

M arketting A pplications P ublication



APPLICATION:

Beer Trap Filtration

BACKGROUND:

Once beer has been brewed (fermented and aged), it must be filtered to remove residual yeast and undissolved organics. Most breweries filter beer through diatomaceous earth (DE) pre-coat filters just prior to packaging or, in the case of the newer "draft-brewed" beers, just prior to the aseptic or "cold-filtering" process. Cartridge filters are located downstream of the DE filters to "trap" DE, yeast and undissolved organics which pass through the DE filters. Wound or melt blown depth cartridges are the most common "trap" (or beer polishing) filter cartridges used in the U.S. brewing industry.

The trap filter, including cartridges, is periodically "sanitized" by backflushing with hot water at 180 - 195½ F for up to 30 minutes. "Santization" is done not only to prevent microbial growth but also to increase cartridge life. Depth cartridges are not well suited for backwash purposes. It is difficult to flush out particles collected within the fiber matrix of either wound or melt blown depth cartridges. In addition, the fiber matrix in wound cartridges can shift during backwash causing reduced efficiency when filtration resumes.

Fulflo® Poly-Mate XTRA Duty™ and Abso-Mate™ polypropylene pleated cartridges eliminate the deficiencies of depth cartridges. The surface type media, with thermally-bonded fixed pores, releases particles readily during backwash. A rigid exterior support cage and a glass fiber reinforced core provide dimensional stability required for hot water backflushing.

Poly-Mate XTRA Duty one micron rated cartridges (PXD010) have been successfully substituted for one micron nominal wound or five micron "absolute" melt blown depth cartridges in beer trap filters.

The hot water used to sanitize/backflush the trap filter cartridges must also be filtered. To prevent fouling of the downstream (clean) side of the trap filter cartridges, PXD005-30FA-DO cartridges are being used to provide clean hot water.

CASE STUDY:

A major U.S. brewery had been using 1 µm nominal wound cotton cartridges as beer trap cartridges. The trap filter housing was designed to handle 275 barrels per hour through 49 triple length cartridges (1 gpm/10" equivalent) for optimum yeast and DE removal. The system was either "sanitized" on a weekly basis or when the pressure drop rose above 20 PSID. A set of wound cartridges normally



lasted about two weeks or 60,000 barrels of beer. However, the brewery could not effectively increase flow rates to sufficiently meet the demand during peak production periods. When flow was increased, the pressure drop would increase rapidly requiring more frequent backwashes which interrupted flow to the packaging area. Yeast and DE counts would often exceed specified limits following backwash.

MEDIA:

- PXD010-30FA-DO (Beer Trap Filter)
- PXD005-30FA-DO (Sanitizing Water Filter)

RESULTS:

Their problems were solved using Poly-Mate XTRA-Duty cartridges (PXD010-30FA-DO). The high surface area provided more flow capacity for peak demand periods while at the same time, the sanitization/backwash cycles remained at one week intervals. Moreover, one set of PXD cartridges processed over **850,000 barrels** of beer over an **8 month** period... more than **10 times the life** of the wound cartridges. Using PXD010 rated 99% at 1 µm, microbial (yeast) and particulate (DE) counts were maintained within specified limits. Including labor to change and disposal costs of spent cartridges, **this brewery reduced its trap filtration costs by 32% with PXD cartridges.**

Beer Trap Filtration

