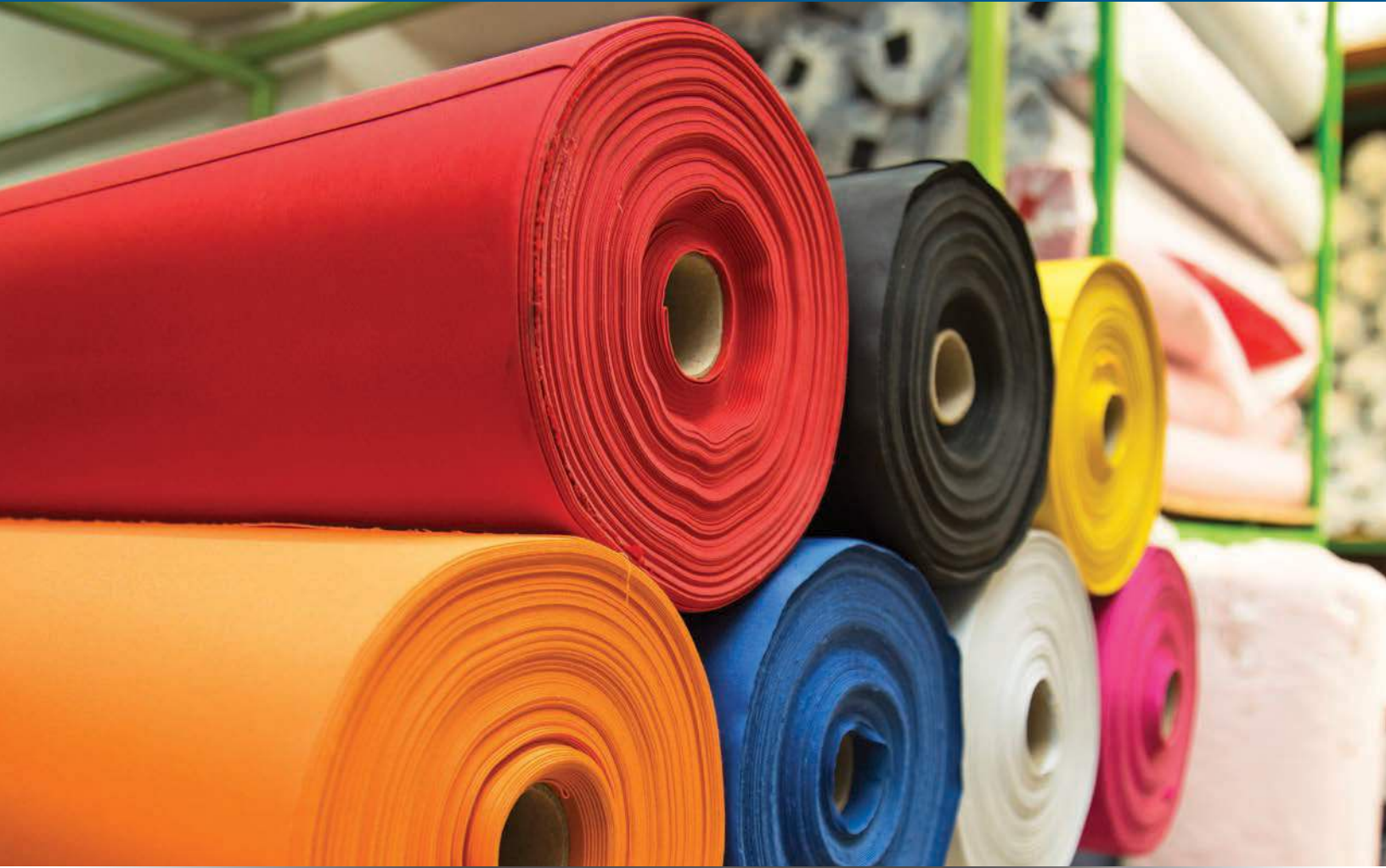


# Textile Filtration Solutions

Promoting Sustainability Through Recovery and Reuse



 **KOVALUS**  
Separation Solutions™

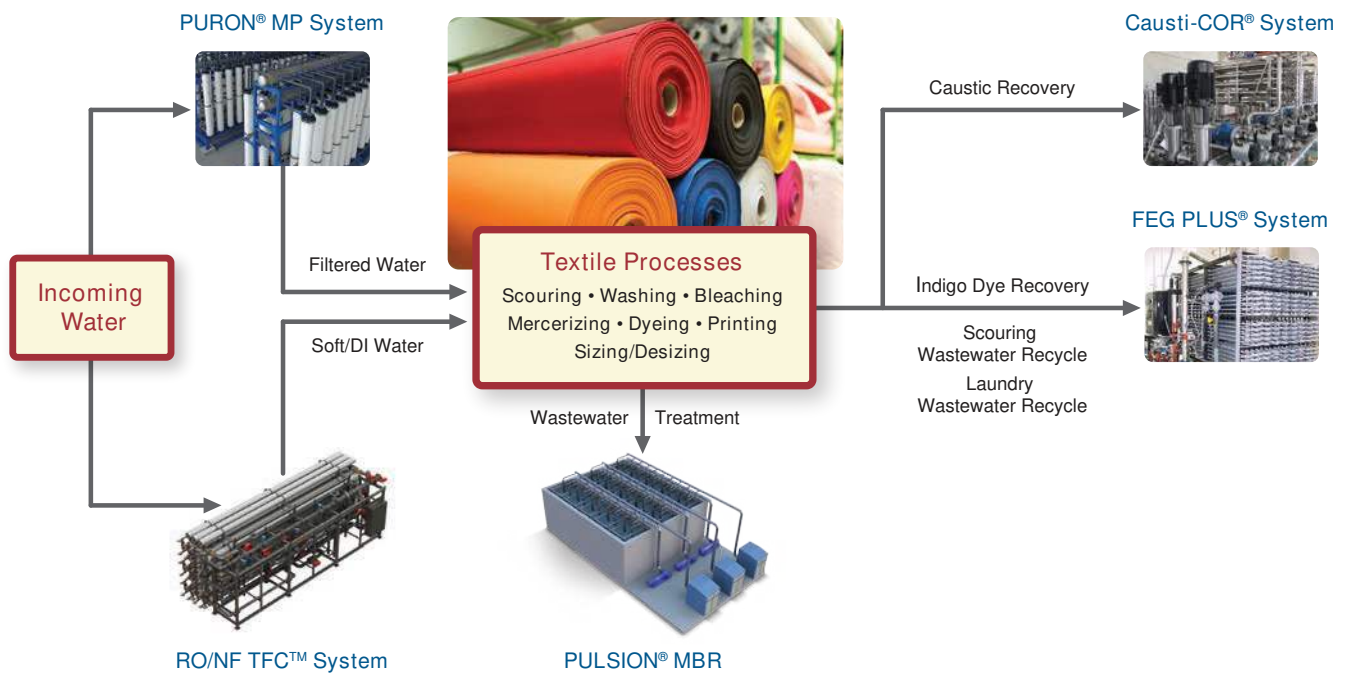
# How can KSS help you?

## Over 50 Years of Membrane Experience

KOVALUS 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 employ them in our systems.

As a complete solution provider, we have applied our experience and expertise to develop a line of crossflow filtration spiral and tubular membrane products, suitable for the harsh conditions practiced in the textile industry. Our broad portfolio includes unique membrane products to treat and recover caustic, and dyes, to increase the efficiency of your operations and reduce the load on your wastewater treatment system. Our water filtration solutions will help you meet the process water demand and wastewater treatment solutions to treat the plant wastewater for discharge or reuse.

These filtration solutions are energy efficient and are environmentally friendly to help your company comply with most stringent water quality requirements.



## Combined Solution Approach to all your Filtration Challenges

You will find in KSS an experienced partner to all your filtration needs. Your facility will benefit from our PURON® MP water filtration systems, which will reliably produce high quality water for your different processes. Our tubular KONSOLIDATOR™ crossflow filtration systems will concentrate indigo dye and other dyeing and printing effluents to recover and reuse expensive chemicals. Our high-temperature spiral systems will recover PVA from your sizing/desizing lines and our nanofiltration spiral products will concentrate and desalinate your soluble dye to improve product quality and shelf life.

On the backside of your operations, our unique Causti-COR® technology will recover the spent caustic from the bleaching, mercerization, and CIP operations, reducing your waste stream and cutting down your chemical costs. Lastly, we will help you treat your wastewater using our PURON MBR systems, for safe discharge or reuse, meeting most stringent regulations.

# Caustic Recovery

## The Challenge - How Much Is Your Caustic Really Costing You?

Caustic is used in the textile industry in two major applications: purification of cellulosic fibers, to remove hemicellulose and other impurities from the fibers, to produce high purity cellulose, and in treatment of cotton fabric where it goes through mercerization process to achieve better quality product and higher quality dyeing and printing.

The spent caustic, although still at high strength, cannot be reused in any of the plant operations due to the high concentration of contaminants. Hence, it is usually sent to the wastewater treatment plant, where in most cases it is neutralized with acid, increasing even more the costs of operation.



## The Solution - Causti-COR® Systems

Our Causti-COR systems are designed specifically to recover, purify and reuse caustic from different industrial applications.

The KSS Causti-COR Nanofiltration Membrane Systems offer a cost effective, environmentally friendly way to recover the expensive caustic solutions used in the textile processes.

### Benefits of Causti-COR Systems

- Less spending on caustic and acid materials
- Reduction in effluent volume and reduced waste treatment costs
- Lower energy consumption

## The KSS SeIRO® Product

Causti-COR systems utilize our patented SeIRO membranes to recover up to 95% of caustic by removing low molecular weight organic and inorganic contaminants.

The SeIRO product line was developed to allow continuous operation under aggressive feed conditions, up to 20% sodium hydroxide (pH well above 14) and at temperature up to 70°C (158°F).

Over 100 full scale SeIRO systems are operating successfully in the pulp industry, cellulose and textile industries, and in the dairy, pharmaceutical and mining industries.

# PVA Recovery

PVA (Polyvinyl Alcohol) is a common synthetic sizing agent, used for treatment of cotton or synthetic fabrics. It is typically washed out in the desizing process using hot water at 80-85°C (175-185°F).

## The Challenge

Spent PVA solution is high in organic matter; it contains 1-1.5% PVA, starch and salts. If sent to the wastewater treatment facility, PVA precipitates upon cooling to ambient temperature, causing clogging of pipes and costly treatment process.



## The Solution – KSS PVA Recovery Systems

With many years of experience of our R&D scientists and process engineers, KSS possesses the necessary expertise to develop a spiral membrane element that can operate at the harsh conditions of textile desizing process. We have developed and implemented successfully an optimal pore size ultrafiltration membrane, capable of operating at 85°C (185°F) continuously and reliably.

Our PVA recovery systems effectively concentrate PVA solution from 1 to 10%. At 8-10% PVA, the product stream is ready to be sent back to the sizing process for reuse, without further treatment.

## Benefits of PVA Recovery Process Using Membranes

- Reduced PVA spending
- Significant reduction of COD, up to 90%, from waste desizing solution sent to the wastewater treatment plant
- Heat energy savings on recovered PVA

# Recovery of Indigo Dye

In the production of denim fabric, yarn is impregnated in a series of reduced or soluble indigo dye baths. After dyeing, the yarn is rinsed with water and the dilute dye solution is sent to the wastewater treatment plant.

## The Challenge

Large amounts of dilute dye solution of approximately 0.5 g/L are generated in the rinse process. The dilute dye stream imposes heavy load of organic matter to the wastewater treatment plant, and if not recovered, large amounts of valuable dye are lost.



## The Solution - KSS KONSOLIDATOR System for Recovery of Indigo Dye

The rinse water from the dyeing operation is oxidized to produce an insoluble indigo dye solution of approximately 0.5 g/L, which is then sent to a membrane system for concentration and reuse.

KSS utilizes the unique KONSOLIDATOR™ tubular systems to capture the insoluble indigo dye, without a risk of plugging the flow channels of the membrane product with dye particles.

## The FEG PLUS Product

The KONSOLIDATOR systems utilize the wide-channel FEG PLUS® tubular membrane for the recovery of indigo dye and for other filtration challenges involving high suspended solids concentration.

## Benefits of the FEG PLUS Product

- Robust, wide channel tubular product – can reach up to 65% solids at extremely high recovery
- PVDF chemistry – compatible with most challenging wastewater streams
- Plugging resistant
- Can be mechanically cleaned using spongeballs
- Long membrane life under most difficult process conditions



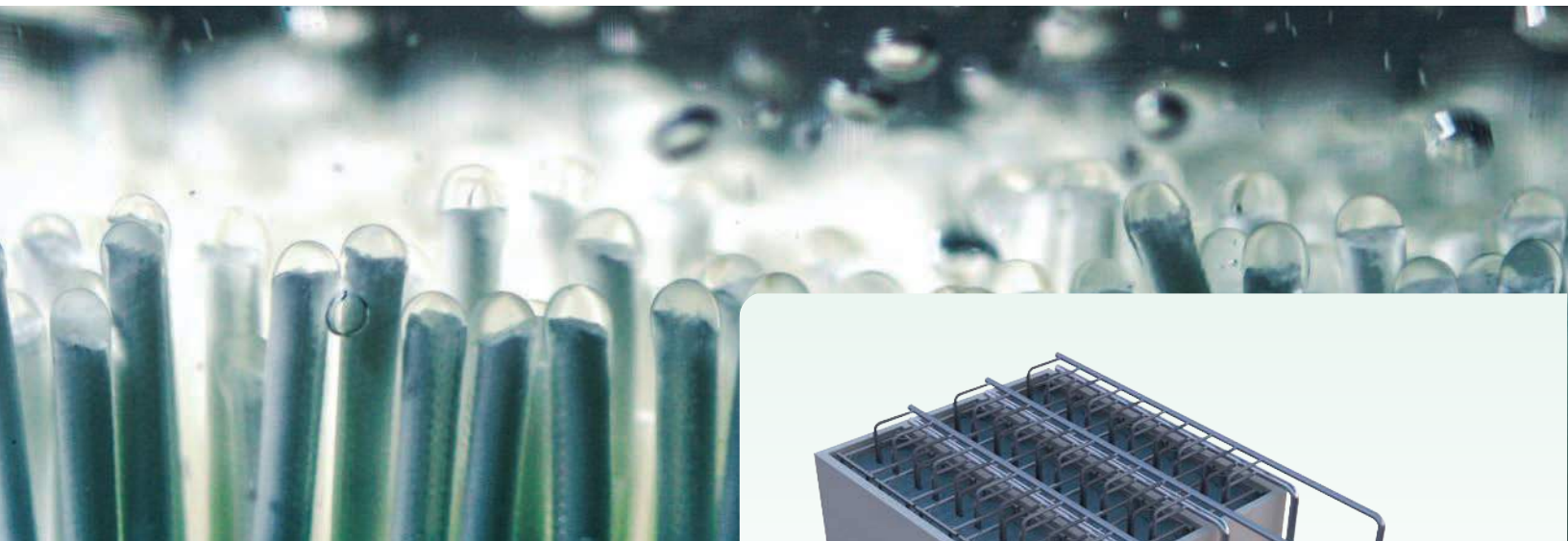
# Water and Wastewater Solutions

## Wastewater Treatment

Our engineers are well familiar with the type of wastewater generated in a textile plant. We have the knowledge, the expertise and the right products to provide you with a comprehensive solution to treat your wastewater economically, comply with discharge limits or treat the water for reuse.

For small wastewater streams, our tubular 1-inch KONSOLIDATOR™ Ultrafiltration crossflow membrane systems will effectively clarify your wastewater to produce high quality effluent.

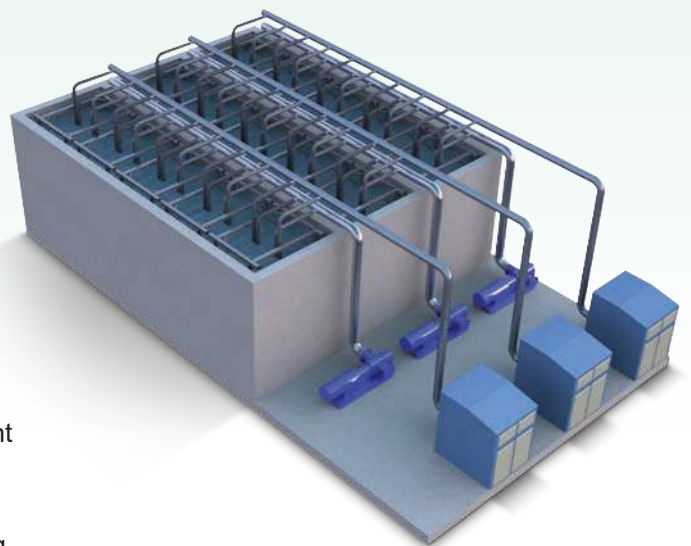
We have successfully implemented the KONSOLIDATOR systems treating various dyeing, stone washing, and laundry wastewater streams.



## The PURON® MBR Product

For end of pipe textile wastewater treatment, we are offering the PURON MBR (Membrane Bioreactor) technology. Unlike conventional wastewater treatment technologies, MBR technology pairs biological treatment with ultrafiltration membranes, which act as a physical barrier to solids and bacteria, producing high quality effluent using minimal space.

Our PURON MBR product has quickly become the technology of choice for companies looking to reduce energy, minimize downtime, and increase operation capacity.



## Benefits of MBR Technology

- Produces excellent effluent quality water
- Requires minimal space
- Low maintenance

## Water Treatment

Meet the highest water quality standards and regulations for your process water with our innovative hollow fiber ultrafiltration technology. Easily installed and serviced, the 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 small footprint.



The PURON MP product innovation starts at the membrane; strong fiber, practically unbreakable, with optimal pore size and pore size distribution awarded this membrane drinking water certification for reliable solids and bacteria removal.

Our PURON MP systems are available in small, packaged plants to treat up to 200,000 gallons (750 m<sup>3</sup>) per day, and in larger pre-engineered skidded systems for larger demand.



## 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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**KOVALUS**  
Separation Solutions™

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