PRECISION VEE – WIRE SCREENS CAPABLE OF FILTRATION SMALLER THAN 20 MICRON

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Vee-Wire® (wedge wire) screens have been successfully used in filtration applications for over 100 years. These screens consist of a triangularly shaped wire spirally wrapped around a set of longitudinal wires or rods. The resulting assembly is essentially a pipe with a continuous spiral opening of a specified size. Particles or other media larger than the screen opening or slot are retained safely on the surface. The geometry of the screen wires prevents plugging or entrapment of particles in liquid/solid separation processes by allowing particles smaller than what is intended to be filtered to pass thru the initial surface of retention to continue thru the screen rather than being trapped in the screen material. The screens then avoid the issues of plugging or degradation of service often present in porous media based filters. This type of screen is highly durable, and, does not typically degrade due to breakage or wear providing a reliable retention surface. Often, these screens can be cleaned in service, or removed for cleaning rather than being replaced, avoiding the environmental costs of disposable filters. Vee-Wire® screens have been used successfully in many applications and configurations related to filtration processes, but have been historically limited to the retention of larger particles or material as the size and accuracy of the screen slots has been insufficient to allow them to be used in fine particle or micro-filtration applications.

A new manufacturing platform has been developed to allow the use of Vee-Wire® (wedge wire) screens with an opening smaller than 20 microns. These new screens also offer a significant improvement in the accuracy of the screen slot openings, providing increased consistency in the opening size distribution. These screens, targeted to the micro-filtration market, provide a viable alternative to other types of media with the traditional advantages of Vee-Wire® screen geometry.

The new technology will be presented in the context of several potential applications and general capabilities of the new fabrication process.

Performance estimates of the new screen configuration will be presented as the results of several computational fluid dynamics (CFD) models and testing. The presentation of this new technology is intended to inspire the exploration new options of finer filtration than has been previously available for this type of screening material. This newly developed manufacturing capability has the potential to be an enabling technology for many new processes, and an opportunity for the optimization of existing applications. This presentation will provide information to stimulate discussions of potential use cases to be future focus areas of development for the new platform.