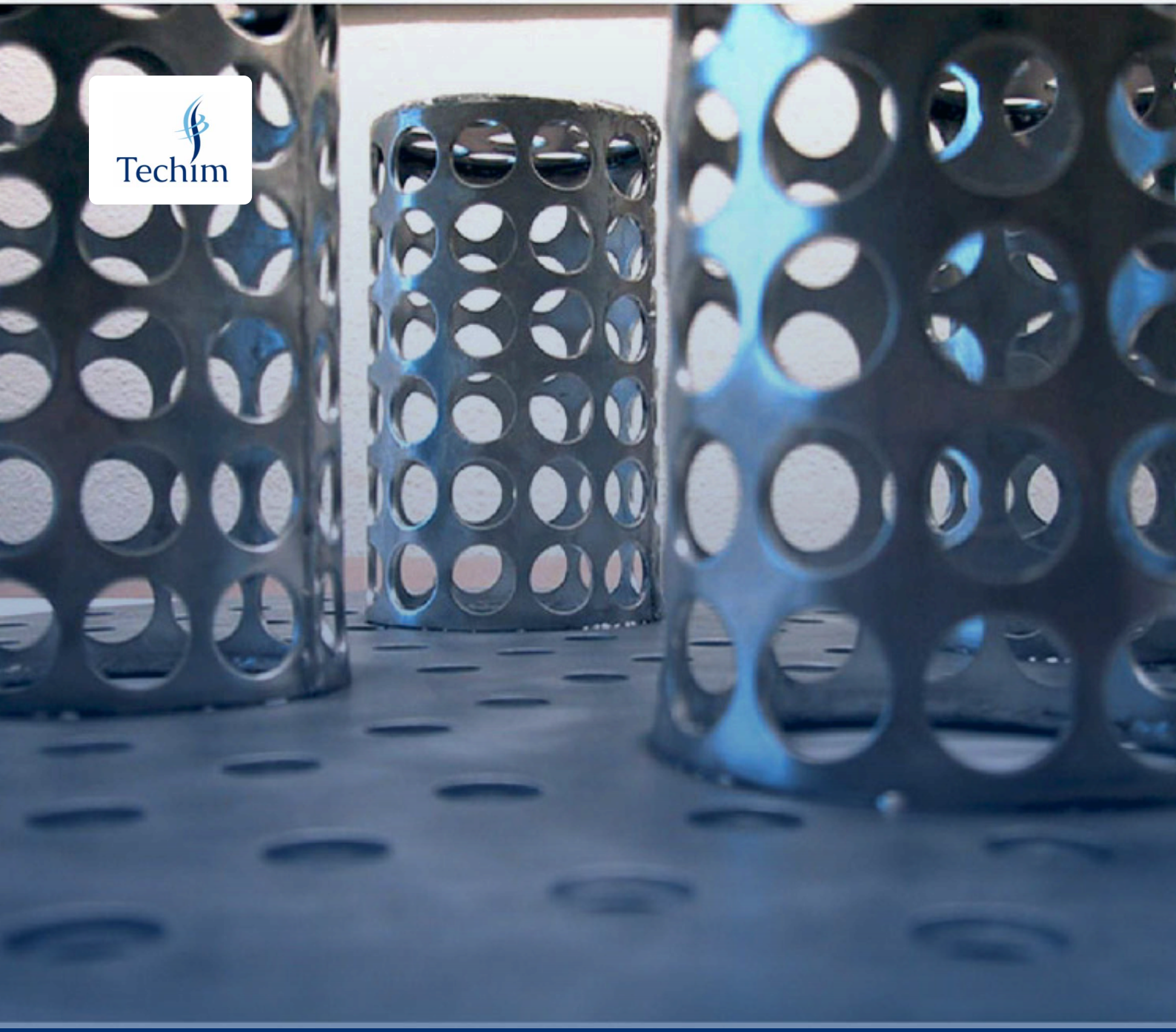


PRODUCT BULLETIN

Packed Tower Internals

Support plates and grids, liquid distributors and re-distributors, feed distributors and hold down grids, for all packing types and column diameters.

Techim, Versailles, France

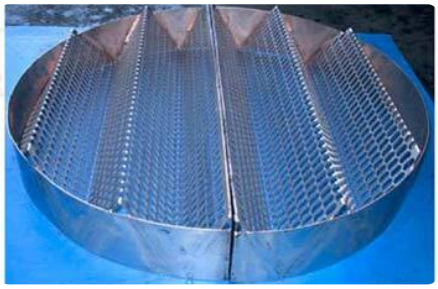
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Packed columns using random or structured packing require complementary internals. At Techim we have the answer to your requirement for all packed tower internals since we design, manufacture and install a full range of internals suitable for all packing types and column diameters.

Techim design standards are based on many years of proven experience in the mass transfer field and are used to custom design the internals to suit the specific process requirements, resulting in consistent and reliable column performance.

Packing Support Plates



Model 100 support plate, random packing
800 mm Ø esterification column

To support a bed of random packing the most common type of packing support plate used is a gas injection multi-beam type which can be designed to support loads of 5000 kg/m² or more.

Our Model 100 gas injection multi-beam packing support plate is used for small diameter columns between 300 mm and 1200 mm.

Two piece construction is used for column diameters between 300 mm and 850 mm for installation through column body flanges. Three or four piece construction is provided for column diameters between 851 mm and 1200 mm, with installation through column man-holes.

A partial support ring or wall clips welded to the column shell are required for supporting the plates. The packing support plate sections are bolted to each other inside the column and clamped to the support ring or wall clips.



Model 110 support plate, random packing
4300 mm Ø deaeration tower, MOC 316L



Model 110 support plate, random packing
1400 mm Ø deaeration tower, MOC GRP

Our Model 110 packing support plates are used for column diameters greater than 1201 mm. They provide a free area of approximately 100% and are designed to be clamped to full support rings welded to the column shell. For column diameters of 3000 mm and greater, major support beam(s) are used. Installation is through column man-holes.

For special applications such as liquid-liquid extraction columns, a perforated plate support plate c/w risers is used. Our Model 120 support plate is shown on the front page.

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Model 150 support grid, structured packing
1800 mm Ø IPA distillation column

Packing Support Grids

For structured packing beds a lattice bar type packing support grid is used, which allows free and uniform passage of the vapour and liquid. Thus the capacity of the structured packing is not restricted.

Model 140 series: one piece construction (for installation through column body flanges) is used for small diameter columns. A partial support ring or wall clips welded to the column shell are required for supporting the grid.

Liquid Distributors

The single most important factor determining the performance of a packed column is the liquid distribution, i.e. **"a packing is only as good as the liquid distributor"**.

At Techim we design all liquid distributors with meticulous attention to detail, taking into account the relevant factors:

- number of distribution points (point density)
- hole or notch size
- fouling tendency
- turndown (operating range) required
- operating (design) liquid head
- minimum (turndown) liquid head
- levelness sensitivity

With over 50 types of liquid distributors to choose from, Techim clients are assured that the most appropriate type will be selected for their specific service and duty.

Plate-Orifice Type Distributors

For general applications plate-orifice type distributors c/w risers are used. For small columns (< 800 mm Ø), a pan construction can be used where the distributor is fixed to lugs welded to the column. Alternatively a plate construction is used where the distributor is clamped to a full support ring. The distributors are made in one or two pieces for installation through column body flanges.

For larger columns (> 800 mm Ø) the distributor is made in sections for installation through column man-holes. The distributor is clamped to a full support ring welded to the column shell. Consequently the distributor levelness is dependent upon the levelness of the support ring.



Model 210-R liquid re-distributor
1800 mm Ø column

Model nos. 200 and 210 have holes in the deck and are used for non fouling services. For fouling services Model nos. 201 and 211 are used, which have drip tubes welded to the deck plates. The normal operating range is 2 to 1. However, the latter type can be designed for an operating range of 5 to 1 or greater by using double or triple level holes in the sides of the drip tubes.

Risers are normally circular for small diameter columns and rectangular for large diameter columns. The risers can be equipped with hats (covers) at the top to make the distributor into a re-distributor. Risers can also have anti-migration bars or mesh welded at the bottom, thus eliminating the need for separate hold down grids (bed limiters).

Trough Type Distributors



Model 231-CP narrow trough distributor
1800 mm Ø IPA distillation column

Trough type distributors are normally used in column diameters greater than 1200 mm.

Model nos. 220 and 230 have holes in the deck and are used for non fouling services. For fouling services the holes are put in the sides of the troughs. Normal operating range is 2 to 1.

Using double or triple holes in the sides of the trough the distributor can be designed for operating ranges of 5 to 1 or more. For the high turndown designs an alternative is to use drip tubes welded to the deck (Model nos. 222 and 232) with the distribution holes in the sides of the tubes.

For services with very low liquid loads (0.1 $m^3/m^2.h$ or less) drip tubes c/w spider fingers are used. The spider fingers, operating by capillary action, spread the liquid onto the packed bed, thus increasing the number of distribution points.

For structured packing beds narrow troughs are used to significantly increase the open area and number of distribution points.

The space between the secondary troughs can be covered with anti-migration bars or mesh, thus eliminating the need for separate hold down grids.

With all trough type distributors it is possible to use levelling screws to level the distributor.



Model 223-AM narrow trough liquid distributor
800 mm Ø esterification column



Model 252 pipe ladder distributor in 316L

Pipe Ladder Distributors

This type of distributor is usually designed for a head loss of 1.5 m. The header pipe and laterals run full of liquid and hence the distributor is insensitive to levelness.

Pipe ladder distributors are particularly suited for systems with high liquid to vapour ratios.

Single Phase Feed Distributors

For a single phase liquid feed to a plate-orifice distributor a sparge pipe is used, located centrally between the risers. The pipe can be either a straight type or a Tee-type.

For single phase liquid feeds to a trough distributor, a feed pipe or a combination of feed pipe + primary trough(s) are required to correctly feed the secondary troughs. Depending on the number of primary troughs the feed pipe can be straight, Tee-type or H-type.

For single phase vapour feeds a sparge pipe is used (straight, Tee or H type) or a pipe ladder distributor. Alternatively a chimney tray can be used to distribute the vapour.

Two Phase Feed Distributors

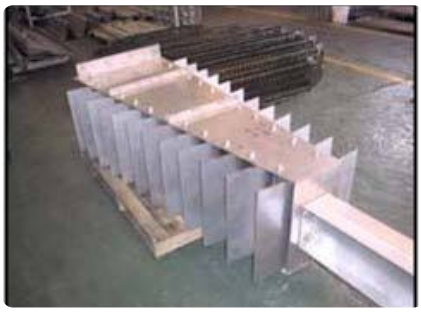
The importance of correctly feeding a tray or packed column cannot be over-stressed, particularly in the case of two phase feeds. Poor design arrangements can lead to premature flooding of the trays or packed bed. At Techim we have a wide range of two phase feed distributors, thus ensuring the correct type will be selected: sparge pipe c/w shroud, flashing gallery and vane inlet device.



Model 750 two phase feed distributor
Sparge pipe c/w shroud, nozzle Ø 12" nb
4270 mm Ø stabilizer column



Model 740 two phase feed distributor
Flashing gallery, nozzle Ø 20" nb
3800 mm Ø CO_2 stripper



Model 760 two phase feed distributor
Vane inlet device, nozzle Ø 1200 mm nb
Column Ø 2800 mm



Model 310 bed limiter for random packing
3810 mm Ø seawater deaeration column

Hold Down Grids (Bed Limiters)

For columns where pressure or flow surges can occur across a bed of random packing, a packing hold down grid (bed limiter) is recommended.

The hold down grid is made from a wire mesh (or expanded metal) screen attached to an annular frame. Free area for vapour and liquid flow is normally greater than 85% of the column cross sectional area.

For small columns one piece construction is used (Model nos. 300 and 301). Segmental construction is used for large diameter columns (Model nos. 310 and 311).

Talk to us about your project

Send us your column data and operating conditions: our engineers will propose the most appropriate design.

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