



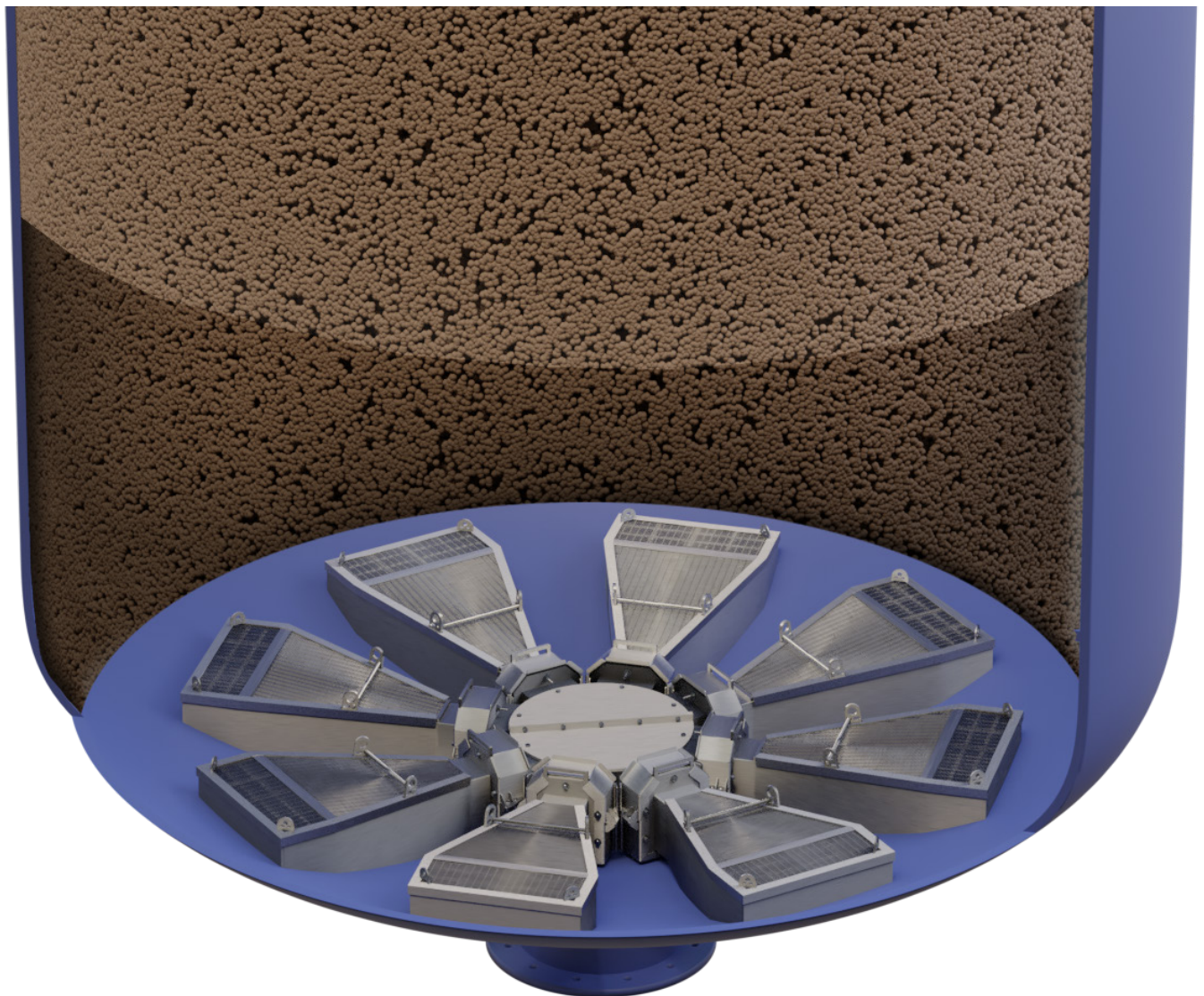
**Johnson
Screens**

A brand of
Aqseptence Group

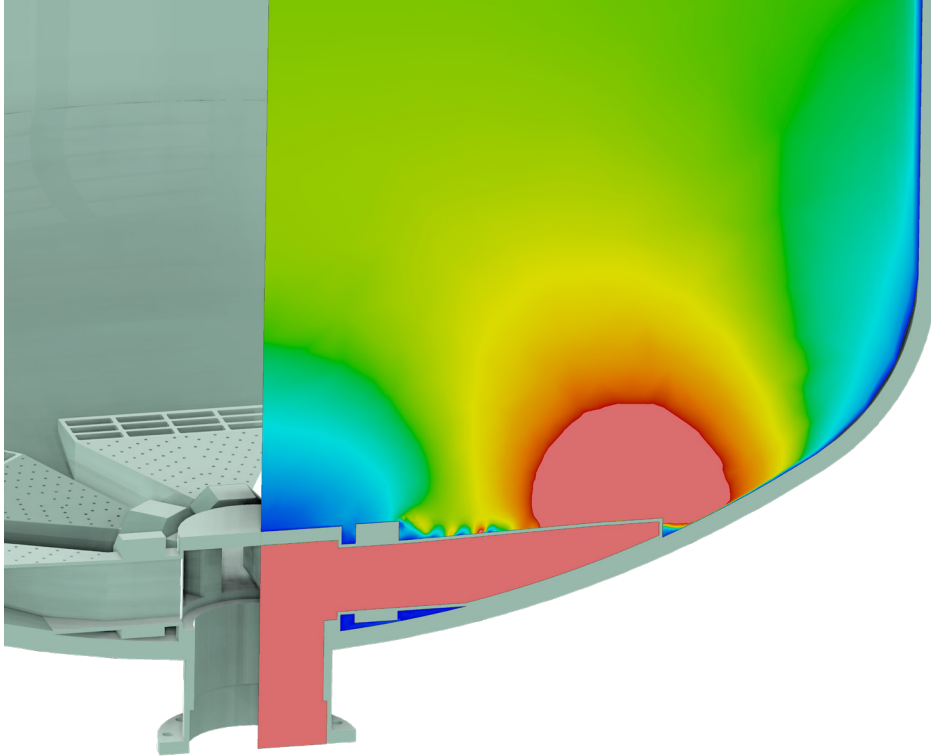
Shaped Support Grid

Johnson Screens' Shaped Support Grid (SSG) technology allows traditionally wasted vessel space to be fully utilized

The Shaped Support Grid's tapered design matches the contour of the vessel head. Fluid is collected and/or distributed across the entire bed's cross-section through the Shaped Support Grid panels. Fluid movement from through the central hub develops efficient distribution, maximizing the vessel's bed performance.



Shaped Support Grid Down Flow



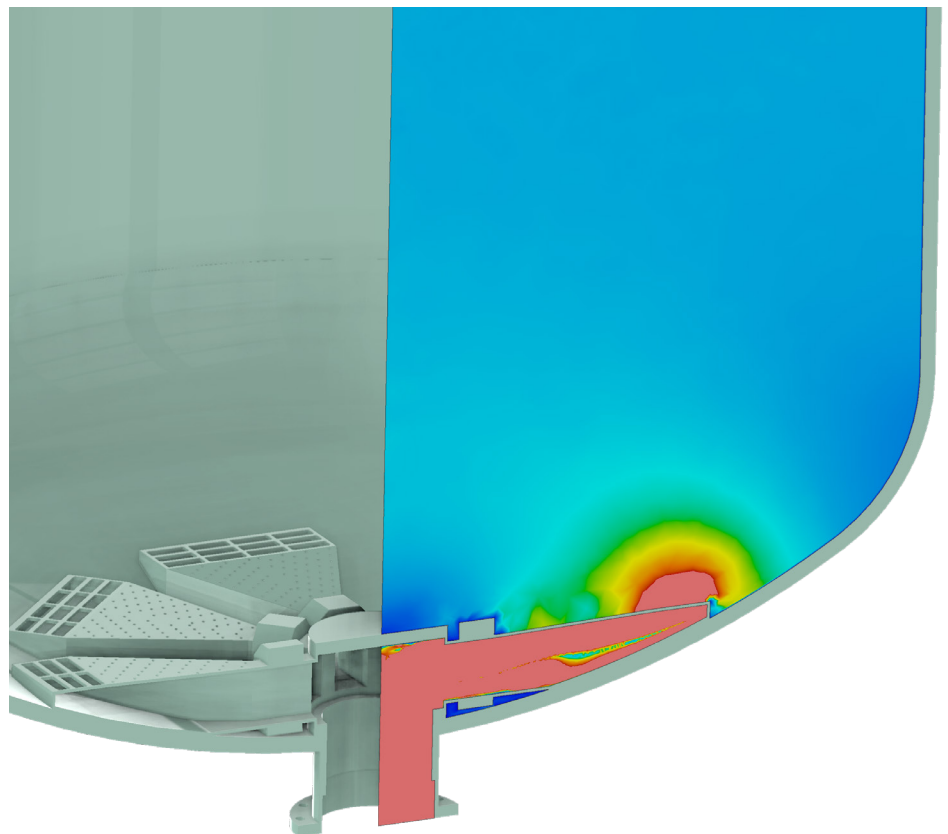
Bed utilization by the Shaped Support Grid is exceptionally efficient. Every level of the bed has uniform flow within horizontal planes and from top to bottom. The entire bed is utilized, maximizing the return on the investment in media and allowing the unit to perform as the bed volume is engineered. Any additional bed volume placed in the bottom head becomes usable space, enhancing unit capacity.

Distribution of Gas Up Flow

The Shaped Support Grid provides up flow gas distribution and performs better than a traditional flat support grid with beams or an outlet basket.

The vessel head is filled with inert balls to the Shaped Support Grid's height, and then active media is loaded on top of the inert balls. Deep into the head, flow distribution is excellent, allowing full use of the entire bed and effective regeneration over the whole volume.

Even though the Shaped Support Grid does not extend to the vessel wall, flow is actively moving into the entire bed cross-section. The bed sections show uniform flow in proximity to the Shaped Support Grid and improved results as the flow moves upward.



Shaped Support Grid



Johnson Screens' Shaped Support Grid is installed into the bottom head of hydroprocessing or gas dehydration vessels. This allows for increased media volume, increased run time, improved gas and liquid flow distribution, bed utilization and an overall more efficient process.

The Shaped Support Grid performs better than traditional flat surface grid assemblies that are located near the tangent line of the head to shell weld. With traditional flat surface grids designs, the entire volume of the head is a dead area, with no reaction or adsorption occurring.

Johnson Screens' Shaped Support Grid lies directly on the bottom head surface, allowing for the entire volume to be filled with media. Increased bed volume allows for the conversion of existing vessels to achieve higher process capacity and new vessels to be built shorter in shell length.

Each panel's stainless steel bottom surface ensures that no media will leak into the downstream process equipment. For process applications with coking potential, a Vee-Wire® screen surface is applied to the bottom to eliminate dead flow zones while still retaining media.

Each grid panel is an enclosed element with a bolted and gasketed connection to the central hub. The enclosed design allows the SSG to expand and contract under the bed without compromising an outer perimeter seal. The encapsulated design is particularly useful in thermal swing regeneration applications.



Side-by-Side Comparison

The Shaped Grid allows for up to 30% more media placement

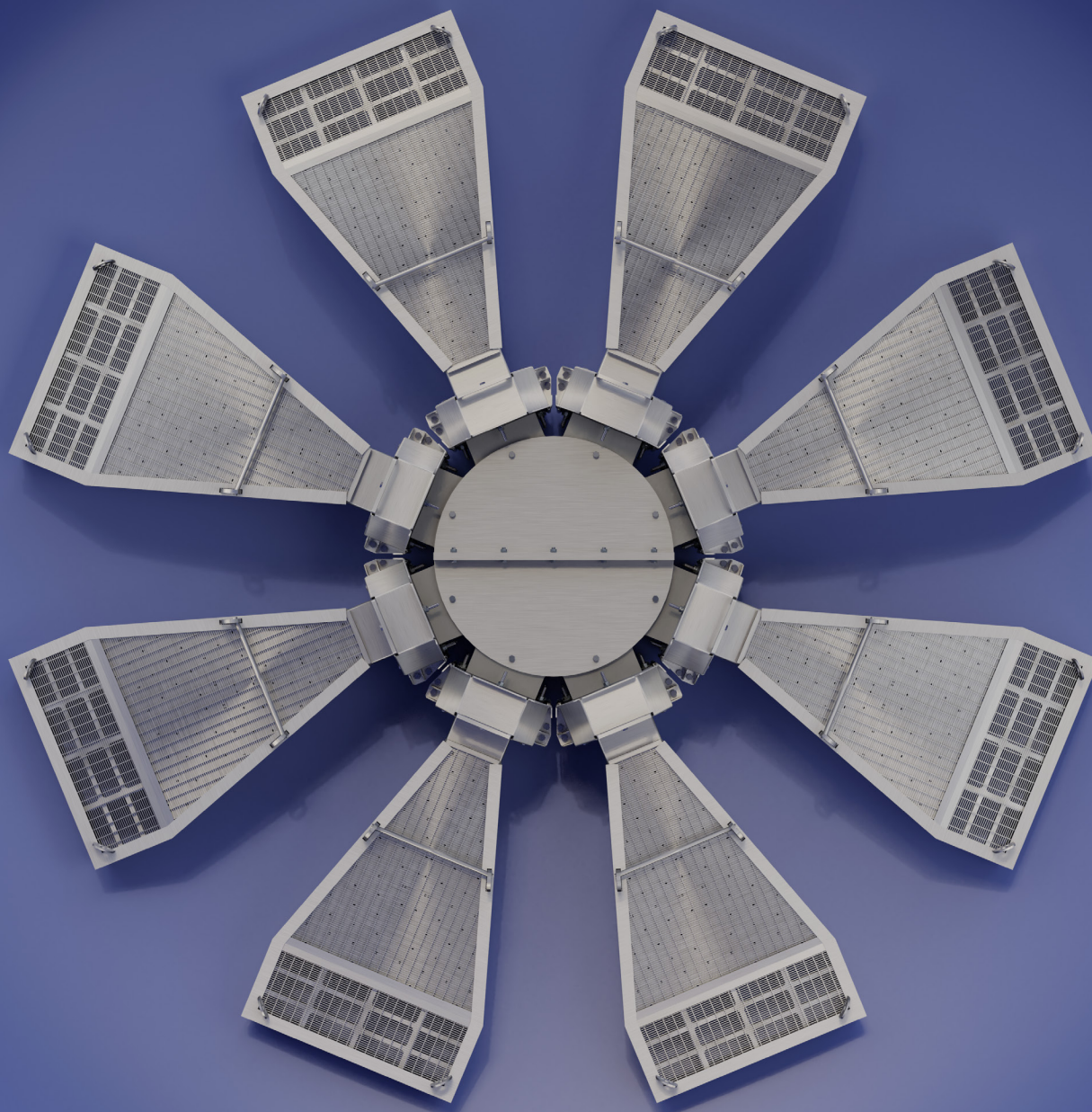


Traditional Support Grid Configuration



Shaped Support Grid

Patented Design



The Shaped Support Grids design offers:

- Increase cycle time/run time
- Maximum absorbent/catalyst volume
- Improved fluid distribution
- Easy installation and retrofit proven
- Ultra low profile
- Secure media retention
- Proven multi-directional process flow
- 15 - 30% increased media placement

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