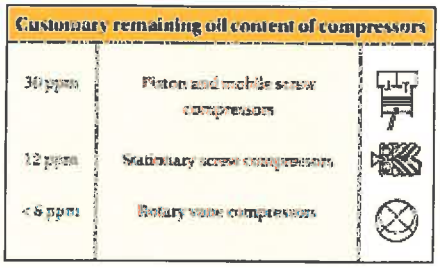
Title: Parker Finite HX-Series Coalescing and Water Separator Filters
Category: Compressed Air

As air is compressed, the volume of containments in the incoming air stream is concentrated as the same rate as the compression ratio. As an example, if compression ratio is 8:1, the moisture, containments and aerosols are compressed at the same rate. To protect your equipment from the contamination, water, and aerosols (hydrocarbons such as oil) have to be filtered from the compressed air.

Using a high performance filter to measure oil aerosol removal, these effects can be observed:

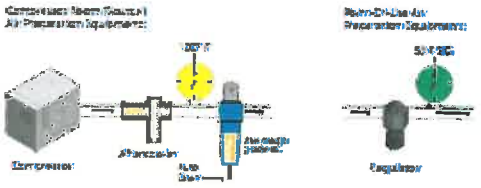


International Standard ISO8573-1 has become the industry standard method for specifying compressed air cleanliness.

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particles per m^3			Mass Concentration mg/m^3	Vapor Pressure Dewpoint	Liquid g/m^3	Total Oil (aerosol liquid and vapor) mg/m^3
	0.1 - 0.5 micron	0.5 - 1 micron	1 - 5 micron				
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -94°F (-70°C)	-	0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40°F (-40°C)	-	0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -4°F (-20°C)	-	1
4	-	-	≤ 10,000	-	≤ 37.4°F (3°C)	-	5
5	-	-	≤ 100,000	-	≤ 44.6°F (7°C)	-	-
6	-	-	-	≤ 5	≤ 50°F (10°C)	-	-
7	-	-	-	5 - 10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 5

The five schematics shown below and on the following page show the major compressed air system components, where filters can be positioned, and the resulting compressed air quality specifications met.

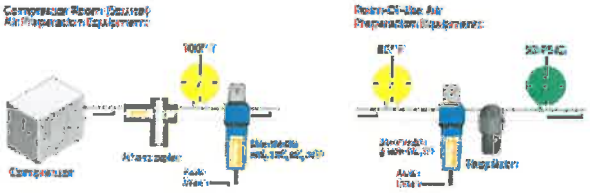
ISO Class 2 ☐ 3



Any compressor with aftercooler. Air intended for use with lubricated air tools, air motors, cylinders, shot blasting, non-frictional valves.

OTHER SPECS MET: CGA – G7.1 (Grades A & Ba1)

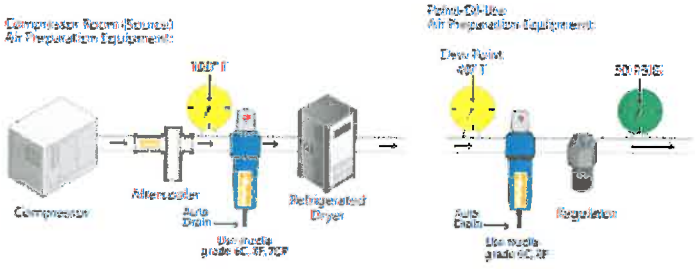
ISO Class 1 ☐ 2



Any compressor with aftercooler and 2-stage coalescing. Air intended for use with lubricated control valves, cylinders, parts blow-down, etc.

OTHER SPECS MET: Mil. Std. 282 H.E.P.A., U.S.P.H.S. 3A Accepted particles for milk.

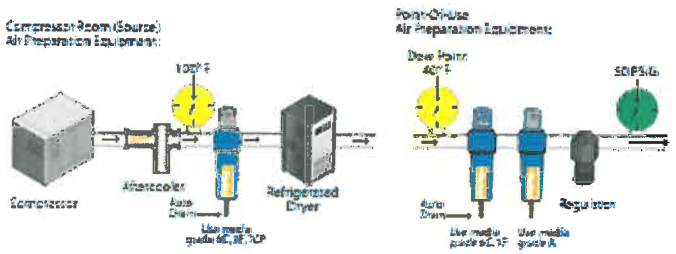
ISO Class 1 4 2



Any compressor with aftercooler, 2-stage coalescing and refrigerated dryer. Air intended for use with air-gauging, air conveyors, spray-painting, food processing, instrumentation, blow molding, cosmetics, film processing, bottling, pharmaceuticals, dairy, breweries, medical, robotics and close tolerance valves.

SPECS MET: CGA – G7.1 (Grades D & E), ISAS7.3 Fed. Std. 209 (Class 100)

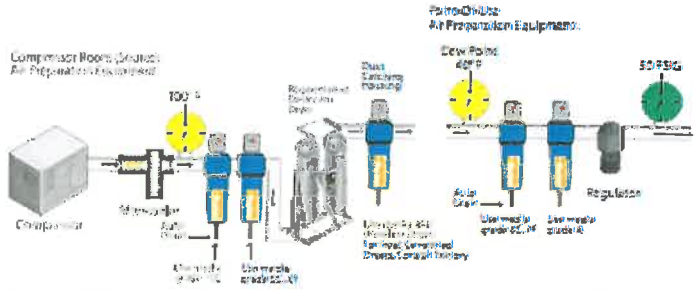
ISO Class 1 4 1



Any compressor with aftercooler, 2-stage coalescing, refrigerated dryer and carbon absorber. Air intended for use as industrial breathing air and decompression chambers. CAUTION: Always use high temperatuse synthetic lubricants and monitor (alarm for carbon monoxide concentrations). This system will not eliminate toxic gases!

OTHER SPECS MET: O.S.H.A. 29CFR 1910.134

ISO Class 1 2 1

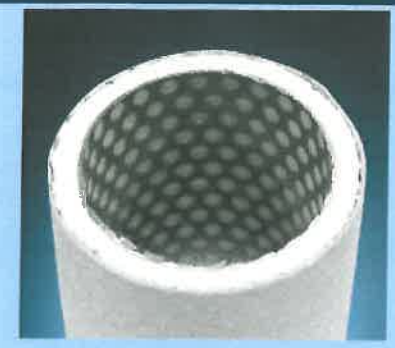


Any compressor with aftercooler, two-stage and double coalescing regenerative-type desiccant dryer and a carbon adsorber. Air intended for use in applications involving rapid expansion of compressed air, critical instrumentation, high purity gases, automotive paint systems, etc. CAUTION: This air is too dry for respiratory use.

For media selections options, you can review the following information or contact us for application assistance.

Choose media type from the descriptions below, from the basic application circuits on the previous page, or consult a Finite application engineer. Decide the media grade from the bottom of the following page. If your application requires a coalescing element, use the information listed below. For other media types, please see the following page.

Coalescing Elements (removal of liquids and particulate)



Media type C

Available in grades 4,6,8 or 10
Air Flow: Inside to Outside

This coalescing element is made with our special UNI-CAST construction. Composed of an epoxy saturated, borosilicate glass micro/nano fiber media, this media is used in applications requiring the removal of liquid and particulate contamination. The outer synthetic fabric layer allows swift removal of coalesced liquids.

Media type 7CP or XF

Air Flow: Inside to Outside

Finite's 7CP media type consists of two filter layers between metal retainers. The outer layer removes aerosols while the inner layer traps solid particles, protecting and extending the life of the outer layer. 7CP elements are used in bulk liquid coalescing applications or when relatively high efficiency and low pressure drop are required.

Finite's XF media type are constructed similarly to the 7CP, but offer even higher filtration efficiency for more critical compressed air quality demands.

Media type C... Choose your grade...

Grade 4

Finite's media grade 4 is typically chosen when an extremely high coalescing efficiency is required. Its 99.9999% rating is the best available and is ideal for use as a final filter in applications with elevated operating pressures up to 250 PSIG. Grade 4's higher operating pressure drop can be reduced by oversizing. Consult factory.

Grade 6 (Standard)

Grade 6 filters are used when "total removal of liquid aerosols and suspended fines" is required. Because of its overall performance characteristics, this grade is most often recommended in a variety of industrial applications. Grade 6 is an excellent choice as a prefilter for regenerative/desiccant air dryers, as it prevents oil or vapours from coating the desiccant.

Grade 8

Grade 8 filters combine high efficiency (99.5%) with high flow rate and long element life. A separate prefilter is not required for "normal to light" particulate loading. A grade 8 element is often chosen as protection for refrigerated air dryers. This element allows the dryer to maintain efficiency by preventing the coating of copper coils with the build-up of oil or varnish.

Grade 10

Grade 10 filters are used as pre-filters for grades 6 or 8 to remove gross amounts of liquid aerosols or tramp/non aerosols. Grade 10 is often referred to as a coarse coalescer, or precoalescer. It is typically followed by a grade 6C final filter.

Water Separator Element
(removal of bulk liquids)

Media type WS

Air Flow: Inside to Outside

This rolled stainless steel mesh element has ID and OD metal retainers with rolled stainless steel mesh in between. It is an extremely robust design. With a nominal rating of 100 micron, this media is used for the reduction and elimination of excess liquids in gas streams. It also would be a good choice as a prefilter for coalescing grades 6 and 10 when extreme volumes of liquid contaminants are present.

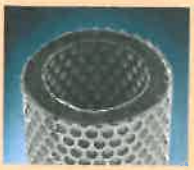
Interceptor Element
(removal of solids)

Media type 3P

Air Flow: Inside to Outside

Finite's 3P pleated cellulose element removes solid contaminants, with a 3 micron absolute rating. Because this element is designed to flow from its inside to the outside, it has a strong outer retainer that gives this element added strength. 3P particulate "Interceptor" elements are used where very high dirt loading is expected but a relatively fine pore structure is required. It is also used as a prefilter to a coalescing filter in systems where a lot of solid contamination exists.

Adsorption Element
(removal of odor)



Media type A

Air Flow: Inside to Outside

This hydrocarbon vapor removal element consists of an ultra-fine grained, highly concentrated, activated carbon sheet media. Because these elements are designed to flow from the inside to their outside, they have a strong outer retainer giving this element added strength. This media type is used to remove hydrocarbon vapor and is often used to remove the smell or taste of compressor lube oil from breathing air.

Finite Media Specifications

Media Grade	Coalescing Efficiency 0.3 to 0.6 Micron Particles	Micron Rating	Aerosol Content per ISO 12500-1	Maximum Oil Carryover (mg/m³)	ISO Class*	Operating ΔP	Recommended Prefilter
4C	99.999%	0.01	10	0.0005	1_2	3.4 - 6.7	10C or 7CP
6C	99.97%	0.01	10	0.003	1_2	3.0 - 4.0	10C or 7CP
XF	99.95%	0.3	10	0.05	1_2	1.5 - 2.0	7CP
7CP	99.5%	0.5	40	0.2	2_3	0.7 - 1.2	WS or 3P
8C	99.5%	0.5	40	0.6	2_3	1.0 - 1.4	WS or 3P
10C	99%	1.0	40	2	2_4	0.7 - 1.0	WS or 3P
WS	99+%	100	NA	NA	NA	0.7 - 1.2	NA
3P	N/A	3.0	NA	NA	3_ _	0.7 - 1.2	NA
A	99+%	3.0	NA	NA	2_3	3.0 - 4.0	6C or XF

Note1: Tested per ISO 12500-1 at specified inlet content.
Note 2: "*" indicates suitability in accordance with ISO 8573-1:2010
Note 3: Grades 4C, 6C and XF could be used to achieve Class 1_ _1 if followed by a Grade A oil vapor adsorber.
Note 4: Bulk liquid removal efficiency is given for WS media.
Note 5: Oil vapor removal efficiency is given for A media.

Housing Selection Chart

Rated Flows: SCFM @ 100 PSIG. These flowrates can be exceeded by 10% and will still meet filtration efficiencies. For other pressures, please see Step 2a below.

				Rated Flows (SCFM) at 100 PSIG Operating Pressure, 70°F Operating Temperature								
				Final Stage Coalescers			Pre-Coalescers			Water Sep.	Particulate	Vapors
Housing Assembly	Media Grade	Accessory (see step 3)	Conn (NPT)	4C	6C	XF	7CP	8C	10C	WS	3P	A
HXN1A-	___	☐	1/4"	15	15	20	20	15	15	15	15	15
HXN1SB-	___	☐	3/8"	35	35	40	40	35	35	35	35	35
HXN2B-	___	☐	1/2"	35	35	40	40	35	35	35	35	35
HXN2BH-	___	☐	1/2"	50	50	65	65	50	50	50	50	50
HXN3BH-	___	☐	3/4"	50	50	65	65	50	50	50	50	50
HXN3C-	___	☐	3/4"	100	100	125	125	100	100	100	100	100
HXN4C-	___	☐	1"	100	100	125	125	100	100	100	100	100
HXN4D-	___	☐	1"	180	180	230	230	180	180	180	180	180
HXN5D-	___	☐	1-1/4"	180	180	230	230	180	180	180	180	180
HXN6D-	___	☐	1-1/2"	180	180	230	230	180	180	180	180	180
HXN5E-	___	☐	1-1/4"	320	320	340	340	320	320	320	320	320
HXN6E-	___	☐	1-1/2"	320	320	340	340	320	320	320	320	320
HXN8E-	___	☐	2"	320	320	340	340	320	320	320	320	320
HXN8F-	___	☐	2"	430	430	465	465	430	430	430	430	430
HXN8G-	___	☐	2"	540	540	700	700	540	540	540	540	540
HXN10H-	___	☐	2-1/2"	650	650	900	900	650	650	650	650	650
HXN12H-	___	☐	3"	650	650	900	900	650	650	650	650	650
HXN12J-	___	☐	3"	900	900	1300	1300	900	900	900	900	900

Use this step for applications that do not have standard conditions (100 PSIG and 70°F)

Sizing Equation

Flow Rate		Pressure		Temperature		Specific Gravity (Air = 1.0)		Adjusted Flow Rate
Actual System Flow Rate (SCFM)	X	$\frac{(100\ PSIG + 14.7\ PSIG)}{(System\ Pressure\ (PSIG) + 14.7\ PSIG)}$	X	$\frac{(System\ Temp.\ °F + 460°F)}{70°F + 460°F}$	X	$\sqrt{\frac{1.0\ (specific\ gravity\ of\ gas)}{}}$	=	____SCFM @ 100 PSIG, 70°F

Example:

$$135\ SCFM \quad \frac{(100\ PSIG + 14.7\ PSIG)}{(150\ PSIG + 14.7\ PSIG)} \times \frac{(100°F + 460°F)}{70°F + 460°F} \times \sqrt{\frac{1}{1}} = 100\ SCFM$$

Information Given:
Flow Rate = 135 SCFM
Pressure = 150 PSIG
Actual Temperature = 100°F
Gas = Air