



Donaldson Air Filtration Basic Overview



Objective?

At the end of this Introduction, the participant will know:

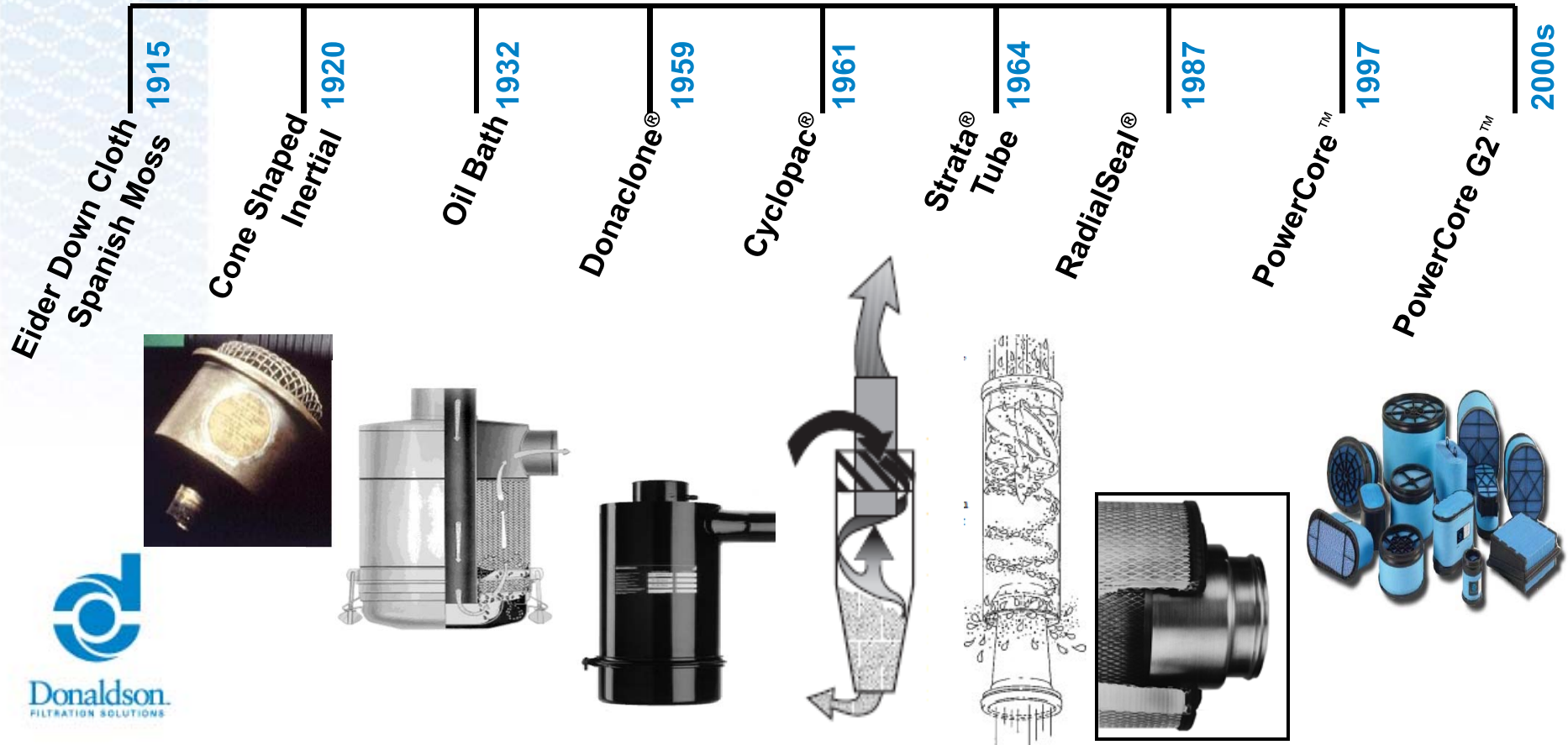
- **Types of Donaldson Air products for a diesel engine system**
- **Donaldson Engine Air filtration product family**
- **Donaldson Basic Air filtration terminology**

Donaldson

Is The Leader in Filtration Innovation

Original Equipment Manufacturers' Evolving Needs

Product Evolution



Basics – Air Filtration

Hand full, about 250 grams of dust

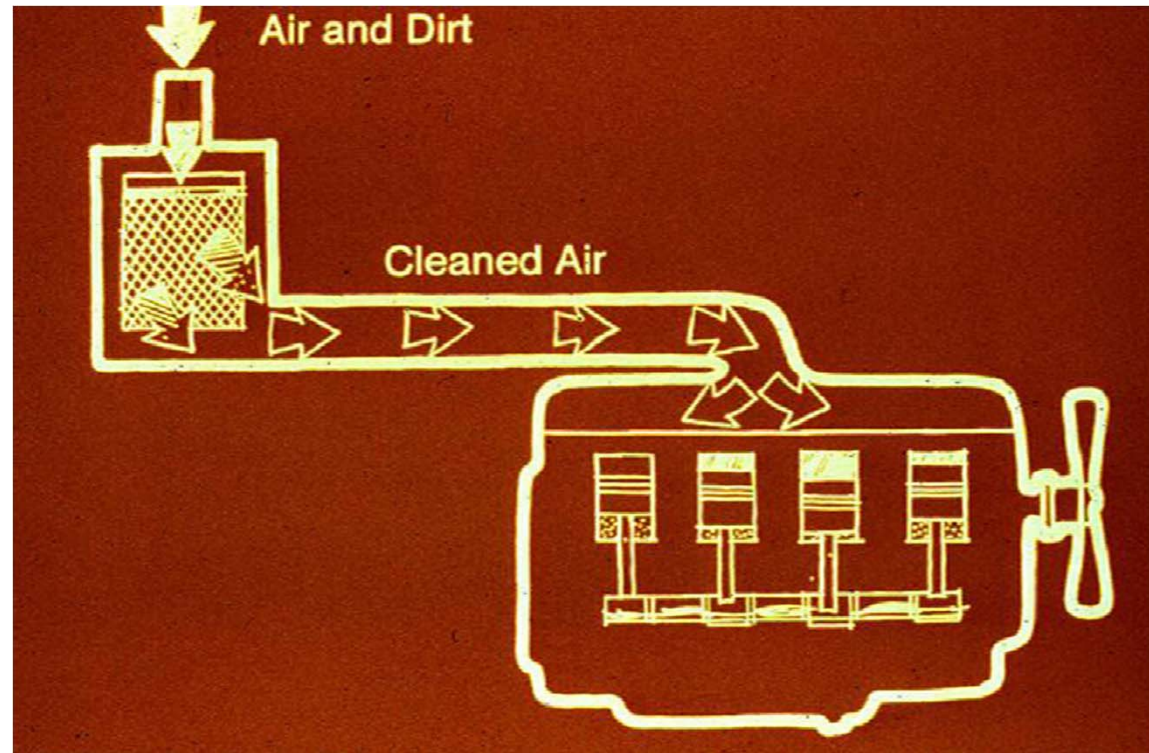


... is all it takes to destroy a diesel engine



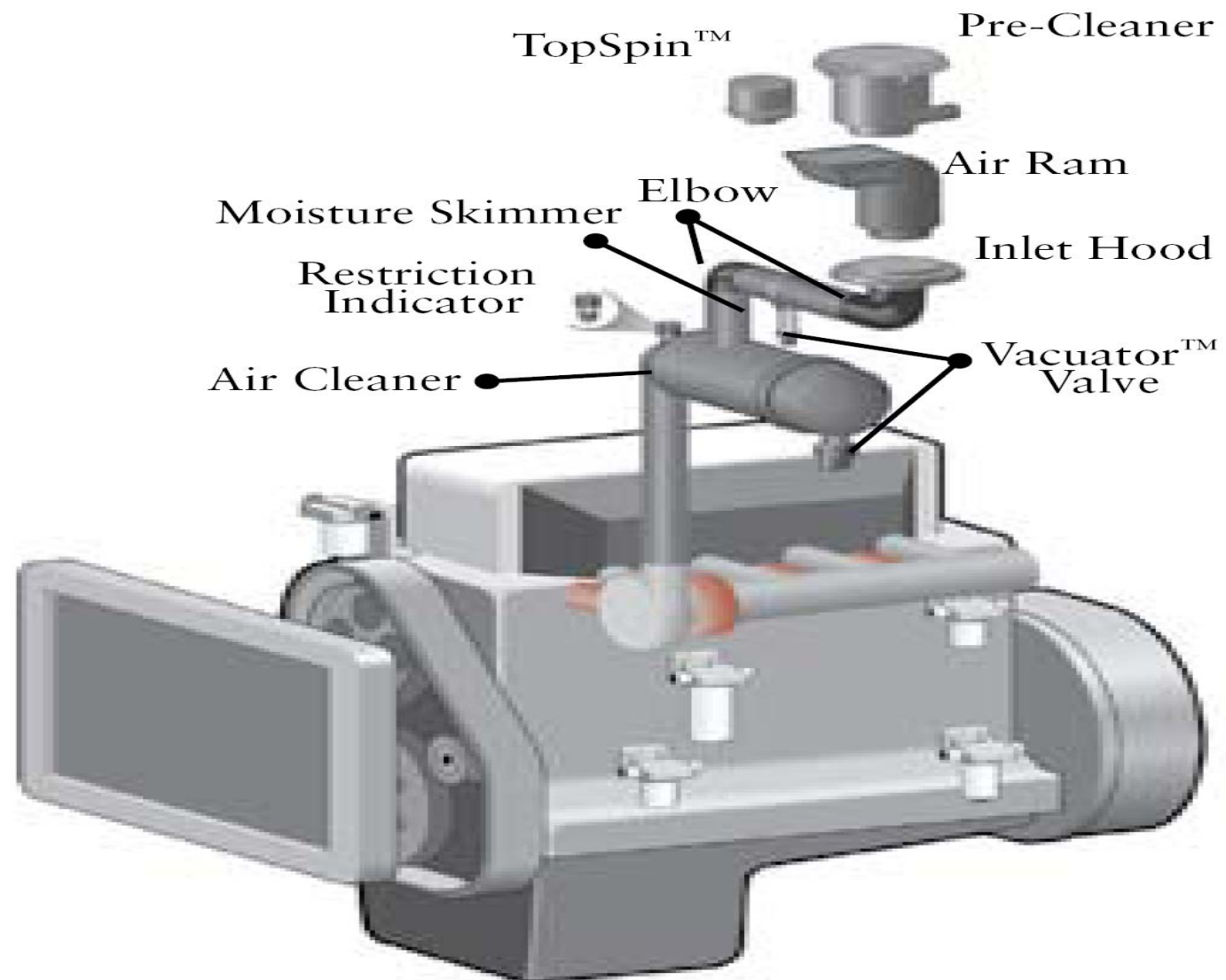
Basics – Air Filtration

Only one chance at dirt removal



***Air filtration
Single pass only***

Air Intake System & Air Filters



Donaldson Top spin

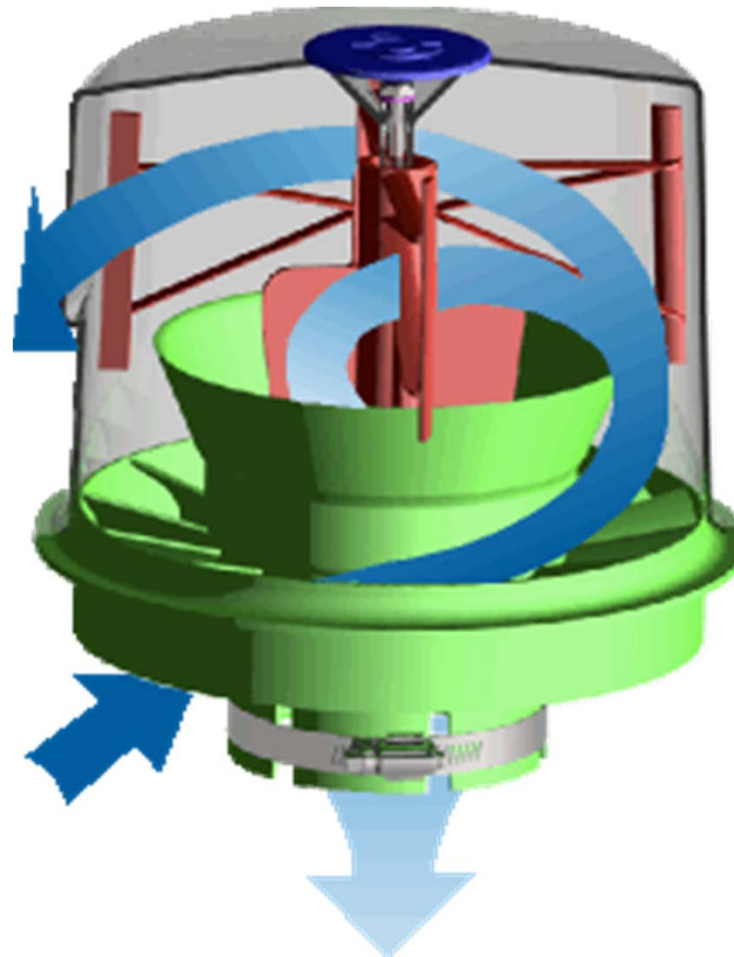
- Separates up to 85% of incoming contaminant per ISO 501/SAE J726
- Greatly extends filter life
- Reduces air filter usage
- Lowers cost per operating hour
- Automatically ejects mixed debris
- Separates more than 99% of 20 micron and above particles



How It Works

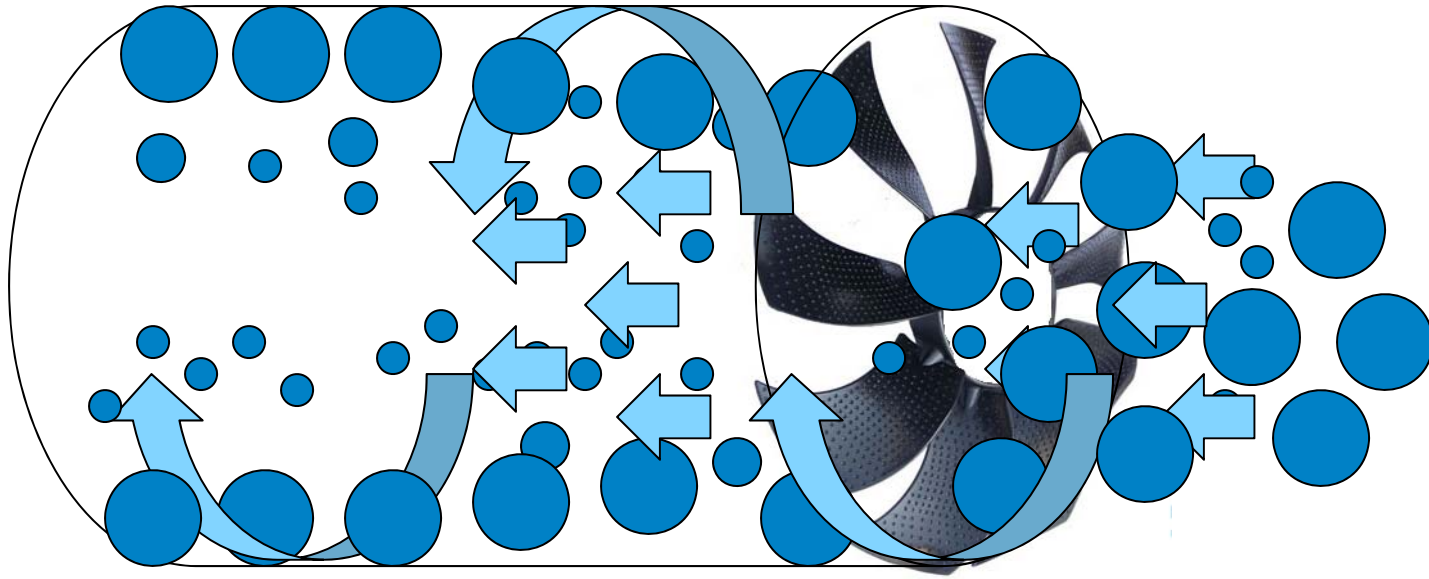
More than 99%
of contaminant
20 micron and
larger is expelled

Incoming dirty air



Pre-cleaned air enters
the intake system

How It Works



Precleaning – Centrifugal Force

Our Product Portfolio Pre-Cleaners

TopSpin™ Pre-Cleaner

Strata™ Cap

Donaspin™

In-line
Separator

Full-View
Pre-Cleaner



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Applications of Pre-Cleaners



Industry Filtration Trends



Industry Filtration Trends

Off-Road Housings

*Metal
Two-Stage
Air Cleaner*



*FRG RadialSeal™
Plastic / Metal
Air Cleaner*



*PSD PowerCore®
Plastic Air
Cleaner with
non-metal filters*



On-Road Housings

*Bright Stainless
Air Cleaner
(Cowl Mount)*



*EPG RadialSeal
Plastic Air
Cleaner In Engine
Compartment*



*Integrated Intake
Systems with
PowerCore®
Filtration for
underhood or
behind cabs*



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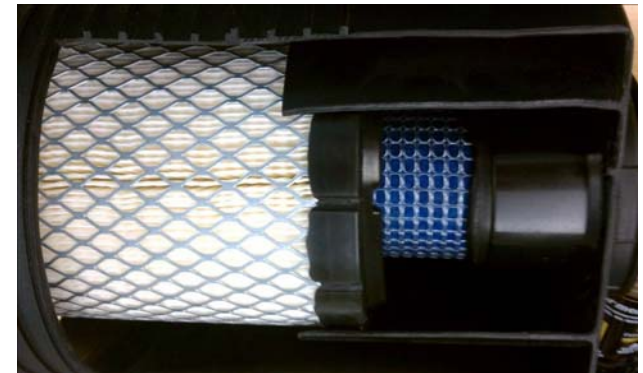
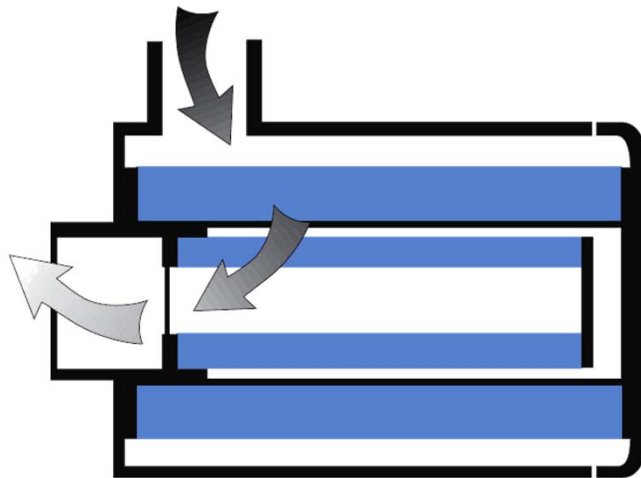
Air Cleaner Housing Designs

- Metal – Typically Axial Seal
- Plastic – RadialSeal™
- Metal /Plastic – RadialSeal™
- Disposable – Donaldson DuraLite™



Single Stage Air Cleaners

- This is the most basic air cleaner design
- This is a filter housing with the maximum paper area into it

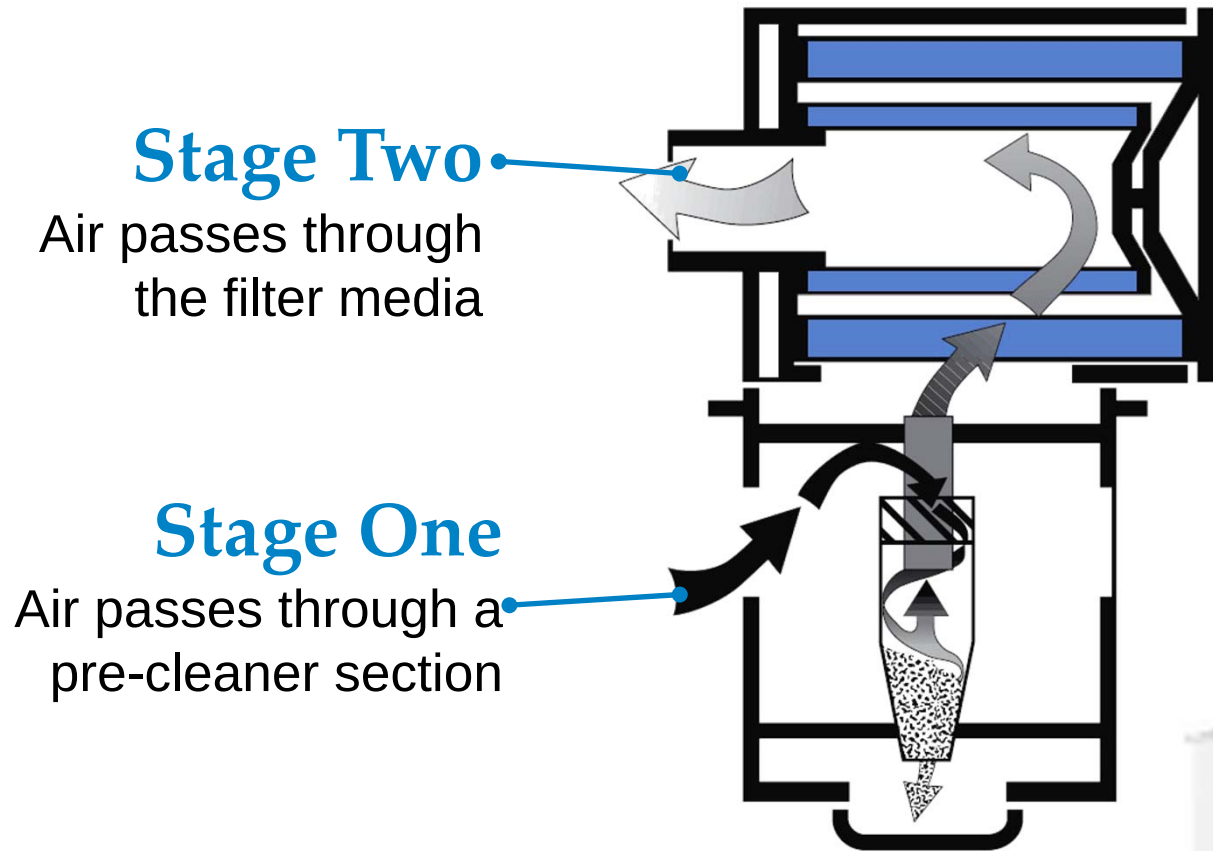


E-Style

No incorporated pre-cleaner

May have safety element option

Two Stage Air Cleaner



Air Ram

- Primarily over-highway trucks
- Improves intake system airflow and fuel economy by reducing restriction
- Inlet screen prevents large debris from entering intake ducting
- Side louvers ensure continuous airflow to intake system
- Common inlet sizes fit most installations
- Eliminates water from air intake system



Vacuator™ Valves

Dust Evacuator Valve: Replace dust evacuator valve in any of these conditions



Remains open



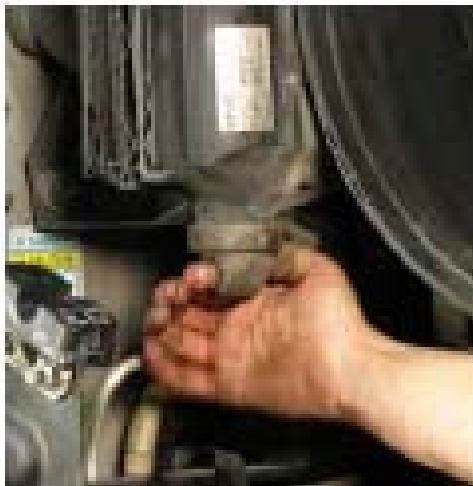
Cracked



Torn



Missing



Moisture Skimmer

- Removes over 80% of water before it damage the filter
- No service needed
- Made of durable rubber
- Collected water is automatically released by Vacuator™ Valve
- Adds little or no restriction to airflow
- Common inlet sizes fit most installations



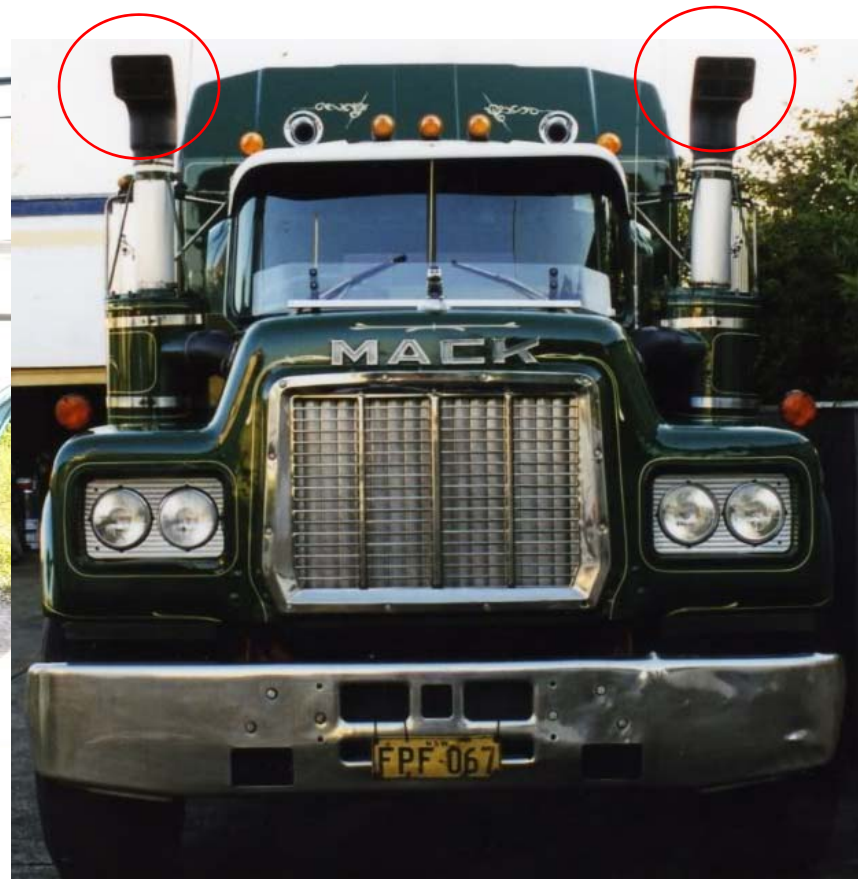
Filter Indicator

Typical mounting options: on the air cleaner outlet tube, on the intake duct, or remote

- Replacing filters based on restriction readings
- Can reduce your maintenance costs significantly.
- Visual inspection of air filters is not adequate
- Filters that appear very dirty may still contain a great amount of service life.



Examples!



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Donaldson Filter Features

Heavy-duty liners

Corrosion resistant, coated steel liners support the filter media during operation and maximizes airflow.

Beading

Applied to both inner and outer liners, beading is designed to stabilize the media and proven pleat tip wear.

Metal filter end caps

Designed to protect the filter media and provide structural integrity.

Radial seal filter seals

RadialSeal filters slip easily on and off the outlet tube during installation and service

Axial seal filter seals

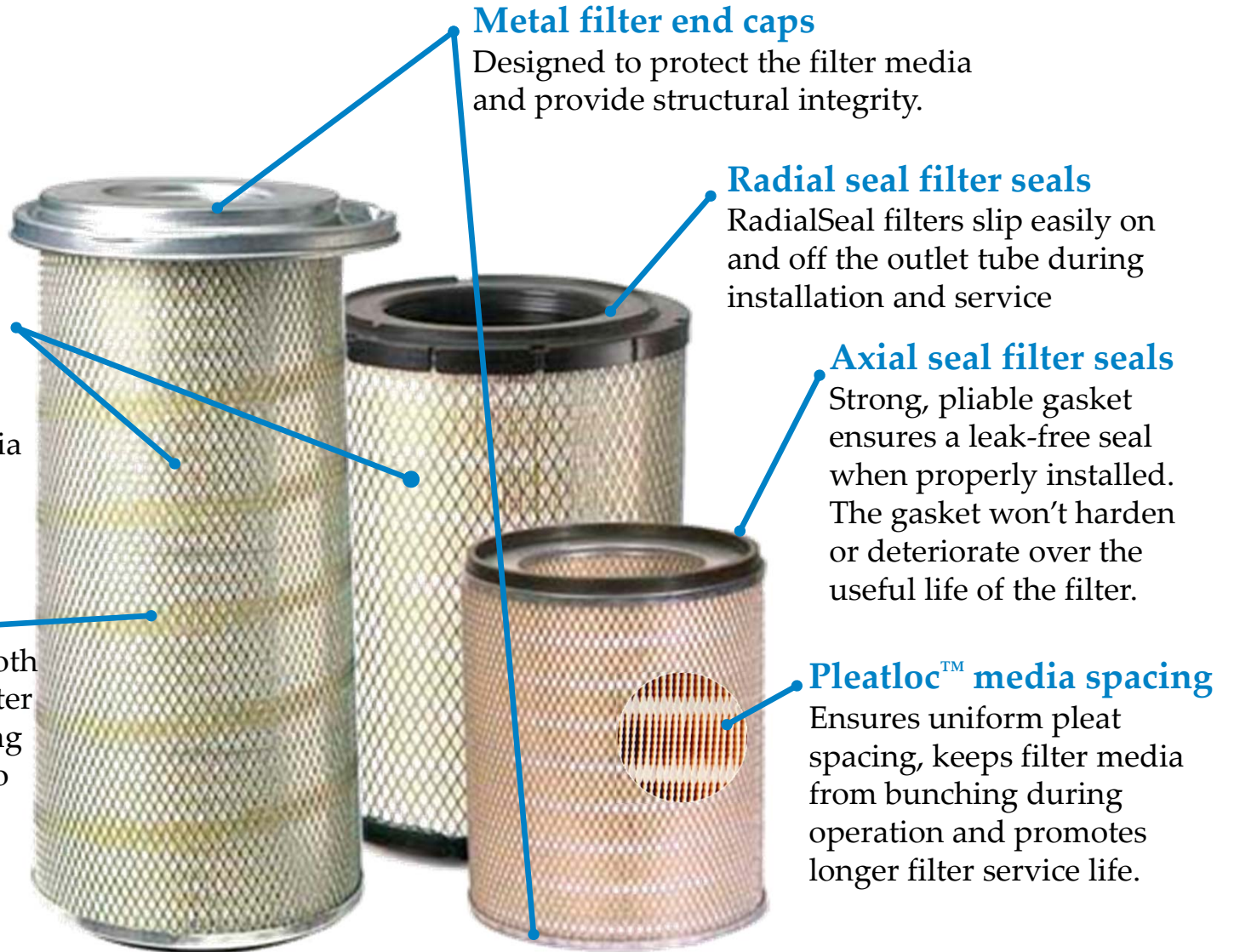
Strong, pliable gasket ensures a leak-free seal when properly installed. The gasket won't harden or deteriorate over the useful life of the filter.

Pleatloc™ media spacing

Ensures uniform pleat spacing, keeps filter media from bunching during operation and promotes longer filter service life.



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What is RadialSeal?

Axial Seal



Cover bolts down against filter gasket to seal out dust. Filters can also be retained by wing nuts.

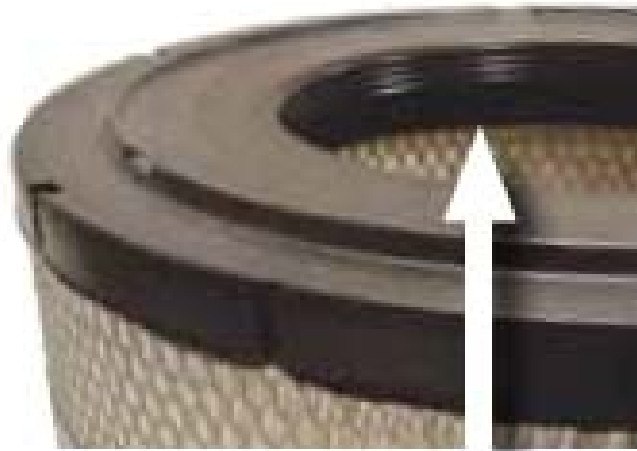
RadialSeal™



The inside circumference of the flexible urethane end cap stretches onto the outlet tube to form a tight seal

Preferred sealing type because filters are self sealing and easy to service

What is RadialSeal?



RadialSeal™ Technology

RadialSeal filters slip easily on and off the outlet tube during installation and service. This design eliminated the separate gaskets used with metal endcap filters.



Axial Seal

Axial seal style filter has a metal endcap with an attached gasket. This design requires housing cover pressure on a gasket to create the critical seal.

What are the Criteria of a Good Filtration Media?

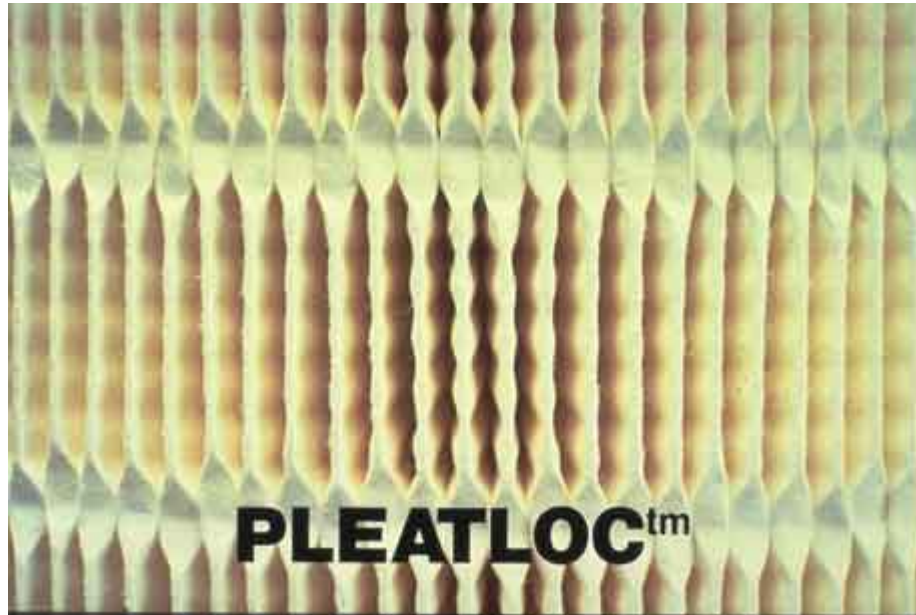
1. High efficiency
2. Low pressure drop
3. High dust capacity

Donaldson develops its own media!



Pleatloc™

Mechanical spacing prevents pleat bunching



Pleatloc™

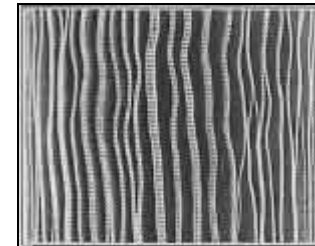
- Pleatloc

- Regular pleat spacing
- Prevents pleat bunching
- Increases dust loading



- Pleat bunching

- Decrease dust capacity in humid conditions



- Test results

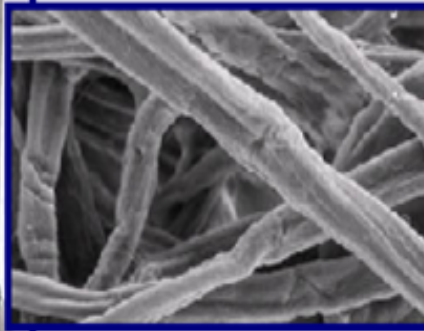
- Life gain: 50 %



Air Filtration Media Types



Standard
Cellulose Media



Ultra-Web® Media



UL Approved, Flame Retardant Media

Donaldson Product Families



Light Dust Air Cleaners



On-road Truck



Convenient DuraLite™ Disposables
Rugged Air Cleaners for Small and/or High
Pulsation Gas & Diesel Engines

Medium Dust Air Cleaners



Large Articulated Dump Truck



**Powerful Two-Stage Filtration for Diesel Engines
Operating in Medium to Heavy Dust Conditions**

Heavy Dust Air Cleaners

**SSG Air
Cleaner**



**SRG Air
Cleaner**



**STB Air
Cleaner**



**STG Air
Cleaner**



**Heavy-Duty Two-Stage Filtration for Diesel
Engines Operating in Severe Dust Conditions**

Applications of Air Cleaners



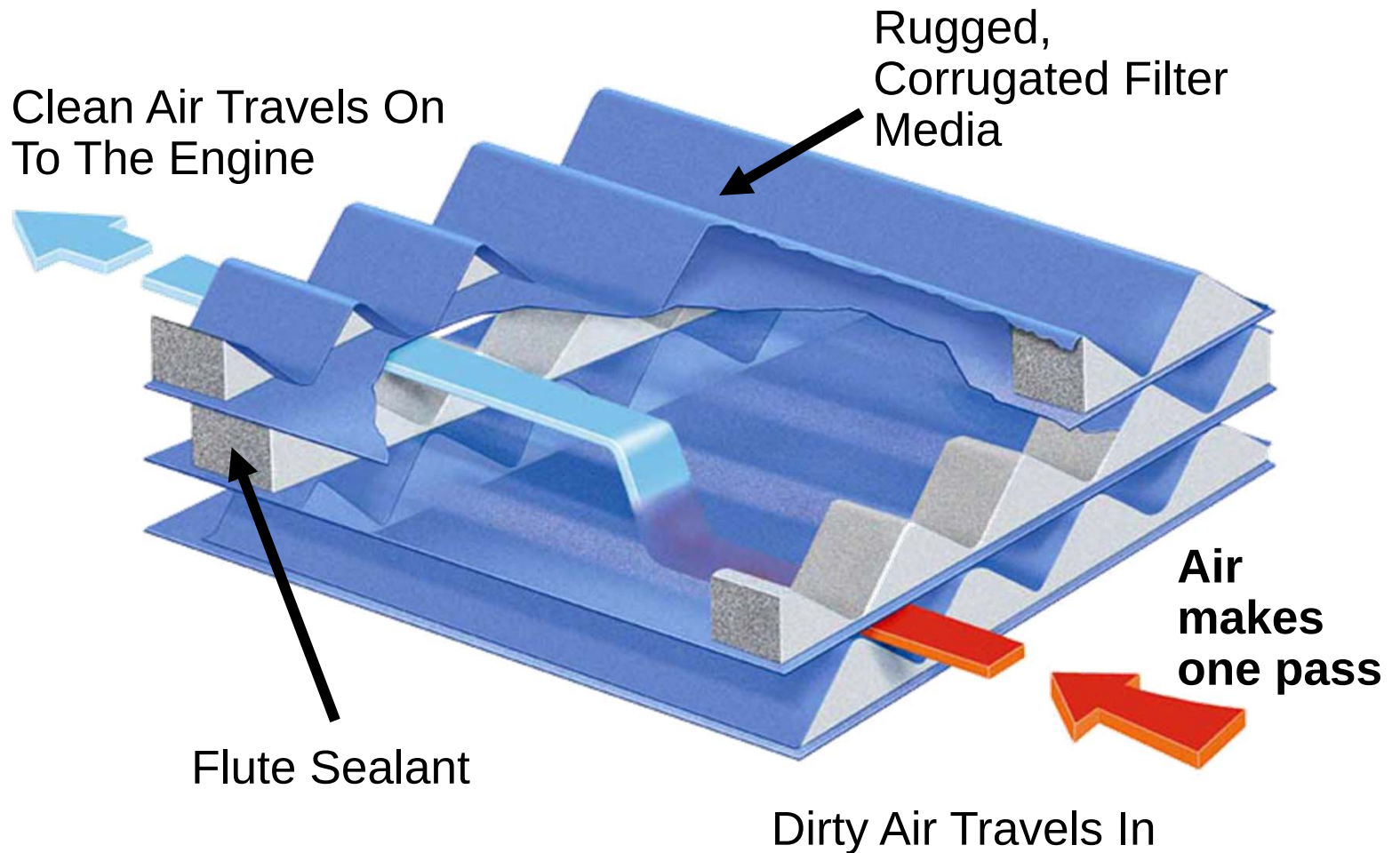
What is PowerCore™ Filtration Technology

- Proprietary air filtration technology developed by Donaldson over the last 15 years to improve engine protection
- Revolutionary, fluted media design for improved air filtration
 - High density media packaging technology
 - Axial flow
 - Nano-fiber media technology



The Key to PowerCore™

Less Restriction with Straight-through Airflow

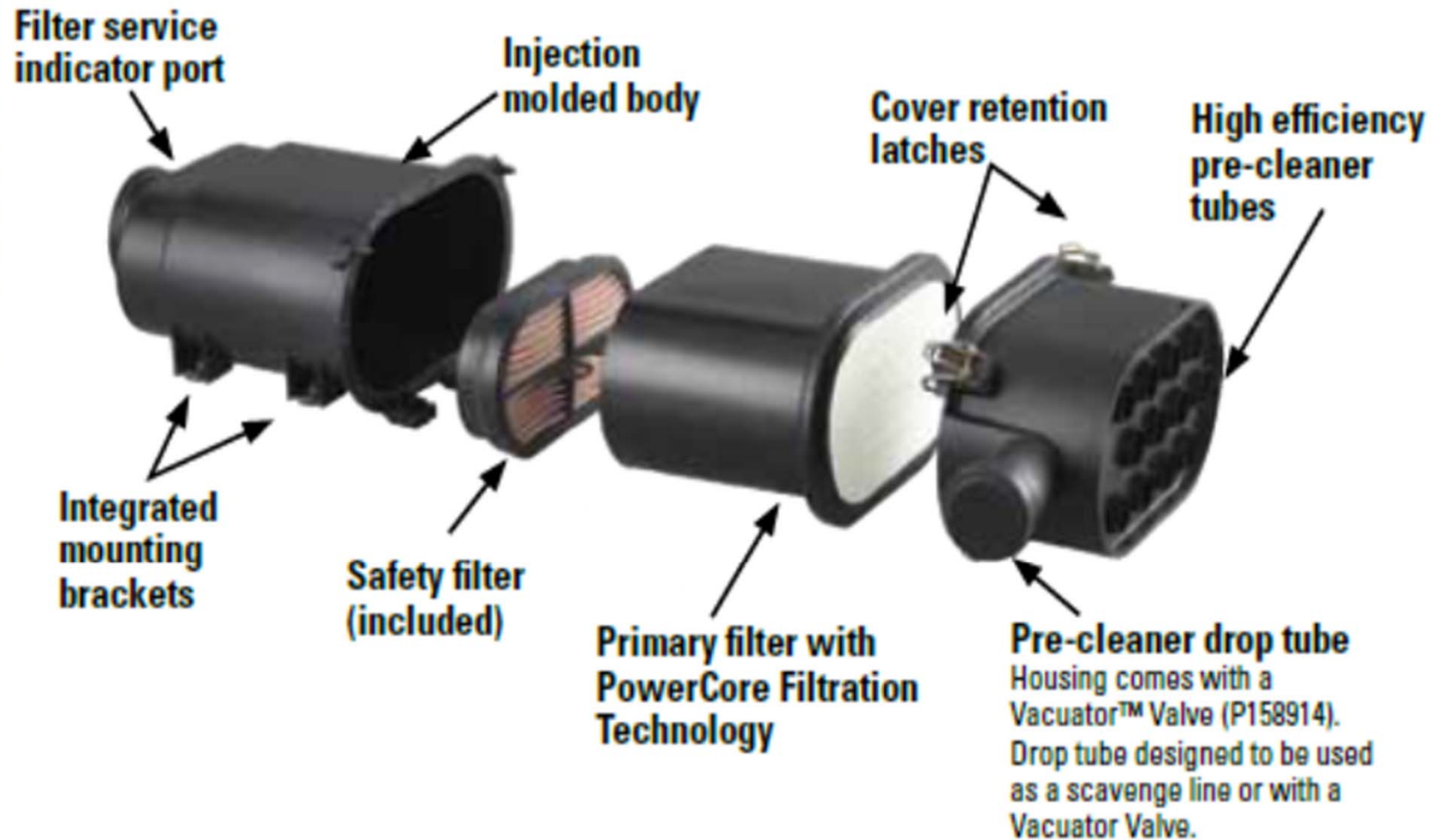


Advantages of PowerCore™

- Increased dust- and soot-holding capacity
- System design flexibility
- Dust is contained during servicing
- Metal-free construction (recyclable)
- Lightweight
- Rugged



Advantages of PowerCore™



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FILTRATION SOLUTIONS

Applications of Powercore



Why Choose Donaldson?

- We research, design & manufacture our own media
- Compact design, achieving both efficiency and capacity
- Wide range of filters for light to heavy dust environment applications
- Continual innovation in air filters product design



Questions?

