New Purified Water System
RO / CEDI with Ozone Sanitation
4,000 gal. Feldmeier 316 Stainless Steel Storage Tank
316LSS Distribution Loop

About Harrison:

Harrison Specialty Co., Inc. is a Contract Filler / Packager specializing in Personal Care and Household products based in Canton, MA.

Harrison is FDA - Drug and Device Registered and is also Bay State Organic Certifiers (BOC) Certified for the production of Natural and Certified Organic products. Our capabilities go beyond filling to include product formulation / reformulation (staff Chemists) and packaging development. We fill containers of all sizes and types, including a wide variety of plastics, as well as glass and tubes of metal and plastic. We also hot fill hot products (jars) and have a large cooling tower to facilitate efficient production. Our work includes premium products for “prestige brands” as well as carefully cost engineered products for the competitive retail market. We have been qualified by a wide variety of Companies, from well known brands with an international presence, to smaller regionally based businesses.

All of our work is done for others, we do not market our own products.

Why Purified Water?

Water is the main ingredient in most of the products that we and so many others in our highly competitive industry make. With the ever increasing concerns about ingredients in Personal Care and Household products, we felt it was critical to ensure that the water we use be consistent and stable. The USP Purified Water standard is widely agreed to be a benchmark of quality and it is now available at Harrison.

Our new system is designed to produce Purified Water as defined by the latest edition of the US and European Pharmacopoeia. The system is validated to current industry standards, and represents a higher quality than what is required by regulatory authorities for the production of both prescription and OTC products. Batch data and complete traceability for each campaign is available.

Product water quality exceeds the following standards:

Total Organic Carbon (TOC)..............< 500 p.p.b.(μg/l)
(p.p.b. = parts per billion = ~1 second in 32 years)
Conductivity..............................< 1.3 at 25 °C [μS·cm−1]
Bacteria......................................< 100 CFU/ml
Reverse Osmosis (RO)

The heart of the water purification process is a new Reverse Osmosis (RO) system manufactured by GE, a world leader in membrane technology. It utilizes semipermeable polyamide membranes which provide rejections of ionic and organic impurities in excess of 99%. The “pores” of RO membranes are actually intersegmental spaces among the polymer molecules. They are big enough for permeation of water molecules, but too small to permit passage of hydrated chemical ions. However, many factors including pH, temperature, and differential pressure across the membrane affect the selectivity of this permeation. With the proper controls and operation, RO membranes achieve unparalleled chemical, microbial, and endotoxin quality reduction from aqueous streams.

CEDI Continuous Electro-Deionization Unit

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The product water from the RO system is further purified by a Continuous Electrodeionization (CEDI) system.

CEDI produces deionized water without the use of chemicals using a combination of mixed resin, selectively ion-permeable membranes, and a direct current, providing continuous flow (product and waste concentrate) and continuous regeneration.

Water enters both the resin section and the waste (concentrate) section. As it passes through the resin, it is deionized to become theoretically pure water. The resin acts as a conductor enabling the electrical potential to drive the captured cations and anions through the resin and appropriate membranes for concentration and removal in the waste water stream. The electrical potential also separates the water in the resin (product) section into hydrogen and hydroxide ions. This permits continuous regeneration of the resin without the need for regenerant additives producing water free of ionic impurities.

Continuous Monitoring

Careful and continuous monitoring throughout the automated system includes on-line: pH, Conductivity, Temperature, Pressure, Flow as well as TOC (Total Organic Carbon via an Anatel TOC analyzer).
There is only one alternative method for sanitization of stored and distributed pure water and ultra pure water that has proved equivalent to heat sanitization. The use of ozone, when properly applied, provides continuous sanitization of the storage tank system and intermittent sanitization of the distribution piping. The use of ozone as a sanitant is cost effective, reliable and uncomplicated. The risk of microbial proliferation in the storage and distribution system is all but eliminated with this process.

Continuous storage tank ozonation to a concentration of 20 to 25 ppb will prevent TOC build up and microbial contamination of your high purity water, typically yielding <5 ppb TOC and <5cfu/100mL in ambient temperature water systems. A side-stream in the distribution loop supply continuously recirculates back to the storage tank. Gaseous ozone is injected into this stream in order to deliver purified water with dissolved ozone levels of 0.1 to 0.2 mg/L into the tank.

An Ozone Destruct Ultraviolet (UV) Light at the beginning of our loop effectively breaks down the dissolved ozone in the purified water to un-detectable levels prior to distribution. Periodically, this unit is automatically turned off, allowing ozonated purified water to recirculate throughout the entire distribution loop. Ozone sanitization exposure time is programmable and typically lasts between 15 and 60 minutes, after which time the Ozone Destruct UV unit is turned back on. After a residual ozone check to ensure no dissolved ozone is detected in the distribution loop, the system is placed back into service.

This process also eliminates the need for periodic chemical sanitization of the storage and distribution network. The use of Ozone is coupled with the use of high-quality 316L Series Stainless Steel (316LSS) piping and valves.

- Ozone provides a clean, safe & efficient alternative to chemical water treatment systems
- Ozone is a very effective sanitant with cell destruction kinetics higher than chlorine
- Ozone is a green chemical that decays to oxygen
- In addition to destroying living micro-organisms, Ozone reduces TOC and endotoxins
Harrison Specialty Co., Inc. is a contract filler / packager specializing in Personal Care and Household products based in a 100,000 sq. ft. facility in Canton, MA.

We have in excess of 70,000 gallons of bulk storage capacity ("EX" rated for flammable materials), which includes a variety of Specially Denatured Alcohols.

We make batches of all sizes from < 100 gallons up to 4,000 gallons. All our batch tanks are 316SS and most are jacketed for steam heating and/or cooling via a large “chiller” system.

**Micro Motion Meters**

Harrison’s “EX Rated” Compounding Room is equipped with two identical Sanitary Micro Motion meters, with integrated valve controls, to ensure precise batching.

In addition to an R&D Lab, we have an Analytical Lab and conduct our own Microbiological testing in our separated/controlled “Micro Lab” area.

Over the years we have expanded our business to meet the production requirements of our customers and we are willing and able to do that as may be required.

We will gladly provide you with specific details of any and all of our present capabilities and capacities.

Please contact us for additional information:
Info@harrisonspecialty.com

Our Purified Water System was engineered, installed and is serviced by:

Water Consulting Specialists, Inc.
“Experts in High Purity Water”
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Ohio Valley: 330-923-8606
Mid-Atlantic: 215-348-0050
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