

# Automotive Solutions

Your Partner for **All** Your Filtration Needs

Advanced Membrane Filtration for Enhanced Quality and Reduced Costs



**K KOCH**<sup>TM</sup>  
SEPARATION SOLUTIONS

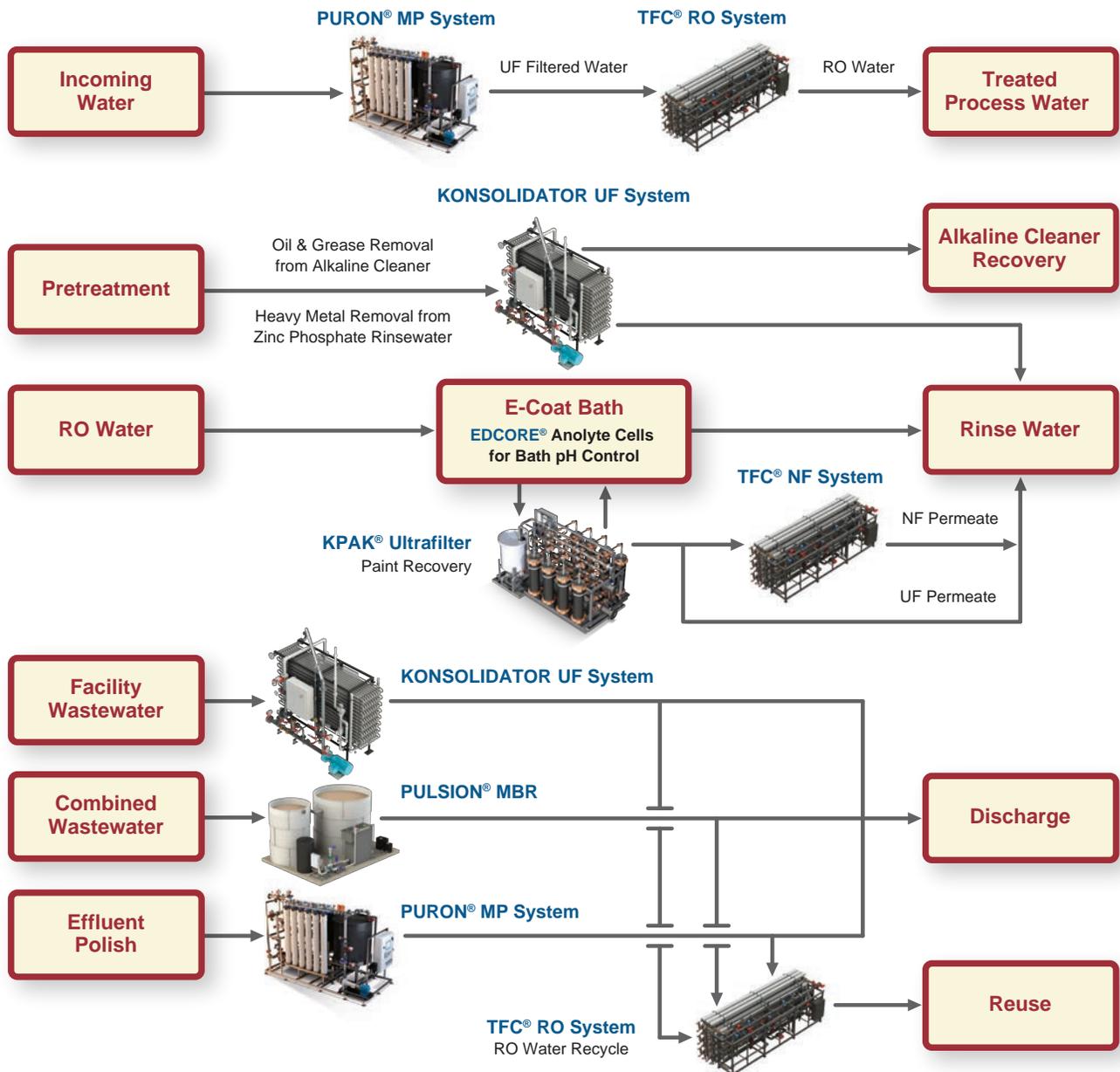
*Separation Technologies for a Better Future<sup>TM</sup>*

# How can KSS help you?

## Over 50 Years of Membrane Experience

Koch Separation Solutions (KSS) is a global leader in innovative membrane filtration technologies. Over our 50-year history, we have developed an extensive portfolio of membrane products, and the expertise to deliver solutions to the automotive industry. We manufacture our membrane products in our state-of-the-art facility in the US and we employ them in our systems and treatment solutions worldwide. Our experience and portfolio of products make KSS the ideal partner to develop & supply membrane-based solutions for your most challenging liquid filtration needs.

In addition to providing the most advanced line of spiral, tubular, and hollow fiber products for your process needs, KSS offers a complete array of market-leading water and wastewater solutions. KSS water and wastewater solutions will improve the economics and sustainability of your operation by cost-effectively meeting discharge requirements or by producing water suitable for reuse within your process.



# Major Applications

## Alkaline Cleaner Reuse and Heavy Metal Treatment

Alkaline cleaners and conversion coatings are used in the pretreatment stages of the electrocoating process. Metal parts that are to be painted in the electrocoat bath need to be sufficiently degreased and free of oils and other particulates in order to prepare the part for electrocoating. They are also conditioned with conversion coatings such as zinc phosphate to provide corrosion resistance and enhanced paint adhesion. The oils and greases from alkaline cleaners as well as the heavy metals from the zinc phosphate coating are often present in the wastewater streams, which can lead to significant environmental and economic challenges.



To minimize wastewater generated from pretreatment bath disposal and overflow rinse-water discharge, the KONSOLIDATOR Ultrafiltration (UF) system treats the bath or rinse-water from the pretreatment stage prior to electrocoat paint application. KSS is a top manufacturer of industry-leading robust tubular membranes equipped to tackle streams containing high levels of emulsified oils, greases, and insoluble heavy metals.

The KONSOLIDATOR system, made of robust FEG PLUS tubular membranes, effectively recovers alkaline cleaners for reuse in the pretreatment step and removes heavy metals to less than 0.1 ppm from wastewater streams. There is less drag-in of pretreatment chemicals to the electrocoat paint bath and treatment costs are reduced.



KONSOLIDATOR System

# Major Applications

## Paint Recovery

In the electrocoat painting process, a metal part is submerged in a bath of charged paint particles. When voltage is applied, the particles migrate to the oppositely charged metal part and deposit uniformly on its interior and exterior surfaces. When the metal part is removed from the bath, deposited and undeposited paint solids are dragged out along with it. The part is brought to a closed-loop rinse system where undeposited paint solids are recovered using water generated by an ultrafiltration system operating on the paint bath.

KSS pioneered this solution with the KPAK® PLUS ultrafiltration system. The spiral-wound modules are available for operation on cathodic paints and are highly efficient at generating high quality rinse-water, recovering and recycling up to 98% of paint solids in the bath. As a result, less fresh paint is consumed and less paint waste is generated, lowering operating costs for the electrocoat end user.



## Rinse-water Recovery

Deionized rinse-water is a requirement for successful electrocoating, but is also a crucial part in pretreatment stages, fabrication processes, metal stamping, casting, and assembly steps. In order to lower fresh deionized or reverse osmosis water consumption and operating expenses, reverse osmosis (RO) and nanofiltration (NF) systems can be installed following UF treatment to enable the reuse of treated process water as rinse-water. The FLUID SYSTEMS® TFC® RO and NF systems provide low-conductivity process water through high rejection and low-fouling spiral membranes. The TFC RO system can be readily installed following wastewater treatment to reroute usable low total dissolved solids (TDS) water back into the process. The cost-effective and zero-bypass KPAK PLUS UF system can be succeeded by a TFC NF system to polish UF permeate for reuse in post-rinse applications. Lower conductivity NF permeate is used as the last rinse in the closed-loop process.

# KPAK® PLUS Ultrafiltration System

## Simple Design, High-Quality Permeate, and Outstanding Performance Set the Standard for Electrocoat Paint Applications

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.



KPAK PLUS System

### 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

### SPIRAPAK PLUS Series

For smaller electrocoating systems with low production rates and that require less permeate flow, KSS offers the 4" SPIRAPAK PLUS module with the same quality membrane as our KPAK PLUS product.

Perfect for:

- Hollow fiber cartridge retrofits
- Smaller volume baths
- Test tanks



SPIRAPAK PLUS  
Ultrafiltration Module

## EDCORE® Pressurized ED Cells

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.

### Membranes

- 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



## FLUID SYSTEMS® Spiral Elements

FLUID SYSTEMS® reverse osmosis and nanofiltration technologies are key components of KSS solutions, complementing the MBR, MF and UF technologies to provide municipal and industrial clients 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 a fiberglass reinforced plastic (FRP) hard overwrap construction.

KSS offers a range of RO and NF products to serve in the automotive industry. The TFC® NF membranes remove metals, hardness, and divalent ions and the TFC RO is a high rejection, low fouling product, ideally suited for the removal of dissolved monovalent ions from automotive industry streams.

### 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 can also polish treated wastewater for reuse in various processes in an automotive plant.





PURON® MP System



PULSION® MBR System

## Water Solutions

### PURON® MP Systems for Water Treatment

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

The PURON MP product 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<sup>3</sup>/h), and in larger pre-engineered skidded systems for larger demand.

### PURON® MP Benefits

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

## 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, The KONSOLIDATOR UF system is designed with robustness and longevity and is ideal for heavy-duty industrial applications.

The KONSOLIDATOR UF system is available in seven standard sizes, treating wastewater volumes as small as 200 gallons per day (0.032 m<sup>3</sup>/h) and as large as 140,000 gallons per day (22 m<sup>3</sup>/h). It is offered in an Economy or Plus version depending on the required level of sophistication of valves, instrumentation, and other controls. The KONSOLIDATOR UF system offers an efficient, simple, and effective way to reduce economic and environmental impact of facility wastewater.

### KONSOLIDATOR UF 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. 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.

### PULSION® MBR Benefits

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

## KSS Assist™

KSS will partner with you throughout the life cycle of your membrane filtration system. Our experienced technical team will provide global service and support and will work directly with you to maximize process efficiency. KSS ASSIST™, our service and maintenance program, provides the tools to keep your system operation at the highest level, including:

- Membrane Process Optimization
- Plant Audits
- Data Collection, Analysis & Reporting
- Operator Training
- Telephone Support

### Koch Separation Solutions

Koch Separation Solutions (KSS) is a global leader in membrane filtration technologies with over 50 years of membrane experience. We manufacture our membranes in our state of the art facility in the US and we apply them in our systems.



**KOCH™**  
SEPARATION SOLUTIONS

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