



EN-2018-06

Product Bulletin 101

Mass Transfer Products



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Mass Transfer Products

To be a global player in the field of separation technology, Raschig is more than just a supplier of random packings. We offer a wide range of trays and structured packings in addition to high performance random packings to meet customers' needs.

For decades, Raschig has reacted to constant changes driven by market forces and global supply and demand. This is reflected in Raschig's mass transfer portfolio and the desire to utilize the most efficient devices, which are highlighted on the following pages.

General overview of Raschig products and services:



Mass Transfer Products



Engineering Service



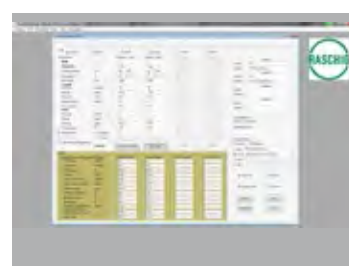
Process Development



Applications



Performance Test



Design Software "WINSORP"



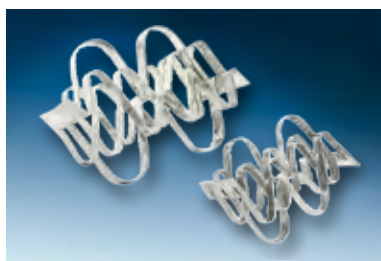
Metal Random Packings



Metal Random Packings

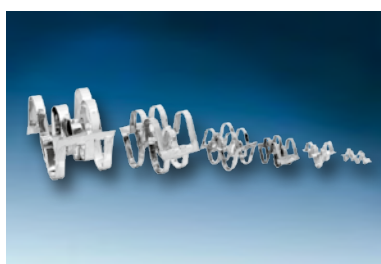
Process Data

The design of Raschig Super-Ring® was published in 1998 and had set a new standard in the performance of random packings. Nowadays it is called the first fourth generation random packing compared to earlier designs like Raschig-Rings, Pall-Rings and IMTP® packings. Soon after the Raschig Super-Ring® was available to the industry it was a new reference line for packing



Raschig Super-Ring® Plus
(FRI-tested)

Size	Surface (m ² /m ³)	Free Vol. %
1	150	98
2	100	98



Raschig Super-Ring®
(FRI-tested)

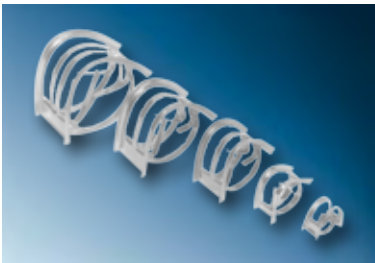
Size	Surface (m ² /m ³)	Free Vol. %
0.1	450	95
0.3	315	96
0.5	250	97
0.6	215	98
0.7	180	98
1	150	98
1.5	120	98
2	100	98
3	80	98
4	70	98

Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys

Metal Random Packings

Process Data

comparisons in terms of pressure drop, capacity and efficiency. Raschig Super-Ring® Plus is the result of a consequent design development based on many years of research. The target was to stay with all advantages of Raschig Super-Ring® but improve capacity and reduce pressure drop.



RI-Ring
(equivalent to IMTP)

Size	Surface (m ² /m ³)	Free Vol. %
15	300	96
25	235	97
40	150	97
50	98	98
60	85	98
70	60	98



LPR Low Profile Ring
(equivalent to
CASCADE MINI-RINGS)

Size	Surface (m ² /m ³)	Free Vol. %
0.5	356	96
1	247	96
1.5	187	97
2	157	97.5
2.5	130	98
3	102	98
4	79	98
5	46	98

Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys

Metal Random Packings

Process Data



Pall-Ring

Size	Surface (m ² /m ³)	Free Vol. %
10	515	94
15	360	95
25	215	95
38	135	96
50	105	96
80	80	96



Ralu-Ring®

Size	Surface (m ² /m ³)	Free Vol. %
25	215	96
38	135	97
50	105	98



Raschig-Ring

Size	Surface (m ² /m ³)	Free Vol. %
5	1.000	87
6	900	89
8	630	91
10	500	92
12	430	94
15	350	95
25	220	95
38	135	93
50	110	95
80	65	96
100	48	96

Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys



Plastic Random Packings



Plastic Random Packings

Process Data



Raschig Super-Ring®

Size	Surface (m ² /m ³)	Free Vol. %
0.3	325	92
0.6	205	93
2	100	96
3	75	97



Ralu-Flow®

Size	Surface (m ² /m ³)	Free Vol. %
1	165	95
2	100	95



Ralu-Ring®

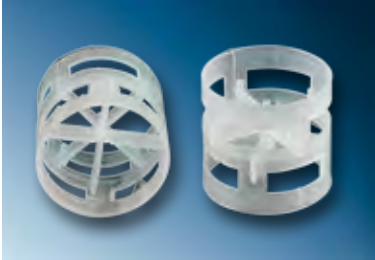
Size	Surface (m ² /m ³)	Free Vol. %
15	320	90
25	190	94
38	150	95
50	110	95
90	75	96
125	60	97

Available Materials:

PP, PE, PPH, PFA, PVC, PVDF, HDPE, E-CTFE, FEP, etc.

Plastic Random Packings

Process Data



Pall-Ring

Size	Surface (m ² /m ³)	Free Vol. %
15	350	88
25	220	91
90	78	94



Super-Torus-Saddle

Size	Surface (m ² /m ³)	Free Vol. %
1	240	90
2	110	94
3	90	96



Hacketten® / Tri-Packs®

Size	Surface (m ² /m ³)	Free Vol. %
25	279	90
50	157	94
90	125	95

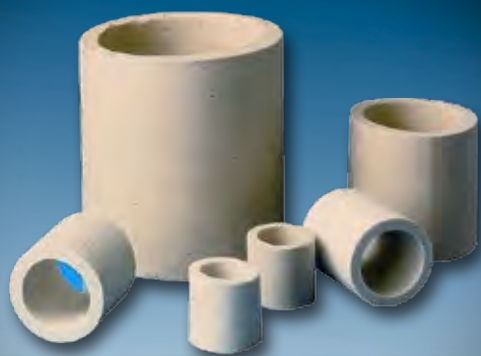


LPR Low Profile Ring
(equivalent to
CASCADE MINI-RINGS®)

Size	Surface (m ² /m ³)	Free Vol. %
25 (1A)	280	92
50 (2A)	164	93
50 (2)	144	95
90 (3A)	131	94

Available Materials:

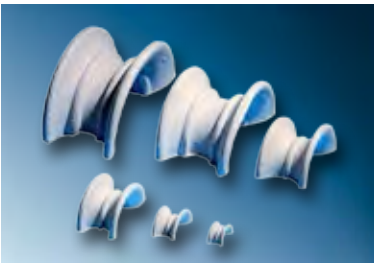
PP, PE, PPH, PFA, PVC, PVDF, HDPE, E-CTFE, FEP, etc.



**Ceramic and Carbon
Random Packings
Process Data**

Ceramic and Carbon Random Packings

Process Data



Torus-Saddle

Size	Surface (m ² /m ³)	Free Vol. %
12 (½")	622	73
20 (¾")	335	74
25 (1")	255	74
38 (1½")	166	75
50 (2")	120	77
75 (3")	92	79

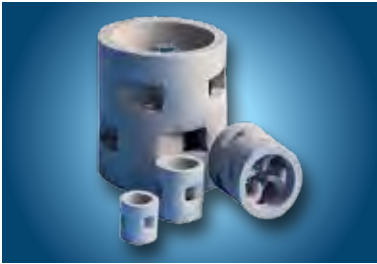


Balls

Ball-Ø (inch)	Ball-Ø (mm)	Surface (m ² /m ³)	Free Vol. %
1/8	3 – 5	1.285	44
1/4	6 – 8	500	44
3/8	9 – 11	350	44
1/2	11 – 14	280	45
5/8	14 – 17	220	45
3/4	19 – 21	170	45
1	23 – 28	125	45
1 1/2	29 – 35	105	48
2	48 – 55	65	45

Ceramic and Carbon Random Packings

Process Data



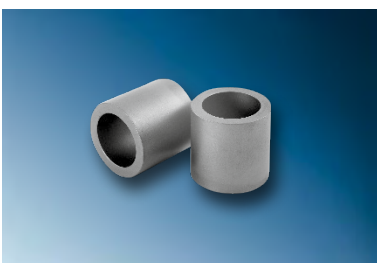
Pall-Ring

Size	Surface (m ² /m ³)	Free Vol. %
25	220	75
35	165	78
50	120	78
80	80	79
100	55	81



Raschig-Ring (Ceramic)

Size	Surface (m ² /m ³)	Free Vol. %
5	1.000	63
6	940	64
8	550	65
10	440	66
12	360	67
15	310	72
25	190	74
35	140	76
50	98	78
80	60	77
100	44	81



Raschig-Ring (Carbon)

Size (inch)	Surface (m ² /m ³)	Free Vol. %
1/4	623	53
1/2	392	66
3/4	210	73
1	179	76
1-1/2	126	77
1-1/2+	113	71
2	91	72
3	67	70
4	43	68

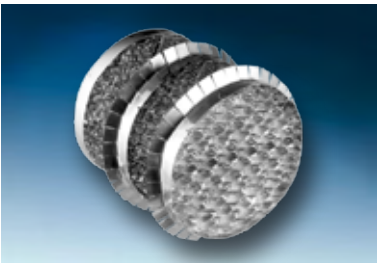


Metal Structured Packings

Metal Structured Packings

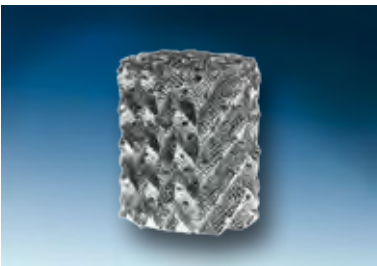
Process Data

The new Raschig Super-Pak is a novel development in mass transfer technology because of its optimized surface design. It enables, to an extent never known before, great separation efficiency and high loading capacity while keeping the pressure drop extremely small.



Raschig Super-Pak®

Size	Style		Surface (m ² /m ³)	Free Vol. %
150	X	Y	150	98
200	X	Y	200	98
250	X	Y	250	98
300	X	Y	300	98
350	X	Y	350	97
500		Y	500	96



Raschig-Pak
(equivalent to Mellapak™)

Size	Style			Surface (m ² /m ³)	Free Vol. %
125	X	Y	–	125	98
170	X	Y	–	170	98
200	X	Y	–	200	98
250	X	Y	HC	250	98
300	X	Y	–	300	98
350	X	Y	HC	350	97
500	X	Y	HC	500	98
500 Gauze	X	–	–	500	95

Y = Angle of inclination 45°

X = Angle of inclination 60°

HC = High Capacity Packing

Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys

Plastic Structured Packings, Metal Grids

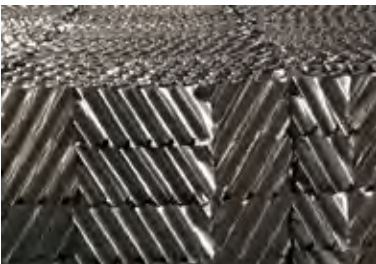
Process Data



Raschig-Pak (plastic)

Size	Style			Surface (m ² /m ³)	Free Vol. %
110	X	–	–	110	88
220	–	Y	HC	170	82

Available Materials: PP, other materials on request



Raschig-Grid

Size	Style		Surface (m ² /m ³)	Free Vol. %
P40	X	Y	40	98
P64	X	Y	64	97
P90	X	Y	90	96

Y = Angle of inclination 45°

X = Angle of inclination 60°

HC = High Capacity Packing

Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys

Internals

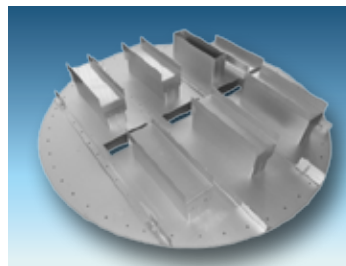
For optimum performance, proper liquid and vapor distribution are of critical importance. To complement the random and structured packings, a wide range of internals is available such as high quality liquid distributors besides the standard type, support plates, hold-down plates, gas/vapor distributors, liquid collectors and gas/liquid flash devices.



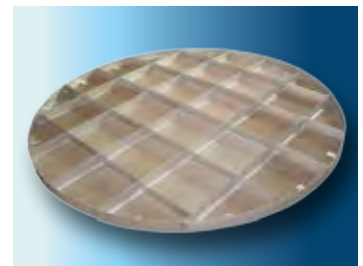
Gas-Liquid Phase Separator



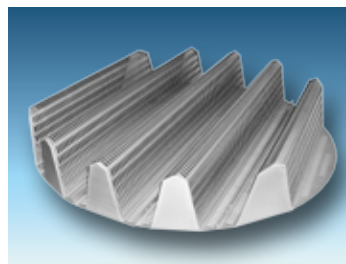
Liquid Distributor



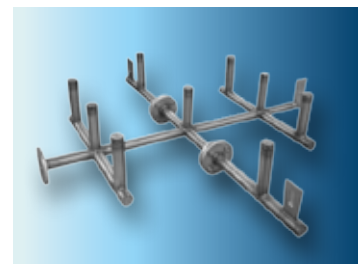
Liquid Collector



Hold-Down Plate



Support Plate





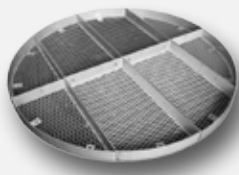
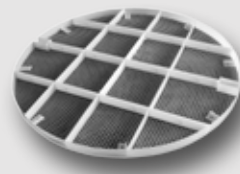
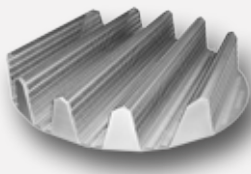
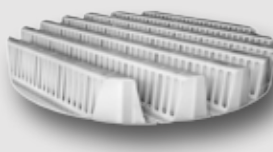
Gas Distributor

The Importance of Internals in Packed Columns

Nowadays, the ever-increasing efforts to achieve a process with optimal chemical engineering characteristics demand modern mass-transfer columns, i.e. high mass-transfer efficiency but a minimal energy requirement. These demands can only be met by the use of modern packed beds if the internals in the packed columns – liquid and gas distributors, hold-down and support structures, liquid collectors and redistributors – are designed according to modern principles. The gas and liquid distributors, which must be carefully designed and mounted with the greatest accuracy, are of prime importance in this respect. Detailed investigations into the uneven

distribution of liquid in packed columns (maldistribution) have highlighted the influence on mass transfer efficiency of uniform distribution over the column cross-section. Properly designed support and hold-down plates are also important if a reduction in throughput is to be avoided. Increased pressure drops may sometimes result from the use of an inadequate support plate. Furthermore, there have been cases in which the tower packings have been damaged or even swept away due to the absence of a hold-down plate. The costs arising from the resultant malfunction in the downstream plant installations due to this damage are gener-

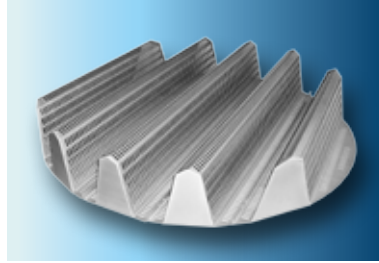
ally higher than the price of a hold-down plate. Our range of internals includes many types and sizes, manufactured in metal or plastic, and designed according to the state of the art of chemical engineering. A modern column design demands a basic understanding of the fluid-dynamic flow relationships in mass transfer columns. Experiments in the pilot plants at Raschig have in the past produced important criteria for designing internals, criteria which are taken into account in every new design project today. We would be happy to advise you and are able to offer tailor-made solutions to your individual problems.

Metal	Plastic
	
High Quality Liquid Distributor DT-S	
	
Hold-Down Plate HP-1	
	
Multibeam Support Plate SP-1	

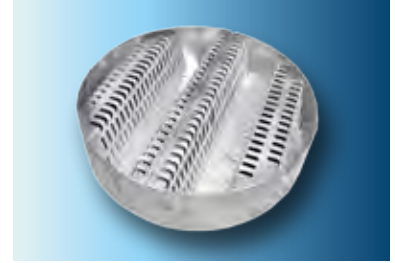
Available Materials: Carbon Steel, Stainless Steel, Hastelloy, Titan, Copper, Aluminium, Nickel, special Alloys...

Available Materials: PE, PP, PVDF, ECTFE, PFA, Teflon, TFM, FRP...

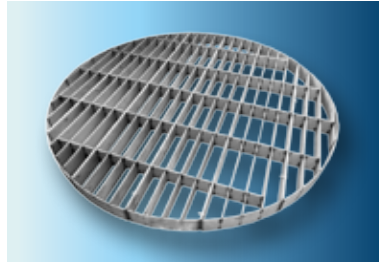
Support Plates in Metal and Plastic



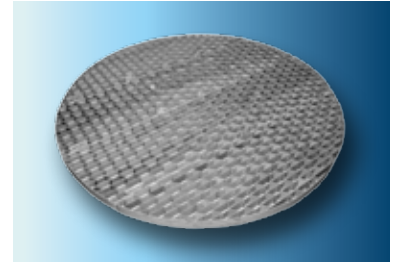
**Multibeam Support Plate
Type SP-1,**
 $\varnothing > 1200 \text{ mm}$
for metal and plastic packings



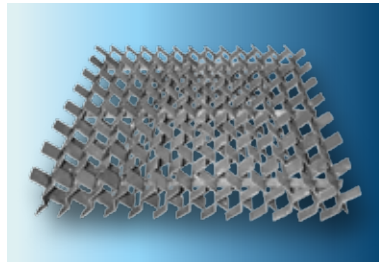
**Multibeam Support Plate
Type SP-2 and SP-3,**
 $100 \text{ mm} < \varnothing < 1200 \text{ mm}$
for metal and plastic packings



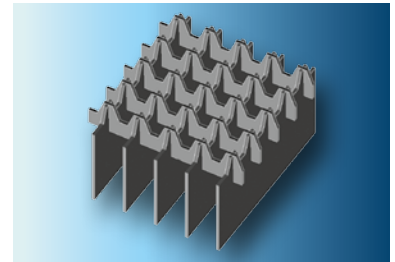
**Flat Bar Support Plate
Type SP-P,**
 $\varnothing > 100 \text{ mm}$
for structured packings



**Hexa-Grid Support Plate
Type SP-HG,**
 $\varnothing > 500 \text{ mm}$
for metal and plastic packings
for fouling services

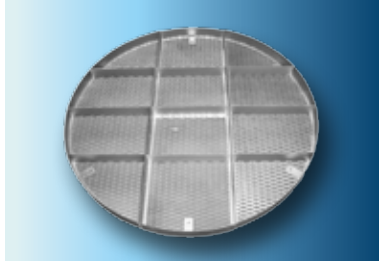


**Cross-Flow-Grid Support Plate
Type SP-CF,**
 $\varnothing > 500 \text{ mm}$, for metal and plastic
packings for fouling services and
enhanced gas distribution

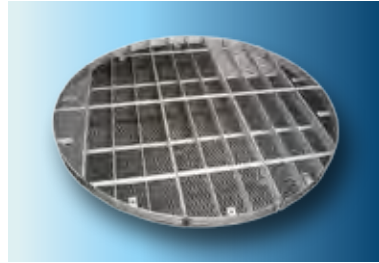


**Raschig-Super Grid Support Plate
Type RSG (in plastic),**
 $\varnothing > 500 \text{ mm}$
for plastic packings

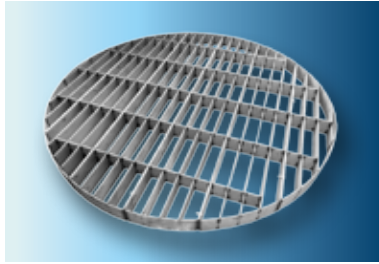
Hold-Down Plates in Metal and Plastic



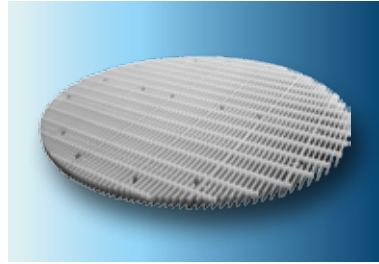
**Hold-down Plate
Type HP-1,**
Ø > 100 mm
for metal and plastic packings



**Hold-down Plate
Type HP-2,**
Ø > 100 mm
for ceramic packings



**Hold-down Plate
Type HP-P,**
Ø > 100 mm
for structured packings



**Hold-down Plate Raschig Grid
Type RG in plastic,**
Ø > 100 mm
for plastic packings

Liquid Distributors and Redistributors

in Metal and Plastic

Standard liquid distributors are usually used for liquid loads in a range of 5 to 80 m³/m²/h. Their simple design allows short production times and low cost.

Various applications in industry require special liquid distributors to ensure optimal distribution quality, highest wettability, controlled gas flow, low pressure drop, fouling resistance or high operating ranges.

For all of the different industrial demands, Raschig has a standardized or customized solutions.

The liquid distributor selection matrix below offers a first indication on the liquid distributor for the individual application.

Liquid Distributor Selection Matrix:

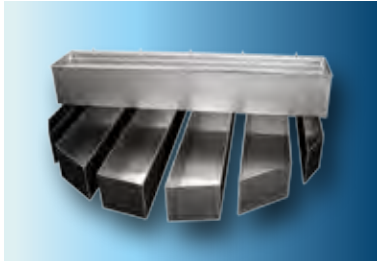
Standard Distributor

Type	Column diameter (mm)	Standard loading range	Liquid load u_L [m ³ /m ² h]			Gas capacity factor [\sqrt{Pa}]			Sensitivity to fouling
			$u_L < 5$	$5 < u_L < 80$	$u_L > 80$	$F_v < 1$	$1 < F_v < 2,5$	$F_v > 2,5$	
DT-1	> 800	2:1		x	x	x	x		yes
DT-2	> 800	10:1		x	x	x	x		no
DR-2	< 1200	2:1		x	x	x	x		yes
DR-3	< 1200	10:1		x	x	x			no
DP-1	> 100	2:1		x	x	x	x	x	yes
DP-S	> 500	3:1		x		x	x		no
RP-1	> 1200	2:1		x	x	x	x		yes
RP-2	> 300	2:1		x	x	x	x		yes

High-quality Distributor

Type	Column diameter (mm)	Standard loading range	Liquid load u_L [m ³ /m ² h]			Gas capacity factor [\sqrt{Pa}]			Sensitivity to fouling
			$u_L < 5$	$5 < u_L < 80$	$u_L > 80$	$F_v < 1$	$1 < F_v < 2,5$	$F_v > 2,5$	
DT-MF	> 500	2:1 – 5:1	x	x (<10)		x	x	x	no
DT-S	> 300	2:1 – 5:1	x	x		x	x	x	no
RP-P2	> 300	2:1			x	x			yes
RP-S	> 300	2:1 – 5:1	x	x	x	x	x	x	no
DR-S	< 1200	2:1 – 5:1	x	x	x	x	x	x	no
DT-W	> 300	2:1		x		x	x		yes
DR-LL	< 1200	2:1 – 5:1	x (<2)			x	x		no

Standard Liquid Distributors and Redistributors in Metal and Plastic



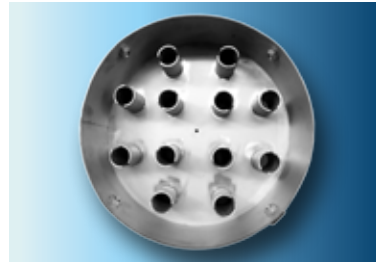
**Trough Distributor
Type DT-1,**
 $\varnothing > 800 \text{ mm}$



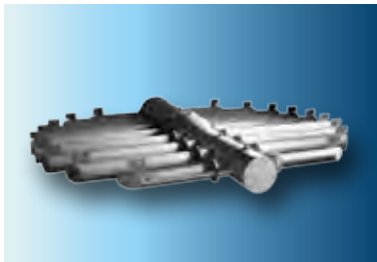
**Trough Distributor
Type DT-2,**
 $\varnothing > 800 \text{ mm}$
Fouling service



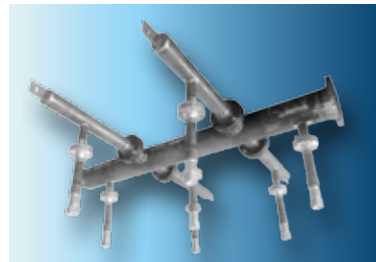
**Pan Distributor
Type DR-2,**
 $100 \text{ mm} < \varnothing < 1200 \text{ mm}$



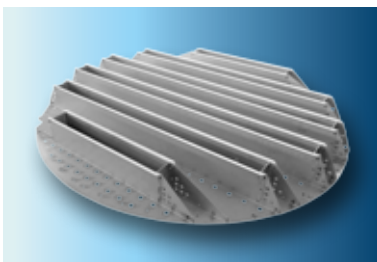
**Pan Distributor
Type DR-3,**
 $100 \text{ mm} < \varnothing < 1200 \text{ mm}$
Fouling service



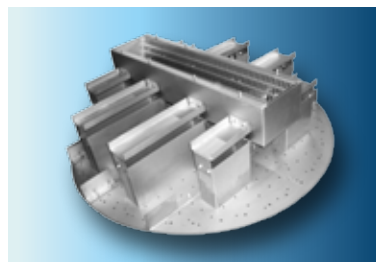
**Pipe Distributor
Type DP-1,**
 $\varnothing > 100 \text{ mm}$



**Spray Distributor
Type DP-S,**
 $\varnothing > 500 \text{ mm}$

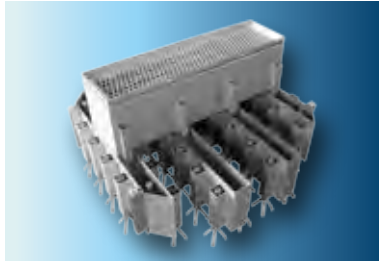


**Chimney Distributor
Type RP-1,**
 $\varnothing > 1200 \text{ mm}$



**Chimney Distributor
Type RP-2,**
 $\varnothing > 300 \text{ mm}$

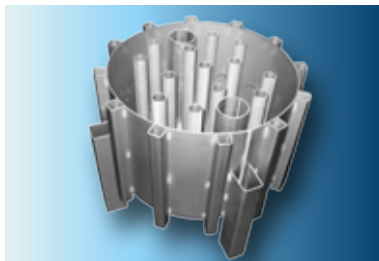
High Quality Liquid Distributors in Metal and Plastic



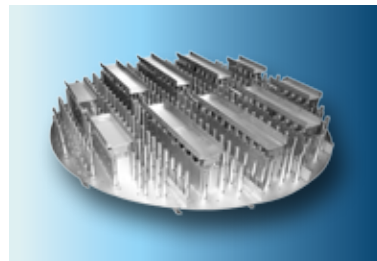
**High quality Distributor
Type Multi-Flow DT-MF,**
Ø > 500 mm
Very low liquid rates



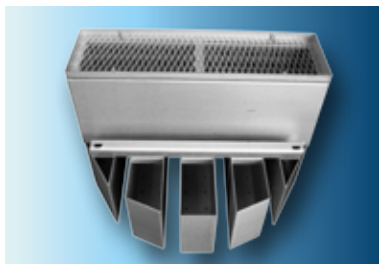
**High quality Distributor
Type DT-S,**
Ø > 300 mm
Low to medium liquid rates



**High quality Distributor
Type DR-S,**
100 mm < Ø < 1200 mm
Low to medium liquid rates



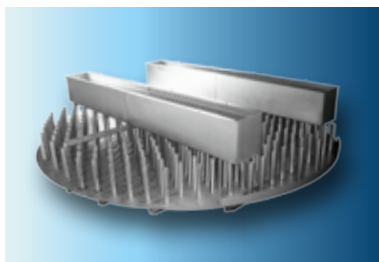
**High quality Distributor
Type RP-S,**
Ø > 300 mm
Low to medium liquid rates



**High quality Distributor
Type DT-W,**
Ø > 300 mm
Medium liquid rates

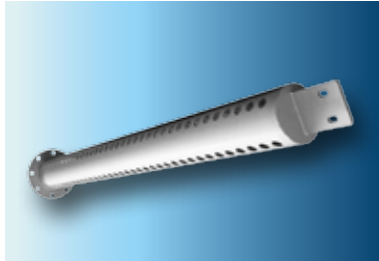


**High quality Distributor
Type DR-LL,**
Ø < 1200 mm
Very low liquid rates

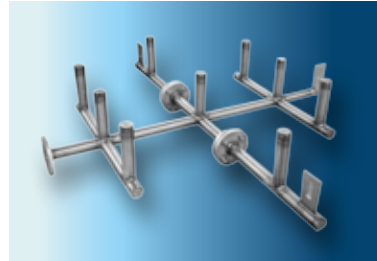


**High quality Distributor
Type RP-P2,**
Ø > 300 mm
High liquid rates beside low gas velocity

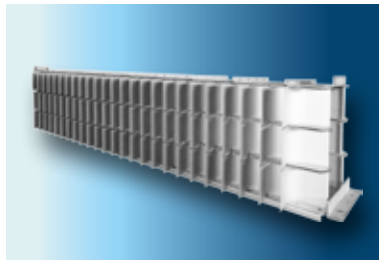
Gas / Vapor Distributors in Metal and Plastic



**Pipe Distributor
Type GV-1,**
Ø > 300 mm



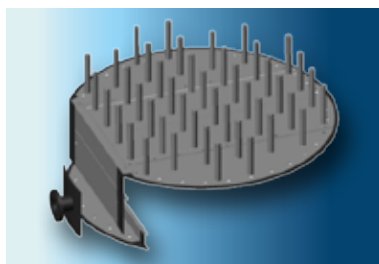
**Pipe Distributor
Type GV-P1,**
Ø > 300 mm
Lowest gas flow rates



**Vane Distributor
Type GV-2,**
Ø > 500 mm

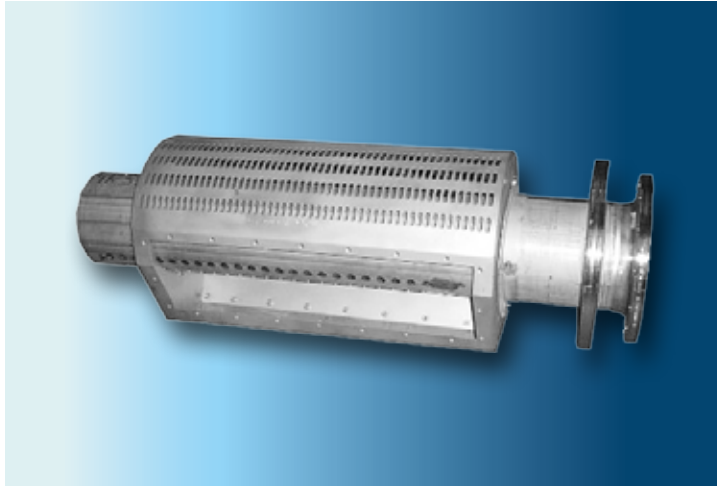


**Chimney Distributor
Type GV-3,**
Ø > 800 mm

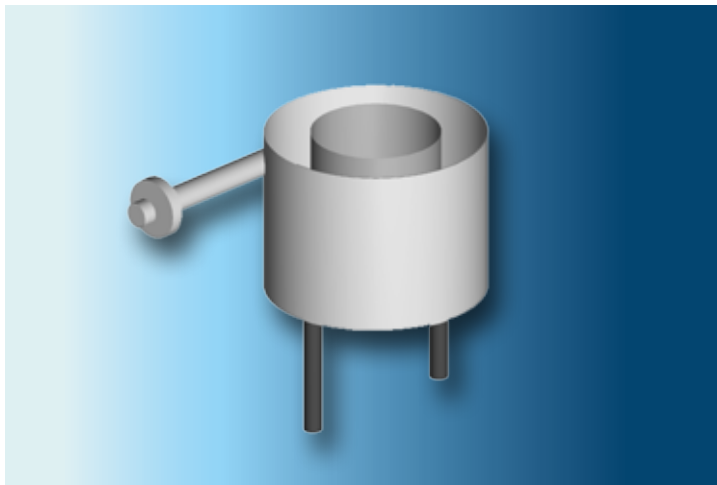


**Chimney Distributor
Type GV-P3,**
Ø > 800 mm
Lowest gas flow rates

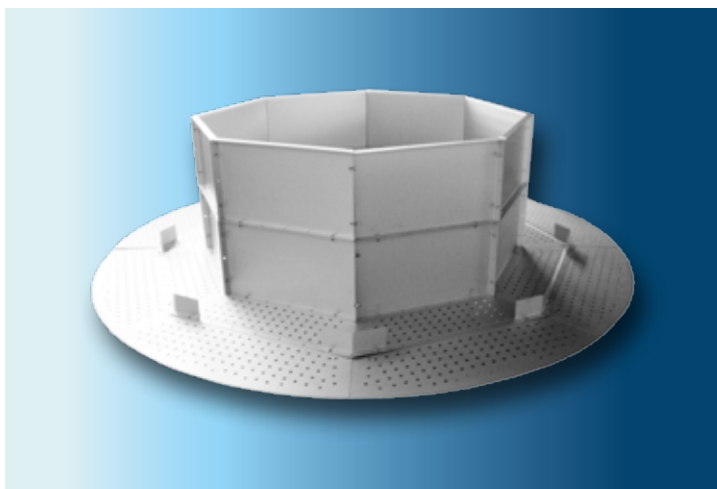
Gas-liquid Phase Separators in Metal and Plastic



Two-phase
Double-shell
Flashbox
Type FB-1

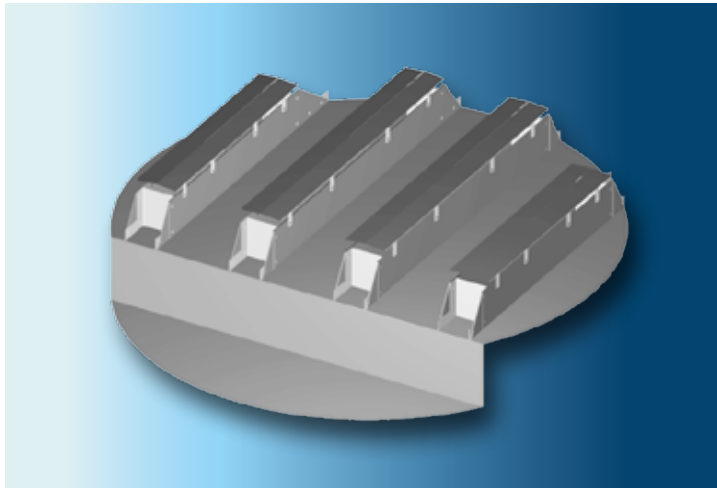


Two-phase
Centrifugal
Flashbox
Type FB-2

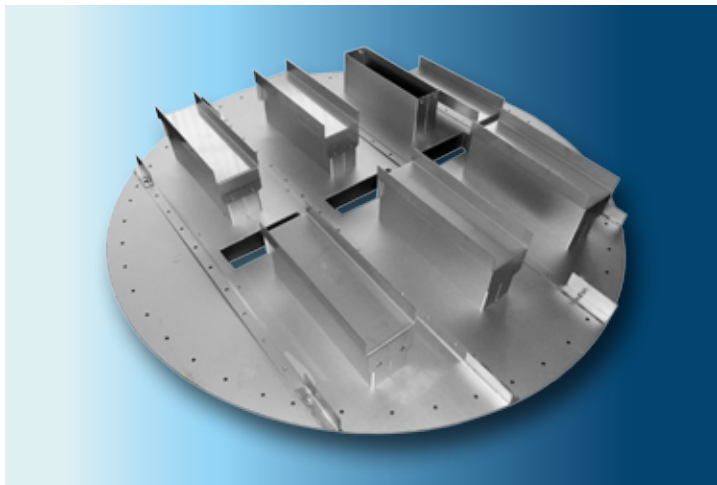


Two-phase
Flash Gallery
Type FB-3

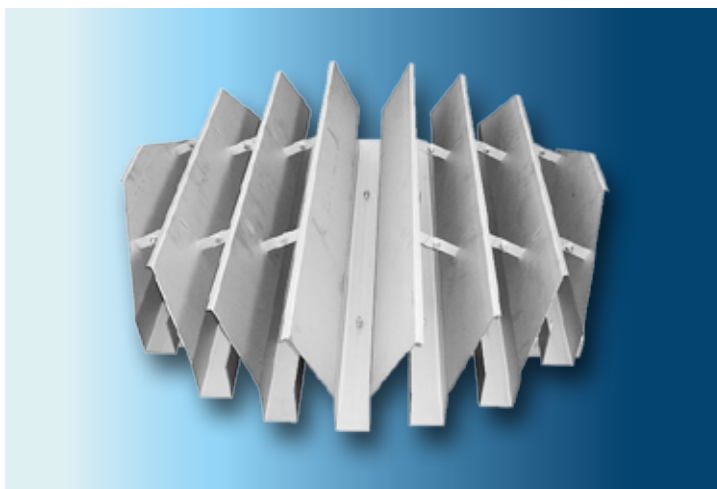
Liquid Collectors in Metal and Plastic



**Chimney Collector
Type CP-1**
Ø > 1200 mm



**Chimney Collector
Type CP-2**
Ø > 300 mm

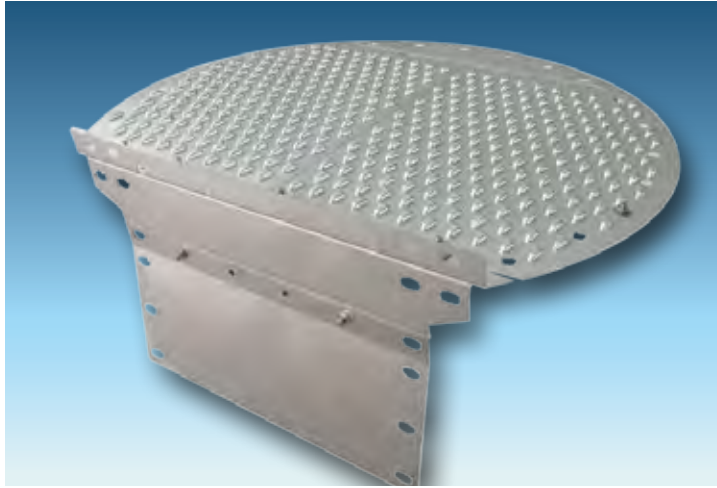


**Vane Collector
Type CV-1**
Ø > 800 mm

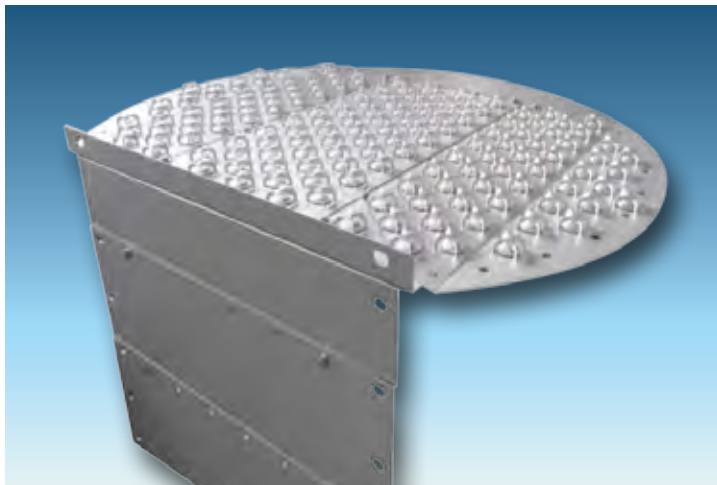


Tray Technology

Tray Technology

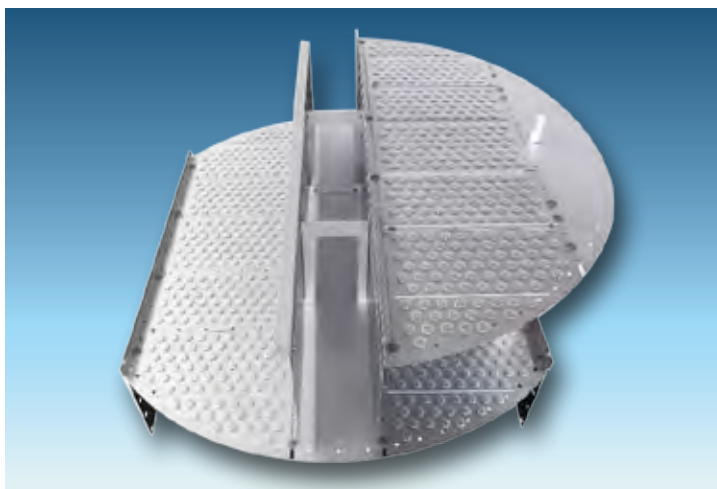


Raschig offers you an extensive product portfolio and engineering expertise in the field of mass transfer trays, from the design of completely new columns to status analysis and revamps of existing installations. We provide the hydraulic and mechanical design matching your individual application and reliably supply conventional trays and enhanced capacity trays. Ranging from sieve and valve trays towards bubble and tunnel cap trays, various 1- to 4-pass assemblies are manufactured from diverse metallic or specific thermoplastic materials.

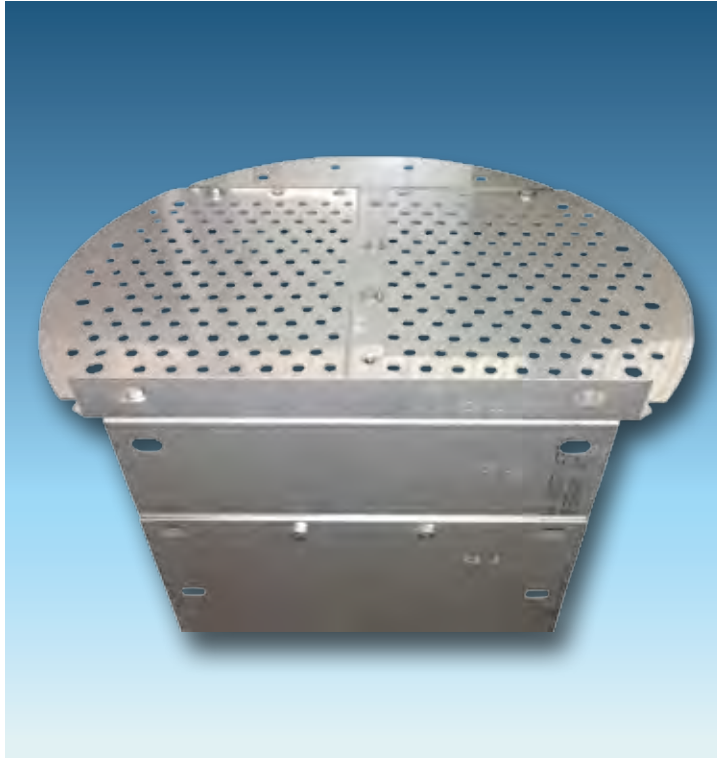


Moreover, we procure spare parts for rapid repairs. If desired, we also provide assembly technicians and supervisors.

We offer cartridge-trays for flanged columns with small diameters, chimney trays and special tray types like baffle trays or disk and donut trays.

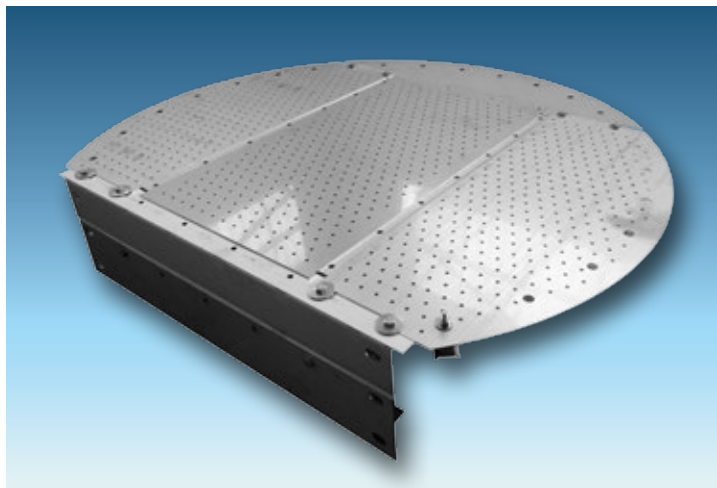


Tray Technology



Sieve Trays

Our sieve trays are the unbeatably low cost solution for applications with clearly defined flow rates. These trays perforated with holes are suitable for relatively high loads. They show a moderate pressure drop and are suited for applications with high fouling tendency. Metallic and thermoplastic materials can be used and the hole diameters vary from 3.0 mm to 25 mm.



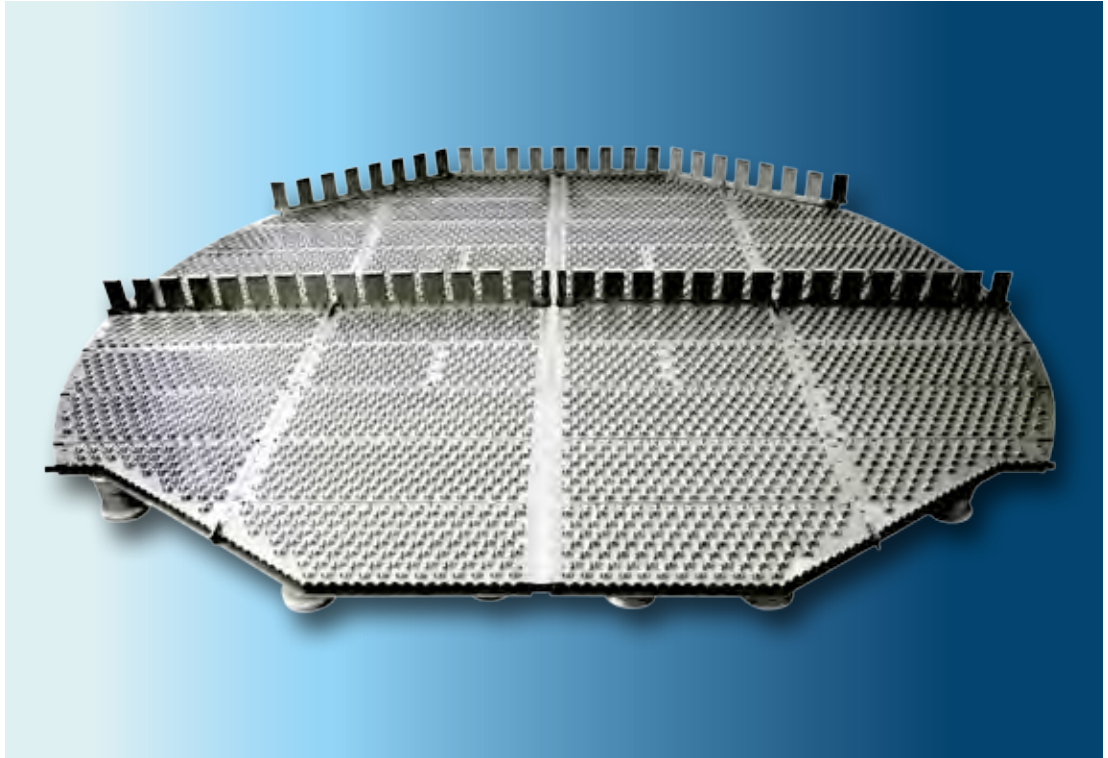
Extraction Trays

These trays used for liquid-liquid extraction serve to distribute the disperse phase within the continuous phase. Therefore, a high surface quality is required for the tray decks usually equipped with small holes. These trays feature either downcomers or upcomers.

Dualflow Trays

Specific sieve trays without downcomers, where vapor and liquid are sharing the same orifices. As these trays are working at counter current flow, the operation range is very narrow. The active area spans the entire cross section of the column and is completely perforated with holes. Dual flow trays are excellently suited for systems with contaminants or a tendency to polymerise.

Tray Technology



Valve Trays

For realizing large and very large operating ranges, Raschig offers a variety of valve tray designs, ranging from round standard valves and caged valves to fixed valves with large and small size (minivalves). Valve units cover the orifices and direct the vapor stream more horizontally than vertically into the liquid. By this change in direction of the vapor phase, entrainment is reduced significantly in comparison to sieve trays. Special designs like venturi-shaped orifices for lower pressure drop are available.

Valve trays have large capacities and can realize good separation efficiencies over wide operating ranges. Especially moveable valve units achieve high turndown flexibilities. Fixed valves are a cost-effective solution for various applications with medium operating range, even for corrosive systems. Large fixed valves produce relatively low pressure drops, yet show a low weeping tendency. The use of smaller-sized minivalves clearly augments tray capacity.

Tray Technology



Valve Types

R-V1

Round, moveable standard valve with integral legs. Three dimples define the initial rise. Universal purpose, large operating range, variable weights. **R-V1X**: Flush seating version without dimples.



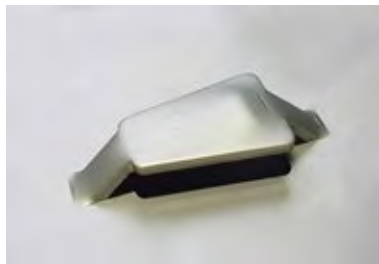
R-T3

Caged, round, moveable valve with high mechanical strength. Three lugs at the domed valve disk define the initial rise. Low wear, suitable for fouling services. **R-T3-11**: Version with smaller diameter orifice.



R-T1

Double-disk valve with a mechanically strong cage. With an orifice cover and a separate ballast plate, it enlarges the operating range to a maximum extent. The light-weight orifice cover can close completely.



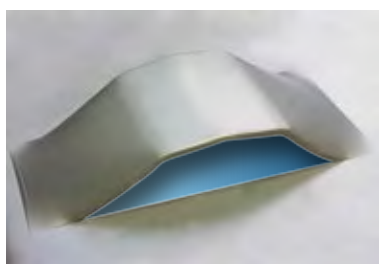
R-MV

Fixed minivalve with a unique, domed cover. Net rises of 3.5 to 5.5 mm. Higher capacity compared to conventional sieve or valve trays, moderate costs. Directional horizontal vapor stream into the liquid results in high efficiency.



R-RV

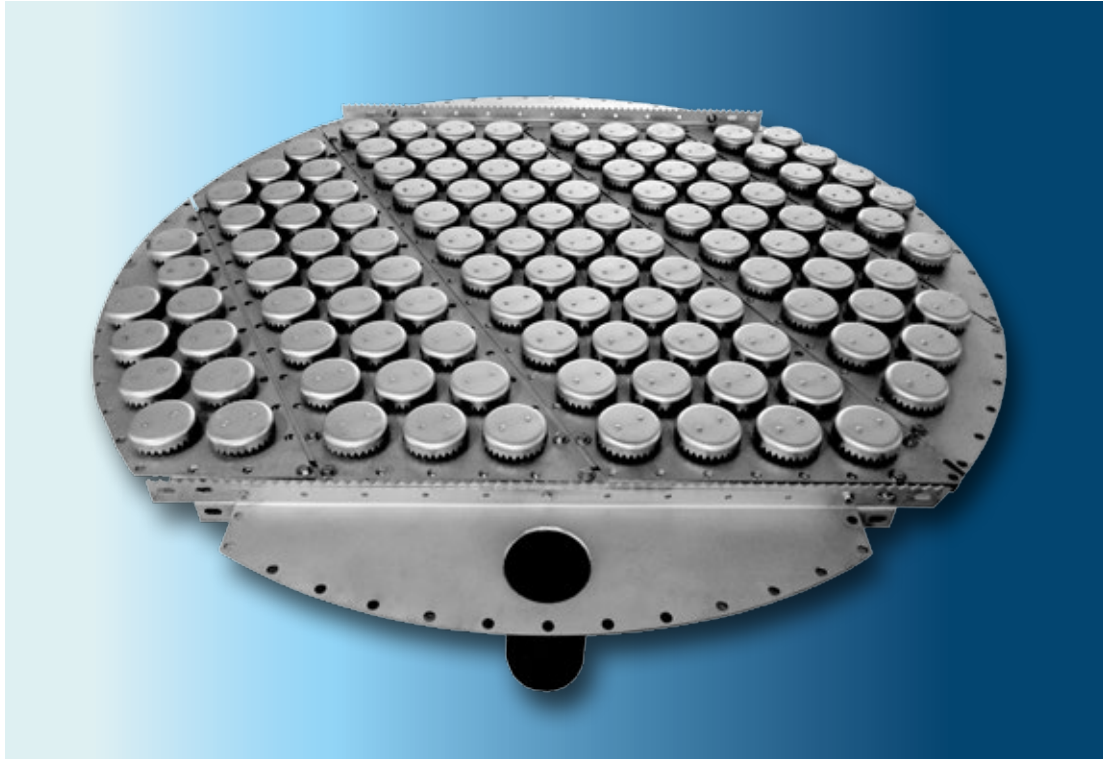
Round, fixed minivalve for higher capacity. More uniform bubbling zone, reduced entrainment. Good fouling resistance. Net rises of 4.5 to 8.0 mm.



R-SV

Large fixed valve. Net rises of 8.0 to 13.5 mm. Versatile, low pressure drop, suitable for fouling services. Low weeping tendency at reduced gas load conditions.

Tray Technology

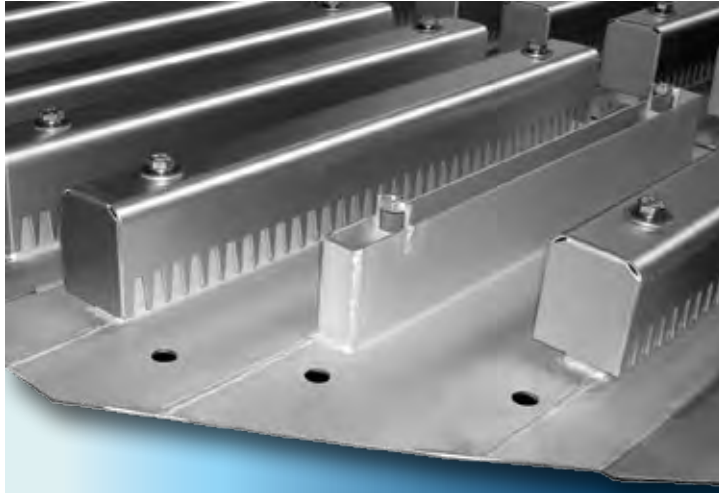


Bubble Cap Trays

Being the most traditional representative of mass transfer equipment, the bubble cap tray is still today indispensable for applications with very low vapor or liquid loads, or wide variations of the flow rates. The liquid tight risers and the flow of the vapor stream through the submerged slots in the bubble caps ensure a permanent contacting between both phases. Using sealed constructions, very low leakage rates can be achieved.

Various shapes, sizes and types of design allow tailor-made solutions for your individual needs. Bubble cap trays can be manufactured from metallic as well as from thermoplastic materials.

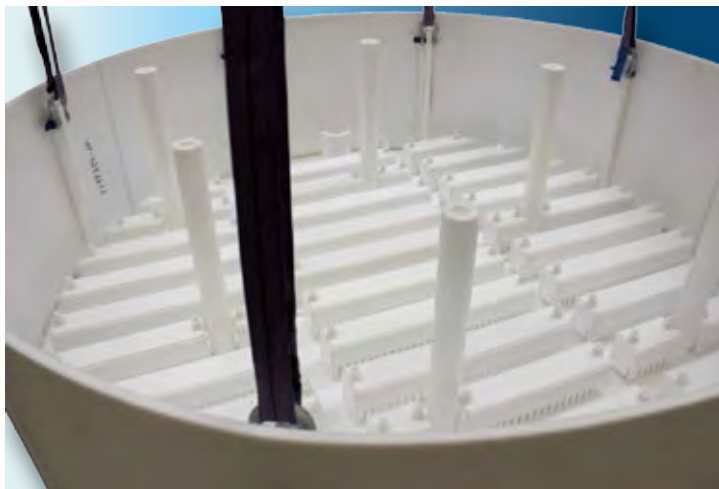
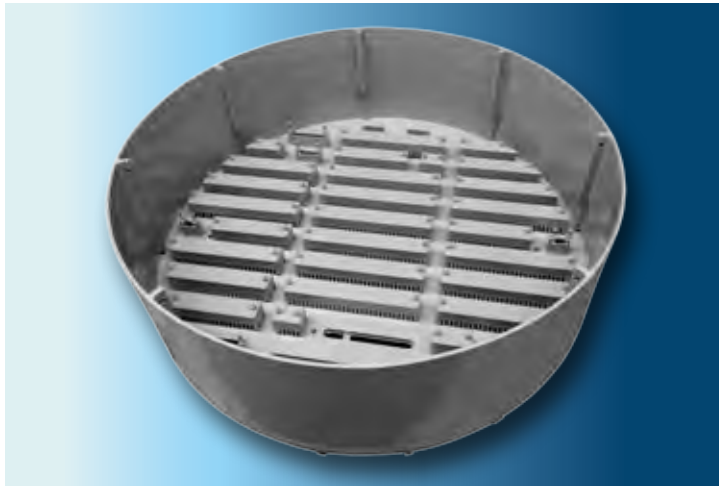
Tray Technology

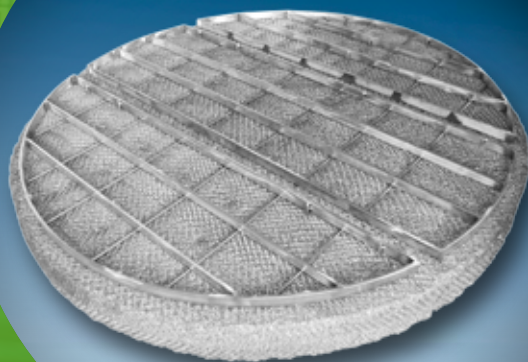


Tunnel Trays

Tunnel trays are equipped with tunnels arranged either in parallel or crosswise to the flow direction. The elongated vapor risers are covered by slotted caps. Shape and number of the slots in the caps are variable as in the case of bubble cap trays.

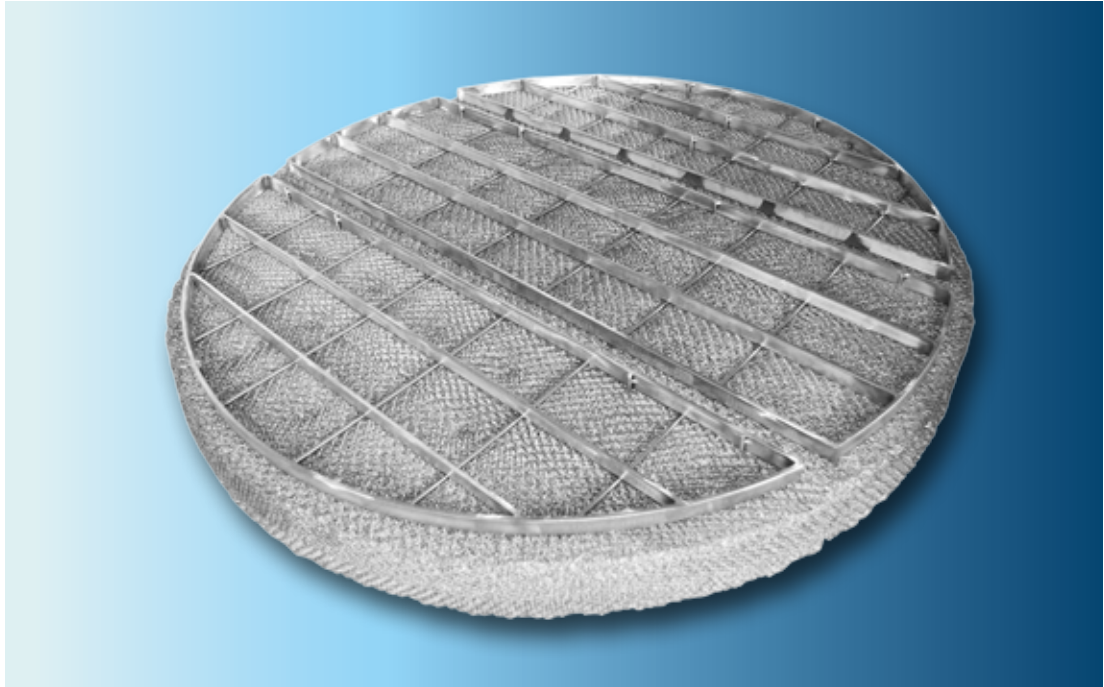
Trays with tunnels in parallel to the flow direction suit medium to very high liquid loads. Trays with tunnels crosswise to flow are appropriate for very low liquid loads and provide long residence times. They can be manufactured also from thermoplastic materials like bubble cap trays.





Droplet Separator

Droplet Separator in Metal and Plastic



In many separation processes, gas and vapor flows play an essential role. Mechanical and thermal droplet formation take place in gas streams of absorption columns, gas scrubbers and liquids accumulators.

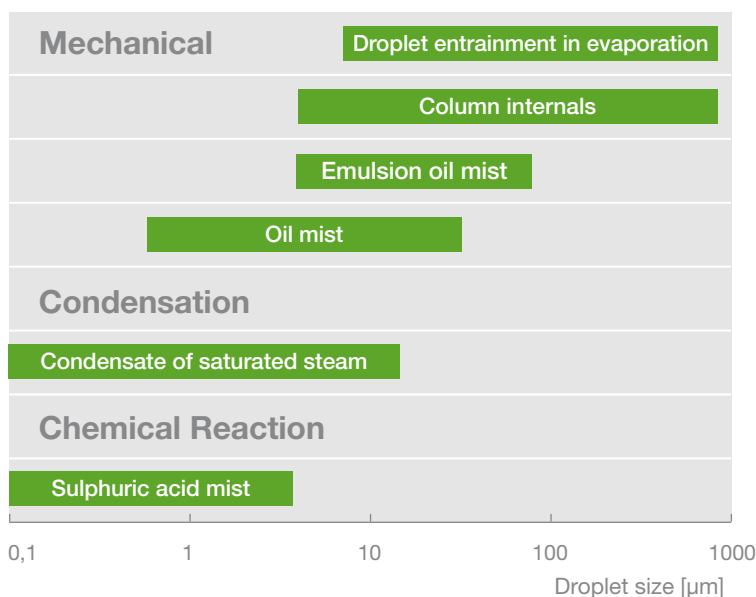
For certain processes, these liquid fractions must be separated from the overall gas or vapor flow. Especially droplet separators made from knitted wire mesh and fiber materials are very effective for the

tradeoff between good separation efficiency and low pressure drop.

The size of the droplets mostly depends on their kind of origin and their prehistory. Two principal mechanisms are responsible for their formation: mechanical generation as well as condensation. A rough distinction of the droplet size can be made to the effect, that droplets bigger than 10 μm are called spray and smaller ones are called mist or aerosols.

Applications

- Evaporators (To avoid entrainment and to improve product purity)
- Absorption- and distillation columns (Increase of flow rates and products purity)
- Vacuum- and compressed air systems (Separation of the condensate generated)
- Oil mist separator (Waste air abatement and recovery of oils and lubricants)
- Fat filters/ fatty acid systems (Separation of fatty acids)
- Paint shops (Separation of painting particles)
- Sulphuric acid plants (Separation of sulphuric acid mist)
- Air conditioning and waste air systems (Separation of liquid and solid particles)
- Cooling towers (Retaining aerosols)



Droplet Separator

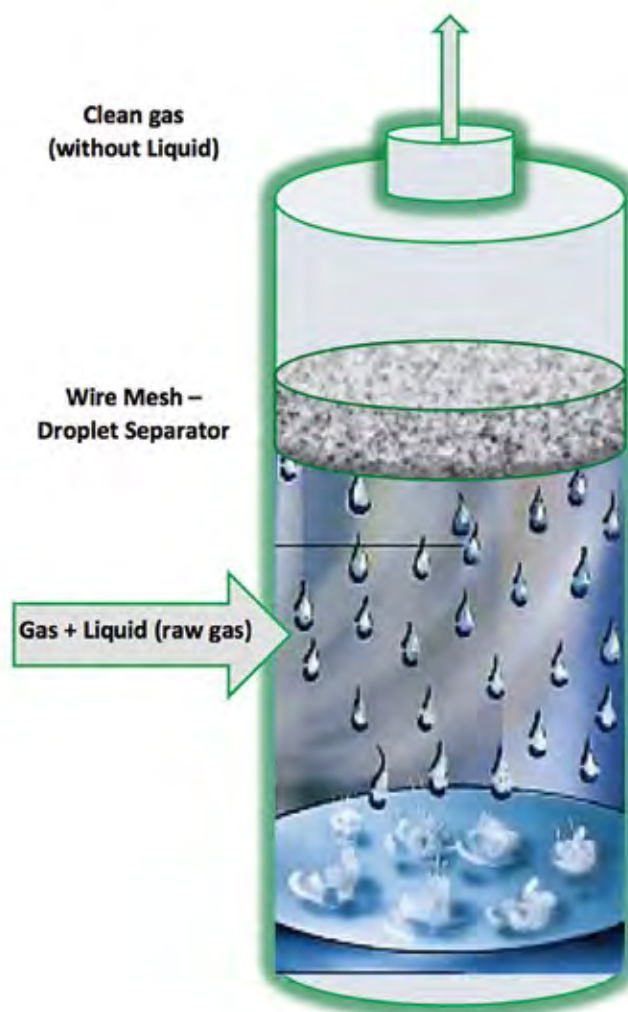
Overview of the separation systems

Seperation System	Limit Droplet [μm]	Free Vol. %
Separation by Inertia (vessel/ column)	> 100	–
Cyclone or Cyclone liquid Collector	50 – 100	10 – 20
Impact baffle or Vane Type Separator	> 15	3 – 10
Knitted Wire Mesh Separator	> 3	3
Knitted Wire Mesh + Agglomerator	> 1	< 3

The following figure on the right side provides information about commercially available Droplet Separation systems and precisely defined, in which process conditions with respect to the limit drop size and stream velocity existing one separator is used.

The application limits arise from the separation mechanism, which come into effect depending on the droplet size and the gas velocity.

The column figure is showing a droplet separation process with an installed knitted wire mesh droplet separator in the top of the column.



The separation of liquid droplets is based on the effect, that the particles cannot follow the streamlines of the gas when they hit an obstacle and stick to a periphery.

Each individual wire of the knitted wire mesh separator constitutes an obstacle in a gas stream, so that a deflection of the streamlines occurs. Entrained droplets cannot follow due to its inertia this redirection and rebound on the single wire. The most important separation mechanism are:

- Separation by Inertia
- Separation by Interception
- Separation by Diffusion

Droplet Separator

Standard-Types

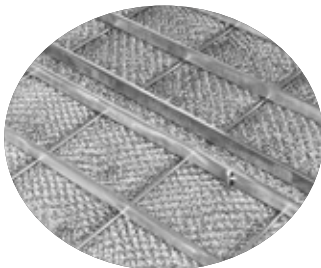
Types	Density [kg/m³]	Density [lbs/ft³]	Surface [m²/m³]	Surface [ft²/ft³]	Porosity [%]	Application
Metal Types						
RA-80-S0-0,28	80	5	145	44	99,0	High liquid load – big droplets > 15 µm
RA-130-S0-0,28	130	8	236	72	98,3	High gas velocity
RA-145-S0-0,28	145	9	265	80	98,1	Normal process conditions
RA-192-S0-0,28	192	12	350	107	97,5	Emulsion mist - droplets > 5 µm
RA-240-S0-0,28	240	15	435	133	97,0	
RA-240-S0-0,28	240	15	868	265	97,0	Agglomeration droplets > 2-3 µm
RA-350-S0-0,10	350	21,8	1772	545	95,6	Oil - mist droplets 1 - 3 µm
Plastic Types						
RA-50-P0-0,40	50	3,1	550	167	94,5	Normal process conditions High separation efficiency
RA-100-P0-0,40	100	6,2	1100	335	89,0	
RA-100-P0-0,22	100	6,2	2000	610	89,0	
RA-80-P2-0,27	80	5	665	200	95,5	Normal process conditions High separation efficiency
RA-100-P3-0,27	100	6,2	870	265	94,2	
Combination Types						
RA-200-S0/P0-F	200	12,5	< 900	< 280	92,8	Oil-Emulsion mist separation ≤ 10 mg/m³
RA-240-S0/Y3	240	15	> 480	> 150	96,6	Acid - droplets 2-3 µm
RA-175-Y3/P8	175	11	> 360	> 110	97,5	High concentrated sulphuric acid mist by high temperature up to 220 °C

Droplet Separator

Material and Wire Diameters

Metals	Plastics	Fiber – Materials
Galvanized steel	PP (Polypropylen)	
Stainless steel – Variants	PE (Polyethylen)	
Aluminum	PVDF (Polyvinylidenfluorid)	GSF (Glas staple fiber)
Monel	ETFE (modif. PTFE)	GF (Glas fiber)
Inconel	PFA (Perfluoralkoxycopolymer)	PP-Fiber
Incoloy	FEP (Perfluorethylenpropylen)	PES-Fiber
Titan	PVC (Polyvinylchlorid)	PTFE-Fiber
Copper	PTFE coated	
Brass	PFA coated	

Wire Diameters	Dimensions of monofilament	Fiber materials
Ø 0,25 – 0,70 mm	Ø 0,22 – 0,50 mm	4 µm – 100 µm
(ironed material available)	Dimensions of coated wire: Ø 0,28 – 0,45 mm	



Metal – Demister



Plastic – Demister



Fiber Material – Demister



Servicepartner

More information under
www.raschig.com

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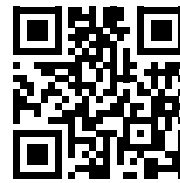
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