

ENHANCED PROCESS TECHNOLOGY AND MASS TRANSFER SOLUTIONS

PROCESS SYSTEM & EQUIPMENT

TOWER TRAYS & PACKINGS

REVAMPING / DEBOTTLENECKING

DIVIDED WALL COLUMN

GAMMA-RAY SCANNING DIAGNOSIS

ON-SITE SERVICES

SOLVENT RECOVERY



TPT PACIFIC CO.,LTD.
TAEYANG PROCESS TECHNOLOGY

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If you need our services, please contact ;

TPT PACIFIC

http : //www.tptpacific.com

E-mail : tpt@tptpacific.com





INTRODUCTION

TPT Pacific Co.,Ltd.(TPT) has optimum solution for the mass transfer operations based on the ample experiences. TPT has developed beyond the state of the art breakthrough separation equipment and systems for mass transfer applications.

TPT supplies advanced mass transfer equipment and technologies. TPT can provide cost effective design, engineering, procurement, project management and construction services for mass transfer operations such as:

- Simple and Complex Distillation.
- Azeotropic and Extractive Distillation.
- Liquid-Liquid Extraction.
- Absorber/Stripper Systems.
- Reactive Distillation Systems.

Simply put, TPT has unique expertise, experience and capability to meet client's demands for grass root plant construction, existing column debottlenecking and complete process plant modernization.

TPT has joined Fractionation Research Inc. (FRI) the member-driven research institute for distillation technologies, since 2003.



ISO 9001



ISO 14001



OHSAS 18001



FRI membership

TOWER INTERNALS

ENGINEERING SUPPORT

The success of a mass transfer job depends as much on the quality of the hardware as it does on the quality of the engineering support provided by the supplier. As TPT has extensive experience basic/detail engineering as well as in the design of tower internals for the refinery and petrochemical plants, TPT can assist you in the design of mass transfer system.

TPT also can supply all kinds of tower internals including the high performance trays and structured packings.

Therefore, the superior engineering support in the areas of tower internal selection can be provided by TPT.

For trouble-shooting and debottlenecking mass transfer equipment, it is very important to identify them. This can be achieved by the Gamma-ray scanning and process simulation provided by TPT.

HARDWARES

Trays:

- High Performance Tray
- Valve Tray
- Sieve, Bubble Cap Tray
- Dual Flow Tray, Baffle Tray

Packings:

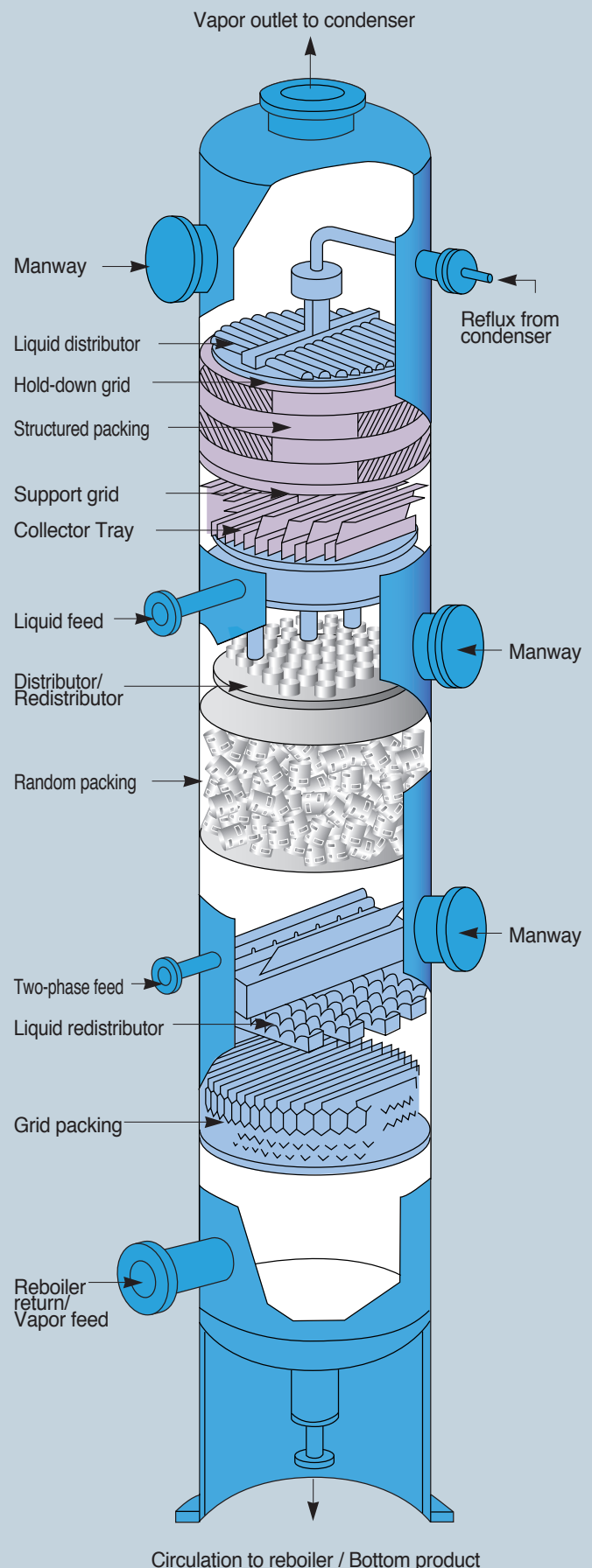
- Structured Packings
- Random Packings
- Grid Packings

Packing Internals:

- Liquid distributors
- Vapor diffusers
- Two-phase feed distributors
- Collector trays & Chimney trays
- Bed supports, Bed limiter and etc.

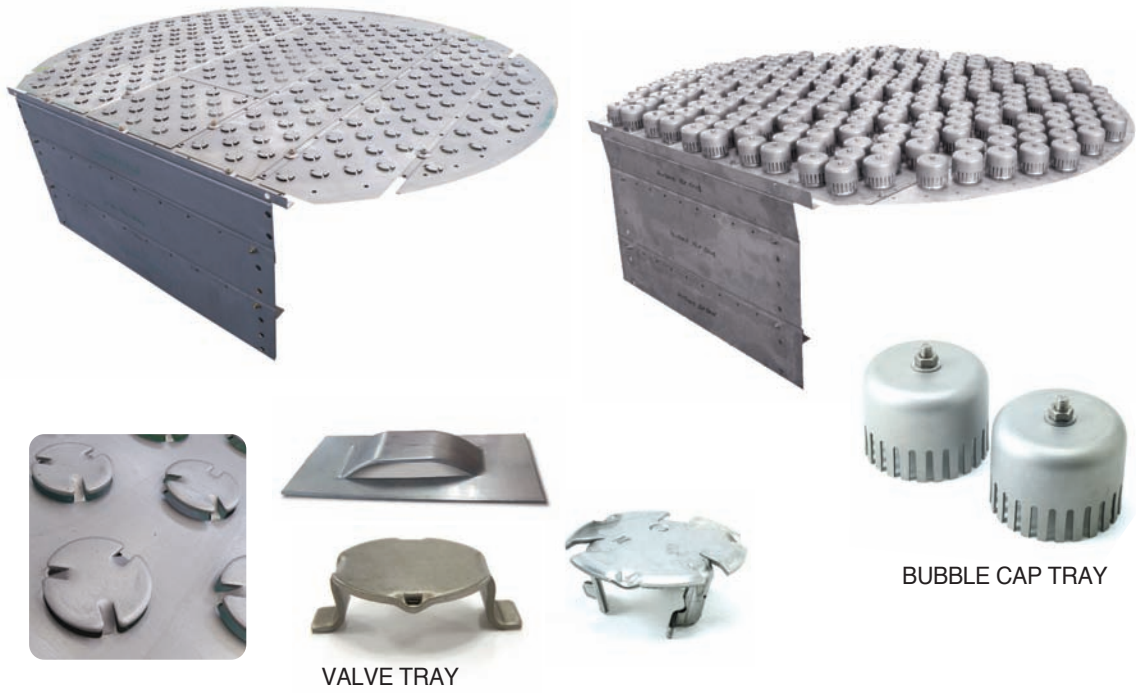
ON-SITE SERVICES

- Installation
- Installation Supervision
- Start-up Assistance



TPT SUPPLIES ALL KINDS OF TOWER INTERNALS

Fractionation Trays



Packings & Internals



TOWER OPERATIONAL DIAGNOSIS

LOOK INSIDE YOUR COLUMN WHILE IT'S OPERATING

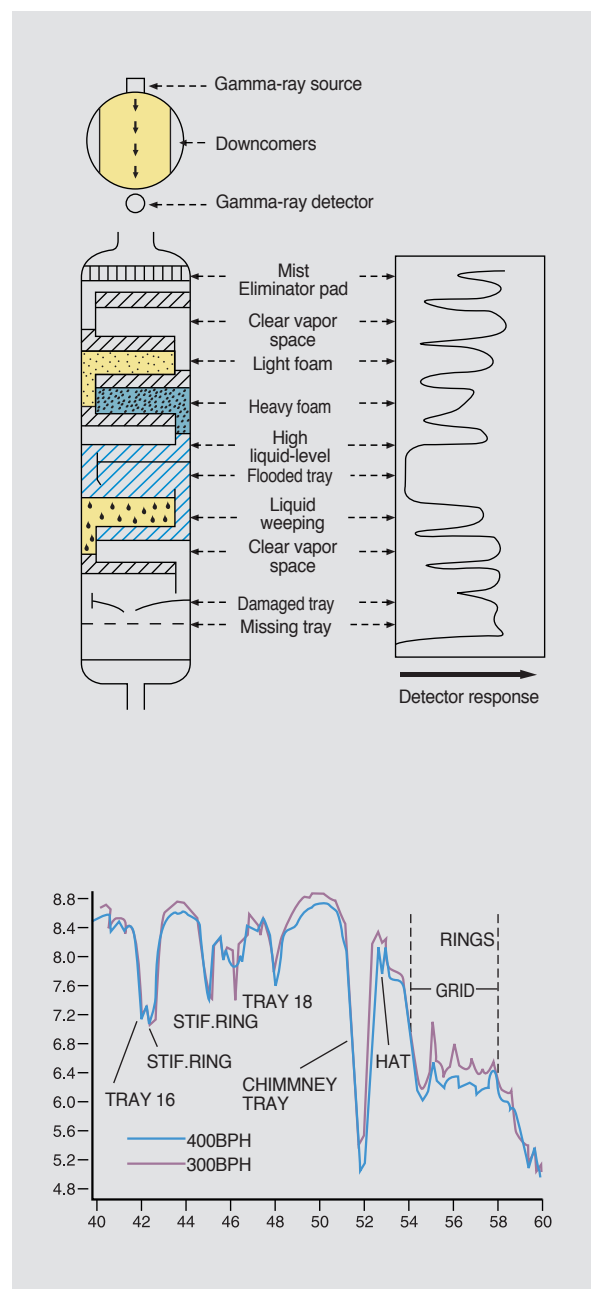
Gamma-ray scan testing is a non-invasive technique that can be used to look inside towers and vessels to examine the abnormal operation and to obtain the data for revamp. Using a collimated beam of Gamma-rays from an enclosed millicurie radio-isotope source, one can determine a density profile and interpret the scan to produce a detailed picture of what is (or isn't) inside and what is (or isn't) happening.

Gamma-ray scan can identify these conditions and determine their causes

- Displaced or damaged trays and packings.
- Flooded trays and packings.
- Foaming on trays or in reboilers, condensers and accumulators.
- Weeping or dumping trays.
- Flooded downcomers.
- Maldistribution of vapor and liquid in packings.
- Fouling, plugging and coking.
- Unequal liquid levels on trays and in parting boxes, troughs and collectors.

Almost all column operating problems fall into one of these classes:

- Operation is poor right from start-up.
- Performance deteriorates gradually over time.
- An upset degrades performance.



Diagrams from Gamma-ray Scanning

High Efficient Distillation Technology using DIVIDED WALL COLUMN(DWC)

“TPT achieved the successful operation of DWC Technology in many separation columns in Petrochemical plant”

What Will TPT Do in Mass Transfer Application for DWC?

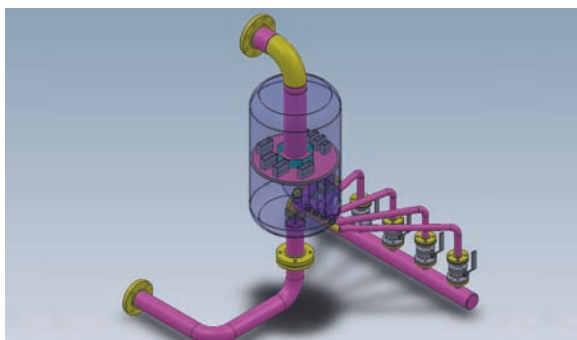
- DWC Modeling & Simulation
- Optimum DWC Design
- High Performance DWC Internal Design
- High Performance DWC Internal Supply
- Liquid Splitter Design & Supply
- Column Modification & Internal Installation

Typical Application of DWC Technology

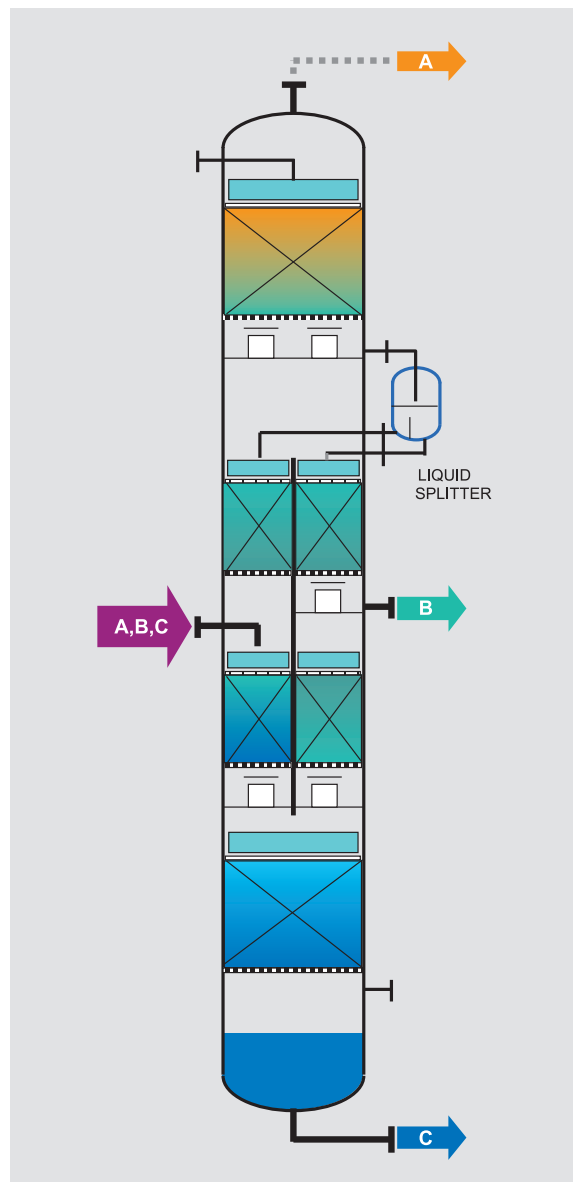
- Octanol Separation Plant
- Bio-Diesel Plant
- VCM Plant
- NPG Separation Plant
- Aromatic Plant
- Solvent Recovery Plant
- Other Chemical Separation Plant

TPT's Liquid Splitter (Patent Pending)

- Non-moving Type
- Various Split Range

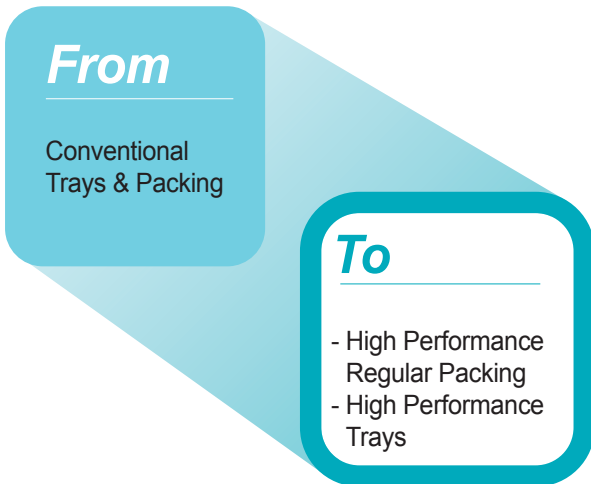


*Energy Saving (20~30%)
Reduce the Investment Cost*



REVAMPING

Column revamping can be achieved by replacing the existing tower internals, if necessary:



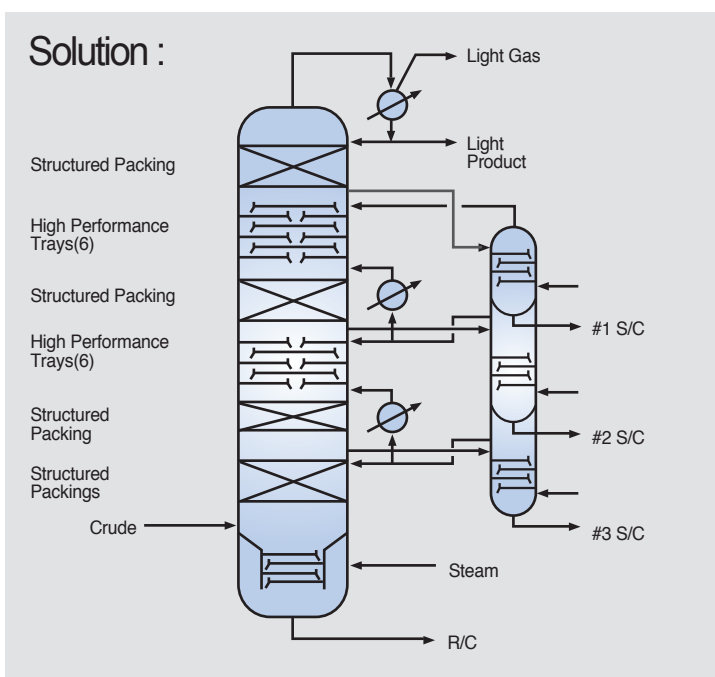
Scope of Revamping

- Feasibility Study
- Gamma-Ray Scanning
- Process Simulation & Optimization
- Auxiliary Equipment Review
- Selection of optimum mass transfer equipment
- Design & Supply of mass transfer equipment
- On-Site Services
 - Installation Supervision
 - Start-up assistance

Crude Atmospheric Unit Revamp With High Performance Tray and Structured Packing

Objectives:

To modernize the 4.2 meter crude atmospheric unit yields.



Results :

- 5% more lift of lights : From 28% to 33%
- 15% extra crude throughput

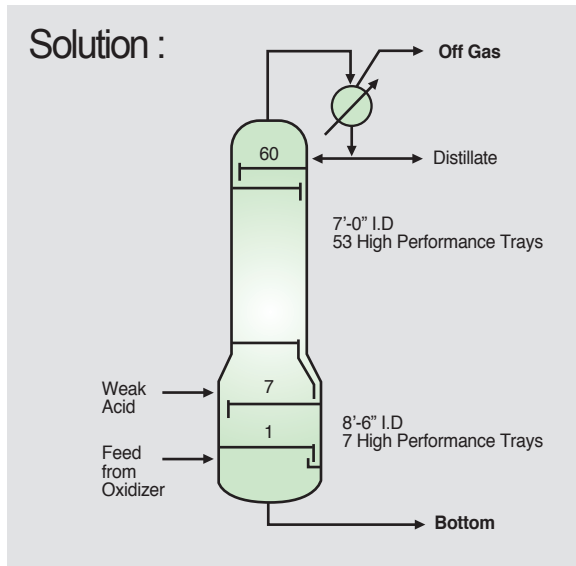
Column Performance after Debottlenecking	
Stream	Yield, wt%
Crude	100.0
Preflash	3.8
Feed	96.2
Top	4.0
Side #1	2.2
Side #2	18.0
Side #3	5.6
Side #4	66.4

Return on investment was less than two(2) months

Acetic Acid Dehydration Column by High Performance Tray:

Objectives :

To increase acetic acid dehydration column capacity by as much as 30% and over to meet with the desired capacity of the existing PTA plant.



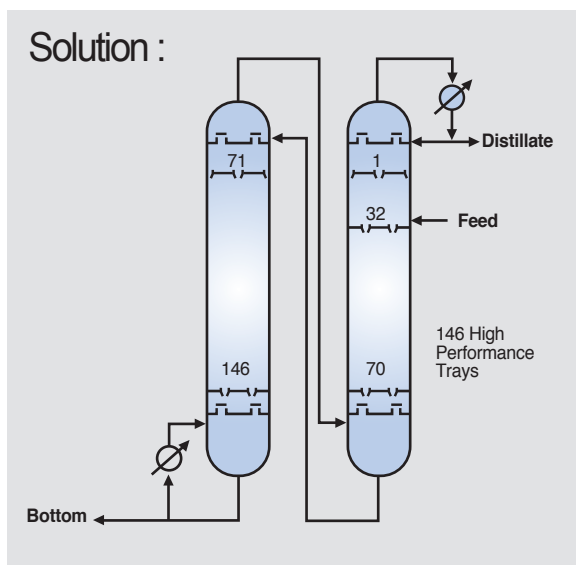
Results :

	Before Revamp		After Revamp	
Column Dia.	7'-0"	8'-6"	7'-0"	8'-6"
No. of Trays	53	7	53	7
No of Passes	1	1	1	1
Type of Tray	Valve		High Performance	
Feed Rete	100%		130%	
Reflux Ratio	100%		100%	
-Distillate	0.46 wt% HAc		0.43 wt% HAc	
-Bottom	92.8 wt% HAc		93.5 wt% HAc	
Press. Drop	0.47		0.47	
Kg/cm2(overall)				

Xylene Splitter Revamp by High Performance Tray:

Objectives :

To increase column throughput by 20% and improve tray efficiency from 56% to 88%



Results :

	Before Revamp	After Revamp
Column Dia.	7500mm	7500mm
No. of Trays	150	146 (4 Transition Trays)
No. of Passes	4	4
Type of Tray	Valve	High Performance
Feed Rate	100%	120%
Product Purities (O-Xylene Base)	98.1%	98.3%
Tray Efficiency	56%	88%

RECOVERY OF SOLVENTS AND CHEMICALS

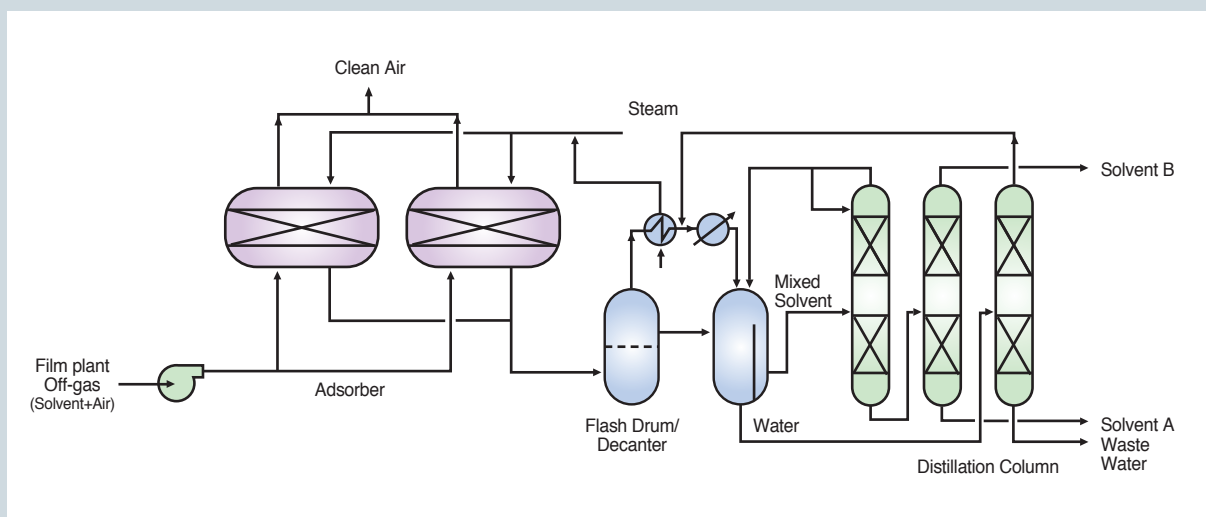
The demands for recovery of useful solvents and other chemicals from the waste continue to increase in order to meet environmental regulations and reuse recovered solvents and chemicals to reduce operating cost. TPT can provide innovative solutions to waste treatment problems using the advanced separation technologies;

- Distillation/Azeotropic Distillation.
- Extractive Distillation.
- Liquid-Liquid Extraction.
- Extraction/Distillation Systems.
- Absorber/Stripper Systems.
- Adsorption.

APPLICATIONS:

- Recovery of solvents from a large-volume of vent gas containing thin solvents
- Recovery of Carboxylic Acids from waste water formed in the DMT, PTA, paper and pulp, and other chemical plants.
- Aromatic recovered from refinery and petrochemical plants.
- Useful Gas recovered from vent gas.
- Alcohols recovered from waste water.
 - Primary, Secondary & Tertiary Butyl Alcohol and Ethanol, Methanol, IPA, Butanol etc...

Solvent Recovery From Waste Gas

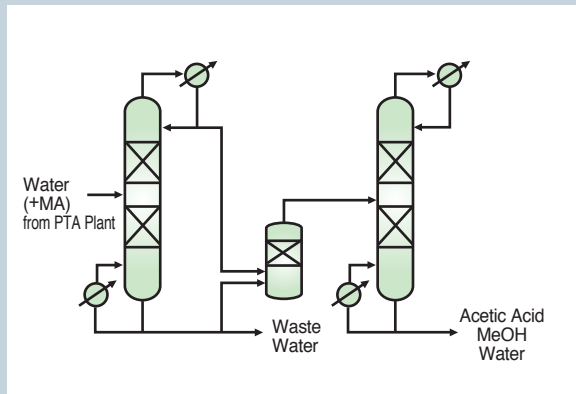


TPT's solvent recovery process is based on an activated carbon adsorption method which recovers solvents from a large-volume of vent gas containing thin solvents. This process treats such solvents as THF, Ketone and Anone without degrading or

polymerizing.

The recovered solvent is perfectly reclaimed, and identical to fresh solvent. Costs for solvents can be remarkably reduced, and at the same time, pollution control can be achieved completely.

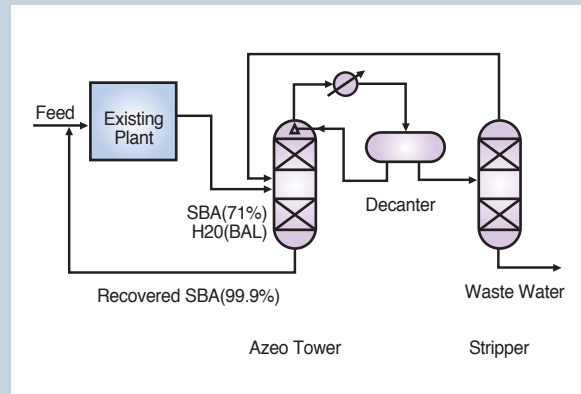
Methyl Acetate Hydrolysis Plant



Methyl Acetate (MA) is generated during oxidation of PX with solvent(Acetic Acid) in PTA plant. MA can be recovered by concentrating of waste water and this MeAc is raw material of this plant. TPT's MA Hydrolysis process produces Acetic Acid, Methanol and water mixture with high yield and efficiency. Acetic Acid & MeOH separation tower can be added by customer's need.

This process has already been proven in commercial operation and is getting good reputation from PTA makers who get MA as a by product.

Sec-Buthyl Alcohol (SBA) Recovery



Highly nonideal solutions like this SBA and water mixture can be separated by azeotropic distillation technology with entrainers.



TPT PACIFIC CO., LTD.

TAEYANG PROCESS TECHNOLOGY

- **Head Office** : 1st Floor, Hanaro Building, 25, Insadong 5-gil, Jongno-gu, Seoul, 03162, Korea
Tel : +82-2-6356-2550 Fax : +82-2-6356-2565
- **Ulsan Shop** : 19, Sannam-gil, Onsan-eup, Uiju-gun, Ulsan, 45010, Korea
Tel : +82-52-237-2720 Fax : +82-52-237-2721
- **E-mail** : tpt@tptpacific.com