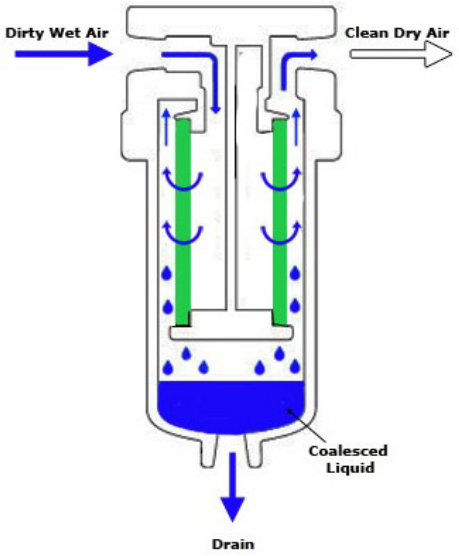
# How Coalescing Filtration Works

**Set-Up**




Borosilicate glass microfibers are widely recognized as the ideal filter media for the coalescing of liquid aerosols. Unlike liquid adsorbent or absorbent materials, borosilicate glass retains its original properties throughout its service life. This material is naturally hydrophobic (water-repellent). Water forms droplets on the fibers rather than spreading as a film — a critical characteristic that supports continuous filtration efficiency and low pressure drop performance.

**C-Type Coalescing Element Design**

Our **C-Type Coalescing Element** features a dual-layer construction:

**1. Inner Capture Layer**

- The wet gas stream enters the center of the element.
- Fine aerosol droplets are trapped within the tightly wound capture layer.
- Droplets combine and grow in size.

**2. Outer Drainage Layer**

- Enlarged droplets migrate into the intersecting fibers of the drainage layer.
- The outer layer contains larger pores.
- Coalesced droplets fall by gravity into the bowl base.
- Collected liquid is removed via manual or automatic drain.

This staged coalescing process ensures high removal efficiency and consistent performance.

**Pre-Filtration Recommendation**

In heavily contaminated systems, we strongly recommend installing a 3-micron pleated pre-filter element upstream of the coalescing filter. This prevents dirt and solid particles from clogging the capture layer and compromising coalescing performance. We offer a complete range of pleated elements to suit various applications.

**Proper Installation Is Critical**

The filter housing must be piped so that the gas stream enters port 2 (deep port) and exits port 1 (shallow port) so that the captured liquid can pass through the element (coalesce) and drop into the drain. Do not pipe backwards or the coalesced liquid will pass back into the system. Liquid collected in the filter bowl can be removed by a manual or fully automatic drain.

**Pressure Drop & Maintenance**

- Initial dry pressure drop: **< 2 psi**
- Pressure drop increases slowly as solids accumulate.
- Recommended element replacement at: **10 psi differential pressure**

An optional differential pressure indicator provides a visual maintenance alert.

Metallic, plastic, paper (pleated), and baffle units do not exhibit the same natural properties as borosilicate glass microfibers, i.e. metallic and plastic elements do not have fibers to turn liquid contamination into droplet form. A film builds up on these elements, thus increasing Δp and reducing long-term efficiency. Paper elements have fibers but tend to retain the water droplets like a sponge and there again, Δp increases and reduces long-term efficiency. Baffles are fairly efficient at removing bulk contamination. Unfortunately, most contamination in compressed air lines is in the form of fine mist.



unitedfiltration.com 586.802.5561 800.311.5561 Sterling Heights, Michigan