

Reactor Internals

PANTAN

صنایع پنتان شیمی



PANTAN is a well-established leading designer and manufacturer of a vast range of equipment for the Oil, Gas and Petrochemical Industries.

For almost two decades, our company has developed a comprehensive range of products and services including:

Business Segment

1. Process Vessel Internals

- Fractionation Trays
- Packing and Internals
- Separator Internals
- **Reactor Internals**

2. Process Packages

3. Miscellaneous Process Equipment

PANTAN is a complete solutions provider in mass transfer and separation systems for oil, petrochemical, refining, gas processing and other chemical process industries. We can offer a comprehensive and efficient range of products and services for distillation, absorption, adsorption and multiphase separation processes.

Today, the company is leading specialist in process vessel internals and modular separation systems (as turnkey process packages) for the chemical process industries in Iran's market.

Based on highly skilled professional experts, innovation & research center and modern production facilities, PANTAN is operating as "one-stop solution provider" for wide range of process applications.

Vision



We want to be the best company throughout the region for “Mass Transfer and Separation Technologies” demanded by the market.

Mission

PANTAN is a pioneer and knowledge-based company in designing, manufacturing, installation, and related services by utilizing cutting-edge technologies at a world-class level focused on “Mass Transfer and Separation Technologies” in Oil, Gas, and other process industries.



PANTAN is a professional designer and manufacturer company that offers a wide range of separator internals and drums based on well established, tried and tested, industry standard design concepts with unique mechanical enhancements to ensure effective and reliable performance. Our design expertise and manufacturing standards are obtained by many different successful projects in the field of separation for different customers including petrochemicals, refineries, food industries, power plants, steel manufacturing companies, etc.

Our professional well-trained engineers are ready to offer the best solution that is tailor-made for your specific separation requirement.

AXIAL Flow Reactor Internals

PANTAN designs and manufactures a wide range of reactor internals for media retention for both axial flow and for radial flow Reactors.

The down flow or up flow systems are widely used in Desulfurizers, Hydrotreaters, Hydrocrackers, Molecular Sieves, Gas Sweeteners and other Absorption Process. PANTAN design and manufacture wide range of internals for these systems to retain the media and to provide a proper collection area for the process flow across the entire vessel diameter or length. These are :

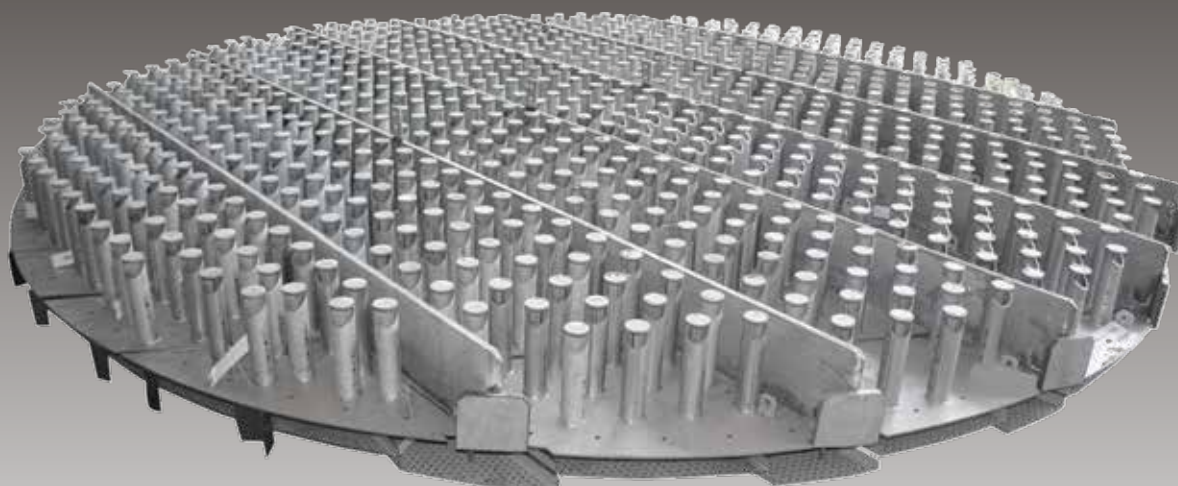
- Distributor Tray
- Quench Mixer
- Catalyst Support Grid
- Scale Trap
- Inlet Diffuser
- Outlet Collector

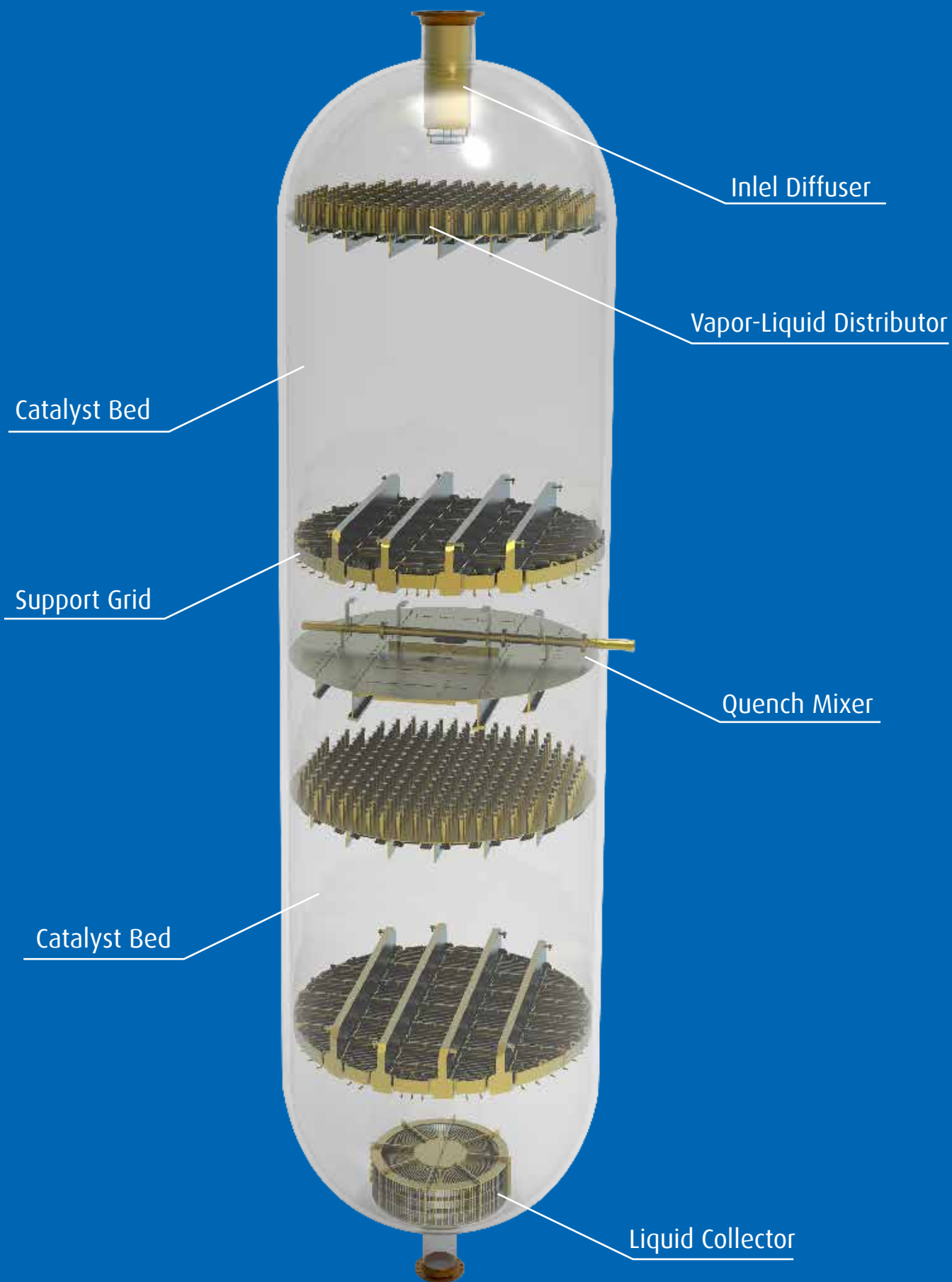


Distributor Tray

In the hydroprocessing reactor, the hydrocarbon feed is reacted with hydrogen over a fixed bed of catalyst at an elevated temperature and pressure. For petroleum fractions heavier than naphtha, the mixture of hydrocarbon feed and hydrogen typically consists of two phases: a liquid phase and a vapor phase.

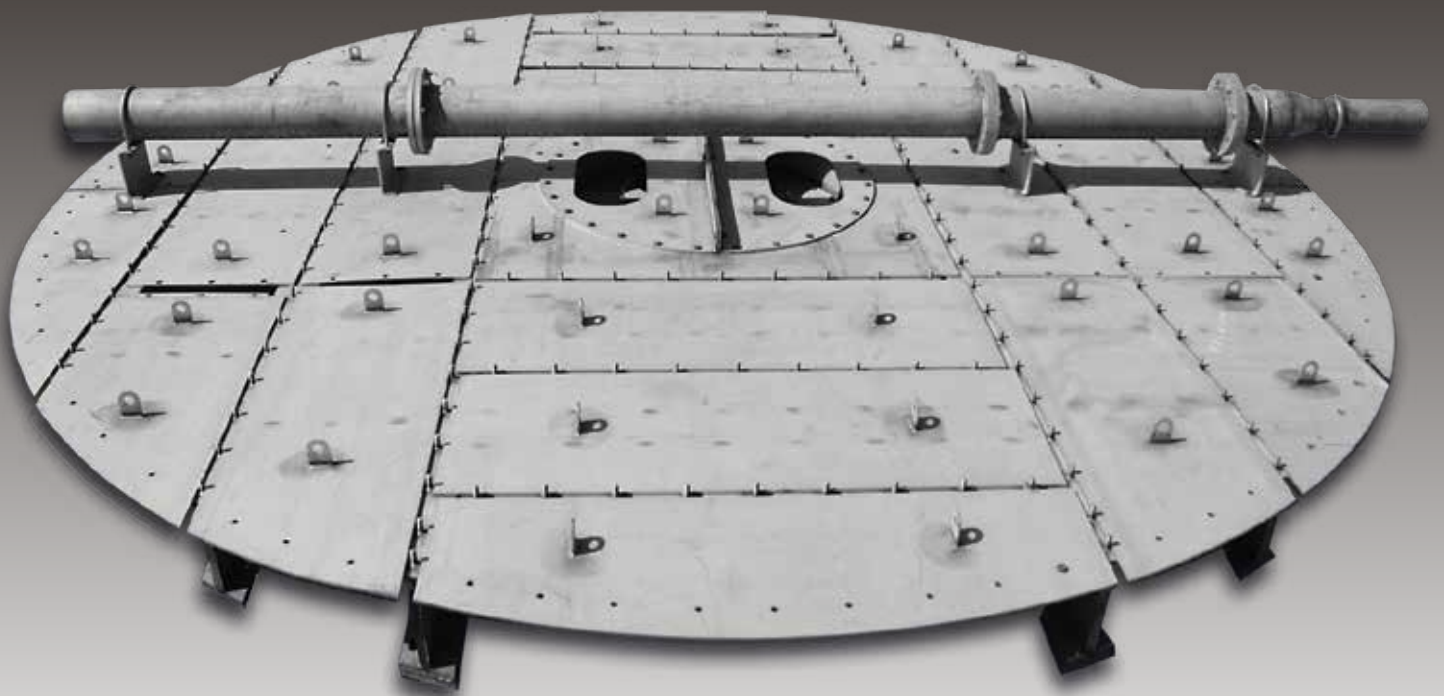
In order to use the catalyst efficiently, the liquid and the vapor must be distributed uniformly across the reactor cross-section. Our standard Distributor Trays is multi chimnies type which are generally composed of lateral openings (holes spaced vertically up the axis of the chimney) for liquid and superior apertures for gas.





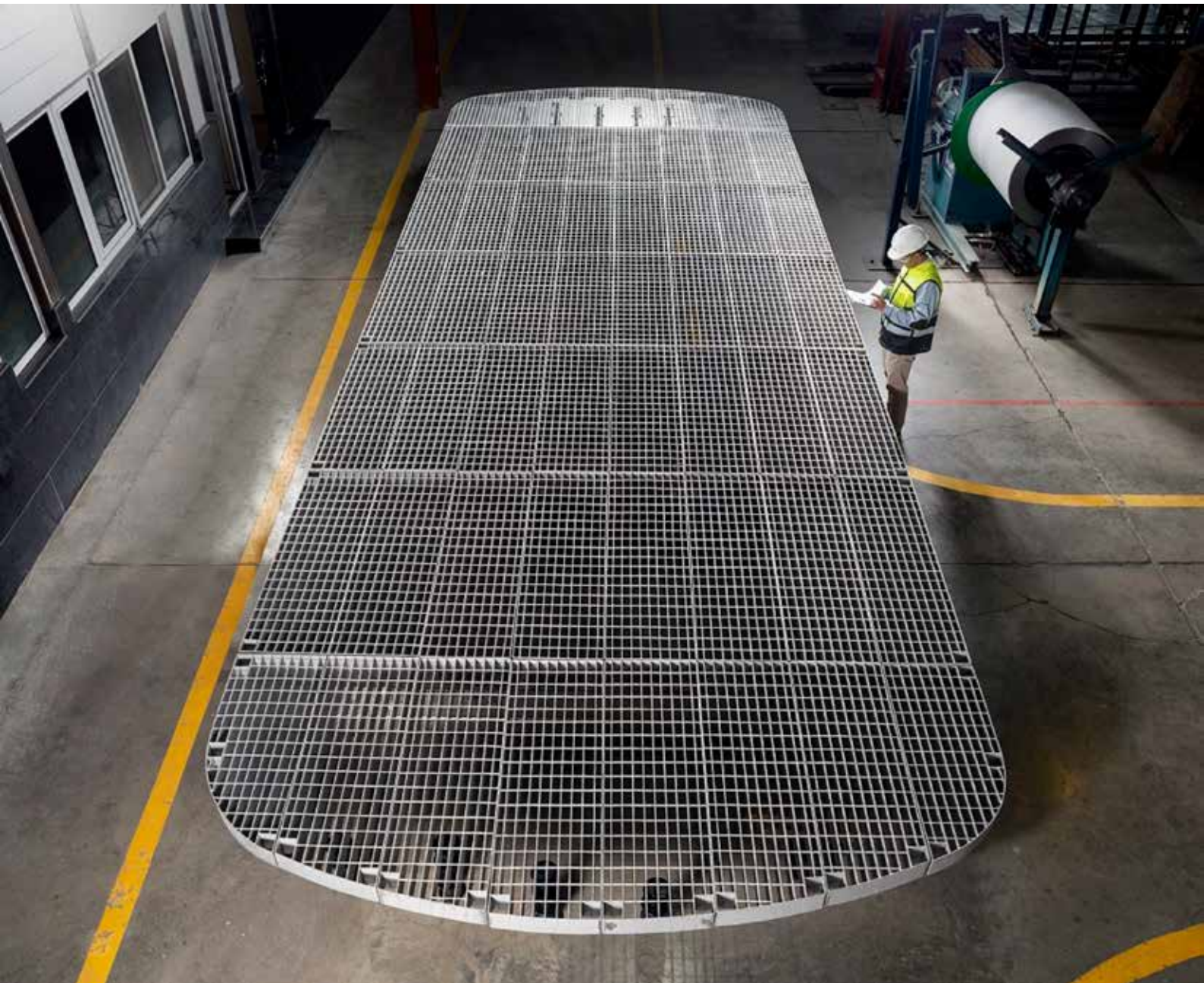
Quench Mixer

In two phase hydroprocessing reactors with quench in inter-bed, a mixing device is required in order to contact the quench fluid with vapor and liquid media from above catalyst bed for efficient transfer phenomena with uniform composition and temperature profiles in the bed below.



Catalyst **Support Grid**

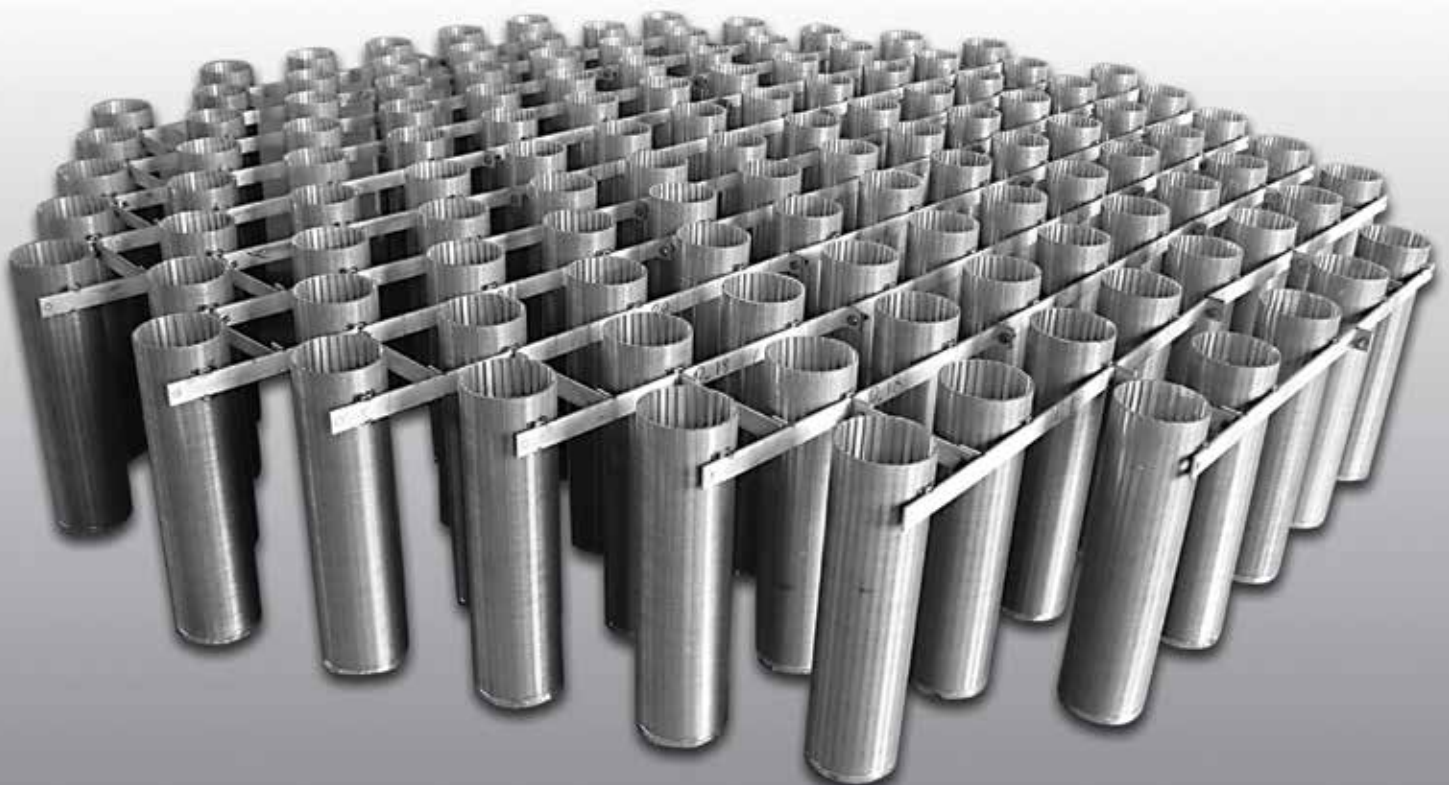
Support Grids are designed to provide sufficient strength to support catalytic beds under normal operating conditions while at the same time without creating any capacity restriction in the column. A suitable support grid selection depends on the type of catalyst as well as maximum design load. The Support Grid surface is furnished by wire meshes or wedge wire screens which are the filtering elements for retaining catalyst media.



Scale Trap

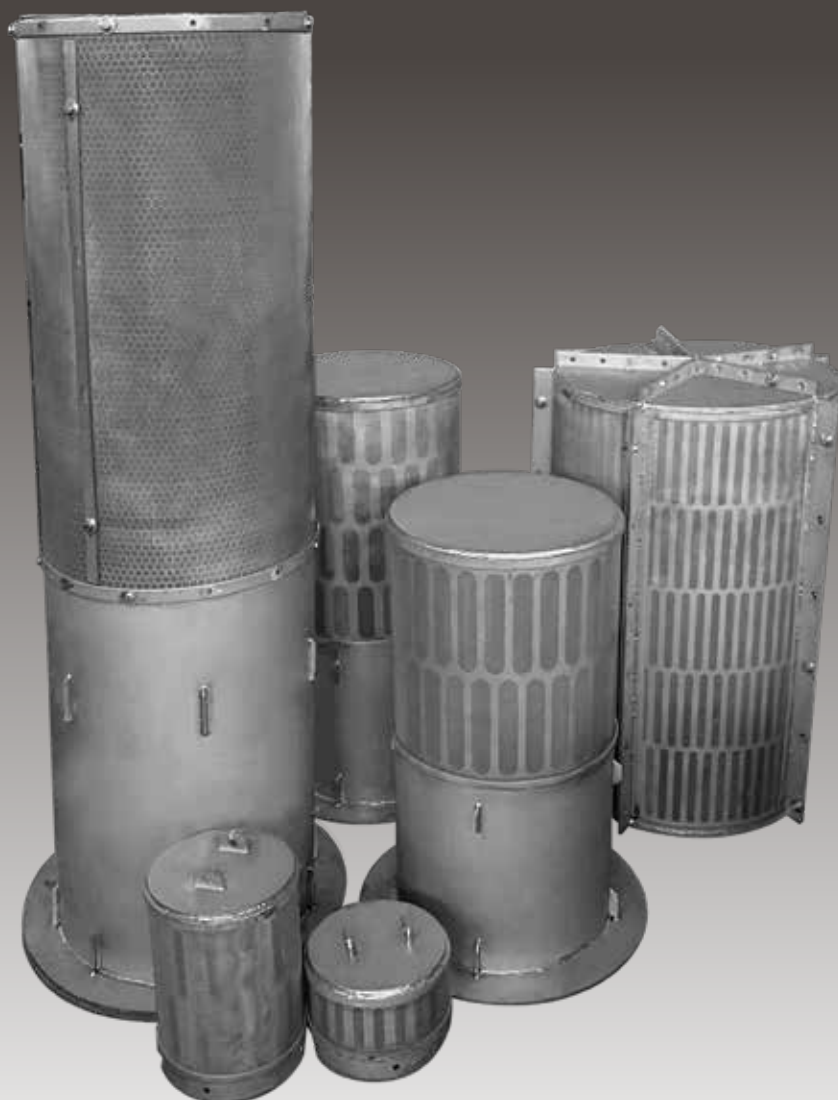
A series of cylindrical screens arrayed at the top of the upper catalyst bed either to :

1. collect metallic contaminants or scales from plugins the top surface of the upper catalyst bed
2. to increase the total surface area of the upper catalyst bed to extend the bed's useful life.



Inlet Diffuser

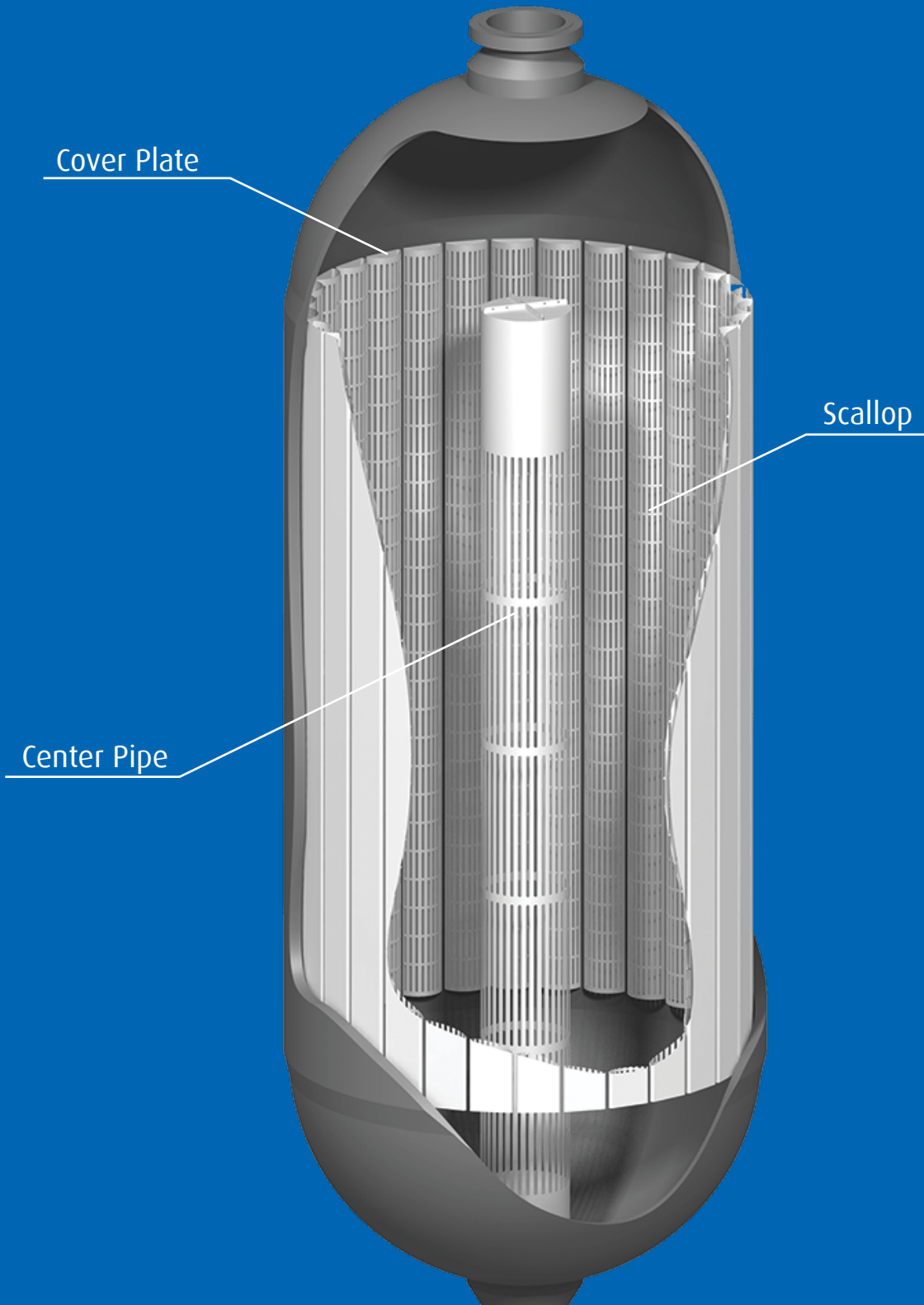
Inlet Diffuser reduces kinetic energy of feed to ensure get proper distribution of feed inside reactor or to prevent turbulence current directly from the Inlet Diffuser in the Distributor Tray below. It is designed to **prevent flow maldistribution in the bed** and to avoid movement of the catalyst bed by high-velocity impingement.



Outlet Collector

It is designed to give an even flow distribution at the bed outlet in order to ensure optimal utilization of the catalyst in the bottom of bed. Another task of Outlet Collector is to prevent the catalyst , inert Ball and fines from entering the outlet pipe.





RADIAL Flow Reactor Internals

The radial flow systems are widely used in Catalytic Reforming, Styrene Dehydrogenation, NOX Removal Systems, Solvent Recovery, Ammonia Converters, and Isomerization Processes.

These reactors are employed for their high-volume flow capacity with minimal pressure drop. Radial flow systems increase contact efficiency between the process stream and catalyst bed which causes vessel size reduction. These types of reactors not only produce a higher yield, but also they are more effective in energy consumption.

The main internals of a Radial Flow Reactor are :

- Center Pipes
- Scallops
- Cover Plates

In the simplest form, a radial flow system consists of two concentric screens and an annulus filled with catalyst. Slots on both the center screen and outer basket are oriented vertically to allow media to slide against the screen surface during processing without becoming abraded by the slot edges.



R&D & Product **Development**

PANTAN uses different approaches to improve product performance. It is believed that to fulfil market requirement and new operation demands, it is necessary to establish new product.

For these two goals, PANTAN uses field tests in "Research & Development Center" located in PANTAN factory and even client site in small and large scales to check hydraulic performance of equipment.

The other ways to check performance is to maintain calculation and model with mathematical calculation. So Computational fluid dynamics "CFD" and process simulation could be so helpful and prevent in wasting capital cost and time.

The CFD is used to analyze products, key further and new products development whilst CFD reduces the volume of necessary experiments for design studies where would hardly be available.

PANTAN uses CFD to investigate the flow regime in wide range of products like Fixed and Float Valve Trays. This approach allows to increase the separation efficiency and to optimize the design rules. PANTAN uses all these techniques to provide services to his clients.

Catalyst Support Grid

Excellence in design

Process Technology

Engineered to Innovate

One Stop Solution Provider

Spent Caustic Treatment

Catalyst Support Grid

Packed Tower Internals



Reactor Internals

Static Mixer

Wedge Wire Screens

Liquid Diffuser & Outlet Collector

Vapor/Liquid Distributor

Separator Internals

Special Equipment

PANTAN - Your Specialist

for Mass Transfer and Separation Technologies

Engineered Smarter

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