REVERSE FINCELL

High efficiency pleated filter cartridges
for removing water aerosol and oil vapour
from compressed air and gases

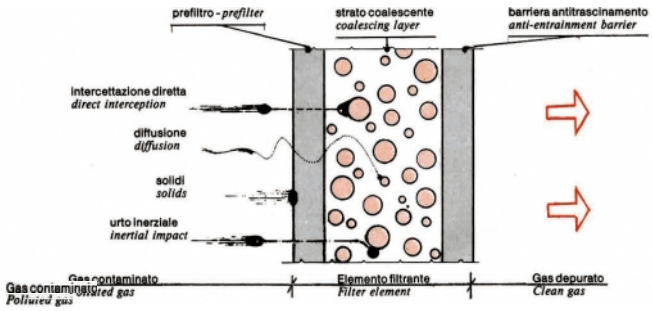
APPLICATIONS

Manufacturing companies require clean and reliable compressed air and industrial gases. REVERSE FINCELL filter cartridges are designed to remove water aerosol and droplets from compressed air and industrial gases (nitrogen, hydrogen etc.) and also oil mist generated by compressor lubrication systems. During the process of compression, a large quantity of water and oil can be atomized, and if not removed can enter piping systems in aerosol form and condense thereafter. These aerosols are too small to be retained by simple mechanical filters. REVERSE FINCELL high efficiency filter cartridges are designed to remove water and oil aerosols from compressed air and gases by the following mechanisms:

1) Inertial impaction (for aerosols with dimensions larger than 2.0 micron)
2) Direct interception (for aerosols with dimensions between 0.2 micron and 2.0 micron)
3) Diffusion (for aerosols smaller than 0.2 micron).

INERTIAL IMPACTION

Particles are trapped and removed within the depth of the filter media by the tortuous path formed by the microfibres.



DIRECT INTERCEPTION

Coarse particles are trapped on the outside surface of the filter media.

DIFFUSION DEPOSITION

The smallest particles adhere to the microfibres through the mechanism of Brownian Motion. Brownian Motion causes the irregular movement of the smallest aerosol particles as they collide with gas molecules. The irregular motion increases, which also increases the probability of small particles colliding and becoming trapped by the microfibers within the depth of the filter media, as the size of the particles decreases.

FILTRATION EFFICIENCY

REVERSE FINCELL cartridges are available in two filtration efficiency grades, to achieve effluent gas with residual aerosol content of either 0.01 ppm or 1.0 ppm. REVERSE FINCELL cartridges are subjected to stringent efficiency testing. Bea Technologies laboratory is equipped with specialized test equipment, including an apparatus that carries out non-destructive hot aerosol testing in accordance with ASTM D. 2986. This apparatus produces mono-disperse aerosols with 0.3 micron size particles which are used to challenge the filter elements, and thereafter the apparatus measures the efficiency and integrity with optical-electronic instrumentation.

PRESSURE DROP

REVERSE FINCELL cartridges coalesce oil mist, which saturates the filter media and produces an increase in pressure drop; REVERSE FINCELL elements remain effective filters for a long period under this condition. The pressure drop will continue to increase further due to particle retention by the filter elements.

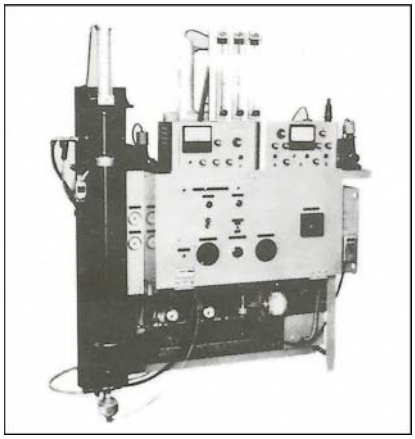


FIG. 1

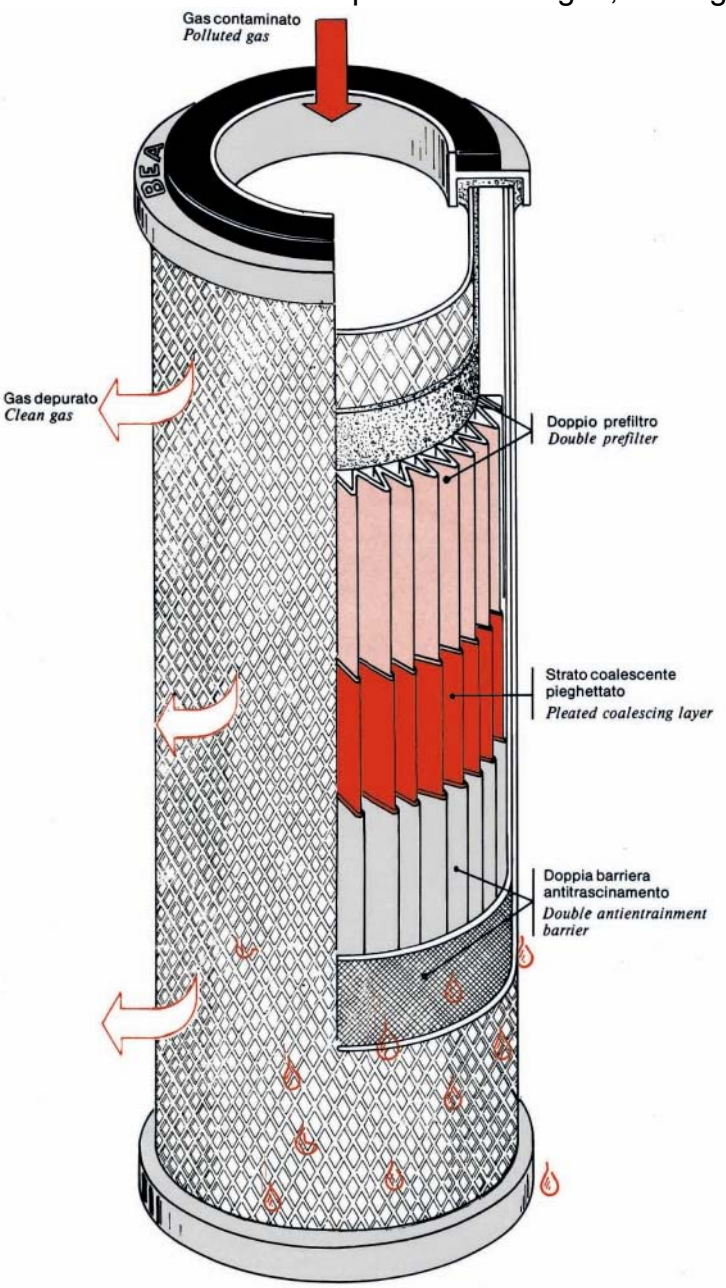
TABLE 1

GRADE	RESIDUAL AEROSOLS ppm	D.O.P. EFFICIENCY
RA	0,01	99,998
RC	1	70,00

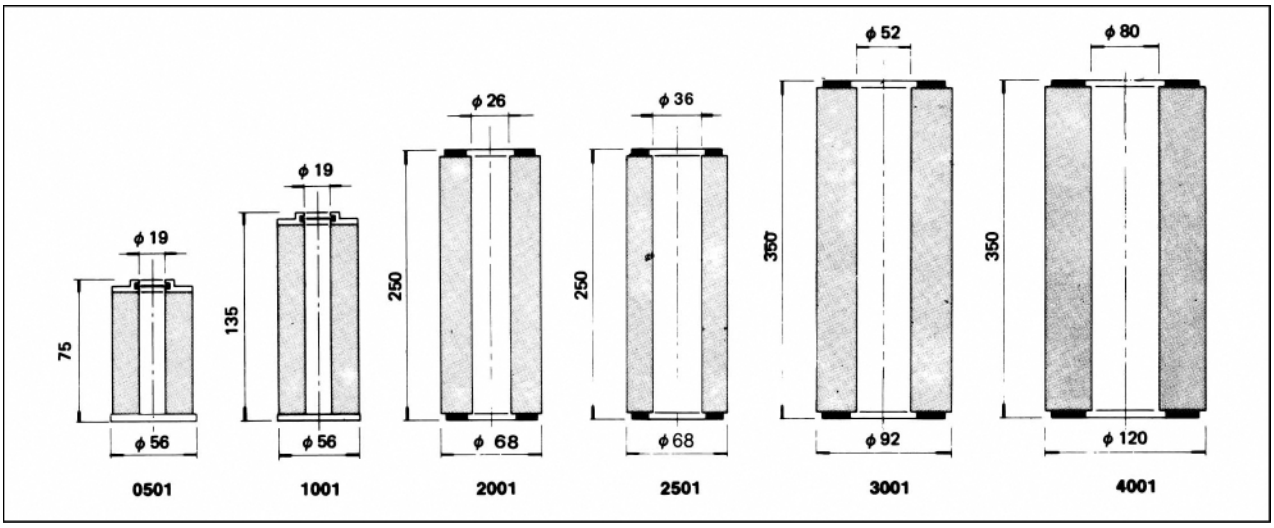
*Hot AEROSOL. test according to ASTM D. 2986

CONSTRUCTION

REVERSE FINCELL elements are pleated to provide a very high surface area, contributing to an exceptionally long service life and low pressure drop. REVERSE FINCELL elements are constructed from multiple layers of diverse filter media, each layer performing a distinct function. The contaminated compressed air or gas, flowing through the cartridges from inside to outside, first passes through resin impregnated cellulose media, which acts as a pre-filtration layer to remove solid particles. The resin impregnation treatment imparts great strength to the cellulose media, even in the presence of water. Next, the air or gas passes through a coalescer layer of glass microfiber media, which contains microfibers with diameter down to 0.1 micron. This layer can trap aerosols with particle size of 0.01 micron through the mechanism of Brownian Motion. The large condensate droplets that are coalesced by the glass microfiber media are conveyed by air flow to the final double layers of nonwoven felt media. The accumulated liquid phase water and oil then flow by gravity to the bottom end of the cartridge from which the liquid drops into a sump at the bottom of the filter housing.



TAB. 2



FLOW RATE TABLES

CARTRIDGE MODEL		RECOMMENDED FLOW RATE	
		Nm^3/h ♦	Nl/m♦
FCY - 0501	RA	30	500
	RC	36	600
FCY -1001	RA	60	1000
	RC	72	1200
FC □ - 2001	RA	180	3000
	RC	210	3500

CARTRIDGE MODEL		RECOMMENDED FLOW RATE	
		Nm^3/h♦	Nl/m♦
FC □ - 2501	RA	240	4000
	RC	330	5500
FC □ -3001	RA	720	12000
	RC	840	14000
FC □ - 4001	RA	1200	20000
	RC	1350	22500

♦ Reference air at 7 bar and 20° C with initial pressure drop less than 0.06 bar

REVERSE FINCELL ORDERING INFORMATION

DS-FC-688-UK-05-0

FC Y - 2001 - RA - V

END CAP MATERIAL	
Zinc Coated Carbon St.	Z
Stainless Steel	R
Plastic Material	Y

GASKET	
No symbol	Buna N
V	Viton

CARTRIDGE SIZE	EXTERNAL DIAMETER mm	INTERNAL SECTION	LENGTH mm
0501	56	19	75
1001	56	19	135
2001	68	26	250
2501	68	36	250
3001	92	52	350
4001	120	80	350

RESIDUAL OIL		SEPARATION EFFICIENCY %
GRADE	ppm	
RA	0.01	99.998
RC	1	70.00

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