



Distillation

Distillation

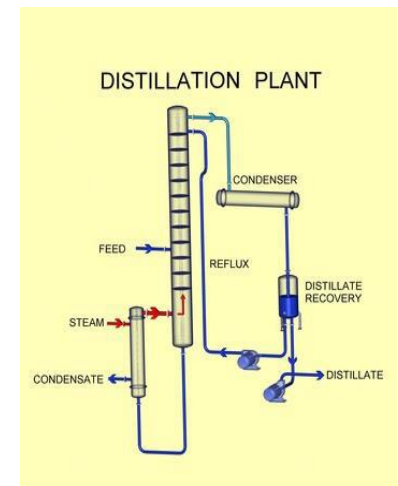
In many pharmaceutical, chemical and textile processes, solvents are used as solvent mixtures or as water solutions. Solvents can ("must") be recovered.

TMIP manufactures both batch and continuous distillation plants suitable for the above mentioned process. Discontinuous (batch) units are normally used for recovering solvents from complex mixtures, usually present in pharmaceutical industry.

Continuous distillers are aimed at chemical industries.

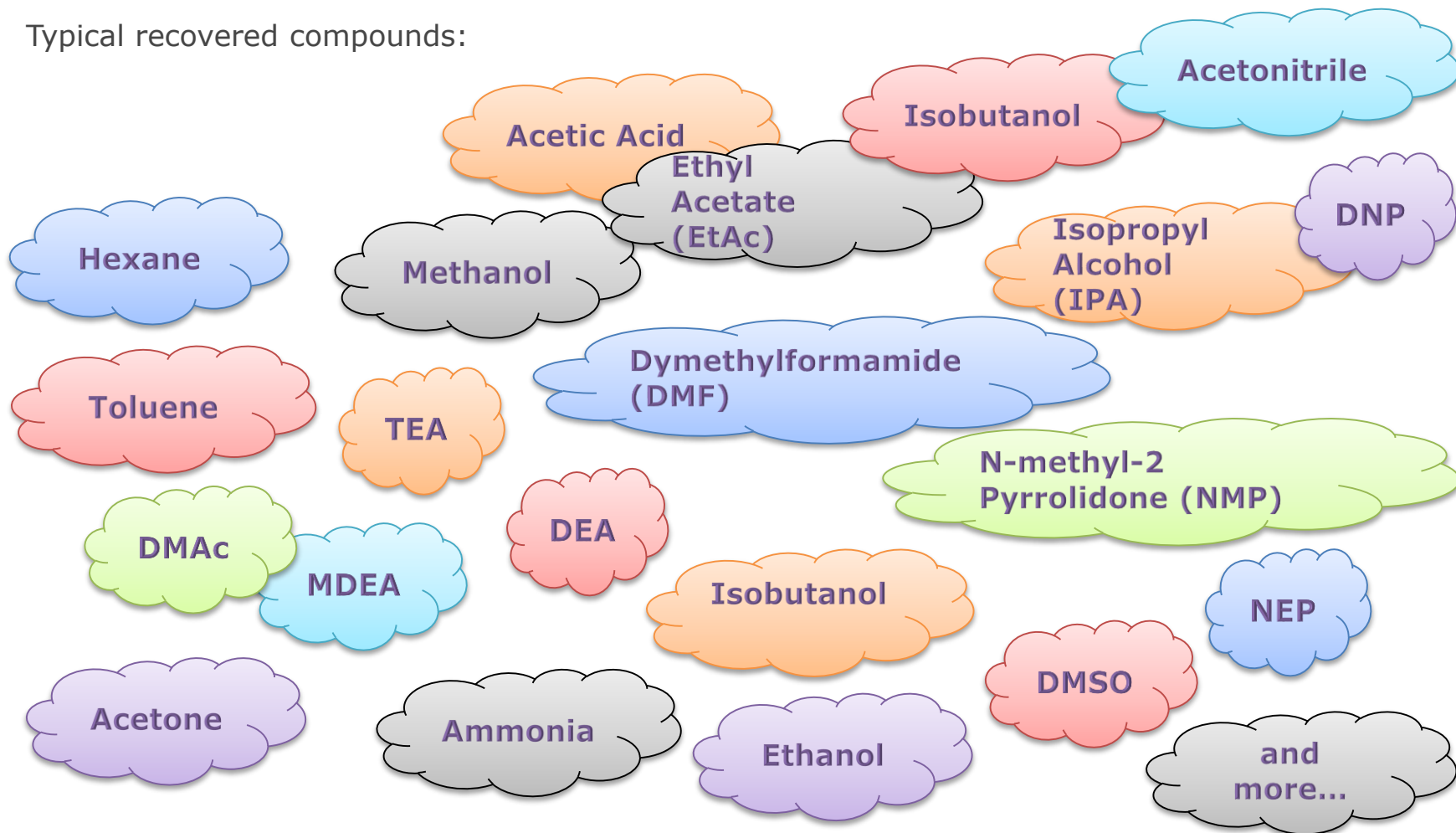
TMIP distillation plants include units for operating under pressure or vacuum, double or triple effect, with yields above 95% and controlled by some of the most sophisticated control systems available.

	Chemical industry in general
	Paints production
	Synthetic leather production
	Resins production
	Pharmaceutical industry and related material (API)



Distillation

Typical recovered compounds:



Distillation

The distillation process cannot always be optimized in a theoretical way. In some cases the presence of substances deriving from the proprietary production process that generated the pollutant wastes can hinder and/or limit distillation.

Process Solution

- Continuous Distillation
- Batch Distillation
- Azeotropic Distillation
- Extractive Distillation
- Vacuum Distillation
- High pressure Distillation
- With Mechanical Compression
- With Thermocompression
- Multiple effects

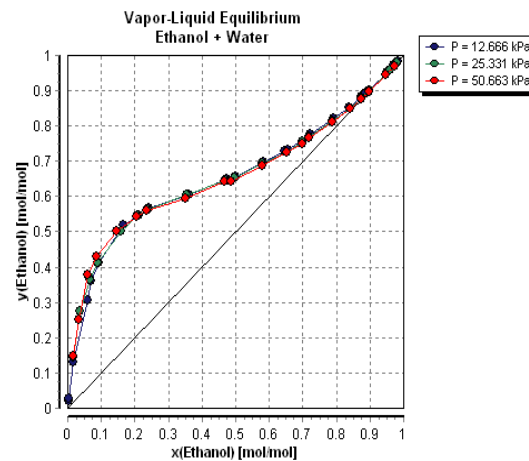
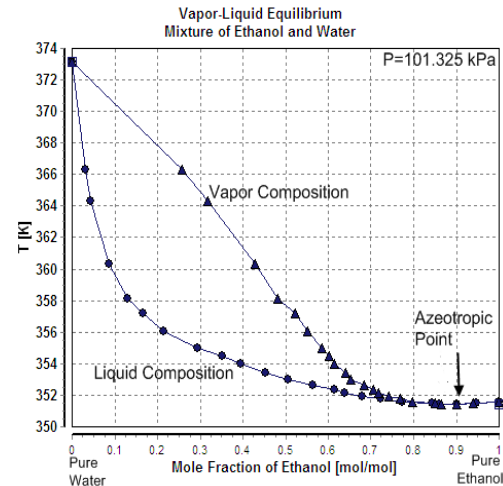
TMIP offers its distillation experience in order to recover the solvents into the original process or other process.



Ethanol –water

Process Data

- **Operation:**
Continuous Double Effects
- **Type:** Sieve Trays
- **Capacity:** 3000 kg/h
- **Operating pressure:** Atm
- **Top operating Temperature:**
78 °C
- **Bottom operating Temperature:**
100 °C
- **Recovered Ethanol:** >98%
- **Concentration of Recovered Ethanol:** >95% wt.
- **Material of construction:**
AISI 304 SS



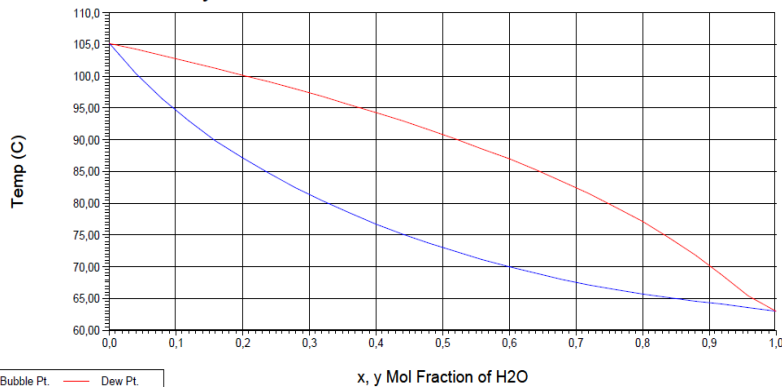
DMF –water

Process Data

- **Operation:** Continuous
- **Type:** Sieve Trays
- **Capacity:** up to 9000 kg/h
- **Material of construction:** AISI 316-304 SS
- **Top operating Temperature:** 56°C
- **Bottom operating Temperature:** 105 °C
- **Recovered DMF:** >99%
- **Concentration of Recovered DMF:** 99% wt.
- **Operating pressure:** vacuum



T-x-y Plot for H₂O and DMF at 0,23 bar



MC / ACETONE / IPA / TEA-DEA

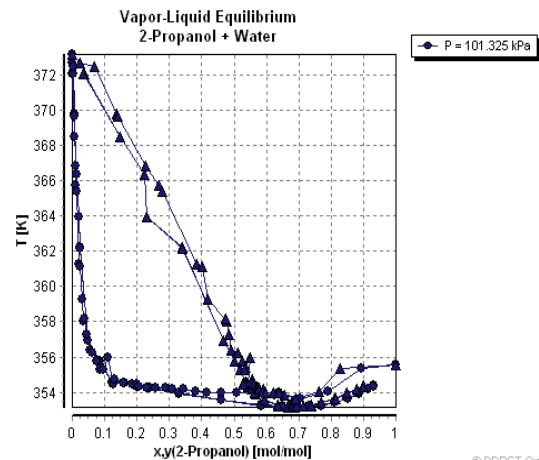
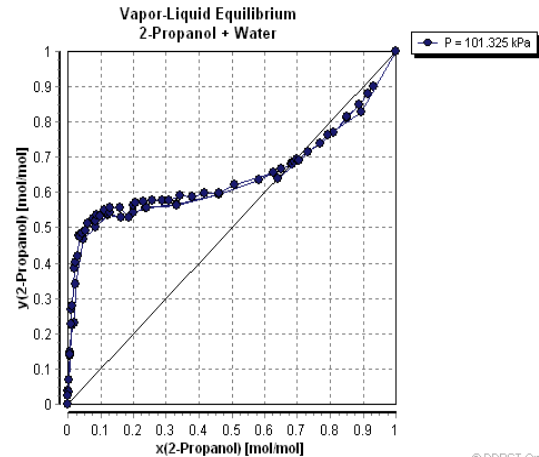
	MC -water	IPA -water	TEA/DEA -water	ACETONE -water
Operation	Continuous	Continuous	Batch	Continuous/ Batch
Type	Sieve Trays	Sieve Trays	Structured Packing	Structured Packing
Capacity	1500 kg/h	1500 kg/h	800 kg/h	1500 kg/h
Operating pressure	Atm.	Atm.	Atm.	Atm.
Concentration of Recovered Compounds	99% wt	85% wt	99% wt	95% wt 99% wt
Material of construction	AISI 316 SS	AISI 316 SS	Carbon steel, Glass lined Column, Titanium heat exchanger	AISI 316 SS



IPA –water

Process Data

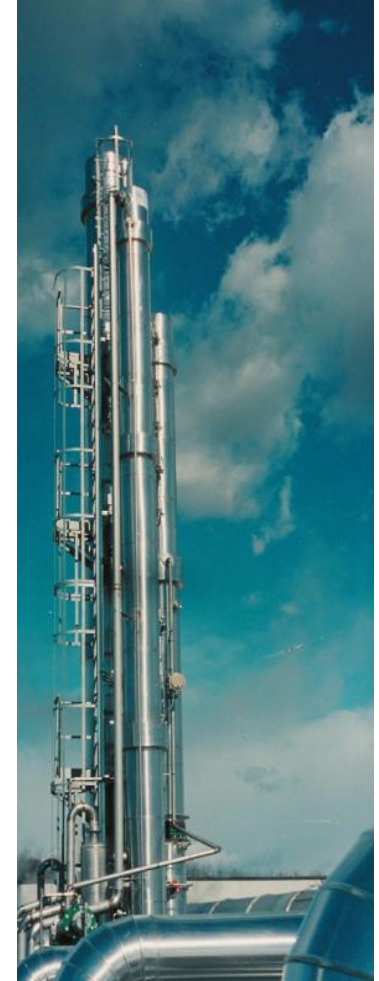
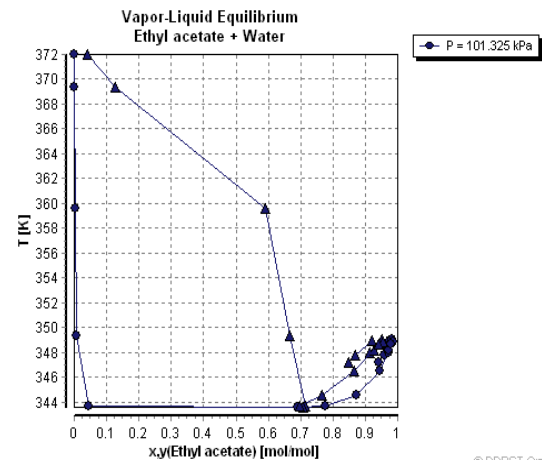
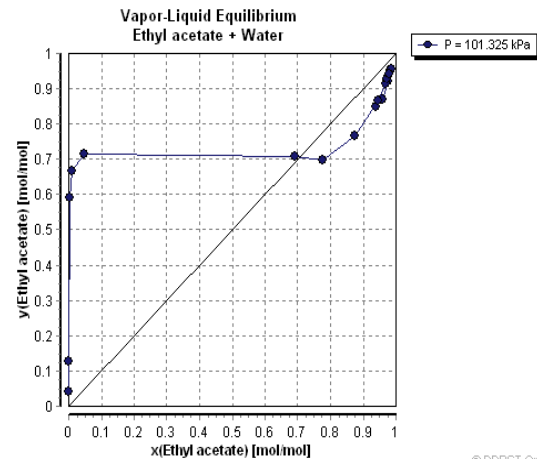
- **Operation:** Continuous double effects
- **Type:** Sieve Trays
- **Capacity:** 5000 kg/h
- **IPA inlet concentration:** 50% wt
- **Top operating Temperature:** 80°C
- **Bottom operating Temperature:** 100 °C
- **Recovered IPA:** >98%
- **Concentration of Recovered IPA:** >87% wt.
- **Operating pressure:** atm
- **Material of construction:** AISI 316 SS / HastelloyC22



Ethyl acetate –water

Process Data

- **Operation:** Continuous
- **Type:** Sieve Trays
- **Capacity:** 1000 kg/h
- **EtAcinlet concentration:** 50% wt
- **Top operating Temperature:** 70°C
- **Bottom operating Temperature:** 100 °C
- **Concentration of Recovered EtAc:** >99% wt.
- **Operating pressure:** atm
- **Material of construction:** AISI 304 SS



thank you



Termomeccanica Industrial Process

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