



APPLICATION PAPER

Compressed Air & Process Filtration

- CUSTOMER:** Purified Water Bottling Company
- LOCATION:** North America
- INDUSTRY:** Beverage
- PRODUCT:** Bottled Water
- APPLICATIONS:** Point-of-Use Compressed Air Purification and Steam sterilization (SIP) for PET bottle blowing
- PRODUCTS:** PE 10/30 in HD 0072 650 PSIG Housing
SMF 10/30 in HD 0072 650 PSIG Housing
AK 10/30 in HD 0072 650 PSIG Housing
SRF 10/30 in HD 0072 650 PSIG Housing



SUMMARY

Donaldson® currently has multiple compressed air filtration lines installed in a number of facilities across the U.S. for a major bottled water company. These lines supply purified process air to the PET bottle blowing machines which produce bottles for bottled water. By injecting sterile compressed air into a shell of polyethylene terephthalate (PET) the shell expands into a mold which produces the bottle shape.

These bottle blowing machines typically need pressures at 600 psig or higher. For this reason, we used Donaldson high pressure HD housings made of 304 stainless steel.

As shown in Figure 1 below, there are 4 stages of filtration. The first stage uses our nominally rated PE element for removal of all larger particulates. This reduces the challenge to, and extends the life of, the higher purity and sterile elements to follow. The second stage Donaldson Submicron Element (SMF) is an absolute filter for particles 0.01 micron, and also lowers the effluent oil residual to 0.01 ppm. The third stage incorporates the AK carbon filter for odor and gas phase hydrocarbons removal down to 0.003 ppm. And finally, the fourth stage filter houses the SRF sterile element, which has a retention rate (logarithmic retention value – LRV) of greater than or equal to 7. Table 1 summarizes the point-of-use purity of compressed air entering bottle blowing machines.

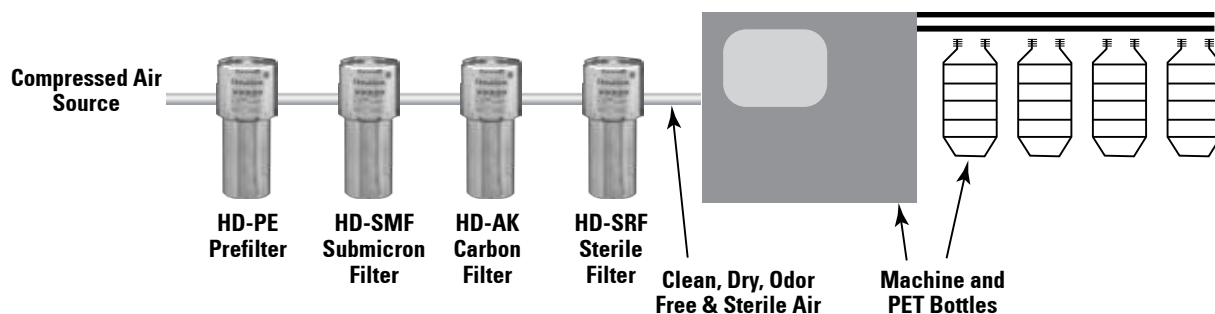


Figure 1. Four Stages of Filtration to PET Bottle Blowing Machines.

Purity Specifications at Point of Use

Maximum Residual Oil Concentration (PPM)		0.01 ppm
Water Dew Point (°F)		35°F pdp
Maximum Residual Dirt Concentration (ppm @ μm)		0.1 ppm @ 0.1 μm
Maximum Hydrocarbon Concentration (PPM)		0.003 ppm
Sterility (Retention Rate) [LRV]	Brevundimonas (Pseudomonas) diminuto	≥ 7 / cm ² (0.02 μm)
	MS-2 Coliphagen	>9 / cm ² (0.02 μm)

Table 1. Effluent Purity Of Gas Being Fed To Bottle Blowing Machine.



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