnveteC 200 Series installation.



- Calibration Worksheet
- Validating Efficacy Test (Spore Test)



4.7 EnveteC 200 Series Documentation

The following documentation is supplied with the EnveteC 200 Series.

- EnveteC 200 Series Operator & Maintenance Manual (This Manual)
- Electrical Schematics
- VigorOx 15/23 SDS

4.8 Preventative Maintenance Schedule

	<h2 style="text-align: center;">Envetec 200 Series recommended preventative maintenance schedule</h2> <p style="text-align: center;">(Revision 02, 08 July 2019)</p>		 Warning Isolate electrical supply prior to carrying out any maintenance
Interval	Maintenance action	Carried out by:	
Daily	Verify that water and electrical power are connected to unit.	Operator	
	Verify that inlet pipe water pressure gauge reads 4 Bar / 60Psi	Operator	
	Inspect connections of water and sewer for leaks or kinks in service lines due to machine movement during house-keeping	Operator	
	Using a wet-vac clean the 1st stage effluent drain collector box	Operator	
	Clean 1st stage effluent drain screens to prevent blockages.	Operator	
	Clean 2nd stage effluent drain filters	Operator	
	Clean the surface area of the machine with a mild disinfectant	Operator	
	Ensure the internal chemical tank has sufficient chemical for the shift, replenish as required.	Operator	
	Check the chemical carboy bund is clean, rinse with clean water and dry if any chemical spillages noted.	Operator	
	Clean and degrease receiver loading bay door. (Best done during first and last cycle of the day when the loading bay door can be opened)	Operator	
	Note: Do not use abrasive pads/abrasive cleaners which will scratch the polished stainless steel surfaces.		
Weekly (Includes items listed daily actions)	Using a wet-vac clean the dewatering unit collector trays.	Operator	
Monthly	Safety circuit test, test 3-phase supply protection breaker	On-site Facilities technician	
3 Monthly	Inspect and grease shredder shaft seals	Service engineer	
	Clean water supply filter (if installed)	Service engineer	
	Check tighten bolts inside the receiver	Service engineer	
	Visually inspect the shredder cutters for any obvious damage	Service engineer	
	Inspect all internal water system components and pipework for leaks	Service engineer	
	Inspect all internal & external chemical system components and tubing for leaks	Service engineer	
	Check all effluent drain pipework Tri-clover connections for leaks and check clamps are secure.	Service engineer	
	Check internal chemical tank bund for cleanliness, clean as required.	Service engineer	
	Carry out a visual inspection of all mechanical components and structure for missing/loose hardware. Replace and/or secure as required.	Service engineer	
	In case of using a water booster pump, check air pressure in accumulator and water	Service engineer	
6 Monthly	Wash and flush out chemical metering pump with warm water	Service engineer	
(Includes items listed in	Inspect pump diaphragm - replace if required	Service engineer	
3 monthly service)	Water and Chemical calibration	Service engineer	
	Clean and inspect receiver cover plate, operating mechanism and actuator for damage/security and missing hardware - replace if required	Service engineer	
	Inspect the loading bay door interlocks for damage and correct operation.	Service engineer	
	Inspect and test earth grounding straps and panel to earth ground of system	Service engineer	
	Bulb/Led test on "RESET" button	Service engineer	
	Inspect shredder shaft outer seals, if water present replace seals	Service engineer	
	Check tighten shredder shaft coupling bolts - ensure they are at the correct torque setting	Service engineer	
	Check tighten shredder motor/gearbox drive bolt - ensure it is at the correct torque setting	Service engineer	
	Inspect/clean floor drain (If applicable)	Service engineer	

	Envetec 200 Series recommended preventative maintenance schedule		 Warning Isolate electrical supply prior to carrying out any maintenance
Interval	Maintenance action	Carried out by:	
12 Monthly	Main unit:		
(Includes items listed in	Carry out a detailed shredder, drive motor and gearbox inspection (Cutters/spacers/shafts/bearing/seals)	Service engineer	
3 & 6 monthly services)	Clean & inspect the shredder drive gears for any obvious damage and wear, lightly lubricate all teeth with an anti-fling open gear lubricant.	Service engineer	
	Inspect the receiver locking pins for damage, security and missing hardware.	Service engineer	
	Replace chemical pump diaphragm and functionally test	Service engineer	
	Check water supply low pressure switch for correct operation and the warning message is displayed	Service engineer	
	Check E-stop buttons for damage and correct operation	Service engineer	
	Inspect all visible electrical cabling and connection for obvious damage, chaffing and security.	Service engineer	
	Carry out a thermographic inspect on all electrical systems	Service engineer	
	Dewatering Unit:		
	Note: Remove rear access walkway and access panels from Dewatering unit before carrying out these step:		
	Clean and inspect dewatering conveyor belts	Service engineer	
	Inspect/check dewatering system conveyor belts tension, tracking and alignment. Adjust as required.	Service engineer	
	Inspect all dewatering unit bearing blocks for wear and lubricate with a general purpose bearing grease (e.g. SKF LGMT 2)	Service engineer	
	Inspect all dewatering unit motor drive chains for wear and tension, lightly lubricate with an aerosol anti-fling chain lube	Service engineer	
	Check dewatering units for missing and loose hardware, replace and/or tighten as required.	Service engineer	
2 Yearly	Shredder rotary and stationary cutter replacement	Service engineer	
(Includes items listed in		Service engineer	
3 ,6, & 12 monthly services)		Service engineer	
		Service engineer	

4.9 Revision History

Date	Version	Editor / Author	Notes
17/05/2019	0.0	JH/AM/BOD/POD	Initial Draft for Observation & Comment
30/05/2019	0.1	JH/AM/BOD/POD	Updated screenshots, etc.
27/06/2019	0.2	JH/AM/BOD/POD	Revised text , etc.
03/07/2019	0.3	JH/AM/BOD/POD	New screenshots, Revised text , etc.
04/07/2019	0.4	JH/AM/BOD/POD	New screenshots, etc.
08/07/2019	0.5	JH/AM/BOD/POD	New screenshots, Revised text etc.
16/07/2019	0.6	JH/AM/BOD/POD	New screenshots, Revised text etc.
26/07/2019	VigorOx Rev 1.0	DT/AM	Initial Release
16/11/2020	VigorOx Rev 2.0	BB/AM	Updated MSDS for VigorOx Antimicrobial Agent; references to disinfectant corrected.
01/03/2022	2.1	MjB/PH	Updated per EPA Communication “Study Conclusions and Label Comments” 21/02/2022
04/03/2022	2.2	MjB/PH	Updated per EPA Communication 03/03/2022
14/03/2022	2.3	MjB/PH	Updated per EPA Communication 12/03/2022