

The Use of Sintered Wire Cloth Filter Media in Diesel Particulate Filtration
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Sintered wire cloth filter media have been successfully used in a variety of liquid and gas filtration applications over the past 30 years. Markets such as aerospace, chemical processing, nuclear power production, pharmaceutical, and oil & gas refining have long relied on the performance attributes of this media. This media is now available for use in Diesel Particulate Filters (DPF).

Sintered wire cloth media is manufactured via a diffusion bonding process which permanently bonds multiple layers of wire cloth at every point of contact. This creates a porous stainless steel structure that is strong, ductile, and heat/corrosion resistant. The diffusion bonding process starts with a precisely engineered filter medium made from heat resistant alloys such as 316 and 310 stainless steel. Other higher alloys are also available for use in applications with higher regeneration temperatures. These filter cloths are rated as low as 2-3 microns in gas service. Multiple layers of a coarse, highly permeable wire cloth are then added on both sides of the filter medium to provide strength and support. The entire structure is then furnace-sintered in a controlled atmosphere to permanently bond the multiple layers. The result is a durable filter media with a permanently fixed pore structure. After the diffusion bonding process, the media is pleated to provide greater surface area, then fabricated into its final form. End fittings and an internal support core are then attached using electron beam welding technology.

Sintered wire cloth filters are particularly well suited for DPF applications because of their mechanical strength, durability over time, and their fixed pore structure. This fixed pore structure not only ensures consistent particle removal for the life of the filter, but also eliminates the risk of abrasion of the individual layers of wire cloth that can result from vibration forces common in DPF use. Non-sintered wire cloth filters exhibit wear between the multiple layers of loose wire cloth.

Due to its highly permeable pore structure, these sintered wire cloth laminates exhibit extremely low pressure drops as compared to conventional DPF media. Testing has also confirmed that these media respond very well to thermal regeneration, achieving new filter pressure drops after multiple cleaning cycles.

This paper will provide details on the manufacturing process, mechanical properties, performance specifications, and a summary of test results of this filter media when used as a DPF.

Bio

Mark Willingham is Director of Sales & Marketing for Purolator Facet, Inc. He has over 28 years of experience in sales of porous metal filter products for applications in the oil & gas, chemical processing, nuclear power generation, polymer, and general industrial markets. He has authored several papers for industry publications, most of which dealt with the use of porous metal filter products. Mr. Willingham is an active member of the AFS, and past President of the Dixie Chapter.

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