

LEACHATE TREATMENT WITH DIRECT-RO

WEHRLE's solution

DIRECT-RO is an inexpensive basic solution for the treatment of landfill leachate and a 1st step into reliable and sustainable leachate treatment from WEHRLE, the technology leader for this application.

A Reverse Osmosis system separates leachate into high quality / low salinity permeate, that can be safely discharged into the water body or sewage system, and concentrate that needs to be stored or disposed of.

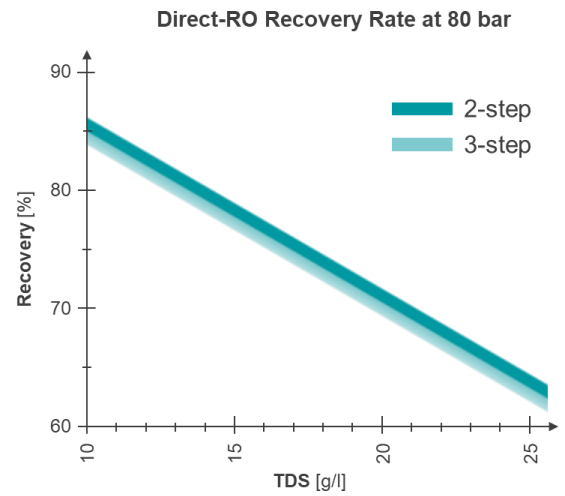
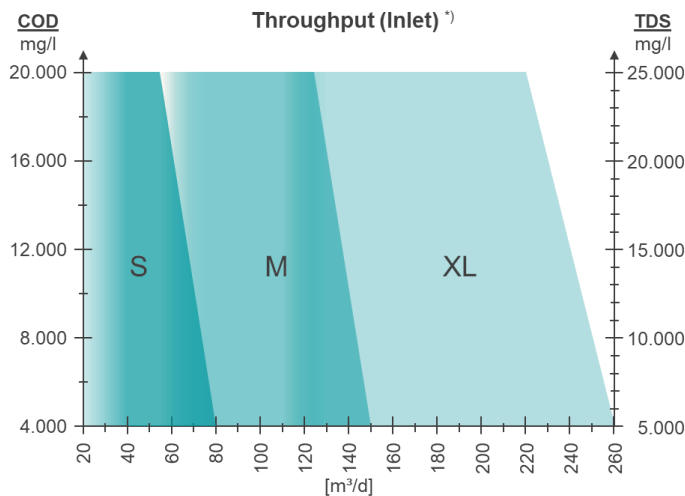
Simple installation



Example photos

Size selection / Throughput Recovery rate

Depending on the flow rate and the parameters of the leachate, select both, the system size (S, M or XL) and the treatment stages (2 or 3) according to the expected flow recovery rate:

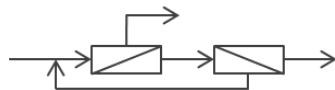


¹⁾ the higher level (COD or TDS) determines the working point

Selection of steps Rejection rates expected: COD NH₄-N TDS

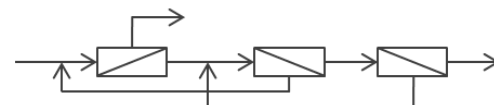
Select the required Reverse Osmosis stages depending on the limit values to be achieved:

2 steps:



98 % 92 % 98 %

3 steps:



99 % 97.5 % 99.5 %

Optimized recovery rate due to system internal concentrate recirculation

PRODUCT OVERVIEW

DIRECT-RO

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Inlet specification limits¹⁾

T_{feed} :	0 ... 30 °C
$T_{ambient}$:	0 ... 20 °C ²⁾
Si:	< 5 mg/l
Sum of Fe + Mn:	< 5 mg/l
TSS:	< 150 mg/l

1) exceeding these limits may reduce performance
 2) for average daily temperatures > 20°C, and to keep the inside container < 35°C, air conditioning should be considered by the client (connections are available as standard)

Membranes / Plant configuration



DIRECT-RO operates with **spiral wound membranes**, widely used for sea-water desalination and produced in large quantities by various suppliers worldwide. These membranes are very simple and cost effective to work with, membrane replacement is quick and inexpensive.

The **feed & bleed configuration** ensures high circulation velocity in the membranes, avoiding salt deposition and minimizing concentration polarization, which results in fewer chemical cleaning and less chemical consumption.

Expected membrane service life:

1st stage: 1 ... 2 years, 2nd / 3rd stage: 3 ... 4 years

The lifespan of the membranes depends on the leachate characteristics and the operating conditions of the plant.

Highly flexible and automatized system configuration

The basic configuration of the DIRECT-RO contains everything that is necessary for the proper operation of the system. Depending on site requirements, additional options can be selected.

Technical details of the **BASIC CONFIGURATION**:

System pressure:	1 st stage, 80 bar 2 nd & optional 3 rd stage, ~20 bar
SW-Membranes:	organic spiral wound in 1m 8" modules, typically 5 per pressure tube
Automated operation:	pH value adjustment, foam regulation, sand filter incl. backwash, auto-adjustment of the permeate yield and cleaning process, in the 1 st stage
Live data-messurement:	pH value, conductivity, temperature, pressure, flow rate
Autom. process control:	Siemens S7- PLC with Graphical User Interface in a 19" Touch Panel remote control with possible SMS alerting via internet
Safety equipment:	mobile eye shower
System protection:	separate machine and switch cabinet rooms coated panels wall and ceiling insulation external sulfuric acid storage
Sustainable container:	used modified shipping container
Transport for container:	loading only possible per crane or forklift chassis without gooseneck, platform only

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OPTIONS to supplement the basic configuration:

Advanced automation package containing

- ✓ PLC controlled pressure control valves, CIP valves and cleaner pumps in 2nd & 3rd steps
- ✓ Advanced PC based process control system
- ✓ maximized permeate recovery at all times
- ✓ automatic CIP, based on process parameters
- ✓ detailed evaluation and long-term recording

OPEX reduction package containing

- ✓ Additional stand-by sandfilter³⁾
- ✓ Degasifier column
- ✓ improves plant availability
- ✓ pH-adjustment of effluent without need for chemicals

3) not available for XL Compact

Corrosive environment package containing

- ✓ All pumps stainless steel
- ✓ Air filter
- ✓ long lasting unit due to reduced corrosion in the container

Cold climate package for average daily ambient temperatures < 0 °C containing

- ✓ Extra heater
- ✓ Container floor insulation
- ✓ keeps temperature in the container above ≈ 5 °C

Inlet set package containing

- ✓ Suction boat and transfer pump
- ✓ Hoses including connections
- ✓ to further facilitate on-site installation

High alkalinity package containing⁴⁾

- ✓ acid inline and external dosing point
- ✓ Inlet pump
- ✓ for alkalinity values > 7.500 mg CaCO₃ mg/L
- ✓ price on request

4) only available for XL Compact. Pre acidification tank (by client)

Basic chemicals package for commissioning & first weeks of operation (within E.U. only) containing

- ✓ Membrane cleaners
- ✓ Antiscalant
- ✓ Antifoam
- ✓ price on request

Spares package for high availability containing

- ✓ Spare membranes and filters
- ✓ Spare part sets for all pumps
- ✓ Spare probes for essential sensors
- ✓ individual package compiled based on your budget

Extended warranty package

In combination with Spares Package Parts only. Subject to wear and media contact are excluded. It only applies when operating the system according to our operating instructions

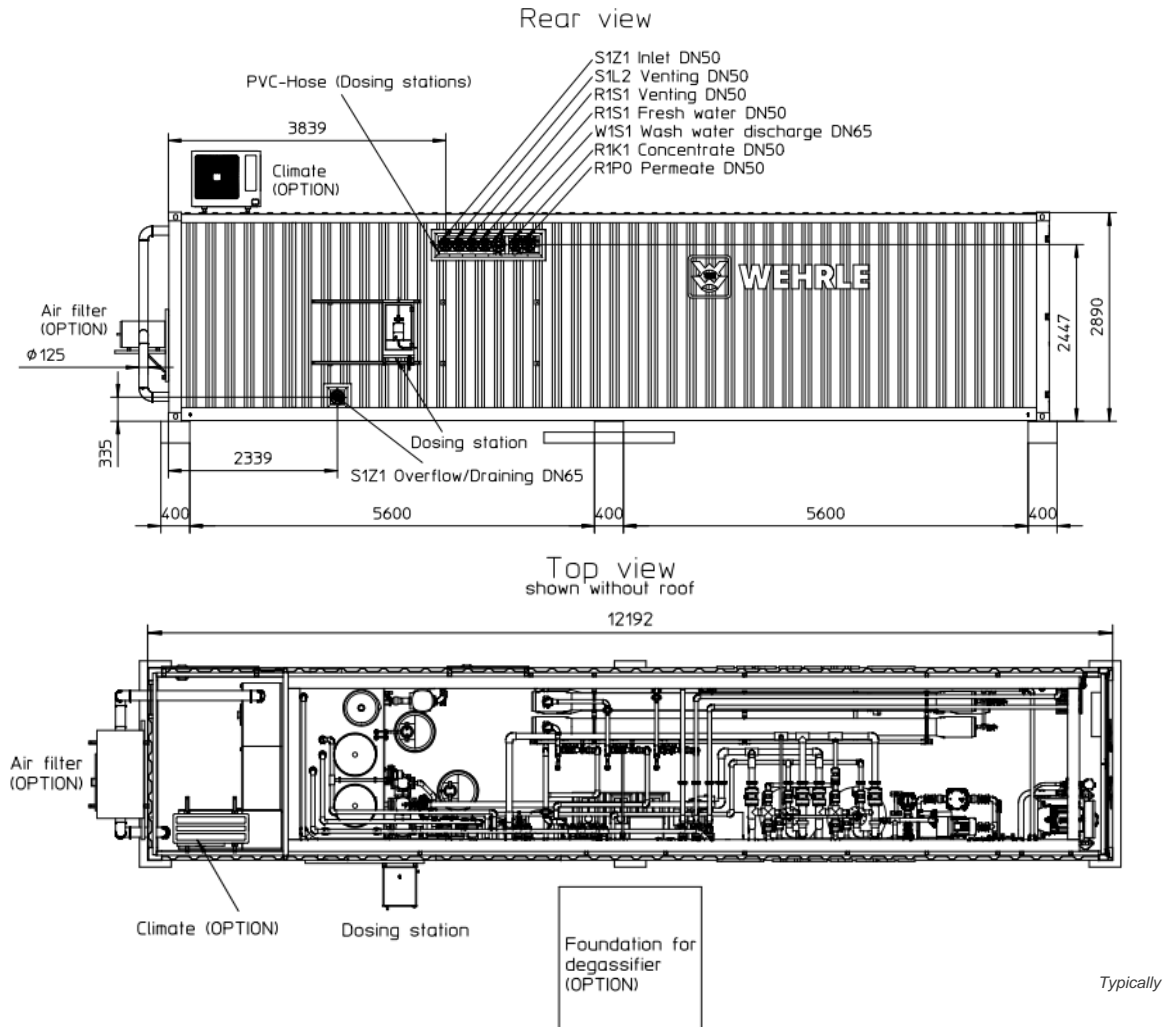
- ✓ price on request

CSC certification for overseas shipments

- ✓ price on request

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Layout and positioning of connections and doors




Supplies by client

Electrics: 3~/N/PE 400V / 50 Hz ⁴⁾

	S	M	XL
Main power switch:	160 A	250 A	400 A
Process water:	3 bar		
Chemicals: ⁵⁾	max.98% H ₂ SO ₄ , NaOH ⁶⁾ , anti-scalant, anti-foam ⁶⁾ , membrane cleaner		

⁴⁾ 380 V and/or 60 Hz systems on request
⁵⁾ depending on requested discharge level
⁶⁾ if required

Further notes

 [Watch product video](#)

For more information or individual upgrades please contact us

Subject to change without notice