

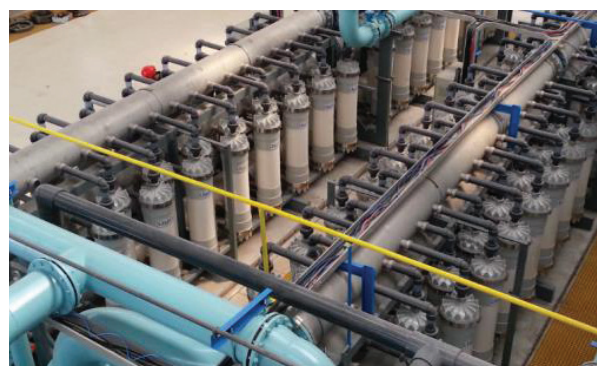
# Reliable Large Scale Treatment of River Water for Industrial Use

Ultrafiltration (UF) is commonly used as a pre-treatment to Reverse Osmosis (RO) to ensure reliable, consistent and efficient operation. As Shandong Hongxin Chemicals Co., Ltd in China recently discovered, this consistency and reliability, along with quick setup and installation times, helped them realize convenience and cost savings. Additionally, given the fluctuations in contamination levels of the water source, the selected UF modules continuously exceeded requirements. In 2014, HWTT designed a 13,000 m<sup>3</sup>/day ultrafiltration system that was equipped with 120 3M™ Liqui-Flux™ W10 Ultrafiltration Modules to provide reliable pre-treatment to RO. The water source for this project was the middle and lower reach of the Yellow River. The system design consisted of a settling pool to lower Total Suspended Solids (TSS) such as sludge and sand from the river. A heat exchanger is used maintain a certain minimum water temperature in colder months.

Due to the presence of algae and other organic contaminants, the feed water to the UF is continuously conditioned with 2 ppm NaClO, which improved the filtration process. Finally, 100 µm disc filters are used to protect the UF capillary membrane from obstruction by large particles.

The reliable and robust design of the Liqui-Flux W10 ultrafiltration modules allowed HWTT to install, preserve and ship the entire skid after testing was completed. This allowed the customer to shorten installation time by several weeks and save on construction and testing costs. This UF system has been running since March 2014 without incident. The produced water continues to exceed the customer's technical requirements, low maintenance expectations and service level.

System Summary	
Ultrafiltration System Summary	120 pcs 3M™ Liqui-Flux™ W10 in 2 racks
Location	Shanghai, China
OEM/System Manufacturer	HWTT
End User	Shandong Hongxin Chemical Plant
Market/Industry	Chemical
Plant Capacity	13,000m <sup>3</sup> /d
Application	Reverse osmosis pre-treatment
Feed Water Source	River water
Pre-treatment	Biological and chemical treatments including gravel filter
Commissioning	May, 2014

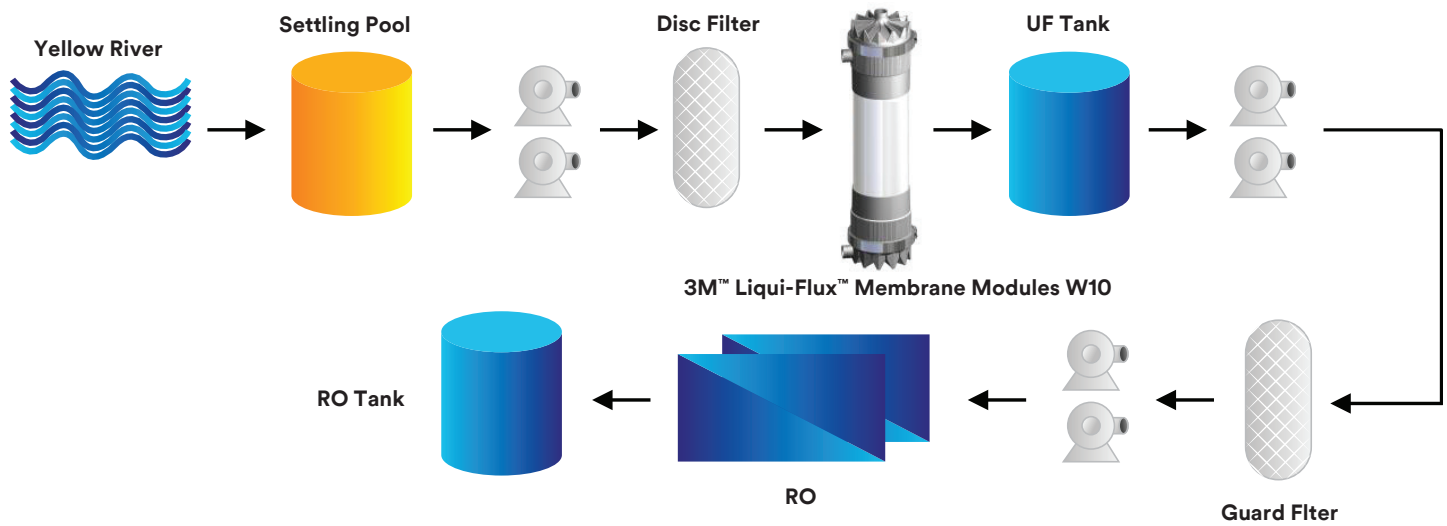


Shandong Hongxin UF System  
(2x60 pcs 3M™ Liqui-Flux™ Membrane Module W10)

Technical Measurements	Project Results
SDI ≤3	Exceed
Turbidity <0.2 NTU	Exceed
Recovery >90%	Exceed

# Case Study | Reliable Large Scale Treatment of River Water for Industrial Use

## Process Diagram



Product Selection and Use
Many factors beyond 3M’s control and uniquely within user’s knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer’s application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.
Warranty, Limited Remedy, and Disclaimer
Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M’s option, replacement of the 3M product or refund of the purchase price.
Limitation of Liability
Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

3M and Liqui-Flux are trademarks of 3M Company. All other trademarks are the property of their respective owners.  
 © 2020 3M Company. All rights reserved.



**3M Company**  
**3M Separation and Purification**  
**Sciences Division**  
 13840 South Lakes Drive  
 Charlotte, North Carolina 28273  
 USA  
 Phone: +1980 859 5400

**3M Deutschland GmbH**  
**Separation and Purification**  
**Sciences Division**  
 Öhder Straße 28  
 42289 Wuppertal Germany  
 Phone: +49 202 6099 - 0

LF-1046  
 70-2016-0186-4  
 Rev. 10/2020 AO  
**3M.com/Liqui-Flux**

