

Industry Shaping Technology

Air Filtration Trends and Evolution

Air Filtration System Trends – Smaller Air Cleaner Systems

Over the past decade numerous emission standards and engineering achievements have come together to create advanced, clean, and flexible engines. These diesel engines and the vehicles they power are requiring smaller air cleaner system package sizes, increased contaminant loading performance, improved contaminant separation efficiency, and higher temperature performance; all the while maintaining low initial restriction to airflow. Emissions compliant engines, extended oil drains and oils, and tighter component tolerances all contribute to the need for increased air filtration system performance.

Donaldson Delivers!

PowerCore® Filtration Technology – Big Performance, Small Footprint

Pleated filter designs have given way to PowerCore® Filtration Technology and now, to PowerCore® G2, the next generation. The need for shrinking intake system size will continue as emissions regulations continue and manufacturers design smaller, lighter, and more efficient vehicles.

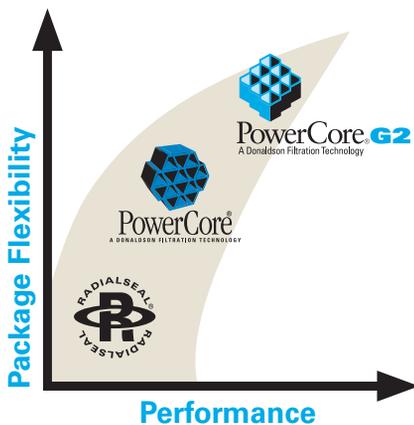
PowerCore® G2 Filtration Technology delivers longer life and/or less restriction in less space than our original PowerCore design.

- System design flexibility
- Metal-free, lightweight materials
- Rugged construction
- Straight-through airflow technology invented by Donaldson
- Advanced sealing technology
- Superior filtration performance



For given filter life and efficiency targets, PowerCore® G2 configurations can result in a 30% reduction in size from the first generation of PowerCore filters and a 60% reduction in size from pleated, cylindrical filters.

PowerCore® Evolution

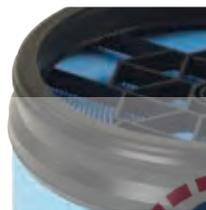


More than 11,000,000 PowerCore® Filters Sold

Sealing Technology Guarantees a Reliable, Sure Fit



Donaldson pioneered the RadialSeal™ design for air filtration more than 20 years ago, creating a superior seal and vibration-resistant interface between the air cleaner and filter. This industry changing sealing technology combines two components into one — the end cap and sealing gasket. The flexible sealing material creates a sure-fit and simplifies filter maintenance. The reliable seal helps protect engines in extreme operating conditions and in challenging heavy-duty applications.



Close-up of RadialSeal endcap and gasket.

Donaldson air cleaners, including PowerCore systems, use an advanced RadialSeal sealing systems. The combination of RadialSeal and PowerCore Technologies offer you best-in-class air intake system solutions for you and your customers.

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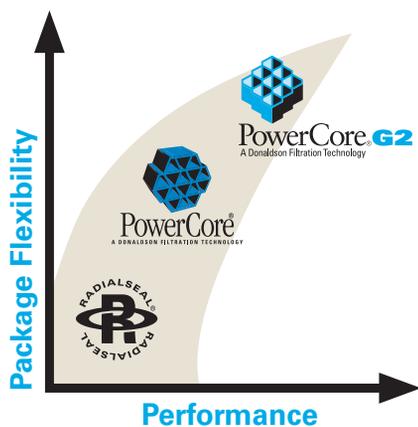
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Close-up of RadialSeal endcap and gasket.

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Pre-cleaning for Extreme Dust Conditions



Close-up of pre-cleaner section of a PowerCore® air cleaner. Pre-cleaning tubes can be arranged in various patterns, depending on the space and efficiency requirements of your application.

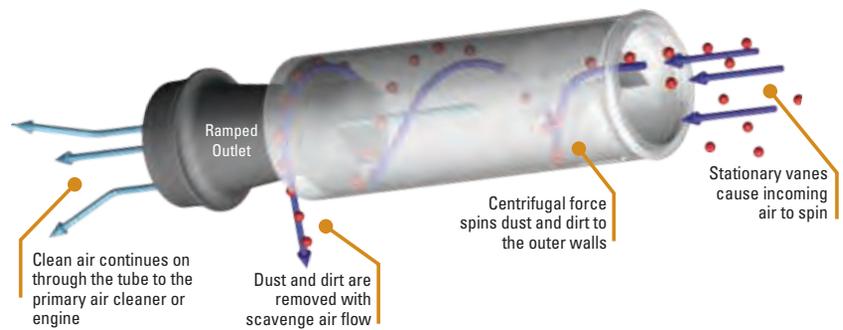
Pre-cleaners expel dust and debris before it reaches your air cleaner — extending air cleaner life, extending maintenance intervals, boosting air intake system efficiency and extending engine life.

Donaldson inertial particle separation technology offers maintenance-free air filtration for turbines, diesel engines and environmental applications. Inertial separation technology is used extensively on ground vehicles, rotorcraft, off-road vehicles and other critical equipment exposed to harsh environments.

Our light-weight pre-cleaning tubes have no moving parts to wear out or break. They are self-cleaning and do not require regular maintenance.



See the Accessories Section for our pre-cleaner / rain hood product offering.



Strata™ Tubes offer low airflow restriction with efficient contaminant removal up to 99%.

On- & Off-Road Air Filtration Evolution

On-Road Housings

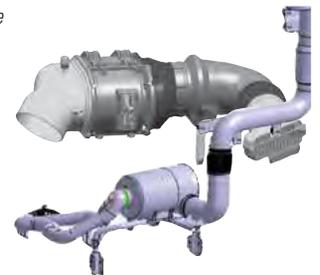
Bright Stainless Air Cleaner (Cowl Mount)



EPG RadialSeal Plastic Air Cleaner in engine compartment



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



Off-Road Housings

Metal Two-Stage Air Cleaner



FRG RadialSeal™ Plastic / Metal Air Cleaner



PSD PowerCore® Plastic Air Cleaner with non-metal filters



Unique Filtration Solutions

Crankcase Filtration – An Emissions Device or Air Filter?

Actually, it's both. Donaldson Spiracle™ Systems filter contaminant and aerosols from blow-by gasses.

For engine manufacturers, regulators now recognize that engine blow-by gas emitted from the crankcase is a major emissions source and requires that the vent be closed or filtered with high efficiency filtration.

Our Spiracle™ Crankcase Filtration Systems for closed (CCV) or open (OCV) ventilation systems reduce or eliminate harmful and unwanted crankcase emissions.



Small, small extended and mid-sized standard models are available for engine blow-by flow ranges up to 300 lpm / 10.6 cfm and with blow-by mass flow rates up to 15 gms/hr.

For more on Spiracle™ crankcase filtration technology, refer to the technical reference section.

What's the Right Intake System?

As you develop the future design of your engine or application, it is important to consider the filtration system. Depending on your objectives, it may be beneficial to choose from a catalog offering or partner with Donaldson for a filtration solution tailored to your needs.

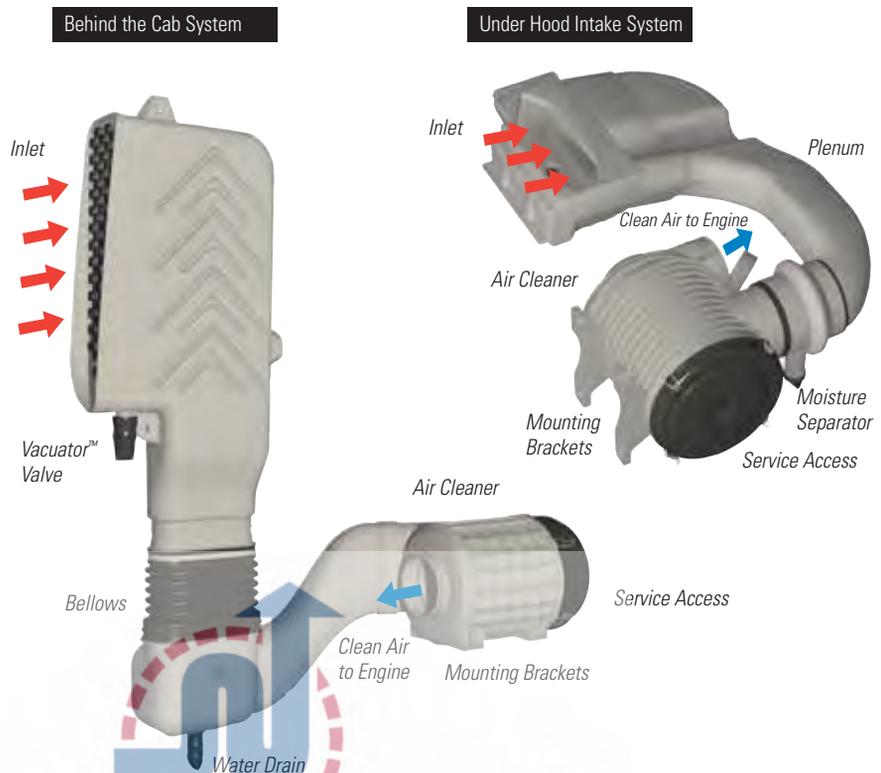
Reasons to Select a Traditional System

- No or low budget for engineering collaboration, development time or cost, or component tooling
- Prefer to have parts readily available — want to avoid manufacturing lead times (8 – 12 weeks) and not interested in warehousing service parts
- Prefer an established brand for filtration

Reasons to Consider a Custom, Integrated System

- Engine design team is integrating new components that require a higher degree of filtration
- Looking for a system that does more, which may include pre-cleaning, sensors, unique intake plenums
- Have budget for engineering collaboration, development time/cost
- Interest in component / supplier consolidation — solutions that bridge a wide range of engine/vehicles.
- Offering a unique solution with ease of maintenance

Molded Plastic Intake Systems



Filtration Solutions

Global Capabilities — Design & Logistics

Donaldson has accumulated numerous engineering, design, and testing tools that are used during the design process.

Engineering Capabilities

- Design centers in three key regions — United States, Asia and Europe

Prediction and Simulation

- CAD
- Proprietary, internally developed filter modeling software
- Fundamental fluid mechanics
- Computational fluid dynamic methods
- Structural analysis
- Thermal analysis

Development and Validation

Analytical Evaluation

- Particle Characterization
- Chemical Analysis Laboratory
- Acoustic Analysis

Filter Durability

- Filtration performance testing per applicable SAE and ISO standards
- Fabrication integrity
- Environmental conditions
 - Salt spray and thermal cycling
- Pressure fatigue
- Flow fatigue
- Hydrostatic burst
- Flow benches
- Vibration benches
- Gravimetric analysis

Rapid Prototyping

- SLA, SLS
- Investment casting
- RTV molding

Test & Evaluation Tools

Structural Analysis

- Per SAE, ISO, and NFPA standards
- Ansys & Abaqus
- Collapse
- Pressure impulse and fatigue

Tensile Compression

- Used to test material, component and assembly properties

Environmental Chambers

- Allows testing at hot or cold temperature, with humidity control

Flow Test Benches

- Allows measurement of static and dynamic flow and restriction for a device
- Allows calculation of device restriction at varying flows and temperatures
- System simulation

Performance Testing

- ISO, SAE, NFPA
- Filter performance
- Efficiency testing
 - Gravimetric
 - Fractional
 - Capacity testing per ISO5011
- Customer standards
- Crankcase ventilation tests
- Soot loading bench
- MAFS Test Bench
- Acoustic Test Chambers

Design Validation

Diesel Engine Test Cells

- Test cell locations in three key regions — United States, Asia and Europe
- Up to 600 kW / 800 hp capability
- Measurement of gaseous and particulate emissions
- Component durability
- Soot test bench
- 24/7 durability testing
- Web-based test cell monitoring access
- Tensile/Compression Tester
- Temperature Chambers

Vibration/Shaker

- Multiple benches
- Performance vibration with flow test
- Can apply sine, random, shock or custom variable vibration profiles
- Capable of hot or cold tests

Field Testing

- On and off highway
- Heavy-duty
- Tests conducted on both end user and OEM vehicles

Field Data Acquisition

- Real time measurements
- Remote communications
- On-line collection tools
- Review daily, weekly and monthly reports to analyze operational trends

Filter Media

- Wide selection
- Media characterization testing
- In-house media capabilities



Donaldson European Technical Center.
Expanded testing capabilities for engine filtration businesses in October, 2010.

Standard Models with Donaldson Technology

Newer designs offer improved features and performance!



XRB Housings: left XRB12; middle XRB10; and right XRB08

XRB Air Cleaners

The XRB family is ideal for light- to medium-duty diesel engine trucks, agriculture, construction, mining, and industrial engine applications. The XRB air cleaner is smaller, lighter and easier to install and it effectively reduces contaminants, providing a high level of engine protection. Available in three diameter sizes.



FKB Housings and Filters: top center, FKB06; bottom left, FKB05; and bottom right, FKB04

For smaller sizes, check out the FKB air cleaner family.



PSD08, PSD09, PSD10 and PSD12 housings

PSD PowerCore® Air Cleaners

Air cleaners with PowerCore filtration technology offer maximum design flexibility. You gain equal performance in significantly less space, freedom to design unique configurations to fit tight spots, and overall design simplicity. See the PowerCore air cleaner section for all the details.



The smallest of our PSD family, this D080056 Side Service model is designed for in airflow ranges of 180-245 cfm, see the PowerCore section for more details.

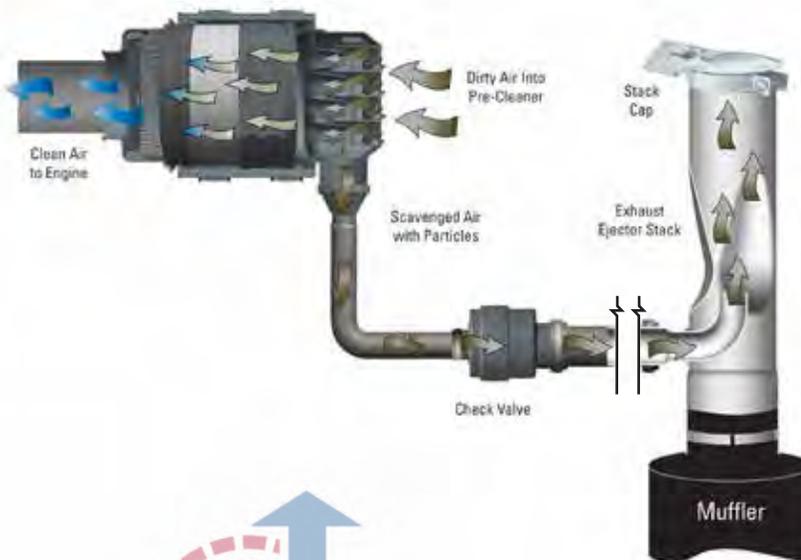


PowerCore
A Donaldson Filtration Technology



PowerCore Air Cleaner Scavenge System Components

This catalog features new Exhaust Ejectors, Check Valves, and Adapters that work with the PSD Air Cleaner family. To learn more, see the PowerCore Air Cleaner section.



Newer Filtration Technology for Mining Trucks Enhancements offer improved features and performance!



SSG

SSG Style — Our Largest Engine Air Cleaner

The SSG Air Cleaner offers design improvements over our older SRG air cleaner style — including filters with RadialSeal™ sealing technology, and a filter access cover with a quick release cover latches and chain.



No more bolt to unscrew for a filter change — simply unlatch the cover and let it hang from the housing during service.

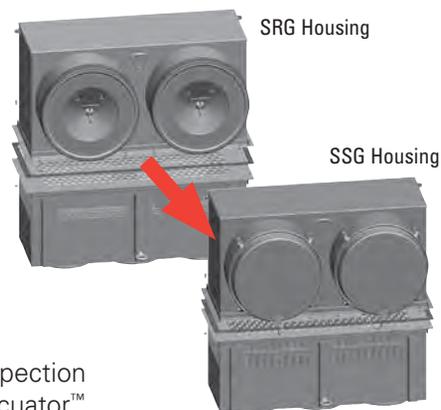
Upgrade to newer filtration technology . . . with our Conversion Kit

Replacing an older SRG housing with the new SSG housing allows you to simplify your routine filter service — no more separate gaskets at each filter change or removing a bolted on cover. SSG filters have radial seal end caps that provide a more reliable, consistent seal.



Conversion kit includes all you need to replace the upper unit of an old SRG air cleaner, including the filters.

Choose from an upper assembly conversion kit or you may want to install a complete new housing if your current SRG assembly needs repair or is reaching the end of its useful life.



SRG Housing

SSG Housing

Dust Dumpa kits allow for visual inspection related to dust-cup servicing and Vacuator™ Valve purging. See page 9 or the accessories section.

Donaldson Endurance™ Air Filters with Ultra-Web® Advanced Nanofiber Filtration Technology

Donaldson
Endurance



ULTRA-WEB® Advanced Nanofiber Filtration Technology

- Invented by Donaldson
- Engineered to perform in extreme temperature and humidity conditions, unlike ordinary nanofibers
- Optimized fiber structure and fiber diameter so it's stronger and lasts longer in all environmental conditions
- High efficiency — longer filter life
- High capacity — holds more contaminant
- Identifiable by the blue media color
- Proven — used in diesel engine market for nearly two decades

Finding a Donaldson Endurance air filter in this catalog

Part numbers starting with EAF are Donaldson Endurance Air Filters. EAF part numbers, if available for an air cleaner model, are listed in the service parts listing with an ES (Extended Service) in the description.

A150138	ERA	
bolt.....		P119463
cover.....		P544238
filter, primary — SM.....		P544301
filter, primary — ES & HE.....		EAF5150
gasket, cover.....		P535559
mounting band, black.....		P016845
nut, plastic.....		P119325
retaining ring.....		P129469
Vacuator™ Valve.....		P149099

Intake System Accessories

Pre-Cleaners • Hoods • Indicators • Elbows • Connectors • Mounting Bands

Designed to solve your customer's specific problems — such as excessive moisture or noise — or to simply help maintain the overall system



- Inlet Hoods — protect air intake from large debris and rain
- Pre-cleaners — extend air filter life and boost system efficiency
- Filter Gauges and Indicators — maximize filter life and reduce maintenance costs
- Rubber Elbows and Connectors — minimize air intake flow resistance, reduce noise levels in severe operating condition
- Vacuator™ Valves — automatically dispel dust and water from the air cleaner

New Pre-cleaning Device for Heavy-Dust Conditions!

Donaldson air cleaners for heavy-dust conditions have pre-cleaning inertial separation technology built-in to the inlet side of the housing — you'll find this technology in our industry shaping PSD, STB, STG, SRG and SSG air cleaner models.

Finally, the same durable, reliable, particle separation technology is now available in a stand-alone pre-cleaner — the Strata™ Cap!

**Strata™ Cap —
Our Highest Rated
Pre-cleaner Ever
Invented!**



The Strata™ Cap pre-cleaner expels up to 96% of dust and debris BEFORE it ever reaches the air cleaner.



Donaldson developed the first air particle separator system in the early 1960s to protect helicopter turbine engines from sand ingestion. Today, this technology continues to be used on defense equipment and other turbine and diesel engine applications that operate in extreme dust conditions.



Intake System Accessories

Pre-Cleaners • Hoods • Indicators • Elbows • Connectors • Mounting Bands



Dust Dumpa for PowerCore®, SRG, and SSG Style Air Cleaners

In extreme dust conditions (mining, construction and quarrying), the dust is so concentrated that maintenance personnel have to empty the dust cups or check the Vacuator™ Valves more frequently than they like.

Both Dust Dumpa kits incorporate rubber connections that improve dust evacuation from the housing during normal vehicle vibration. The clear tube allows you to easily see what's happening during daily inspections without climbing up to open or check out the Vacuator Valve.



The addition of Dust Dumpa tube extensions to this double PSD air cleaner application resulted in extended filter life on this Australian geothermal drill rig.



Dust Dumpa tube extensions ship fully assembled. **Left:** Part No. X006561 and Part No. X006562 on right.

Air Cleaner Materials, Finishes & Construction Designed for long life, rust resistance and good looks!

Injection and Blow-Molded Air Cleaners

Our non-metal finish is always black plastic and can be found on DuraLite™, PowerCore® (PSD) and other RadialSeal™ air cleaners (FPG, XRB, FKB). Advantages include:

- Lighter weight than metal air cleaners
- Corrosion and chemical resistant
- Impact, mar and vibration resistant



Injection and Blow-Molded Air Cleaners

Polymer Coating Resists Corrosion

Donaldson's gloss black finish — on most of our metal air cleaners (ERA, FVG, FRG) — is resistant to chemicals and corrosion. Advantages include:

- Corrosion and chemical resistance. This polymer coating lasts five to 10 times longer than traditional paint.
- Impact and mar resistance. Polymer coating is up to 17 times harder than most solvent-based paint.
- Consistent thickness coating over the entire air cleaner, even in crevices and small, hard-to-reach places.



Polymer Coating

Buff Prime Finish (not shown)

Our large SRG, SSG & STG air cleaners have a buff prime finish — ready for you to apply paint to match the overall look of your equipment. (Exception: the SRG to SSG conversion kit contains an upper unit that has a white polymer coating.)

Filter Features

Seals • Media • End Caps • Beading • Liners

Donaldson brand performance air filters give you consistent performance over the life of your engine

RadialSeal™ filter seals

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

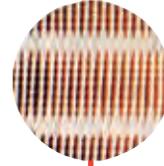


Axial filter seals

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.



Filter end caps

Designed to protect the filter media and provide structural integrity.

Beading

Applied to filter liners, beading is designed to stabilize the media and prevent pleat tip wear.

Heavy-duty liners

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

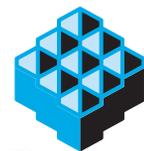
RadialSeal™ filter seals

Our RadialSeal technology on PowerCore filters provides a tight critical seal on unique filter shapes.



Non-metal construction

Weights less and with less disposal impact.



PowerCore
A Donaldson Filtration Technology

To learn more about the PowerCore advantages, see the PowerCore® Section.



Donaldson's Commitment to Quality & Continuous Improvement

Donaldson Quality Commitment

Our employees are committed to providing our Customers with products and services that consistently meet or exceed their expectations.

We will work toward:

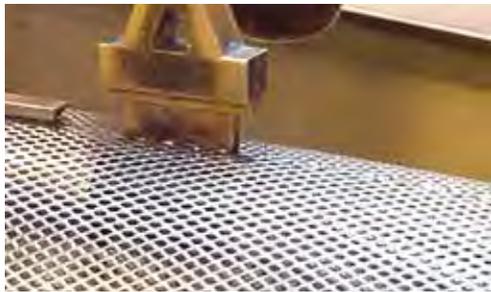
- Continuous improvement of products, processes, and services for the benefit of our Customers;
- Complete Customer satisfaction;
- Elimination of waste and variation;
- World-class standards and benchmarks.

We believe in:

- The development and empowerment of our people;
- Standardization of processes and measurement of progress;
- Simplicity, visibility and capability of all activities;
- Continuous improvement in our management and quality systems.

For the long-term success of our company, our first operating priority is the satisfaction of our Customers. Understanding their needs and serving them will benefit both our shareholders and our employees. Our management is responsible for ensuring that this policy is understood, implemented and maintained at all levels of our organization.

Bill Cook
Chairman, President, CEO



Air Cleaner Selection

With the multitude of sizes and styles of air cleaners available from Donaldson, how do you choose the proper model that will reliably protect your engine and deliver maximum filter service life? Selection is based on two primary factors — airflow requirements of your engine and the environment the air cleaner will be operating in. Use our five-step selection method on the next few pages to make the right choice for your application:

1 Determine the combustion air requirements of the engine

For the most accurate engine airflow specifications, Donaldson recommends using the intake airflow rate specified by the engine manufacturer. If this information is not readily available, you can calculate your own numbers by using the preferred or alternative methods shown below. If the air cleaner may see excessive engine vibration, include a pulsation factor into your calculations.

Ideal Method Obtain from Engine Manufacturer

For the most accurate engine airflow specifications, Donaldson recommends using the intake airflow rate specified by the engine manufacturer. This information may be obtained from the manufacturer.

Preferred Method Engine Displacement Formula

4-Stroke (Cycle) Engine Formula

English Units

$$\text{Airflow (CFM)} = (\text{Engine Size (CID)} \times \text{RPM}) \times \text{VE} / 3456$$

Metric Units

$$\text{Airflow (m}^3\text{/min)} = (\text{Engine Size (Liters)} \times \text{RPM}) \times \text{VE} / 2000$$

VE = Volumetric Efficiency — 4-Stroke*

- 0.90 for naturally aspirated gas engine
- 0.90 for naturally aspirated diesel engine
- 1.60 for turbo charged diesel engine
- 1.85 for turbo charged after cooled diesel engine

2-Stroke (Cycle) Engine Formula

English Units

$$\text{Airflow (CFM)} = (\text{Engine Size (CID)} \times \text{RPM}) \times \text{VE} / 1728$$

Metric Units

$$\text{Airflow (m}^3\text{/min)} = (\text{Engine Size (Liters)} \times \text{RPM}) \times \text{VE} / 1000$$

VE = Volumetric Efficiency — 2-Stroke*

- 0.90 for naturally aspirated diesel engine
- 1.40 for scavenge blower diesel engine
- 1.90 for turbo charged diesel engine

* The VE values are guidelines. It is always best to use manufacturer ratings when they are available. Electronic controls on modern engines can raise VE ratings to 2.0 or greater.

Alternative Method Engine Horsepower Formula

English Units

$$\text{Airflow (CFM)} = \text{HP (SAE)} \times \text{SA}$$

SA = (Specific Airflow) per Horsepower

- 4-stroke naturally aspirated diesel engine — 2.0
- 4-stroke turbo charged diesel engine — 2.3
- 4-stroke turbo charged after cooled diesel engine — 2.3

- 2-stroke naturally aspirated diesel engine — 2.0
- 2-stroke scavenge blower diesel engine — 3.3
- 2-stroke turbo charged diesel engine — 3.6

Metric Units

$$\text{Airflow (m}^3\text{/min)} = \text{HP (SAE)} \times \text{SA}$$

SA = (Specific Airflow) per Horsepower

- 4-stroke naturally aspirated diesel engine — 0.057
- 4-stroke turbo charged diesel engine — 0.065
- 4-stroke turbo charged after cooled diesel engine — 0.065

- 2-stroke naturally aspirated diesel engine — 0.057
- 2-stroke scavenge blower diesel engine — 0.093
- 2-stroke turbo charged diesel engine — 0.102

The Pulsation Factor (PF)

On naturally aspirated** engines, intake airflow to the air cleaner can negatively affect the cubic displacement of the air into the engine. To compensate for the loss, we recommend you multiply the engine airflow by one of the following factors:

English Units

- 2.1 for 1 cyl.
- 1.5 for 2 cyl.
- 1.2 for 3 cyl.
- 1.0 for 4 or more cyl.

Metric Units

- 1,2 m3/min.

2 Determine the dust condition for the engine/machine and typical operating environment

For example, a standby hospital generator set would probably see light dust; whereas, a rock crusher would almost always be surrounded by an extremely heavy dust concentration of large dirt particles. Our air cleaner selection chart, on the next page, is a visual guide to select your vehicle type and operating environment.

** No airflow adjustment is required for turbo-charged engines on Donaldson air cleaners with high pulsation filter media (e.g., Donaldson DuraLite™ ECB, ECC, ECD air cleaners).

3 Select an air cleaner series

Key design differences are color coded in our selection chart including PowerCore® filtration technology, axial seal, RadialSeal™ and disposable air cleaners.

AIR CLEANER STYLES

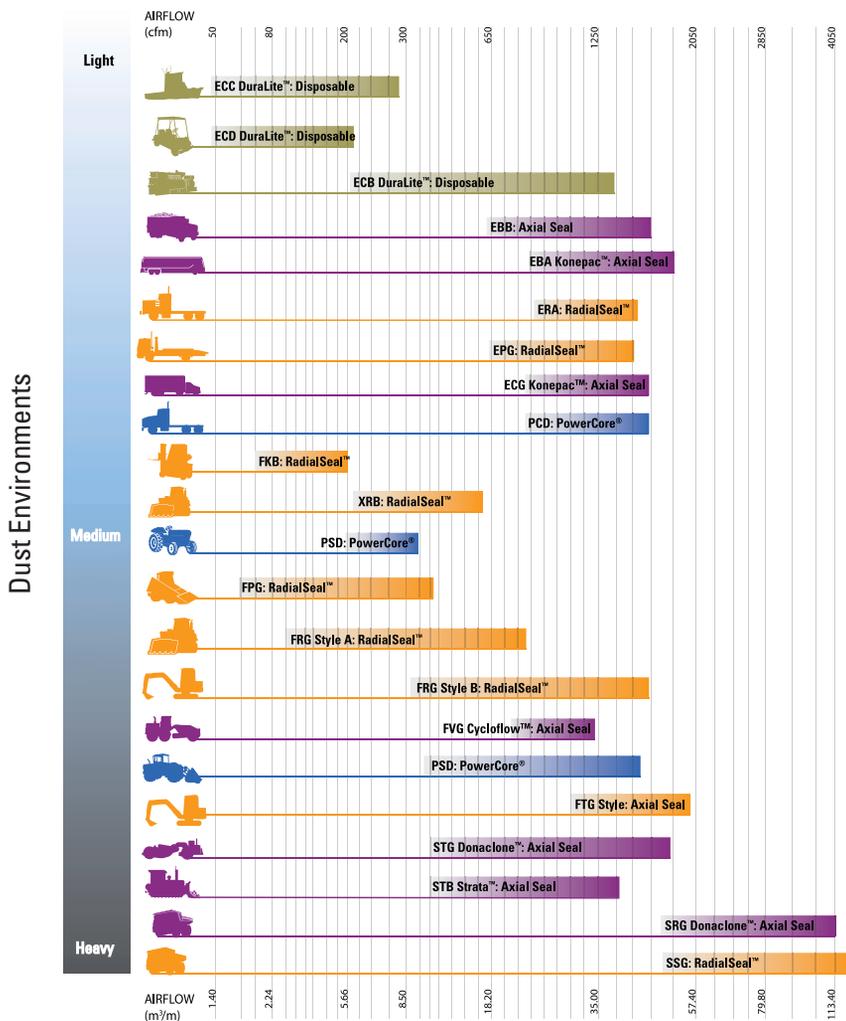
PowerCore®

RadialSeal™

Axial Seal

Disposables

Application notes, dimensional, locations of the inlet and outlet, and mounting configurations are appropriately considered at this step. These parameters are sometimes critical and may lead you to an alternative model or series that is better suited to your application.

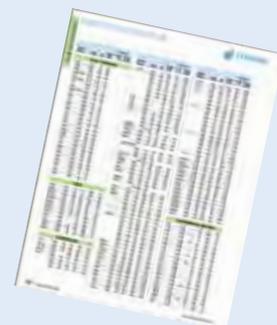


Looking for Engine Airflow Reference Guide?

See Engine HP & Air Consumption Rating Guide Reference Section of this catalog.



Please note, this information should not be used for the application of retrofit emissions devices.



4 Choose a specific air cleaner family or series

Use the table of contents from this guide to locate the choices for a particular air cleaner family according to the cfm your engine needs. Refer to the Initial Airflow Restriction table for the style you're considering. If there are two air cleaner models that fit your parameters, choose the one with the **lowest** restriction to ensure maximum service life from that air cleaner/filter.

5 Choose intake accessories

Even though they're called accessories, things like inlet hoods, mounting bands, rubber connectors, and clamps are important parts of the overall intake system. See our accessories section for more information.



Airflow Direction for Donaldson Air Cleaners

Donaldson has air cleaner housings that work in a variety of dust conditions and air flow patterns (A – D and G).

For improved filtration reliability and quicker filter service compared to older axial seal style air cleaners, Donaldson recommends installing either PowerCore® air cleaners or housings with RadialSeal™ sealing technology, whenever possible.

Flow Direction Legend

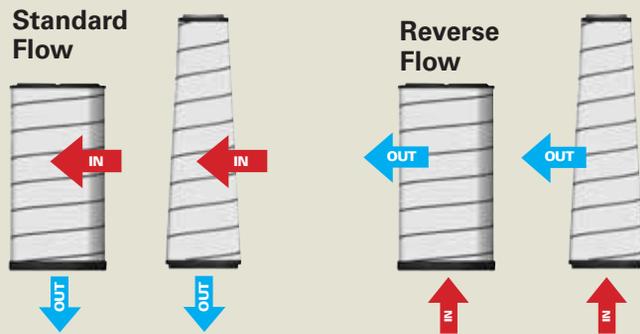
Description

Part No. Example

A = Air in the End, Out the Side	A 042511, A 112018
B = Air in the Side, Out the End	B 045008, B 120271
C = Air in the End, Out the Same End	C 080025, C 065003
D = Air in the End, Out the Opposite End	D 100030, D 055004
G = Air in the Side, Out the End	G 290010, G 110214

Standard & Reverse Flow Filters

These filters look exactly the same except there are dark lines viewable on the filter media of one of the filters. What's different? One is a standard flow filter, the other reverse flow. They fit housings that have specific flow requirements and are not interchangeable even though they look like they could be.



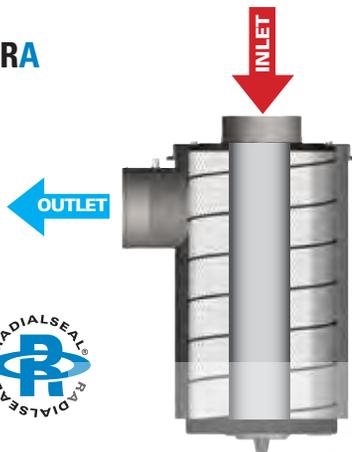
Recognizable by dark stripes on the outer side of the filter media.



Air in the End, Out the Side (reverse flow filters)

Light Dust — ERA

Classic cylindrical design, black finish, cowl-mounted for vertical installation. Airflows to 1350 cfm. *Page 58*



Light Dust — EBA Konepac™

Same housing as original EBA but with cone shaped filter (Konepac), can be mounted either horizontally or vertically. Airflows to 1850 cfm. *Page 63*



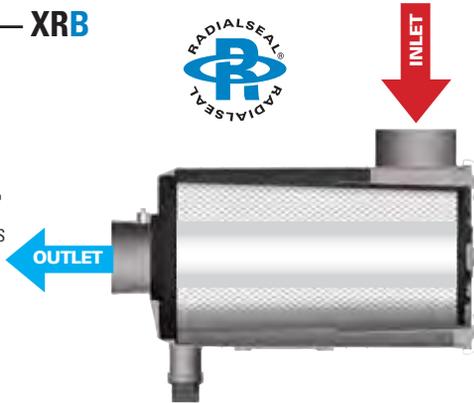
FLOW

B

Air in the Side, out the End (standard flow filters)

Medium Dust — XRB

The RadialSeal, plastic, two-stage air cleaner with side inlet for horizontal installation. Body diameters in 8", 10" and 12". Handles airflows of 265-630 cfm. Mount under hood or behind cab. *Page 88*



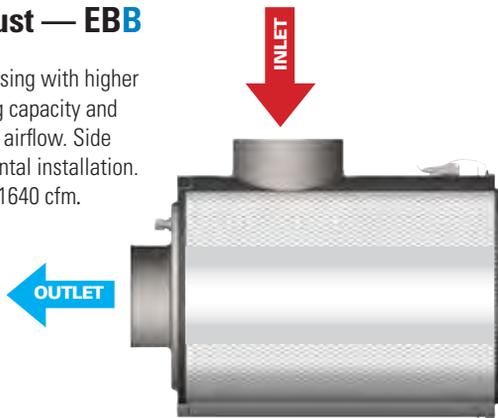
Light and Medium Dust — FKB

A compact housing high dust holding capacity and comparable airflow to FPG. Two-stage filtration, side inlet, horizontal installation. Body diameters in 4", 5" and 6". Mount under hood or behind cab. Handles airflows from 70–207 cfm. *Page 80*



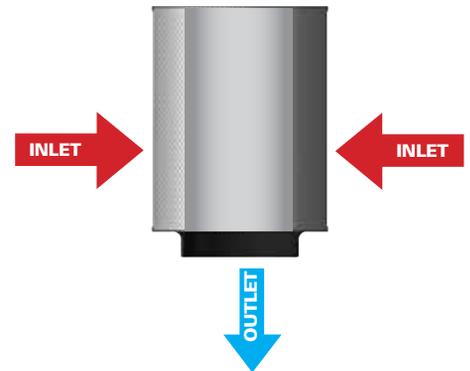
Light Dust — EBB

A small housing with higher dust holding capacity and comparable airflow. Side inlet, horizontal installation. Airflows to 1640 cfm. *Page 74*



Light Dust — ECB

Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 2118 cfm. *Page 46*



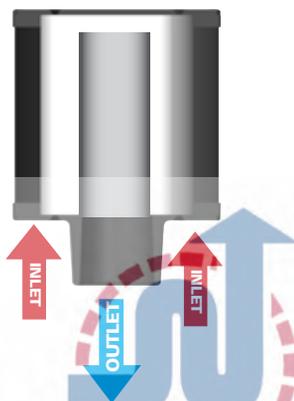
FLOW

C

Air in and out the Same End (standard flow filters)

Light Dust — ECC

Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 760 cfm. *Page 46*



Airflow Direction for Donaldson Air Cleaners

FLOW → D Air in the End, out Opposite End

Medium to Heavy Dust — PSD



PSD units are small and compact with built-in mounting brackets. Can be vertically or horizontally mounted. Airflows to 915 cfm. *Page 32*



Light Dust — ECD

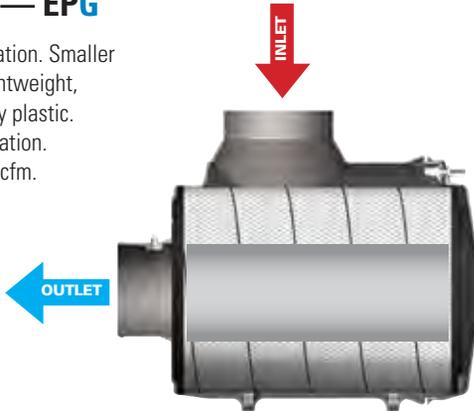
Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 185 cfm. *Page 46*



FLOW → G Air in the Side, Out the End (standard flow filters)

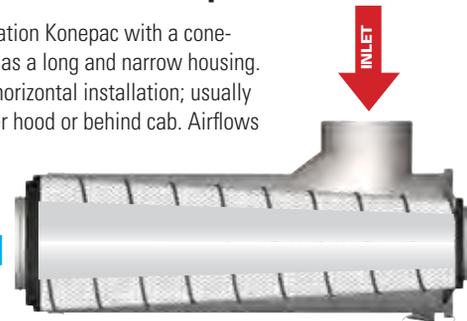
Light Dust — EPG

Single stage filtration. Smaller than ECG and lightweight, sturdy, and totally plastic. Horizontal installation. Airflows to 1325 cfm. *Page 52*



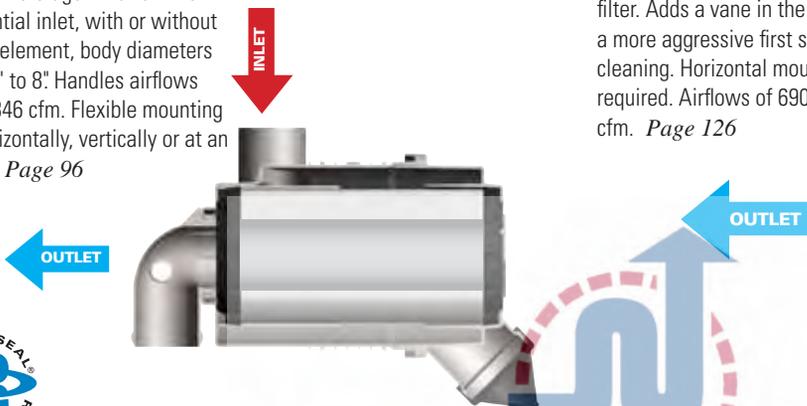
Light Dust — ECG Konepac™

Second generation Konepac with a cone-shaped filter has a long and narrow housing. Designed for horizontal installation; usually mounted under hood or behind cab. Airflows to 1600 cfm. *Page 68*



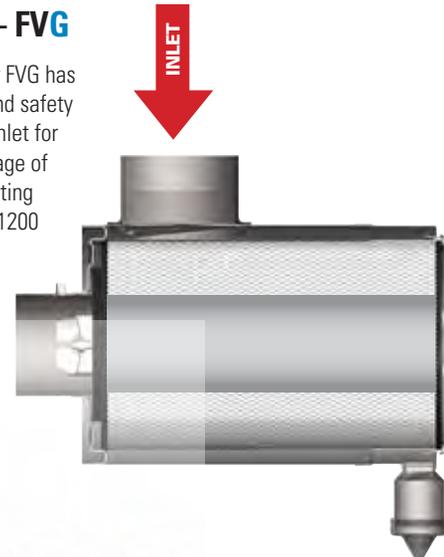
Medium Dust — FPG

The first fully plastic air cleaner in our two-stage filtration line. Tangential inlet, with or without safety element, body diameters from 4" to 8". Handles airflows of 55-346 cfm. Flexible mounting — horizontally, vertically or at an angle. *Page 96*



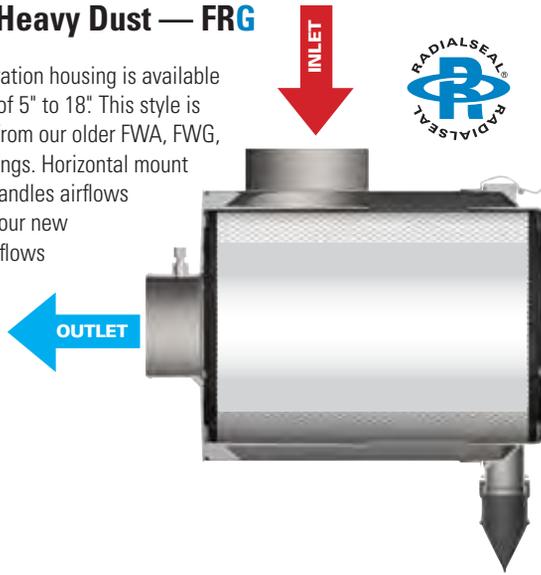
Medium Dust — FVG

A heavy-duty housing, our FVG has high airflow throughput and safety filter. Adds a vane in the inlet for a more aggressive first stage of cleaning. Horizontal mounting required. Airflows of 690-1200 cfm. *Page 126*



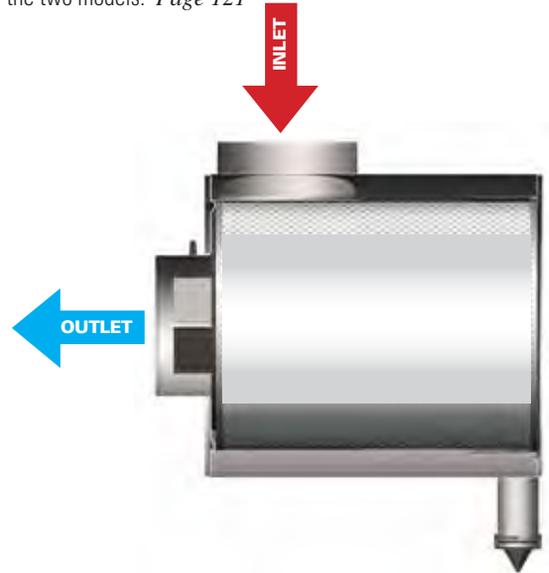
Medium to Heavy Dust — FRG

This two-stage filtration housing is available in body diameters of 5" to 18". This style is the ideal upgrade from our older FWA, FWG, FHG and FTG housings. Horizontal mount required. Style A handles airflows up to 795 cfm and our new Style B handles airflows up to 1390 cfm. *Page 107*



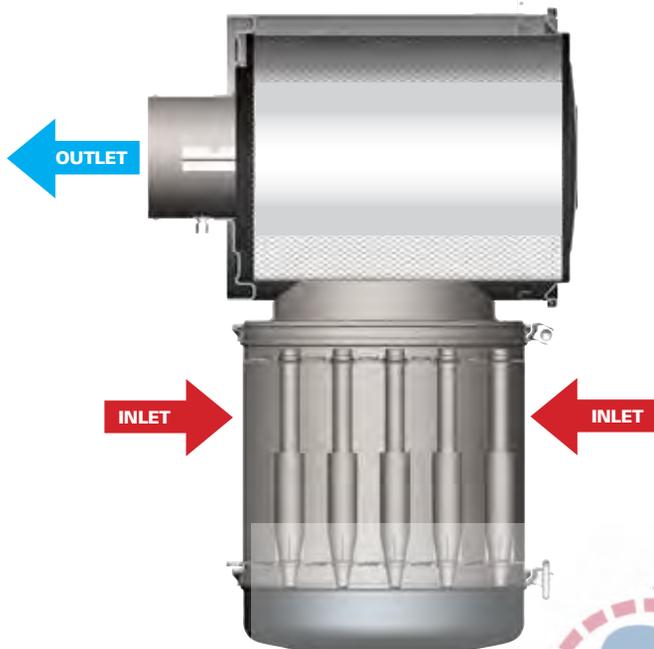
Heavy Dust — FTG

Two models available and designed for the engines on large equipment. Both have exact same airflow (from 1480-1870). Inlet tube position on housing body is only difference between the two models. *Page 121*



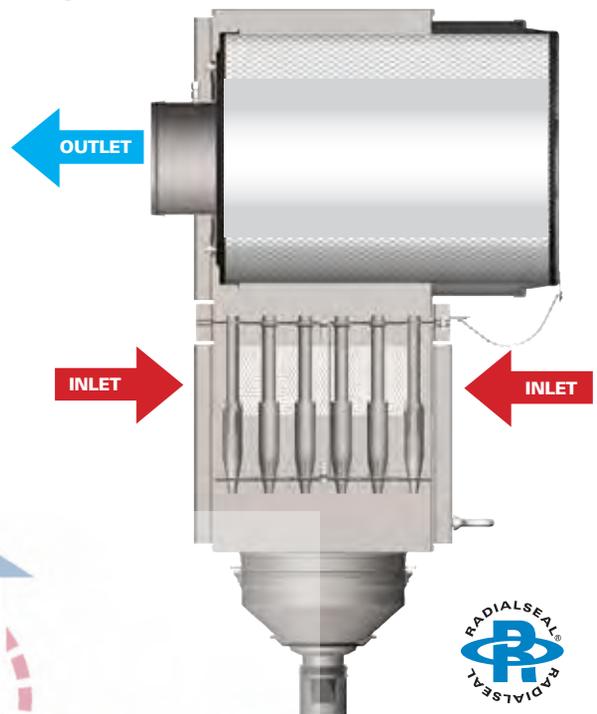
Heavy (Severe) Dust — STG

The efficient "T" design of the STG allows high airflow and strong two-stage filtration. Two styles available — one with a peripheral inlet and another with a tubular inlet. Handles airflows from 390-1760 cfm. Can be mounted vertically or horizontally. *Page 142*



Heavy (Severe) Dust — SSG

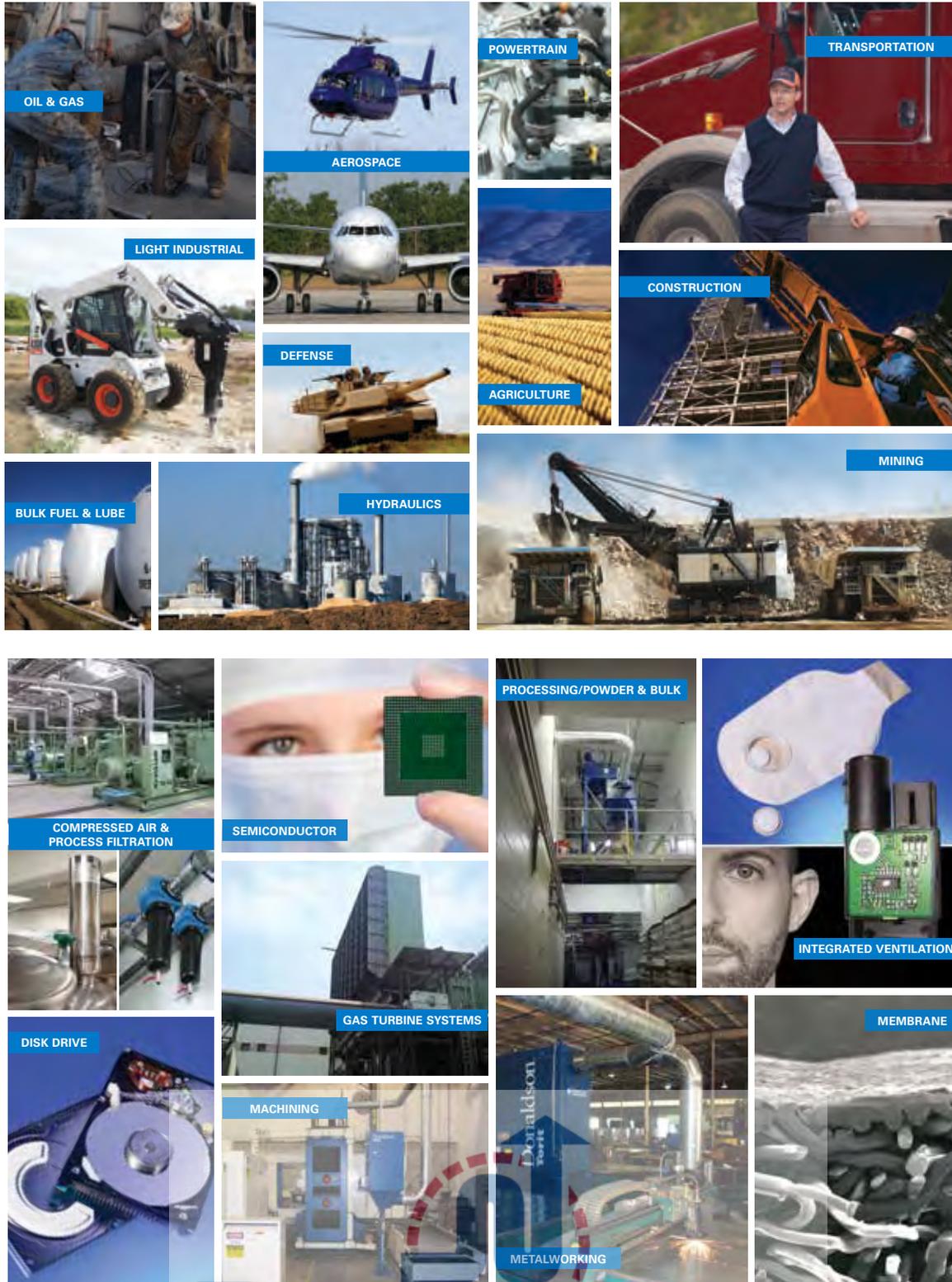
These new models are replacing our older SRG models. Donaldson's largest two-stage engine air cleaner, designed for the engines on large equipment. Handles airflows up to 4800 cfm per air cleaner. Multiple units can be used on very large equipment. The best protection for 500 to 3000+ horsepower diesel engines. This model uses RadialSeal™ sealing technology for filter retention. *Page 132*



www.buydonaldson.com A Single Location to a Global Aftermarket Resource

Donaldson serves industrial and engine markets including in-plant air cleaning, compressed air and gas purification, power generation, disk drive filtration, off-road equipment, vehicles and on-road trucks.

Donaldson filtration solutions serve diverse markets all around the world.



Pre-cleaning for Extreme Dust Conditions



Close-up of pre-cleaner section of a PowerCore® air cleaner. Pre-cleaning tubes can be arranged in various patterns, depending on the space and efficiency requirements of your application.

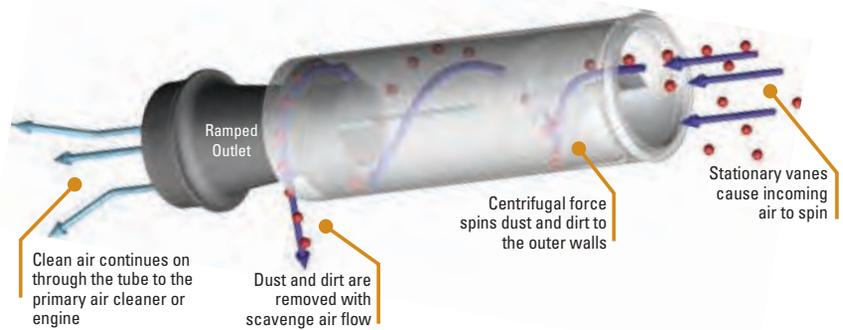
Pre-cleaners expel dust and debris before it reaches your air cleaner — extending air cleaner life, extending maintenance intervals, boosting air intake system efficiency and extending engine life.

Donaldson inertial particle separation technology offers maintenance-free air filtration for turbines, diesel engines and environmental applications. Inertial separation technology is used extensively on ground vehicles, rotorcraft, off-road vehicles and other critical equipment exposed to harsh environments.

Our light-weight pre-cleaning tubes have no moving parts to wear out or break. They are self-cleaning and do not require regular maintenance.



See the Accessories Section for our pre-cleaner / rain hood product offering.



Strata™ Tubes offer low airflow restriction with efficient contaminant removal up to 99%.

On- & Off-Road Air Filtration Evolution

On-Road Housings

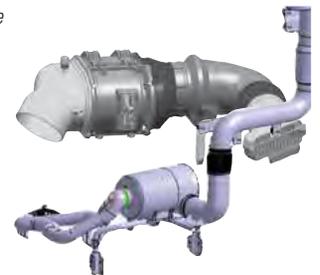
Bright Stainless Air Cleaner (Cowl Mount)



EPG RadialSeal Plastic Air Cleaner in engine compartment



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



Off-Road Housings

Metal Two-Stage Air Cleaner



FRG RadialSeal™ Plastic / Metal Air Cleaner



PSD PowerCore® Plastic Air Cleaner with non-metal filters



Unique Filtration Solutions

Crankcase Filtration – An Emissions Device or Air Filter?

Actually, it's both. Donaldson Spiracle™ Systems filter contaminant and aerosols from blow-by gasses.

For engine manufacturers, regulators now recognize that engine blow-by gas emitted from the crankcase is a major emissions source and requires that the vent be closed or filtered with high efficiency filtration.

Our Spiracle™ Crankcase Filtration Systems for closed (CCV) or open (OCV) ventilation systems reduce or eliminate harmful and unwanted crankcase emissions.



Small, small extended and mid-sized standard models are available for engine blow-by flow ranges up to 300 lpm / 10.6 cfm and with blow-by mass flow rates up to 15 gms/hr.

For more on Spiracle™ crankcase filtration technology, refer to the technical reference section.

What's the Right Intake System?

As you develop the future design of your engine or application, it is important to consider the filtration system. Depending on your objectives, it may be beneficial to choose from a catalog offering or partner with Donaldson for a filtration solution tailored to your needs.

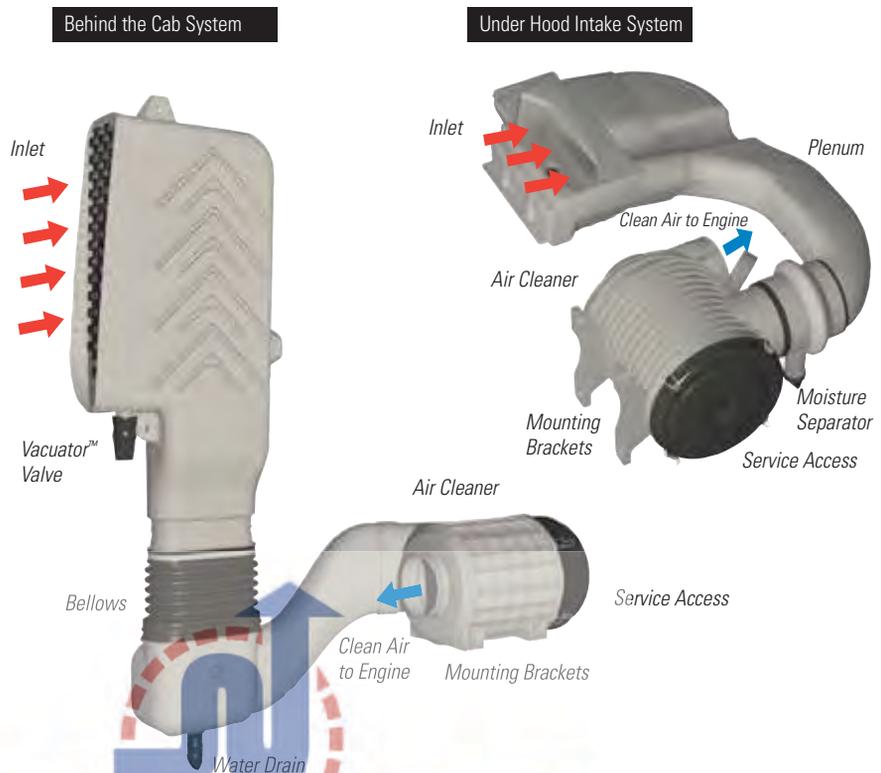
Reasons to Select a Traditional System

- No or low budget for engineering collaboration, development time or cost, or component tooling
- Prefer to have parts readily available — want to avoid manufacturing lead times (8 – 12 weeks) and not interested in warehousing service parts
- Prefer an established brand for filtration

Reasons to Consider a Custom, Integrated System

- Engine design team is integrating new components that require a higher degree of filtration
- Looking for a system that does more, which may include pre-cleaning, sensors, unique intake plenums
- Have budget for engineering collaboration, development time/cost
- Interest in component / supplier consolidation — solutions that bridge a wide range of engine/vehicles.
- Offering a unique solution with ease of maintenance

Molded Plastic Intake Systems



Filtration Solutions

Global Capabilities — Design & Logistics

Donaldson has accumulated numerous engineering, design, and testing tools that are used during the design process.

Engineering Capabilities

- Design centers in three key regions — United States, Asia and Europe

Prediction and Simulation

- CAD
- Proprietary, internally developed filter modeling software
- Fundamental fluid mechanics
- Computational fluid dynamic methods
- Structural analysis
- Thermal analysis

Development and Validation

Analytical Evaluation

- Particle Characterization
- Chemical Analysis Laboratory
- Acoustic Analysis

Filter Durability

- Filtration performance testing per applicable SAE and ISO standards
- Fabrication integrity
- Environmental conditions
 - Salt spray and thermal cycling
- Pressure fatigue
- Flow fatigue
- Hydrostatic burst
- Flow benches
- Vibration benches
- Gravimetric analysis

Rapid Prototyping

- SLA, SLS
- Investment casting
- RTV molding

Test & Evaluation Tools

Structural Analysis

- Per SAE, ISO, and NFPA standards
- Ansys & Abaqus
- Collapse
- Pressure impulse and fatigue

Tensile Compression

- Used to test material, component and assembly properties

Environmental Chambers

- Allows testing at hot or cold temperature, with humidity control

Flow Test Benches

- Allows measurement of static and dynamic flow and restriction for a device
- Allows calculation of device restriction at varying flows and temperatures
- System simulation

Performance Testing

- ISO, SAE, NFPA
- Filter performance
- Efficiency testing
 - Gravimetric
 - Fractional
 - Capacity testing per ISO5011
- Customer standards
- Crankcase ventilation tests
- Soot loading bench
- MAFS Test Bench
- Acoustic Test Chambers

Design Validation

Diesel Engine Test Cells

- Test cell locations in three key regions — United States, Asia and Europe
- Up to 600 kW / 800 hp capability
- Measurement of gaseous and particulate emissions
- Component durability
- Soot test bench
- 24/7 durability testing
- Web-based test cell monitoring access
- Tensile/Compression Tester
- Temperature Chambers

Vibration/Shaker

- Multiple benches
- Performance vibration with flow test
- Can apply sine, random, shock or custom variable vibration profiles
- Capable of hot or cold tests

Field Testing

- On and off highway
- Heavy-duty
- Tests conducted on both end user and OEM vehicles

Field Data Acquisition

- Real time measurements
- Remote communications
- On-line collection tools
- Review daily, weekly and monthly reports to analyze operational trends

Filter Media

- Wide selection
- Media characterization testing
- In-house media capabilities



Donaldson European Technical Center.
Expanded testing capabilities for engine filtration businesses in October 2010.



Standard Models with Donaldson Technology

Newer designs offer improved features and performance!



XRB Housings: left XRB12; middle XRB10; and right XRB08

XRB Air Cleaners

The XRB family is ideal for light- to medium-duty diesel engine trucks, agriculture, construction, mining, and industrial engine applications. The XRB air cleaner is smaller, lighter and easier to install and it effectively reduces contaminants, providing a high level of engine protection. Available in three diameter sizes.



FKB Housings and Filters: top center, FKB06; bottom left, FKB05; and bottom right, FKB04

For smaller sizes, check out the FKB air cleaner family.



PSD08, PSD09, PSD10 and PSD12 housings

PSD PowerCore® Air Cleaners

Air cleaners with PowerCore filtration technology offer maximum design flexibility. You gain equal performance in significantly less space, freedom to design unique configurations to fit tight spots, and overall design simplicity. See the PowerCore air cleaner section for all the details.



The smallest of our PSD family, this D080056 Side Service model is designed for in airflow ranges of 180-245 cfm, see the PowerCore section for more details.

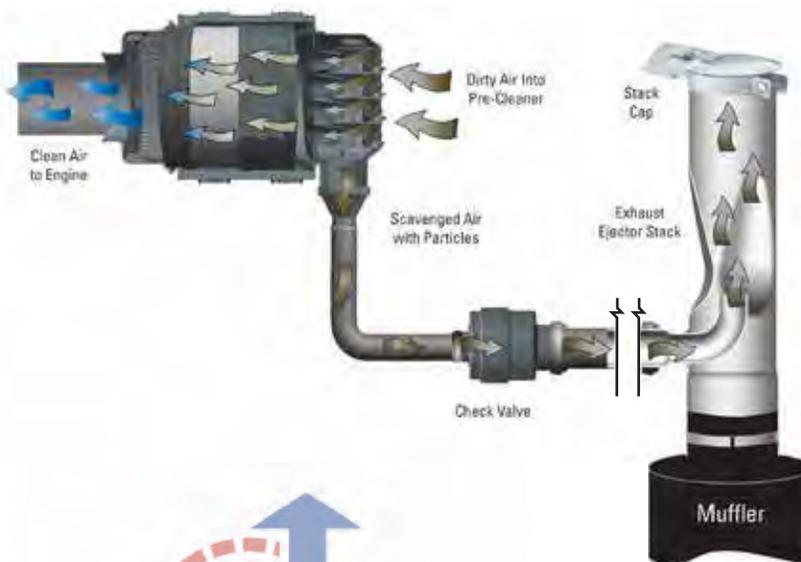


PowerCore
A Donaldson Filtration Technology



PowerCore Air Cleaner Scavenge System Components

This catalog features new Exhaust Ejectors, Check Valves, and Adapters that work with the PSD Air Cleaner family. To learn more, see the PowerCore Air Cleaner section.



Newer Filtration Technology for Mining Trucks Enhancements offer improved features and performance!



SSG

SSG Style — Our Largest Engine Air Cleaner

The SSG Air Cleaner offers design improvements over our older SRG air cleaner style — including filters with RadialSeal™ sealing technology, and a filter access cover with a quick release cover latches and chain.



No more bolt to unscrew for a filter change — simply unlatch the cover and let it hang from the housing during service.

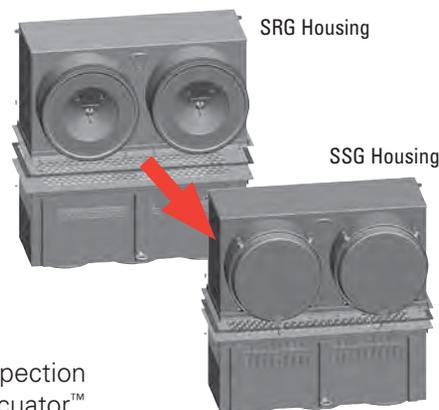
Upgrade to newer filtration technology . . . with our Conversion Kit

Replacing an older SRG housing with the new SSG housing allows you to simplify your routine filter service — no more separate gaskets at each filter change or removing a bolted on cover. SSG filters have radial seal end caps that provide a more reliable, consistent seal.



Conversion kit includes all you need to replace the upper unit of an old SRG air cleaner, including the filters.

Choose from an upper assembly conversion kit or you may want to install a complete new housing if your current SRG assembly needs repair or is reaching the end of its useful life.



SRG Housing

SSG Housing

Dust Dumpa kits allow for visual inspection related to dust-cup servicing and Vacuator™ Valve purging. See page 9 or the accessories section.

Donaldson Endurance™ Air Filters with Ultra-Web® Advanced Nanofiber Filtration Technology

Donaldson
Endurance



ULTRA-WEB® Advanced Nanofiber Filtration Technology

- Invented by Donaldson
- Engineered to perform in extreme temperature and humidity conditions, unlike ordinary nanofibers
- Optimized fiber structure and fiber diameter so it's stronger and lasts longer in all environmental conditions
- High efficiency — longer filter life
- High capacity — holds more contaminant
- Identifiable by the blue media color
- Proven — used in diesel engine market for nearly two decades

Finding a Donaldson Endurance air filter in this catalog

Part numbers starting with EAF are Donaldson Endurance Air Filters. EAF part numbers, if available for an air cleaner model, are listed in the service parts listing with an ES (Extended Service) in the description.

A150138	ERA	
bolt.....		P119463
cover		P544238
filter, primary — SM.....		P544301
filter, primary — ES & HE.....		EAF5150
gasket, cover		P535559
mounting band, black.....		P016845
nut, plastic.....		P119325
retaining ring.....		P129469
Vacuator™ Valve		P149099

Intake System Accessories

Pre-Cleaners • Hoods • Indicators • Elbows • Connectors • Mounting Bands

Designed to solve your customer's specific problems — such as excessive moisture or noise — or to simply help maintain the overall system



- Inlet Hoods — protect air intake from large debris and rain
- Pre-cleaners — extend air filter life and boost system efficiency
- Filter Gauges and Indicators — maximize filter life and reduce maintenance costs
- Rubber Elbows and Connectors — minimize air intake flow resistance, reduce noise levels in severe operating condition
- Vacuator™ Valves — automatically dispel dust and water from the air cleaner

New Pre-cleaning Device for Heavy-Dust Conditions!

Donaldson air cleaners for heavy-dust conditions have pre-cleaning inertial separation technology built-in to the inlet side of the housing — you'll find this technology in our industry shaping PSD, STB, STG, SRG and SSG air cleaner models.

Finally, the same durable, reliable, particle separation technology is now available in a stand-alone pre-cleaner — the Strata™ Cap!

**Strata™ Cap —
Our Highest Rated
Pre-cleaner Ever
Invented!**



The Strata™ Cap pre-cleaner expels up to 96% of dust and debris BEFORE it ever reaches the air cleaner.



Donaldson developed the first air particle separator system in the early 1960s to protect helicopter turbine engines from sand ingestion. Today, this technology continues to be used on defense equipment and other turbine and diesel engine applications that operate in extreme dust conditions.



Intake System Accessories

Pre-Cleaners • Hoods • Indicators • Elbows • Connectors • Mounting Bands



Dust Dumpa for PowerCore®, SRG, and SSG Style Air Cleaners

In extreme dust conditions (mining, construction and quarrying), the dust is so concentrated that maintenance personnel have to empty the dust cups or check the Vacuator™ Valves more frequently than they like.

Both Dust Dumpa kits incorporate rubber connections that improve dust evacuation from the housing during normal vehicle vibration. The clear tube allows you to easily see what's happening during daily inspections without climbing up to open or check out the Vacuator Valve.



The addition of Dust Dumpa tube extensions to this double PSD air cleaner application resulted in extended filter life on this Australian geothermal drill rig.



Dust Dumpa tube extensions ship fully assembled. **Left:** Part No. X006561 and Part No. X006562 on right.

Air Cleaner Materials, Finishes & Construction Designed for long life, rust resistance and good looks!

Injection and Blow-Molded Air Cleaners

Our non-metal finish is always black plastic and can be found on DuraLite™, PowerCore® (PSD) and other RadialSeal™ air cleaners (FPG, XRB, FKB). Advantages include:

- Lighter weight than metal air cleaners
- Corrosion and chemical resistant
- Impact, mar and vibration resistant



Injection and Blow-Molded Air Cleaners

Polymer Coating Resists Corrosion

Donaldson's gloss black finish — on most of our metal air cleaners (ERA, FVG, FRG) — is resistant to chemicals and corrosion. Advantages include:

- Corrosion and chemical resistance. This polymer coating lasts five to 10 times longer than traditional paint.
- Impact and mar resistance. Polymer coating is up to 17 times harder than most solvent-based paint.
- Consistent thickness coating over the entire air cleaner, even in crevices and small, hard-to-reach places.



Polymer Coating

Buff Prime Finish (not shown)

Our large SRG, SSG & STG air cleaners have a buff prime finish — ready for you to apply paint to match the overall look of your equipment. (Exception: the SRG to SSG conversion kit contains an upper unit that has a white polymer coating.)

Filter Features

Seals • Media • End Caps • Beading • Liners

Donaldson brand performance air filters give you consistent performance over the life of your engine

RadialSeal™ filter seals

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

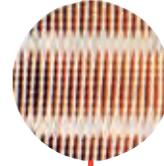


Axial filter seals

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.



Filter end caps

Designed to protect the filter media and provide structural integrity.

Beading

Applied to filter liners, beading is designed to stabilize the media and prevent pleat tip wear.

Heavy-duty liners

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

RadialSeal™ filter seals

Our RadialSeal technology on PowerCore filters provides a tight critical seal on unique filter shapes.



Non-metal construction

Weights less and with less disposal impact.



PowerCore
A Donaldson Filtration Technology

To learn more about the PowerCore advantages, see the PowerCore® Section.



Donaldson's Commitment to Quality & Continuous Improvement

Donaldson Quality Commitment

Our employees are committed to providing our Customers with products and services that consistently meet or exceed their expectations.

We will work toward:

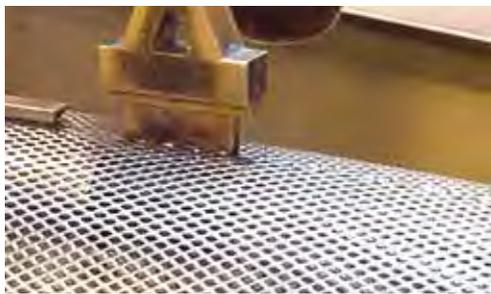
- Continuous improvement of products, processes, and services for the benefit of our Customers;
- Complete Customer satisfaction;
- Elimination of waste and variation;
- World-class standards and benchmarks.

We believe in:

- The development and empowerment of our people;
- Standardization of processes and measurement of progress;
- Simplicity, visibility and capability of all activities;
- Continuous improvement in our management and quality systems.

For the long-term success of our company, our first operating priority is the satisfaction of our Customers. Understanding their needs and serving them will benefit both our shareholders and our employees. Our management is responsible for ensuring that this policy is understood, implemented and maintained at all levels of our organization.

Bill Cook
Chairman, President, CEO



Air Cleaner Selection

With the multitude of sizes and styles of air cleaners available from Donaldson, how do you choose the proper model that will reliably protect your engine and deliver maximum filter service life? Selection is based on two primary factors — airflow requirements of your engine and the environment the air cleaner will be operating in. Use our five-step selection method on the next few pages to make the right choice for your application:

1 Determine the combustion air requirements of the engine

For the most accurate engine airflow specifications, Donaldson recommends using the intake airflow rate specified by the engine manufacturer. If this information is not readily available, you can calculate your own numbers by using the preferred or alternative methods shown below. If the air cleaner may see excessive engine vibration, include a pulsation factor into your calculations.

Ideal Method Obtain from Engine Manufacturer

For the most accurate engine airflow specifications, Donaldson recommends using the intake airflow rate specified by the engine manufacturer. This information may be obtained from the manufacturer.

Preferred Method Engine Displacement Formula

4-Stroke (Cycle) Engine Formula

English Units

$$\text{Airflow (CFM)} = (\text{Engine Size (CID)} \times \text{RPM}) \times \text{VE} / 3456$$

Metric Units

$$\text{Airflow (m}^3\text{/min)} = (\text{Engine Size (Liters)} \times \text{RPM}) \times \text{VE} / 2000$$

VE = Volumetric Efficiency — 4-Stroke*

- 0.90 for naturally aspirated gas engine
- 0.90 for naturally aspirated diesel engine
- 1.60 for turbo charged diesel engine
- 1.85 for turbo charged after cooled diesel engine

2-Stroke (Cycle) Engine Formula

English Units

$$\text{Airflow (CFM)} = (\text{Engine Size (CID)} \times \text{RPM}) \times \text{VE} / 1728$$

Metric Units

$$\text{Airflow (m}^3\text{/min)} = (\text{Engine Size (Liters)} \times \text{RPM}) \times \text{VE} / 1000$$

VE = Volumetric Efficiency — 2-Stroke*

- 0.90 for naturally aspirated diesel engine
- 1.40 for scavenge blower diesel engine
- 1.90 for turbo charged diesel engine

* The VE values are guidelines. It is always best to use manufacturer ratings when they are available. Electronic controls on modern engines can raise VE ratings to 2.0 or greater.

Alternative Method Engine Horsepower Formula

English Units

$$\text{Airflow (CFM)} = \text{HP (SAE)} \times \text{SA}$$

SA = (Specific Airflow) per Horsepower

- 4-stroke naturally aspirated diesel engine — 2.0
- 4-stroke turbo charged diesel engine — 2.3
- 4-stroke turbo charged after cooled diesel engine — 2.3

- 2-stroke naturally aspirated diesel engine — 2.0
- 2-stroke scavenge blower diesel engine — 3.3
- 2-stroke turbo charged diesel engine — 3.6

Metric Units

$$\text{Airflow (m}^3\text{/min)} = \text{HP (SAE)} \times \text{SA}$$

SA = (Specific Airflow) per Horsepower

- 4-stroke naturally aspirated diesel engine — 0.057
- 4-stroke turbo charged diesel engine — 0.065
- 4-stroke turbo charged after cooled diesel engine — 0.065

- 2-stroke naturally aspirated diesel engine — 0.057
- 2-stroke scavenge blower diesel engine — 0.093
- 2-stroke turbo charged diesel engine — 0.102

The Pulsation Factor (PF)

On naturally aspirated** engines, intake airflow to the air cleaner can negatively affect the cubic displacement of the air into the engine. To compensate for the loss, we recommend you multiply the engine airflow by one of the following factors:

English Units

- 2.1 for 1 cyl.
- 1.5 for 2 cyl.
- 1.2 for 3 cyl.
- 1.0 for 4 or more cyl.

Metric Units

- 1,2 m3/min.

2 Determine the dust condition for the engine/machine and typical operating environment

For example, a standby hospital generator set would probably see light dust; whereas, a rock crusher would almost always be surrounded by an extremely heavy dust concentration of large dirt particles. Our air cleaner selection chart, on the next page, is a visual guide to select your vehicle type and operating environment.

** No airflow adjustment is required for turbo-charged engines on Donaldson air cleaners with high pulsation filter media (e.g., Donaldson DuraLite™ ECB, ECC, ECD air cleaners).

3 Select an air cleaner series

Key design differences are color coded in our selection chart including PowerCore® filtration technology, axial seal, RadialSeal™ and disposable air cleaners.

AIR CLEANER STYLES

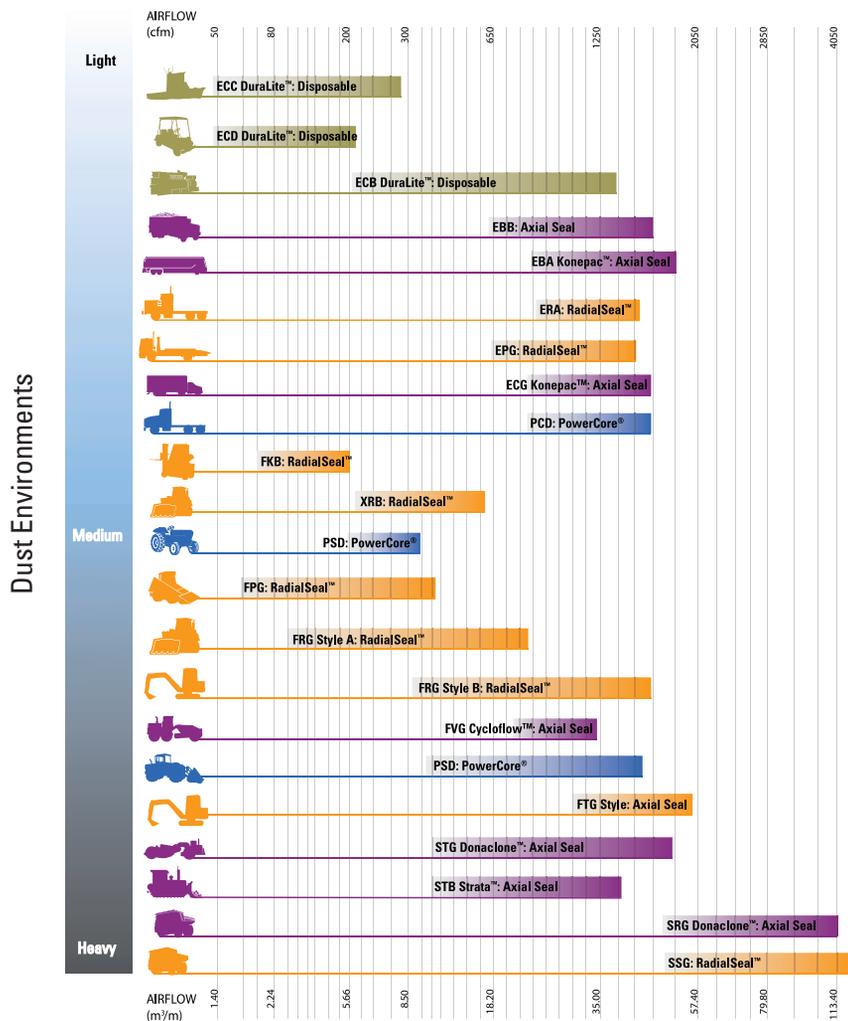
PowerCore®

RadialSeal™

Axial Seal

Disposables

Application notes, dimensional, locations of the inlet and outlet, and mounting configurations are appropriately considered at this step. These parameters are sometimes critical and may lead you to an alternative model or series that is better suited to your application.

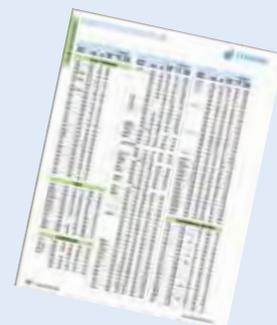


Looking for Engine Airflow Reference Guide?

See Engine HP & Air Consumption Rating Guide Reference Section of this catalog.



Please note, this information should not be used for the application of retrofit emissions devices.



4 Choose a specific air cleaner family or series

Use the table of contents from this guide to locate the choices for a particular air cleaner family according to the cfm your engine needs. Refer to the Initial Airflow Restriction table for the style you're considering. If there are two air cleaner models that fit your parameters, choose the one with the **lowest** restriction to ensure maximum service life from that air cleaner/filter.

5 Choose intake accessories

Even though they're called accessories, things like inlet hoods, mounting bands, rubber connectors, and clamps are important parts of the overall intake system. See our accessories section for more information.



Airflow Direction for Donaldson Air Cleaners

Donaldson has air cleaner housings that work in a variety of dust conditions and air flow patterns (A – D and G).

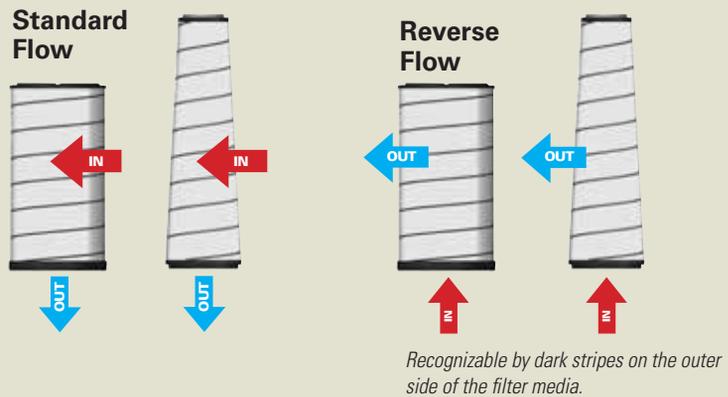
For improved filtration reliability and quicker filter service compared to older axial seal style air cleaners, Donaldson recommends installing either PowerCore® air cleaners or housings with RadialSeal™ sealing technology, whenever possible.

Flow Direction Legend

Description	Part No. Example
A = Air in the End, Out the Side	A 042511, A 112018
B = Air in the Side, Out the End	B 045008, B 120271
C = Air in the End, Out the Same End	C 080025, C 065003
D = Air in the End, Out the Opposite End	D 100030, D 055004
G = Air in the Side, Out the End	G 290010, G 110214

Standard & Reverse Flow Filters

These filters look exactly the same except there are dark lines viewable on the filter media of one of the filters. What's different? One is a standard flow filter, the other reverse flow. They fit housings that have specific flow requirements and are not interchangeable even though they look like they could be.

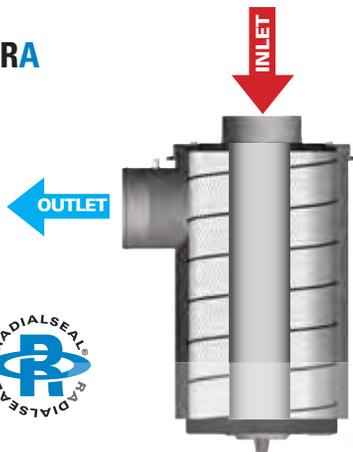


FLOW **A**

Air in the End, Out the Side (reverse flow filters)

Light Dust — ERA

Classic cylindrical design, black finish, cowl-mounted for vertical installation. Airflows to 1350 cfm. Page 58



Light Dust — EBA Konepac™

Same housing as original EBA but with cone shaped filter (Konepac), can be mounted either horizontally or vertically. Airflows to 1850 cfm. Page 63

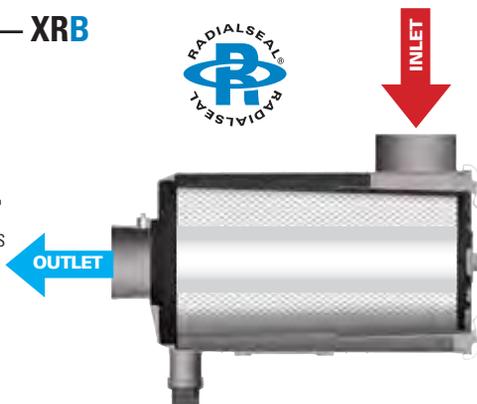


FLOW **B**

Air in the Side, out the End (standard flow filters)

Medium Dust — XRB

The RadialSeal, plastic, two-stage air cleaner with side inlet for horizontal installation. Body diameters in 8", 10" and 12". Handles airflows of 265-630 cfm. Mount under hood or behind cab. *Page 88*



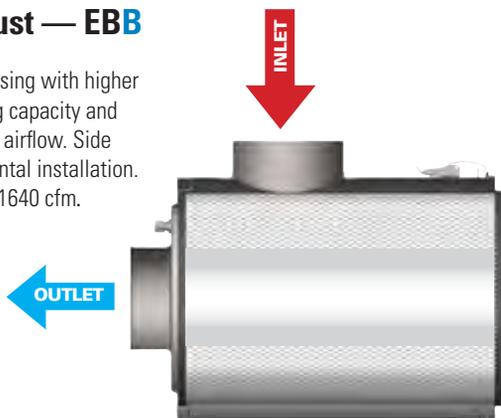
Light and Medium Dust — FKB

A compact housing high dust holding capacity and comparable airflow to FPG. Two-stage filtration, side inlet, horizontal installation. Body diameters in 4", 5" and 6". Mount under hood or behind cab. Handles airflows from 70–207 cfm. *Page 80*



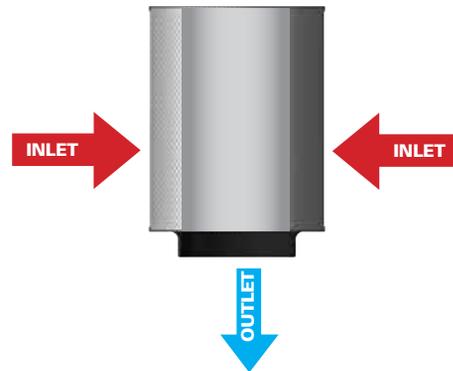
Light Dust — EBB

A small housing with higher dust holding capacity and comparable airflow. Side inlet, horizontal installation. Airflows to 1640 cfm. *Page 74*



Light Dust — ECB

Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 2118 cfm. *Page 46*

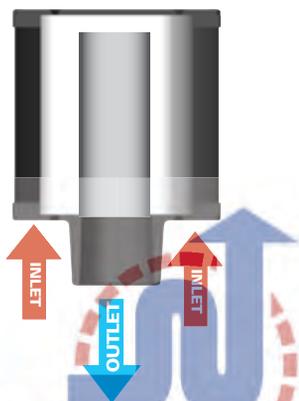


FLOW **C**

Air in and out the Same End (standard flow filters)

Light Dust — ECC

Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 760 cfm. *Page 46*



Airflow Direction for Donaldson Air Cleaners



Air in the End, out Opposite End

Medium to Heavy Dust — PSD



PSD units are small and compact with built-in mounting brackets. Can be vertically or horizontally mounted. Airflows to 915 cfm.
Page 32



Light Dust — ECD

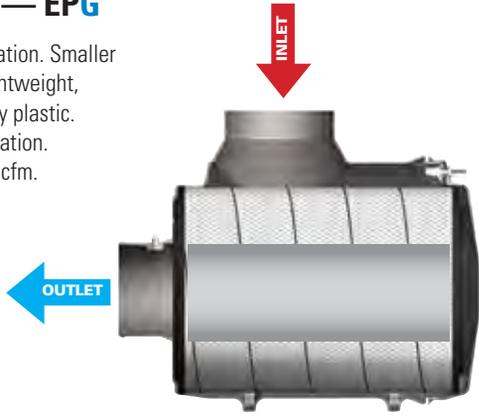
Disposable, small, lightweight and unitized (housing and filter in one). For high-vibration engines. Can be vertically or horizontally mounted. Airflows to 185 cfm.
Page 46



Air in the Side, Out the End (standard flow filters)

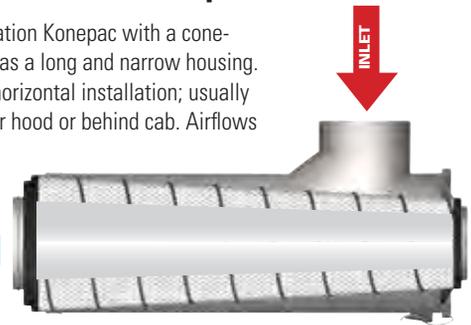
Light Dust — EPG

Single stage filtration. Smaller than ECG and lightweight, sturdy, and totally plastic. Horizontal installation. Airflows to 1325 cfm.
Page 52



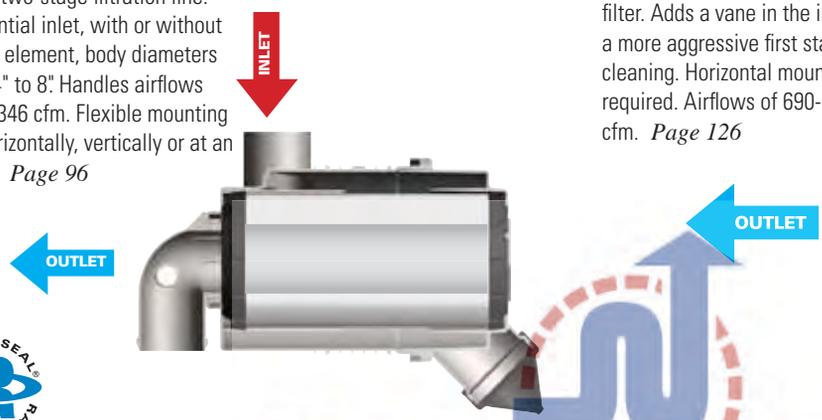
Light Dust — ECG Konepac™

Second generation Konepac with a cone-shaped filter has a long and narrow housing. Designed for horizontal installation; usually mounted under hood or behind cab. Airflows to 1600 cfm.
Page 68



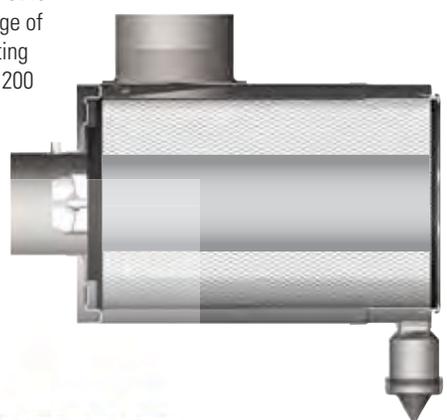
Medium Dust — FPG

The first fully plastic air cleaner in our two-stage filtration line. Tangential inlet, with or without safety element, body diameters from 4" to 8". Handles airflows of 55-346 cfm. Flexible mounting — horizontally, vertically or at an angle. *Page 96*



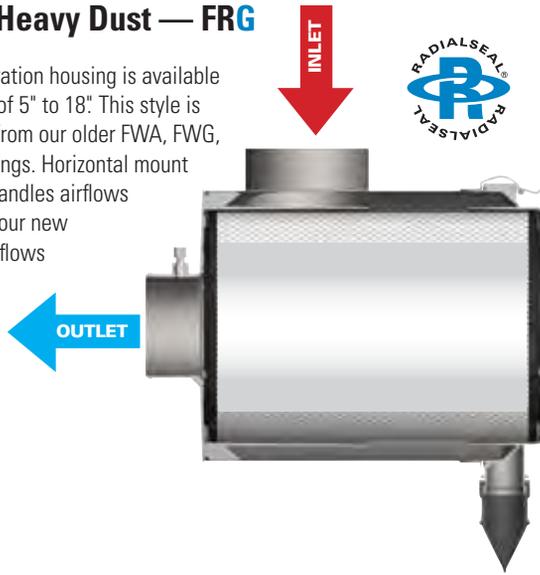
Medium Dust — FVG

A heavy-duty housing, our FVG has high airflow throughput and safety filter. Adds a vane in the inlet for a more aggressive first stage of cleaning. Horizontal mounting required. Airflows of 690-1200 cfm. *Page 126*



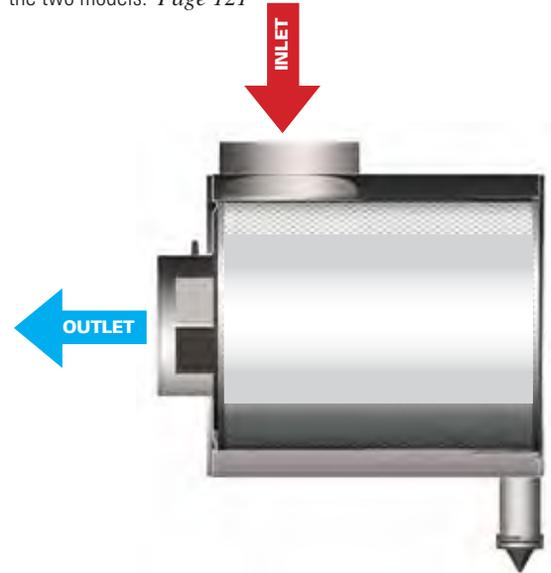
Medium to Heavy Dust — FRG

This two-stage filtration housing is available in body diameters of 5" to 18". This style is the ideal upgrade from our older FWA, FWG, FHG and FTG housings. Horizontal mount required. Style A handles airflows up to 795 cfm and our new Style B handles airflows up to 1390 cfm. *Page 107*



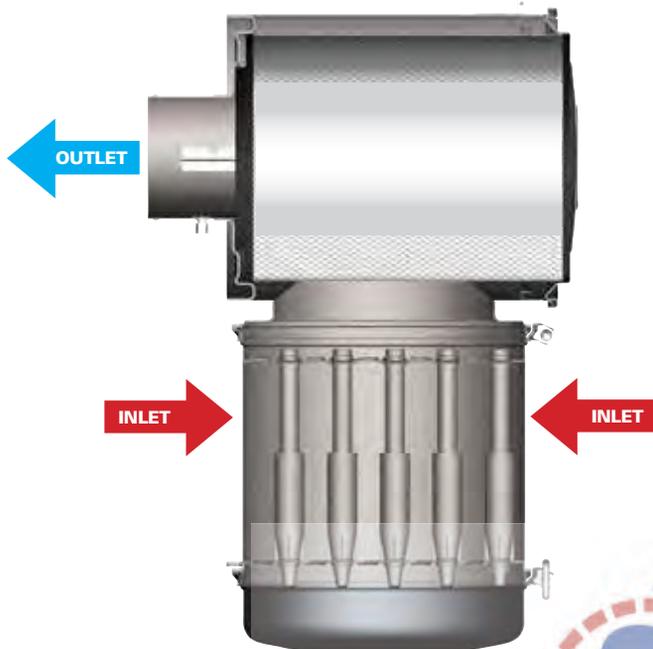
Heavy Dust — FTG

Two models available and designed for the engines on large equipment. Both have exact same airflow (from 1480-1870). Inlet tube position on housing body is only difference between the two models. *Page 121*



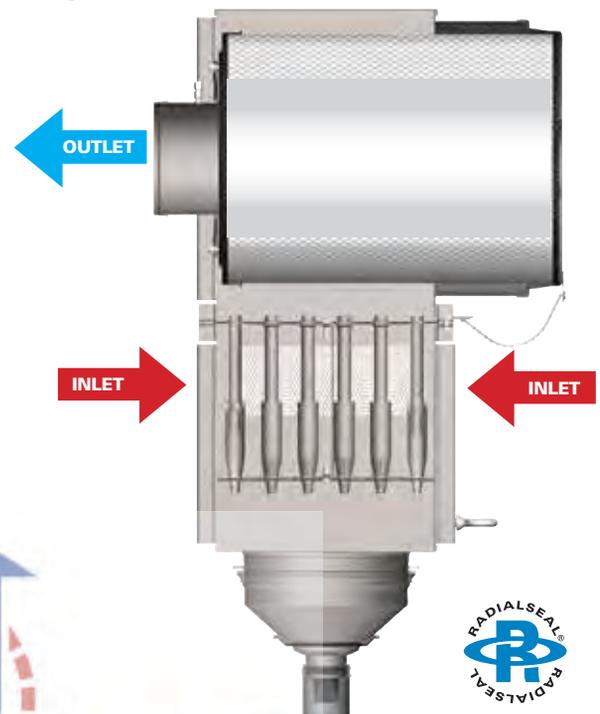
Heavy (Severe) Dust — STG

The efficient "T" design of the STG allows high airflow and strong two-stage filtration. Two styles available — one with a peripheral inlet and another with a tubular inlet. Handles airflows from 390-1760 cfm. Can be mounted vertically or horizontally. *Page 142*



Heavy (Severe) Dust — SSG

These new models are replacing our older SRG models. Donaldson's largest two-stage engine air cleaner, designed for the engines on large equipment. Handles airflows up to 4800 cfm per air cleaner. Multiple units can be used on very large equipment. The best protection for 500 to 3000+ horsepower diesel engines. This model uses RadialSeal™ sealing technology for filter retention. *Page 132*



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Donaldson filtration solutions serve diverse markets all around the world.

