



- Distillation Columns
- Gas Absorption
- Petroleum Refinery
- Solvent Recovery
- Liquid- Liquid Extraction
- COD Strippers
- Structured Packings & Internals
- Random Packings & Internals

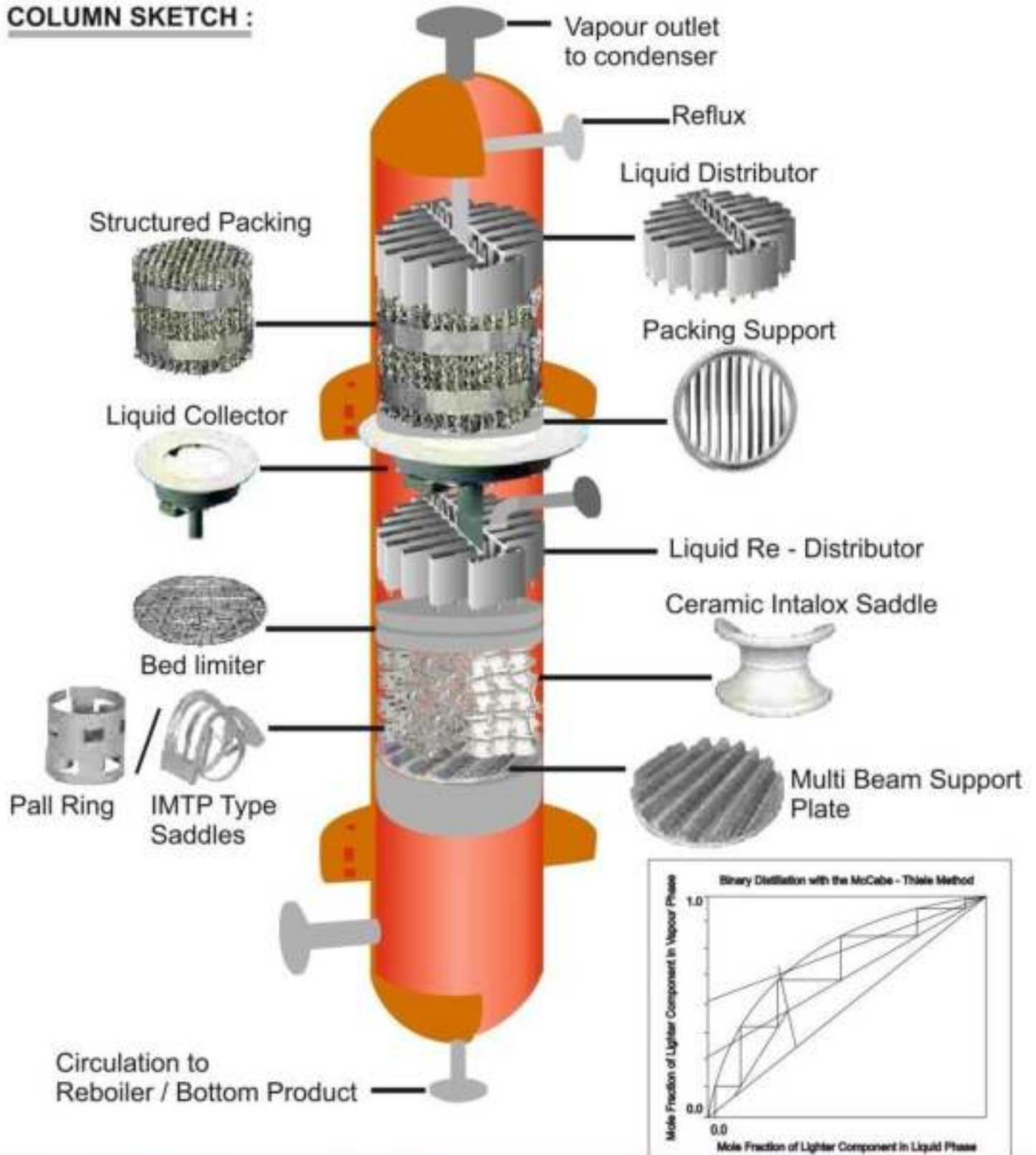


PROCESS AND COLUMN DESIGN :

Supply of Distillation Column with Process Hydraulic & Mechanical designs are our expertise. Computer aided Design & Simulation softwares are used for the purpose.

- DMF-WATER SEPARATION
- METHANOL-WATER SEPARATION
- IPA-WATER SEPARATION
- ETHYL ACETATE-WATER SEPARATION
- SOLVENT RECOVERY UNITS (SRU)
- GAS SCRUBBERS FOR HCl, SO₂, H₂S, Cl₂, HBr
- LIQUID - LIQUID EXTRACTION
- HIGH COD STRIPPERS
- MULTI EFFECT EVAPORATOR

COLUMN SKETCH :



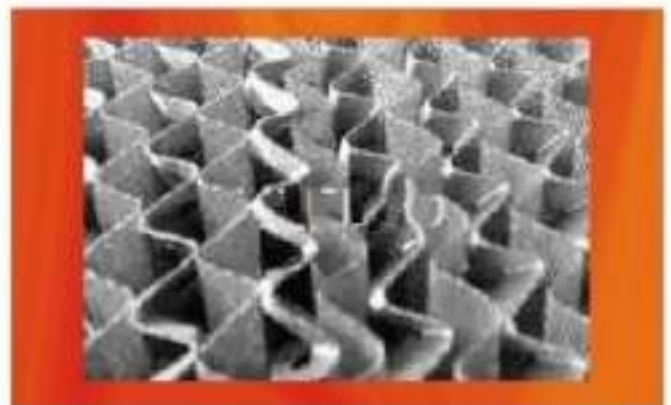
STRUCTURED COLUMN PACKING :

STRUCTURED TOWER PACKING:

It's an advanced Column Packing with high efficiency performance in distillation column for solvent recovery, stripping or absorption. A high specific surface area facilitate efficient mass transfer. Hence higher NTSM, higher voidage and lower packing factor provides lower pressure drop & higher throughput with lower energy consumption. This also reduces required column diameter and height, hence lower capital investment.



- Available in specific mass transfer surface areas (m^2/m^3) of 125, 250, 350, 500 & 750.
- Material of Construction :
SS 304/304L, SS 316/316L, Duplex, 904L, Alloy 825, Hastelloy, Ceramics, PTFE, P.P, PVDF etc.



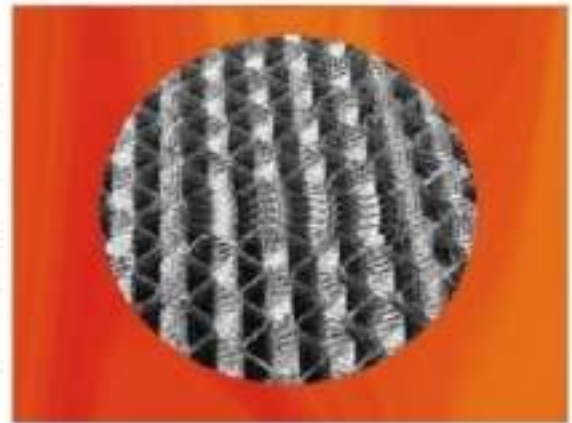
APPLICATIONS & FEATURES:

- Ranging from laboratory columns to large scale process systems.
- Solvent recovery.
- Close boiling components distillation.
- Azeotropic distillation.
- High vacuum process columns.
- Suitable for both batch & continuous distillation systems.
- Process & Hydraulic designs are available if required.
- Ideal for quality improvement.
- Heat sensitive materials.
- High efficiency.
- Low energy consumption.
- Low pressure drop.
- Minimum hold-up.
- High vacuum operations.
- Available in SS 316 / 304.
- Available in specific area of 250, 350, 500, 750 sq.m. / cu.m.



SHEET METAL STRUCTURED PACKINGS :

These are made from thin metal sheets formed to provide maximum surface area with higher void fraction and efficient surface characteristics. On account of high surface area per cubic meter, high NTSM and lower pressure drop across structured packings, column diameter is considerably reduced as compared to conventional types of random packings for the same application.



Types	Surface Area SQ m/ CUm.	F-Factor	No. of Theoretical Stages per meter ht. (NSTM)*
ULT PACK 1.25 L/M	125	3.5	1.0
ULT PACK 1.70 L	170	3.0	1.5
ULT PACK 2.00 L	200	2.7	2.0
ULT PACK 2.50 L	250	2.2	2.3
ULT PACK 3.50 L	350	1.8	2.8
ULT PACK 5.00 L	500	1.5	3.8
ULT PACK 7.50 L	750	1.2	4.5



WIRE MESH STRUCTURED PACKING :

Wire Mesh Structured Packings are made from woven wire mesh to provide higher surface area & voidage required for separation of closed boiling mixtures. Wire mesh packing is available in WM 5.0M, WM7.5L. These are the most efficient structured packings with better wetting characteristics and used for high cost heat sensitive products.

SALIENT FEATURES :

- WM5.0M (Surface Area 500 m²/m³)
- High no. of theoretical stages per unit height.
- WM7.5L (Surface Area 750m²/m³)
- Maximum no. of theoretical stages per unit height

Types	SurfaceArea SQ m/ CUm.	F-Factor	No. of Theoretical Stages per meter ht. (NSTM)*
ULT PACK WM 5.0 M	500	2.2	6.0
ULT PACK WM 7.5 L	750	1.5	9.0



LABORATORY PACKING:

Laboratory Packings are designed for 25 mm to 200 mm diameter columns and provide large specific surface area per unit height.



Sheet Metal Packing



Knitmesh Packing



Wiremesh Packing

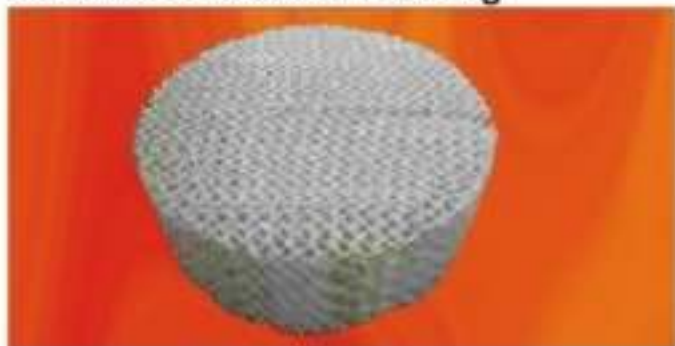
APPLICATION

- Laboratory Column from 25 mm to 200 mm diameter.
- Where a high number of theoretical stages is required .
- With low pressure drop & high capacity.
- NTSM remain constant over wide range of liquid loading.
- Available in stainless steel, alloys & various plastics.

CERAMIC STRUCTURED PACKING :

Ceramic Structured Packings replaces random ceramics packings in many process applications owing to it's high separation efficiency and lower pressure drop.

Ceramic Structured Packing



PTFE, PVDF & P.P. Structured Packing



Type	Specific Surface.(m ² /m ³)
250 Y	250
350 Y	350
400 Y	400
450 Y	450
550 Y	550

COLUMN INTERNAL FOR STRUCTURED PACKING : _____

A mass transfer tower also requires other internals equipments, Liquid Distributor, for equal distribution of liquid and vapour within the tower. Collector plates capture liquid for removal from the tower. Packing support plates are used to physically support and retain packings inside the tower. Ultimo manufactures tower internals in a Variety of metals for use in virtually all mass transfer processes with hydraulic designs.

M.O.C : S.S. 304/316/ Hastelloy / Inconel / PVDF / PTFE / Graphite, Ceramic.

LIQUID DISTRIBUTOR

- Channel type Distributor: It is in single piece or segmented distributor with intergral channel.
- Liquid Distributor VEP: Large hole dimension than conventional discharge systems.
- Liquid Distributor: Trough type.
- Branched Pipe liquid Distributor.
- Chimney Tray liquid Distributor.
- Liquid Distributor Cum Collector.



LIQUID COLLECTOR

Lamella (Vane) type Collector :

The primary function of the collector is to collect liquid from above bed and feed to re-distributor below. This collector requires a ring channel to be welded to the column wall. The pressure drop across the collector is negligible.



VANE PACK

Vane pack is designed to separate entrained liquid from gas stream. The basic design consideration are particle size of the liquid droplets to be entrained & physical properties of the fluid to estimate pressure drop throughout & efficiency. It comes in complete range of efficient vane packs for both horizontal & vertical flow. Size of mist droplets that can be separated are 10 microns or larger.



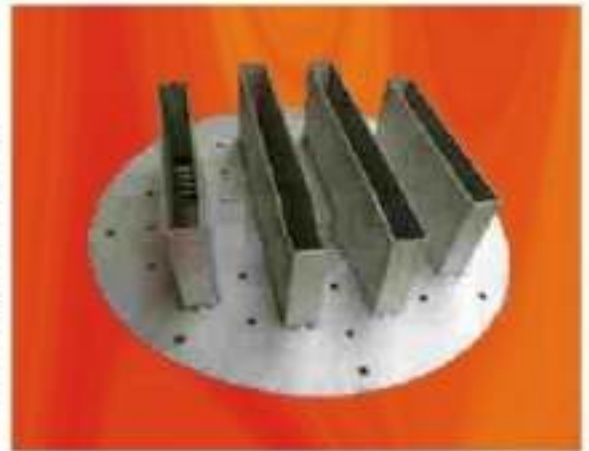
TOWER INTERNALS FOR RANDOM PACKING :

To achieve the desired performance of the packed column, the use of properly designed column internals play the most important role.

LIQUID DISTRIBUTORS

MOCs.: S.S, P.P, PVDF.,FRP, PTFE Coated, Graphite, Ceramics

Uniform initial liquid distribution at the top of the packed bed is essential for efficient column operation. This is accomplished by a device called Distributor, which spreads the liquid uniformly across the top of the packings. If the distributor is not designed properly, the mal-distribution can cause channelling and by passing of the liquid and gas resulting in poor performance of the column.



PACKING SUPPORT

MOCs.: S.S, P.P, PVDF.,FRP, PTFE Coated, Graphite, Ceramics

While primary purpose of the support plate is to retain packings without excessive restriction to gas and liquid flow, it also serves to distribute both streams. Unless carefully designed, the support plate can cause premature column flooding. Thus, design of the support plate significantly effects column pressure drop and stable operating range.



DEMISTER PADS OR MIST ELIMINATORS

MOCs.: S.S, ALLOYS, PTFE, P.P ETC.

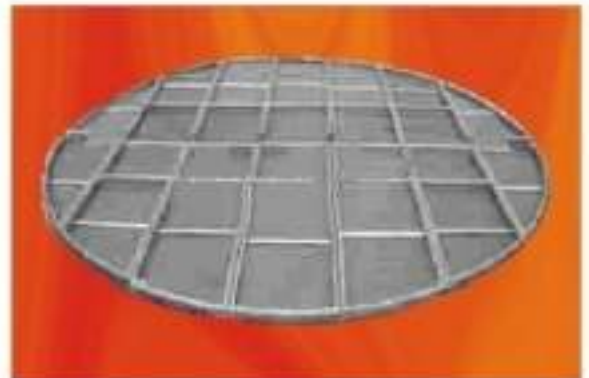
These are Metal / PP wire knitted pads with maximum openings and contact surface. Useful to trap liquid droplets escaping along with vapour. Thus it prevents high boiler products droplets carry-over into low boiler top condenser and acidic or corrosive mist droplets escape from the vent of the gas scrubber.



BED LIMITERS

MOCs.: S.S, P.P, PVDF.,FRP, PTFE Coated, Graphite, Ceramics

Bed Limiters are usually recommended for metal and plastic random packings. The primary function of it is prevent the expansion of the bed and retain the packings in its position, Bed limiter is to be clamped on a support ring or fixed by using friction bolt.



METAL TOWER PACKING :

Metal Packings are available in MOCs. S.S. 316 / 304, and S.S. Alloys like Hastelloy, Inconel, Monel, MS, Copper and Aluminium etc. These are used in a solvent recovery plants & multi purpose distillation units. Standard as well as higher thickness are also available.

PALL RINGS

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage	Packing Factor F
13 mm	4,00,000	430	90	73
16 mm	2,10,000	345	93.1	71
19 mm	1,00,000	250	94	63
25 mm	51,000	208	94.5	48
38 mm	13,500	131	95	28
50 mm	6,500	98	96	20
75 mm	1,820	71	96	18



IMTP TYPE SADDLES

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage	Packing Factor F
Saddle No. 15	3,47,500	290	95	51
Saddle No. 25	1,36,500	226	96.2	41
Saddle No. 40	50,000	150	97.3	24
Saddle No. 50	14,750	99	98	18
Saddle No. 70	4,625	59	98	12



RASCHIG RINGS

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage	Packing Factor F
13 mm	4,00,000	430	87	73
16 mm	2,10,000	345	90	71
19 mm	1,00,000	250	91	63
25 mm	51,000	208	92	137
38 mm	13,500	131	95	82
50 mm	6,500	98	96	57
75 mm	1,820	71	96	45

Available in 6,8,10,13, 16, 19, 25, 38, 50 and 70 mm sizes . (ht. x dia)



PLASTIC TOWER PACKINGS :

Engineering Plastic Packings are widely used for corrosive applications like Gas Scrubbers, Strippers, STP, ETP Plants & Formaldehyde plants.

M.O.C.s	Indicative Temp. Operating	M.O.C.s	Indicative Temp. Operating
Poly Propylene	95°C	PFA / FEP	upto 225°C
PVDF	140°C	PVC	60°C
Poly Propylene LTHA	130°C	CPVC	80°C
HDPE	70°C	PTFE	200°C

PALL RINGS

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage %	Packing Factor F
16 mm	2,10,000	338	88	95
19 mm	1,00,000	240	88	68
25 mm	51,000	210	89	52
38 mm	13,500	135	90	32
50 mm	6,500	100	92	25
75 mm	1,800	92	93	20
90 mm	1,200	85	93	16

Also Available in PVC & CPVC



INTALOX TYPE SADDLES

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage %	Packing Factor F
25 mm	56,000	210	90	33
38 mm	12,000	140	91	25
50 mm	6,000	110	93	21
75 mm	1,350	89	94	16



CMR TYPE MINI RINGS

Type	Nos. / Cu.m.	Surface m ² / m ³	Voidage %	Packing Factor F
No. 1	26,500	140	95	30
No. 2	7,000	115	96	18
No. 3	4,500	90	96.5	12



TELLERETTE TYPE PACKINGS

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage %	Packing Factor F
50 x 18	23,500	185	88	36
74 x 27	7,000	127	89	18
93 x 36	3,600	102	90	16

Also Available in PVC & CPVC



RASCHIG RINGS

Size	Nos. / Cu.m.	Surface m ² / m ³	Voidage %	Packing Factor F
25 mm	51,000	210	86	137
38 mm	13,500	135	90	82
50 mm	6,500	100	92	57

Also Available in PVC & CPVC



CERAMIC TOWER PACKING :

Made from chemical grade white porcelain with exceptionally good chemical resistance except HF and strong alkali. Available with glazed (smooth) or unglazed surface finish. Most suitable for Sulphuric Acid Applications.

INTALOX TYPE SADDLES

Size	Wt. kg / m ³	Surface m ² / m ³	Voidage %	Packing Factor
12-13 mm	725	623	71	200
20 mm	700	334	72	145
25 mm	660	255	73	92
38 mm	625	165	74	52
50 mm	585	121	75	40
75 mm	545	91	77	22



PALL RINGS

Size	Wt. kg / m ³	Surface m ² / m ³	Voidage %	Packing Factor
25 mm	640	220	73	107
38 mm	570	160	76	55
50 mm	535	120	77	43



RASCHIG RINGS

Size	Wt. kg / m ³	Surface m ² / m ³	Voidage %	Packing Factor
15 mm	710	330	70	560
20 mm	660	240	72	255
25 mm	640	195	73	155
38 mm	570	140	76	95
50 mm	535	98	77	65
75 mm	500	70	77	37



BERL SADDLES

Size	Wt. kg / m ³	Surface m ² / m ³	Voidage %	Packing Factor
25 mm	640	220	73	110
38 mm	570	160	76	65
50 mm	535	120	77	45



CERAMIC CATALYST SUPPORT BALLS

Size	Wt. kg / m ³	Surface m ² / m ³	Voidage %
10 mm	1300	314	45
12 mm	1300	230	45
20 mm	1280	157	45
25 mm	1280	125	45
40 mm	1200	80	48
50 mm	1300	63	48



Also available Ceramic Grinding Media Balls in Porcelain Steatite & High Aluminium

RASCHIG RINGS with 2 cell partition



RASCHIG RINGS with 4 cell partition



HONEY COMBS



MINI PARTITION RINGS



CARBON RASCHIG RINGS



These are available in sizes 12mm, 19 mm, 25mm, 38mm, 50mm and 75mm diameter and height. Suitable for highly corrosive applications.

FEATURES

- Resistant to a wide range of acids, alkalis and solvents
- Very high resistance to hot strong Alkalis
- Available in a variety of sizes
- High mechanical strength
- Fully carbonized – no extractable impurities

GLASS RASCHIG RINGS

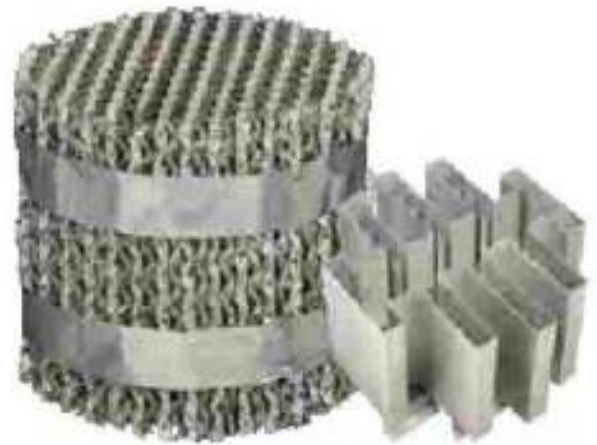
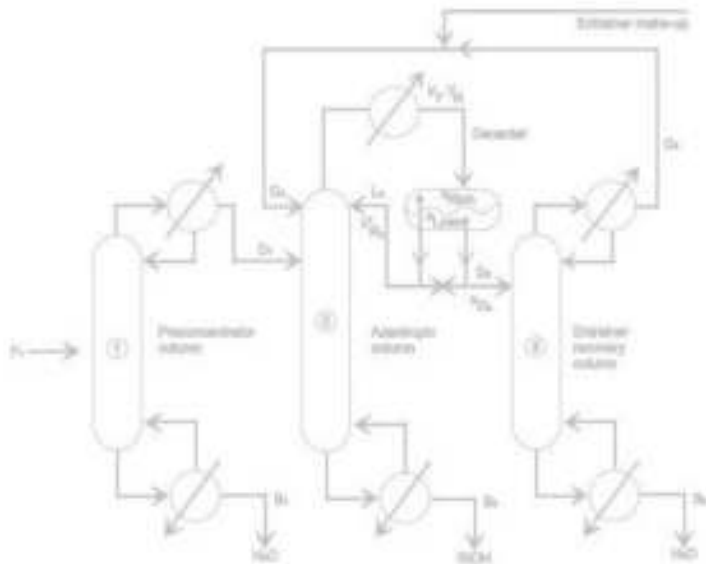


- Suitable for Bromine application and Pharmaceutical plants.
- Due to their low bulk densities, Glass Raschig Ring are particularly suitable for packing glass columns.

Note:

1. Data provided in this brochure shall not form the basis of any contract unless specifically given in writing by us.
2. Data may vary by 7%
3. Depending upon column diameter, 10% excess packing may require for large dia. column with small size random packing.

Azeotropic Distillation



- 
- DMF-Water Separation
 - Methanol-Water Separation
 - IPA-Water Separation
 - Ethyl Acetate-Water Separation
 - Solvent Recovery Units (SRU)



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