



**Johnson  
Screens**

# Scallops For Radial Flow Systems



A brand of Aqseptence Group

# Scallops for Radial Flow Vessels

Johnson Screens' products are used for a wide variety of screening applications in the water, wastewater, oil and gas, refining and petrochemical and liquid and solid separation industry.

Utilizing this experience in the refining and petrochemical industries, Johnson Screens is supplying products that are recognized as a global leader in media retention and liquid and solid separation.

One of these products for the oil and gas industry is scallop screens for radial flow applications.

Scallop screens traditionally were wire mesh or perforated sheet scallops. Johnson Screens' product line has developed a complete line of scallop screen construction, including perforated sheet, Vee-Wire® and OptiMiser® scallops to best fit the specifications of the application.

## Increasing Efficiency to Radial Flow Vessels

Vee-Wire scallops are a highly effective means to direct inlet flow in radial flow processes. Compared to a single large outer basket, installation and repair can be much faster and simpler with these individual screens.

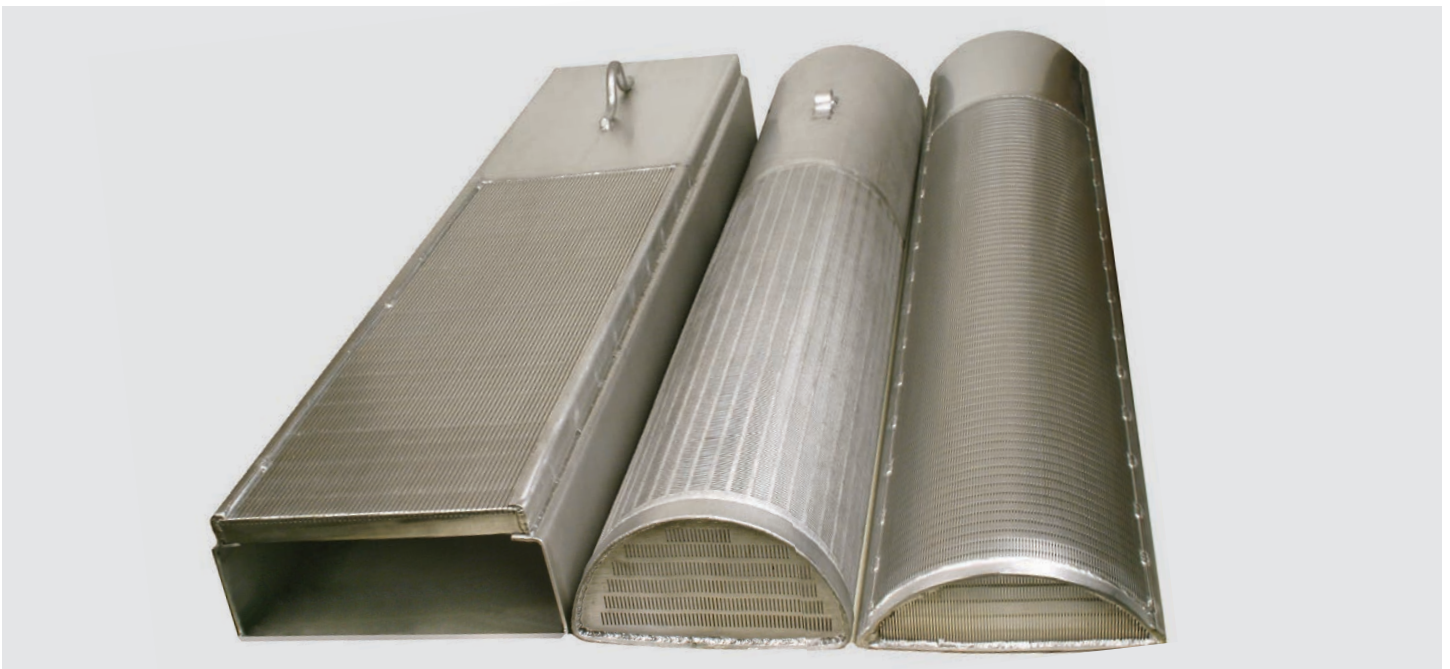
Made of welded Vee-Wire and rods, Johnson Screens scallops have exceptional resistance to bending, twisting or collapsing - all essential qualities, when faced with extreme loads caused by expansion in temperature cycling operations.

Buckling, a problem in tall reactors, is virtually eliminated as is damage caused during installation. Once installed, the screens are easily maintained. Their special slot design virtually eliminates plugging.

Vee-Wire scallops have distinct operating advantages. Vertical slots, for example, allow the catalyst to ride up and down during operation without abrading. Slots can be as narrow as 0.012 in. / 0.3 mm to retain small-size catalyst.

Despite the narrowness of individual slots, the scallop arrangement has a much higher total open area than a single large outer basket or perforated plate scallops of the same size. This increased open area translates directly into reduced pressure drop and enhanced process efficiency.

Johnson Screens scallops are manufactured in either high grade stainless steel or nickel alloys suitable for operations above 1,000° F (538° C), and the carbon content of the material is above 0.04 percent, and is supplied as standard for high temperature applications.



# Vee-Wire Scallop for Radial Flow Vessels

The Johnson Screens Vee-Wire scallops are stronger and have a more robust catalyst retention surface than perforated plate scallops. Vee-Wire scallops are best applied in tall radial flow applications and in any situation where the current scallop system is having problems.

## Features and Benefits

- Minimal catalyst fines generation
- Resistance to plugging
- Increased open area
- Resistance to increase in pressure drop
- Greatly enhanced mechanical strength
- Less catalyst damage from fewer required expander rings
- Reduced turnaround costs from fewer scallop repairs
- Lower cleaning costs from unplugged retention surfaces

When the full load of the catalyst bears down on the Vee-Wire scallop, the extra strength provides assurance of full length runs and minimal repairs at turnarounds.

Vee-Wire scallops are available for both new applications and to replace existing scallops.

When replacing existing scallops, Vee-Wire scallops are built to the same dimensions and have equivalent or superior process performance.

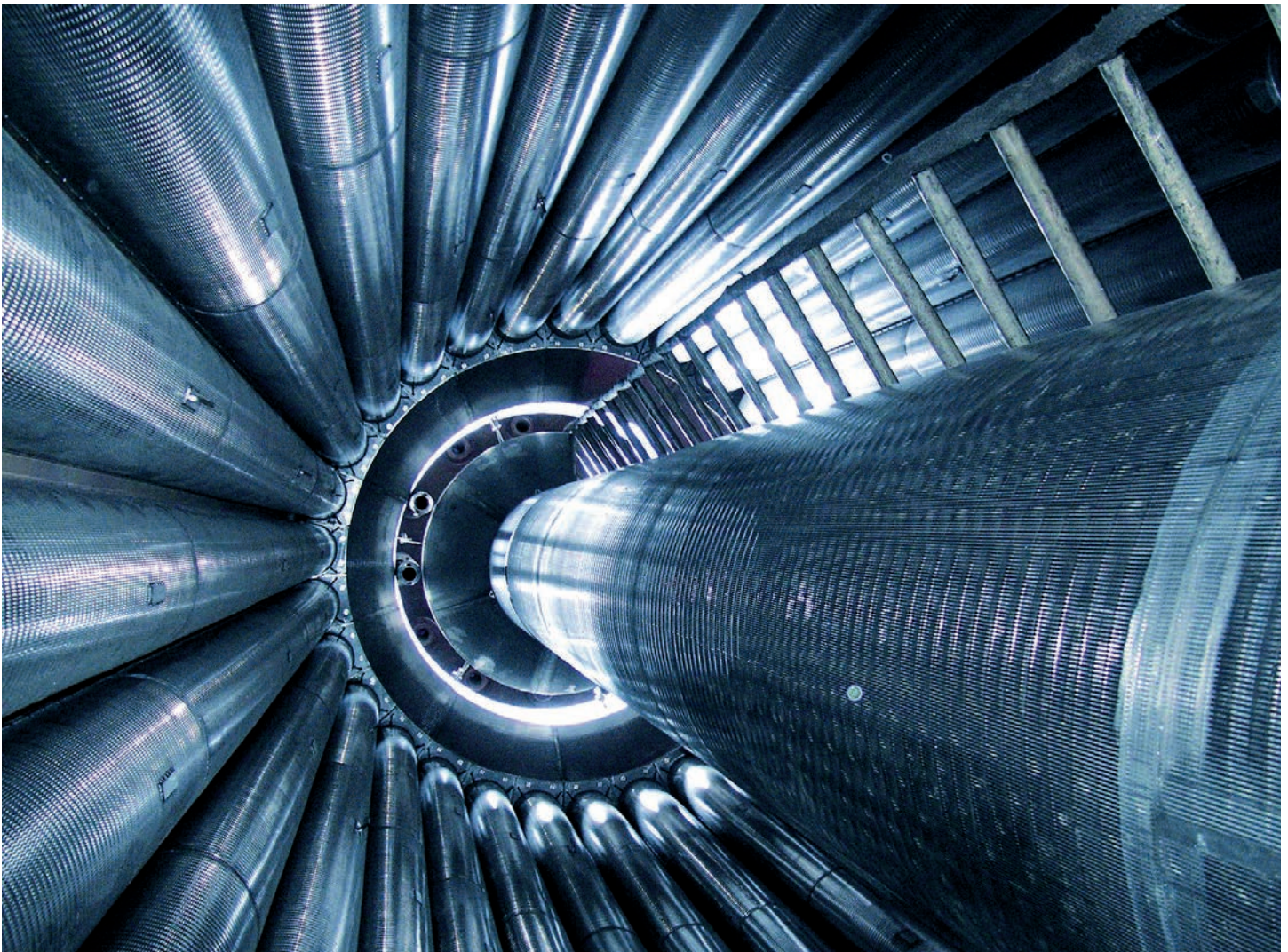
The type of scallop can be switched out during a turnaround in the same time frame needed to clean and repair your perforated scallops. No modifications are required inside the reactor.

The mechanical strength of the Vee-Wire scallops can be designed to meet the specific needs of your unit. The vertical strength of the scallop can be increased while maintaining flexibility in the radial direction.

Simple reinforcement of the centerpipe provides a matched strength set of internals for more reliable operation.

Johnson Screens team of engineers will work with you to design the Vee-Wire scallop system that best suits your application.

With sales and service offices in the USA, France, Australia and Japan, Johnson Screens is able to support major EPC's, vessels from major licensors and a wide range of processes and applications.



# Optimiser<sup>®</sup> Scallops

OptiMiser<sup>®</sup> scallops combine the process efficiencies of an outer basket with the installation and maintenance advantages of standard scallops.

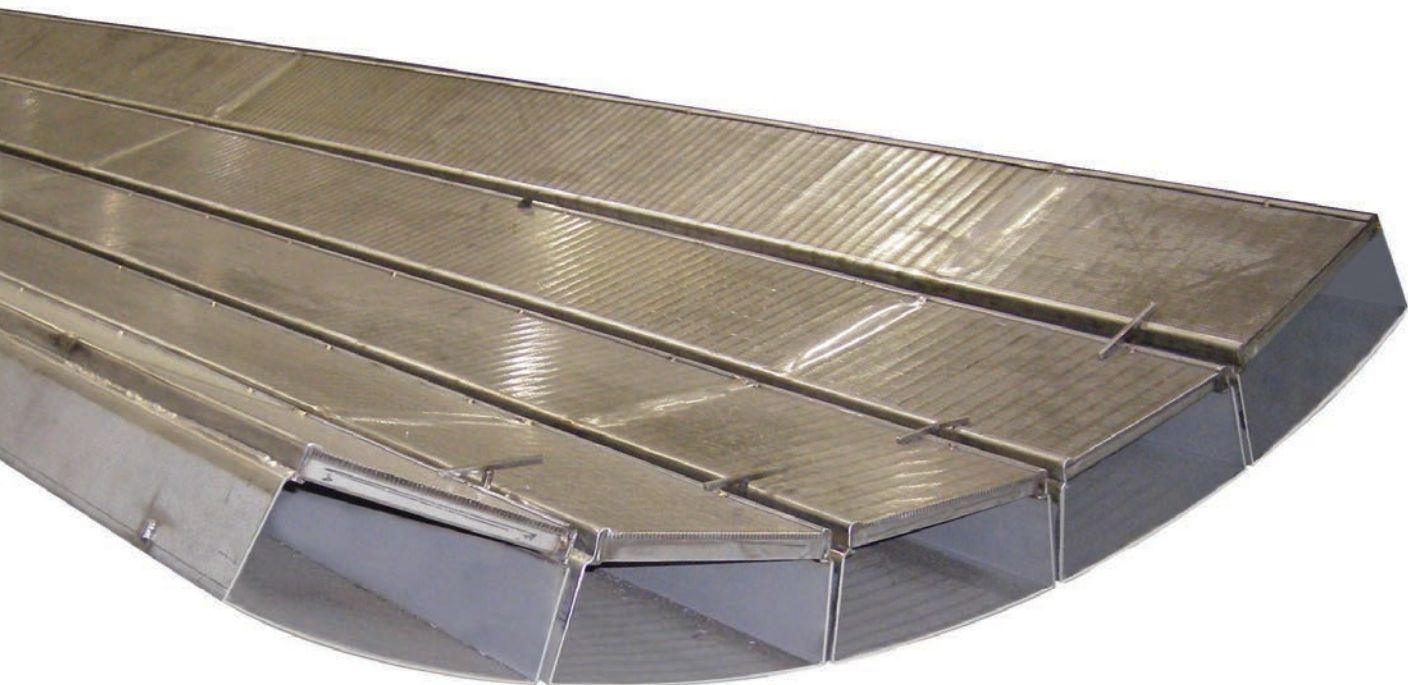
OptiMiser scallops are made from Vee-Wire and maintain a uniform bed thickness, maximizing the use of the bed.



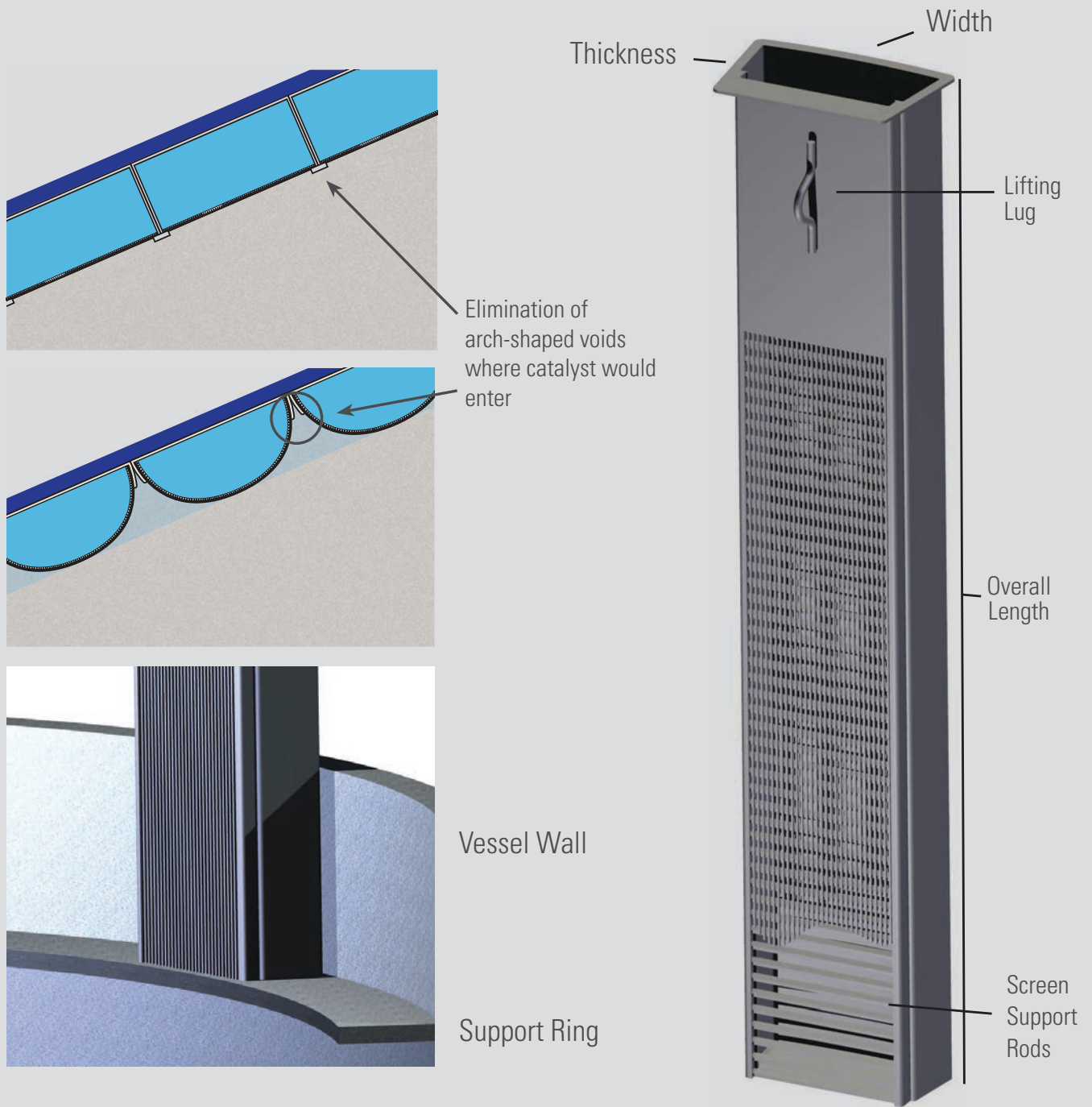
#### Features and Benefits:

- Easy installation
- High flow capacity
- More effective use of the catalyst than conventional arch-shaped scallops
- Stronger than conventional scallops
- Ability to adapt to any size vessel
- Uniform annular space for predictable process flow and pressure drop
- Slots are as small as 0.010 in. (0.25 mm). Larger sizes are available in increments of 0.0004 in. (0.01 mm).
- Blank interval at the screen top which prevents "short-circuiting" of flow if the catalyst bed settles
- Longitudinal and horizontal plates which seal the spaces between screens
- Vertical slots and a flat Vee-Wire face, prevents abrasion of catalyst beads as the bed moves vertically in operation
- Strong construction creates a high column strength
- Elimination of expander rings

The flat screen face of the OptiMiser scallop, eliminates the underutilized heel catalyst found with traditional scallops. Coke formation is reduced since all catalyst volume sees gas flow without stagnant areas. The uniform gas flow across the face of the scallop simulates the performance of an outer basket.



# Better Process Efficiency



# Perforated Plate Scallop

The perforated plate scallops are an economical approach for retaining catalyst and protecting against catalyst leakage in a radial flow unit. The perforated scallops are light weight and easy to install in your reforming unit.



Scallops are installed as a partner to a centerpipe in a reformer. As thermal expansion and contraction of the vessel occurs, loads are exerted on the surfaces of the scallops and centerpipe. Perforated scallops are designed to deform under extreme load, acting as a safety valve to protect the centerpipe and reduce the chance for catalyst leakage into heaters or exchangers. Proper functioning as a safety device requires the scallop to be fabricated to specific tolerances and uniform shape. Johnson Screens scallops meet all these requirements.

Each licensor of radial flow units has critical perforation size specifications and characteristic end assembly details. Scallop are typically fabricated from 18 ga. (1.2 mm) sheet in 321H SS material and custom built for a particular unit's needs. Scallops fabricated from 16 ga. (1.57 mm) sheet are available for operators looking for a more rugged design.

Material in 321H SS is maintained in inventory to allow emergency replacement of components damaged during operation. Our field service crews are also available to maintain your perforated scallops to quickly get your unit back on line.

#### Features and Benefits:

- Economical solution
- Light weight and easy to install
- Protection from the centerpipe deformation
- 18,16 or 14 gauge stainless steel construction
- Quick turnaround for specific needs

## Service, Inspection, Installation and Maintenance

Field Service Team for Johnson Screens products is experienced and available for complete turnarounds, emergency repairs and new installations.

Experienced in a variety of industries, Field Service Team has experience in maintaining refining and petrochemical applications, natural gas and chemical uses.

#### Services include:

- Problem detection
- Recommissioning
- Project engineering assistance for revamping or upgrading
- Technical assistance when damage is found or suspected
- Expertise on vessel internals after catalyst unloading
- On-site installation
- Supervision of contractor's installation
- Consultation in emergency situations

Field Service Team expertise includes:

- Catalytic reforming
- Styrene dehydrogenation
- Sulfur treatment
- Ammonia conversion

The Field Service Team is available when problems arise in a product's life cycle; no matter how distant or difficult the problem is. They can be mobilized to a job site, usually within 48 hours, to anywhere in the world.



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