Catalytic Ceramic Filter Systems
Air Pollution Treatment

Air Quality Management Symposium
June 2015

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Ceramic Filter Tubes ("Candles")

10 ft. by 6 in. lightweight ceramic fiber filter

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<th>CHARACTERISTICS OF (LOW-DENSITY) CERAMIC ELEMENTS</th>
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Pressure Drop and Filter Life

• Initial pressure drop dP approximately 4 inch w.g.
• Less than of **10%** differential pressure increase per year.
• Increased pressure drop triggers filter change-out, *not* catalyst deactivation or change in performance.
• Fan has enough power to cover filter life.
• Time between filter changes is financial decision depending on local power cost.
• **5 to 10 year or more filter life** – application dependent
PM + SOx/HCl/HF/Hg + NOx/CO/O-HAPs/Dioxins

Tri-Mer provides completely integrated all-in-one system
Typical Performance

- **PM** Filterable Submicron PM, PM2.5, PM10
  Outlet less than 0.001 grains/dscf (2 mg/Nm³)
- **SOx** Over 90% removal with dry sorbent injection (DSI)
  95+% in certain applications
- **NOx** Over 90% removal at 400° F.
  95+% in certain applications

Also removes
- Cement Organic HAP VOC (Portland Cement MACT)
- HCl, HF (Many regulations)
- Dioxins (CISWI MACT)
- Mercury (Many regulations)
- Soon introducing a system for CO simultaneously
Embedded catalyst – NOx, O-HAPS, Dioxins, CO

Nano-bits of NOx catalyst are embedded within the fibers and on the fibers
Lower Temperature Activation of Catalyst

Utilization of catalytic surface is almost 100%, compared to 15% for traditional SCR.

Lower temperatures achieve higher removal efficiency—60-70% starting at 350°C F, and over 90% at 400°C F and above.

Traditional block SCR requires 600 - 650°C F to reach 90%.
Protection from Catalyst PM Blinding and Poisoning

Particulate captured on the filter surface

Nano-Catalyst embedded in the walls of the filter

PM does not penetrate walls of the filter

CLEAN AIR

Process PM + SO2 Sorbent PM + NOx + Ammonia

Meets EPA Regulations

AIRFLOW

DIRTY AIR

Tri-Mer® CORPORATION
Technology Leader air pollution control

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Turnkey Projects – Civil, Ductwork, Ceramic Systems
12 Housings – Ceramics (PM, SO2, NOx)

- Ceramic fracking proppants
- 2 kilns
- Operational Q1 2013
- Compliance verified
Barge-mounted Ceramic Catalyst Filters – At-Berth Ships
Clean Air Engineering Maritime (CAEM) system at POLA
Clean Air Engineering Maritime (CAEM) system at POLA
Thank You

PM, SO\textsubscript{x} and NO\textsubscript{x} IN ONE SYSTEM

+ Organic HAPS & Dioxins

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