



## Mass Transfer Technology

Distillation

Absorption

Rectification

Extraction

Reactive Distillation

**Your Partner  
For Complete Mass Transfer Solutions.**



Typical Internal Accessories of Distillation Column

**Columns / Towers**  
**Distillation, Stripping, Rectification,**  
**Absorption, Extraction & Reactive Distillation.**

# OFFERING YOU THE COMPLETE FXRANGE OF MASS TRANSFER & SEPARATION INTERNALS

Fenix™ Process Technologies is a Mass Transfer Equipment manufacturing company with an integrated engineering solution. This enables us to provide high efficiency process design & detailed mechanical design.

Our vertical centric solution approach makes us a trusted partner for all our client needs. Headquartered in Pune and headed by an efficient team with over three decade of cumulative experience in the process design & manufacturing industry, Fenix is poised to lead its industry segment.

Fenix has a state-of-the-art manufacturing plant with an area of 50,000 sq.ft. and an able set of resource for the process and mechanical design capabilities.



The below table represents our process engineering capabilities.

Domain	Sub Domain
Chemical Industry	<ul style="list-style-type: none"> <li>• Solvent Recovery</li> <li>• Separation/Purification of Chemicals</li> <li>• Absorption</li> <li>• Extraction</li> <li>• Reactive Distillation</li> </ul>
Food Technology	<ul style="list-style-type: none"> <li>• Vegetable Oil Refining</li> </ul>
Pharmaceutical Industry	<ul style="list-style-type: none"> <li>• Solvent Recovery</li> <li>• Absorption</li> <li>• Extraction</li> </ul>
Alcohol Technology	<ul style="list-style-type: none"> <li>• Fuel Ethanol</li> </ul>
Ethanol Derivatives	<ul style="list-style-type: none"> <li>• Acetaldehyde</li> <li>• Glacial Acetic Acid</li> <li>• Ethyl Acetate</li> </ul>
Aromatic	<ul style="list-style-type: none"> <li>• High Vacuum Distillation of Perfumery Products</li> </ul>
Bio-diesel	<ul style="list-style-type: none"> <li>• Methanol Recovery</li> <li>• Glycerol Recovery</li> </ul>
Dyes & Intermediates	<ul style="list-style-type: none"> <li>• Distillation/Purification of Intermediates</li> <li>• Solvent Recovery</li> </ul>
Oil & Gas	<ul style="list-style-type: none"> <li>• Crude Distillation</li> <li>• Vacuum Distillation</li> <li>• Cleaning of Crude Oil</li> </ul>

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ООО «ТИ-СИСТЕМС» ИНЖИНИРИНГ И ПОСТАВКА ТЕХНОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ  
Интернет: [www.tisys.ru](http://www.tisys.ru) [www.tisys.kz](http://www.tisys.kz) [www.tisys.by](http://www.tisys.by) [www.tesec.ru](http://www.tesec.ru) [www.ти-системс.рф](http://www.ти-системс.рф)  
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Structured Packings, made from thin-gauge sheets or woven wire mesh to give a regular pre-formed shape, provide high surface area with high void fraction to promote efficient vapour-liquid contacting in mass transfer operations. Surface enhancement techniques are incorporated to promote liquid spreading over the packing and avoid channelling. To achieve a predetermined level of separation efficiency, Fenix FXPack™-SP structured packings require much less height of column with lower pressure drop compared to random packings or trays.

## Structured Packings



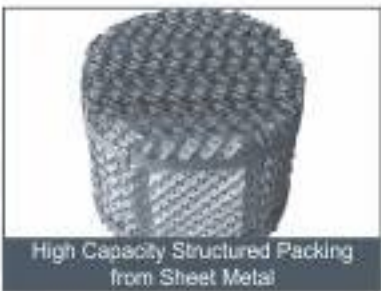
FXPack 60.0L/M  
 FXPack 1.25L/M  
 FXPack 1.70L/M  
 FXPack 2.0L/M  
 FXPack 2.5L/M  
 FXPack 3.5L/M  
 FXPack 5.0L/M  
 FXPack 7.5L

MOC : Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy, etc.  
 Sizes : 50 mm to 8.0 m diameter.  
 Application : Standard application, Moderate vacuum to high pressure, Low to high liquid loading.  
 F-factor : 1.2 to 3.5  
 Surface area : 60 to 1000 m<sup>2</sup>/m<sup>3</sup>  
 NTSM : 1.0 to 4.5



FXPack WM5.0M  
 FXPack WM7.5L

MOC : Stainless steels, Carbon steel, Phosphor bronze, or any metal/alloy according to customer request.  
 Sizes : 25 mm to 3.0 m diameter  
 Application : High vacuum to low pressure. Good for where low pressure drop required.  
 High no. of stages per meter. Highly efficient even at low liquid loading.  
 F-factor : 1.5 to 2.2  
 Surface area : 500 to 750 m<sup>2</sup>/m<sup>3</sup>  
 NTSM : 6 to 9



FXPack SUPER\* 250  
 FXPack SUPER 350  
 FXPack SUPER 450  
 FXPack SUPER 600  
 FXPack SUPER 750  
 FXPack SUPER 1000

FXPack SUPER WM 500  
 FXPack SUPER WM 600  
 FXPack SUPER WM 750

FXPack AL SUPER 250  
 (for aqueous systems only)

MOC : Stainless steels, 904L, 254SMO, Monel, Hastelloy, or any metal/alloy according to customer request.  
 Sizes : Up to 8.0 m diameter  
 Application : High liquid loading, High vapour loading, Useful for heat-sensitive systems.  
 Very low pressure drop  
 F-factor : 2.2 to 3.0  
 Specific surface area : 250-1000 m<sup>2</sup>/m<sup>3</sup>  
 NTSM : 2.2 to 5.0



\* FXPack SUPER is only available in countries where no patent infringement occurs.



FXGrid 45L  
FXGrid 60L/M  
FXGrid 90L/M

MOC : Stainless steels, SS410S, Duplex, Monel, Hastelloy, Carbon steel, or according to customer request.

Application : Fouling systems, corrosive environment, where frequent cleaning or replacement needed.

Sheet Thickness : 1.0 - 2.0 mm



FGG25  
FXGrid-3

MOC : Stainless steels, SS410S, Duplex, Monel, Hastelloy, Carbon steel, or according to customer request.



FXLab-EM  
FXLab-DM  
FXLab-DMPlus

Standard MOC : SS, others on request.  
Suitable for heat-sensitive systems.  
NTSM : 20 - 40  
Pressure drop low, 0.1 to 0.4 mbar/stage.  
Suits low liquid load 0.05 m<sup>3</sup>/m<sup>2</sup>h.  
Can be used for high vacuum to 2 mbar.  
Can be scaled up easily.  
Diameter : 25 - 100 mm



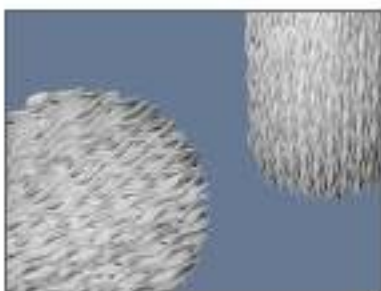
FXReact SM  
FXReact WM

MOC : According to customer request.  
High separation efficiency.  
Reaction capacity/rate can be high.  
Flexible design of catalyst element.  
Can be used in laboratory columns.  
Diameter : 50 - 500 mm  
Surface area : 150 to 450 m<sup>2</sup> / m<sup>3</sup>  
NTSM : 1.0 to 3.0



FXExtract 2.0  
FXExtract 2.5  
FXExtract 3.0

This is a specially designed packing combination made from sheet metal for liquid-liquid extraction.  
MOC : Stainless steels, Carbon steel, or any metal/alloy according to customer request.  
Available upto 3 m diameter.



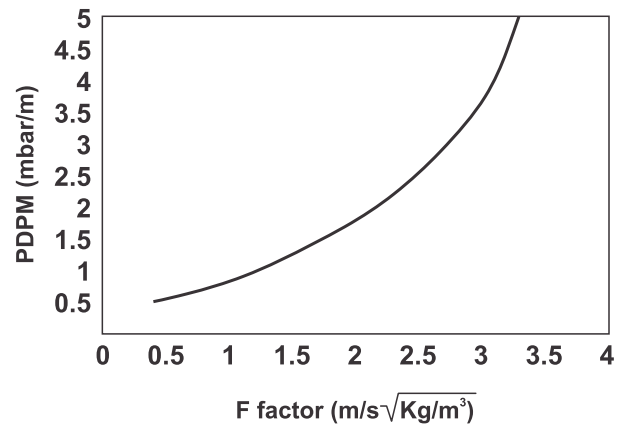
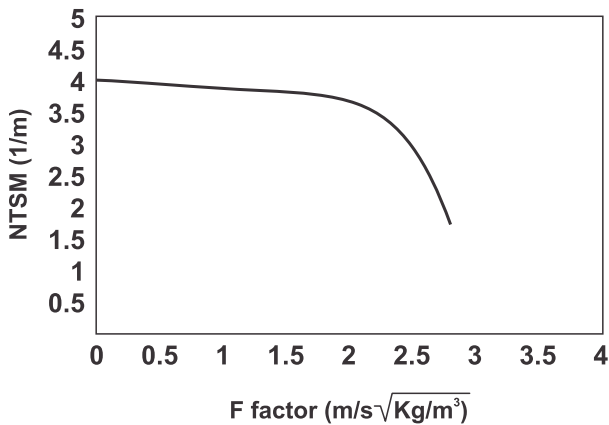
FXPack PTFE

Sizes : 100 mm to 300mm  
Application : Corrosive systems  
Temperature : Up to 150° C

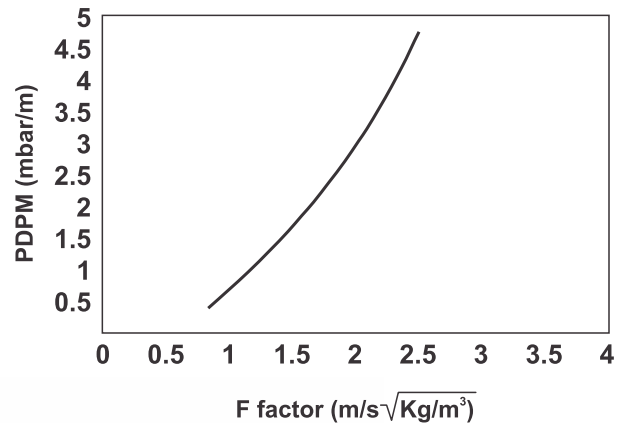
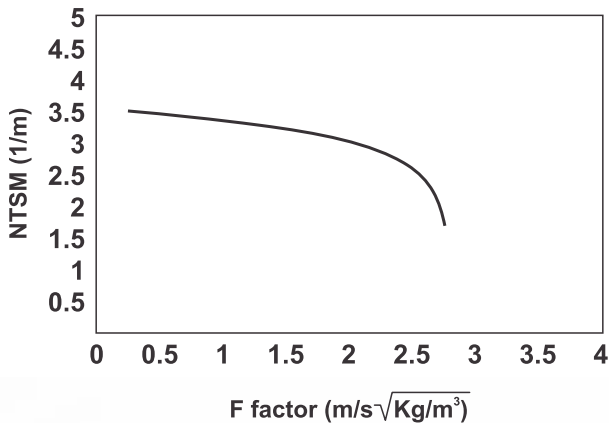
## Typical Performance Characteristics

Performance characteristic curves for three models of Fenix Structured Packing are given underneath. The values plotted in the graphs are mean values and were obtained by using standard/ideal test mixtures. Production plant data/results may vary marginally from system to system.

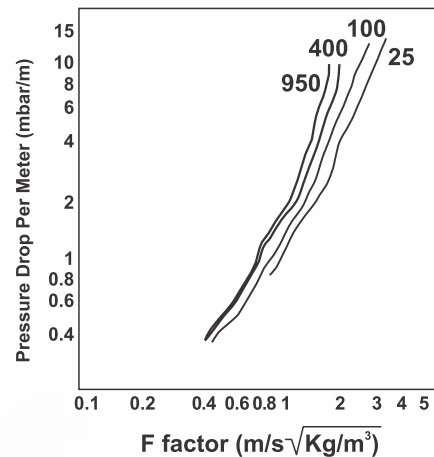
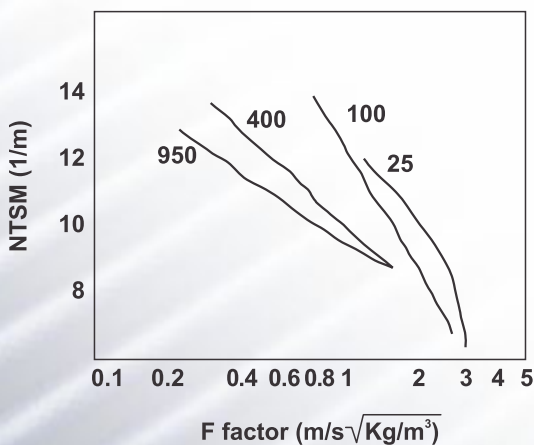
### Performance Curves of FXPack 3.5L



### Performance Curves of FXPack 5.0M



### Performance Curves of FXPack WM 7.5L



NTSM : Number of theoretical stages per meter packing height [ m<sup>-1</sup> ]



## Distillation Trays



FXTray-1

### Sieve Tray

Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy or any metal/alloy according to customer request  
Up to 8.0 m diameter.

Low cost. Not flexible for wide range of turndown ratio.

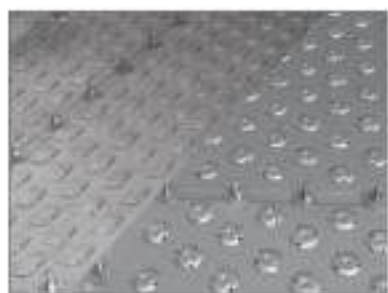


FXTray-2

### Fixed Valve Tray

Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy or any metal/alloy according to customer request.  
Up to 8.0 m diameter.

Wider turndown ratio and better resistance to fouling compared to FXTray-1.



FXTray-3

### Floating Valve Tray

Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy or any metal/alloy according to customer request.  
Up to 8.0 m diameter.

Tray open area automatically changes according to vapor flow rate. Most versatile – can be used for almost all services. Widest turndown ratio. Available in two modules : rotating and non-rotating.



FXTray-4

### Bubble Cap Tray

Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy or any metal/alloy according to customer request.  
Bubble Caps : 10-100 mm diameter

Used for low liquid loads. Very wide turndown ratio.



FXTray-5

### Cartridge Tray

Stainless steels, 904L, 254SMO, Duplex, SS410S, Titanium, Hastelloy or any metal/alloy according to customer request.

Normally supplied in small sizes up to 1.0 m diameter.

Highly suitable for fouling and foaming applications. and for systems which require frequent maintenance or replacement. Wide turndown ratio.

To enable mass transfer to take place, liquid and vapour/gas must be contacted intimately in the equipment. Random packings, small objects of regular shape and size made from metals, polymers, ceramics or glass, is one such device. Random packings are just dumped into the column. Fenix FXPack™-RP random packings offer the advantage of lower pressure drop across the column (when compared to plates or trays), which is beneficial while operating under vacuum.

## Random Packings - Metals

Material of Construction: Stainless Steel or any metal/alloy according to customer request.



Cylindrical Rings

FXPack RR10  
FXPack RR15  
FXPack RR19  
FXPack RR25  
FXPack RR38  
FXPack RR50  
FXPack RR70  
FXPack RR80

Bulk density : 200-900 kg/m<sup>3</sup>  
Surface area : 90-600 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.5-1.8  
High mechanical strength.  
Thickness : 0.3mm - 1.0mm



Fenix P-Rings

FXPack P10  
FXPack P15  
FXPack P19  
FXPack P25  
FXPack P38  
FXPack P50  
FXPack P75

Bulk density : 220-350 kg/m<sup>3</sup>  
Surface area : 120-500 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.8-2.2  
Thickness : 0.3mm - 0.6mm



C-Rings

FXPack C1.0  
FXPack C1.5  
FXPack C2.0  
FXPack C2.5  
FXPack C3.0  
FXPack C4.0  
FXPack C5.0

Bulk density : 150-250 kg/m<sup>3</sup>  
Surface area : 110-220 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 2.2-2.5  
Thickness : 0.3mm - 0.8mm  
Low pressure drop, Suits vacuum systems  
Good liquid distribution, High throughput, Low liquid hold-up.



Saddle Rings

FXPack S15  
FXPack S25  
FXPack S40  
FXPack S50  
FXPack S60  
FXPack S70

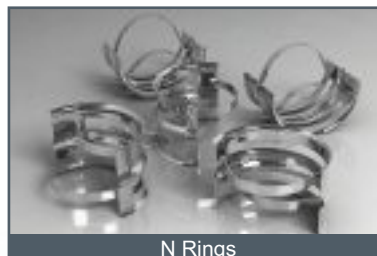
Bulk density : 120-330 kg/m<sup>3</sup>  
Surface area : 60-280 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 2.2-2.5  
Thickness : 0.3mm - 0.8mm  
Very low pressure drop, Suits high vacuum application.  
Very low liquid hold-up.



HP Rings

FXPack HPR30  
FXPack HPR45  
FXPack HPR60  
FXPack HPR90

Bulk density : 190-280 kg/m<sup>3</sup>  
Surface area : 90-270 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.8-2.2  
Thickness : 0.3mm - 0.6mm  
High capacity, lower pressure drop, high mechanical strength than P-Rings.



N Rings

FXPack NR15  
FXPack NR25  
FXPack NR30  
FXPack NR50

Bulk density : 130-180 kg/m<sup>3</sup>  
NTSM : 1.2-2.5  
Very low pressure drop, Suits high vacuum application.  
Very low liquid hold-up.



## Random Packings - Plastics



FXPack PPR15  
FXPack PPR25  
FXPack PPR50  
FXPack PPR80

MOC : PP, PVDF  
Bulk density : 55-110 kg/m<sup>3</sup>  
Surface area : 100-350 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.8-2.5



FXPack PSR15  
FXPack PSR50  
FXPack PSR75

Bulk density : 45-75 kg/m<sup>3</sup>  
Surface area : 85-230 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 2.0-2.5

## Random Packings - Ceramics



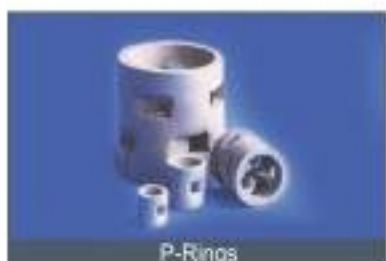
FXPack CSR13  
FXPack CSR25  
FXPack CSR38  
FXPack CSR50  
FXPack CSR75

Bulk density : 590-720 kg/m<sup>3</sup>  
Surface area : 100-522 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.8-2.6



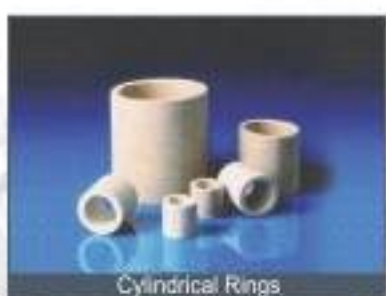
FXPack CB06  
FXPack CB13  
FXPack CB19  
FXPack CB25  
FXPack CB38  
FXPack CB50

Bulk density : 1300-1400 kg/m<sup>3</sup>  
Surface area : 65-420 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 0.8-1.5



FXPack CPR25  
FXPack CPR38  
FXPack CPR50  
FXPack CPR75  
FXPack CPR100

Bulk density : 500-650 kg/m<sup>3</sup>  
Surface area : 55-220 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.4-1.8



FXPack CRR13  
FXPack CRR19  
FXPack CRR25  
FXPack CRR38  
FXPack CRR50  
FXPack CRR75  
FXPack CRR100

Bulk density : 500-840 kg/m<sup>3</sup>  
Surface area : 44-350 m<sup>2</sup>/m<sup>3</sup>  
NTSM : 1.4-1.7

Packings, whether random or structured, serve the basic purpose of providing intimate contact between liquid and vapour/gas in mass transfer operations. But for effective and efficient performance of packings some more peripherals (i.e. internals) are needed. Fenix has been designing, manufacturing and supplying efficient and economic internals to its customers.

## FXInt LD & RD - Liquid Distributors & Redistributors

	<p><b>FXINT-CTD</b></p>	<p><b>Channel Type Distributor</b></p> <p>Channel type distributor is one of the regularly used distributors. Specially successful for structured packing. Diameter upto 800mm can be manufactured in single segment and can be manufactured with top trough upto 2 metres diameter in segmented pattern.</p>
	<p><b>FXINT-FEP</b></p>	<p><b>Baffle Type Distributor</b></p> <p>These distributors are best suited for low to heavy applications available from 700 mm diameter and onwards. These distributors are provided with holes at certain level on side wall of the channels &amp; fitted with baffle plates. This construction helps to distribute liquid flow evenly, helps to cover more surface area even for low liquid flow rates.</p>
	<p><b>FXINT-STD</b></p>	<p><b>Spiral Type Distributor</b></p> <p>Construction of this distributor resembles the construction of channel tube type distributor. Channelised construction is applied with holes on the side wall where it is covered with the spiral tube. Such construction helps to apply for viscous liquids &amp; severely plugging application.</p>
	<p><b>FXINT-CTD</b></p>	<p><b>Chimney Tray Type Distributor</b></p> <p>Chimney tray distributor are applicable for high liquid loads &amp; higher diameter columns. Features of this distributor help it to work as distributor as well as redistributor. Whenever collection &amp; re-distribution is required this distributor can be used.</p>
	<p><b>FXINT-SNTD</b></p>	<p><b>Spray Nozzle Type Distributor</b></p> <p>Liquid loading : 2 to 200 m<sup>3</sup>/m<sup>2</sup>h Size : upto 8.0 m</p>
	<p><b>FXINT-PTD</b></p>	<p><b>Pipe Type Distributor</b></p> <p>Pipe Type Distributor is one of the simplest design. These distributors can be very efficient where the vapour flow is very high as the pipe type construction provides large surface for vapour flow.</p>



FXINT-PTD

**Pan Type Distributor**

Pan type distributor provides liquid holdup in the distributor which can operate for very low liquid loads. Vapour passes through a circular or rectangular gas risers. Distributor can be used even from as low as 100mm & above upto 800mm column diameter with pan. For fouling application pan type distributor can be used with V-Notch Tubes. It can be successfully applied for random Packing. Liquid loads can be possible even from  $1\text{m}^3/\text{m}^2\text{hr}$  to  $80\text{m}^3/\text{m}^2\text{hr}$ .



FXINT-LLE

**L-L Extraction Type Distributor**

Used in packed L-L Extraction columns for continuous and dispersed phase preventing emulsions at low surface tensions.



FXINT-TTD

**Trough Type Distributor**

Trough type distributor can be used for very high liquid load & higher column diameter from 900mm & above diameters. Both bottom holes & tube construction is possible in trough type distributor. Top trough distributes the liquid in bottom channels which distributes the liquid evenly on the surface of packing. Can be used for both structured & random packing. Liquid loads may vary from  $2\text{m}^3/\text{m}^2\text{hr}$  to  $50\text{m}^3/\text{m}^2\text{hr}$ .



FXInt LD-6

**Antenna Type Distributors**

These distributors have very small distribution holes and are used usually for smaller diameters and for low liquid loads. Solid impurities are not tolerated.



FXInt LD-10  
FXInt RD-10

**Deck Type Distributor & Redistributors**

Liquid loading : 5 to  $220\text{m}^3/\text{m}^2\text{hr}$   
Size : upto 8.0m

This can also be used as a liquid redistributor.



FXINT-SPTD

**Spider Type Distributor**

Features of this distributor resembles with channel type distributor, for special applications where low liquid flow rates are required, we propose to have a special distribution arrangement at the bottom to cover the max. area of packing & to care for low liquid loads even as low as  $0.05\text{m}^3/\text{m}^2\text{hr}$ . The low liquid load can be possible by using special arrangement at bottom of tubes like Spider type distribution. Can handle Gas Load up-to  $4.5\text{Pa}^{0.5}$ .



Open Trough Type

Nozzle Overflow Type

**Matsui Distributor**

**Nozzle Overflow Type:** A hole is located on the upper surface of a pipe, through which a liquid flows out.

**Open Trough Type:** Notches on the upper side are sloping to divide the outflow liquid.



## FXInt LC - Liquid Collectors



FXInt LC-1

### Vane Type Collectors

Also known as “ring type collectors”, these collectors have very low pressure drop – almost negligible.



FXInt LC-2

### Collectors With Support Grid

This is a combination of packing support grid and vane type collector.



FXInt LC-3

### Flanged Type Collectors

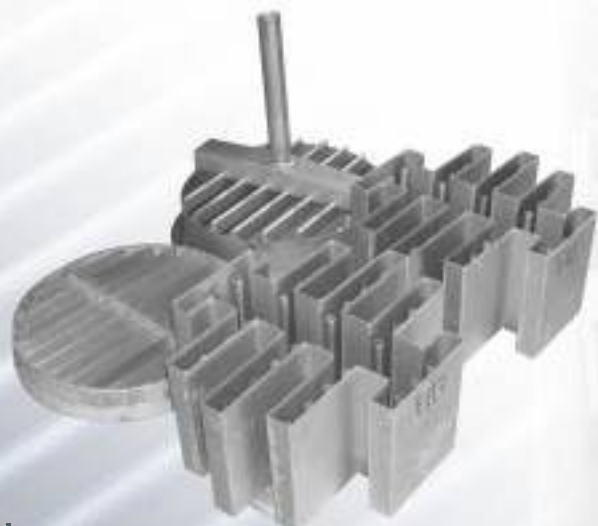
This is suitable for comparatively smaller diameter columns where manholes are not practicable and the column sections are flanged in construction.



FXInt LC-4

### Chimney Tray Type Collectors

Normally used for large diameter columns with high liquid throughput, available in both welded and bolted structure.



## FXInt LFS - Liquid Feed Systems



**FXInt LFS-1A**

This “L” type of feed inlet is most suitable for comparatively smaller diameter columns with feed liquid at bubble point or lower temperatures.



**FXInt LFS-2**

This type is used for feeding process liquids containing gases.



**FXInt LFS-1B**

Comparatively larger diameter columns perform well with this “T” type of feed inlet for feeding liquid at bubble point or lower temperatures.



**FXInt LFS-3**

This type is used for feeding superheated liquid.

## FXInt GFS - Gas Feed Systems



**FXInt GFS-1**

**Plain Inlet**



**FXInt GFS-2**

**Pipe Inlet**



**FXInt GFS-3**

**Impingement Inlet**



**FXInt GFS-4**

**Tangential Inlet**

GFS-3 and GFS-4 are used in cases where the gas velocity is high, ensuring reduction of kinetic energy content of incoming gas thus improving the gas distribution.

### FXInt PS - Packing Supports



FXInt PS-1

Support grid used for structured packings.

Very strong construction is not needed for support plates to be used with structured packing as the weight per unit cross section area of a bed of structured packing is not very high.



FXInt PS-2

Multi beam support used for random packings.

For random packings which are dumped on the support plate, the weight per unit cross section area is high. Therefore comparatively stronger construction is required for the support plate.



FXInt PS-3

For large columns.

For large diameter and heavy duty distillation columns, the static weight of packed bed combined with the liquid column is quite high. Strong construction of packing support is therefore necessary.

### FXInt BL - Bed Limiters



FXInt BL-1

Bed Limiters are installed directly above a packed bed in a distillation column to prevent any movement or shifting of packing elements under turbulent conditions of liquid or vapour flow. These are fabricated as segmented and bolted for large diameter columns but in one piece for small columns.



FXInt BL-2





## FXInt ME - Mist Eliminators



FXInt ME-1

### Knitted Mesh Type

Low cost. High efficiency. Upto 3-5 micron size particles can be removed. Almost complete removal of droplets for turndown ratio of 3:1.

Mostly used for vertical gas flow.



FXInt ME-2

### High Efficiency Mesh Type

Denser weaving and thinner wire used compared to FXInt ME-1 for more demanding applications.

Mostly used for vertical gas flow.



FXInt ME-3

### Hook Type

Low pressure drop. Normally used for larger droplets. Fouling systems can be handled.

Used for both vertical and horizontal gas flow.



FXInt ME-4

### Pocketed Vane Type

Low pressure drop. Well-suited for applications with high gas/vapour velocity. Fouling systems can be handled.

Especially designed for horizontal gas flow.



FXInt ME-5

### Plain Type Mist Eliminator

These mist eliminators are generally not efficient for mist droplets smaller than about 20 microns, but they are sturdier than mesh pads and impose much less pressure drop.

## Separator Internals for Oil & Gas Industry



Vane Pack Module



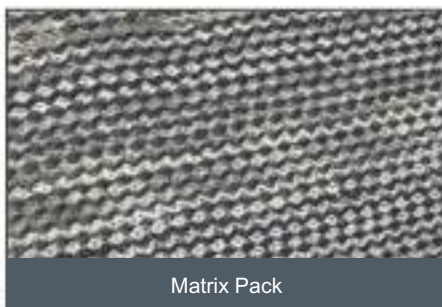
Plate Pack



Sand Jet Assemble



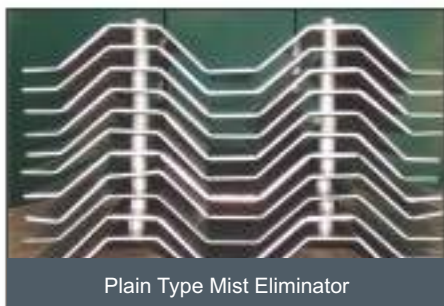
Vane Inlet Device



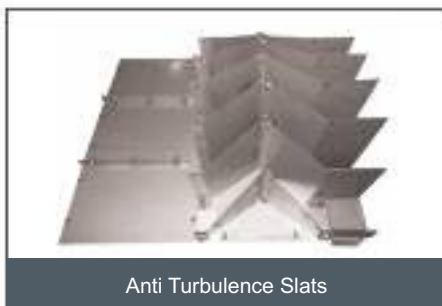
Matrix Pack



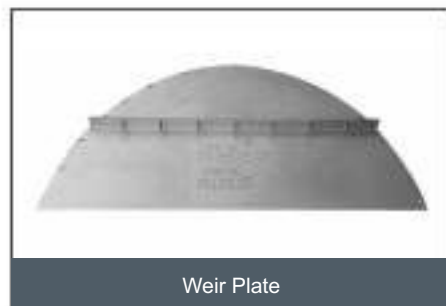
Wave Breaker



Plain Type Mist Eliminator



Anti Turbulence Slats



Weir Plate



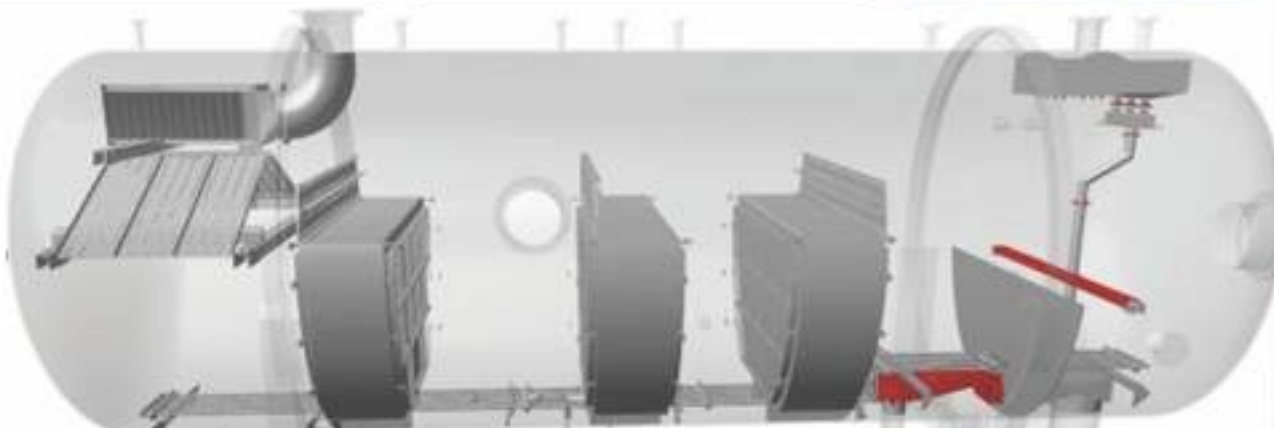
Double Skin Perforated Baffle



Double bank 'v' droplet separator



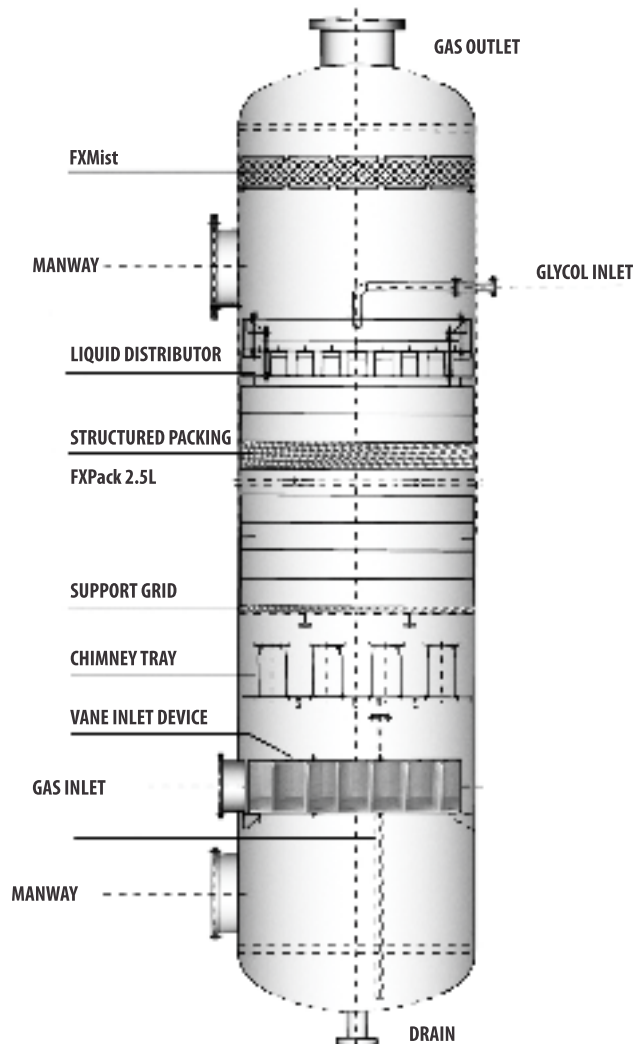
Multi Cyclone



## TEG Contactor for Moisture-Free Gas

Gas fields and oil fields are usually located far away from gas processing and petrochemical production facilities. Crude gas, extracted from a depth below the surface of the earth is not fit for transportation as it contains moisture along with acid gases like  $H_2S$  and  $CO_2$  which severely corrode the gas transportation system. Therefore a dehydration facility is provided in the vicinity. Fenix has the requisite design strength to model and design Triethylene Glycol dehydration systems for gas with stringent process guarantees.

Saturated gas is fed to the first column where lean Triethylene Glycol removes moisture to bring it to 10 ppm level using packed bed counter current operation. The column works as an absorber and Fenix structured packing FXPack™-SP is used for efficient moisture removal. The exit TEG which is rich in moisture content is regenerated using two columns - Stripper and Regenerator. In the stripper, moisture is removed from TEG by heating, usually employing a reboiler. The moisture in TEG is further removed in the regenerator by recycling a small quantity of dry gas obtained from the first column.



## Amine Contactors for Sweetening Sour Gas



Amine contactor is the process equipment to remove acidic gases like  $H_2S$  and  $CO_2$  from sour gas to make it "sweet" i.e. fit for all downstream processing. Usually n-methyl diethanolamine (MDEA) is used as the sweetening agent.

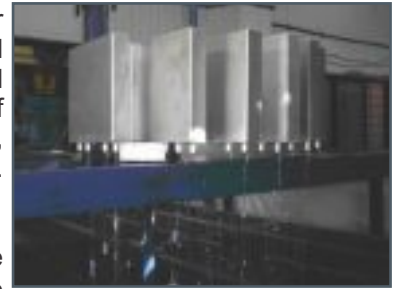
Fenix has the requisite strength to model and design high-efficiency Amine Contactors. The sour gas stream enters the bottom of the amine contactor while pre-cooled lean amine is fed from the top for countercurrent extraction of acid gases. Sweet gas comes out from the top of the column. The acid-rich amine solution leaving the bottom of the column is hot due to exothermic sweetening reactions and is led to surge drum where desorption of hydrocarbon from the amine solution takes place leaving behind acid-containing amine.  $H_2S$  and  $CO_2$  are stripped off from the amine solution in the Amine Regenerator and the amine so obtained is recycled back to amine contactor after cooling.

For Amine contactors, the design basis is the specified ppm level concentration of amine in the exit gas.



## Liquid Distributor Testing

Fenix has a state-of-the-art testing facility for performance of liquid distributors for standardizing design and manufacture of liquid Distributors. This ensures that any Liquid Distributor designed and manufactured by Fenix performs consistently, efficiently and economically during operation. Statistical technique is applied to quantify the quality of liquid distribution and its effect on the performance of the packing to be used. In this test rig, performance parameters are verified before the liquid distributor is delivered and installed. Designed duty is confirmed by a flow test with water.



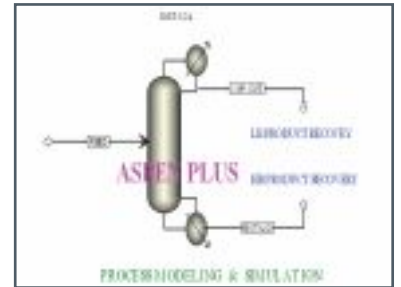
This facility is capable of testing Liquid Distributors up to 4 meter diameter and can be operated with liquid loads upto 270 m<sup>3</sup>/h. All liquid distributors manufactured by us are subjected to test with water in this facility for ascertaining quality and performance. This water test is free of additional costs.

## Process Modeling & Simulation

One of the most sophisticated process simulation software Aspen Plus is available at our disposal which enables us to predict the behavior of a process being designed.

Given reliable thermodynamic data and realistic operating conditions, we can simulate chemical process systems including distillation columns and compare the various alternative designs with actual plant behavior. Thus better new plants are designed and existing plants are made more efficient.

Efficient and economic capacity and column diameter with different types of structured packings, random packings and trays for given feed compositions are determined by simulation with Aspen Plus using its data bank and models.



## Process & Equipment Design

We have modern facility, capable management, well trained engineers and skillful technicians to carry out the complete process and equipment design for our valued clients.

- Process Simulation using ASPEN
- Process Design of Heat Exchangers
- Column Hydraulics
- GA Drawing
- Mechanical Design of all Equipments
- Equipment Drawing
- P&I Diagram
- Plant Layouts

**Softwares at our disposal :**

**'AspenPlus' (version 2006 Aspen 7.1)**

**'Designer's Desktop' (mechanical design of equipments)**

**'TZValve' (version 5.0)**

**'PCOL' (version 1.1)**

And various internally developed programs/softwares for in-house use.

## Revamping/Retrofitting of Existing Columns



## Erection, Commissioning & Troubleshooting



# The FXRange of Mass Transfer & Separation Internals from Fenix Process Technologies

## FXPack™



Structured Packing



Wire Mesh Packing



P Rings



C Rings



Saddle Rings

## FXInt™



Trough Distributor



Chimney Tray Distributor



Pan Type Distributor



Feed Pipe Distributor



Support Grid

## FXMix™



Static Mixer



Jacketed Mixer



Teflon Element



Housing with Elements



Shear Mixer

## FXTray™



Distillation Trays



Bubble Caps



Tray Panel



Bubble Cap Tray



Cartridge Tray

## FXIntSep™



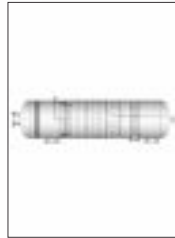
Vane Pack Module



Sand Jet Assembly



Perforated Baffle



TEG Contactor



Vane Inlet Device

## FXPRO™



Pusher Centrifuge



Heat Exchanger



SS Distillation Column



# Total Solution from Fenix

## Process Technology

Feasibility Study  
Conceptual Design  
Process Simulation  
Testing (Laboratory / Pilot Plant)  
Design Manual  
Process Guarantee

## Control Systems

Instrumentation Diagram  
Control Specifications

## Project Management

Project Engineering  
Equipment Fabrication  
Erection & Commissioning  
Operators Training

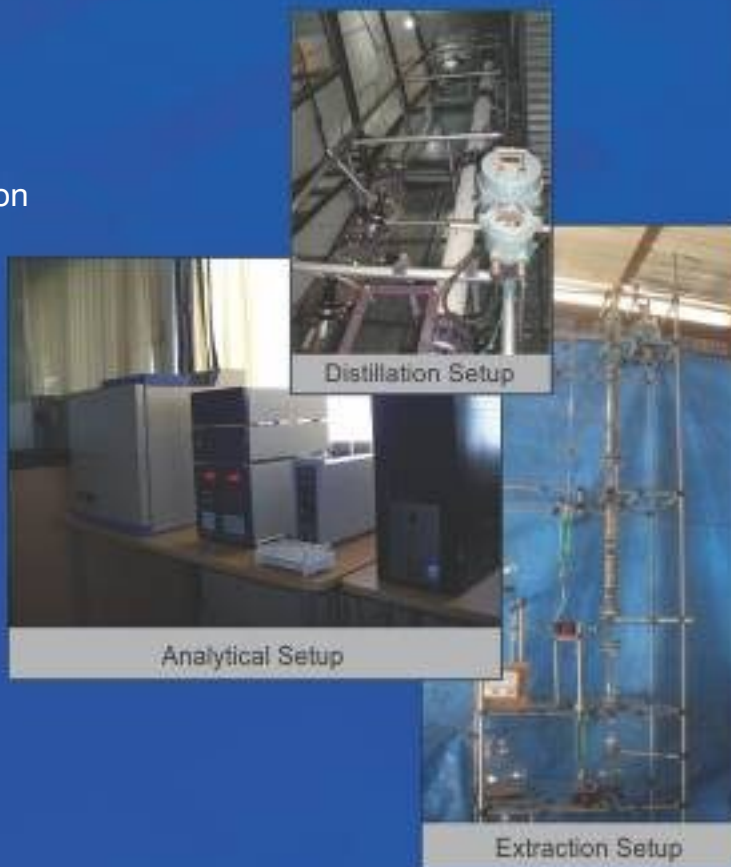
## After Sales Service

Troubleshooting  
Spare Parts  
Revamping of Non-Fenix Plants

## Fenix Engineering Services

for Distillation, Extraction, Stripping and Absorption

- ✦ Feasibility Study
- ✦ Process Simulation & Process Design
- ✦ Lab & Pilot Plant Facilities
- ✦ Basic Engineering Package BEP
- ✦ Detail Engineering of Key Equipments
- ✦ Startup & Commissioning Assistance
- ✦ Inhouse Analytical & Data Analysis
- ✦ Data Analysis for Plant Operations



**Fenix Process Technologies Pvt. Ltd.**

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