

# Tower Tray Bulletin 400



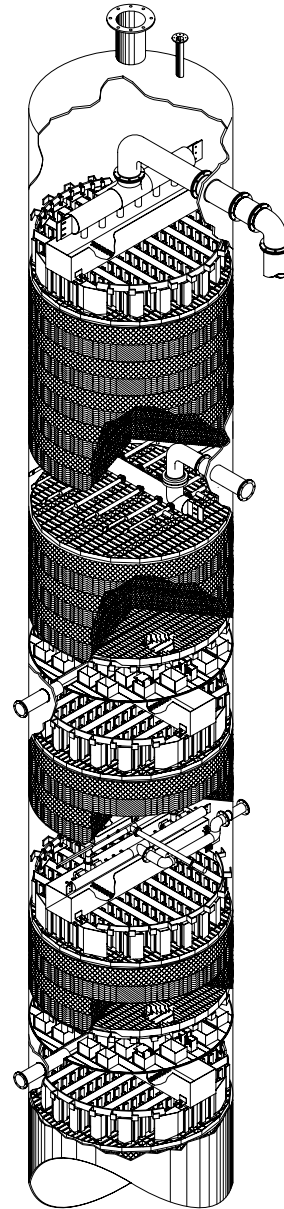
# Table of Contents

|  |    |
|--|----|
| <b>SERVICES AND PRODUCT</b>                              | 3  |
| MP-121 High Efficiency Packing Support                   | 4  |
| MP-201 Vapor Injection Packing Support Plate             | 5  |
| MP-209 Vapor Injection Packing Support Plate             | 6  |
| MP-218 Vapor Injection Packing Support Plate             | 7  |
| MP-351 Disperser Support Plate                           | 8  |
| MP-352 Two-Phase Liquid-Liquid Distributor               | 9  |
| <b>HOLDDOWNS AND BED LIMITERS</b>                        |    |
| MP-421 Structured Packing Holddown Grid                  | 10 |
| MP-461 Packing Bed Limiter                               | 11 |
| <b>LIQUID ACCUMULATORS</b>                               |    |
| MP-501 Collector Tray                                    | 12 |
| MP-521 Collector Tray                                    | 13 |
| MP-531 Collector Tray                                    | 14 |
| <b>LIQUID DISTRIBUTOR TRAYS</b>                          |    |
| MP-551 Riser Type Distributor/Re-distributor             | 15 |
| MP-551D Riser Type Distributor/Re-distributor            | 16 |
| MP-553 Rectangular Riser Type Distributor/Re-distributor | 17 |
| MP-561 Flashing Feed Distributor                         | 18 |
| MP-601 Pan Type Orifice Distributor                      | 19 |
| MP-651 Notched Riser Distributor                         | 20 |
| MP-701 Vee-Notched Distributor                           | 21 |
| MP-711 Slurry Type Distributor                           | 22 |
| MP-721 Narrow Trough Distributor                         | 23 |
| MP-727 Trough Type Liquid Distributor w/Drip Tubes       | 24 |
| MP-871 Wall Wiper  | 25 |
| <b>LIQUID-LIQUID EXTRACTION INTERNALS</b>                |    |
| MP-753 Continuous Phase Distributor                      | 26 |
| MP-754 Dispersed Phase Distributor                       | 27 |
| <b>PIPE DISTRIBUTORS</b>                                 |    |
| MP-901 Pipe Orifice Header (Pressure Fed)                | 28 |
| MP-921 Pipe Orifice Header (Gravity Fed)                 | 29 |
| MP-951 Spray Nozzle Header                               | 30 |
| <b>STRUCTURED GRID</b>                                   |    |
| Type MP-C  | 31 |
| Style MP-II  | 32 |
| Type MP-25A & Style MP-III                               | 33 |
| Grid Thru-Bolt Assembly                                  | 34 |

## Services and Products

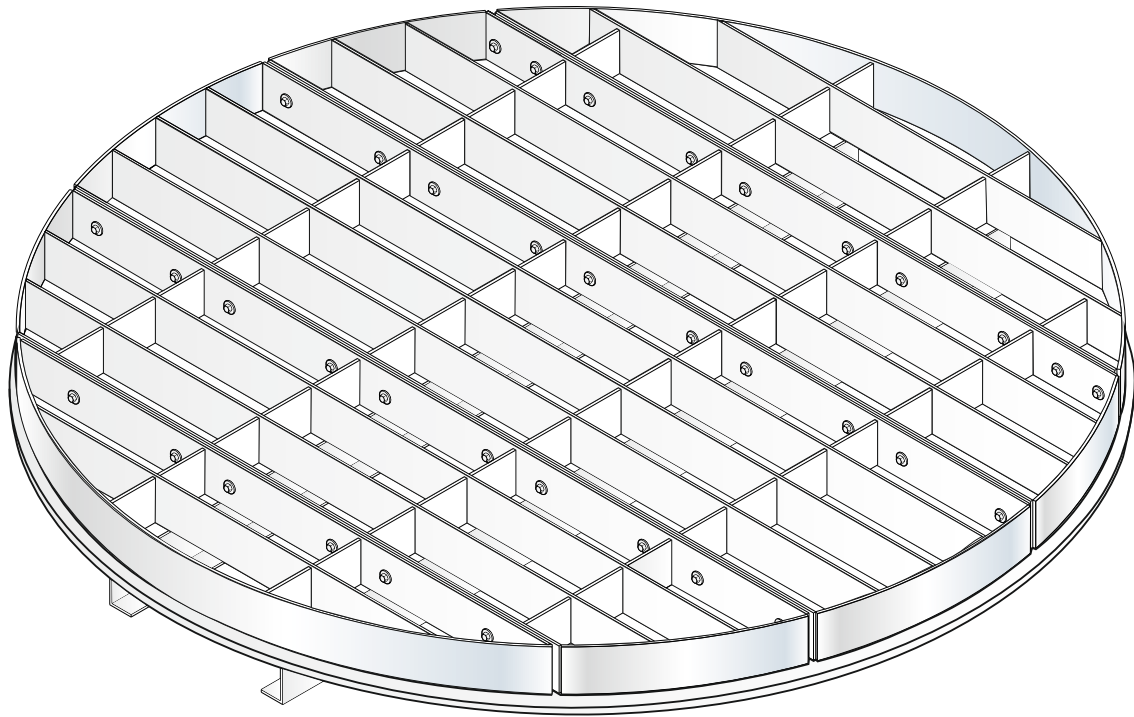
*Manufacturas Petroleras, S.A. de C.V. (MAPESA) designs and manufacture a complete line of packed tower internals to suit virtually any project requirements which may be specified. Our primary packed internal products include support plates and bed limiters for random packing and structured packing, liquid distributors/re-distributors, feed devices, collectors trays, vapor distributors and liquid/liquid extraction internals.*

**MAPESA** offers very competitive pricing for our packed tower internals. We utilize and recommend standard traditional internals, as depicted in this brochure, whenever the needs may be sufficiently accomplished. However, we do not hesitate to custom designs to better accomplish the specific requirements for any project of our undertaking.



Typical Packed  
Tower Elevation

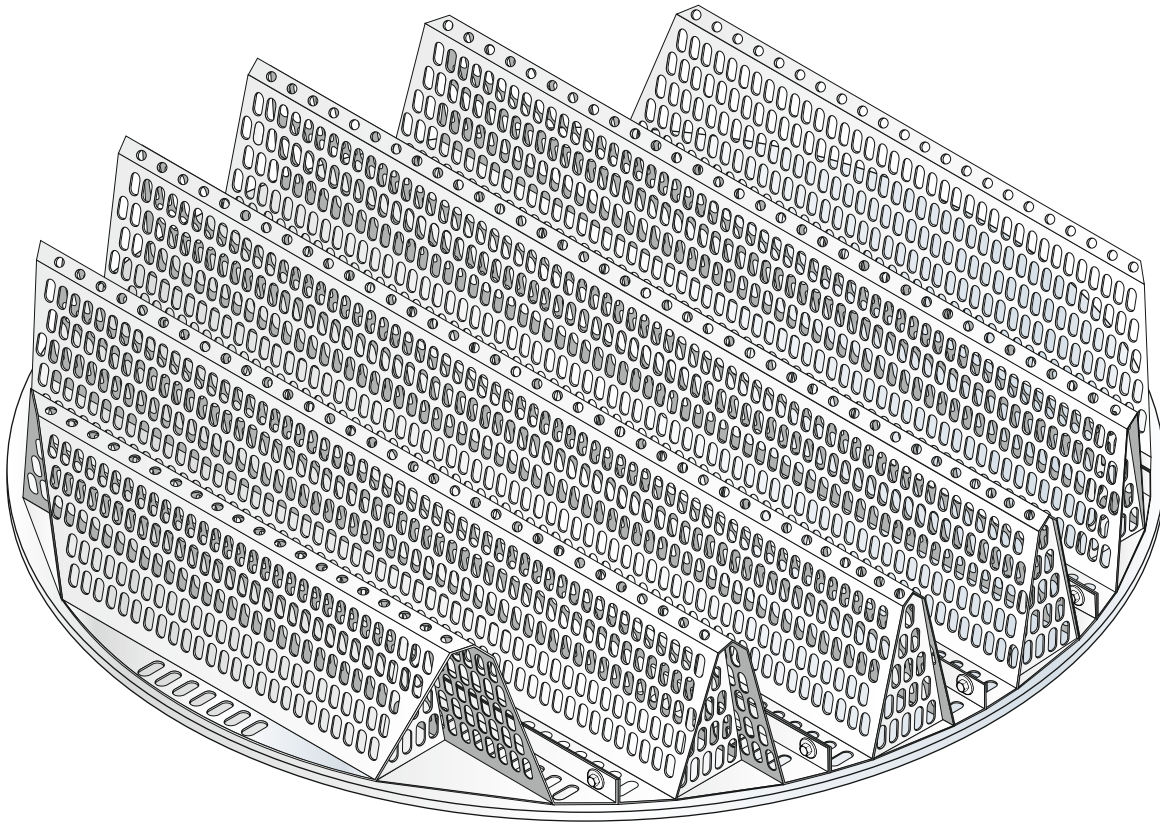
# ***MP-121 (High Efficiency Packing Support)***



## ***Features***

- *Provides minimum vapor/liquid obstruction for support of grid or structured packing.*
- *May be supported from flat bar support ring or beams or support rings with free flow features.*
- *Bars are usually 3" high on 3" centers with a minimum thickness of 12 ga.*
- *Panels are 15" wide and are bolted together at sides and ends.*

## ***MP-201 (Vapor Injection Packing Support Plate)***

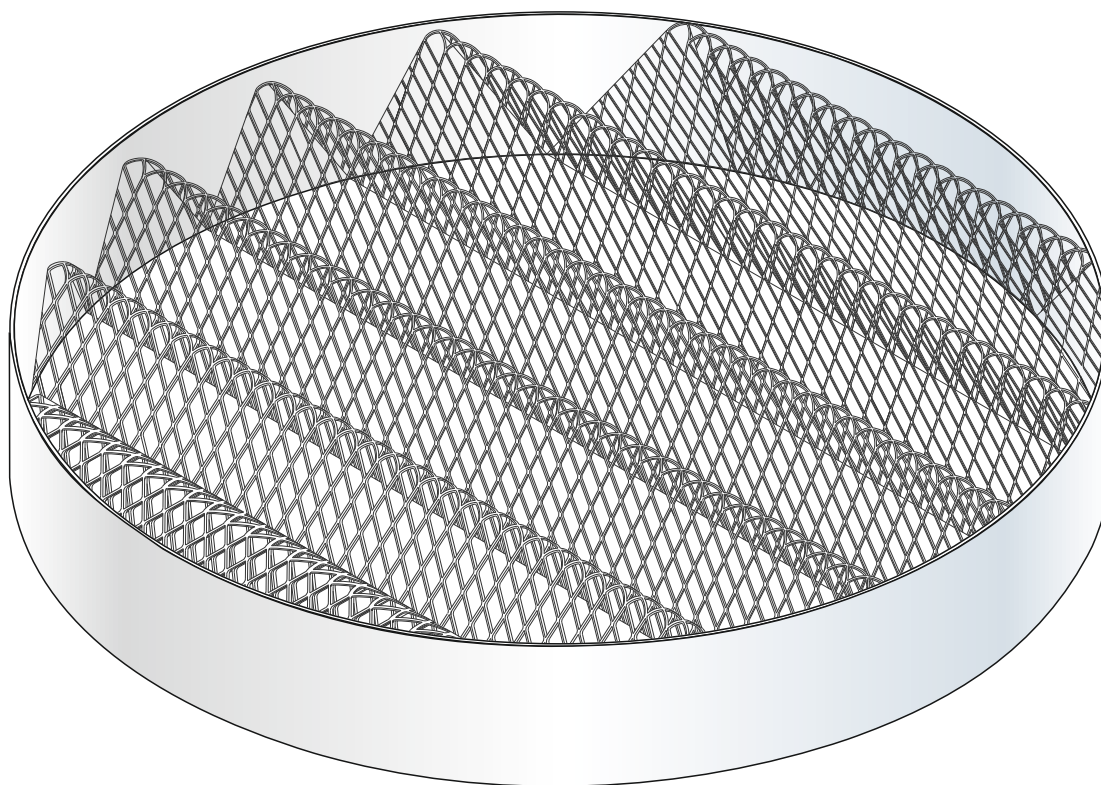


### ***Features***

- *Provides vapor injection support for random packing for tower diameters 3 feet and greater.*
- *Open area is approximately 100 percent of the tower area.*
- *Provides separate paths for vapor and liquid.*
- *Special slotting can be provided to retain smaller packing.*
- *Rigid construction typically does not require beams for diameters up to 12 feet.*
- *Easily installed by attachment to a flat bar support ring.*



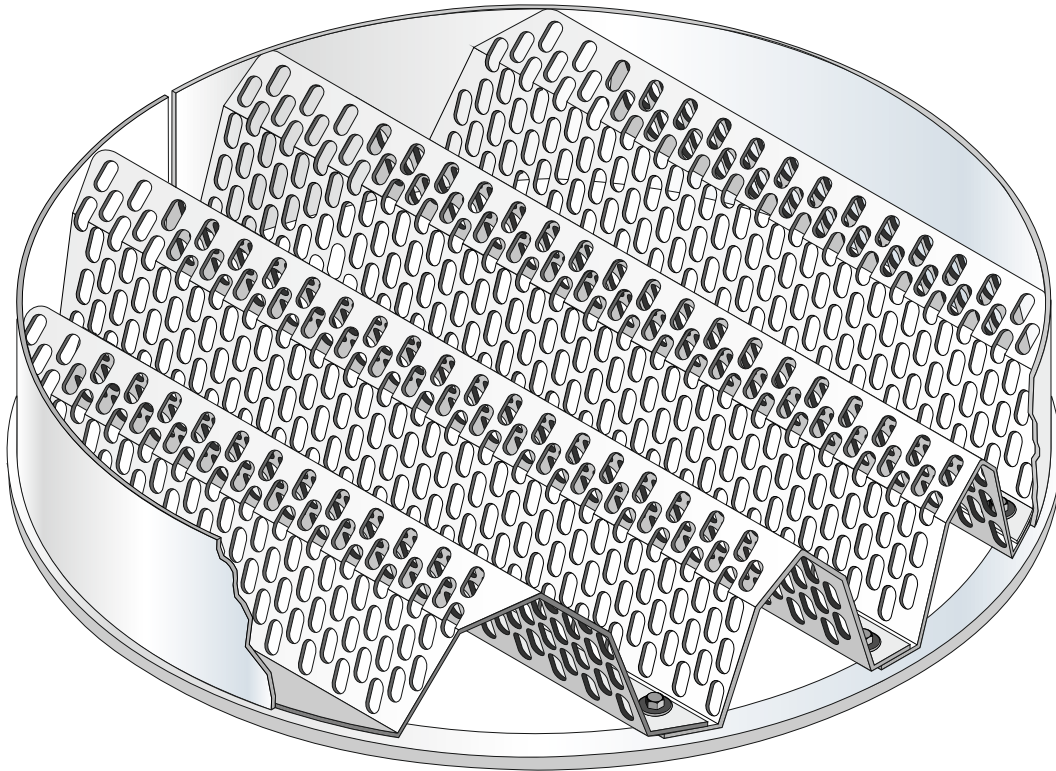
## ***MP-209 (Vapor Injection Packing Support Plate)***



### ***Features***

- *Provides vapor injection support for random packing for towers up to 2 feet in diameter.*
- *2" high x 2" wide corrugated sections in 16" panel widths.*
- *Fabricated from 1/2 # 16 expanded metal for support of very small packing.*
- *Installed on flat bar support ring.*

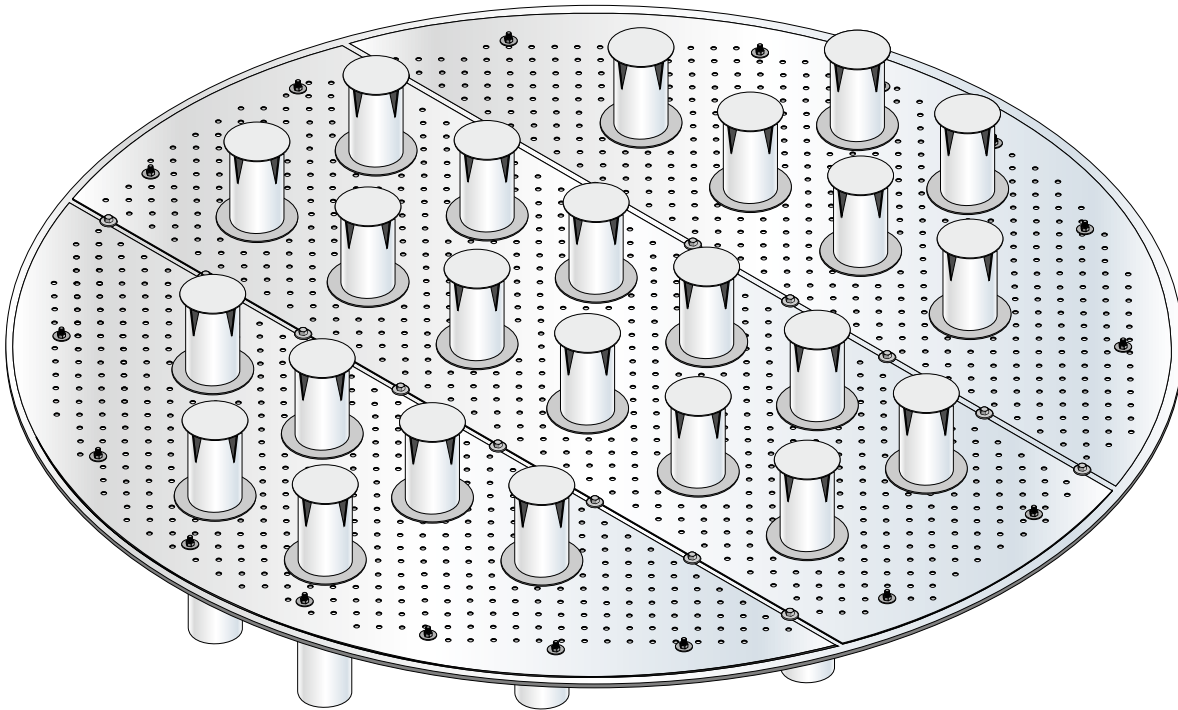
## ***MP-218 (Vapor Injection Packing Support Plate)***



### ***Features***

- *Provides vapor injection support for random packing for smaller diameter towers.*
- *Custom design slotting for maximum open area.*
- *Slots are designed to support a multitude of packing sizes and configurations.*
- *Rigidly constructed as a one piece unit with a total height of 4 1/2".*
- *Easily installed by attachment to a flat bar support ring.*

# ***MP-351 (Disperser Support Plate)***

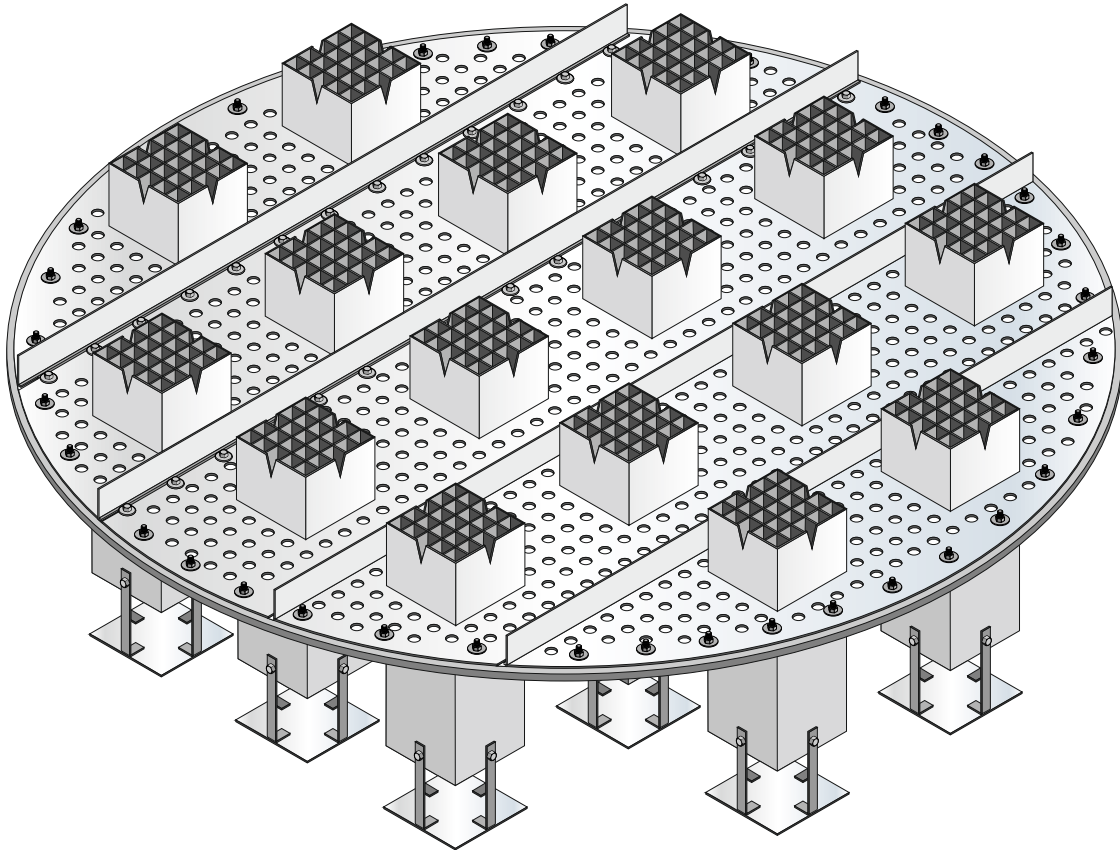


## ***Features***

- *A dispersed phase distributor/re-distributor which provides support for random packing in liquid to liquid contactors.*
- *Height requirement of 12" to 20".*
- *Provided with a perforated tray floor and 2.125" o.d. Notched risers on a spacing to yield approximately 0.75 risers/sq. Ft.*
- *Risers to have hats and are to extend 3" above and 6" below the tray.*
- *Supported from flat bar support ring, integral trusses and beams.*



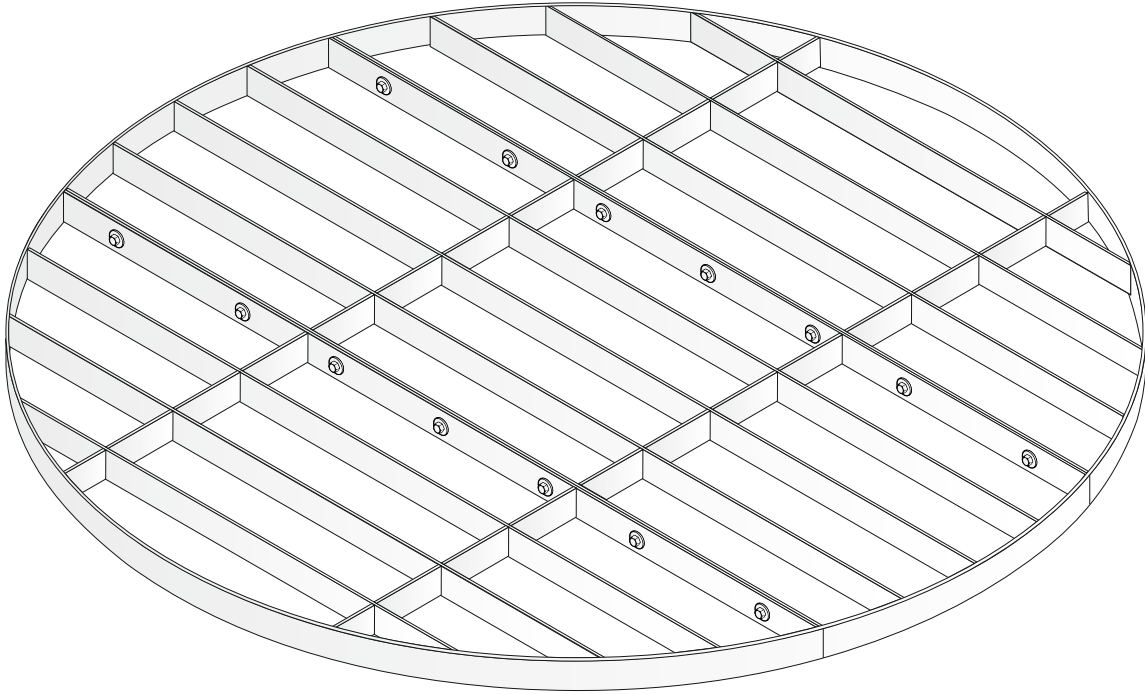
## ***MP-352 (Two-phase Liquid-liquid Distributor)***



### ***Features***

- *Provides distribution and serves as support for random packing in liquid to liquid contactors.*
- *Height requirement of 12" to 20"*
- *Provided with a perforated tray floor and 6" square notched risers 3" above and 6" below tray, with square hats.*
- *Supported from flat bar support ring with trusses and beams on top side.*

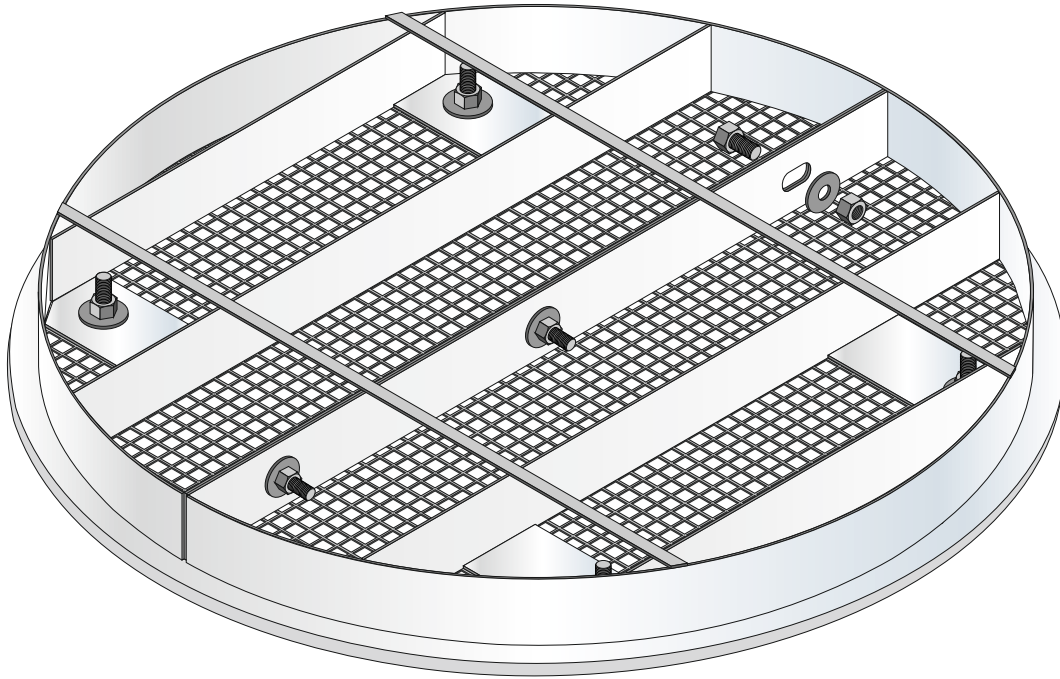
## ***MP-421 (Structured Packing Holddown Grid)***



### ***Features***

- *Provides minimum vapor/liquid obstruction for holddown of structured packing.*
- *Bars are usually 2" high on 5" centers with a minimum thickness of 14 ga.*
- *Panels are 15" wide and are bolted together at sides and ends.*
- *Rests directly on top of packing and is held down with shell clips, channels or from clips and rods from distributor tray or spray header above.*

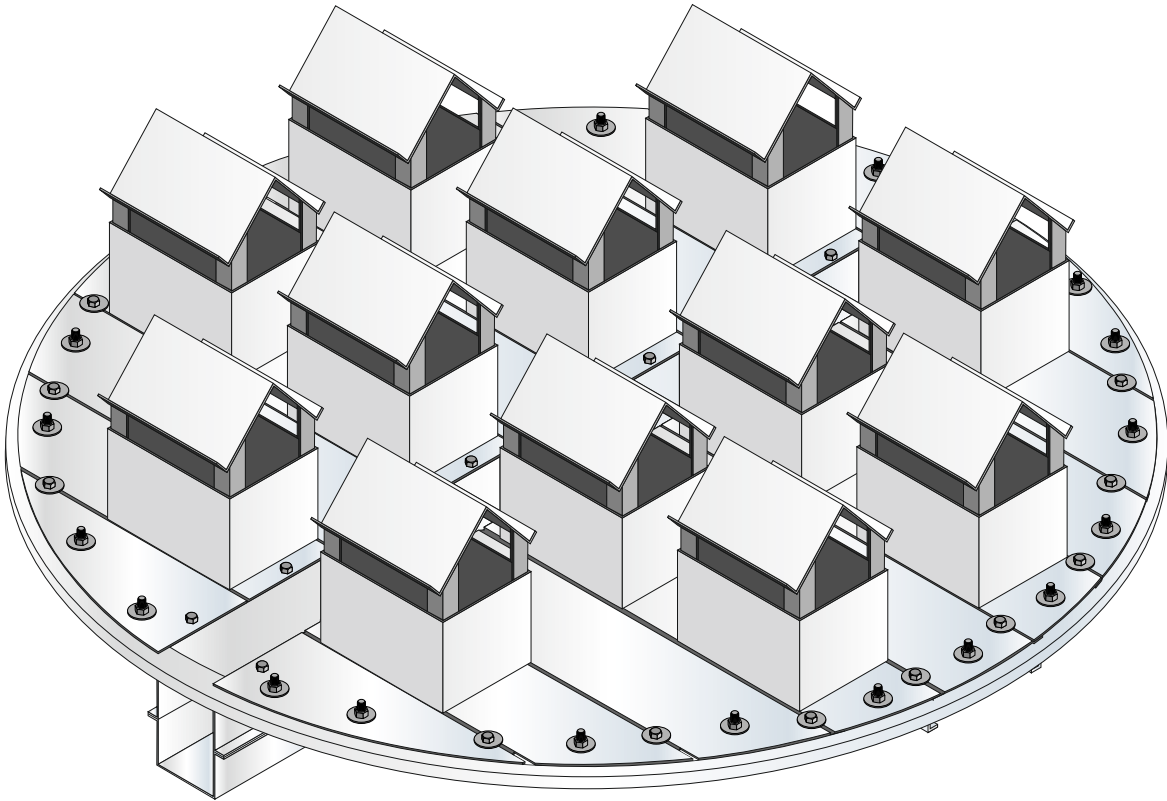
## ***MP-461 (Packing Bed Limiter)***



### ***Features***

- *Provides holddown capability for random packings of 5/8" diameter and larger.*
- *Rigidly bolted together or provided in a sturdy one piece construction.*
- *Custom designed to meet all diameter and mechanical requirements.*
- *Easily installed by attachment to either a flat bar support ring or from rods attached to distributor above.*

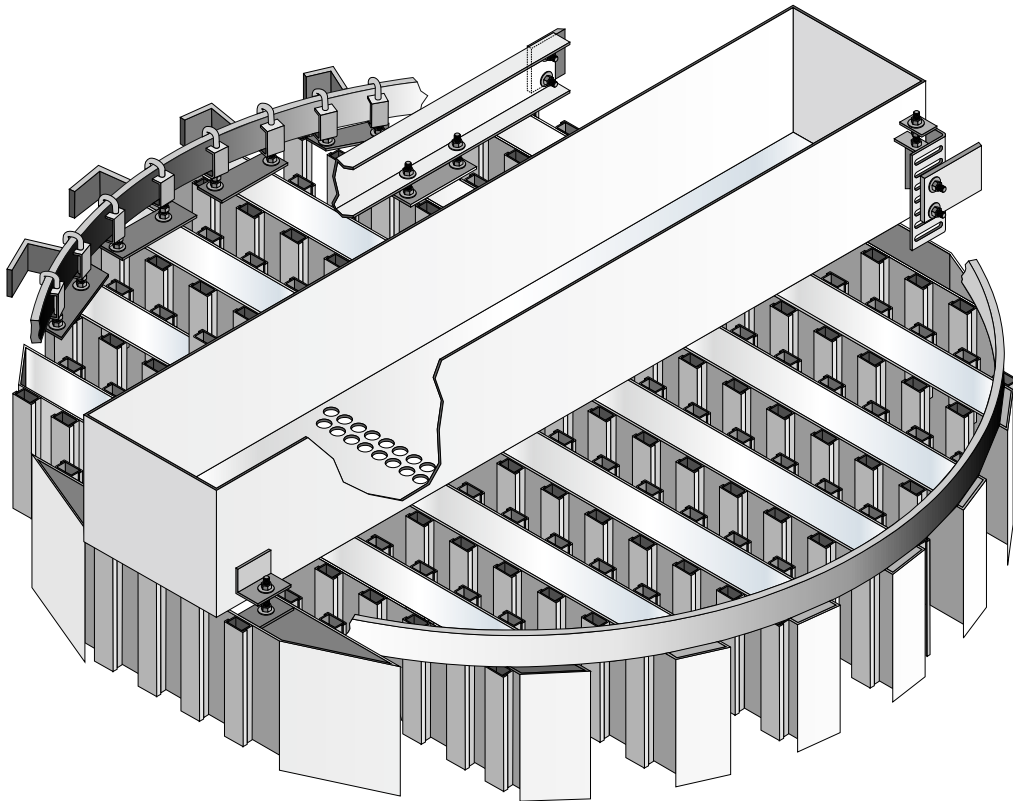
## ***MP-501 (Collector Tray)***



### ***Features***

- *Standard performance liquid collector with rectangular risers.*
- *Options include bolted & gasketed or leak free seal welded constructions.*
- *Hats may be removable for stacks to serve as manway passage.*
- *May include side, center or off-center sumps.*
- *Supported from flat bar support ring, integral trusses and beams.*

## ***MP-521 (Collector Tray)***

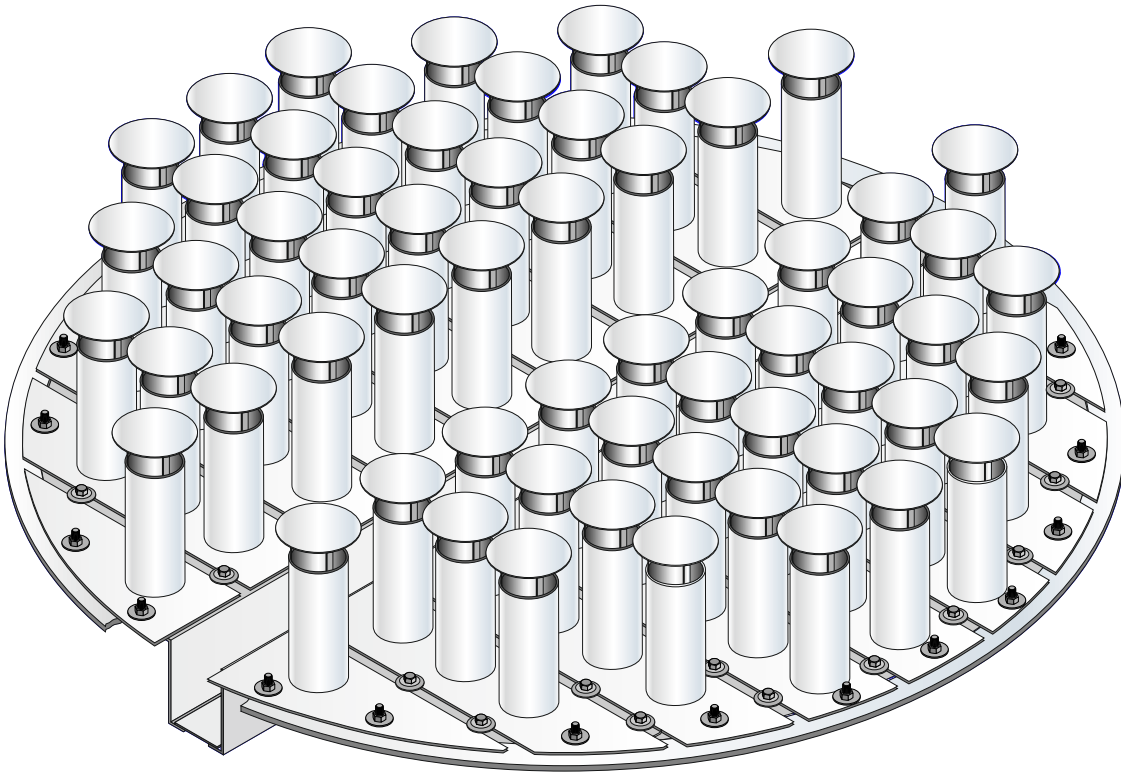


### ***Features***

- *High open area liquid collector with troughs which form risers and drain to center sump.*
- *Options include bolted & gasketed or leak free seal welded constructions.*
- *Height requirement of 30" to 48".*
- *Provides approximately 40% open area.*
- *Fully utilizes strength of sump walls whereby major beams are usually not required.*
- *Supported from flat bar support ring.*



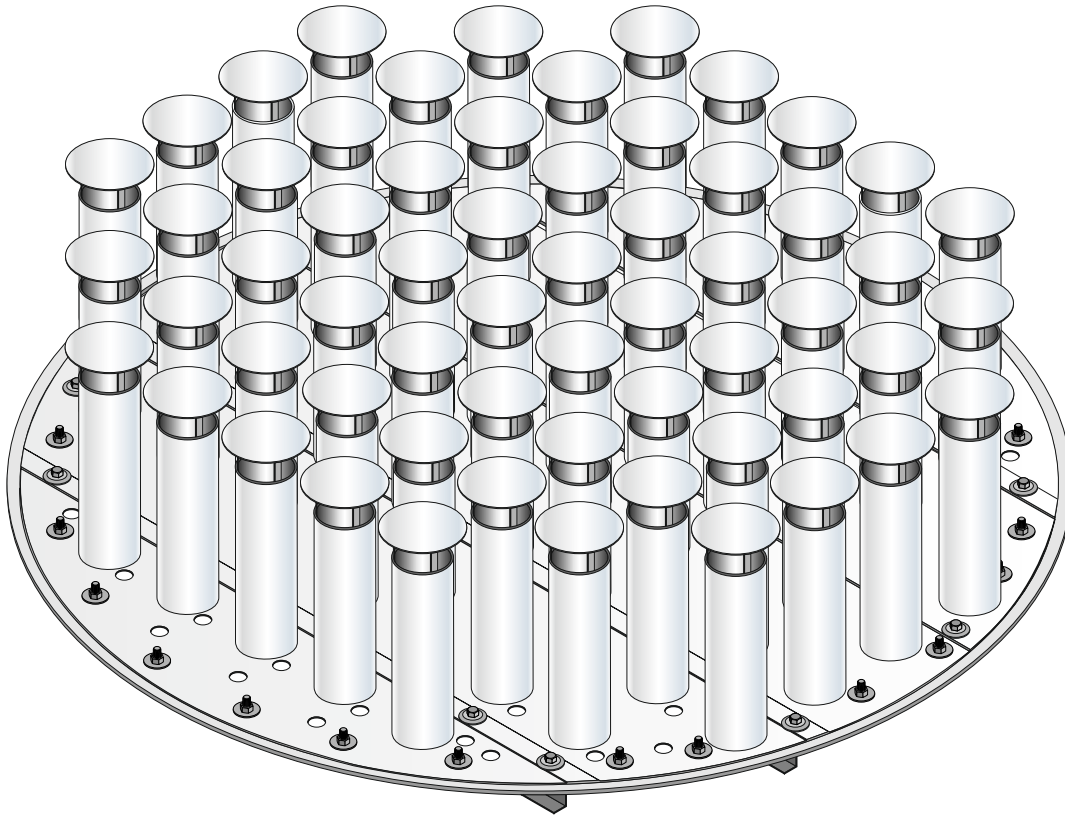
## ***MP-531 (Collector Tray)***



### ***Features***

- *Multiple risers uniformly distribute vapor.*
- *Optional orifices may be used under risers for controlled pressure drop and vapor distribution.*
- *Optional bubble cap style hats improve vapor distribution to packed bed.*
- *Tapered edge hats prevent liquid entry into riser from migration under hat.*
- *Supported from flat bar support ring, integral trusses and beams or sump walls.*

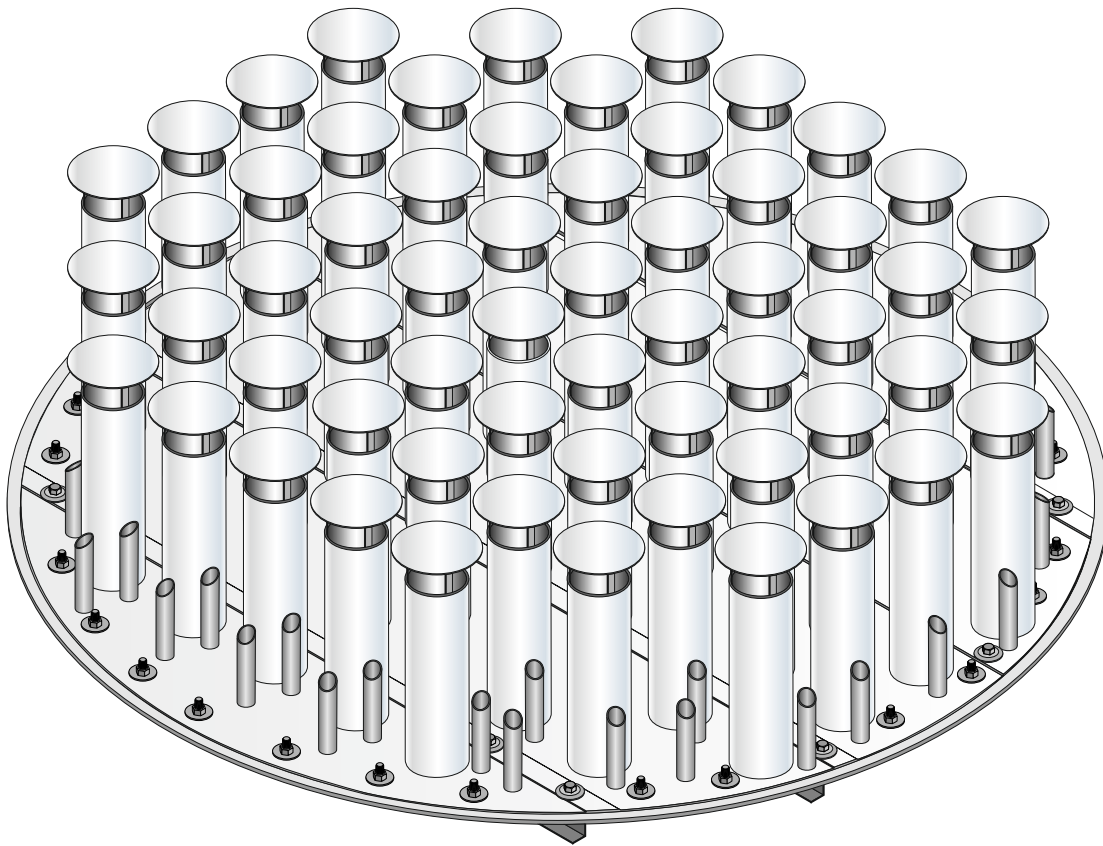
## ***MP-551 (Riser Type Distributor/re-distributor)***



### ***Features***

- *Provides uniform vapor and liquid distribution in clean service.*
- *Commonly used in small to medium sized towers.*
- *May be used as a re-distributor if optional riser hats are utilized.*
- *Supported from flat bar tray support ring.*
- *Utilizes integral trusses with major beam for larger diameters.*
- *Does not require a collector when used as a re-distributor.*

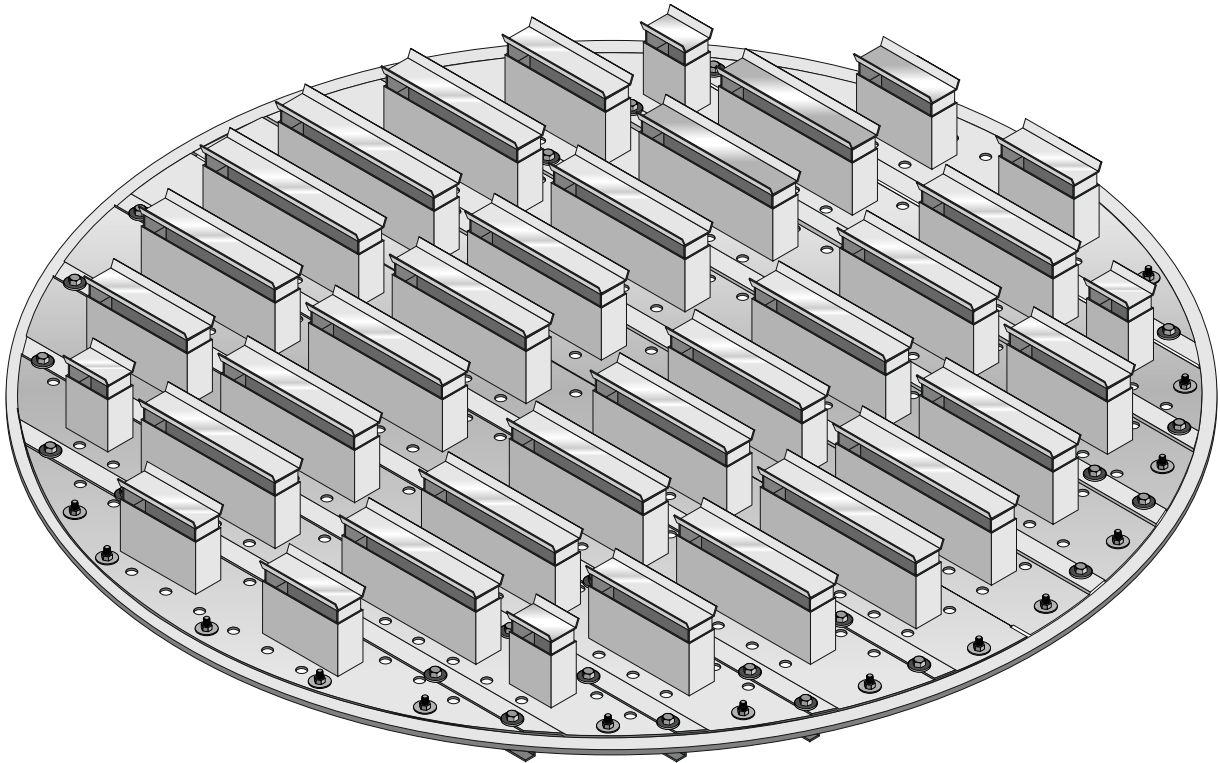
## ***T-551 D (Riser Type Distributor/re-distributor)***



### ***Features***

- *Similar to t-551 except drip tubes are utilized.*
- *Provides uniform vapor and liquid distribution in clean service.*
- *Commonly used in small to medium sized towers.*
- *May be used as a re-distributor if optional riser hats are utilized.*
- *Supported from flat bar tray support ring.*
- *Utilizes integral trusses with major beam for larger diameters.*
- *Does not require a collector when used as a re-distributor.*
- *May incorporate antimigration features.*

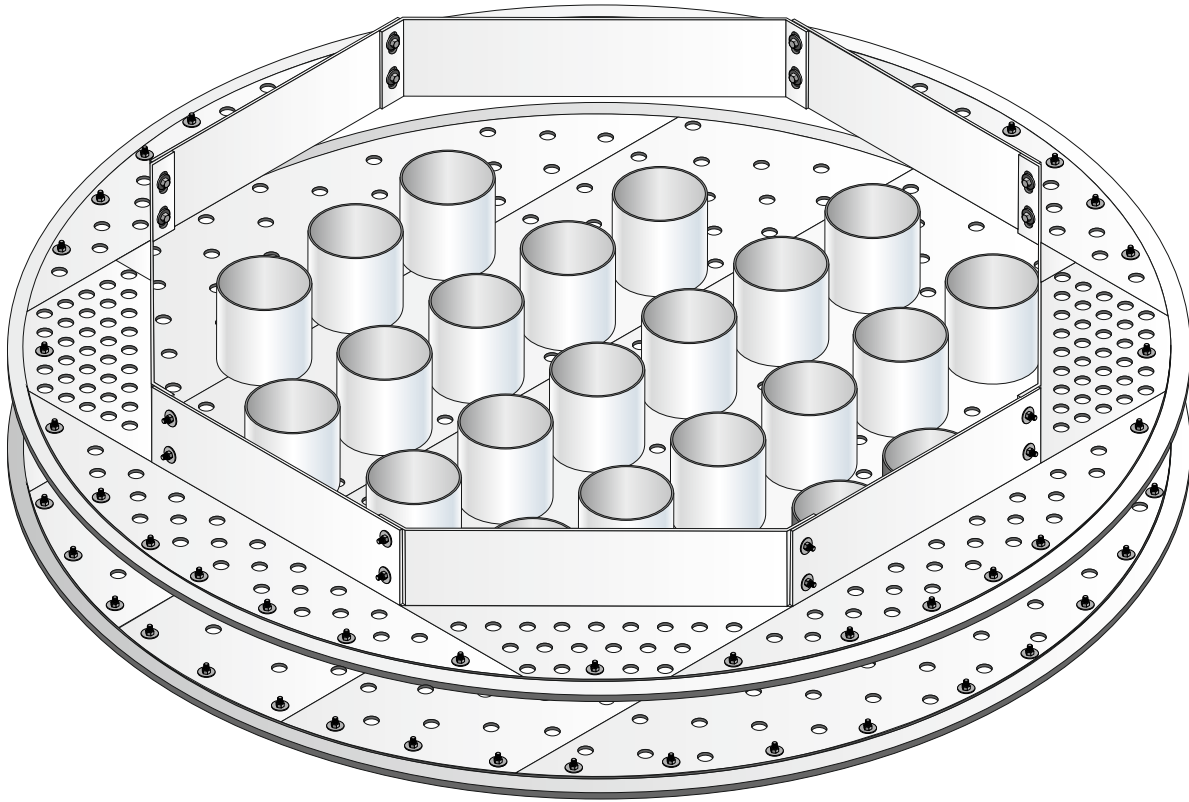
## ***T-553 (Rectangular Riser Type Distributor/Re-Distributor)***



### ***Features***

- *Provides liquid distribution to dumped or structured packing beds.*
- *Utilizes rectangular risers without sacrificing uniform liquid distribution.*
- *Options include hats over risers (for use as a redistributor), antimigration bars (to serve as bed limiter) and drip tubes in lieu of standard design which utilizes feed holes in tray floors.*
- *Supported from flat bar tray support ring.*
- *Utilizes integral trusses for support with major beams for larger diameters.*
- *Does not require a collector when used as a re-distributor.*

## ***T-561 (Flashing Feed Distributor)***

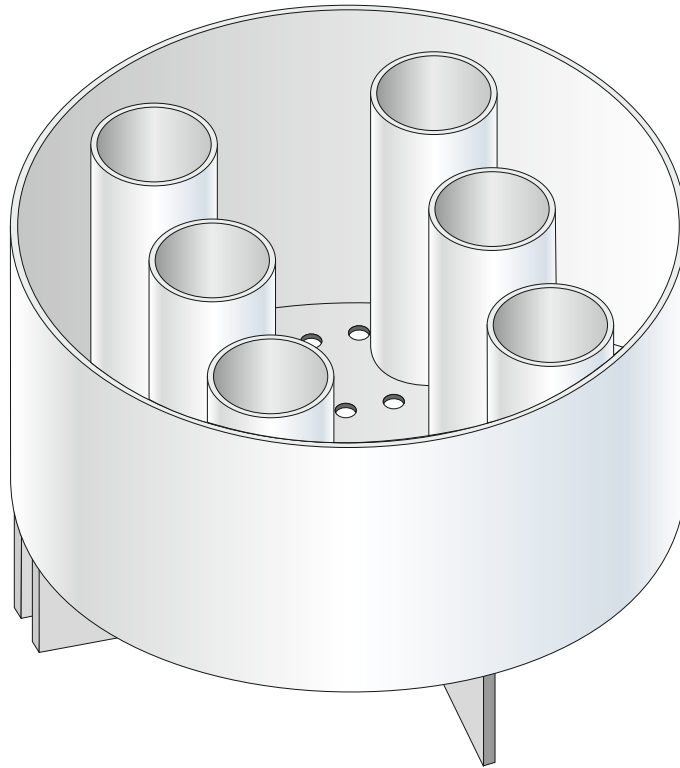


### ***Features***

- *Provides liquid distribution for severely flashing feeds.*
- *Height requirement 24" to 42" total.*
- *Inlet vanes guide feed tangentially to diffuse the flashing energy.*
- *Residence time in gallery allows good separation of flashed vapors.*
- *Distribution pan under gallery offers uniform liquid distribution.*
- *Supported from flat bar support ring, integral trusses and beams.*



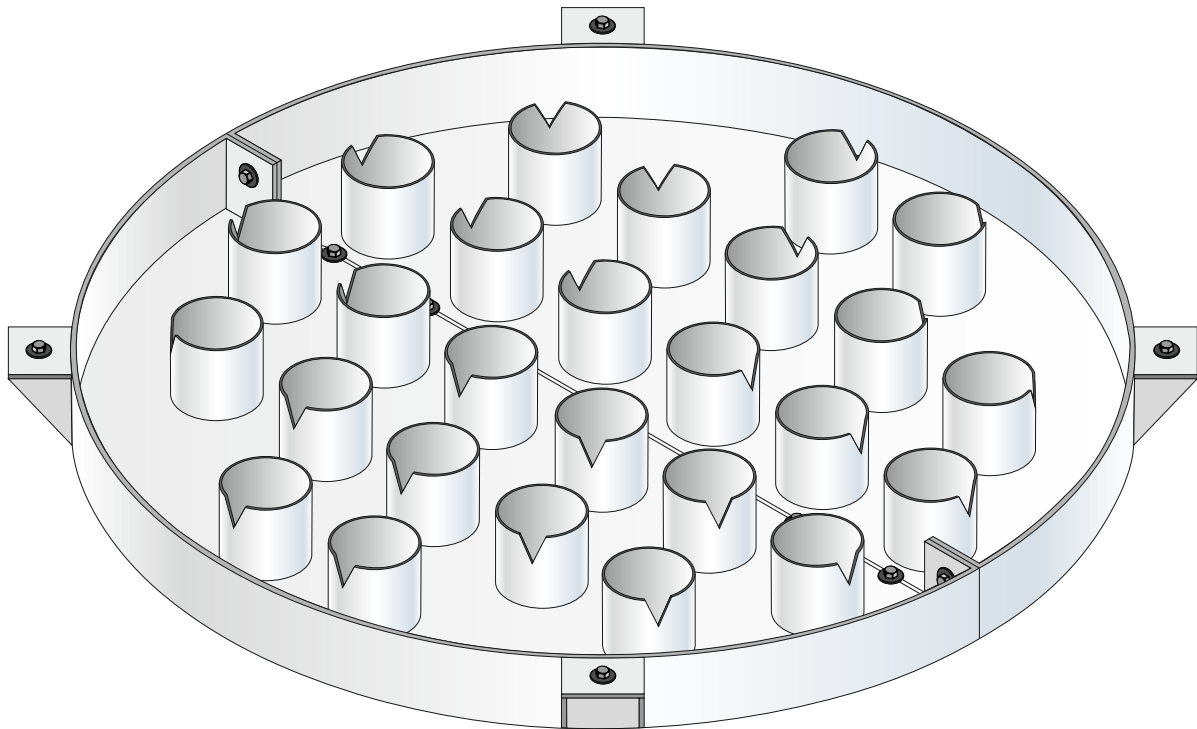
## ***T-601 (Pan Type Orifice Distributor)***



### ***Features***

- *Provides uniform liquid distribution for small towers.*
- *May be equipped with riser hats when utilized for re-distributor service.*
- *Provides for annular vapor flow area.*
- *Custom design to meet all process and mechanical requirements.*
- *Easy installation onto support lugs or rods.*

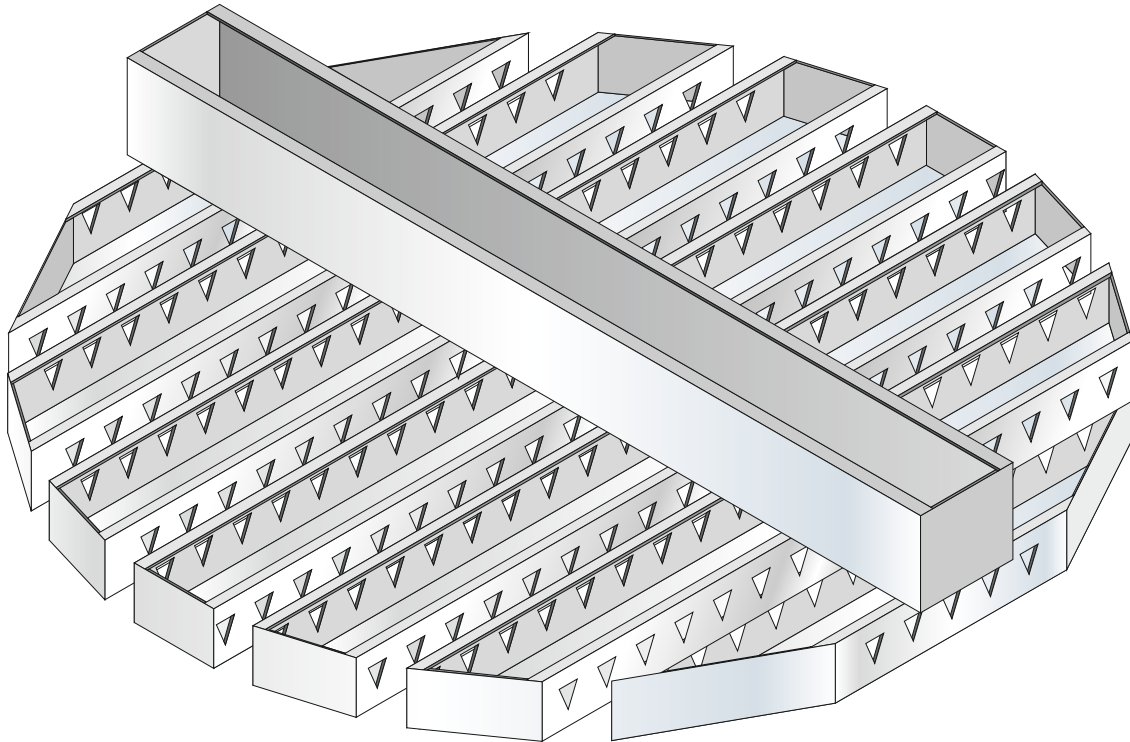
## ***T-651 (Notched Riser Distributor)***



### ***Features***

- *Provides liquid distribution for random or structured packing.*
- *Provides for annular vapor flow area.*
- *Supported from shell clips and integral trusses.*
- *Risers are arranged similar to "t-551".*
- *Each riser is to have a v-notch oriented radially from tower center line.*
- *Feed holes are not located in the tray floor.*

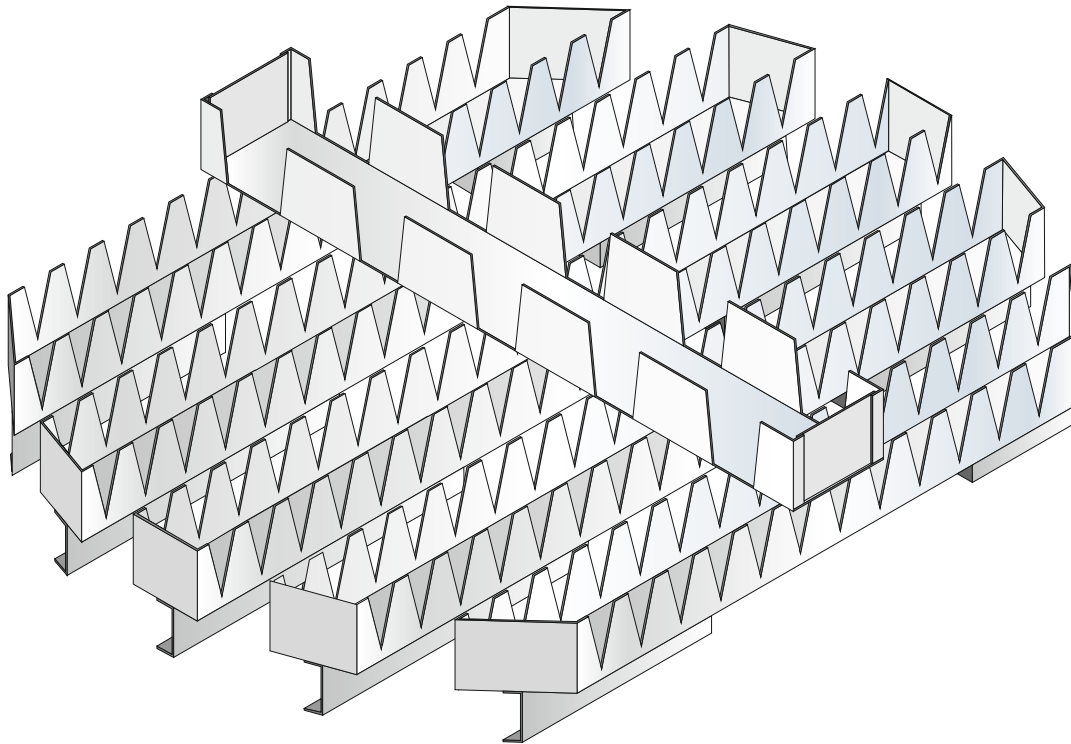
## ***T-701 (Vee-Notched Distributor)***



### ***Features***

- *Provides uniform liquid distribution for fouling service.*
- *Height requirement of 20" to 30"*
- *Utilizes one parting box for diameters up to 10 feet and two parting boxes for diameters up to 20 feet.*
- *Plugging resistant design with high open area.*
- *Supported from shell clips, parting box and beams when required.*

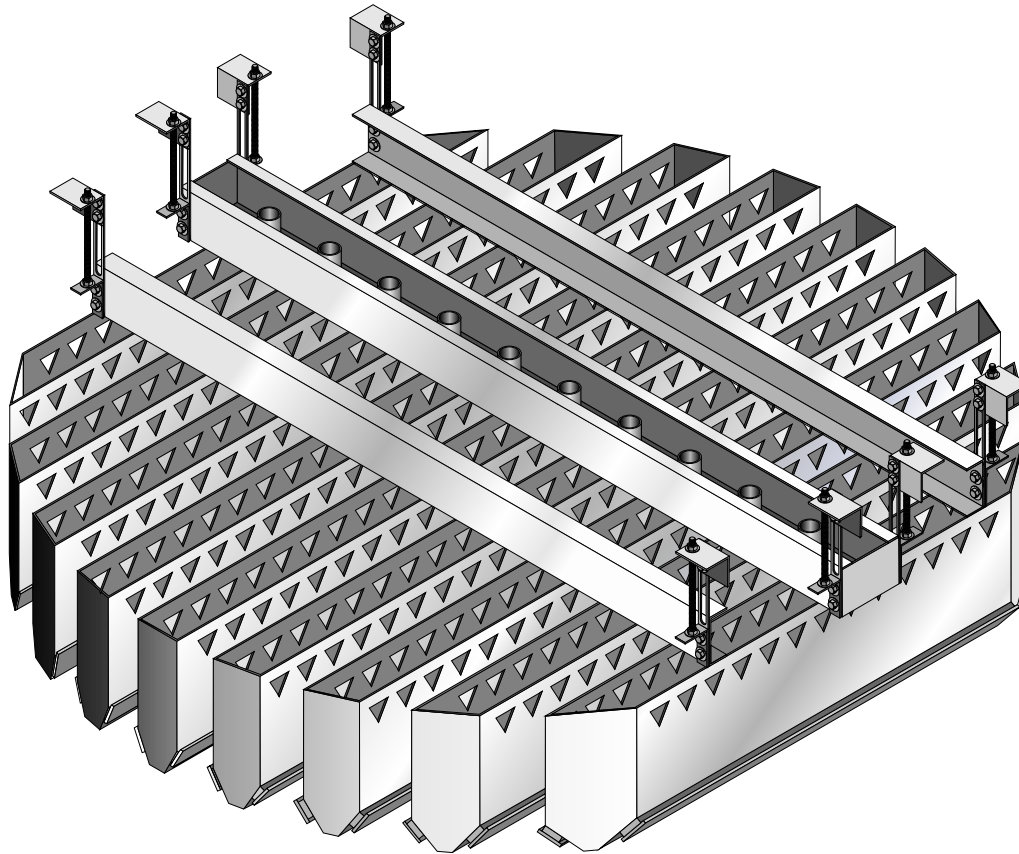
## ***MP-711 (Slurry Type Distributor)***



### ***Features***

- *Provides uniform liquid distribution for slurry service.*
- *Height requirement of 24" to 36".*
- *Provides fouling resistant distribution with high open area.*
- *Utilizes special v-notches. Otherwise, it is similar to the "t-701" v-notched distributor.*
- *Utilizes one or more parting boxes.*
- *Supported from shell clips, parting box and beams.*

## ***MP-721 (Trough Type Liquid Distributor With Deflector Plates)***

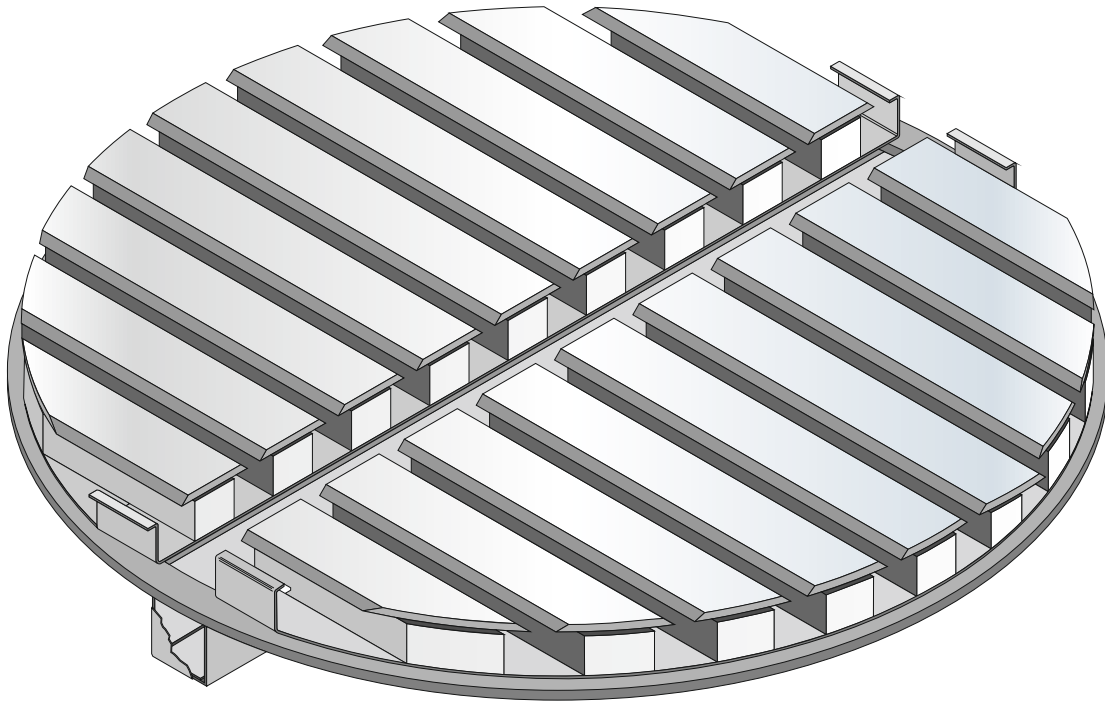


### ***Features***

- *Provides uniform liquid distribution for high purity systems.*
- *Height requirement of 20"-28".*
- *Utilizes deflectors to direct and spread drip point coverage to enhance distribution.*
- *Simplifies liquid feed by utilizing one parting box for tower diameters of up to 10 feet and two parting boxes for diameters up to 20 feet.*
- *Distributors with two or more parting boxes are equipped with equalization tubes between the boxes to enhance optimum liquid distribution.*
- *Diffusers are provided to keep the liquid calm.*
- *Easily installed and leveled.*
- *Supported from shell clips, parting box & beams when required.*



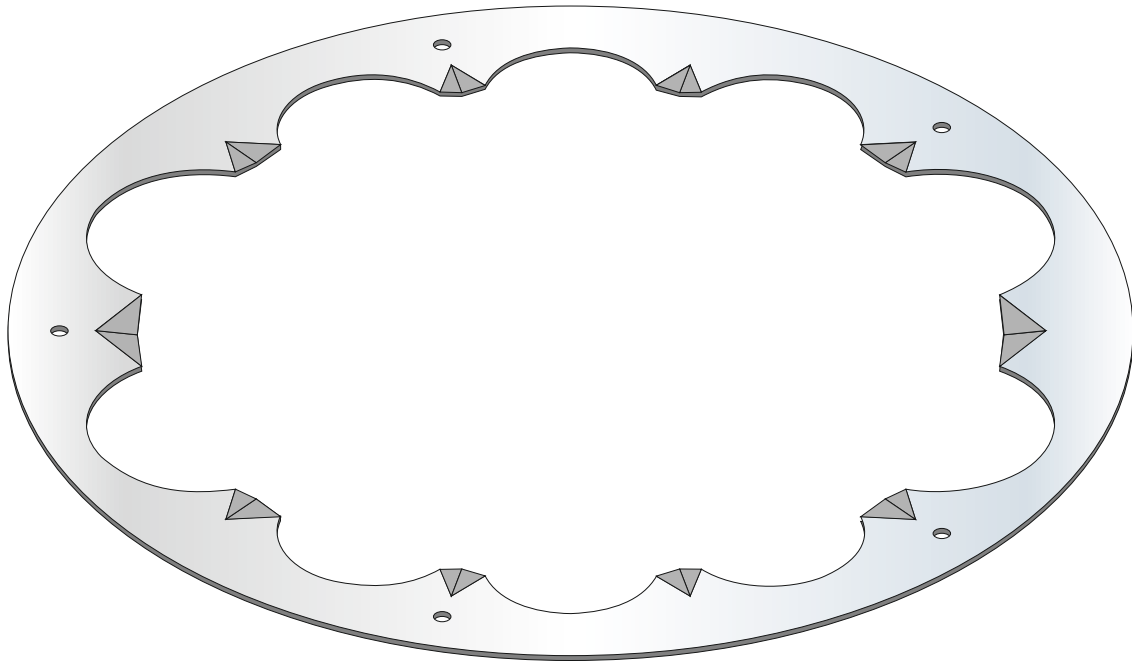
## ***MP-727 (Trough Type Liquid Distributor With Drip Tubes)***



### ***Features***

- *Provides uniform liquid distribution for high purity systems.*
- *Height requirement of 20"-28".*
- *Simplifies liquid feed by utilizing one parting box for tower diameters of up to 10 feet and two parting boxes for diameters up to 20 feet.*
- *Distributors with two or more parting boxes are equipped with equalization tubes between the boxes to enhance optimum liquid distribution.*
- *Diffusers are provided to keep the liquid calm.*
- *Easily installed and leveled.*
- *Supported from shell clips, parting box & beams when reqd.*

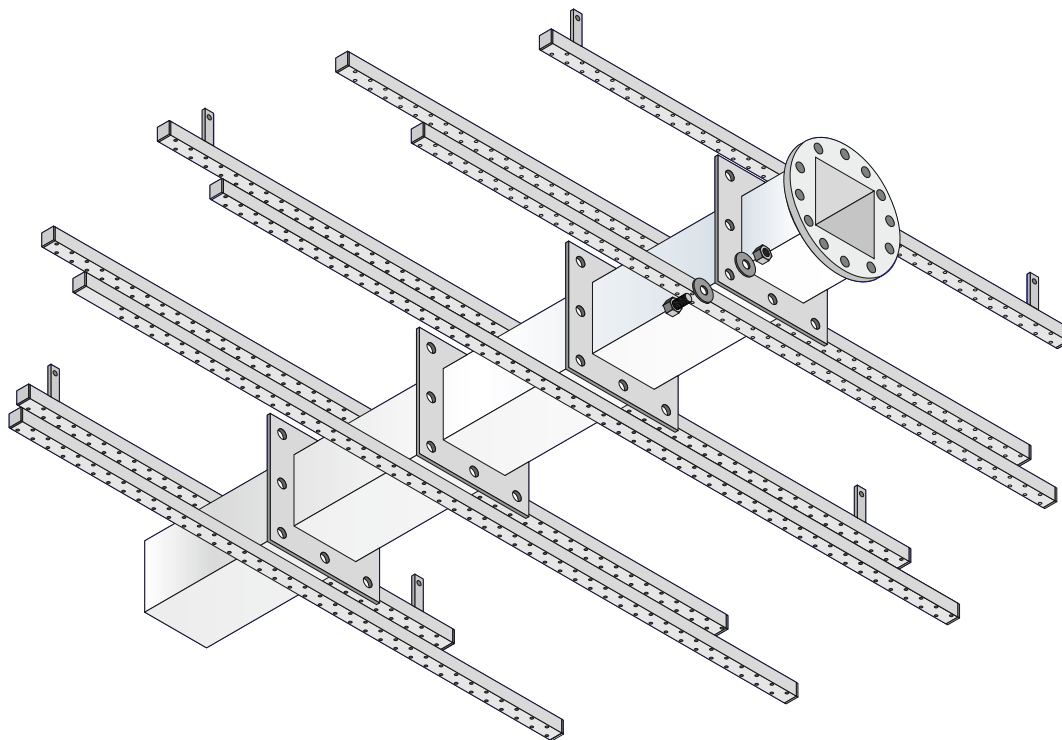
## ***MP-871 (Wall-wiper Re-distributor)***



### ***Features***

- *Provides re-distribution of liquid away from tower shell toward the packed bed.*
- *Normally provided from 10 ga. For carbon steel material or 12 ga. For stainless material.*
- *Light seal weld is adequate for attachment to column wall.*

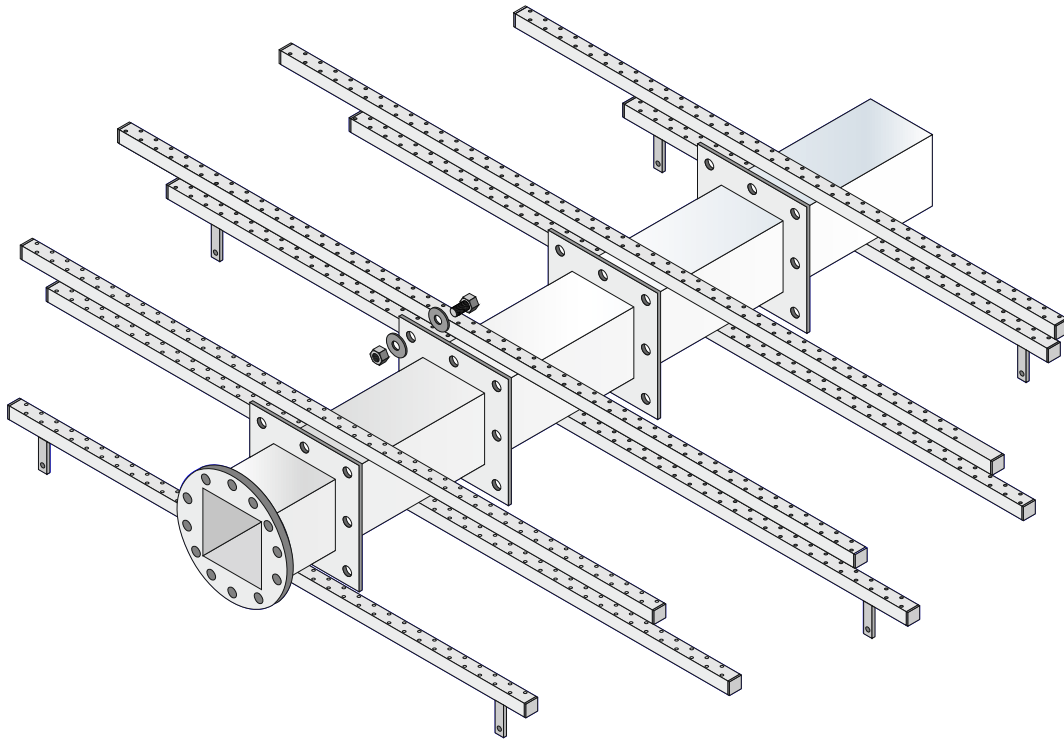
## ***MP-753 (Continuous Phase Distributor)***



### ***Features***

- *Provides uniform and dense distribution with minimized obstruction to flow around the distributor.*
- *Utilized in liquid-liquid contactors.*
- *Orifices in mainline are sized to proportionally feed secondary lines.*
- *Utilizes square mainline and offset square laterals.*
- *Secondary line have distribution orifices pointing downward.*
- *Supported from internal shell nozzle projection and support clips welded to shell.*

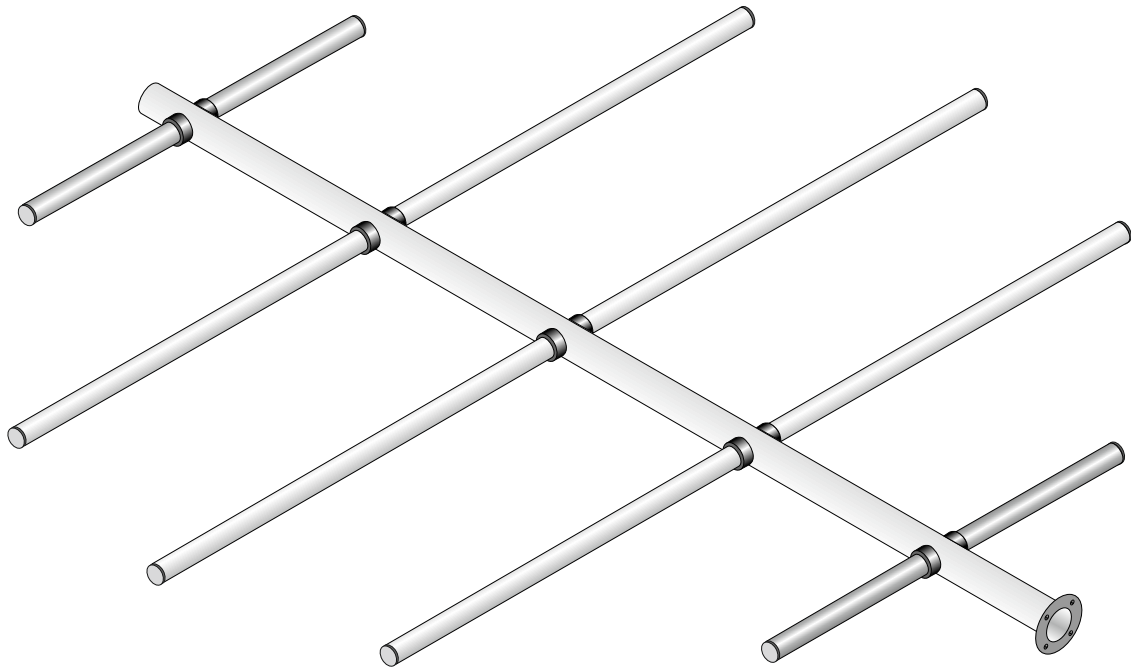
## ***MP-754 (Dispersed Phase Distributor)***



### ***Features***

- *Provides uniform and dense distribution with minimized obstruction to flow around the distributor.*
- *Utilized in liquid-liquid contactors.*
- *Orifices in mainline are sized to proportionally feed secondary lines.*
- *Utilizes square mainline and offset square laterals.*
- *Secondary lines have distribution orifices pointing upward.*
- *Supported from internal shell nozzle projection and support clips welded to shell.*

## ***MP-901 (Pipe Orifice Header)***

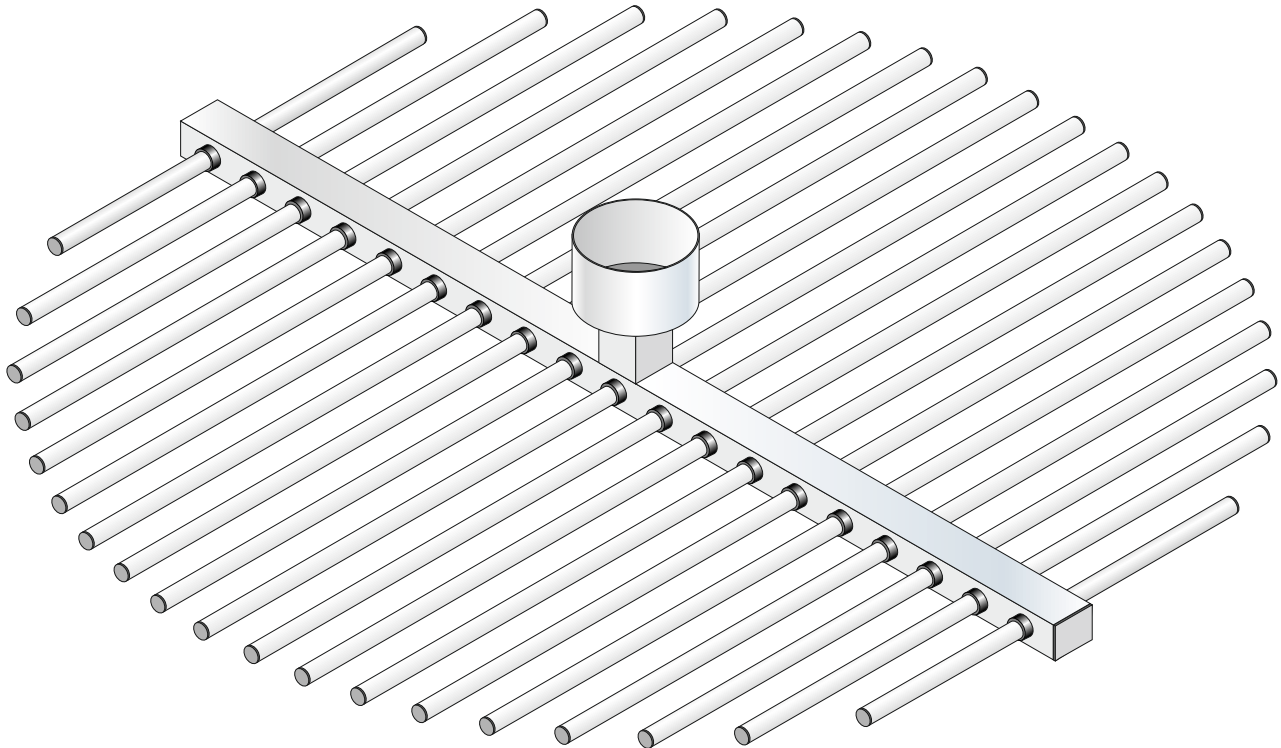


### ***Features***

- *Pressure fed liquid distributor which may be used for dumped or structured packing.*
- *Lateral lines are on 4" to 6" centers, and should be 1" to 2" smaller than mainline.*
- *Supported from internal shell nozzle projection and clips welded to shell and beams.*
- *Requires a minimum height of mainline diameter plus 6".*



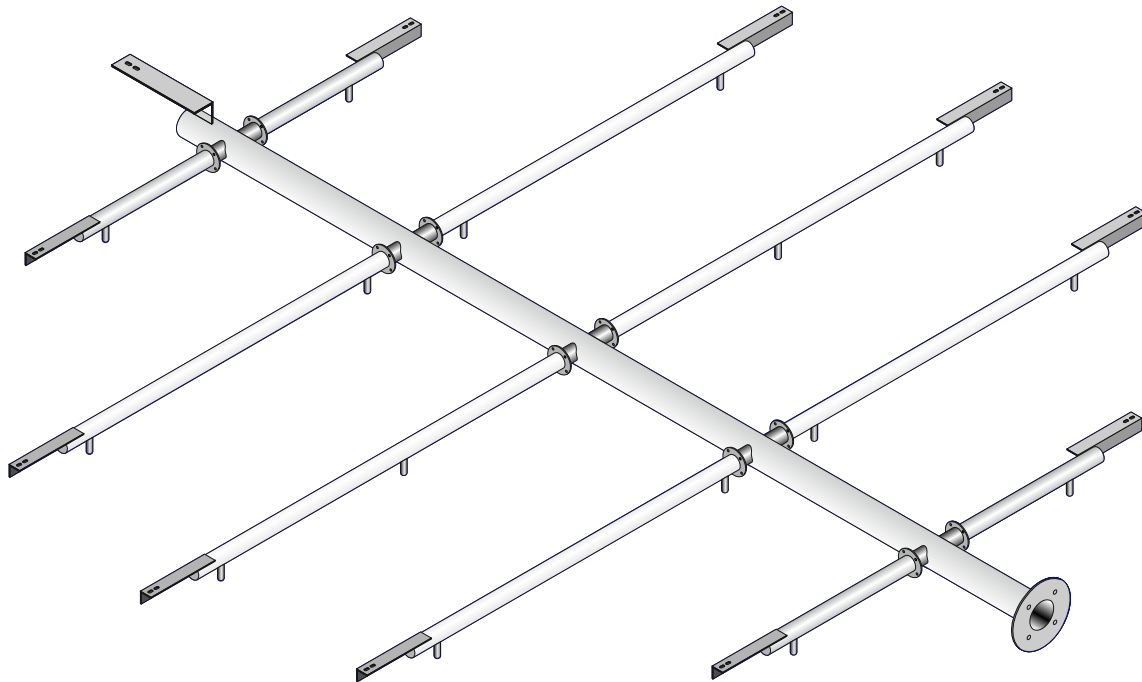
## ***MP-921 (Pipe Orifice Header)***



### ***Features***

- *Provides uniform distribution pattern with high open area.*
- *Mainline may be square or round.*
- *Lateral lines are located on 4" to 6" centers.*
- *Supported from shell clips and/or support beams.*
- *Gravity fed liquid distributor which can be used as a re-distributor with chimney tray.*

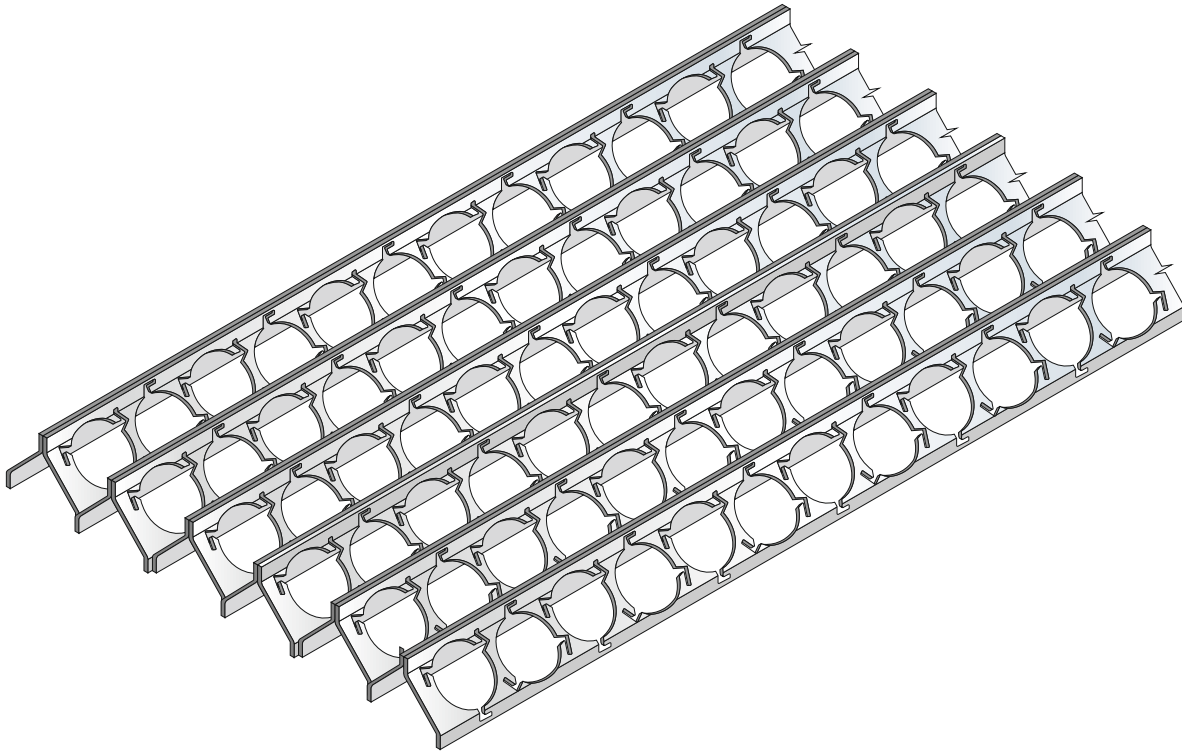
# ***MP-951 (Spray Nozzle Header)***



## ***Features***

- *Pressure fed liquid distributor which may be used for dumped or structured packing.*
- *Available in 1, 3, 7, 19, 37 and 61 optimum nozzle distribution systems.*
- *Supported from internal shell nozzle projection and clips welded to shell.*
- *Designed for complete coverage of cross section with 30% to 100% overlap of spray circles.*
- *Plugging resistant nozzles are available.*
- *Requires a minimum height of mainline diameter plus 18" to 42".*

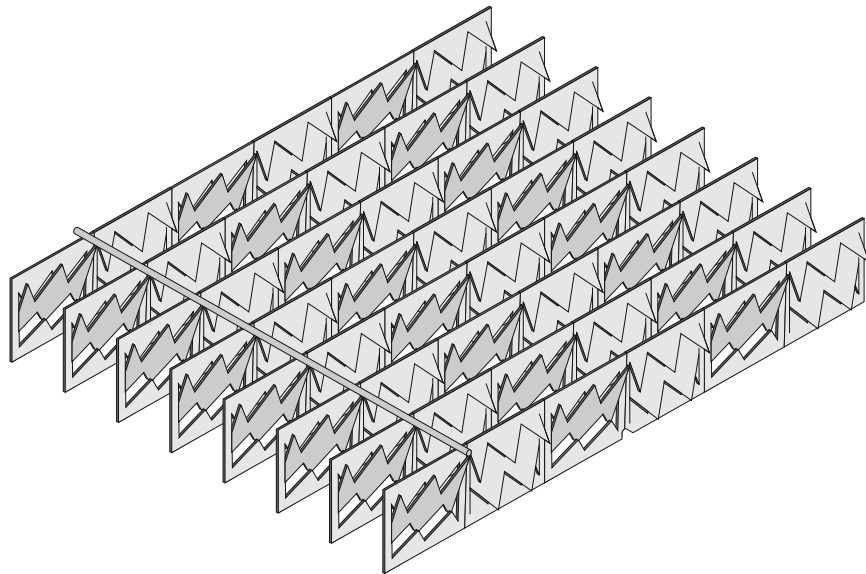
## ***Structured Grid (Type MP-C)***



### ***Features***

- *Considered equal to t-25a grid except at very low vapor rates type t-c may have a slightly greater efficiency.*
- *Has wide turndown ratio.*
- *Has good resistance to plugging, coking and fouling.*
- *Rigid construction which is easily installed by attachment to flat bar support rings.*
- *Strength obtained by criss cross installation allows minor support members below grid bed to be spaced up to 5 feet apart without a special support structure for beds up to 10 feet deep.*

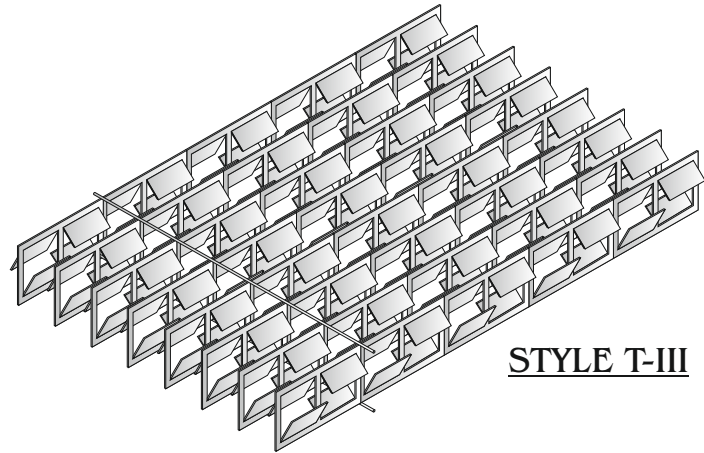
## ***Structured Grid (Style MP-II)***



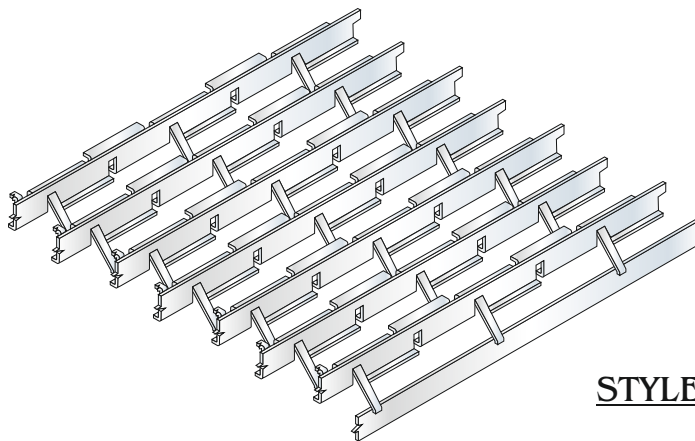
### ***Features***

- *Provides high capacity with low pressure drop.*
- *Has excellent resistance to plugging, coking and fouling.*
- *Has wide turndown ratio.*
- *Ideally suited for wash zones in coker and fcc fractionators and crude, vacuum towers and visbreaker fractionators.*
- *Rigid construction which is easily installed by attachment to flat bar support rings.*
- *Strength obtained by crisscross installation allows minor support members below grid bed to be spaced up to 5 feet apart without a special support structure for beds up to 10*

## ***Style MP-25<sup>a</sup> Structured Grid***



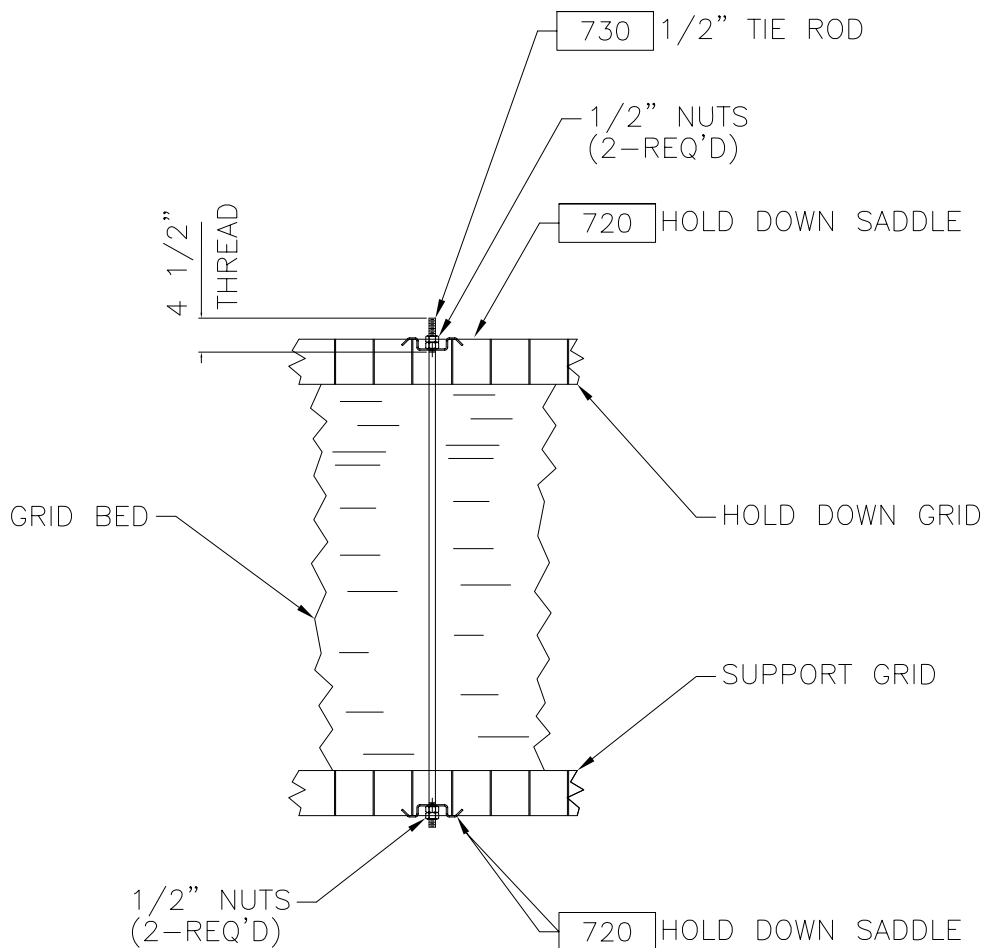
STYLE T-III



STYLE T-25A

### ***Features***

- Utilizes larger rectangular projections (which create higher local velocities) to provide more efficiency with only a slightly higher pressure drop than style t-11.
- Has excellent resistance to plugging, coking and fouling.
- Has wide turndown ratio.
- Ideally suited for wash zones in coker and fcc fractionators and crude, vacuum towers and visbreaker fractionators.
- Rigid construction which is easily installed by attachment to flat bar support rings.
- Strength obtained by crisscross installation allows minor support members below grid bed to be spaced up to 5 feet apart without a special support structure for beds up to 10 feet deep.



- *This design consists of rods that are driven through the grid bed and attached to plates at the top and bottom of the bed, creating a packed bed that is essentially one unit.*
- *This eliminates the element of "looseness" of the bed which contributes to vibration and ultimately to dislodgement.*
- *This technique has been used extensively in vacuum tower wash zones where upsets often occur. The through rod technique has been successful in keeping wash grid beds in place.*







[www.mapesamx.com](http://www.mapesamx.com)