HIGH TAPS SERIES

APRIL 2025

HEUMANN ENVIRONMENTAL

DUAL TWO-STAGE CYCLONE ASSEMBLY IN AN OXYCHLORINATION REACTOR

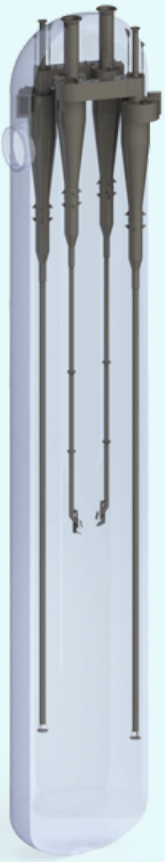
THE CHALLENGE

In 2022, a leading U.S. supplier of PVC and VCM tasked Heumann Environmental with replacing a dual two-stage cyclone assembly nearing the end of its lifecycle in an oxychlorination reactor. The challenge was to design a reliable replacement system that could:

- Withstand abrasive oxychlorination process conditions
- Effectively remove catalysts
- Operate round the clock
- Match existing components for seamless integration

SOLUTION PROVIDED

Using legacy reactor data, our team engineered new reactor cyclones to improve oxychlorination performance. Leveraging refractory lining and fluid bed expertise, the design ensured durability, seamless integration, and minimal downtime during installation.



SYSTEM SPECIFICATIONS

DESIGN PRESSURE: +/- 5 PSIG

DESIGN TEMPERATURE: 550°C

INLET FLOW RATE: 10,170 ACFM

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MATERIAL OF CONSTRUCTION:

Chosen for its proven strength and reliability, SA516 Grade 70 carbon steel is a staple in industrial pressure systems and perfectly suited to the demands of this cyclone design.

REFRACTORY LINING:

Strategic internal and external lining with ¾" Rescobond AA-22S and carbon steel hex mesh protects against abrasion and heat, enabling the use of a cost-effective base steel and eliminating the need for costly specialty metals.

DUAL TWO-STAGE CYCLONE CONFIGURATION TO MAXIMIZE CATALYST RETURN:

This dual two-stage cyclone system, equipped with dipleg stubs, splash plates, and trickle valves, is designed for seamless integration and in-bed discharge. It prevents gas backflow, enhances particle separation, and maximizes catalyst recovery for peak oxychlorination performance.

RESULTS AND OUTCOMES

This cyclone system was engineered with cost-efficiency in mind—using carbon steel reinforced with a refractory lining to deliver high durability and abrasion resistance without the premium of specialty alloys. By precisely matching the original reactor dimensions, the design seamlessly integrated with existing diplegs, bracings, and hangars—eliminating the need for structural modifications, minimizing waste, and accelerating installation. The result: faster install, lower cost, and a system built to perform without compromise.