

S3.2.4 EXPLOITING METAL 3D PRINTING TO DELIVER INNOVATION IN FILTER MEDIA DESIGNS

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Industrial filters are employed to remove particulates from fluids to prevent contamination or damage to downstream industrial processes. For manufacturing processes, the essential requirements for the filters is the level of filtration, time of operation prior to filter cleaning or change, ease of change and operational downtime. Additive manufacturing (AM) builds a component layer by layer and so delivers alternative design opportunities compared to conventional manufacturing. The aim here is to design filter housings and inline filters that deliver operational benefits to the end user. The Y-strainer filter conventional design was altered to improve the seals of the filter and allow for the filter mesh to be changeable leading to an increase of operational precision in the filtration level. AM design enabled the overall shape of the new inline filter design to increase the particulate reservoir size, and allow different methods for particulate removal to be incorporated into the single unit. In-line filter housing designs were then developed to have a run down wedge wire screen. AM design freedom here was employed to produce a curved wedge screen that directs the accumulation of particulates towards the collection reservoir. The AM designs created here represent novel filtration media designs that can be adapted to suit reservoir requirements to reduce process downtime. Creation of a shaped wedge wire screen without tooling has led to further investigation of the viability of complex shaped wedge screen as a filtration media.