

Basket Strainer Pressure Drop Analysis

Fluidtrol Process Technologies, Inc. is always looking for ways to improve its products. Recently, Fluidtrol reexamined its SW line of basket strainers with the goal of reducing pressure loss. The answer was to increase the volume of annular space around the basket. This design change decreased the peak velocities across the basket wall, reducing skin drag, and distributed the pressure across the effluent wall more evenly. Collectively, these changes reduced the ratio of basket surface area to annular cross section from 10.8 to 5.0.



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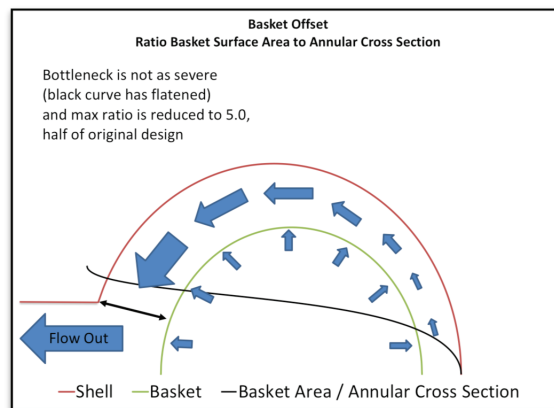
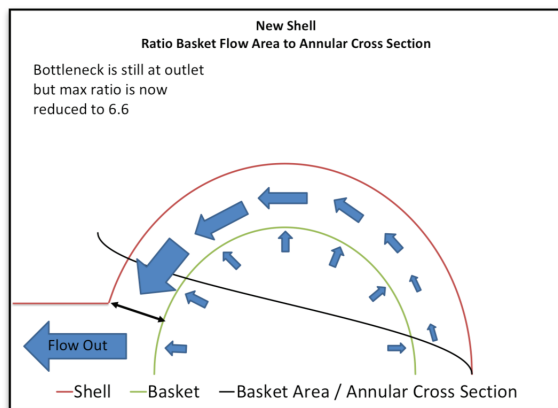
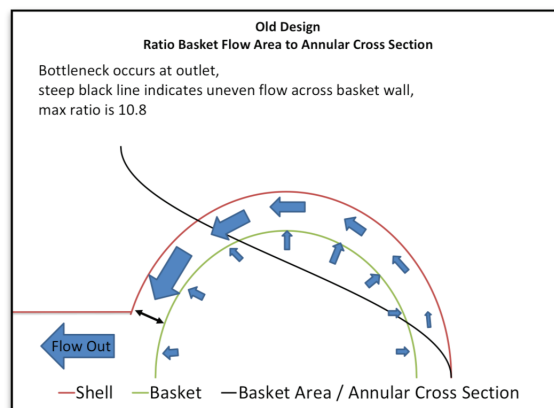
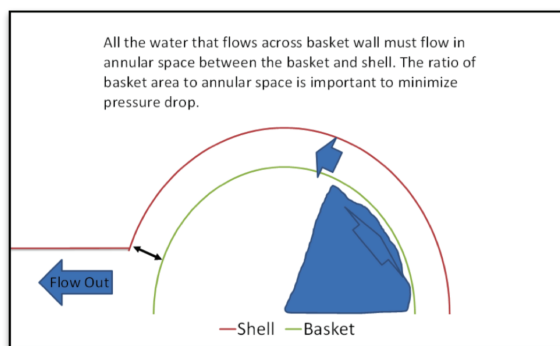
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DESIGN IMPROVEMENTS

Fluidtrol has incorporated a FRP molded body that allows more control over the geometry of internal surfaces. Where possible, effluents are tapered and all edges rounded. The flange to FRP body is now made on the exterior of the flange instead of the interior. This allows more distance to accelerate the fluid. Also, the annular space around the basket was adjusted.

Annular Space

The annular space around the shell has been increased without changes to the interface dimensions. The annular space, the gap between the shell and the basket, allows water to flow around the basket towards the exit. More annular space reduces the flow resistance. By adjusting the shell diameter and the basket location, we increased the effective annular space.



RESULTS

Below is a comparison of the velocity and dynamic pressure profiles of the old style to the improved design. The old style had a symmetric configuration and debris typically collected at the effluent. An analysis of the fluid flow path reveals the effluent cross section is a critical factor. Very high flow across the basket wall is indicated by the red color map. The junction of the effluent and shell also has high localized velocities.

Tapering the effluent flow path reduces the localized velocities at the wall, which will reduce pressure loss due to skin drag. Increasing the annular space has reduced the peak velocities across the basket wall, which will reduce pressure loss. Redistributing the flow across the basket will reduce the impact of localized debris loading.

