INFO

FCC CATALYST HOPPER VENT GAS FILTRATION

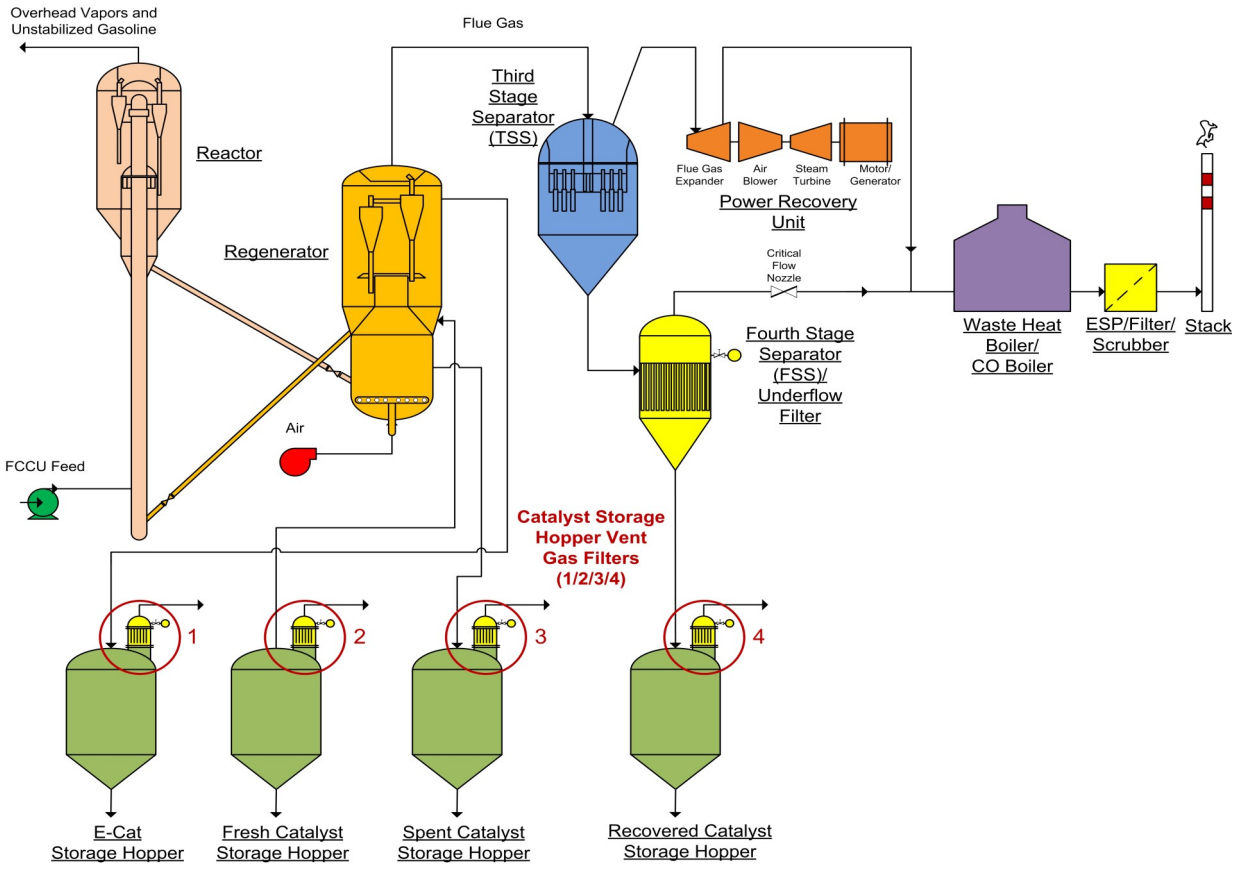
Overview Catalyst is a crucial component in the processing of highly valued products in many industries. In refineries Fluid Catalytic Cracking (FCC) is the most important conversion process to convert fractions of crude oils to products like gasoline, diesel, jet fuel and olefinic gases. The oil is cracked in the presence of a finely divided catalyst which is maintained in a fluidized state by the oil vapours. Fluid catalyst is continuously circulated between the FCC reactor and the regenerator using air, oil vapours, and steam as the conveying media. During the pneumatic transfer of catalyst to and from processing units and catalyst storage hoppers, fine catalyst is created.

AUTOMATIC BLOWBACK DUST FILTRATION SYSTEMS

Filters effectively remove catalyst particles from vent gas streams before release to atmosphere, while efficiently recovering valuable product.
Typically vent gas filters in FCCU's are located on top of:

- Fresh Cat Storage Hoppers;
- Low Metals/ High Metals Equilibrium Cat Storage Hoppers;
- Spent Cat Storage Hoppers;
- Recovered Cat/ Cat Fines Storage Hoppers;

Being part of the continuous FCC process operating 24 hours a day with minimized shutdowns for routine maintenance, reliability and availability of the vent gas filters is of critical importance.



Possible locations of Catalyst Storage Hopper Vent Gas Filters in a FCC plant (1,2,3 & 4)

Process Description Dahlman's Catalyst Hopper Vent Gas Filters consist of a cylindrical filter vessel, a blowback gas accumulator vessel and the required controls, valves, instruments and piping.

Vent Gas Filters are installed on top of Catalyst Storage Hoppers, and remove catalyst fines from conveying gas during loading and unloading of the Hoppers. During filtration catalyst fines will collect on the outside of the filter elements. Over a period of time a layer of solids will build-up on the surface of the filter elements. Upon reaching a certain pre-set differential pressure over the filter elements, the filtration system is automatically regenerated *in-situ* by performing several blow back pulses in reverse direction, each cleaning a number of filter elements.

The combination of the corrosive, oxidative environment and the possible high temperature, requires the use of advanced sintered metal filter media and a perfected filter design.

In addition to the right selection of the hardware, it is of critical importance to minimize (upward) velocities to avoid:

- direct impact of the incoming abrasive particles and irreparable damage to the filter media;
- re-entrainment of particles on the filter media during blowback cleaning, and eventual plugging of the filtration system.

Dahlman utilizes high quality, sintered porous metal filter elements, which have proved to perform excellent under the severe FCC flue gas conditions. Their features include:

- special alloy filter medium with optimal
- resistance against mechanical & thermal shock and oxidizing environment;
- excellent *in-situ* cleaning characteristics;
- low pressure drops compared to other filter media;
- long lifetime.

Features	***Benefits***
Use of high-efficiency filter media suitable for surface filtration and optimal cleaning results	Maximum solids recovery & minimal environmental exposure
Highly effective *in-situ* element cleaning due to pressurized backwash	Minimized backwash volume -> minimized utility costs and increased upgraded product quantity
Elimination of filter plugging and consequently, *ex-situ* cleaning	Enhanced operational safety & reliability, and low OPEX
Non-stop operation	High reliability and availability (no unscheduled downtime)
Full automation by PLC or DCS control system	Operational cost savings and consistent performance
Compactly sized, fully dressed filter packages	Minimum floor space and low installation costs
Full process performance guarantee	Single point responsibility