



# EVALED™ RV

Forced circulation MVR evaporators



Solutions & Technologies



# EVALED™ RV evaporators

EVALED™ RV Solution represents the range of mechanical vapour recompression and forced circulation evaporators, ideal when large quantity of waste which can cause fouling, precipitation and crystal formation has to be treated.

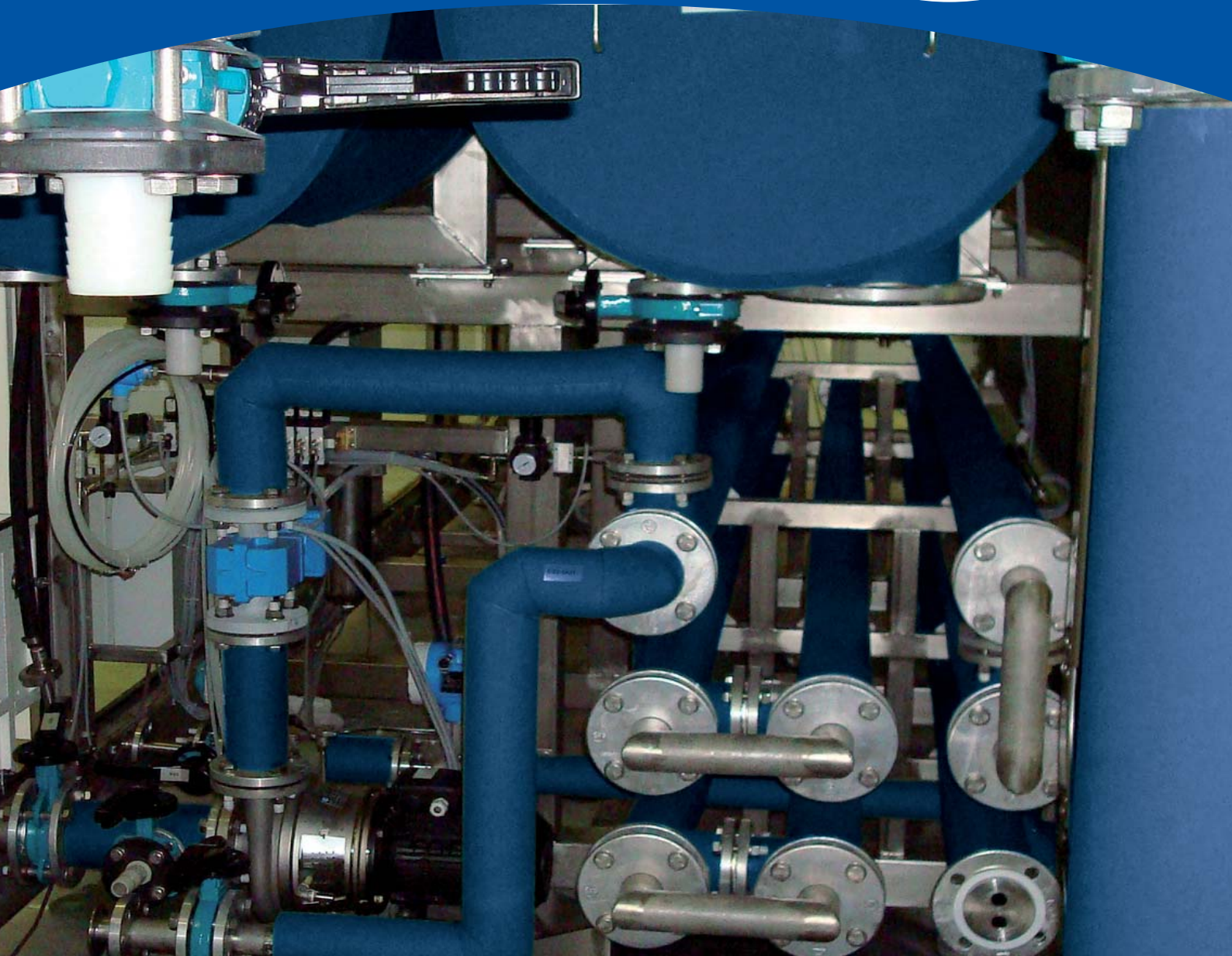
The low running costs enable installation of plants whose return on investment can often be measured in months.

The battle against the climate change is a priority for everyone. VWS Italia has a real commitment to reduce CO<sub>2</sub> emissions: we are working to make sure that our technological offering is ever more environmentally sustainable.



CO<sub>2</sub>

EVALED™ RV comprehends TC and MVR series which distinguish from each other by the heat exchanger technique, one by forced circulation and external tube exchanger, the other by falling film and forced circulation with external tube exchanger.





# Materials



VWS Italia, in co-operation with respected materials research centres, selects the most suitable materials for the safe management of aggressive liquids. The resistance to corrosion is the main features of every EVALED™ evaporators, essential when dealing with extremely concentrated liquids.

## Austenitic stainless steel AISI 316L

(Number: 1.4435 – X2 CrNiMo 18-14-3)

Austenitic weakly bound structure, non-hardening, non-magnetic. The low percentage of Carbon in this alloy reduces the risk of intergranular corrosion at high temperatures.

**Uses:** alkaline liquids, acid liquids (pH>4) with a low percentage of chlorides, oil emulsions, liquids from flexographic printing.

## Superduplex stainless steel

(Number: 1.4410 - X2 CrNiMo 25-7-4)

Austenitic-ferritic structure, magnetic. The high percentage of Chrome gives excellent resistance to localised corrosion.

**Uses:** acid liquids (pH>3) with high chloride and metals content, galvanic waste waters, landfill leachate.

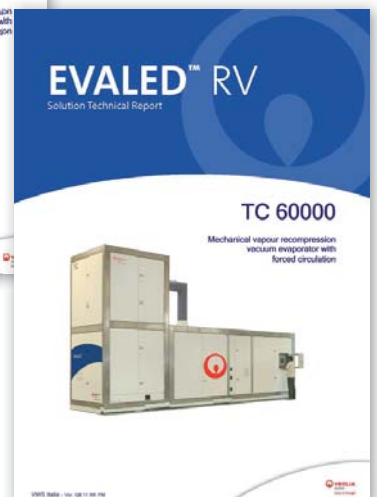
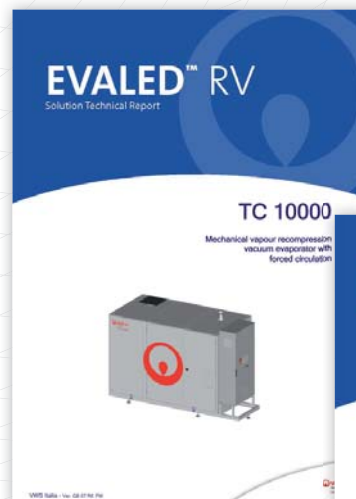
## Nickel alloy

(Number: 2.4819 – NiMo 16 Cr15 W)

High flexibility Cr-Ni.Mo steel. The low Carbon content ensures resistance to the formation of carbides at zones exposed to thermal variation. It has excellent resistance to localised corrosion, both in oxidising and reducing environments, even at high temperatures.

**Uses:** very acid liquids (pH>2) with high content of chlorides, fluorides and metals, anodising waste waters, special applications.

## EVALED RV Technical Reports



# EVALED™ TC Series

TC series is based on forced circulation technology through a tube heat exchanger external to the boiling chamber. The evaporator allows high levels of waste concentration and dramatical reduction of the frequency of cleaning and maintenance operations. Furthermore the high liquid recirculation through the tube heat exchanger allows an high heat exchange efficiency and a reduction of deposits or scaling on the heating surface.

## TC series is the best solution for:

- ✦ *mechanical industry*
- ✦ *surface treatment*
- ✦ *graphic arts*
- ✦ *power*
- ✦ *landfills*



## SPECIFICATIONS

The capacity of TC evaporators varies from 10.000 l (2.650 gal) to 120.000 l (31.700 gal) of distillate per day. The evaporation process is controlled by a PLC so that the evaporator requires a minimum of supervision and automatically manages the functions of waste water feed and discharge of concentrate and distillate.

### TC 10000

**Capacity:** 10.000 l - 2.650 gal of distillate / 24h  
**Specific energy consumption:** 0.050 [kWh/l distillate]  
**Construction:** pre-assembled single module on a stainless steel frame

### TC 15000

**Capacity:** 15.000 l - 3.970 gal of distillate / 24h  
**Specific energy consumption:** 0.050 [kWh/l distillate]  
**Construction:** pre-assembled single module on a stainless steel frame

### TC 30000

**Capacity:** 30.000 l - 7.930 gal of distillate / 24h  
**Specific energy consumption:** 0.050 [kWh/l distillate]  
**Construction:** pre-assembled single module on a stainless steel frame

### TC 60000

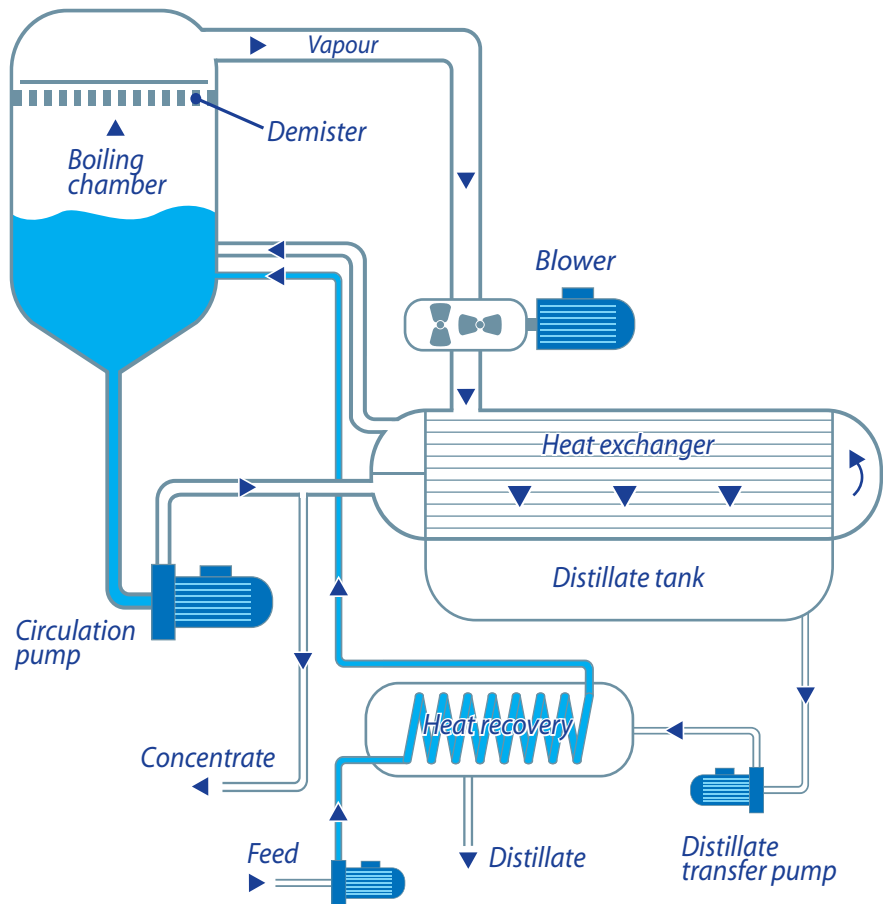
**Capacity:** 60.000 l - 15.850 gal of distillate / 24h  
**Specific energy consumption:** 0.050 [kWh/l distillate]  
**Construction:** pre-assembled single module on a stainless steel frame

### TC 120000

**Capacity:** 120.000 l - 31.700 gal of distillate / 24h  
**Specific energy consumption:** 0.050 [kWh/l distillate]  
**Construction:** pre-assembled single module on a stainless steel frame



### Process diagram





# EVALED™ MVR Series

MVR evaporator is based on the forced circulation technology through a falling film heat exchanger. It operates in two stages both having independent mechanical vapour recompression system: falling film followed by external heat exchanger. The falling film stage carries out the pre-concentration of the solution, while the forced circulation with external shell&tube heat exchanger concentrates up to 30 % total dissolved solids. The distillate is continuously produced and discharged by both stages.

The main benefit of falling film technique is the possibility of treating heat-sensitive products with very low temperature differences between the heat exchanger and the boiling liquid. Therefore the liquid is not effected by any heat shock.

## MVR series main benefits:

- *large heat transfer surface*
- *vertical tube*
- *low speed*
- *low energy consumption*
- *low temperature difference on the surface*

## MVR series is the best solution for:

- *mechanical industry*
- *chemical industry*
- *landfills*
- *biogas*



## SPECIFICATIONS

### MVR 120

**Capacity:** 120.000 l - 31.700 gal of distillate / 24h

**Specific energy consumption:** 0.030 [kWh/l of distillate]

**Construction:** seven modules

### MVR 250

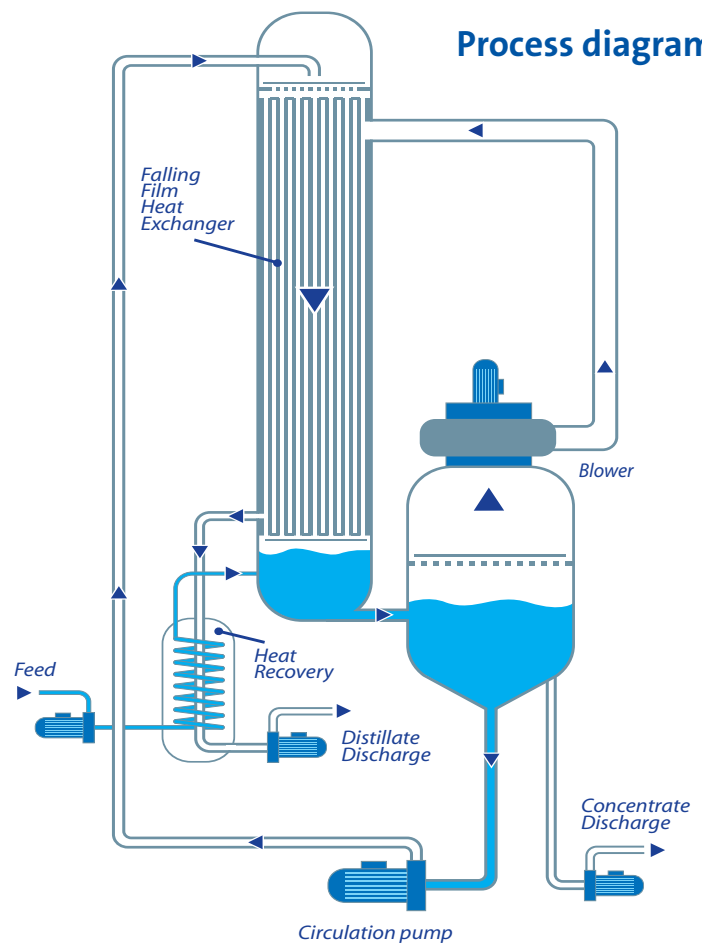
**Capacity:** 240.000 l - 63.400 gal of distillate / 24h

**Specific energy consumption:** 0.030 [kWh/l of distillate]

**Construction:** seven modules



Process diagram





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