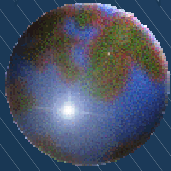


Global Business Perspective on Woven & Nonwoven Filtration Fabrics

Edward C. Gregor

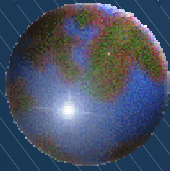
Edward C. Gregor & Associates, LLC

Charlotte, NC



A Marketplace for Growth

- Filtration Outgrows the Economy
- Legislation is Filtration's Best Friend
- Desire for Purer Filtrate Everywhere
- Emerging Industries Require Filtration
 - Microelectronics
 - Pharmaceutical/Bio-Technology/Medical



Filtration Mega-Trends

- One World Business
- Environmental Consciousness
- Specialized Media
- Finer Filtration
- Disruptive Technologies



Market Fragmentation

Aerospace

Inks

Polymers

Chemical Process

Laboratory

Power Gen

Cigarettes

Medical Devices

Pulp & Paper

Coalescing

Microelectronics

Respiratory

Coolant Fluids

Mist Elimination

Small Engines

Dust Collection

Office Equipment

Transportation

Fluid Power

Paints/Pigments/Dyes

Vacuum Cleaner

Food & Beverage

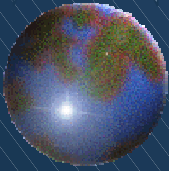
Gas & Petroleum

Water

HVAC

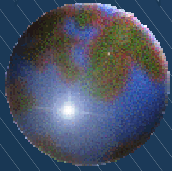
Pharmaceutical

Waste Water



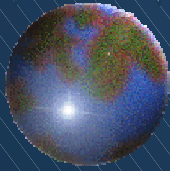
Hourglass Effect





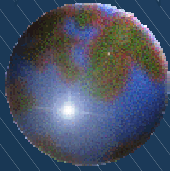
Critical Performance - \$15-100/s.y.

- Precision Woven Monofilament Fabrics
 - Screen: 10 to 200 micron pore sizes (PET/PA)
- Woven and Nonwoven Fabrics
 - Specialty Polymers: PTFE, PPS, PEEK, E-CTFE
- Wire Cloth
 - Screen: Stainless Steel, Copper, Aluminum etc.



Specialty Performance - \$2 to 20/s.y.

- Woven Glass
 - High-Temperature Dust Collection Bags
- Woven Synthetic
 - Press Cloth & Dewatering Belts
- Knitted Synthetic
 - Dust Collection & Channel Fabrics



Mass Market Fabrics: \$0.10 - 1.50/s.y.

- Direct Spun
 - Spunbond - PP & PET
 - Meltblown – PP, PET, PA & PPS
- Fiber Based
 - Needlefelt – PET, Aramid, Acrylic
 - Hydroentangled – PET & PP
 - Carded – Resin, PET & PP
 - Wetlaid – Glass, Cellulose, Misc.

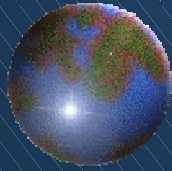


Global Market Volume

Base Year 2000--Millions of U.S. Dollars

	Europe	N. Am.	Asia	Total
Woven Textiles				
Synthetic/Glass	190	195	170	555
Metal (wire cloth etc.)	75	110	80	265
Nonwoven Fabrics	600	750	650	2,000
(synthetic/wetlaid glass)				
Knitted	<u>< 5</u>	<u>20</u>	<u>< 5</u>	<u>30</u>
Total	870	1,075	905	2,850

Excludes carbon steel wire cloth, tea bag, coffee and cigarette filters



Disruptive Technologies

- Sweeping Changes
- New Technology Examples
 - Digital Camera
 - Touch Tone Telephone
 - Home and Office Computers
 - Fuel Cells

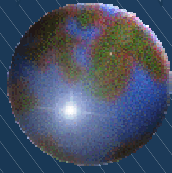




ThermaPore™ Silicon Carbide Media

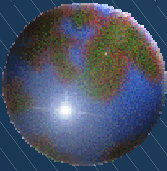
- Chopped Fiber – Wetlaid
- Pleated, Sintered & Fabricated as Filter
- Diesel Filters
 - 96 percent removal of 0.1 size soot particles
- Microwave Unit - 1200° C in <10 seconds
- Harmlessly Vaporizes Organics
- Beer & Wine, Power Generation



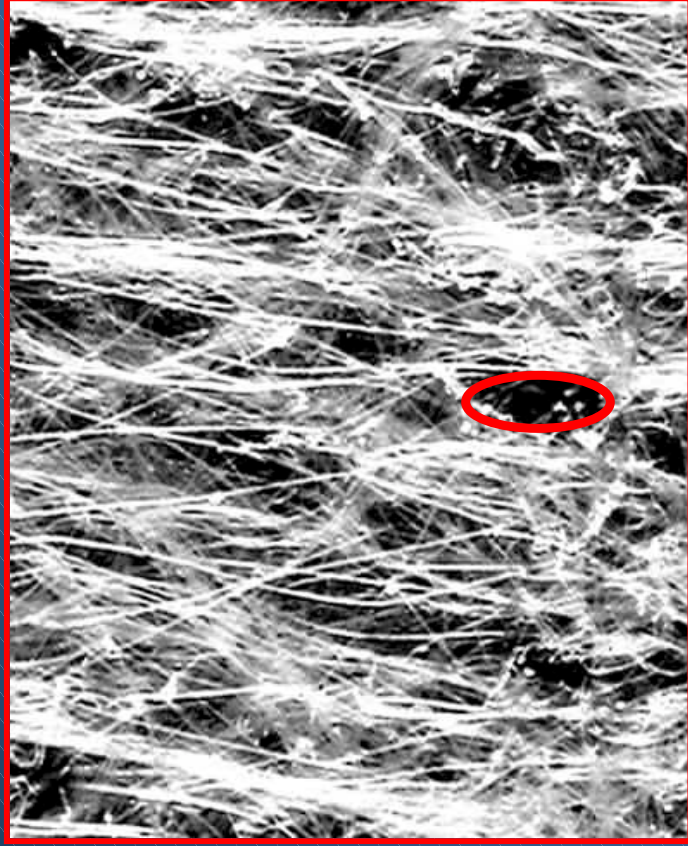


Durapex™ Hydroentangled Nonwoven

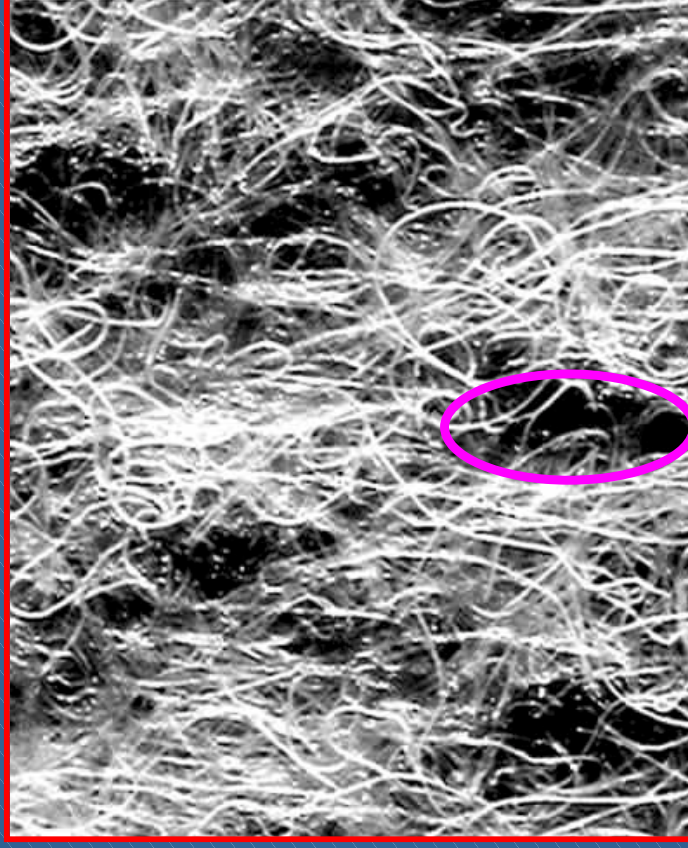
- Baghouse Filtration
- Alternative to Needlefelt Nonwoven
 - \$300-400 Million Dollar Market
- 10.0 osy versus 16.0 osy
 - Improved Fiber Distribution
 - Similar Physical Properties – PET & Aramid
 - Comparable Airflow
- Near Microporous Efficiencies



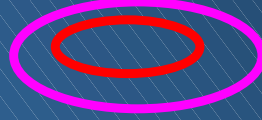
Durapex & Needlefelt Pore Structure

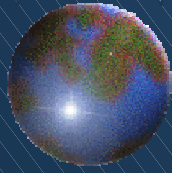


10.5 osy DURAPEX™ PET A2-094A



16 osy Std. PET Felt

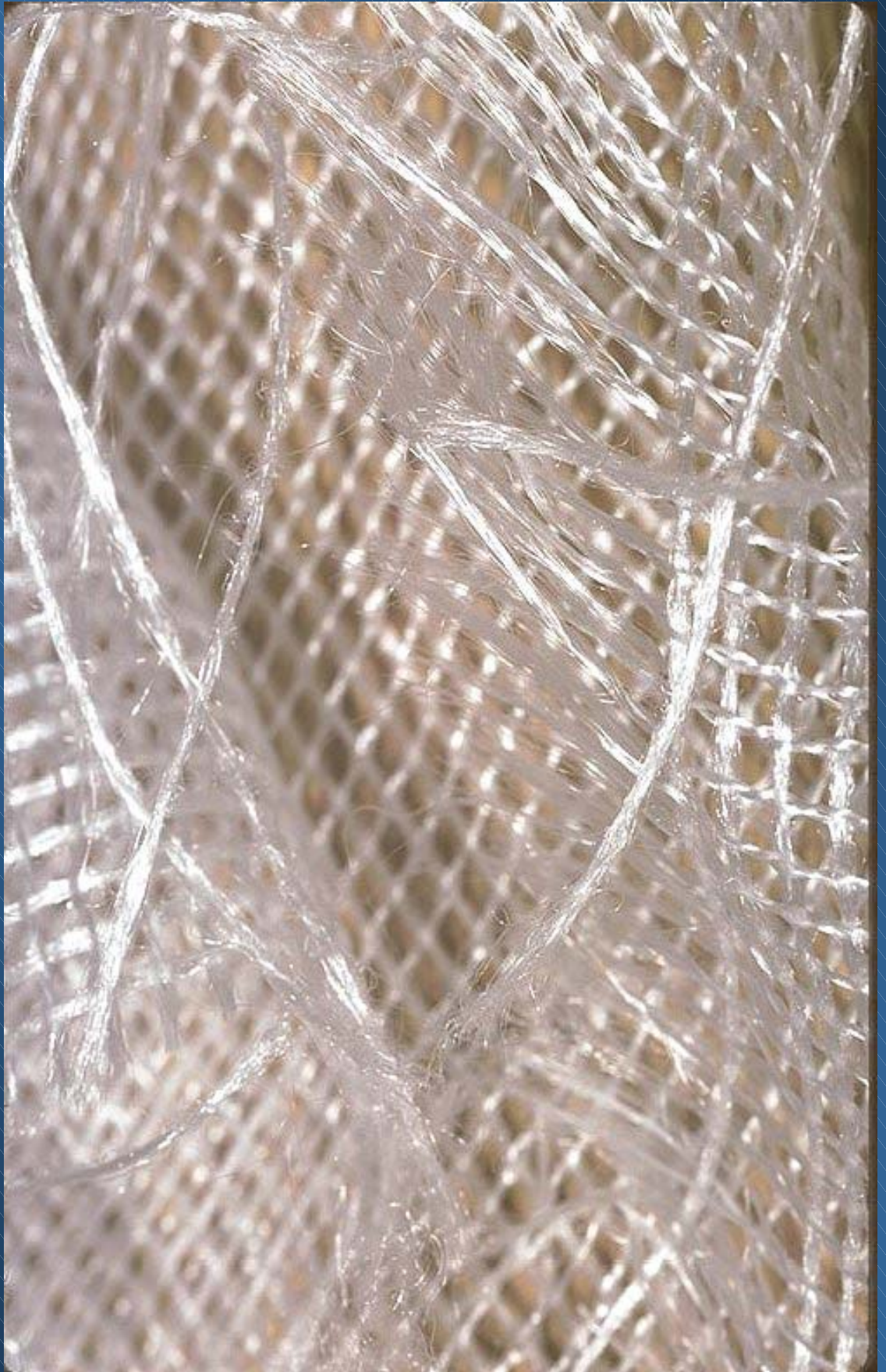




NatureWorks™ Polylactic Acid - PLA

- Melt Processable Polymer
 - Annually Renewable Resource – Corn
- Staple Fiber, Filament Yarn, Fiber Fill, BCF
- Low Moisture Regain – Superior Wicking
- Disposal Methods
 - Landfill, Composting, Incineration
- Uses – Water, Air, Coolant, Baghouse





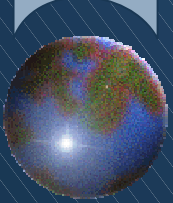


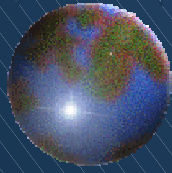
Basalt Fibers and Yarns

- Made from Basalt (Lava Rock)
- Alternative to Fiberglass -52% Silica
- High Temperature Resistance - 1,500° F
 - 500° Higher Than E-Glass
 - 225° Higher Than S-Glass
- Tensile Strength
 - 33% higher than E-Glass – Same As S-Glass
- Lower Elongation at Break Than Glass
- Better Chemical Stability



Basalt Mat™





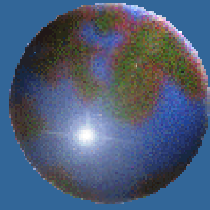
Selected Unmet Filtration Needs

- Market Priced Fibers and Media with High-Temperature, pH and Chemical Resistance
- Woven & Nonwoven Fabrics with a Narrower Pores Size Distribution
- Filtration Media with Higher Void Volume and Flow Rates
- More Durable Media and Filter Designs



Conclusion

- There is No Single Perfect Filtration Media
- The Market is Growing Faster Than the Economy
- Opportunities Abound for New Media
- Specialized Media Will Continue to Grow
- Legislation is Filtration's Friend
- Demand for Finer Filtration Continues
- Disruptive Technologies are Profitable



Success in Filtration Begins with Innovative People & Companies