Industrial Laundry Water Treatment

Workwear & Industrial Wiper Service (IWS)

Case*Study*

cleaning systems for liquids

Challenge: From discharge-based treatment to sustainable closed-loop operation

Following increasing environmental requirements and regulatory intervention, a leading international textile services provider aimed to redesign its industrial wiper cleaning operation to ensure long-term compliance and sustainable operation.
The existing wastewater treatment setup was based on conventional discharge-oriented technologies and was no longer able to meet evolving environmental standards efficiently.
Industrial wiper cleaning generates heavily contaminated wash and rinse streams containing:

- oils and grease
- fibres and suspended solids
- alkaline detergents
- contaminated wash liquors

Conventional treatment systems are typically designed to treat and discharge these streams rather than recover and reuse them. As operating costs and environmental requirements increased, the existing approach became economically and environmentally unsustainable.

Initial Situation

The customer faced a critical operational decision:

- discontinue the industrial wiper cleaning service
  or
- invest in a future-proof and compliant recycling solution

The existing treatment concept could no longer support long-term operation under tightening environmental regulations. A new system was required to eliminate wastewater discharge while maintaining operational reliability and cost efficiency.
Together with Belmar Technologies, MKR Metzger developed a fully integrated closed-loop recycling system specifically tailored to the customer's process requirements.

The Project at a Glance

Implementation of a closed-loop recycling system for industrial wiper cleaning operations

System Technology:

- Ceramic microfiltration system
- MVR evaporation technology
- Closed-loop water recycling
- PLC automation and remote monitoring
- Modular process integration

Process Overview:

- Wash water recovery via ceramic microfiltration
- Rinse water recovery via MVR evaporation
- Concentrate minimization for disposal
- Reuse of recovered water within the process

Customer:
Global service provider in the field of workwear logistics

Contractor:
MKR Metzger GmbH
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Requirements

- Full compliance with environmental regulations
- Elimination of wastewater discharge
- Reduction of water consumption
- Recovery and reuse of process water
- Reduction of chemical consumption
- Stable and fully automated operation
- Lower operating costs
- Sustainable long-term process solution

Removed fibers

MKR Solution

Belmar Technologies and MKR Metzger implemented a fully integrated Industrial Wiper Service (IWS) recycling system designed for closed-loop operation with no wastewater discharge.

The process separates wash water and rinse water treatment in order to apply the most efficient technology for each stream.

The wash water is treated using high-performance ceramic microfiltration technology. This allows the recovery and direct reuse of a clean alkaline wash solution while reliably removing oils, fibres, and suspended contaminants.

Wasted and recovered wash fibers

The rinse water is treated using energy-efficient MVR evaporation technology, producing high-quality distillate suitable for reuse within the process.

The complete system operates fully automatically with PLC control, remote monitoring functionality, and modular integration into the existing production environment.

Results

- Full compliance with environmental regulations
- Closed-loop operation with Zero Liquid Discharge (ZLD)
- Recovery and reuse of the majority of process water
- Significant reduction in chemical consumption
- Reduced energy demand through heat recovery
- Lower operating costs
- Reduced waste handling and disposal volumes
- Stable and fully automated operation
- Improved process reliability and sustainability

By transitioning from a discharge-based treatment concept to a closed-loop recycling model, the customer secured long-term operational capability while significantly reducing water, chemical, and energy consumption.