

HAMON RESEARCH-COTTRELL, INC.



Chesterfield Station

FABRIC FILTER

Low Pressure High Volume Pulse Jet



FABRIC FILTER

Low Pressure High Volume Pulse Jet

Since 2000, HR-C has contracted for approximately 14,000 MW of fabric filters for the U.S. utility fleet. These projects have ranged in unit size from 100 to 800 MW and cover all of the fabric filter applications for utility boiler service including primary flyash collection, higher filter ratio polishing fabric filters, fabric filters downstream of SDA or CDS and/or upstream of WFGD, units for low and higher sulfur coals, fabric filters used with DSI and PAC systems, and conversions from ESP to FF.

Hamon Research-Cottrell is committed to developing fabric filter designs that provide optimal solutions for:

- Safety
- Reliability
- Maintainability
- Emissions performance

The HR-C Low Pressure High Volume Pulse Jet technology has several features which distinguish it from medium pressure pulse jet filters and offer advantages in terms of constructability, performance and ease of maintenance.



UNOBSTRUCTED TUBESHEET

Once the compartment is isolated, purged and has cooled, the HR-C LPHV design provides simple, direct access to the bag filters. Since the rotating cleaning arm design does not obstruct the tubesheet, service activities are easily performed.

ROTATING CLEANING SYSTEM ASSEMBLY

HR-C's low pressure high volume cleaning system, delivers cleaning pulses through a rotating cleaning assembly located on the roof of the compartment. This design allows as many as 1600 filter bags to be cleaned from one mechanism (one pulse valve and air tank), which distributes pulses to all of the bags through the 1 rpm rotation of the cleaning arms.

This arrangement greatly reduces the number of electromechanical devices in the system, eliminates stationary

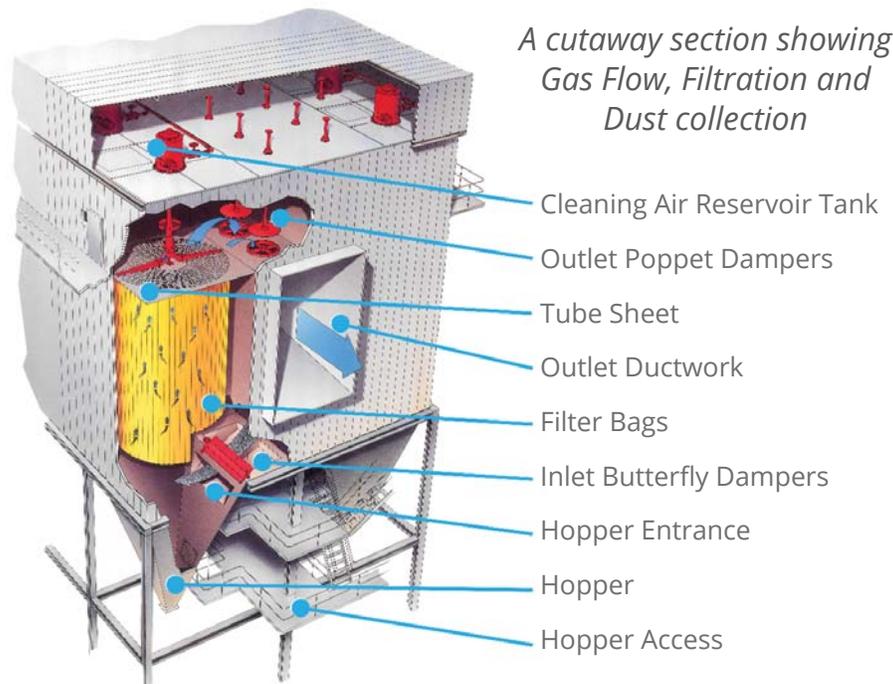
pulse pipes (above rows of bags in other designs) and simplifies both initial installation and long term maintenance.

In the HR-C LPHV design, bags are arranged in a layout of concentric rings, below the rotating cleaning arm pulse nozzles. The oblong bag/cage shape works with the cleaning system geometry. The oblong shape improves the ratio of internal volume to filter surface, and requires less pulse energy for effective cleaning. The oblong shape also yields an improved can velocity allowing for better dust fallout into the hoppers.

CLEANING AIR BLOWERS

The HR-C LPHV cleaning air is supplied by positive displacement blowers at 8 to 12 psig. Blowers are generally lower maintenance devices compared to compressors and use less energy to produce the required cleaning air.





A cutaway section showing Gas Flow, Filtration and Dust collection

MAINTENANCE AND ACCESS

With respect to fabric filters, the key area to be considered is inspection and maintenance of the filter bags which are accessible at the fabric filter compartment tubesheet after a compartment is isolated.

HR-C's typical compartment isolation arrangement for filter bag maintenance, used in approximately 95% of installations) is a "walk-in plenum design" with outlet poppet dampers and low leak inlet louver dampers. This basic design allows ease of entry and egress at the tubesheet level.

LONG FILTER BAG SERVICE LIFE AND LOW EMISSIONS

Many of the HR-C fabric filter installations have achieved better than five years bag life, while at the same time providing very low particulate emissions. As a result of this experience, HR-C is able to confidently offer industry leading performance guarantees for pressure drop, emissions and bag life.

ESP TO FF CONVERSION

The HR-C LPHV design lends itself to the conversion of existing ESP to Fabric Filters. HR-C's first of many ESP to FF conversion projects was implemented in the mid 1990s. ESP to FF conversions can offer significant project savings as ductwork and ash handling systems can be retained and in many cases existing ESP casing walls can be reused.

PARTIAL USER LIST

PacifiCorp Energy

- **Huntington Station Units 1 & 2**
8 Compartment ESP to PJFF Conversions

- **Hunter Units 1 & 2**
8 Compartment ESP to PJFF Conversions

- **Wyodak**
10 Compartment FF Replacing ESP downstream of existing SDA

Dominion Power

- **Chesterfield Station Unit 6**
28 Compartment Fabric Filter

Minnesota Power

- **Boswell Energy**
12 Compartment FF with Carbon Injection

Consumers Energy

- **Karn Units 1 & 2**
10 Compartments Each

- **Campbell Units 1, 2 & 3**
8, 10 & 24 Compartments Replacing ESP's

Nevada Power

- **Reid Gardner Station Units 1, 2 & 3**
12 Shippable Modules Each

SunCoke

- **Haverhill, Gateway, Middletown**
Coke Oven Application

Alliant Energy

- **Lansing Station**
12 Compartment FF for future CDS Service



Hamon Research-Cottrell

(* East Main Street
Somerville, New Jersey 08876

908-333-2000
info.hrc@hamonusa.com

www.hamonusa.com

Chris Davis

EVP, Commercial Operations

Buzz Reynolds

VP, Industrial Products

908-333-2119
buzz.reynolds@hamonusa.com

Royce Warnick

Director, Aftermarket Services

216-233-7227
royce.warnick@hamonusa.com

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.

