

Product News

Recovery and Concentration Systems for
Acids and Alkalis

CHEMICAL PRODUCTION - SURFACE TREATMENT

EVAPORATION

Natural-/ Forced circulation
Falling-film
Multistage
Thin film
Vapour recompression
Heat pump

CRYSTALLISATION/ DRYING

Evaporation crystalliser
Thin film dryer

RECTIFICATION/ ABSORPTION

Packed column
Scrubber
Absorption column

LIQUID-LIQUID-EXTRACTION

Extraction column, agitated
Mixer-Settler
Multistage reaction column

Acid Concentration

$H_2SO_4 + H_3PO_4$ Solution

Assignment

The rinsing water of an Aluminium brilliant bath needs be concentrated to reusing in other processes using a user-friendly method.

Maximum plant safety and a cost-effective automated system is required. Since the flow has a low pH, this will be given special consideration in the choice of materials.

Solution

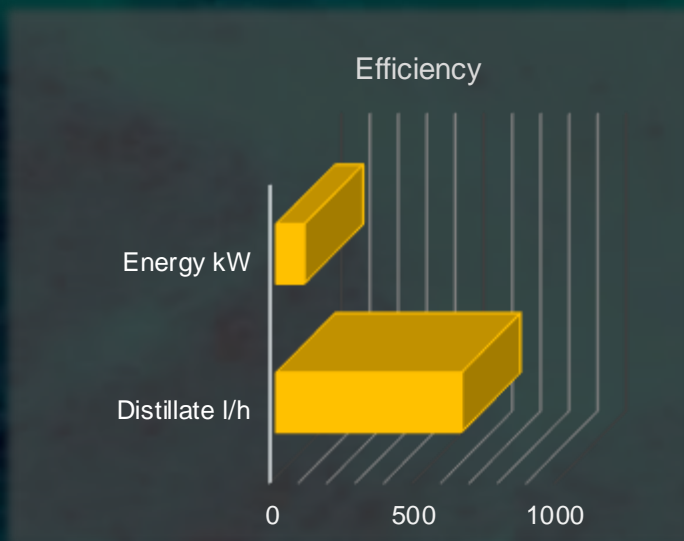
Customised Low Energy Vacuum Distillation Unit with low boiling point for minimisation of corrosion and stress risk.

Performance and Execution

Low energy consumption via Special Technology

Distillate capacity	650 l/h
Energy consumption	98 kW
Efficiency Solvent Recovery	0.15 kWh/l
Operation temperature	< 45 °C

Location: GERMANY



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Acid Recovery

HCl Recovery from process flow

Assignment

The special Ni – HCl Solution needs be concentrated using a user-friendly method. Maximum plant safety and a cost-effective automated system is required. Since the flow has a low pH and a high content at chlorides, this will be given special consideration in the choice of materials.

Solution

Customised Vacuum Distillation Unit with low boiling point for minimisation of corrosion and stress risk.

Performance and Execution

Single stage distillation unit by using special material as Graphite, PTFE, PVDF etc.

Technology / Process

Distillate capacity 620 l/h

Heating medium Steam
pressure 12 bar
temperature >180 °C

Operation Data

pressure < 200 mbar(a)
temperature < 65 °C

Location FRANCE



Recovery of a HF+HNO₃ Zirconium Pickling Bath

Assignment

A flow from the Zirconium pickling bath needs to be crystallised to separate the acid from the metal. Maximum plant safety and a cost-effective automated system is required. Since the flow has a very low pH and a high content of fluorides, this will be given special consideration in the choice of materials.

The recovered distillate, here HNO₃ + HF acid, is returned to production.

Solution

Recovery of HNO₃ + HF by a Vacuum Distillation Unit, which crystallises the metal out of the solution. Including storage tanks, centrifuge to separate the crystals, heating- and cooling system.

Performance and Execution

Single stage crystallisation unit by using special material as SiC, PTFE, PFA, PVDF, ETFE etc.

Technology / Process

Distillate capacity 400 l/h

Heating medium Hot Water
Temperature < 120 °C

Operation Data

pressure < 200 mbar(a)
temperature < 80 °C

Location FRANCE



Recovery of a polishing acid $\text{HF} + \text{H}_2\text{SO}_4$ for lead crystal glass

Assignment

A flow from the lead crystal glass polishing bath needs to be concentrated up to 85% H_2SO_4 . Maximum plant safety and a cost-effective automated system is required. Since the flow has a very low pH and contains fluorides, this will be given special consideration in the choice of materials.

The recovered concentrate, here 85% H_2SO_4 , is returned to production.

Solution

Recovery of H_2SO_4 by a Vacuum Distillation Unit, including heating and a chilled water system.

Performance and Execution

Single stage distillation unit by using special material as SiC, PTFE, PFA, PVDF etc.

Technology / Process

Distillate capacity 120 l/h

Heating medium Steam
Temperature < 165 °C

Operation Data

Pressure < 30 mbar(a)
Temperature < 140 °C

Location GERMANY



Acid Recovery

Recovery of H_3PO_4 from bright plating process

Assignment

Used phosphoric acid solution from the bright plating process needs to be recycled. The diluted aluminium content must be separated before the phosphoric acid is concentrated to bath quality.

Solution

Separation by extraction through Ion Exchange and concentration with Forced Circulating Vacuum Evaporator - FCVE

Performance and Execution

- Special Selective Ion-Exchanger
- Evaporator in High Corrosion Resistant Alloy

H_3PO_4 Concentration	68	%
Distillate capacity	620	l/h
Operation temperature	< 85	°C

Location: FRANCE



Recovery of H_3PO_4 from printed circuit board treatment flow

Assignment

Used Phosphoric Acid H_3PO_4 Solution needs to be concentrated after pre-treatment to 85 % before using it again in the production. Since the flow must be concentrated so high, this will be given special consideration in the choice of materials.

Solution

Concentration with a single stage Forced Circulating Vacuum Evaporator - FCVE

Performance and Execution

- Special Leakage detector system
- Evaporator in High Corrosion Material, e.g. Hastelloy, PTFE, ETFE, PVDF, ...

H_3PO_4 Concentration	85	%
Distillate capacity	750	l/h
Operation temperature	< 98	°C

Location: CHINA



Every customer requirement is a unique task, which has to be solved with customised solutions

Special solutions for the Chemical Industry

- High quality of recovered mediums
- Low Energy Systems (LES) provided by special techniques
- Transparency and good accessibility
- Cleanable systems
- Modular options for further procedures, handling or customer requirements
- Foam handling without additional non product media

Certificates, Conformities and Standards

- CE declaration
- ATEX directive 2014/34/EU
- PWIS free (free of paint-wetting impairment substances)
- Manufacturing after EN13445, AD2000 and ASME

Customised Solutions for Unique Applications

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