
Selecting and Maintaining Filters to Meet ISO 8573-1 Quality Classes

Francisco Lara
Airtec Global
Keynote Speaker

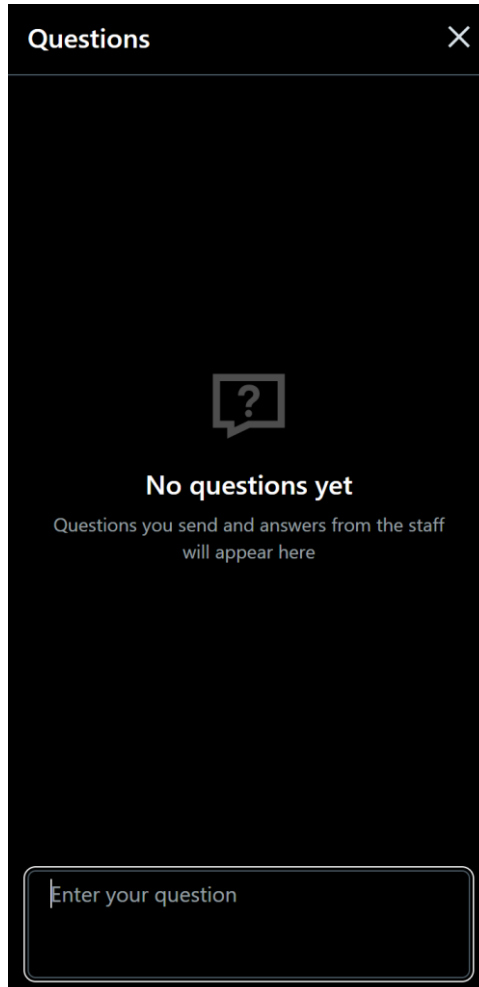
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Q&A Format



- Panelists will answer your questions during the Q&A session at the end of the Webinar.
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Reduce maintenance costs by providing clean air to your plant



Reduce workload for your team, let us provide the data you need



Readings on Oil Vapors, Particulates, Dewpoint, Pressure, Temp & Flow



Reduce energy consumption and avoid production downtime

BEST PRACTICES

2025 EXPO OFFERING 12 DAYS IN INDIANAPOLIS IN
COMPRESSED AIR / VACUUM / COOLING
TECHNOLOGY

AGENDA AT A GLANCE

TRACK 1: SYSTEM DESIGN & OPTIMIZATION

9:00am to 4:00pm

THURSDAY, OCT. 13, 2025

TRACK 2: MAINTENANCE, RELIABILITY & PERFORMANCE

9:00am to 4:00pm

FRIDAY, OCT. 14, 2025

SESSION 1: 9:00am-10:15am

TRACK 1: NATURAL REFRIGERANTS AND HEAT PUMP ENERGY EFFICIENCY

Mattie White, White Refrigeration, Inc. | Trevor, Airtronix, Inc.

SESSION 2: 10:30am-11:45am

TRACK 2: CAGE EDUCATION SEMINAR – COMPRESSED AIR EFFICIENCY, AIRGAS PRACTICES AND CERTIFICATION

Bill Wolfelt, Xerox Corporation, Alstom Power, West Air, Inc. | Robert Lee, East Lincoln, Colson & Co., Inc.

11:55am-12:15pm / OPEN TO ALL ATTENDEES

UPCOMING FREE PANEL DISCUSSION: The Critical Importance of Industrial Energy & Water Efficiency

Moderated by Andrew Sauer, Director, Energy Efficiency, Schneider Electric | Panelists: Scott Pridmore, President, Airtech Air Conditioning, Inc. | David Hargrave, Director, Energy Efficiency, Rockwell Automation | David Hargrave, Director, Energy Efficiency, Rockwell Automation | David Hargrave, Director, Energy Efficiency, Rockwell Automation | David Hargrave, Director, Energy Efficiency, Rockwell Automation

WEDNESDAY, OCT. 14, 2025

SESSION 3: 7:30am-9:00am

WORKSHOP IN COMPRESSED AIR, VACUUM & COOLING NETWORKING BREAKFAST

From Breakfast to Registration, How Women Are Breaking Work Networking Lunch to Industry Speaker: Lucie Lonsdale, Onix, Onix Air Conditioning, Onix Air Conditioning, Onix Air Conditioning

SESSION 4: 9:00am-10:15am

TRACK 1: INTEGRATED ENERGY EFFICIENCY

John Smith, Schneider Electric, Robert Lee, East Lincoln, Colson & Co., Inc.

SESSION 5: 10:30am-11:45am

TRACK 2: WRITING FOCUS INDUSTRY SPEAKERS' GUIDE COMPRESSED AIR QUALITY SPEAKERS & COMPLIANCE GUIDELINES

Robert Lee, East Lincoln, Colson & Co., Inc. | Robert Lee, East Lincoln, Colson & Co., Inc.

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PLAYBOOK DISCUSSION: The Future of Maintenance

Moderated by Andrew Sauer, Director, Energy Efficiency, Schneider Electric | Panelists: Scott Pridmore, President, Airtech Air Conditioning, Inc. | David Hargrave, Director, Energy Efficiency, Rockwell Automation | David Hargrave, Director, Energy Efficiency, Rockwell Automation | David Hargrave, Director, Energy Efficiency, Rockwell Automation

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TRACK 1: OPTIMIZED GASES AND FREE COOLING SYSTEMS

Robert Lee, East Lincoln, Colson & Co., Inc. | Robert Lee, East Lincoln, Colson & Co., Inc.

SESSION 4: 10:30am-11:45am

TRACK 2: SUSTAINED EFFORTS REDUCING THROUGH OPERATIONAL DISCIPLINE AND ENERGY MANAGEMENT

Robert Lee, East Lincoln, Colson & Co., Inc. | Robert Lee, East Lincoln, Colson & Co., Inc.

1:30pm-2:45pm / 2:00pm-3:30pm

CERTIFIED COMPRESSED AIR SYSTEM SPECIALIST EXAM

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SESSION 4: 10

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Water Conservation

10. John Deere Cuts Energy Costs

22. CAGI: Centrifugal Compressor Intercoolers

28. Automotive Plant Displays Magnetic Pickups

32. Alternative Water Strategies For Cooling

38. INEC: Saves 1M Gallons of Water

42. Cleveland Thermal Modernizes Cooling

44. Air Gun Safety and OSHA Compliance

The Magazine for Quality & Reliability in Energy-Efficient Blower & Vacuum Systems

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- 6 Positive Displacement Vs. Centrifugal Blowers
- 10 Wolf Hudebn Vacuum System Water Savings

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OPENING SESSION

OPEN TO ALL ATTENDEES

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The Critical Importance of Industrial Energy & Water Efficiency

📅 Tuesday, October 13, 2026 | 11:15 AM – 12:15 PM 📍 Indianapolis, IN (Indiana Convention Center)

Key Takeaways

- Align plant utility operations with zero-carbon and energy targets
- Apply practical engineering solutions for compressed air and process cooling systems
- Execute large-scale utility and efficiency capital projects effectively
- Gain real-world insights from technical experts managing plant utility upgrades

Featured Panelists



Mustafa Wahid
Roche Diagnostics



**Jose Luis Sarmiento
Escalante**
John Deere



Brad Runda
Runda Energy
Consulting



**Jim
Nonnenmann**
PRVN Consultants

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Selecting and Maintaining Filters to Meet ISO 8573-1 Quality Classes

Introduction by
Compressed Air Best Practices® Magazine



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About the Speaker



Francisco Lara

Airtec Global

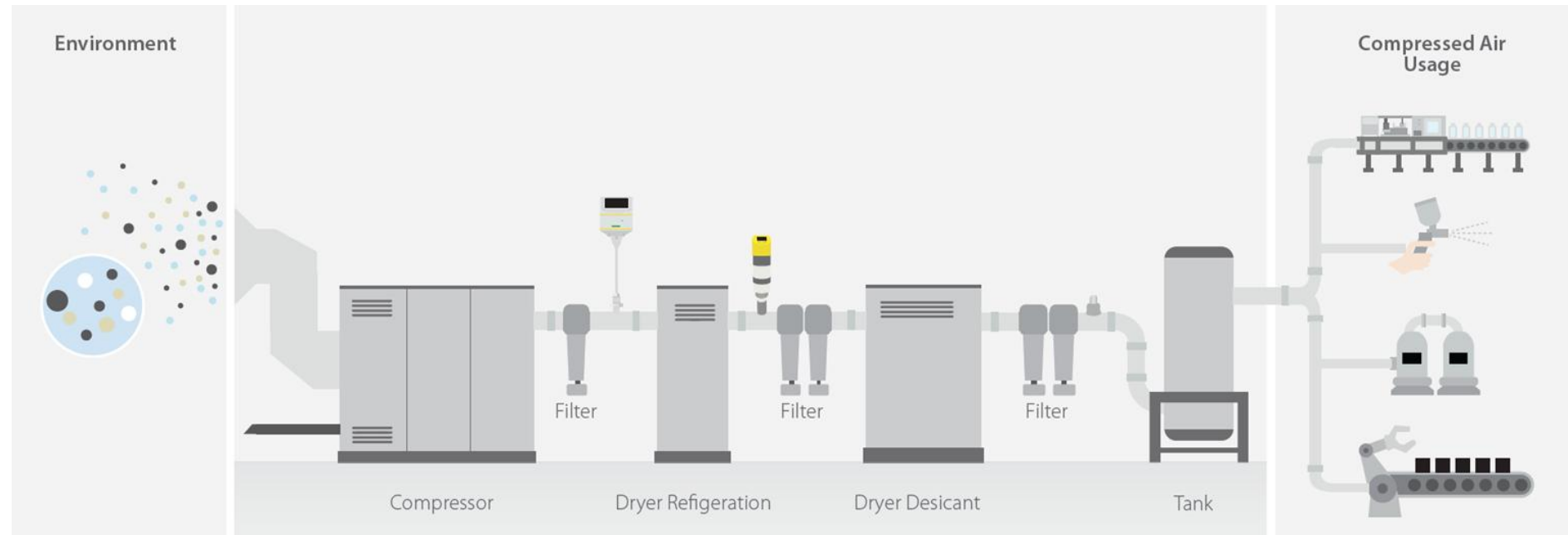
- Manager, Airtec Global
- 10+ years experience in the compressed air industry
- Supervise operations in México and US
- Focused on educating clients to understand the true cost of compressed air and implement optimization

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Introduction

Compressed air is one of the most important utilities in manufacturing, yet it's often one of the least understood. Every cubic foot of compressed air carries contaminants such as particles, moisture, oil aerosols, oil vapor, and microorganisms. If these contaminants aren't properly removed, they can damage equipment, contaminate products, reduce production efficiency, increase energy consumption, and lead to costly downtime.



Why Clean and Dry Air Matters

Compressed air is used throughout manufacturing:

- Pneumatic cylinders
- Valves
- Packaging equipment
- Paint systems
- Robotics
- Instrumentation
- Product contact

Every compressor ingests ambient air that contains:

- Dust
- Water vapor
- Oil (from lubricated compressors)
- Hydrocarbons
- Microorganisms

If these contaminants remain in the system, they can cause:

- Product contamination
- Corrosion
- Sticking valves
- Damaged instrumentation
- Increased maintenance
- Production downtime
- Higher energy costs due to clogged filters

Understanding ISO 8573-1

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particulates per m³			Mass Concentration mg/m³	Vapour Pressure Dewpoint	Liquid g/m³	Total Oil (aerosol liquid and vapour)
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron				mg/m³
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20,000	≤ 400	≤ 10	—	≤ -70°C	—	0.01
2	≤ 400,000	≤ 6,000	≤ 100	—	≤ -40°C	—	0.1
3	—	≤ 90,000	≤ 1,000	—	≤ -20°C	—	1
4	—	—	≤ 10,000	—	≤ +3°C	—	5
5	—	—	≤ 100,000	—	≤ +7°C	—	—
6	—	—	—	≤ 5	≤ +10°C	—	—
7	—	—	—	5 - 10	—	≤ 0.5	—
8	—	—	—	—	—	0.5 - 5	—
9	—	—	—	—	—	5 - 10	—
X	—	—	—	> 10	—	> 10	> 10

Selecting the Right Filtration System

Standard filtration

- Water separator
- General-purpose filter
- High-efficiency coalescing filter
- Super Fine Particulates



VS

Specialized filtration

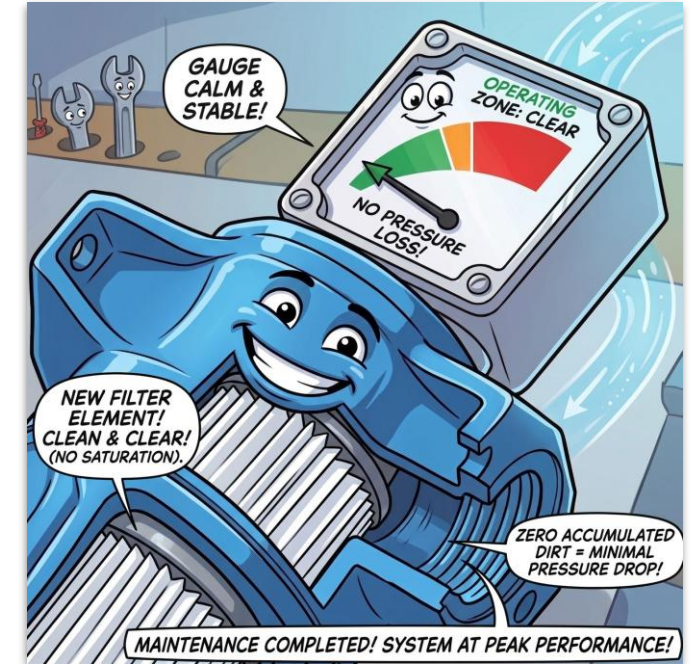
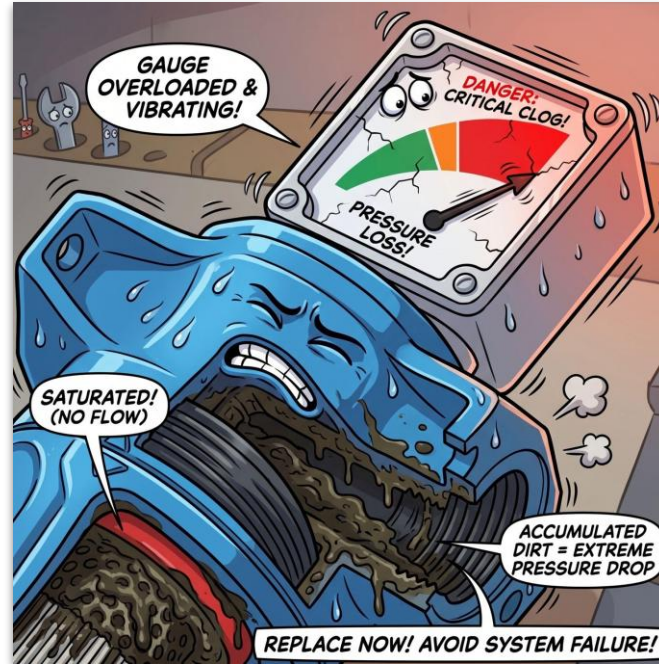
- Activated carbon
- Sterile filters
- Oil vapor removal
- Point-of-use filtration
- High-purity systems



Monitoring and Maintenance: Keeping Air Quality Consistent

A filtration system performs well only if it is maintained properly.

- Differential pressure indicators
- Scheduled element replacement
- Automatic drain inspection
- Dryer performance
- Air quality monitoring



Monitoring and Maintenance: Keeping Air Quality Consistent

Compressed Air Quality Monitoring Solutions that meet ISO 8573-1 standards:

- Dew point
- Oil vapor
- Particle counters
- Periodic ISO testing



Common Mistakes That Reduce Air Quality

Undersized filters

Higher air velocity means:

- Greater pressure drop
- Reduced contaminant capture
- Shorter filter life
- Higher operating costs

Sizing exactly at rated flow

No capacity for:

- Production growth
- Compressor overload
- Seasonal demand

Filters perform best with some operating margin.

Common Mistakes That Reduce Air Quality

Incorrect filter arrangement

- Installing a fine coalescing filter without upstream particulate removal shortens its service life.

Ignoring moisture

- Many filtration problems actually begin with poor dryer performance or failed condensate drains.

Depending only on differential pressure

- A filter may still show acceptable differential pressure while contaminants are already passing downstream.

Closing

- **Compressed air quality directly affects production reliability, product quality, and operating costs.**
- **ISO 8573 defines the target, but proper filtration selection, monitoring, and maintenance are what consistently achieve that target.**
- **The best-performing compressed air systems are designed with the entire lifecycle in mind—from initial sizing to routine maintenance and air quality verification.**

About the Speaker



Wolfgang Bongartz
Donaldson Filtration Solutions

- Global Product Manager, Industrial Gases – Donaldson Company, Inc.
- 30+ years in compressed air filtration, drying and purification
- Leads development of compressed air solutions, specializing in ISO 8573-1 compliance

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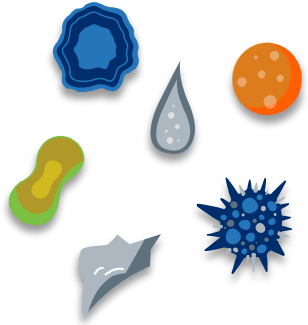


FILTRATION FOR ISO 8573-1

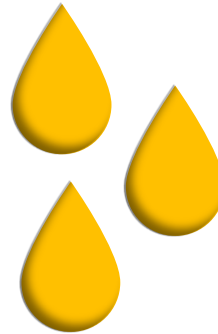
COMPRESSED AIR POLLUTION

COMPRESSED AIR SYSTEM POLLUTION

1 bar atmospheric pressure



Compressor



Oil



>> 1 bar pressure

COMPRESSED AIR
+
CONTAMINANTS

- Water / Humidity
- Particles
- Gaseous Components
- Micro Organisms

WHY IS COMPRESSED AIR FILTRATION & PURIFICATION NEEDED?

CONSEQUENCES:



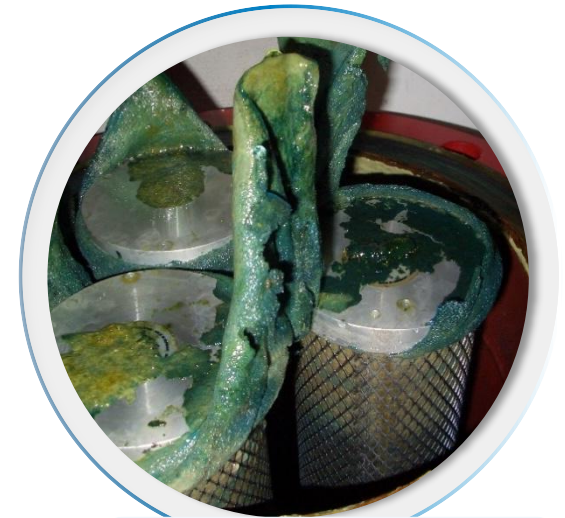
Particle
Contamination



Corrosion



Water
Contamination



Chemical Impact

COMPRESSED AIR PURITY CLASSES

ISO 8573-1

COMPRESSED AIR PURITY CLASSES

Purity Class	A			B		C
	Solid Particles			Water		Oil
	Maximum number of particles per m ³ Particle size d in µm (microns)			Pressure Dewpoint	Liquid Water	Concentration of Total Oil
	0,1 < d ≤ 0,5	0,5 < d ≤ 1,0	1,0 ≤ d ≤ 5,0	°C / °F	g/m ³	mg/m ³
0	As specified by the equipment user or supplier and more stringent than Class 1					
1	≤ 20.000	≤ 400	≤ 10	≤ -70 / ≤ -94		≤ 0,01
2	≤ 400.000	≤ 6.000	≤ 100	≤ -40 / ≤ -40		≤ 0,1
3	*	≤ 90.000	≤ 1.000	≤ -20 / ≤ -4		≤ 1
4	*	*	≤ 10.000	≤ +3 / ≤ +37,4		≤ 5
5	*	*	≤ 100.000	≤ +7 / ≤ +44,6		Not specified
6	0 < cp ≤ 5 mg/m ³			≤ +10 / +50		Not specified
7	5 < cp ≤ 10 mg/m ³				cw ≤ 0,5	Not specified
8	Not specified				0,5 > cw ≤ 5	Not specified
9	Not specified				5 > cw ≤ 10	Not specified
X	cp > 10 mg/m ³				> 10	> 5

The lower the class
the higher the purity

Use sequence
A : B : C
2 : 4 : 1

A = Particles
B = Water
C = Oil

FILTER TYPES AND PERFORMANCE

COMPRESSED AIR FILTER TYPES

ACHIEVABLE COMPRESSED AIR PURITY CLASSES



Purity Class acc. to ISO 8573-1:2010		Particulates	Coalescing	Oil Vapor Adsorption
Class 1	Superfine Filter (0.01µm)	 S SMF	 S SMF	 A T AK
Class 2	High Efficiency Filter (0.1 -1 µm)	 M MF	 M MF	
Class 3		 FF	 FF	
Class 4		 V CF	 V CF	
Class 5	General Purpose Filter (3 -5 µm)			

COMPRESSED AIR FILTER TYPES STRUCTURE AND PERFORMANCE

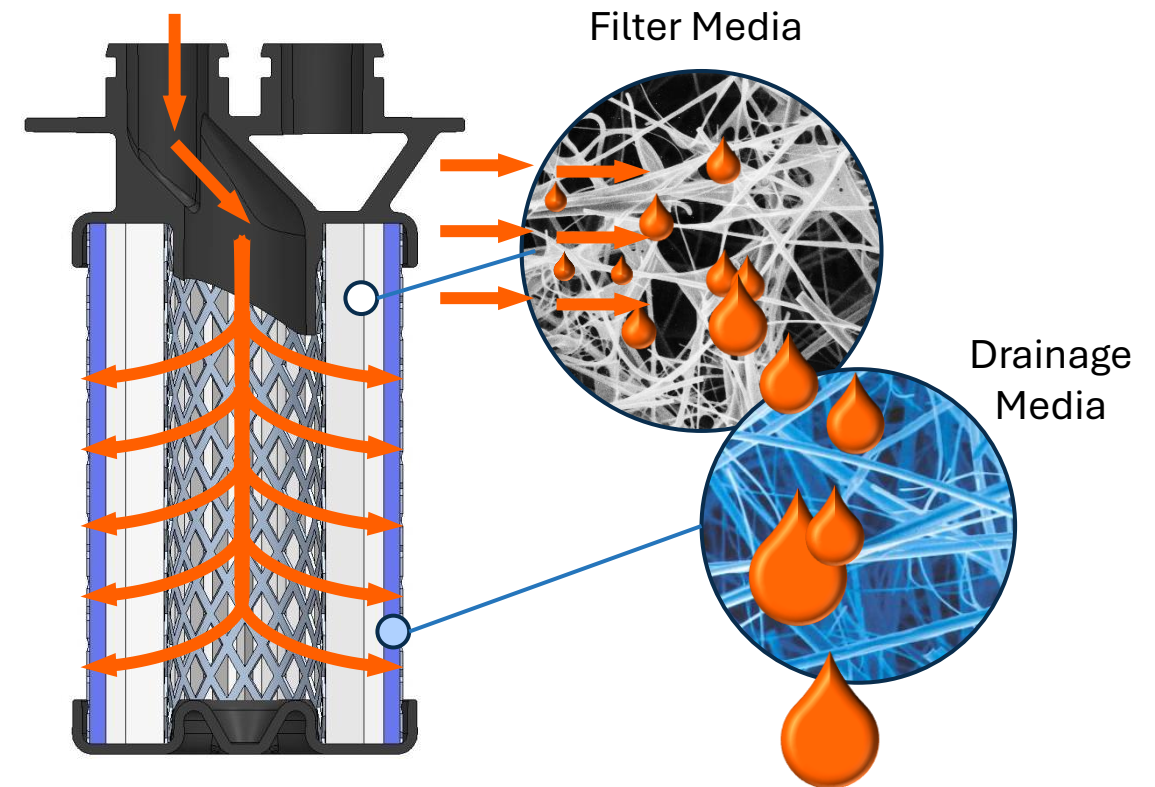
- Filtration of liquid aerosols (water + oil)
- Flow direction from inside to outside
 - Filter media captures small aerosols and forms larger droplets due to coalescing effect
 - Drainage Media collects large droplets

Recommended Filter Performance

Filter Type	Retention Efficiency *)	Residual Oil Content (Only liquid phase)
General Purpose Filter	≥ 50%	≤ 5 mg/m ³
High Efficiency Filter	≥ 90%...≥ 99%	≤ 0.1 mg/m ³ ... ≤ 1 mg/m ³
Superfine Filter	≥ 99.9%	≤ 0.01 mg/m ³

*) According to ISO 12500-1

Coalescing Filter



COMPRESSED AIR FILTER TYPES STRUCTURE AND PERFORMANCE

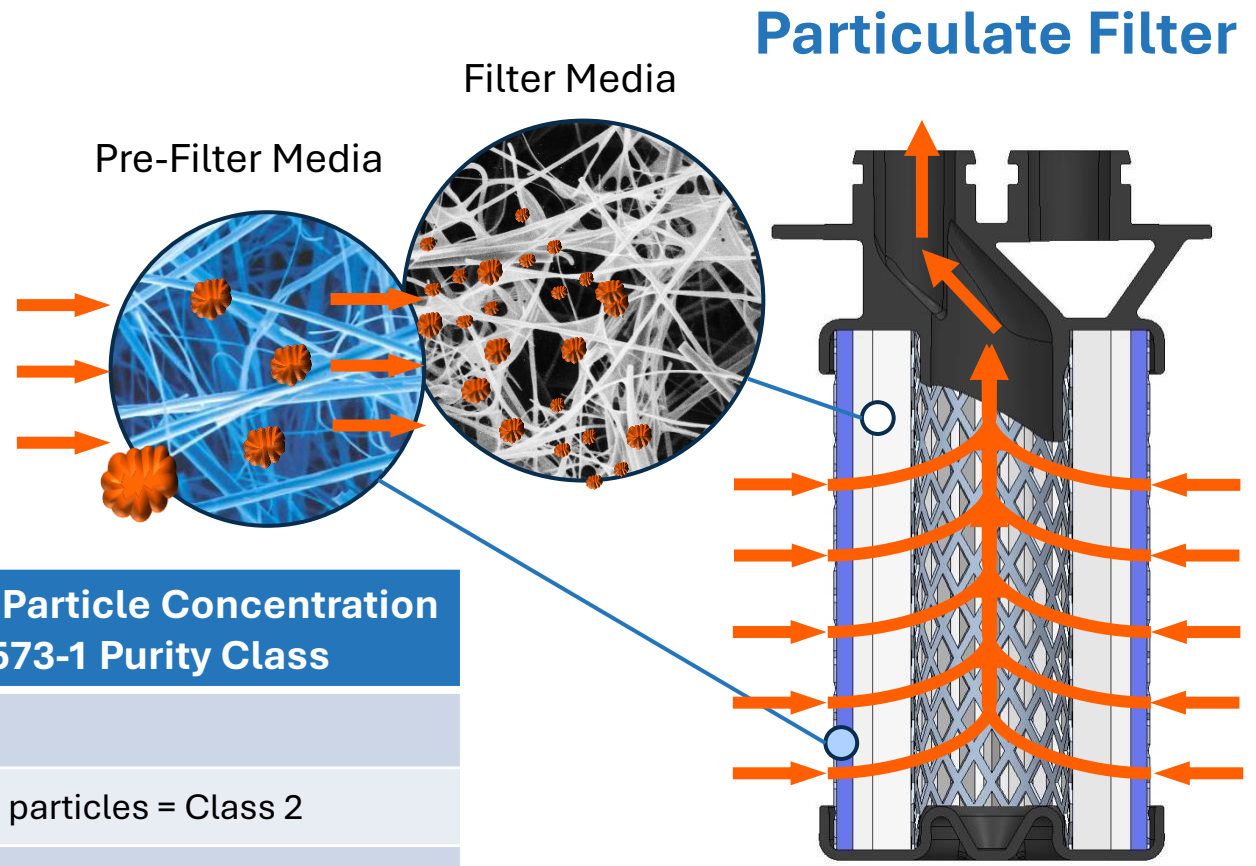


- Filtration of solid particulates
- Flow direction from outside to inside
 - Drainage Media acts as pre filter
 - Filter media captures small particles

Recommended Filter Performance

Filter Type	Retention Efficiency *)	Outlet Particle Concentration / ISO8573-1 Purity Class
General Purpose Filter	N.A.	N.A.
High Efficiency Filter	≥ 99.6%	400,000 particles = Class 2
Superfine Filter	≥ 99.98%	20,000 particles = Class 1

*) According to ISO 12500-1 for particle size range >0.1 µm... ≤ 0.5 µm and 100,000,000 particles at filter inlet



Particulate Filter

COMPRESSED AIR FILTER TYPES STRUCTURE AND PERFORMANCE

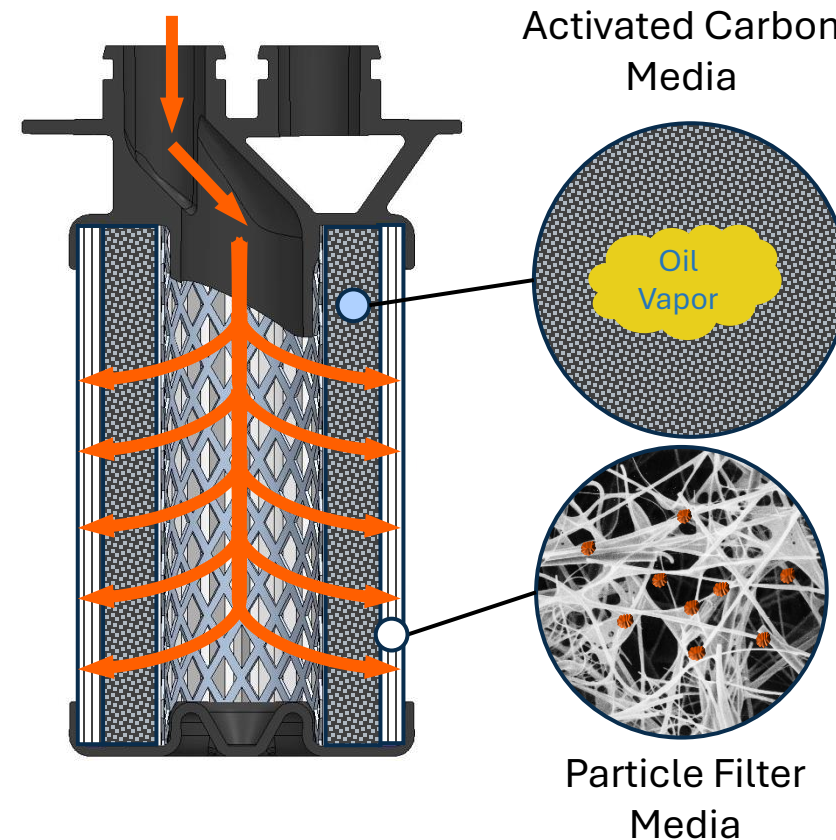
- Adsorption of oil vapor
- Flow direction from inside to outside
 - Activated carbon media adsorbs oil vapor
 - Particle Filter Media collects activated carbon particles

Filter Performance & Lifetime depending on...

- Type of oil
- Compressed air temperature
- Compressed air flow and pressure
- Amount of activated carbon
- Water content in compressed air - compressed air dryer recommended

Recommendation: Always use activated carbon adsorption filter or adsorber to achieve **Purity Class 1**

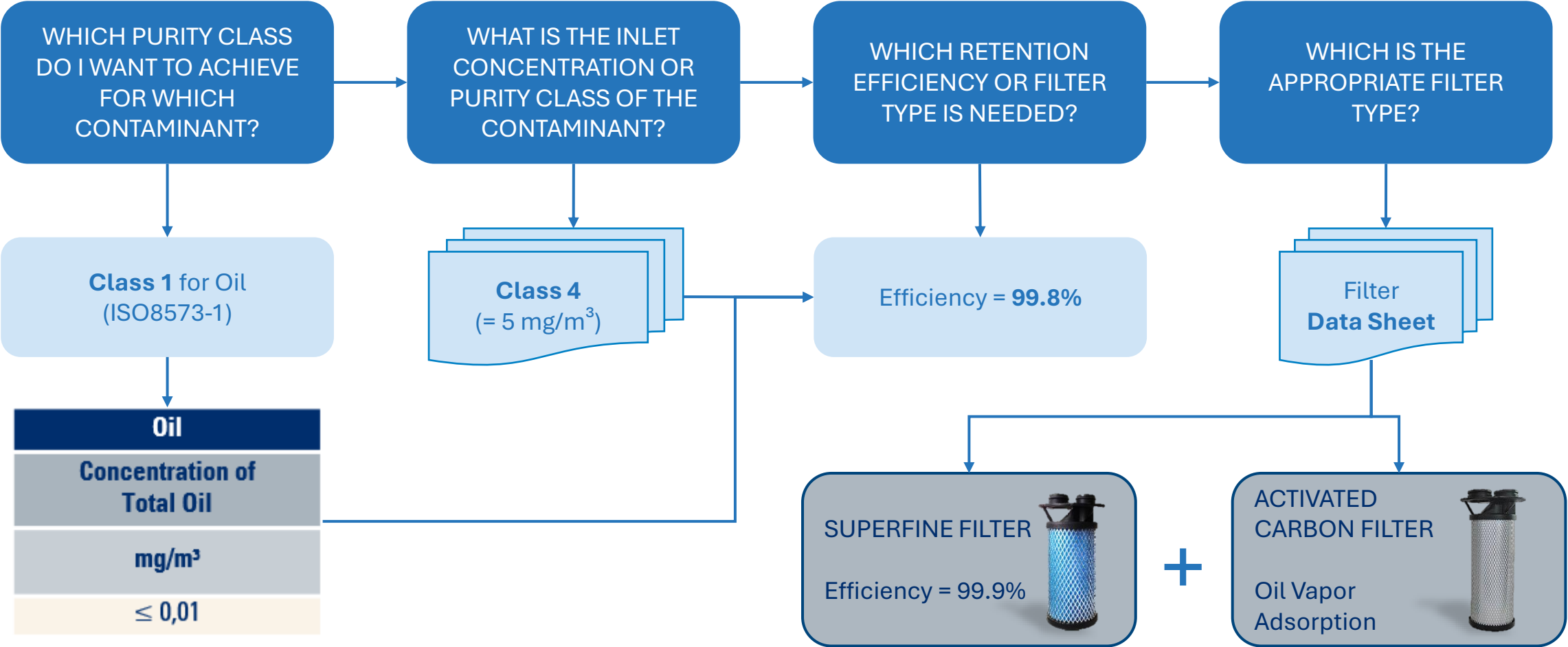
Activated Carbon Filter



SELECTING THE RIGHT FILTERS

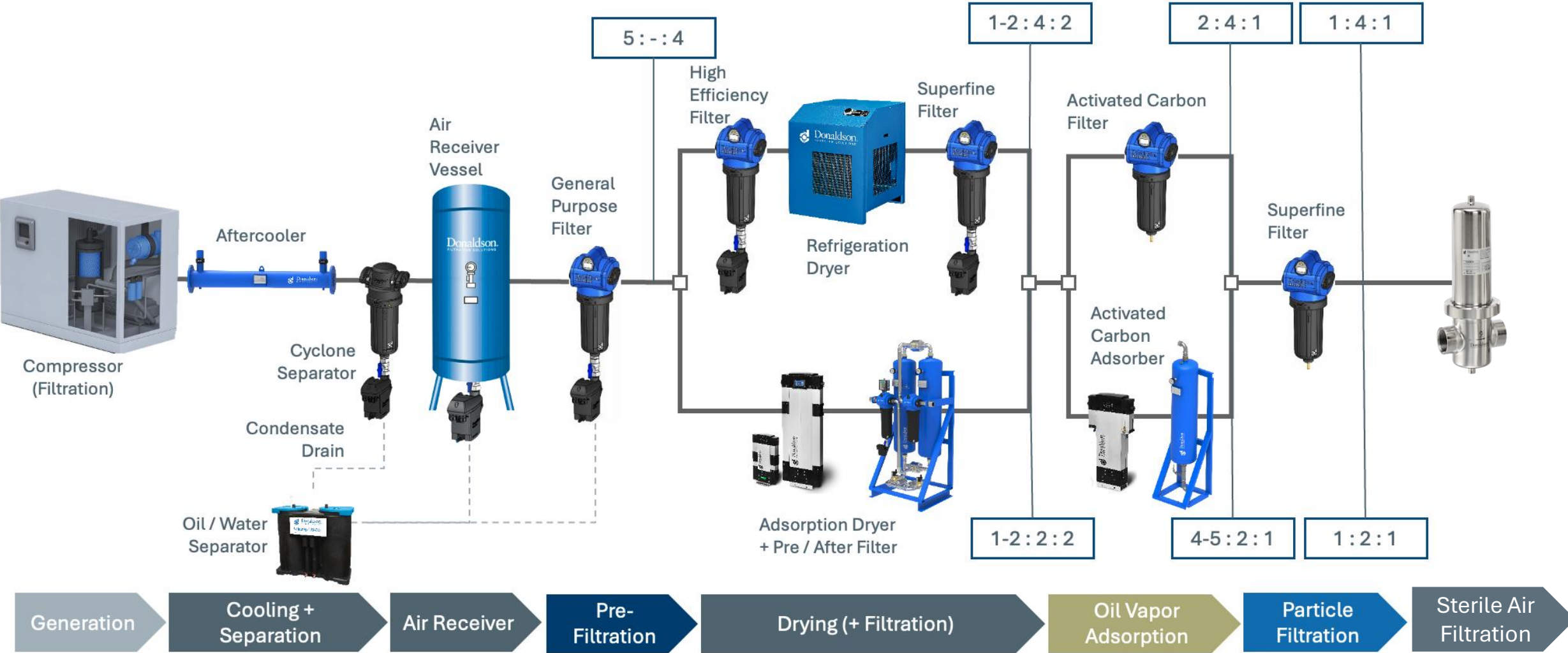
COMPRESSED AIR FILTERS

SELECTING THE APPROPRIATE FILTER



COMPRESSED AIR PURITY FROM SOURCE TO APPLICATION

AIR PURITY FROM SOURCE TO APPLICATION





**Scan for more information about
filtration and purification solutions for
Compressed Air and Gas applications**

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Submit your poll answer to qualify.
Winners notified tomorrow!

*By entering you are giving permission to
announce your name if you are a winner

What removes oil vapor from a
compressed air system?

A

- Activated carbon

B

- Coalescing filter

C

- Water separator

Selecting and Maintaining Filters to Meet ISO 8573-1 Quality Classes

Q&A

Please submit any questions through the Question Window on your GoToWebinar interface, directing them to Best Practices Magazine. Our panelists will do their best to address your questions and will follow up with you on anything that goes unanswered during this session.

Thank you for attending!

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September 2026 Webinar

Alternative Strategies for Air Compressor and Blower Room Design



Tom Jenkins, PE
WEF Fellow
Keynote Speaker

Thursday, September 17, 2026 – 2:00 PM EDT

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