



## CeraQ™ Ceramic Membranes Provide Robust Solution For Automotive Parts Manufacturing

**Application:** Oil removal from rinsing auto parts

**Location:** Abruzzo, Italy

**CeraQ Model:** CQ50

**Pore Size:** 0.05  $\mu\text{m}$

**Total Permeate Flow Rate:** 400 liters/hour (~2 gpm)

### Project Background

Ceramic membranes are growing in acceptance into the water and wastewater treatment industries due to their ability to operate at higher temperatures and wide chemical compatibility. This characteristic allows the membranes to be operated in high temperature applications, difficult waste streams and applications where harsh cleaning chemicals are required. Oil water separation has been a difficult process to perform using a polymeric membrane and ceramic membranes are becoming recognized as a cost effective solution for this challenging application.

An automotive parts manufacturing plant was using a polymeric membrane to remove oil from water it used to rinse parts. The rinse water contained between 6% and 7% oil and the customer wanted to remove >95% of the oil from the water so the water could be reused in the plant. The polymeric membranes were irreversibly fouled and required replacement every two months. The plant started evaluating alternative membrane products to reduce the costly membrane replacement.

Due to the rigid material of construction and broad chemical resistance, ceramic ultrafiltration membranes were evaluated. Since the plant was already operating with a polymeric ultrafiltration membrane in a cross flow configuration they decided to install the membranes directly into their manufacturing line to determine if the ceramic membranes were a viable alternative to their current membrane system.

### QUA Solution

The customer selected QUA CeraQ™ membranes due to QUA's experience in water and wastewater purification. The QUA CeraQ membranes are tubular and operate in an inside-out configuration. The tubular design reduces the permeate pressure drop and allows the system to operate at a lower pressure with a high permeate flux. The membrane is an alumina based ceramic membrane with a proprietary coating that ensures long service life and a high degree of permeate recovery.

QUA worked closely with one of its OEM partners to develop a process to remove the oil from water. A 0.05  $\mu\text{m}$  pore size was selected based on historical test data performed by QUA on oil water separation. The 0.05  $\mu\text{m}$  membrane was found to remove more than 95.5% of emulsified engine oil from water in several pilot tests.

After the system was reconfigured to accept QUA CQ50 ceramic membrane, the system was quickly commissioned. Reconfiguration and commissioning was relatively simple and took approximately one week. During the commissioning, the permeate flow rate was measured to be 400 liters/ hour.

The customer was extremely pleased with the ease of commissioning and installation and performance of the membranes. QUA's CeraQ membranes have been operating for over six months without any fouling issues and have exceeded the project expectations.

## About QUA®

QUA is an innovator of advanced membrane technologies that manufactures and provides filtration products to address the most demanding water challenges. Headquartered in the USA, QUA develops, manufactures and provides advanced membrane products for water and wastewater treatment applications. QUA's products enable its OEM partners to provide cutting-edge solutions to customers in industrial and infrastructure markets worldwide.

## About CeraQ™

CeraQ modules offer superior performance in challenging oil removal applications and are ideal for wastewater recycle / reuse applications in a wide range of industries such as upstream oil & gas, petrochemicals, refinery, food & beverage, and textiles. CeraQ is ideal for challenging applications where conditions are not well suited for polymeric membranes such as wastewater with high fouling and/or high process temperatures.

### **CeraQ Features:**

- Well defined pore size distribution in comparison with polymeric membranes, resulting in high degree of particulate removal at higher flux
- Suitable for high temperature application
- Material stability in harsh environments and compatible with aggressive cleaning chemicals (if necessary)
- Various pore sizes to address diverse applications