

HAMON RESEARCH-COTTRELL, INC.



Chevron Pascagoula

ELECTROSTATIC PRECIPITATORS



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Since Dr. Frederick Cottrell's invention over a century ago, electrostatic precipitators (ESPs) have been a primary technology for controlling particulate emissions. ESPs can be designed to meet stringent particulate emission standards with minimal pressure loss and high equipment reliability for extended plant operation.

- **Proven Design** - Proven technology based on large installed base
- **High Efficiency** - Emission levels to meet the latest standards
- **Reliability** - Robust design features
- **Customized Design** - Treatment time, velocity, field layout to suit the individual application
- **Power Optimization Options** - Flexible control systems

DESIGN FOR PERFORMANCE

From design to manufacturing and construction techniques, each HR-C ESP is engineered to meet the requirements of the project and provide long-term reliable service.

MIGI Rappers

For high efficiency performance, rapping losses comprise the bulk of particulate emissions. MIGI Rappers provide flexible control over rapping intensity and frequency allowing optimization of performance to minimize particulate emissions.



G-Opzel Collecting Plates


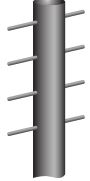

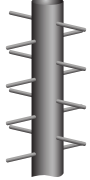
Hamon Research-Cottrell's G-Opzel™ collecting plate incorporates our traditional Optimum Precipitation Zone Electrode design that provides quiescent zones to aid in particulate collection and to reduce re-entrainment during rapping.



The G-Opzel™ has been the collecting plate of choice for many new and upgraded ESPs and is used by some HR-C competitors. The G-Opzel™ Collecting Plate is manufactured by Hamon's Thermal Transfer Corporation.

Rigid Discharge Electrodes

Robust unbreakable rigid discharge electrodes were first introduced by Research-Cottrell in the 1970s. HR-C's latest pipe & spike electrodes allow the discharge electrode electrical properties to be tailored to the specific requirements of each application.

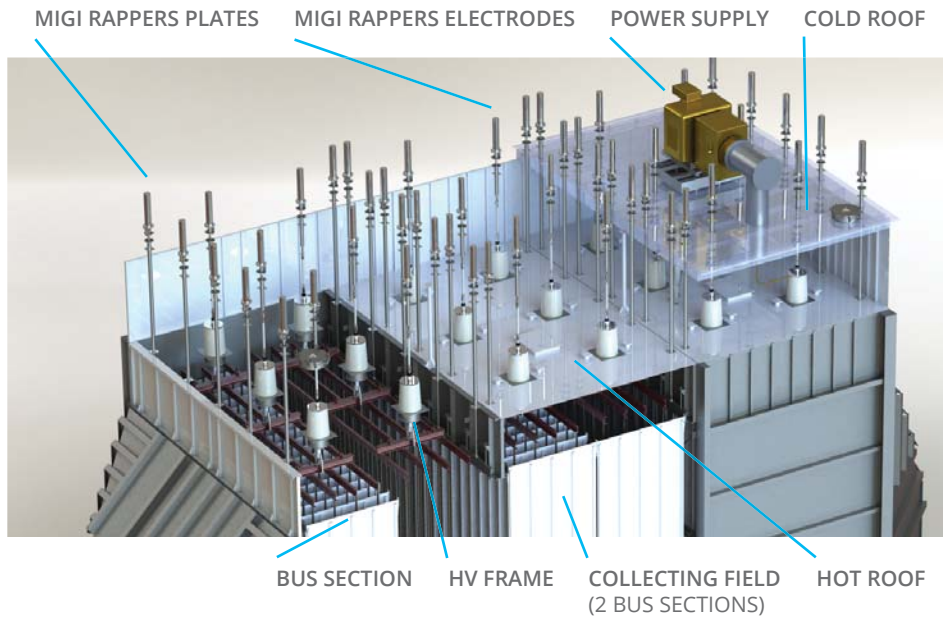
Electrode Type	Configuration	Applications
Pipe & Spike (center line) 		<ul style="list-style-type: none"> • Course particulate • High particulate concentration • Moderate level of corona suppression
Pipe & Spike (tangential) 		<ul style="list-style-type: none"> • Fine particulate • High particulate concentration • Need to overcome corona suppression

Controls and Power Supplies

HR-C works with selected suppliers to provide advanced microprocessor controls and the latest in transformer/rectifiers and switch mode power supplies to maximize performance.



THREE FIELD ESP CROSS-SECTION

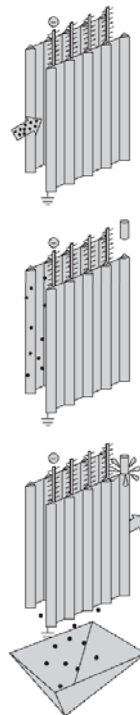


ESP OPERATING PRINCIPLE

Particles suspended in a gas enter the precipitator and pass through ionized zones around the high voltage discharge electrodes. The electrodes, through a corona effect, emit negatively charged ions into the gas which travel to the grounded collecting plates.

The ionized field around the discharge electrodes charges the particulate causing it to migrate to the grounded surface of the collecting plate.

The charged particles agglomerate on the collecting plates where the charge bleeds off. Rappers dislodge the agglomerated particulate, which falls into the collection hoppers for removal.



AFTERMARKET

Spare Parts - responds to requests for all materials and components that can be identified by part number and require no engineering.

Field Services - Engineers & Construction Advisers that have an extraordinary level of experience on a broad range of pollution control equipment.

Engineered Products - develops and implements upgrades to existing equipment in pursuit of improving performance and reliability.

PARTIAL USERS LIST

Hamon Research-Cottrell ESP experience derives from over 5,000 installations since 1907; installed in a wide variety of industries and application, such as:

Power Generation & IPP Utilities

- Pennsylvania Power & Light
- Detroit Edison
- Comisión Federal de Electricidad
- New Brunswick Power
- Nova Scotia Power
- Florida Power & Light

Petrochemical & Oil Refineries

- Western Refining
- Syncrude
- ExxonMobil
- Valero
- BP Carson
- Shell Oil

Other Applications such as Pulp & Paper, Mining & Metals and Glass

- Potash Corp
- Vale Inco
- Westvaco Corporation
- Trinidad Cement
- Weyerhaeuser
- Boise Cascade

Visit our website for a full experience list.



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Hamon Research-Cottrell is part of the worldwide Hamon Group and is a major provider of air pollution control technology. HR-C serves the North American market from its main office in Somerville, NJ.

Hamon Research-Cottrell provides innovative clean air technologies to a wide array of industries including power generation, pulp & paper, petrochemical, chemical, glass, cement, steel, food, and pharmaceuticals. Hamon Research-Cottrell is a worldwide leading supplier of:

- Electrostatic Precipitators
- Fabric Filters
- ReACT™ multi-pollutant control technology
- Dry and Wet Flue Gas Desulfurization Systems
- DeNOx Systems (Selective Non-Catalytic Reduction - SNCR)
- Urea to Ammonia (U2A®) Systems
- ExxonMobil Wet Gas Scrubbers

Hamon Research-Cottrell provides solutions and project services that include new and retrofit equipment, engineering and fabrication, parts and aftermarket support, field services, trouble-shooting, fluid dynamics and specialty consulting.

INTEGRATED SOLUTIONS FOR A CLEAN ENVIRONMENT

The Hamon Group is a global source for engineering and contracting.

Its activities include the design, the manufacturing of critical components, the installation and the after-sale services of cooling systems, process heat exchangers, air pollution control (APC) systems, HRSG's and chimneys.

