

Cascade Chemistries

COLLOIDALCHEM +ISCR



WHAT IS COLLOIDALCHEM +ISCR?

ColloidalChem +ISCR is a special patent-pending formulation of our activated carbon product, ColloidalChem, designed to adsorb contaminants immediately, then rapidly destroy halogenated compounds on the surface and within the carbon particles.

HOW DOES IT WORK?

A soluble reducing agent is combined with a carbon-based activator to transform chlorinated ethenes to non-toxic end products under alkaline conditions. The process is a stepwise, 1-electron reduction (removing a single chlorine at a time). Intermediates DCE and VC are sometimes observed, but in minor amounts and expected not to persist.

- >97% of TCE destroyed, proven by extraction
- Low levels of dichloroethene and vinyl chloride are detected and continue to degrade
- Ethene end-product detected

Advantages for distribution, contact & residence time

The high solubility of the reducing agent in ColloidalChem +ISCR allows it to transport freely in the subsurface when injected. Colloidal-sized particles can be injected below fracture pressures to obtain the best distribution in transmissive zones.

Benefits of activated colloidal carbon

- Groundwater contaminant concentrations decrease rapidly after application (days to weeks)
- Rapid chemical reduction of contaminants
- Excellent application distribution under low-pressure injection conditions
- Sustainable contaminant reductions over time without rebound
- Lower life cycle costs to achieve No Further Action (NFA) determination or closure
- Regulatory acceptance
- Faster, more targeted reactivity compared with other ISCR and colloidal technologies



For more information, visit
[www.cascade-env.com/
cascade-chemistries](http://www.cascade-env.com/cascade-chemistries)

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TURNKEY SOLUTIONS

While effective chemistries are a key part of successful remediation solutions, Cascade's turnkey solution meets the overall in situ remediation objective "to make contact with contaminant mass for a long enough period of time to achieve destruction." Cascade adds significant value and higher performance to the application its Chemistries by providing:

- High resolution design optimization through our MIHPT and Waterloo^{APS} subsurface technologies to identify target zones based on mass, lithology, and hydraulic conductivity.
- Bench-scale and column testing as needed.
- Advanced automated injection and fracturing technologies for both liquids and solid slurries.
- Client design support for chemistry dosing and critical injection parameters, including spacing and injection volumes and concentrations based on geology and hydraulic conductivity.
- Water hydraulics testing and field design optimization to eliminate any full-scale unexpected conditions.