Engineering Bulletin

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QUALITY AIR MANAGEMENT

(800) 267-5585
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Great Savings in Cost of Operation

Ultra-Flow™ is the most advanced baghouse dust collector technology:

- ✓ Reduced emissions from the dust collector, 99% efficient on 1 micron
- ✓ 20-40% Lower power consumption; smaller blower and motor HP
- ✓ 40-80% Lower operating and maintenance cost
- ✓ 3-5 times increase in filter bag life, some jobs lasted 10 years
- ✓ No upward "can" velocity to plug the collector with dust

See how to save $57,455 on a small collector:

(the savings are much greater for larger baghouses)

Ultra-Flow™ baghouse handling 20,000 SCFM @ 18:1 filter ratio, compared to any commonly available dust collector.

Cost to purchase and service a conventional style baghouse:

Dust emissions	66 x10^{-4} gr/cu.ft.
Initial purchase price, c/w 40 HP blower	$62,845.00
Replace 256 bags @ $15.92 each	$4075.00
Labor at $35 per hour at 10 bags per hour	$896.00
Replace 10% cages $40.00 each	$1024.00

Cost to purchase and service an Ultra-Flow baghouse:

Dust emissions	4 x10^{-4} gr/cu.ft. (90% less)
Initial purchase price, c/w 20 HP blower	$56,225.00
Replace 84 bags @ $15.92	$1329.00
Replace 10% cages @ $35.00 (no venturi)	$294.00
Labor at 10 bags per hour	$ 294.00

Power Consumption: (based on 8 hours per day & 5 days per week operation)
Conventional collector = 23 kW x 8 hours x 250 days = 46,000 kWh per year @ $4600
Ultra-Flow collector = 12 kW x 8 x 250 = 25,200 kWh per year @ $2520
Power saving is 46%.

10 Year Operating Cost Analysis:

	Conventional Collector	Ultra-Flow Collector
1st year	$67,445	$58,745
2nd year	$10,595	$2520
3rd year	$4600	$2520
4th year	$10,595	$2520
5th year	$4600	$4437
6th year	$13,033	$2520
7th year	$10,595	$2520
8th year	$4600	$2520
9th year	$10,595	$2520
10th year	$7597	$4437
Total cost	**$131,222**	**$85,259**

Operating Cost Savings over 10 years = $45,963, **factor modest inflation and the savings are $57,455.**
Return On Investment of 67.4%., which can be re-invested in other plant operations!!!!!

See next page for WHY & HOW.

Why and How Ultra-Flow Achieves This:

Ultra-Flow's latest Advanced Technology design gives the user more performance at an affordable price. Typically pressure drop across the collector will be at least 35% less, translating into a reduced power consumption of 30-50%. The low velocity, high volume approach to the pulse-jet allows for 100% of the bag to be cleaned (conventional designs clean as little as 10-20% of the media. As result there is longer bag life and cleaning frequency will be cut in half.
The high, side inlet prevents dust hang-up and re-entrainment on to the bags.

Limitations of Contemporary Dust Collector Designs

A) Media Blinding

As the jet enters the bag through the venturi, it has velocities that drive dust from the bag which is in cleaning mode to an adjoining bag in filtering mode. As the bag cleaning continues the media is partially plugged until as little as 5% of the media is effective. The pressure drop increases and the dust holding capacity between cleanings drops to as little as 5% of the original. This means the bag must be cleaned up to 20 times more often to maintain equilibrium. In an attempt to compensate for this serious design flaw, the approach has been to lower the filter ratio. This has had limited success, in that the bags last longer since it gives the cleaning system more bag area to plug before the cleaning frequency and pressure drop increases enough to indicate a bag change. A collector at 3:1 filter ratio, compared to a conventional design at 6:1 filter ratio, assuming the same cleaning system jet velocity and flow, will last nearly twice as long, but the cleaning frequency will be nearly the same. The dust penetration through the bag on a limestone dust will be in the 0.0100 to 0.080 grains per cu. ft. range. It must be understood that for the above to be valid, the dust must have densities of over 20 lb./cu.ft..

B) Can velocity

Can velocity is defined as the vertical velocity component as the process air enters the bag section from the inlet. You determine cross-sectional area of the bottom of the collector housing and subtract the cross-sectional area of the bags. Most existing collectors use bottom (hopper) inlets. Typically operating at a 6:1 filter ratio with 8 foot long bags, the can velocity is 275 to 300 ft per minute. If the bag is lengthened say from 8 feet to 12 feet, the filter ratio drops to 4:1 but the can velocity remains unchanged. On dusts with a significant component of dust below three microns and densities under 50 lb per cu.ft, this can velocity range impedes dust from falling into the hopper.

The QAM Solution:

1) Use a gentle, although powerful high volume low velocity cleaning pulse-jet.
2) No venturi in the bag cage.
3) New specially designed bags and cages for high-ratio operation. Only half of the number bags are used, compared to conventional designs.
4) More spacing between bags to prevent all dust penetration and ensure dust drops to the hopper.
5) Position the pulse pipes at the critical distance to ensure maximum induction of secondary air and pulse-jet growth.
6) Set the pulse controller, according to instructions supplied by QAM, for optimal operation and much lower operating cost.

The Result:

I. 90% reduced dust emissions from the collector.
II. Increase bag life typically to 84 months (compared to only 18 months).
III. Lower power consumption by 20-40%, due to smaller blower and motor horsepower.
IV. Lower operating cost by 40-80%.
V. No upward "can" velocity.