

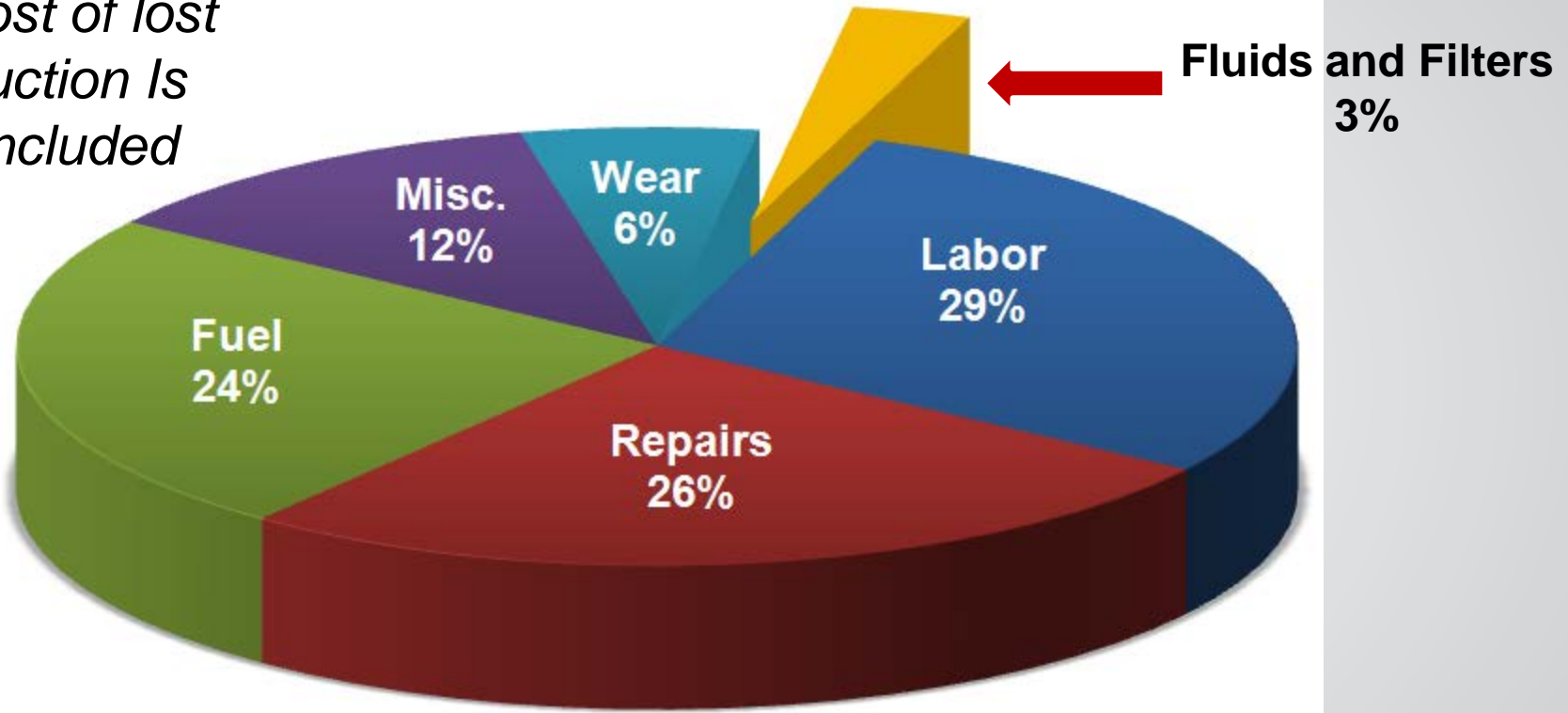
High Quality

Low Risk

Hassle free PM

Total Owner & Operational Cost

The cost of lost production is not included



CAT's goal – reduce total maintenance cost during the operating life of Cat engines & machines

Air Filters

Safeguarding your Cat equipment from the dirt and contaminants created by the work environment is critical to component life and operator health and safety. There are three types of Cat Air Filters: Engine Air Filters, Cab Air Filters and Turbine Pre-cleaners.

Cat Air Filters

- Provide max. protection of vital engine parts and optimum performance
- Reduce airborne irritants, creating a cleaner, more comfortable operator environment
- Offer increased airflow with less restriction
- Deliver the most advanced filtration available, even with limited space constraints
- Are environmentally friendly and incinerable
- Cat offers multiple filter efficiencies depending on machine and application



Engine Oil Filters

With more exacting engineering standards, there is less room between engine components than ever before — which is why it's critical to use only Cat Engine Oil Filters in your Cat equipment. Cat Engine Oil Filters come in Standard Efficiency, Advanced Efficiency and Ultra High Efficiency models.

Cat Engine Oil Filters

- Maximize engine and engine oil cleanliness
- Provide the best machine performance and component protection
- Feature acrylic beads to prevent bunching and spiral roving to increase stability
- Have a nylon center tube to prevent metal contamination
- Include seamless, molded end caps to eliminate leaks
- Cat offers multiple filter efficiencies depending on machine and application



Hydraulic & Transmission Filters

Because of the differences between the hydraulic and transmission systems on Cat equipment, it's important to always use Cat Hydraulic and Transmission Filters. These Filters come in Standard Efficiency, Advanced Efficiency and Ultra High Efficiency models.

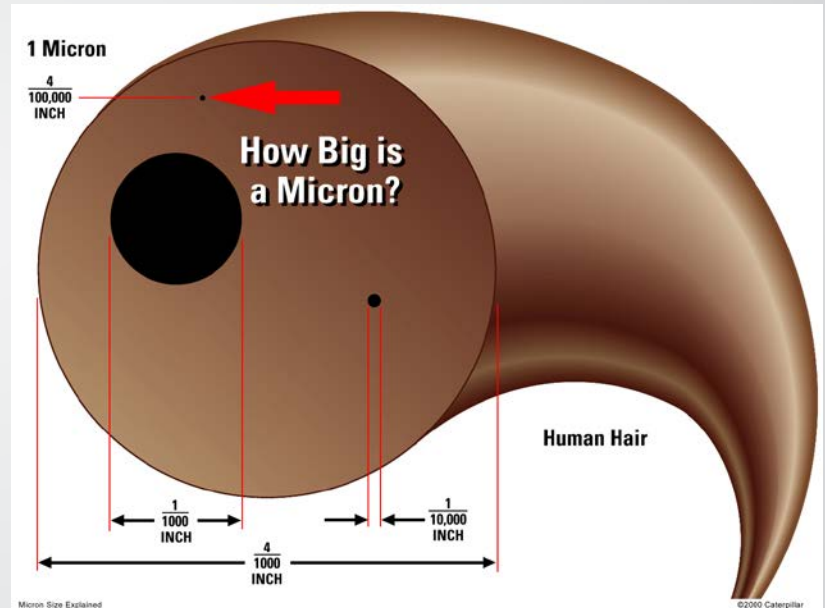
Cat Hydraulic & Transmission Filters

- Capture particles that would otherwise damage hydraulic and transmission systems
- Minimize cold start by-pass while maintaining appropriate cleanliness levels
- Cat offers multiple filter efficiencies depending on machine and application

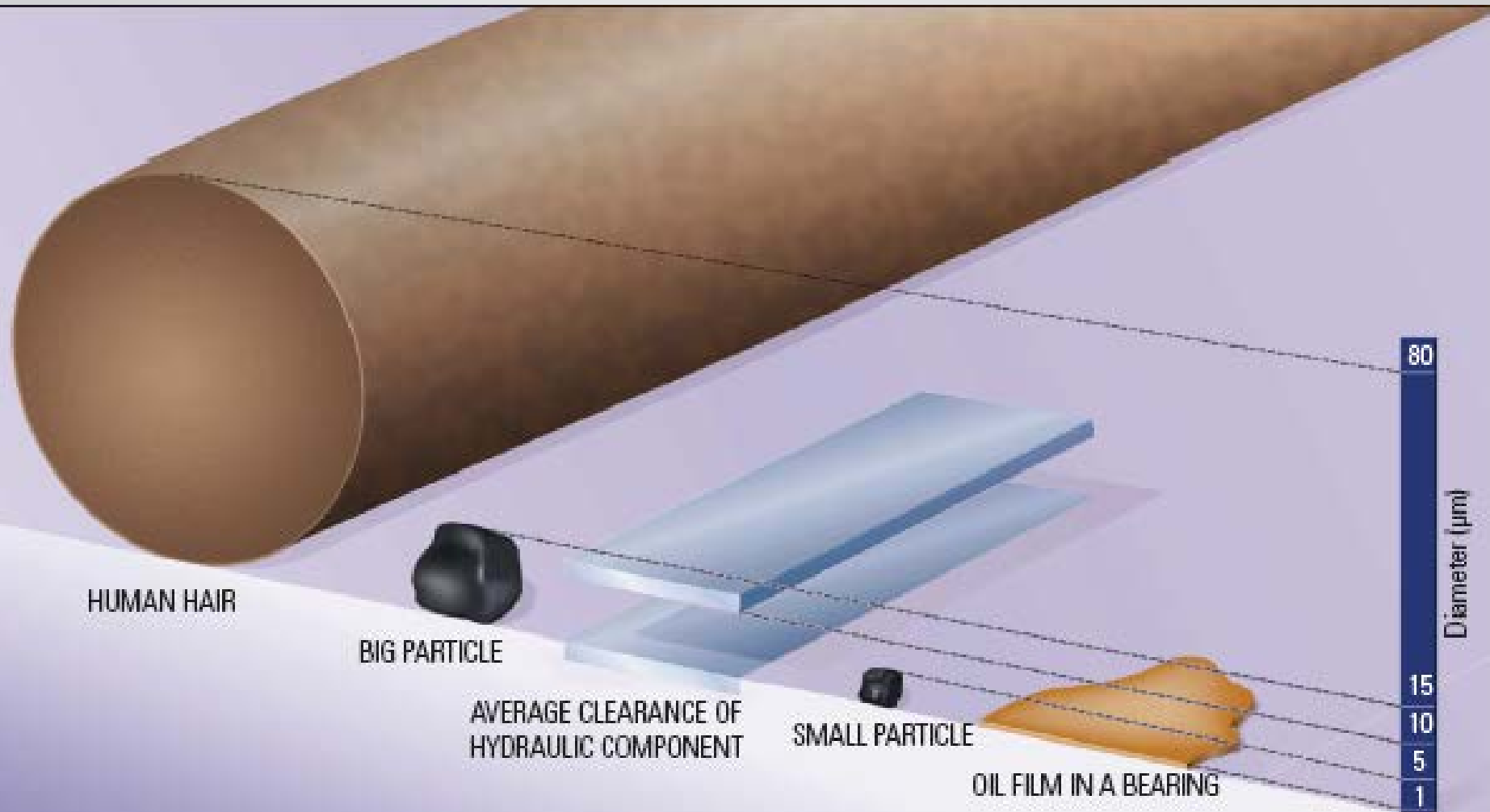


Contamination Control

- No. 1 enemy of components durability: Contamination
- Filters and Fluids are utilized to help control contamination levels in equipment
- Smaller contaminants are becoming more harmful over time



Small Particle Contamination



Do All Filters Look and Perform Alike?

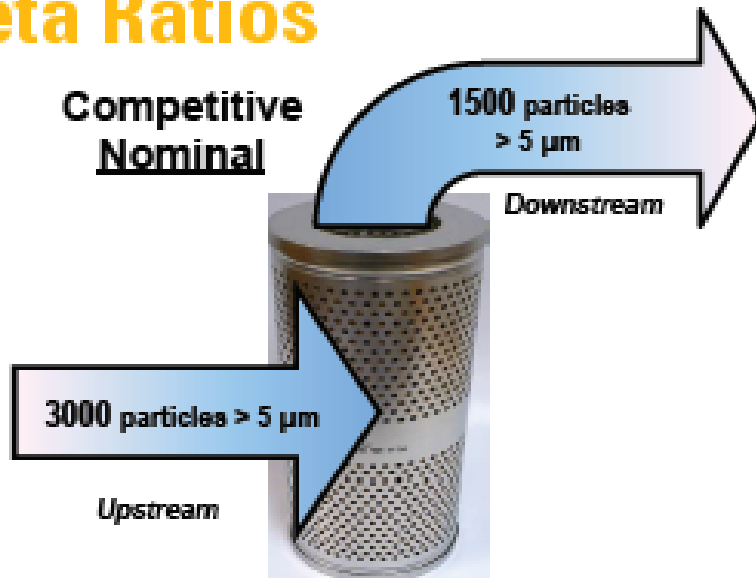
- Same look?
- Same build?
- Same performance?



Do All Filters Look and Perform Alike?



Beta Ratios

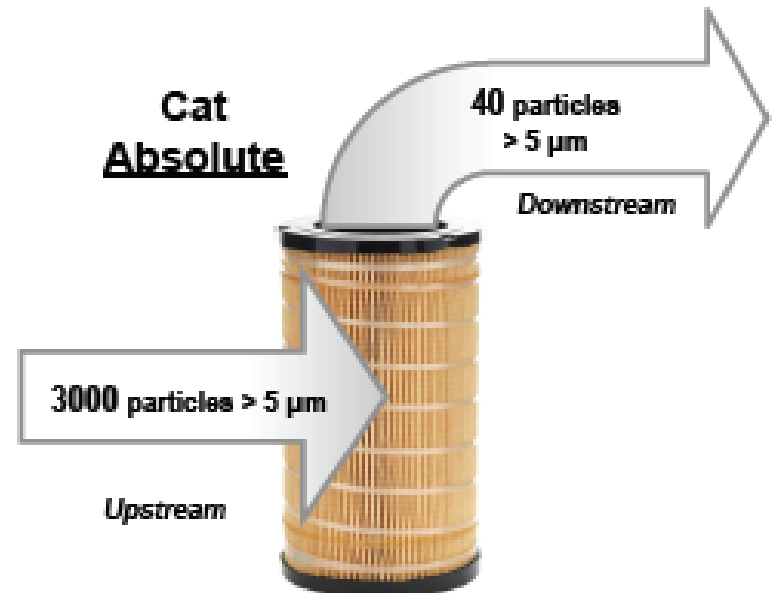


Filter stops
1500 particles

$$\text{Beta Ratio } (\beta_x) = 3000 / 1500 = 2$$
$$\beta_5 = 2$$

$$\text{Efficiency \%} = 1 - (1 / \beta_x)$$
$$1 - (1 / 2)$$

$$\text{Efficiency} = 50.0\%$$



Filter stops
2960 particles

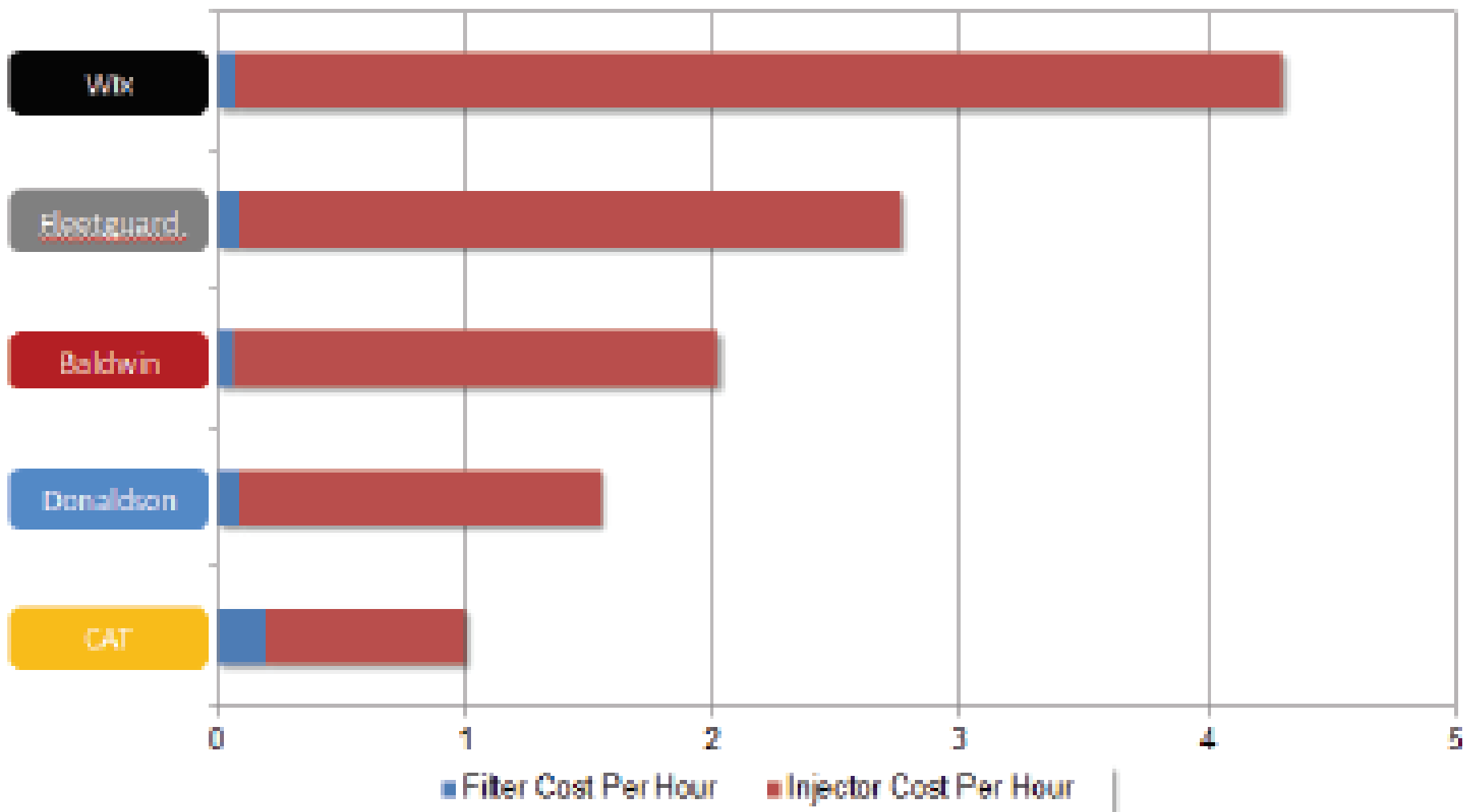
$$\text{Beta Ratio } (\beta_x) = 3000 / 40 = 75$$
$$\beta_5 = 75$$

$$\text{Efficiency \%} = 1 - (1 / \beta_x)$$
$$1 - (1 / 75)$$

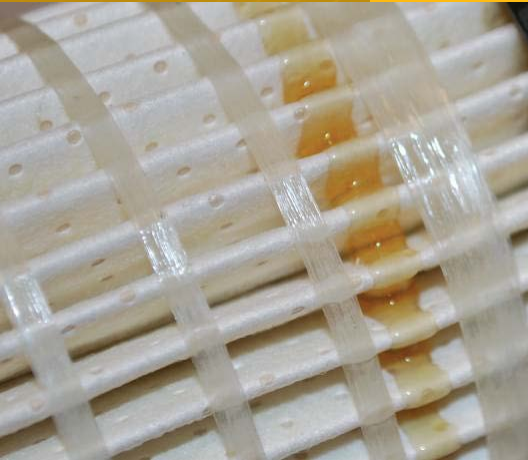
$$\text{Efficiency} = 98.7\%$$

Performance You Can See

Normalized Cost Per Hour



Unique Fit Engine Liquid Filters



- Multi-layered media
- Improved efficiency
- Increased capacity

- Housing drain
- Promotes clean change
- Ensures correct filter used



- Pre-fill deterrent (fuel only)
- Provides clean fuel system
- Integrated seal -- Easy installation

- External positive stop
- Correct installation torque



Optimal Fuel System Protection



UHE Plus Secondary Fuel Filters

- Best choice for long component life
- Protects Tier 4 fuel system parts
- Sub 4 micron at Beta=75
- Increased capacity



Fuel/Water Separators

- New “Bowl less” all metal design
- Same performance
- Eliminates common problems
- Same price

AFSI Facilities

AFSI US

Champaign, IL



228,000 SQ FT Facility
200 Employees
24 Hours / 5 Days
Production started... 1986



AFSI Europe

Most, Czech Republic

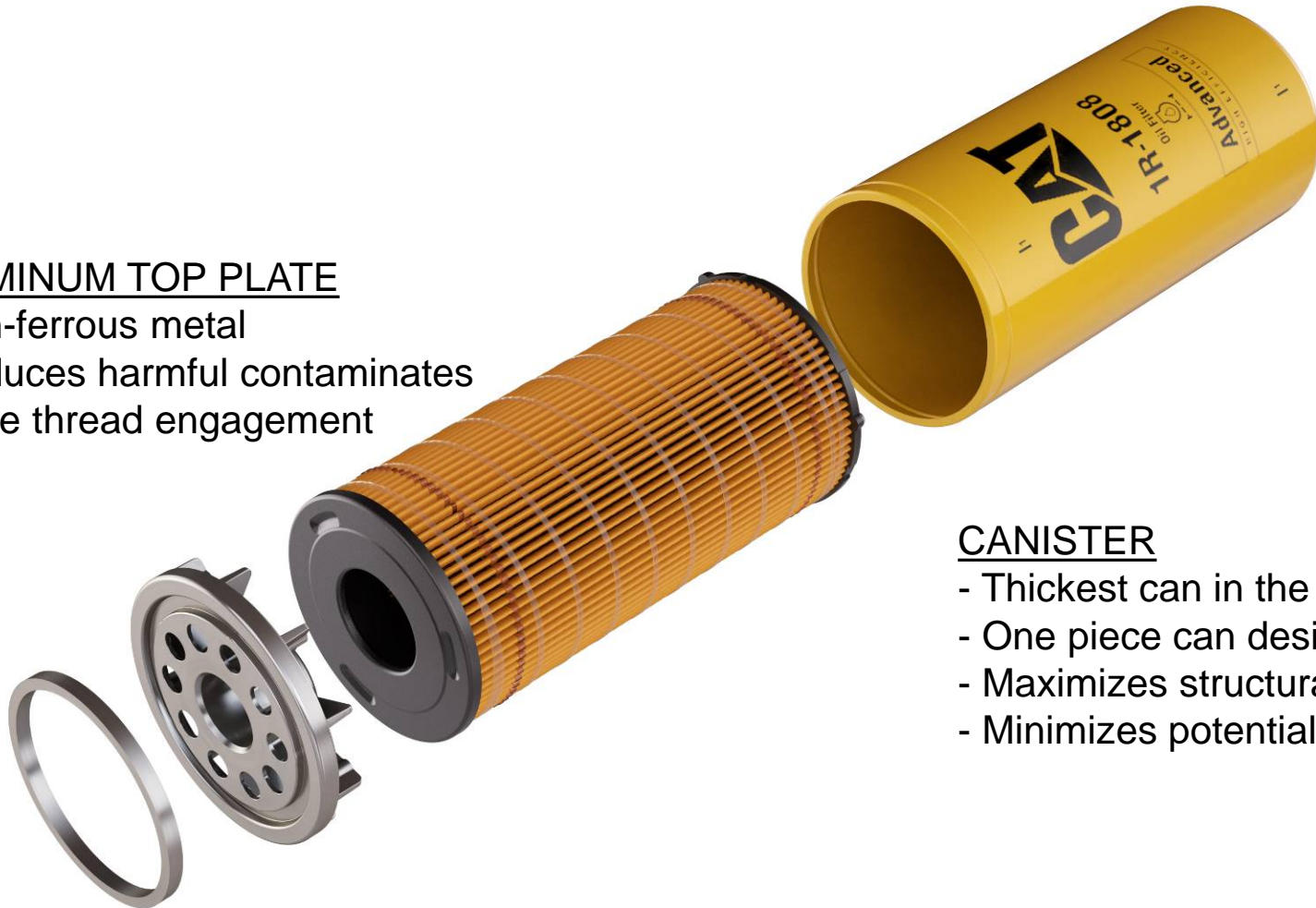
120,000 SQ FT Facility
195 Employees
24 Hours / 5 Days
Production started... 2009

“Only” Cat Filters

Cat Filter Features

ALUMINUM TOP PLATE

- Non-ferrous metal
- Reduces harmful contaminants
- More thread engagement



CANISTER

- Thickest can in the industry
- One piece can design
- Maximizes structural strength
- Minimizes potential leaks

Cat Element Features

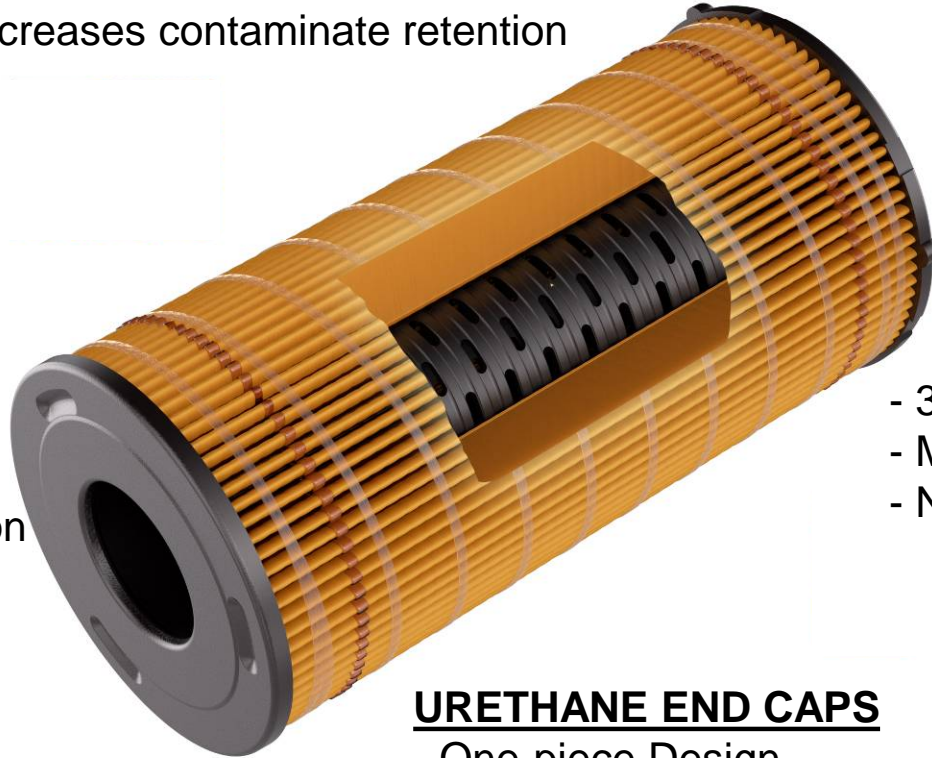
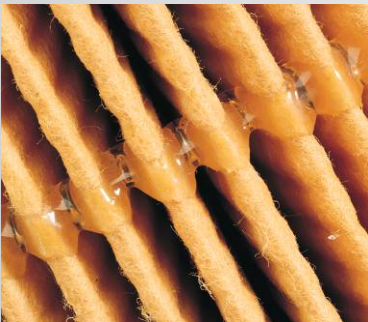
SPIRAL ROVING

- Reduces pleat flex and fatigue
- Maximizes media surface utilization
- Increases contaminate retention



ACRYLIC BEADING

- Prevents Bunching
- Maximizes Media Surface Area Utilization



NON-METALLIC CENTERTUBE

- 30% Stronger than metal
- Maximum cleanliness
- No metal contamination



URETHANE END CAPS

- One-piece Design
- Media Molded into Urethane
- Eliminates Possible Leak Paths



CAT Filters





















Quality & performance:

- Not just attributes & benefits
- Help Cat fuel injectors last 45% longer than when using a competitive filter
- Can decrease the cost per hour up to 80%
- Not just design & engineering “know-how”
- Not just state-of-art manufacturing

Combination of all !



Filtration Efficiency Options

	Engine Lube Oil	Fuel/Water Separator (Primary)	Fuel (Secondary)	Hydraulic	Power Train (Transmission)	Engine Air	Breather
Standard	 30 - 40 μm	 > 20 μm	 > 10 μm	 27 - 40 μm	 27 - 40 μm	 Min. 99.6%	 > 50 μm
Advanced	 15 - 30 μm	 10 - 20 μm	 4 - 10 μm	 10 - 27 μm	 10 - 27 μm	N/A	 10 - 50 μm
Ultra High	 < 15 μm	 < 10 μm	 < 4 μm	 < 10 μm	 < 10 μm	 Min. 99.9%	 < 10 μm

Transmission Filters

- They are transmission specific!!
- New Synthetic media
- Lower pressure drop
- Improved capacity
- Efficiency specific to transmissions
- Reduces “cold start bypass”
- Meets expected change intervals
- Captures most harmful particles



<u>Transmission</u>	<u>Hydraulic</u>
328-3655	338-3540
341-6643	1G-8878
343-4464	132-8875
343-4465	132-8876
417-8416	167-2009

Air Filter Efficiency Options

Standard

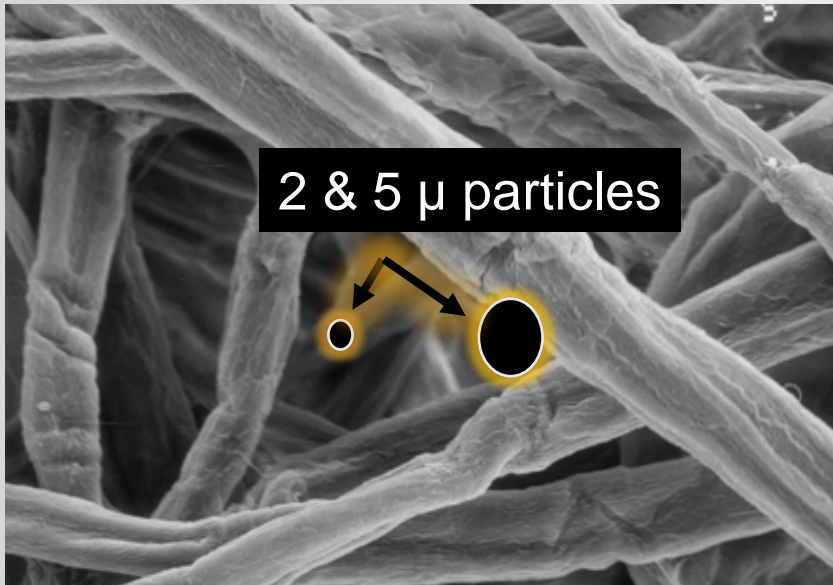
- Less capacity than UHE
- More than “conventional” competitive filters

Ultra High

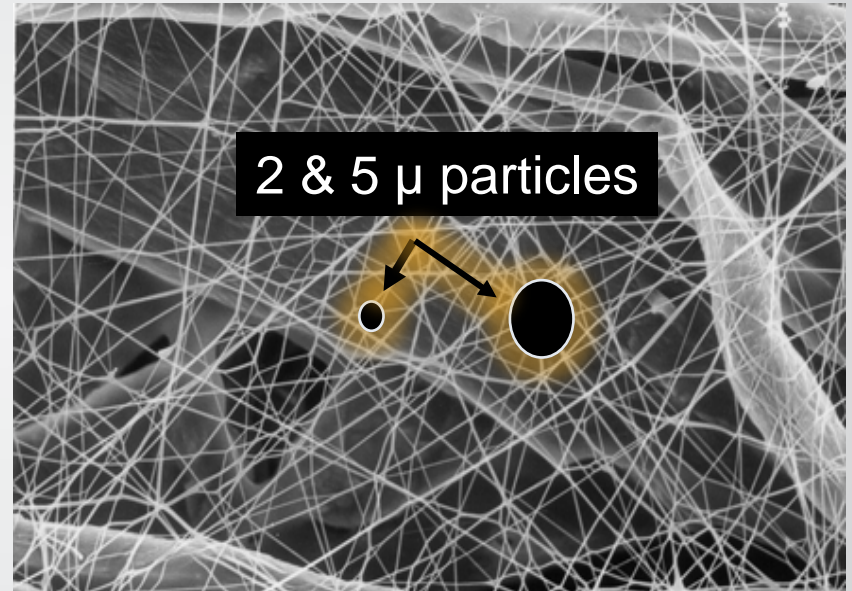
- New - maximum efficiency
- Option for many machine applications



Cellulose



Ultra High Eff.

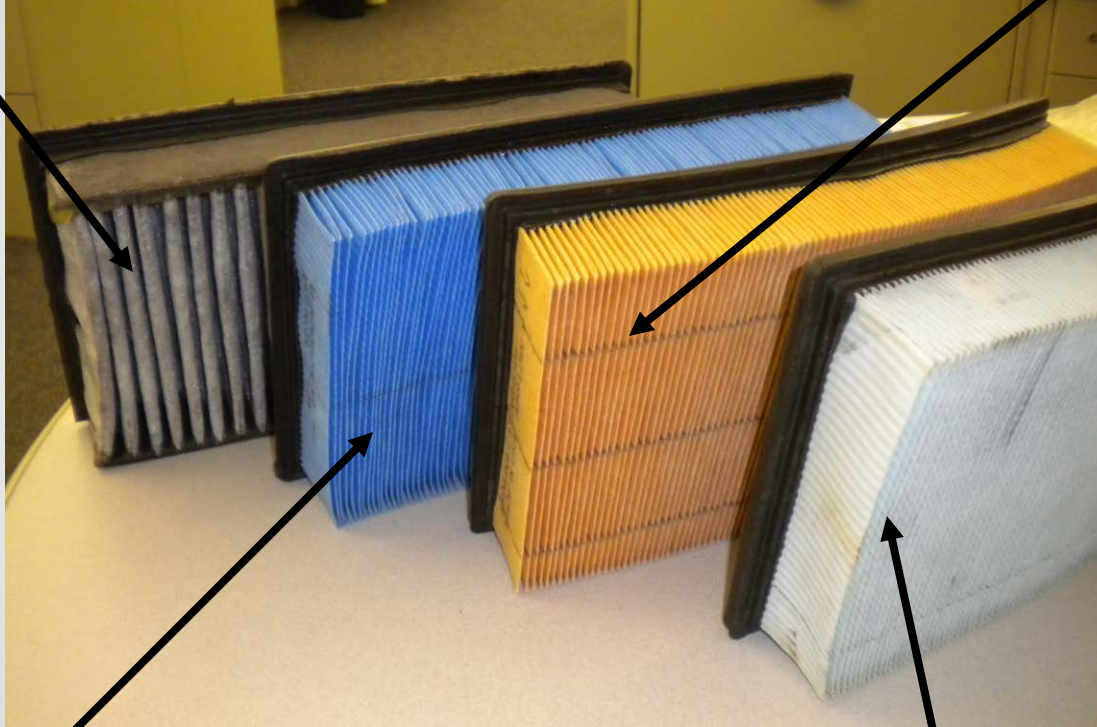


Scanning Electron Microscope Images

Cab Air Filtration Options

- Carbon (MERV 15)*

- Low Restriction (MERV 12)*



Not all filters have all (4) of the options!

- High Efficiency (MERV 14)*

- Standard (MERV 10-11)**

* Based on (1) sample from a single lab test

** Varies by specific part number