

Troubleshooting an Ion Exchange Resin System

Identifying and Solving Common Performance Problems

Ion exchange resin systems are widely used in industrial water treatment to remove dissolved salts, organics, and other impurities. However, like all process equipment, these systems can experience operational issues that reduce performance and increase maintenance costs.

This guide from **Recirculation Technologies, LLC (RTI)** outlines how to troubleshoot the most common ion exchange problems—and how to resolve them efficiently.

Common Symptoms & What They Mean

Symptom	Likely Cause
Low throughput	Resin fouling, channeling, or exhausted resin
High differential pressure	Particulate fouling or resin bed compaction
Poor water quality	Ineffective regeneration, exhausted resin
High chemical usage	Increased regenerations due to fouled resin
Frequent regenerations	Organic fouling or resin with reduced capacity
Resin leakage downstream	Broken lateral or damaged internal structure

Step-by-Step Troubleshooting

1. Check for Mechanical Failures

- Inspect valves, flow controls, and instrumentation for leaks or malfunctions.
- Verify even flow distribution through inlet and outlet headers.
- Examine the vessel's internal structure—especially for broken laterals.

2. Evaluate Inlet Water Quality

- Test for suspended solids, iron, organics, and silica.
- High TSS (total suspended solids) can clog resin beds, especially in packed beds.

3. Test Resin Condition

Submit a resin sample to RTI's lab for:

- **Capacity testing** (cation & anion)
- **Fouling analysis** (organics, iron, hardness, particulates)
- **Salt-split and moisture analysis**
- **Run extension test** to estimate remaining life and throughput

RTI's lab will also clean the sample using our patented protocol, comparing before and after performance.

4. Review Regeneration Process

- Confirm proper chemical concentrations and contact time
- Check for channeling during regeneration (e.g., uneven bed movement)
- Look for brine dilution or premature rinsing that reduces effectiveness

5. Look for Channeling Symptoms

- Inconsistent water quality
- Low pressure in parts of the bed
- Reduced resin contact and regeneration efficiency

RTI can resolve channeling with vessel inspection and, if needed, resin removal and reinstallation.

Solutions from RTI

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Problem	RTI Solution
Organic fouling (Anion Resin)	ReStore+ organic cleaning protocol
Hardness fouling (Cation Resin)	Hardness-based cleaning protocol
Particulate fouling	ReStore CS particulate removal service
Mixed resin contamination	Resin separation and recovery
Structural damage	Internal inspection + lateral/vessel repair

RTI Field Services

- On-site **resin cleaning** (mobile units)
- **Pump & Hold** service for vessel repair
- **Resin sampling and diagnostics**
- **Vessel inspections** and internal repairs
- **Resin rental** for emergencies

Prevention Tips

- Schedule **resin analysis** annually or semi-annually
- Inspect vessels every **3–5 years** depending on age
- Maintain pre-treatment filters to limit solids
- Ensure proper flow and regeneration rates
- Use activated carbon to remove organics before the resin bed

Contact RTI to Restore Your System

Don't guess—test. Let RTI help you troubleshoot resin performance problems and return your system to peak operation.

 **Call us:** 215-682-7099  **Email:** sales@rtiservices.com  **Visit:** www.rtiservices.com

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