

'CANDLE' FILTRATION SERVICE HELPS LEADING BREWERY

SEE THE LIGHT

A comprehensive and efficient filtration service performed by Stella-Meta at Britain's oldest brewer, Shepherd Neame, has delivered sparkling results, showing a major improvement in production no less.

Stella-Meta, is a specialist in the provision of filtration solutions for a range of applications and industries. However, as an adjunct to its main business, the company has previously been involved in the filtration of beer, supplying hygienic filters for this purpose.

Stella-Meta continues to provide a comprehensive service and support for Metafilters in the field. Historically, manufacture can be traced back to the 1960s when Stella-Meta was supplying Metafilters to almost all the major brewers across the UK and Europe. Today, due to various changes in ownership and business diversification, the company no longer has a comprehensive installation history although Stella-Meta is aware of filters that have mysteriously appeared on the African and South American continents through second or third hand market sales.

One problem for users of Metafilters is that depending on volumetric production they require servicing on a regular basis to ensure they operate at maximum efficiency and integrity.

Among the breweries to recently enjoy enormous benefits as a result of Metafilter servicing is Britain oldest brewer, Shepherd Neame. The company's brewery at Faversham in Kent has origins dating back to 1698. Today, it remains a family owned concern, producing around 230,000 barrels of filtered beers and cask ales every year to sell in its 360 pubs across Kent, London and the southeast.

With such an important heritage and reputation to uphold, Shepherd Neame and Stella-Meta recently combined on a project to service one of the brewery's Metafilter streams, of which there are two on site. The candles housed within the Metafilter were manufactured in 1967 and originally supplied to Home Brewery in Nottingham.



7/8-in x 43-in Metapacks before (left) and after servicing. The inset shows compacted filter powder trapped within clean side of pack prior to servicing.

Candles or Metapacks are essentially multiple machined stainless steel washers or Meta rings with raised scallops on one face to maintain a 102 micron gap between each ring when tensioned on a central support. The candles measure around 43" in length and are either 7/8" or 1 1/8" in diameter. The candle also features a collar, lock-nut and adaptor at the top end. As an assembled unit it acts as an efficient and hygienic filter for fine liquid filtration.

Recognising servicing to be a specialist activity requiring professional attention, Shepherd Neame called upon the experience and knowledge of Stella-Meta. At the Faversham brewery, candles are used to filter both bright and dark beers. Two sets of filters are deployed here, MF1 and MF2 – the latter, which contains 363 candles, was the first to be serviced in February 2013. Such a large assembly required specialist equipment to enable servicing.

"My first concern on seeing the top of the Metapacks for the first time was the extent of the fluted Brunton rod protruding through the pack adaptors," states Melvin Gilbert, Field Support Engineer at Stella-Meta. "This was due to insufficient Meta rings and excessive tensioning of the candles. The candles were also quite dirty and the area around the collar, lock-nut and adaptor showed signs of powder migration."

In use, the candles are coated with filter powder (Diatomaceous Earth) as a normal part of the filtration process. The inevitable result is that this powder can sometimes become trapped between the rings. Part of Stella-Meta's service provision is to help instill best working practice so that the coating of the candles with filter powder is performed correctly.

"A large percentage of the candles were also contaminated with an unidentified white crystalline powder, typically 0.5mm in size," says Melvin. "In addition, these crystals were attached to the underside of the division plate, around its circumference. Before refitting the serviced candles, the underside of the plate was cleaned to remove all traces of the powder."

The process of removing 363 candles from the division plate then commenced. Due to excessive tensioning, many candles were seized and around 70-80 adaptors had to be re-tapped to rectify internal thread damage. With the candles de-tensioned and pack adaptors, locknuts and collars removed, inspection and cleaning could take place.

Upon closer inspection there was evidence of filter powder compacted around the bottom plate, a consequence of extended service periods. Also present was an unidentified black resin similar to granular carbon trapped within the fluted rod around the bottom plate. The particle size and shape of the resin made it impossible for it to pass from the dirty to the clean side of the candle. It was deduced that this contamination was entering the bright beer side of the candle during the filter's backwash cleaning cycle.

"Due to the initial protrusion of the Brunton rod through the adaptors, each candle had to be fully tensioned in order to establish how many rings required adding to each candle before reassembly," explains Melvin. "The candles were then de-tensioned before introducing the correct number of rings, and re-tensioned once more. In total, 5 to 15 Meta rings were added to each candle to ensure the correct assembly length. Following fitment of a new filter head joint, the head was replaced and secured via 32 stainless steel bolts to complete the pressure vessel assembly."

The first process run saw the Metafilter back-flushed to drain for several minutes to remove all trace of debris from the filter body and cone. The system was then filled to the underside of the division plate before draining – a process that was repeated to ensure the filter vessel was clean. The vessel was subsequently filled with water before carefully introducing nitrogen to pressure test the complete system.

“Prior to the application of the first powder pre-coat, the filter and pipework were washed with hot caustic soda to sterilise the system,” says Melvin. “However, as the second pre-coat cleared to enable a view of the candles through the sight glass I noticed that the filter bed was not truly uniform. As a result of the improved flow, it will be necessary to adjust the throttling position of the inlet valve to better control the uniformity of the filter bed throughout the length of the candles.”

After the week-long service of MF2, Jean Timmons, Senior Brewer reports checking the production of Oranjeboom on her way out on Friday evening, and seeing the filtrate quality “as bright as a button” when viewed at the outlet sight glass.

“Since then, we have seen a major improvement in production throughput and it won’t be long before we enlist the services of Stella-Meta once more to service MF1,” she says. “Aside from the improvement in throughput, servicing maintains beer and filtrate quality, and reduces unplanned maintenance costs.”



Metafilter with 363 candles serviced and replaced prior to fitment of filter head

Ultimately there is a clear message to any brewery using Metafilter technology – ignoring servicing can be extremely perilous. Failure to perform regular servicing will likely induce operational faults which manifest themselves in various ways. Apart from the obvious potential damage or contamination of candles, some examples include: inconsistent pre-coat application leading to unstable filter bed; excessive start-up pressure resulting in short filtration cycles; the collapse or partial failure of the diatom bridge during filtration cycles; or high filtrate turbidity or haze.

Servicing requirements can be tailored to suit individual filters based on annual volumetric throughput, production schedules or annual public liability insurance inspections.