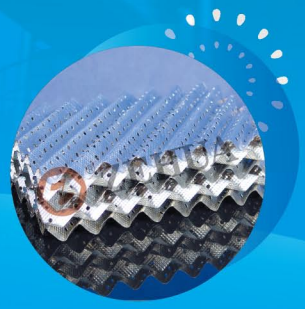
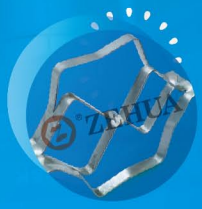
北京泽华化学工程有限公司
Beijing Zehua Chemical Engineering Co., Ltd.

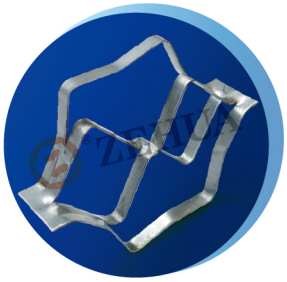
Doc No.: B4-02E





PRODUCT CATALOGUE

Content



AMT Internals Equivalence Table

AMT Model No.	Description	ZEHUA Model No.	Page
Liquid Distributor/Redistributor			
PDX1	Pipe Orifice Distributor (Pressure feed)	LTD-PP01	15
PDX2	Pipe Orifice Distributor (Gravity feed)	LTD-PP04	15
SDX1	Spray Header Distributor	LTD-S01	15
RDX1	Riser Type Distributor with bottom Orifices	LTD-D02/D02R	13
RDX2	Riser Type Distributor with drip tubes	LTD-D03/D03R	13
TDX1	Trough Distributor (Weirs Type)	LTD-T05	12
TDX2	Trough Distributor (Orifices Type)	LTD-T03	12
TDX3	Trough Distributor (Intergrated Feed Box)	LTD-C02/C02R	12
WWX1	Wall Wiper Redistributor	LTD-W01R	15
Flashing/Vapor Feed Distributors			
FDX1	Flashing Feed Distributor with Gallery	FDT-G01	19
FDX2	Flashing Feed Pipe with Impingement baffles	FDT-P04	18
VSX1	Vapor Sparger	FDT-P03	18
VDX1	Vapour Horn	FDT-A01	19
VDX2	Vapor Diffuser	FDT-V01	19
General Packing Internals & Collector trays			
HDX1	Hold Down Grid for Structured Packing	HD-S01	17
BLX1	Bed Limiter for Random Packing	HD-R01	17
PGX1	Structured Packing Support (Grid Type)	PST-S01	18
VIX1	Random Packing Support (Vapor Injection Type)	PST-R01	18
SGX1	Random packing Support (Subway Granting Type)	PST-R02	18
CTX1	Collector tray (with Rectangular Risers/Chimneys)	LCT-C02	16
CTX2	Collector tray (with Round Risers/Chimneys)	LCT-C04	16
CTX3	Collector tray (with Trough Type Risers/Chimneys)	LCT-T01	16
CTX4	Collector tray (Chevron Type)	LCT-V01	16
Distributors for Liquid-Liquid Extractors			
DSX1	Dispersed Phase Distributor with Support	LTD-D05	14
DDX1	Dispersed Phase Distributor (Pipe Type)	LTD-PP05	15

ZEHUA COMPANY

Solving All Your Separation Process Problems

The Sino-US joint venture Beijing Zehua Chemical Engineering Co., Ltd. (Zehua Company) was established in 1995 and is affiliated with Tsinghua University.

As a member of FRI (Fractionation Research, Inc.), Zehua Company is a highly focused engineering company, devoted to solving the separation process problems of each and every one of our customers with services including but not limited to: process simulation/optimization, control strategy analysis, hydraulic calculation & analysis and field trouble-shooting services. We also serve as one of the main suppliers of mass transfer equipment with a diverse array of column tray, structured packing, random packing and column internal, with detailed information on these products featured within this catalogue. Our technical know-how and products have successfully applied to various processes/units and around 5,000 commercial columns unitl now all over the world, relating to oil & gas processing, petroleum refining, petrochemicals, fertilizers, coal chemical and environment industries.

Zehua boasts an R&D institution and pilot test base, and has been granted 39 patents so far. Zehua owns 29 national and 4 international trademarks, forming a fundamentally automatic IPR system.

Insisting on the attitude of “honesty, diligence and practical performance”, Zehua is dedicated to possessing top separating technology with the stamina and ambition to be a global leader in the mass transfer industry.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hereby certify that the organization
Beijing Zehua Chemical Engineering Co.,Ltd.
Domicile: No.8 Bldg., No.7 Yard, Dijin Road, Haidian District, Beijing,P.R.China
Certification Add.: No.8 Bldg., No.7 Yard, Dijin Road, Haidian District, Beijing,P.R.China

Post code.: 100095
is in conformity with
ISO 14001:2004 Standard

This certificate is valid to the following product(s)/service:
Design and technical service of petrochemical separation equipment and parts, marketing service of chemical equipment and products, catalyst, auxiliary agent, additives and reagent and relevant management activities

For the certification scope of the subsidiary place to the following table

Organization	Certification Address/Post code	Products/Activities
Zehua ChemTec International Ltd	No.8 Bldg., No.7 Yard, Dijin Road, Haidian District, Beijing,P.R.China/100095	Marketing, service of chemical equipment and products, catalyst, auxiliary agent, additives and reagent

Issued on:2013-04-26
Validity date: 2016-04-25
Registration Number: CN-00213E20815R0M

Michael Drechsel
President of IQNet

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Issued on:2013-04-26
Validity date: 2016-04-25
Registration Number: CN-00213Q12390R0M

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President of IQNet

Zhang Wei
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ISO 9000 Standard Quality management systems

ADV® HIGH-PERFORMANCE TRAY

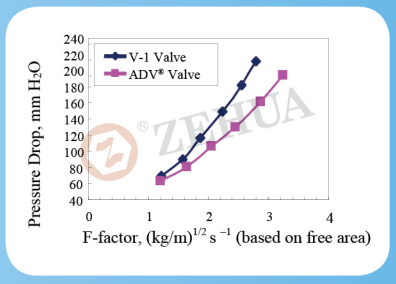
Since its inception in late 1997, ADV® high-performance tray has been successfully used in more than 3000 commercial installations in the refining, petrochemical and chemical industries. ADV® tray has been used in applications where the tower diameter ranges from 0.5 to 10.2m, tray spacing ranges from 170 to 1100mm, the number of tray ranges from a few to more than 200, and the number of passes ranges from one to six. ADV® tray has also been used in vacuum and high-pressure systems. ADV® tray offers you a solution with higher capacity, higher separation efficiency, lower pressure drop and greater flexibility. It can also help you lower capital expenditure.

Main Features

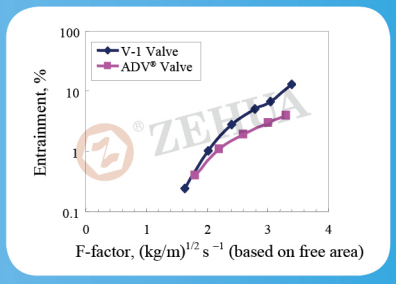
- Non-revolving valve with top canopies
- "Quick-Connect" active tray joints
- Inlet bubble promoter
- New-design downcomer

Advantages Over Conventional Trays

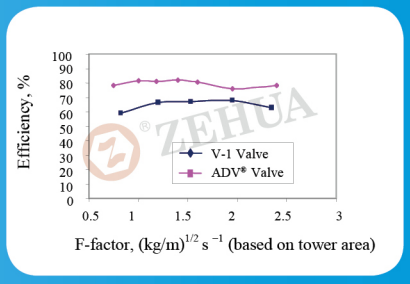
- 40% (or more) higher capacity
- 10-20% more efficiency
- >10% lower pressure drop
- 30-50% greater flexibility
- Minimum modification in reconstruction
- Easy to install and maintain



Pressure Drop



Entrainment



Efficiency

Applications

Refining and Petrochemical

- Crude oil distillation
- FCCU
- Light hydrocarbon recovery and separation
- Hydrotreating
- Delay coking
- Desulfurization
- Sulfur recovery
- Reformation and aromatics
- Ethylene unit
- Styrene unit
- MTBE unit
- Butadiene unit
- Isoprene unit
- Dehydrogenation of light hydrocarbon

Coal Chemical and Other Chemicals

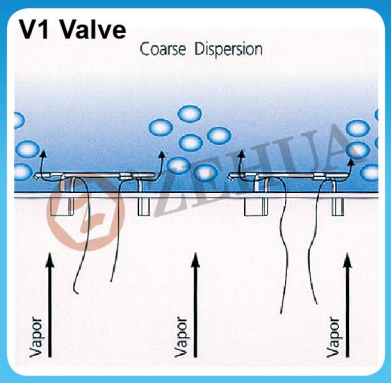
- Coal gasification
- Coal-to-liquids
- Methanol plant
- Rectisol unit
- Methanol-to-Olefin (MTO/MTP)
- Phthalic anhydride
- Acetic acid and ester unit
- PTA plant
- Acrylonitrile plant
- Propylene oxide
- Polysilicon plant
- BDO unit
- MEK unit
- Ethylene glycol unit
- Natural gas De-H_2S and De-CO_2
- Polyester plant
- Fine chemicals

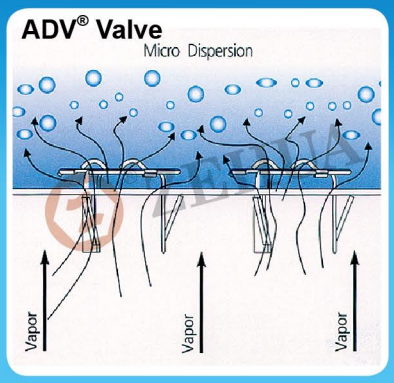
Environmental Protection

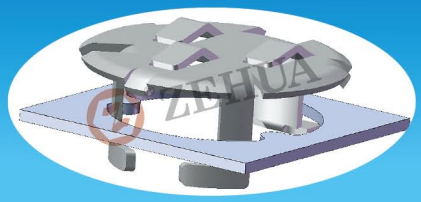
- Solvent recovery
- Waste water treatment
- Off gas recovery and treatment

1. Non-revolving Valve with Top Canopies

Top canopies make vapor dispersion more uniform and fine, which improves efficiency. The anti-spin valve hole can prevent the valve rotating like the V1 valve, and can prevent valve falling from the hole, which occurs when the valve legs become overly worn.

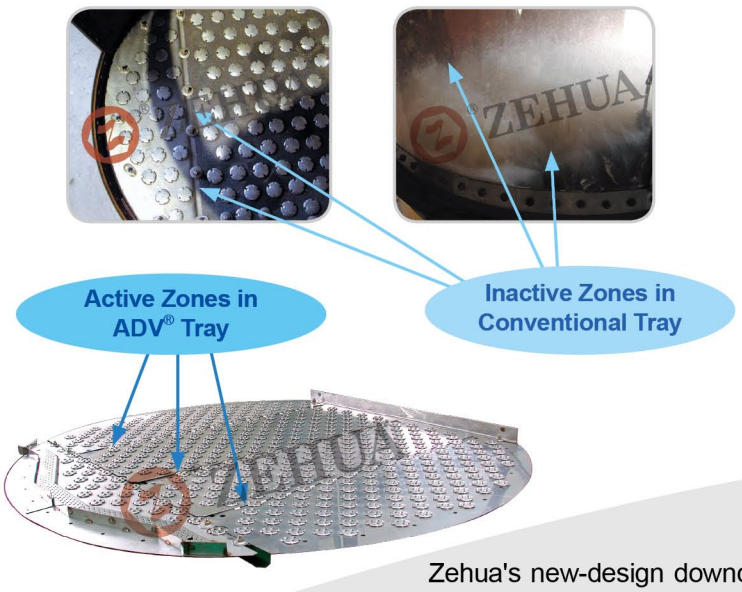






2. "Quick-Connect" Active Tray Joint

The patented "Quick-Connect" active tray joint allows for easy on-site installation and eliminates inactive tray zones found in all other trays. This creates a more "effective active area" and eliminates liquid bypass.



3. Inlet Bubble Promoter

The ADV® Tray has a unique inlet bubble promoter to allow for froth initiation near the inlet area of the active panels. The froth initiation helps minimize or eliminate the liquid gradient on the tray and promotes uniform froth distribution across the entire tray active area. This results in higher tray capacity and operating flexibility.

4. New-design Downcomer

Zehua's new-design downcomer with directional flow promotion helps eliminate stagnant liquid pools on the tray and promotes uniform liquid penetration and froth density across the entire bubbling area. Directional flow promotion prevents fouling material settling on the tray deck and extends the column's run time.

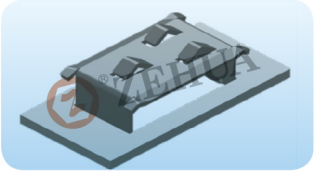
Flow status of traditional downcomer

Flow status of new design downcomer

Valve List for ADV® Tray

1. ADV® Valve Tray (ADV®)

- Floating round valve with top canopies for fine dispersion
- High efficiency, capacity, and operating flexibility
- For wider operating flexibility, Heavy ADV® valve (ADV®-H) can be used together with ADV®

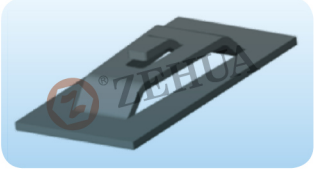


2. ADV® Rectangular Valve Tray (ADV®-R)

- Floating rectangular valve with top canopies for fine dispersion
- Directional ADV®-R valve (ADV®-RD) can be used in conjunction with ADV®-R for directional flow promotion using a directional valve leg
- For more flexible operation, heavy ADV®-R valve (ADV®-RH) can be used together with ADV®-R

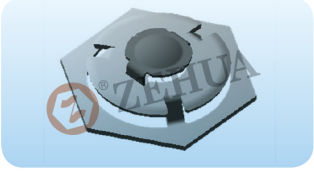
3. ADV® Fixed Valve Tray (ADV®-F)

- Fixed valve tray with three top canopies for fine dispersion
- More flexible and efficient than a conventional sieve tray
- Adapts to fouling and coking system
- Non-top (ADV®-F0) or one-top (ADV®-F1) canopy is available for different operational needs



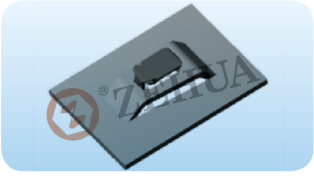
4. ADV® Rectangular Fixed Valve Tray (ADV®-FR)

- Fixed valve tray with three top canopies for fine dispersion
- More flexible and efficient than a conventional sieve tray
- Adapts to fouling and coking system
- One top canopy (ADV®-FR1) is available for different operational needs



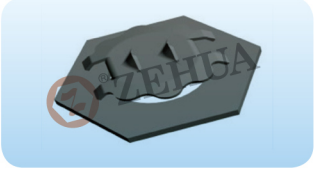
5. ADV® Combinatorial Valve Tray (ADV®-C)

- Combinatorial valve with a fixed round valve as the base valve and a floating round valve as the top valve
- Top valves close in the case of low vapor loading. This allows the tray operate more flexibly
- Combines the advantages of a fixed valve tray and a floating valve tray. It is flexible and has high mass-transfer efficiency
- Adapts to fouling and coking system



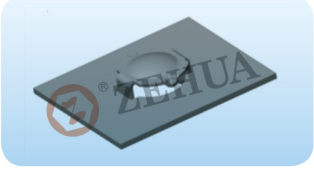
6. ADV® Rectangular Combinatorial Valve Tray (ADV®-CR)

- Combinatorial valve with a fixed trapezoidal valve as the base valve and a floating rectangular valve as the top valve
- Top valves close in the case of low vapor loading. This allows the tray to operate more flexibly
- Combines the advantages of a fixed valve tray and a floating valve tray, It is flexible and has high mass-transfer efficiency
- Adapts to fouling and coking system



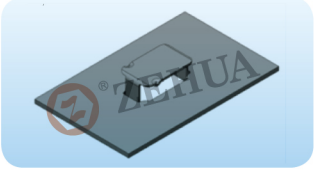
7. Scalloped ADV® Valve Tray (ADV®-S)

- Floating round valve with scalloped lace and top canopies
- Vapor jets from side scalloped lace and top canopies for fine dispersion and to reduce pressure drop
- The valve hole of ADV®-S is smaller than that of a conventional valve. This makes ADV®-S especially suitable for low-vapor scenarios where high efficiency is required
- With an ADV®-SH round heavy valve, a Scalloped ADV® valve tray operates higher capacity and flexibility



8. ADV® Mini Valve Tray (ADV®-M)

- Floating Mini round valve
- The Valve hole is smaller than that of an ADV®-S valve
- Adaptable to scenarios where there is very low vapor and high efficiency is required



9. ADV® Mini Rectangular Valve Tray (ADV®-MR)

- Floating Mini rectangular valve
- The valve hole is smaller than that of a conventional valve
- Adaptable to scenarios where there is very low vapor and high efficiency is required

ADV® HIGH-CAPACITY TRAY

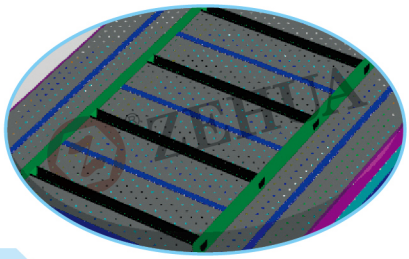
The ADV® high-capacity tray is a new type of multi-downcomer tray developed by Zehua Company for large column diameter and high liquid loading cases. The tray is based on ADV® high performance tray and combines features of multi-pass tray flow. With optimized new downcomer design, it provides higher mass-transfer efficiency and larger liquid capacity in rectification and absorption process. Compared to traditional 4-pass tray, it can increase capacity by at least 25% with comparable tray efficiency.

Main Features

- Improved multi-downcomer tray based on multi-pass tray flow characteristics for reference
- With lateral or longitudinal downcomers, liquid on the tray will form radialized flow or parallel flow which avoid stagnant pool and increase flow path length
- Parallel liquid flow with same path lengths maintain the same vapor to liquid ratio
- Higher mass transfer efficiency by overcoming the liquid maldistribution that occurs on a traditional multi-downcomer tray
- Weir liquid loading can be decreased compared to that of 4-pass and 6-pass trays. This scenario increases tray capacity, especially in high liquid loading
- Adapts to rectification and absorption process with high mass-transfer efficiency requirement and large liquid capacity cases

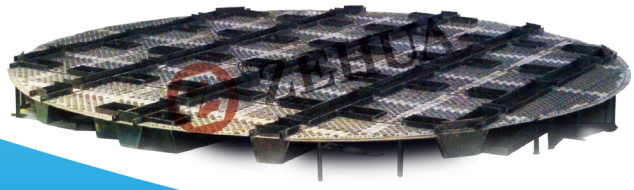
Applications

- Natural gas de-H_2S and de-CO_2
- Propane dehydrogenation
- CO_2 capture
- Solvent regeneration
- C2, C3 splitter
- PX plant

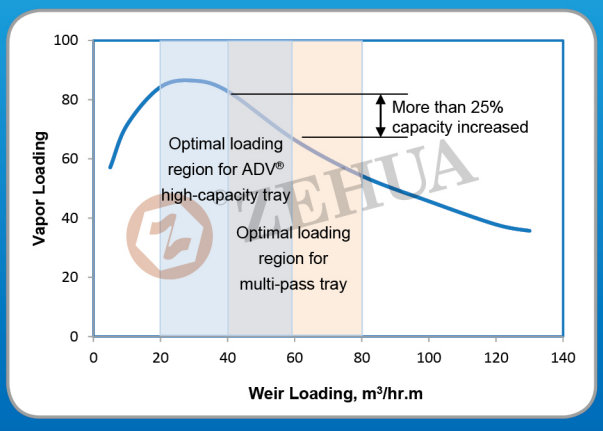


ADV® tray

ADV®-MP tray



ADV® tray test



Effect of weir loading on tray capacity

D-FLOW™ EXTRACTION COLUMN TECHNOLOGY

D-Flow™ extraction column technology includes series of patent products and technologies. Zehua has many years' experience in the extraction field. This technology can increase the efficiency of the extraction column by 30% and the capacity of the extraction column by 50%. D-Flow™ has been successfully used for furfural extraction, LPG amine treatment, acetic acid extraction in the dehydration unit of a PTA plant, and aromatics extraction.

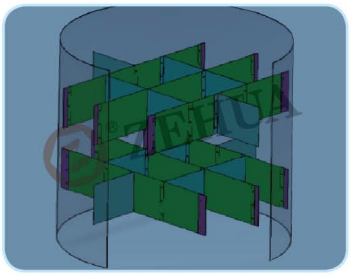
CHARACTERISTICS

- Vertical baffle that eliminates disorderly flow in the continuous phase
- Special distributor/re-distributor promotes directional flow in the continuous phase by using uniform liquid drop
- High-performance extraction structured packing
- High-performance extraction random packing
- High-performance extraction tray that promotes directional flow in the continuous phase

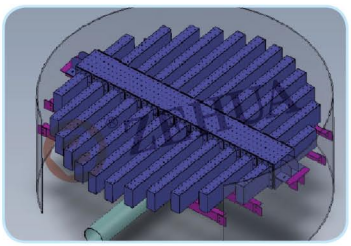
APPLICATIONS

- Furfural extraction
- LPG amine treatment
- Acetic acid extraction in dehydration units of a PTA plant
- Aromatics extraction
- Large-scale extraction column

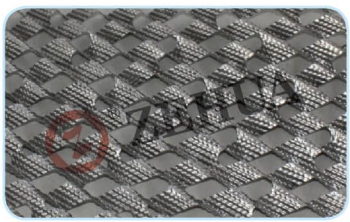
Disorderly flow of consecutive phase in traditional extraction column



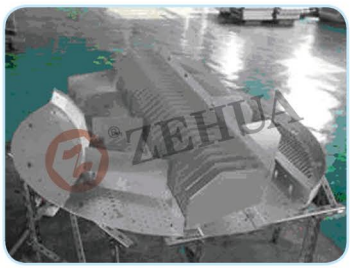
Vertical baffle



Distributor/Redistributor



Sepak® -E structured packing used in D-Flow™ extraction column

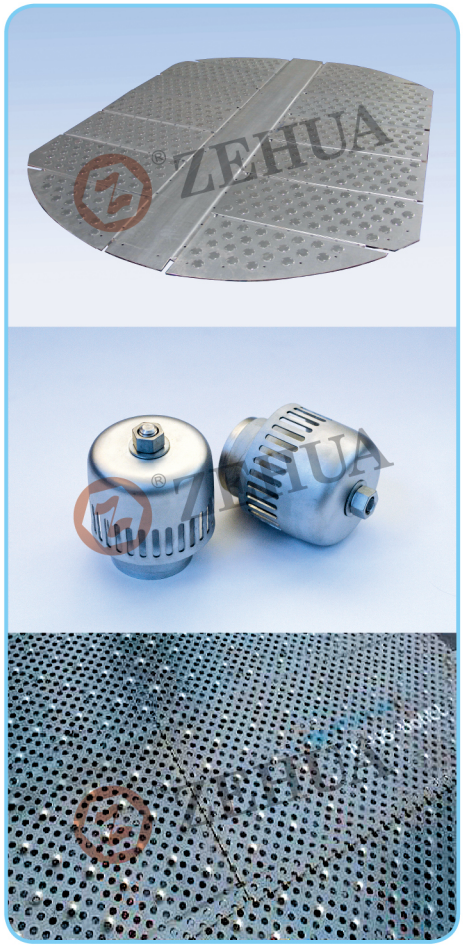


D-Flow™ extraction tray

Sepring®-C random packing used in D-Flow™ extraction column

CONVENTIONAL TRAY

Zehua can also design and supply conventional trays, such as:



Conventional Standard Valve Tray

Available in light and heavy standard valve

Valve trays are essentially flat perforated trays with movable or fixed valve units. Floating valves are disk-shaped devices which contain legs formed out of the valve disk. Fixed valves are units with integral legs formed out of the tray deck.

Bubble Cap Tray

Standard round cap: 80/100/150;

Rectangular cap;

Bubble cap trays consist of a flat perforated deck in which the holes are enclosed with vapor chimney risers and caps in the form of inverted cups mounted on top of the risers. This gives the bubble cap tray advantages to operate at extremely low liquid and vapor rates.

Sieve Tray

Sieve trays are flat perforated plates in which vapor is forced through the holes into the cross-flowing liquid. This vapor flow prevents liquid weeping from leaking through the holes.

Dual-flow Tray

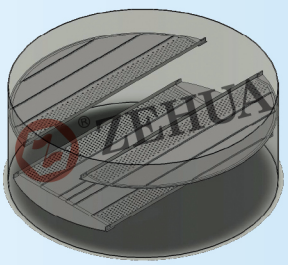
Dual-flow tray is a type of sieve tray that does not feature downcomers such that the entire active area of the tray is perforated with holes. The size of these holes can range from 10 to 25mm in diameter.

Other Trays

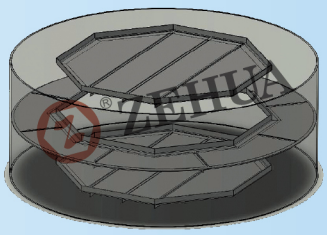
Shower deck tray, disc & donut tray, sump tray, baffle tray, cartridge tray (for small diameter flanged columns), etc.

Others as per client request

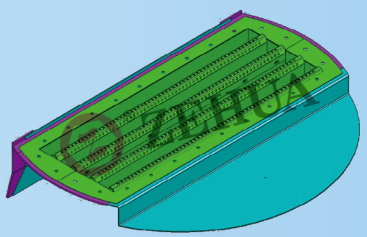
Trays can come in carbon steel, stainless steel, alloy 600, titanium, monel, hastalloy, zirconium or other materials as per client request.



Shower Deck Tray



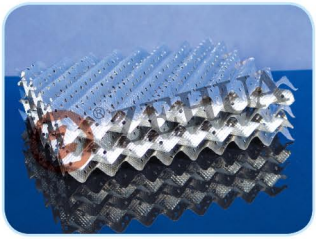
Disc & Donut tray



Sump Tray

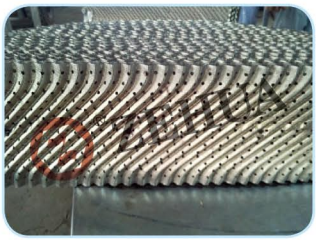
STRUCTURED PACKING

A. SEPAK® SERIES (Corrugated-Sheet Metal Packing)



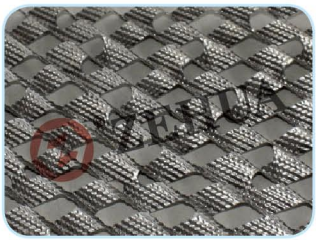
Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP 125Y	45º	125	98.7
SP 125X	60º	125	98.7
SP 175Y	45º	175	98.5
SP 175X	60º	175	98.5
SP 200Y	45º	200	98.6
SP 200X	60º	200	98.6
SP 220Y	45º	220	98.6
SP 220X	60º	220	98.6
SP 250Y	45º	250	98.5
SP 250X	60º	250	98.5
SP 300Y	45º	300	98
SP 300X	60º	300	98
SP 350Y	45º	350	98
SP 350X	60º	350	98
SP 450Y	45º	450	97.5
SP 450X	60º	450	97.5

B. SEPAK®-S SERIES (New Corrugated-sheet Metal Packing)



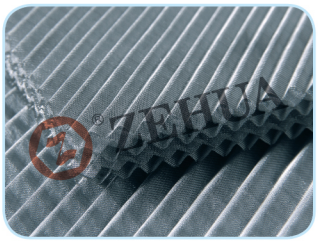
Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP-S 125Y	45º	125	98.5
SP-S 150Y	45º	150	98
SP-S 175Y	45º	175	98
SP-S 200Y	45º	200	98
SP-S 220Y	45º	220	97.5
SP-S 250Y	45º	250	97.5
SP-S 300Y	45º	300	97
SP-S 350Y	45º	350	97
SP-S 450Y	45º	450	97

C. SEPAK®-E SERIES (Extraction Structured Packing)



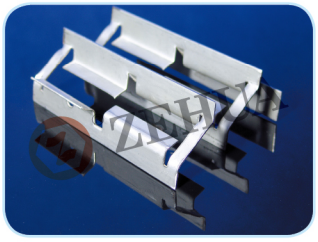
Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP-E 64X	60°	64	99.5
SP-E 64W	75°	64	99.5
SP-E 100X	60°	100	99
SP-E 100W	75°	100	99
SP-E 125X	60°	125	98.5
SP-E 125W	75°	125	98.5
SP-E 150X	60°	150	98.5
SP-E 150W	75°	150	98.5
SP-E 175X	60°	175	98
SP-E 175W	75°	175	98
SP-E 200X	60°	200	97.5
SP-E 200W	75°	200	97.5
SP-E 250X	60°	250	97
SP-E 250W	75°	250	97

D. SEPAK®-G SERIES (Gauze Type Structured Packings)



Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP-G 250Y	45°	250	97
SP-G 250X	60°	250	97
SP-G 350Y	45°	350	95
SP-G 350X	60°	350	95
SP-G 500Y	45°	500	93
SP-G 500X	60°	500	93
SP-G 700Y	45°	700	87

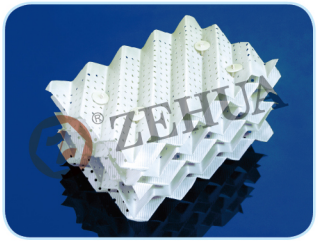
E. SEPGRID® SERIES (Grid Packing)



Mainly used for the application where coking is likely to occur. Typical applications are as follows:

- Atmospheric or vacuum tower: wash section;
- FCC main fractionator: slurry pumparound section;
- Coker or visbreaker fractionator: wash section.

F. SEPAK®-P SERIES (Plastic Structured Packing)



Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP-P 125Y	45°	125	98.5
SP-P 125X	60°	125	98.5
SP-P 250Y	45°	250	97
SP-P 250X	60°	250	97
SP-P 350Y	45°	350	95
SP-P 350X	60°	350	95
SP-P 500Y	45°	500	93
SP-P 500X	60°	500	93

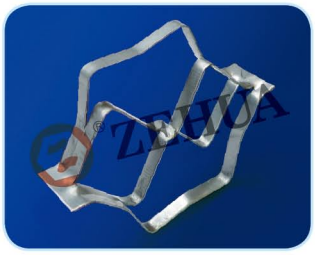
G. SEPAK®-C SERIES (Ceramic Structured Packing)

Type	Crimp Angle	Surface Area m^2/m^3	Void %
SP-C 125Y	45°	125	90
SP-C 125X	60°	125	90
SP-C 160Y	45°	160	85
SP-C 160X	60°	160	85
SP-C 250Y	45°	250	80
SP-C 250X	60°	250	80
SP-C 350Y	45°	350	78
SP-C 350X	60°	350	78
SP-C 450Y	45°	450	72
SP-C 450X	60°	450	72
SP-C 470X	60°	470	75
SP-C 700Y	45°	700	80

Material could be High silicon content ceramic, Alkali resistant ceramic, Lightened & Strengthened ceramic.

RANDOM PACKING

1. METAL PACKING



A. SEPRING®-C (Cross Saddle Ring)

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
16	16	5/8	300	91.5	97
25	25	1	180	54.9	97
38	38	1-1/2	115	35.1	98
50	50	2	90	27.5	98
63	63	2-1/2	70	21.4	98
75	75	3	55	16.8	98

B. SEPRING®-T (Tsinghua Mini Ring)

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
16	16	5/8	348	106.2	97
25	25	1	228	69.6	97
38	38	1-1/2	150	45.8	98
50	50	2	120	36.6	98
63	63	2-1/2	107	32.6	98
75	75	3	70	21.4	98

C. RING-I

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
15	15	5/8	300	91.5	97
25	25	1	225	68.6	97
40	40	1-1/2	155	47.3	98
50	50	2	102	31.1	98
70	70	2-3/4	60	18.3	98

D. RING-C

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
1	25	1	246	75.0	97
1.5	38	1-1/2	187	57.0	97
2	44	1-3/4	147	44.8	98
2.5	50	2	128	39.0	98
3	63	2-1/2	102	31.1	98
4	90	3-1/2	70	21.4	98
5	125	5	55	16.8	99

E. RING-P

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
5/8	16	5/8	348	106.2	95
1	25	1	220	67.1	95
1.5	38	1-1/2	144	43.9	97
2	50	2	110	33.6	97
3.5	90	3-1/2	60	18.3	98

F. RING-R

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
5/8	16	5/8	330	100.7	95
1	25	1	210	64.1	95
1.5	38	1-1/2	140	42.7	97
2	50	2	110	33.6	97
3.5	90	3-1/2	60	18.3	98

2. PLASTIC PACKING

A. RING-P

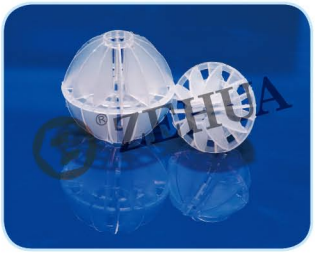
Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
5/8	16	5/8	340	103.7	89
1	25	1	207	63.1	92
1.5	38	1-1/2	128	39.0	91
2	50	2	102	31.1	93
3.5	90	3-1/2	56	17.0	95

B. RING-C

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
1.0	25	1	228	69.6	90
1.5	38	1-1/2	133	40.6	91
2.0	50	2	114	34.8	93
3.0	76	3	90	27.5	93
4.0	100	4	65	19.8	94

C. RING-T

Type	Nominal Size	Specific Surface		Void Fraction
	mm	m^2/m^3	ft^2/ft^3	%
S	47	185	56.4	88
M	73	127	38.7	89
L	95	99	30.2	90



D. RING-H

Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
1	25	1	460	140.3	84
1.5	38	1-1/2	325	99.1	87
2	50	2	236	72.0	90
3	76	3	150	45.8	92

E. RING-S

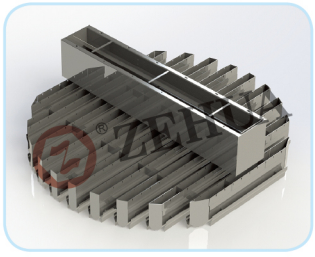
Type	Nominal Size		Specific Surface		Void Fraction
	mm	inch	m^2/m^3	ft^2/ft^3	%
1	25	1	206	62.8	90
2	50	2	108	32.9	93
3	76	3	88	26.8	94

The specific surface and void fraction of random packing in above data sheet are mean value, and the final product data are based on material thickness. Ceramic random packing can be provided as per requirements.

COLUMN INTERNALS

I. Liquid Distributor/Redistributor (LDT)

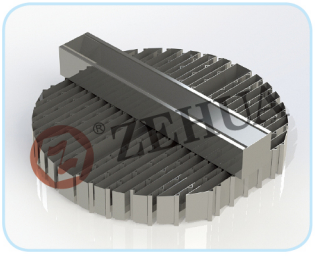
1.1 Trough Liquid Distributor (LDT-T)



A. Trough Distributor with Enhanced Baffle Plates (LDT-T01)

Orifices in the Sidewalls, One or Two Sides.

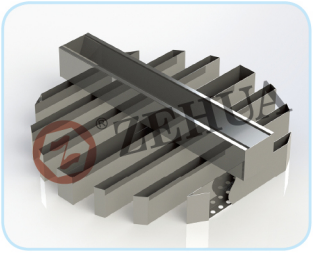
LDT-T01 can be used as a redistributor between beds (Model LDT-T01R), cooperating with a separate liquid collector.



B. Trough Distributor with Lateral Tubes (LDT-T02)

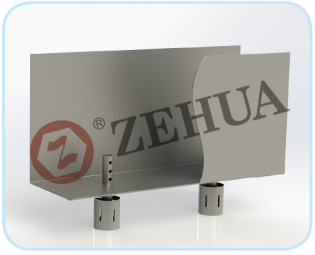
Orifices in the sidewalls, one or two sides

LDT-T02 could be used as a redistributor between beds (Model LDT-T02R), cooperating with a separate liquid collector.



C. Trough Distributor with Base Orifices (LDT-T03)

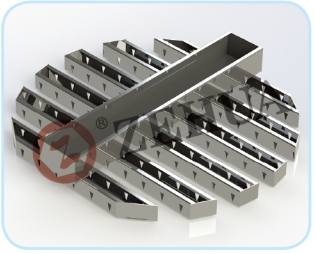
LDT-T03 can be used as a redistributor between beds (Model LDT-T03R), cooperating with a separate liquid collector.



D. Trough Distributor with Drip Tubes and Tri-distribution System (LDT-T04)

Used for extremely low liquid flows.

LDT-T04 can be used as a redistributor between beds (Model LDT-T04R), cooperating with a separate liquid collector.

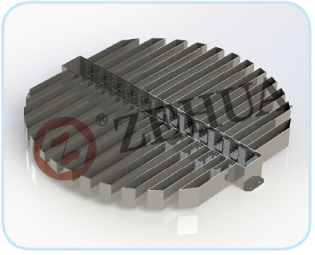


E. Trough Distributor with Weirs (LDT-T05)

"V" notches or slots in the sidewalls, used for severely fouling systems.

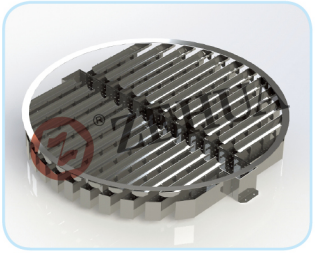
LDT-T05 can be used as a redistributor between beds (Model LDT-T05R), cooperating with a separate liquid collector.

1.2 Channel Distributor/Redistributor (LDT-C)



A. Channel Distributor with Base Orifices (LDT-C01)

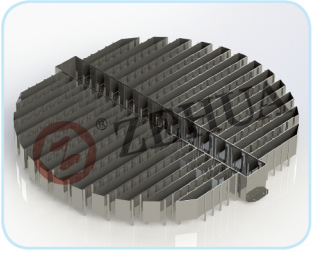
Main trough and branch troughs are linked to provide uniform cross flow and lower column height.



A-1. Channel Redistributor with Base Orifices (LDT-C01R)

LDT-C01R can be used as redistributor without a liquid collector.

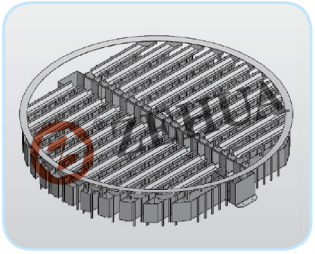
A cap between branch troughs and wall wiper can collect and redistribute liquid from above and also build vapor passages.



B. Channel Distributor with Lateral Tubes (LDT-C02)

LDT-C02 is one-stage distributor in which liquid is easily distributed through lateral tubes.

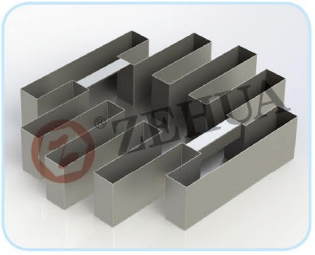
The main trough and branch troughs are linked to provide uniform cross flow and lower column height.



B-1. Channel Redistributor with lateral tubes (LDT-C02R)

LDT-C02R can be used as redistributor without a liquid collector.

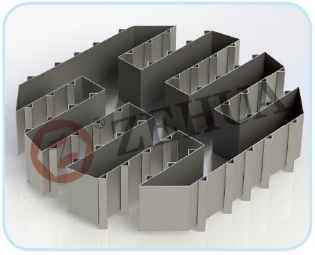
A cap between branch troughs and wall wiper can collect and redistribute liquid from above and also build vapor passages. Liquid is distributed through lateral tubes.



C. Integral Channel Distributor with Base Orifices (LDT-C03)

Main trough and branch troughs are linked to provide uniform cross flow.

LDT-C03 can be used as a redistributor between beds (Model LDT-C03R), and usually works with a LCT-V type liquid collector in small columns.



D. Integral Channel Distributor with Lateral Tubes (LDT-C04)

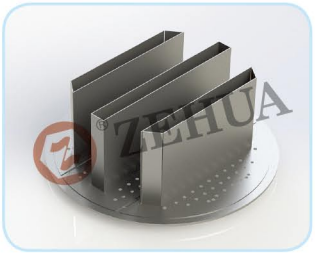
LDT-C04 can be used as a re-distributor between beds (Model LDT-C04R), and usually works with a LCT-V type liquid collector in small columns .

E. Channel Distributor with Weirs (LDT-C05)

"V" notches or slots in the sidewalls, used for severely fouling systems.

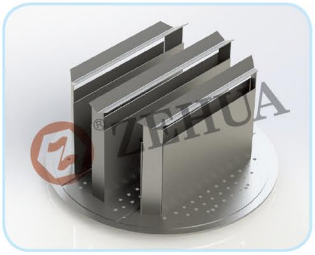
LDT-C05 can be used as a redistributor between beds (Model LDT-C05R), cooperating with a separate liquid collector.

1.3 Deck Distributor/Redistributor (LDT-D)



A. Deck Distributor with Rectangular Risers (Bottom Orifices) (LDT-D01)

Orifices are located in the bottom plate with rectangular gas risers.



A-1. Deck Redistributor with Rectangular Risers (Base Orifices) (LDT-D01R)

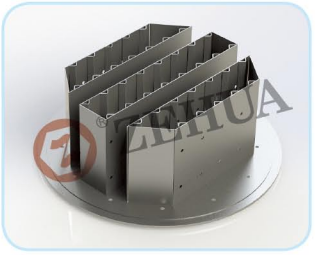
LDT-D01R can be used as redistributor without a liquid collector. Caps are added to the gas risers in order to collect liquid.

B. Deck Distributor with Round Risers (Base Orifices) (LDT-D02)

Orifices are located in the bottom plate with round gas risers.

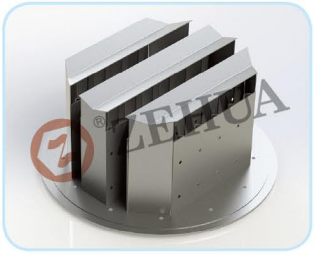
B-1. Deck Redistributor with Round Risers (Base Orifices) (LDT-D02R)

LDT-D02R can be used as redistributor without liquid collector. Caps are added to the gas risers in order to collect liquid.



C. Deck Distributor with Rectangular Risers (Side Orifices with Drip Tubes) (LDT-D03)

LDT-D03 is used when there is a large turn-down ratio. Orifices with variable elevation are located at the gas riser wall to match the drip tubes.



C-1. Deck Redistributor with Rectangular Risers (Side Orifices with Drip Tubes) (LDT-D03R)

LDT-D03R is used when there is a large turn-down ratio.

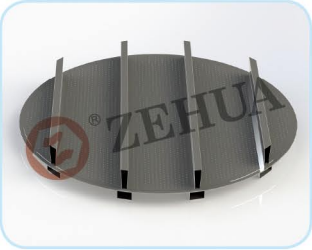
It can be used as a redistributor without a liquid collector. Caps are added to the gas risers in order to collect liquid.

D. Deck Distributor with Round Risers and Drip Tubes (LDT-D04)

Liquid overflow from drip tubes, used for fouling systems.

D-1. Deck Redistributor with Round Risers and Drip Tubes (LDT-D04R)

LDT-D04R can be used as a redistributor without a liquid collector. Caps are added to gas risers in order to collect liquid.



E. Dispersed Phase Distributor with Rectangular Risers and Packing Support (LDT-D05)

Orifices are located in the bottom plate that has rectangular continuous phase risers and packing support with lower column height.

LDT-D05 is usually used in an extraction column.

1.4 Pan Distributor/Redistributor (LDT-P)

A. Pan Distributor with Round Risers (Base Orifices) (LDT-P01)

Orifices are located in the bottom plate that has round continuous phase risers.

Inner liner wall set to avoid liquid leakage and increase vapor passage.

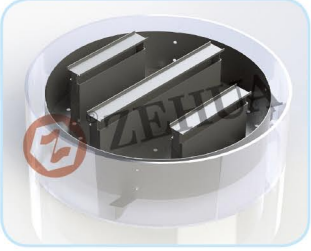
A-1. Pan Redistributor with Round Risers (Base Orifice) (LDT-P01R)

LDT-P01R has capped gas risers, can work with liquid collector model LCT-W01.

B. Pan Distributor with Rectangular Risers (Base Orifices) (LDT-P02)

Orifices are located in the bottom of the pan, which has rectangular gas risers.

Inner liner wall set to avoid liquid leakage and increase vapor passage.



B-1. Pan Redistributor with Rectangular Risers (Base Orifices) (LDT-P02R)

LDT-P02R has capped gas risers and can work with liquid collector model LCT-W01.

C. Pan Distributor with Round Risers (Side Orifices with Drip Tubes) (LDT-P03)

Orifices are located at drip tubes.

Inner liner wall set to avoid liquid leakage and increase vapor passage.

C-1. Pan Redistributor with Round Risers (Side Orifices with Drip Tubes) (LDT-P03R)

LDT-P03R has capped gas risers and can work with liquid collector model LCT-W01.

D. Pan Distributor with Rectangular Risers (Side Orifices with Drip Tubes) (LDT-P04)

Orifices are located at the gas riser wall so that they match with the drip tubes.

Inner liner wall set to avoid liquid leakage and increase vapor passage.

D-1. Pan Redistributor with Rectangular Risers (Side Orifices with Drip Tubes) (LDT-P04R)

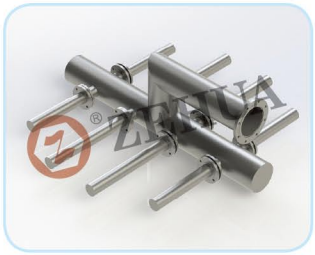
LDT-P04R has caps on gas risers, is available to be worked with liquid collector Model LCT-W01.

E. Pan Distributor with V-notched drip tubes (LDT-P05)

LDT-P05 is used for highly fouling systems.

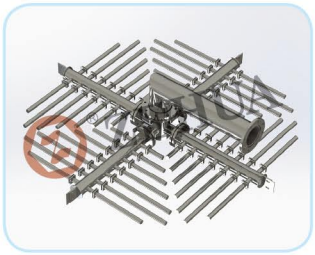
Liquid overflow from V-notched drip tubes and gas pass through the annular passage around the inner liner wall.

1.5 Pipe Type Distributor (LDT-PP)



A. Lateral Pipe with Orifices (LDT-PP01)

LDT-PP01 is often used when the liquid feed is pressurized.



B. Spider Pipe with Orifices (LDT-PP02)

LDT-PP02 is often used when the liquid feed is pressurized.

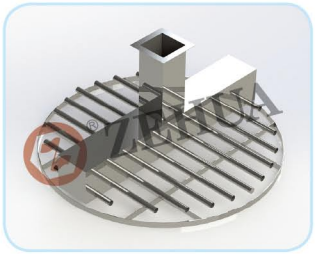
There can be more branches with more orifices.

LDT-PP02 is usually used for dispersed phase distribution in an extraction column.

C. Annular Pipe with Orifices (LDT-PP03)

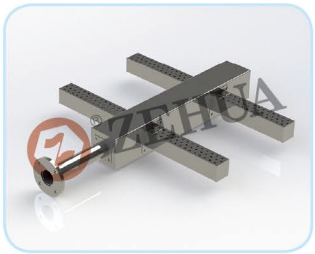
DT-PP03 is often used when the feed is pressurized.

Orifices are located at the bottom of the annular pipes.



D. Tubular Distributor (LDT-PP04)

Liquid is first fed to the tubular box and then distributed into branch pipes. The liquid passes through the orifices in the pipes.



E. Quadrate Pipe Distributor (LDT-PP05)

LDT-PP05 is usually used for extraction.

1.6 Spray Nozzle Distributor (LDT-S)

A. Spray Nozzle Distributor (LDT-S01)

LDT-S01 is a piping distributor with down pipes and spray nozzles.

B. Shower Pipe Distributor (LDT-S02)

LDT-S02 is a piping distributor with one shower nozzle.

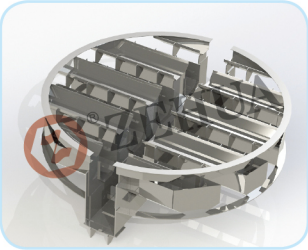
1.7 Wall Wiper Liquid Redistributor (LDT-W)

A. Wall Wiper Liquid Re-Distributor (LDT-W01R)

LDT-W01R is used between beds as a redistributor in a small-diameter packing column.

II. Liquid Collector (LCT)

2.1 Trough Liquid Collector (LCT-T)

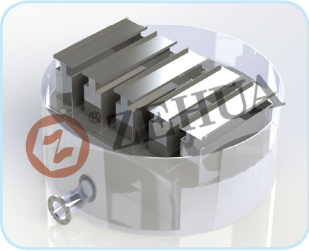


A. Trough Liquid Collector (LCT-T01)

LCT-T is resistant to heat expansion and cooling contraction. It also reduces the need for on-site welding.

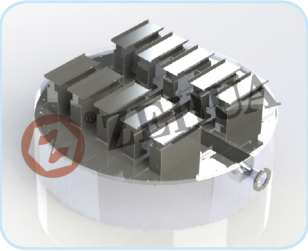
It can be used for total or partial draw-off and/or to feed a liquid distributor below.

2.2 Chimney Tray Liquid Collector (LCT-C)



A. Chimney Tray Liquid Collector with Rectangular Riser (LCT-C01)

Capped rectangular gas risers are used for gas distribution and liquid collection, and liquid is drawn out from a side sump.



B. Chimney Tray Liquid Collector with Rectangular Riser and Main Trough (LCT-C02)

Capped rectangular gas risers are used for gas distribution and liquid collection, liquid is drawn out from a central trough.

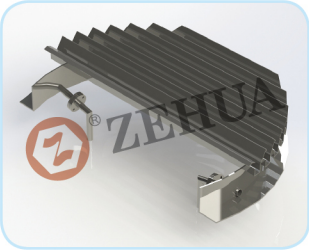
C. Chimney Tray Liquid Collector with Round Riser (LCT-C03)

Capped round gas risers are used for gas distribution and liquid collection, and liquid is drawn out from a side sump.

D. Chimney Tray Liquid Collector with Round Riser and Main Trough (LCT-C04)

Capped round gas risers are used for gas distribution and liquid collection, and liquid is drawn out from a central trough.

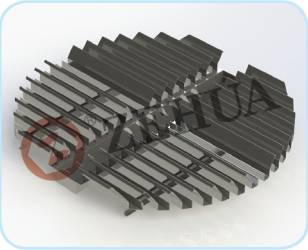
2.3 Chevron Liquid Collector (LCT-V)



A. Chevron liquid collector with Annular Trough (LCT-V01)

Liquid is collected through inclined plates and flows into the annular channel, reducing pressure drop and the need for on-site welding.

It can be used for total or partial liquid draw-off and/or to feed a liquid distributor below from a ring channel welded to the column wall.



B. Chevron Liquid Collector with Center Trough (LCT-V02)

Liquid is collected through inclined plates and flows into the center trough.

LCT-V02 reducing pressure drop and the need for on-site welding.

Liquid total or patial draw-off and/or feed a liquid distributor below from a central trough welded to the column wall.

2.4 Wall Wiper Liquid Collector (LCT-W)

A. Wall Wiper Liquid Collector (LCT-W01)

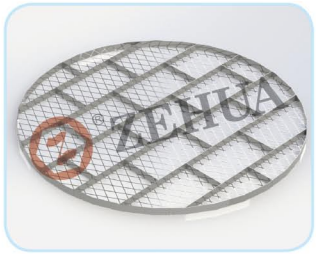
LCT-W01 collects liquid flow from the column wall.

III. Hold Down Grid (HD)

3.1 Hold Down Grid for Random Packing (HD-R)

A. Hold Down Grid for Random Packing (Attached to the Column) (HD-R01)

HD-R01 is a grid-type bed limiter fixed to the column wall.



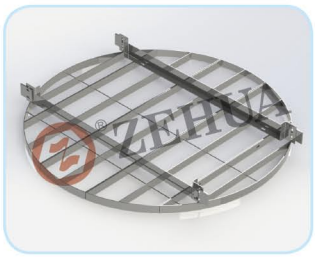
B. Hold Down Grid for Random Packing Assembled with Liquid Distributor (HD-R02)

HD-R02 is a grid-type bed limiter assembled with a liquid distributor.

C. Hold Down Grid for Random Packing for A Small Column (HD-R03)

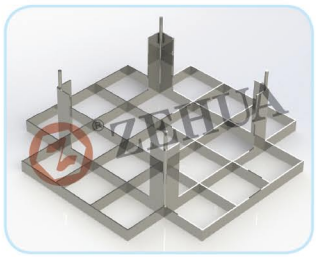
HD-R03 is a grid-type bed limiter assembled with a liquid distributor or attached to the column.

3.2 Hold Down Grid for Structure Packing (HD-S)



A. Hold Down Grid Conjunct with Liquid Distributor or Attached to the Column (HD-S01)

HD-S01 is grid type bed limiter conjunct with a liquid distributor or attached to the column.

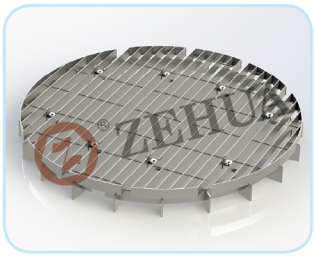


B. Structured Packing Hold Down Grid with Liquid Distributor Support (HD-S02)

HD-S02 is a grid-type bed limiter that acts as a structural support and leveling device for the liquid distributor.

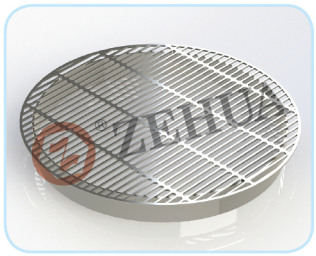
IV. Packing Support (PST)

4.1 Structured Packing Support (PST-S)



A. Grid Type Packing Support (PST-S01)

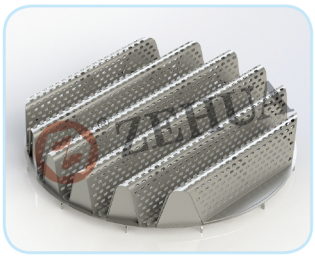
PST-S01 is a grid-type support set on welded bars. It has a large open area (approximately 97% free area) for gas and liquid to pass through and do not significantly add any pressure drop.



B. Grid Type Packing Support for Small Column (PST-S02)

PST-S02 is grid type support placed upon vertical support ring in small size column.

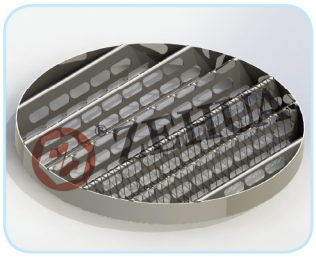
4.2 Random Packing Gas Injection Plate (PST-R)



A. Hump Type Packing Support (PST-R01)

PST-R01 is hump-type support that allows gas and liquid to pass through its inclined walls.

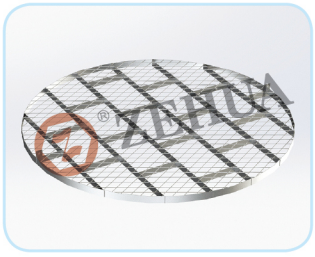
It has a large open area for gas and liquid to pass through, and it does not significantly add any pressure drop. Additionally, it can prevent leakage of random packing.



B. Corrugated Plate Type Packing Support (PST-R02)

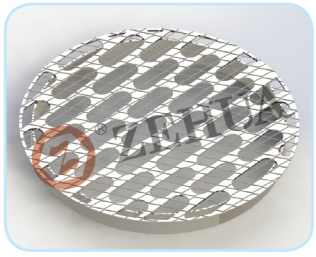
PST-R02 is hump-type support that allows gas and liquid to pass through its inclined corrugated plate.

It has a large open area for gas and liquid to pass through, and it does not significantly add any pressure drop.



C. Subway Grating Type Support (PST-R03)

PST-R03 is grid-type support that has a mesh cover to prevent leakage from random packing.

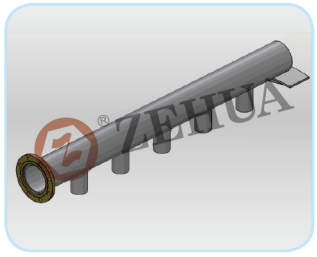


D. Grid type packing support (PST-R04)

PST-R04 is slotted-deck support that has a mesh cover to prevent leakage from random packing. It is used in small columns.

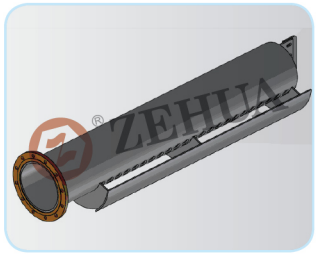
V. Feed/Flashing Feed Distributor (FDT)

5.1 Pipe Type Feed Inlet (FDT-P)



A. Liquid Only Feed Inlet (FDT-P01)

FDT-P01 uses down pipes for better liquid distribution.

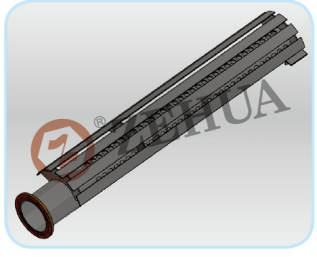


B. Flashing Feed Pipe (FDT-P02)

FDT-P02 provides two-phase flow distribution. Bottom baffles separate the liquid and vapor.

C. Lateral Pipe Vapor Distributor (FDT-P03)

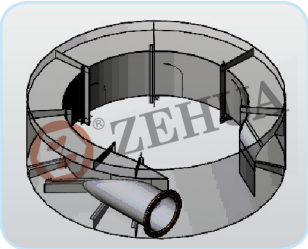
FDT-P03 introduces a vapor feed at the bottom of the tower or introduces a vapor to be mixed with the column vapor.



D. Pipe Vapor Distributor with Baffle (FDT-P04)

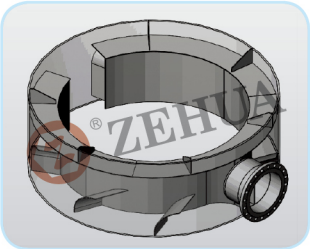
FDT-P04 allows for proper distribution through the addition of top baffles to the tube. This directs vapor downwards.

5.2 Streamline Annular Vapor Feed Distributor (FDT-A)



A. Annular Vapor Feed Distributor with Tangential Feed (FDT-A01)

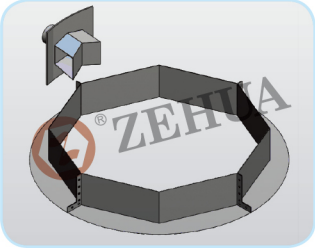
0.1% entrainment rate.
Uniform gas distribution.
Low pressure drop,
Tangential feed.
Also used for flashing feed distribution.



B. Streamline Annular Vapor Feed Distributor (FDT-A02)

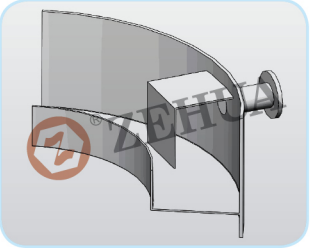
0.1% entrainment rate.
Uniform gas distribution.
Low pressure drop.
Radial feed.
Also used for flashing feed distribution.

5.3 Flashing Feed Gallery (FDT-G)



A. Multilateral Gallery (FDT-G01)

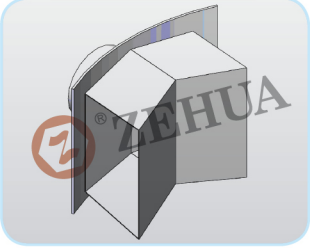
FDT-G01 comprises a feed device with a multilateral gallery. A two-phase flow passes through the feed device and pours into gallery, where the vapor or gas separate from the liquid.



B. Circular Gallery (FDT-G02)

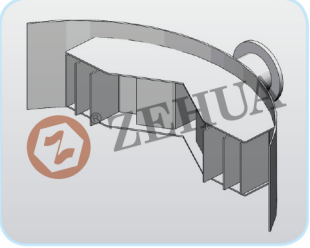
FDT-G02 is composed by a feed device with a circular gallery. Two-phase flow comes through feed device and pours into gallery where the vapor or gas separate from liquid.

5.4 Inlet Baffle/ Diffuser (FDT-B)



A. Baffle Type Diffuser (FDT-B01)

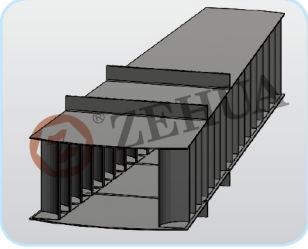
FDT-B01 uses a V-baffle to reduce the incoming flow. With its simple structure, it can effectively separate a two-phase feed.



B. Multi-Baffle Type Diffuser (FDT-B02)

FDT-B02 uses a multi-baffle to reduce the incoming flow. It can effectively separate a two-phase feed and allows for more uniform distribution.

5.5 Vane Type Vapor Feed Distributor (FDT-V)

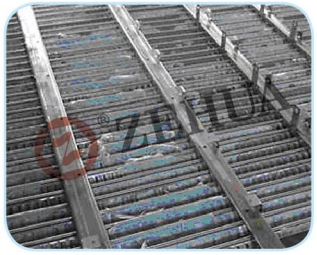


Vane Type Vapor Feed Distributor (FDT-V01)

Effectively decreases the momentum of the inlet feed stream.
Prevents bulk liquid and solids from the entering gas flow.
Prevents re-entrainment of previously collected liquid.
Also used for flashing feed distribution.

VI. Demister (DEM)

6.1 Streamline Vane Type Demister (DEM-SV)



With a special design and surface treatment, DEM-SV vanes have more specific area.

Streamlined vanes change the directions of vapor and liquid flows.

Mist and gas can be better separation by centrifugation with low pressure drop.

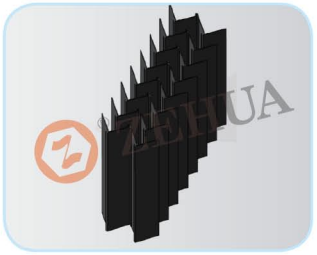
6.2 Mesh Type Demister (DEM-M)

Most efficient for mist elimination.

Adapts to a clean system.

Common (DEM-M01), high-efficiency (DEM-M02), and high-capacity (DEM-M03) models are available for different operational needs.

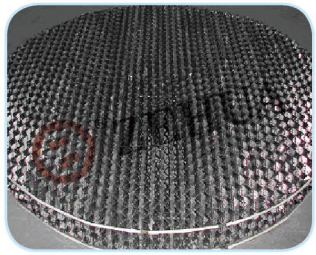
6.3 Vane Type Demisters (DEM-V)



The best solution if the mist contains solid particulate, viscous or sticky liquid, or a large amount of liquid.

Adapts to fouling or coking systems.

6.4 Structured Packing Type Demister (DEM-SP)



Highly efficient mist elimination, adapts to fouling and coking systems.

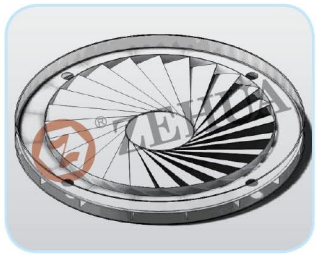
Vertical flow only.

6.5 Cyclone Tube Demister (DEM-CP)

Separates mist and gas by centrifugation through cyclone pipes set on the plate.

Especially beneficial in high-pressure and high gas capacity scenarios.

6.6 Cyclone Tray-Type Demister (DEM-ST)



Separates mist and gas by centrifugation through swirling trays.

Mainly applied in a fouling system where the mist contains solid particulates, viscous or sticky liquids, or a large amount of liquid.

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