



Gulftronic Electrostatic Separators

BETTER YIELDS. BETTER RETURNS.

For more than 50 years, General Atomics Electromagnetic Systems' (GA-EMS) **Gulftronic® Electrostatic Separators** have been helping refineries improve yields by converting low grade by-products into higher value commodities, creating new opportunities to market and increase revenue from upgraded clarified oil.

Performance guaranteed certified below 100 ppm clarity

Field-proven reliability

Designed for continuous operation

Improves per-barrel returns from FCC/RFCC, hydrocracking

Compact, preassembled unit eliminates need for on-site construction

Built to ASME standards

The Electrostatic Difference

Typical mechanical filtration systems allow fine particles to escape capture, causing blockages, build up in the filters, and contamination downstream. As throughput decreases and contamination increases, maintenance costs escalate and margins decline.

Gulftronic Electrostatic Separators provide a more efficient alternative to mechanical filtration. GA-EMS' unique electrostatic technology captures and removes catalyst fines from the process stream. The results are clarified oil products with higher revenue potential, less downstream contamination, greater throughput, and significantly reduced maintenance requirements. For refineries looking to maximize profits and minimize costs, GA-EMS has the solution.



KEY FEATURES	KEY BENEFITS
Unique electrostatic technology	Captures and removes catalyst fines down to submicron levels
Impervious to plugging by asphaltenes, coke particles	Increases throughput Less maintenance required Lower operational costs
Performance guaranteed certified	Clarity below 100 ppm Higher value products created Increases revenue opportunities
Reduced settling tank waste	Reduces costs associated with hazardous waste disposal Minimizes environmental impact
Proven reliability for continuous operation	No loss of FCC/RFCC production Less unplanned downtime Lowers maintenance costs
Compact, skid-mount designs	Preassembled units No on-site construction Reduces installation costs
Field proven technology, built to ASME standards	Suits current and future operational needs Robust technology Designed for challenging applications, harsh environments

System Operation

Modern petroleum refineries rely on Fluid Catalytic Cracking (FCC) to convert heavy crude oil into high margin gas products. The FCC conversion process also creates slurry oil/decant oil (DCO), a by-product containing catalyst fines carried over from the FCC reactor. Gulftronic Electrostatic Separators connect to the FCC/RFCC slurry DCO line. Through a unique electrostatic process, Gulftronic separators polarize and capture catalyst fines in the slurry oil to create upgraded clarified oil products.

Each Gulftronic Electrostatic Separator module contains a high voltage electrode surrounded by unique, patented glass beads. During the separation cycle, an electrostatic charge polarizes the glass beads in each module, capturing catalyst fines from the process stream down to submicron levels. Feed enters at the top of the module and clarified product exits at the bottom and is sent to inventory tanks.

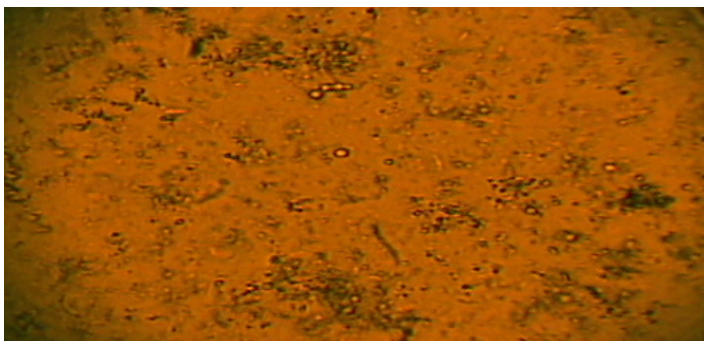
Once saturated, the modules backflush in sequence using raw FCC feed or customer-specified medium. During the backflush cycle, power to the module is shut off and flow is reversed, producing a bead scrubbing action. Catalyst fines are completely removed. The resulting backflush product exits the top of the module and is returned to the riser. The automatic removal of the catalyst fines from each module allows the unit to operate with a constant pressure drop, with no loss of FCC/RFCC production.

A purge cycle is initiated to displace the remaining backflush oil (if FCC/RFCC feed is used) in the modules for reuse. Each module then sequentially returns to the cycle of separation, backflush and purge, continuing each process automatically without interruption.

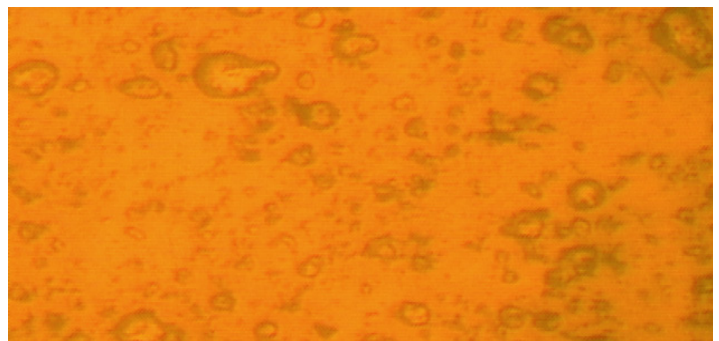


The Gulftronic Electrostatic Separator is impervious to fouling by asphaltenes and coke particles, helping refineries improve yields and profit margins while reducing maintenance costs and downtime resulting from blockages or breakdowns.

Oil Sample Before Gulftronic Filtration



Oil Sample After Gulftronic Filtration



Gulftronic Electrostatic Separators

TESTING AND ANALYSIS

GA-EMS offers thorough laboratory-scale testing and analysis of customer-provided slurry oil and other process fluid samples. By providing comprehensive sample test data, GA-EMS can help customers:

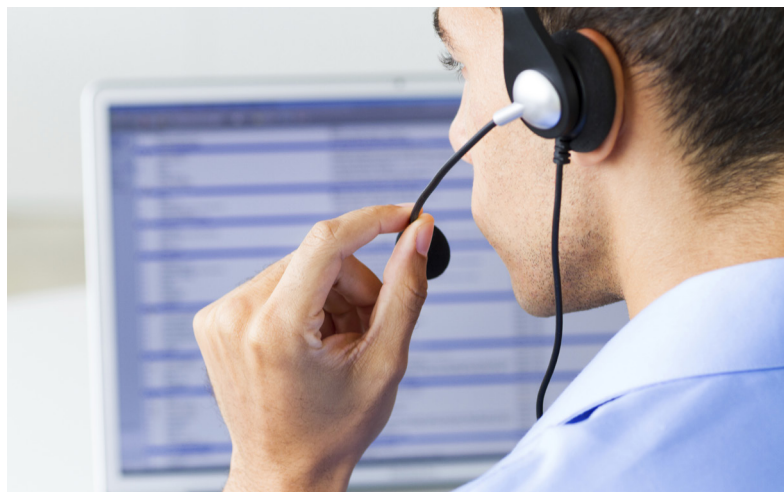
- Determine level of catalyst and other particles content prior to system design
- Provide on-going analysis of customer feedstock oil and clarified (separated) oil outputs
- Support new application and experimental testing



CUSTOMER SERVICE

GA-EMS' staff works closely with customers to develop and customize solutions to meet specific application requirements. GA-EMS is known for creating systems that remain reliable, cost efficient and easy to maintain to support long lifecycles and continuous operation. Customer services include site evaluations, call center support for rapid inquiry turnaround, and spares inventory to ensure systems remain on-line.

Please visit www.ga.com/gulftronic/customer-service for additional information.



CONTACT INFORMATION
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