



LAB & PILOT INFRASTRUCTURE

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NANOFILTRATION - REVERSED OSMOSIS (MOSOFI)

NAME OF DEVICE

MOSOFI

DESCRIPTION

Nanofiltration - Reversed Osmosis



FIELD OF APPLICATION (PRODUCTS/BRANCHES)

- All liquid media (including organic solvents)
- Foodgrade, ATEX GMP-application: concentration, purification, fractionation and solvent exchange

MATERIAL

RVS316

CONTENT (L)

- Max. 400 l batch feed tank (continuous feed supply possible)
- Dead volume: 80 l

CAPACITY (L/H)

- Polymeric: 1 x 4040/3838 spiral wound module of 3 x 25 mm (B) x 1.2 m (L)
- Ceramic : 3 x module 1.2 m, serial, 19 channel
- Max. 45 bar filtration
- (x100 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Mobile

ACCESSORIES

Food grade feed tank

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (SOLANF1)

NAME OF DEVICE

SolaNF1

DESCRIPTION

Nanofiltration - Reversed Osmosis



FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: concentration, purification, fractionation and solvent exchange

MATERIAL

RVS316

CONTENT (L)

- Max. 4 l feed tank (continuous feed supply possible)
- Dead volume: 1 l

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module
- Ceramic: 1 module 50 cm , 19 channel
- Max. 40 bar filtration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (SOLANF2)

NAME OF DEVICE

SolaNF2

DESCRIPTION

Nanofiltration



FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: concentration, purification, fractionation and solvent exchange

MATERIAL

RVS316

CONTENT (L)

- Max. 4 l feed tank (continuous feed supply possible)
- Dead volume: 1 l

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module
- Ceramic: 1 module, 50 cm, 19 channel
- Max. 15 bar filtration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade/ closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (SOLANF3)

NAME OF DEVICE

SolaNF3

DESCRIPTION

Nanofiltration - Reversed Osmosis



FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: concentration, purification, fractionation and solvent exchange

MATERIAL

RVS316

CONTENT (L)

- Max. 1 l feed tank (continuous feed supply possible)
- Dead volume: 300 ml

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module
- Ceramic: 1 module, 50 cm, 19 channel
- Max. 40 bar filtration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (SOLANF4)

NAME OF DEVICE

SolaNF4

DESCRIPTION

Nanofiltration - Reversed Osmosis

FIELD OF APPLICATION

- All liquid media (including organic solvents).
Strong acids: please inform.
- Application: concentration, purification, fractionation and solvent exchange



MATERIAL

RVS316

CONTENT (L)

- Max. 1 l feed tank (continuous feed supply possible)
- Dead volume: +/- 300 ml

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module. Flat sheet cell of 100cm², stacking possible. Tubular polymeric membranes.
- Ceramic: 1 module, 10cm, 50 cm, 120cm, 19 channel
- Max. 40 bar filtration and diafiltration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (SOLANF5)

NAME OF DEVICE

SolaNF5

DESCRIPTION

Nanofiltration - Reversed Osmosis

FIELD OF APPLICATION

- All liquid media (including organic solvents). Strong acids: please inform.
- Application: concentration, purification, fractionation and solvent exchange



MATERIAL

RVS316

CONTENT (L)

- Max. 1 l feed tank (continuous feed supply possible)
- Dead volume: +/- 300 ml

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module. Flat sheet cell of 100cm², stacking possible. Tubular polymeric membranes.
- Ceramic: 1 module, 10cm, 50 cm, 120cm, 19 channel
- Max. 40 bar filtration and diafiltration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (MFU60-1)

NAME OF DEVICE

MFU60-1

DESCRIPTION

Nanofiltration - Reversed Osmosis



FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: concentration, purification, fractionation

MATERIAL

RVS316

CONTENT (L)

- Max. 30 l feed tank (continuous feed supply possible)
- Dead volume: 3.5 l

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module
- Ceramic: 1 module, 1.2 m, 19 channel
- Max. 60 bar filtration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / open system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - ULTRAFILTRATION (MFU10-2)

NAME OF DEVICE

MFU10-2

DESCRIPTION

Nanofiltration - Ultrafiltration

FIELD OF APPLICATION

- All liquid media
- Application: concentration, purification, fractionation

MATERIAL

RVS316

CONTENT (L)

- Max. 200 l feed tank (continuous feed supply possible)
- Dead volume: 15 l

CAPACITY (L/H)

- Polymeric: 1 x 2538/2440/2540 spiral wound module
- Ceramic: 1 module, 1.2m, 19 channel
- Max. 15 bar filtration
- (x10 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / open system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow



NANOFILTRATION - ULTRAFILTRATION - REVERSED OSMOSIS (MFU25-8)

NAME OF DEVICE

MFU25-8

DESCRIPTION

Nanofiltration - Ultrafiltration - Reversed Osmosis



FIELD OF APPLICATION

- All liquid media
- Application: concentration, purification, fractionation

MATERIAL

RVS316

CONTENT (L)

- m³ feed tank (continuous feed supply possible)
- Dead volume: 25 l

CAPACITY (L/H)

- 3 x 4040/3838 spiral wound module
- Ceramic: 3 x module 19 channel (1.2 m)
- Crossflow max. 8 m³/h
- Max. 25 bar filtration
- (x100 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / open system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

NANOFILTRATION - REVERSED OSMOSIS (MFU40-5)

NAME OF DEVICE

MFU40-5

DESCRIPTION

Nanofiltration - Reversed Osmosis



FIELD OF APPLICATION

- Aqueous media
- Application: concentration, purification, fractionation

MATERIAL

RVS316

CONTENT (L)

- m³ feed tank (continuous feed supply possible)
- Dead volume: 25 l

CAPACITY (L/H)

- Polymeric: 3 x 4040/3838 spiral wound module of 3 x 25 mm (B) x 1.2 m (L)
- Ceramic: 3 x module, 1.2m, 19 channel
- Max. 40 bar filtration
- (x100 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / open system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

MICROFILTRATION - ULTRAFILTRATION (MFU03-10A&B)

NAME OF DEVICE

MFU03-10a&b

DESCRIPTION

Microfiltration - Ultrafiltration



FIELD OF APPLICATION

- Aqueous media
- Application: concentration, purification, fractionation

MATERIAL

PVC

CONTENT (L)

- m³ feed tank (continuous feed supply possible)
- Dead volume: 25 l

CAPACITY (L/H)

- Polymeric : 3 x 4040/3838; 1 x 8038 spiral wound module;
- Polymeric: XL multibore UF-modules (dead-end)
- Ceramic : 3-7 module 19 channel (1.2 m)
- Max.3 bar / 10 m³/h filtration
- Crossflow: max. 30 m³/h
- (x100 l/h) Dependent of membrane surface & performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / open system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature, circulation flow

PERVAPORATION (PV1)

NAME OF DEVICE

PV1

DESCRIPTION

Pervaporation

FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: dewatering, alcohol elimination ...



MATERIAL

RVS316

CONTENT (L)

1.2 l feed tank (continuous feed supply possible)

CAPACITY (L/H)

- Flat polymer membrane/tubular mono channel ceramic
- (x1 l/h) Dependent of membrane performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

PERVAPORATION (PV2)

NAME OF DEVICE

PV2

DESCRIPTION

Pervaporation

FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: dewatering, alcohol elimination ...



MATERIAL

RVS316

CONTENT (L)

5 l feed tank (continuous feed supply possible)

CAPACITY (L/H)

- Flat polymer membrane/tubular mono channel ceramic
- (x1 l/h) Dependent of membrane performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow

PERVAPORATION (PV PILOT)

NAME OF DEVICE

PV Pilot

DESCRIPTION

Pervaporation

FIELD OF APPLICATION

- All liquid media (including organic solvents)
- Application: dewatering, alcohol elimination ...

MATERIAL

RVS316

CONTENT (L)

100 l feed tank (continuous feed supply possible)

CAPACITY (L/H)

- Polymeric and ceramic membrane modules
- (x1 l/h) Dependent of membrane performance

OTHER SPECIFIC CHARACTERISTICS

- Installation: Non-food grade / closed system + disinfection protocol
- Mobile

ACCESSORIES

-

REGISTRATION PARAMETERS

Membrane flux, pressure, temperature and circulation flow



MEMBRANE DISTILLATION (MD LAB SETUP)

NAME OF DEVICE

MD lab setup

DESCRIPTION

Membrane Distillation



FIELD OF APPLICATION

Liquids that can be evaporated at $T < 80^{\circ}\text{C}$, including watery streams, acids, solvents

MATERIAL

- Setup: Plastics, glass
- Membrane: PE, PFTE, PP, PVDF

CONTENT (L)

5 l batch feed tank

CAPACITY (L/H)

- Depending on operational parameters
- Membrane surface: 0.03 m²
- Flux: 0-20 l/(m².h)

OTHER SPECIFIC CHARACTERISTICS

Acid resistant

ACCESSORIES

-

REGISTRATION PARAMETERS

Temperature, pressure, flux and circulation flow

MEMBRANE DISTILLATION (MD PILOT SETUP)

NAME OF DEVICE

MD pilot setup

DESCRIPTION

Membrane Distillation



FIELD OF APPLICATION

Separation of ions from watery streams, acid-base production

MATERIAL

- PP tubing, hastolly heat exchangers
- Spiral wound membrane modules: PE, PFTE, PP

CONTENT (L)

150 l feed tank

CAPACITY (L/H)

- Membrane surface: 7.4 m²
- Flux: 0-10 l/(m².h)

OTHER SPECIFIC CHARACTERISTICS

- DCMD, PGMD mode possible
- Acid resistant

ACCESSORIES

- Acid resistant heat exchanger
- Electric boiler 70 kW

REGISTRATION PARAMETERS

Temperature, pressure, flux, circulation flow and EC

ELECTRODIALYSIS (ED LAB/PILOT 1)

NAME OF DEVICE

ED lab/pilot 1

DESCRIPTION

Electrodialysis

FIELD OF APPLICATION

Separation of ions from watery streams, acid-base production

MATERIAL

Acid-base resistant

CONTENT (L)

10 l feed tanks

CAPACITY (L/H)

10 celpairs 0.1m x 0.1m

OTHER SPECIFIC CHARACTERISTICS

Can be coupled to bioreactor

ACCESSORIES

Power source

REGISTRATION PARAMETERS

Current, voltage, pH, EC, temperature, pressure and circulation flow



ELECTRODIALYSIS (ED LAB/PILOT 2)

NAME OF DEVICE

ED lab/pilot 2

DESCRIPTION

Electrodialysis



FIELD OF APPLICATION

Separation of ions from watery streams, acid-base production

MATERIAL

Acid-base resistant

CONTENT (L)

20 l feed tanks

CAPACITY (L/H)

Small stack: 10 celpairs 0.1m x0.1m

Large stack: 10 celpairs 1m x 0.1m

OTHER SPECIFIC CHARACTERISTICS

-

ACCESSORIES

Power source

REGISTRATION PARAMETERS

Current, voltage, pH, EC, temperature, pressure and circulation flow

CAPACITIVE DEIONIZATION (CDI LAB UNIT 1)

NAME OF DEVICE

CDI lab unit 1

DESCRIPTION

Capacitive Deionization

FIELD OF APPLICATION

Desalination of aqueous/organic streams

MATERIAL

Acid-base resistant

CONTENT (L)

Any feed tank can be fitted

CAPACITY (L/H)

0-500ml/min

OTHER SPECIFIC CHARACTERISTICS

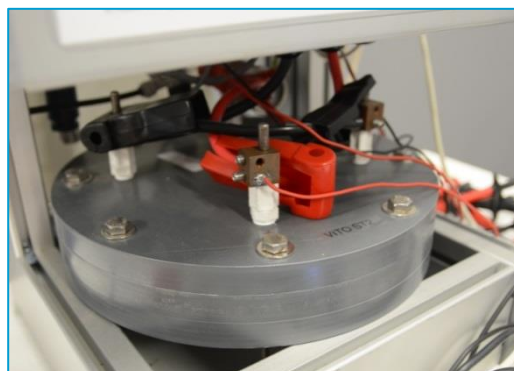
- Circular electrodes: 0,7 m²
- Operation cycles: purification, recharging, purging
- Regeneration: Voltage reversal
- Cycle times: Cycle times variable
- Control: Constant voltage
- Remarks: Conductivity control

ACCESSORIES

- Power source 150A, +/- 3V

REGISTRATION PARAMETERS

Current, voltage, pH, EC, temperature, pressure and flow rate



CAPACITIVE DEIONIZATION (CDI LAB UNIT 2)

NAME OF DEVICE

CDI lab unit 2

DESCRIPTION

Capacitive Deionization

FIELD OF APPLICATION

Desalination of aqueous/organic streams

MATERIAL

Acid-base resistant

CONTENT (L)

Any feed tank can be fitted

CAPACITY (L/H)

0-600ml/min

OTHER SPECIFIC CHARACTERISTICS

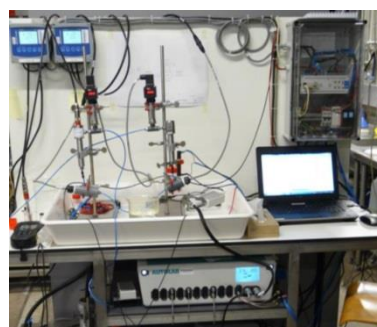
- Square electrodes: 1,2 m²
- Operation cycles: purification, recharging, purging
- Regeneration: Voltage reversal
- Cycle times: Cycle times variable
- Control: Constant voltage / constant current
- Remarks: Conductivity control

ACCESSORIES

- Power source 70A, +/- 3V

REGISTRATION PARAMETERS

Current, voltage, pH, EC, temperature, pressure and flow rate



MEMBRANE EXTRACTION

NAME OF DEVICE

Membrane Extraction

DESCRIPTION

Membrane based solvent extraction

FIELD OF APPLICATION

Liquid-liquid extraction

MATERIAL

The loop itself is solvent resistant.

Membrane module: see “Other specific characteristics”

CONTENT (L)

Following containers are available: 0.1l, 0.25l, 0.5l, 1l

CAPACITY (L/H)

Depending on installed module

OTHER SPECIFIC CHARACTERISTICS

Both flat sheet and hollow fiber modules can be used:

- Flat sheet module is resistant towards most solvents
- Hollow fiber module is depending on the type (commercial modules are used)

ACCESSORIES

-

REGISTRATION PARAMETERS

-



SUPERCRITICAL EXTRACTION (BATCH100)

NAME OF DEVICE

Supercritical Extraction Batch-100

DESCRIPTION

100 ml reactor vessel

FIELD OF APPLICATION

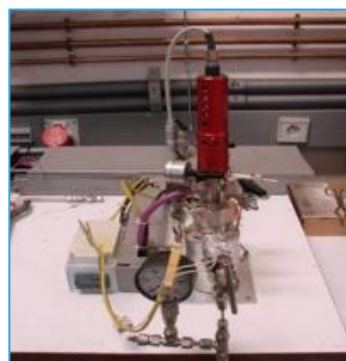
- Reaction
- Pasteurization
- Solvent drying

CONTENT (L)

0,1 L

OTHER SPECIFIC CHARACTERISTICS

- Multiple parallel reactors
- Sample loop for small sampling
- Max P: 250 bar
- Max T: 200 °C



SUPERCRITICAL EXTRACTION (BATCH200)

NAME OF DEVICE

Supercritical Extraction Batch-200

DESCRIPTION

200 ml reactor vessel

FIELD OF APPLICATION

- Extraction
- Reaction
- Pasteurization
- Solvent drying
- CO₂ treatment

CONTENT (L)

0,2 L

OTHER SPECIFIC CHARACTERISTICS

- Dynamic CO₂ dosing
- Solvent dosing possible
- Separation recipient



SUPERCRITICAL EXTRACTION (BATCH1000)

NAME OF DEVICE

Supercritical Extraction Batch-1000

DESCRIPTION

1L reactor vessel

FIELD OF APPLICATION

- Extraction
- Reaction
- Pasteurization
- Solvent drying
- CO₂ treatment

CONTENT (L)

1 L

OTHER SPECIFIC CHARACTERISTICS

- Dynamic CO₂ dosing
- Solvent dosing possible
- Observation screen
- 2 Separation recipients



SUPERCRITICAL EXTRACTION (BATCH200-HT)

NAME OF DEVICE

Supercritical Extraction Batch-200-HT

DESCRIPTION

200 ml reactor vessel

FIELD OF APPLICATION

- Reaction
- Precipitation
- Non-CO₂ treatment application

CONTENT (L)

0,2 L

OTHER SPECIFIC CHARACTERISTICS

- Solvent dosing possible
- Complex temperature profiles



SUPERCRITICAL EXTRACTION (BATCH3500)

NAME OF DEVICE

Supercritical Extraction Batch-3500

DESCRIPTION

3,5 L reactor vessel

FIELD OF APPLICATION

- Precipitation
- CO₂ treatment

CONTENT (L)

3,5 L

OTHER SPECIFIC CHARACTERISTICS

-



SUPERCRITICAL EXTRACTION (2,5/10)

NAME OF DEVICE

Supercritical Extraction-2,5/10

DESCRIPTION

Extraction

FIELD OF APPLICATION

- CO₂ extraction (analytical)

CONTENT (L)

2,5 -> 10 ml

OTHER SPECIFIC CHARACTERISTICS

- Dynamic CO₂ dosing (till 10ml/min)
- Solvent dosing possible
- Observation screen
- 2 Separation recipients



SUPERCRITICAL EXTRACTION (FASE MONITOR)

NAME OF DEVICE

Supercritical Extraction Fase Monitor

DESCRIPTION

Monitoring tool

FIELD OF APPLICATION

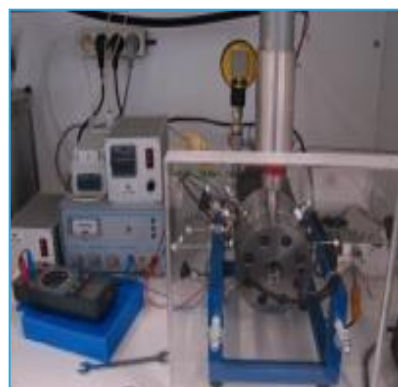
Analytical

CONTENT (L)

30-60 ml

OTHER SPECIFIC CHARACTERISTICS

- Variable cell volume
- Observation screen



SUPERCRITICAL EXTRACTION (500/2000)

NAME OF DEVICE

Supercritical extraction 500/2000

DESCRIPTION

Continuous Extraction

FIELD OF APPLICATION

- Precipitation
- CO₂ extraction
- Solvent drying

CONTENT (L)

500 - 2500 ml

OTHER SPECIFIC CHARACTERISTICS

- Dynamic CO₂ dosing (till 25 kg/h)
- Solvent dosing possible
- 3 separation recipients with CO₂ recycling

