Automotive Solutions

Effective Paint Recovery and Robust Wastewater Treatment

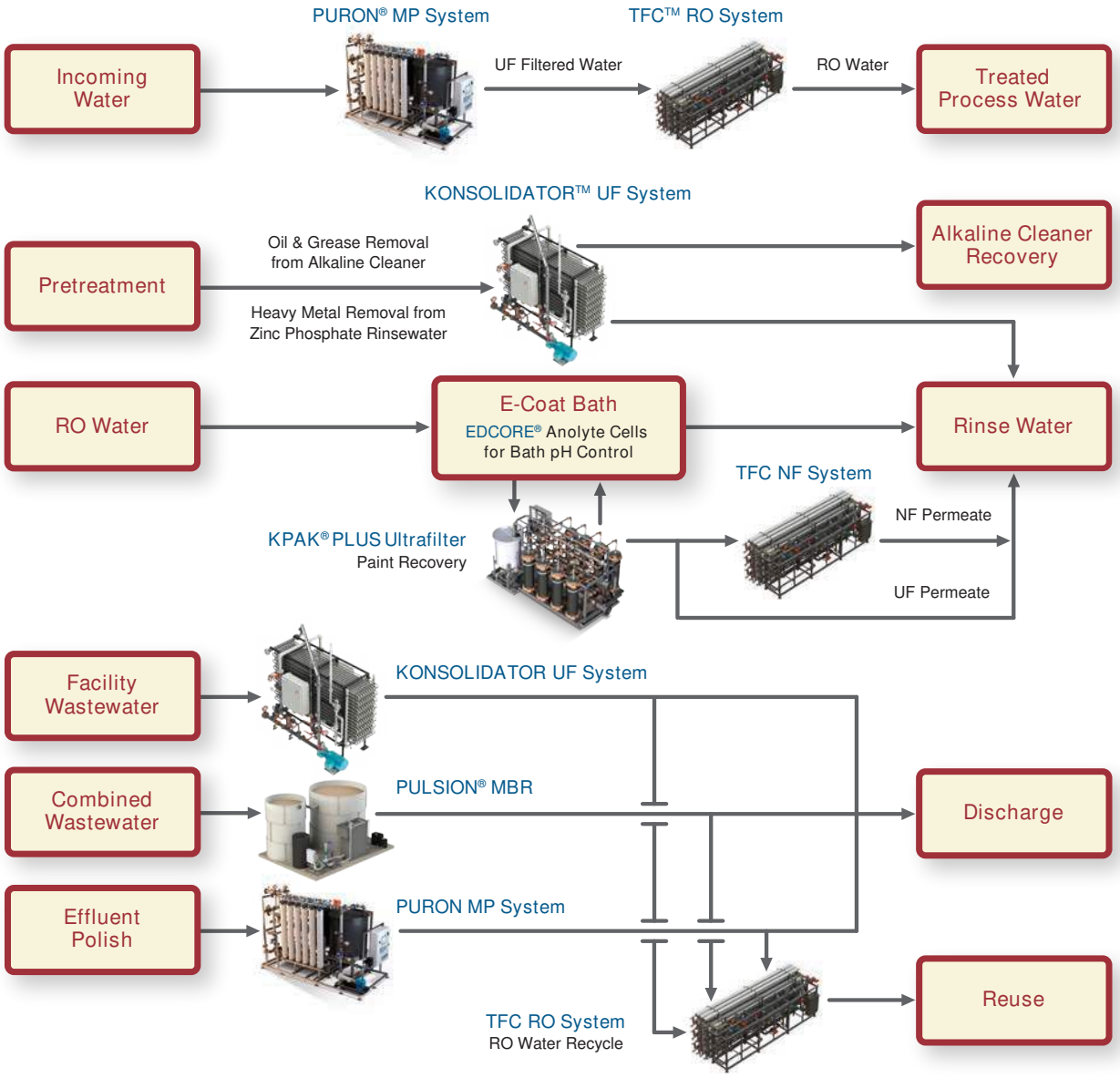
KOVALUS
Separation Solutions™

The KSS Advantage

KOVALUS SEPARATION SOLUTIONS™ (KSS) is transforming the landscape of separations by providing complete solutions through membrane filtration, ion exchange, evaporation, and drying. Meeting the needs of customers in the most demanding applications across food and beverage, life science, and general industrial markets worldwide, KSS uses a collaborative approach when solving separation challenges. Our expertise and industry-leading separation technologies position KSS to be the preferred partner in providing best-fit solutions.

Automotive Industry Challenges

KSS has decades of experience and an extensive portfolio of spiral, tubular, and hollow fiber membrane products and systems to deliver high-quality processing capabilities to the automotive industry. Our advanced technologies are suitable for various automotive operations, including alkaline cleaner recovery, electrocoat paint bath management, rinse water reuse, and plant water and wastewater treatment. KSS is committed to improving operation efficiencies and sustainability while cost-effectively meeting waste discharge requirements or producing water suitable for reuse within the process.



Major Applications

Alkaline Cleaner Reuse and Heavy Metal Treatment

In the pretreatment step prior to electrocoating, alkaline cleaners are used to remove oils, grease, and other particulates from metal parts while conversion coatings such as zinc phosphate condition them to provide corrosion resistance and enhanced paint adhesion. The accumulation of oils, grease, and heavy metals often present downstream challenges in wastewater streams, leading to significant environmental and economic challenges.

To minimize wastewater generation from pretreatment bath disposal and overflow rinse water discharge, KSS offers ultrafiltration (UF) membrane technology to tackle streams containing high levels of emulsified oils, grease, and heavy metals. Our systems effectively recover alkaline cleaners for reuse and reduce heavy metal content in wastewater streams to <0.1 ppm, resulting in less drag-in of pretreatment chemicals to the electro-coat paint bath and lower treatment costs.

Rinse Water Recovery

Deionized (DI) rinse water is a crucial part in pretreatment, electrocoating, fabrication processes, metal stamping, casting, and assembly steps. In order to reduce consumption of DI water, reverse osmosis (RO) and nanofiltration (NF) systems can be used to achieve high-purity water suitable for reuse. KSS' RO and NF systems provide low-conductivity process water through high-rejection and low-fouling spiral membranes.

Applications

- High-purity rinse water
- UF permeate polishing for post-rinse (lower conductivity NF permeate is used as the last rinse in the closed-loop electrocoat paint recovery process)
- Wastewater reuse

Major Applications

Electrocoat Paint Bath Management

The electrocoat bath must meet specific conditions for the charged paint particles to successfully deposit themselves onto a metal part. EDCORE® Pressurized Electrodialysis (ED) Cells are tubular and consist of a cylindrical anion exchange membrane on the exterior and a metal anode in the interior. The ion exchange membrane works by removing excess acid solubilizer anions released during electrodeposition. The pH of the bath is controlled by increasing or decreasing the conductivity of the anolyte flowing through the cells. EDCORE was built uniquely for the automotive industry over two decades ago to increase performance, lifetime of the ED membrane, and stability of the operation while reducing risk to the paint bath and driving down total cost of ownership and operating costs.

EDCORE Benefits

- Up to 20% greater ionic transfer than flat ED-membranes due to polypropylene mesh-free design on interior and exterior
- EDCORE is extruded, leak-free, and wrinkle-free
- Membranes can be dried, re-wetted, and used again
- Impermeable to anolyte and paint
- Smooth surface of cell is easy to clean and maintain
- Optimize energy costs by saving 15-20% on energy usage
- Long lifetime, lasting over 10 years

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Paint Recovery

When the metal part is removed from the electrocoat paint bath, deposited and undeposited paint solids are dragged out along with it. KSS pioneered a closed-loop rinse process in which our KPAK® PLUS system, operating on the paint bath, generates water to recover undeposited paint solids. The spiral wound modules operate on both cathodic and anodic paints and are highly efficient in generating high-quality rinse water, recovering and recycling up to 98% of paint solids in the bath. As a result, fresh paint consumption and waste generation are reduced, lowering operating and disposal costs.

Major Applications

KPAK® PLUS Ultrafiltration System

KPAK® PLUS spiral wound ultrafiltration modules are ideal for the generation of clear permeate and the recovery of cathodic and anodic paint solids. KPAK PLUS modules feature a simple, cost-effective design that is easily installed, simple to operate, and provides a robust solution in harsh electrocoat process conditions.

The KPAK PLUS module is a potted UF spiral element in a PVC shell, resulting in a zero-bypass performing product. It is a self-contained, disposable ultrafilter. The product is available in two sizes: the commonly used 8-inch diameter, and the 10-inch diameter for a larger membrane area in a smaller footprint.

Benefits of the KPAK PLUS System

- Higher, more stable flux
- Better flux recovery after cleaning
- Lower cleaning frequency
- Rugged construction able to withstand harsh cleaning chemicals
- Long membrane life
- Optimized fitting for quick and easy installation and removal

Water & Wastewater Solutions

PURON MP Systems for Water Treatment

Meet the highest water quality standards and regulations for any automotive applications with KSS' innovative hollow fiber ultrafiltration technology. Easily installed and serviced, PURON® MP systems are designed for longevity and performance. These water treatment systems offer robust engineering and reliable operation at low cost of ownership within a small footprint.

The PURON MP product innovation starts at the membrane with a strong, unbreakable fiber that has an optimal pore size distribution necessary for producing the highest quality effluent while minimizing fouling. The superior cartridge design, including efficient air scouring and single potting, improves solids management and brings a low maintenance, cost-effective, and reliable means of water treatment into the production facility.

The PURON MP systems are available in small, packaged plants to treat up to 200,000 gallons per day (32 m^3/h), and in larger pre-engineered skidded systems for larger demand.

Benefits

- Pre-engineered for quick delivery and easy startup
- Robust membrane for extended life & reliability
- Compact design

FLUID SYSTEMS Spiral Elements

FLUID SYSTEMS® RO and NF technology is a key component of KSS solutions, complementing MBR, microfiltration (MF), and UF technologies to provide customers with broad expertise in filtration and purification processes. The RO and NF products are available as standard 8-inch diameter by 40-inch long spirals with an FRP hard overwrap construction.

TFC® NF

Remove dissolved heavy metals from zinc phosphate rinse-water overflow in pretreatment. Also used for polishing of permeate from electrocoat ultrafilter.

TFC® RO

Thin-film composite RO membranes provide low conductivity process water from incoming water supply. These membranes also polish treated wastewater for reuse in various processes in an automotive plant.

Water & Wastewater Solutions

KONSOLIDATOR UF System

Automotive plant wastewater is laden with heavy metals, solids, emulsified oils, and greases. In order to treat these difficult wastewaters, KSS has employed the KONSOLIDATOR™ UF System, made of FEG PLUS® tubular membranes. The system is designed with robustness and longevity in mind and is ideal for heavy-duty applications within the automotive plant.

The KONSOLIDATOR UF system is available in seven standard sizes, treating wastewater volumes as small as 200 gallons per day (0.75 m^3/hr) and as large as 140,000 gallons per day (530 m^3/hr). It is offered in an Economy or Plus version depending on the required level of sophistication of valves, instrumentation, and other controls. The KONSOLIDATOR system offers an efficient, simple, and effective way to reduce economic and environmental impact of facility wastewater in the automotive industry.

Benefits

- High water recovery of up to 99.5%
- Mechanical or chemical cleaning
- Tolerant of harsh chemical conditions

PULSION MBR

Automotive facilities may combine facility waste streams and sanitary streams to result in high concentrations of organic and biological matter. KSS' PULSION® MBR is a reliable and powerful solution that will meet stringent discharge standards or promote wastewater reuse.

The PULSION MBR is a market-driven wastewater treatment solution designed to lower costs and optimize efficiency. By integrating biological wastewater treatment with hollow fiber UF technology, this system reduces chemical and biochemical oxygen demand (COD and BOD), turbidity, and total suspended solids (TSS). The PULSION MBR is innovatively designed to create a piston-like pumping action through the chambered fiber bundle to improve circulation of mixed liquor and boost attainable fluxes and performance.

Benefits

- Reduced operating costs
- Smaller footprint
- Efficient and reliable removal of solids and organics from wastewater

KOVALUS SEPARATION SOLUTIONS

KOVALUS SEPARATION SOLUTIONS™ (KSS) is a global leader in separation technologies. With best-in-class domain expertise, technologies and systems, KSS is uniquely positioned to help customers purify and recover valuable process streams and achieve sustainability goals across food and beverage, life science, and general industrial markets.

Services & Support

After-Sales Services & Maintenance Programs • SepTrac™ Smart System

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