KMU LOFT Cleanwater SE

Market Leader in MVR* Evaporator Based Solutions for Industrial Process Water Treatment

*(Mechanical vapor recompression)

KMU LOFT Cleanwater

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KLC Group

– Leader in Sustainable Process Water Treatment for Industry

We are a world leading solution provider

in sustainable industrial process water treatment

using our MVR evaporation processes.*

**(mechanical vapor recompression)*

KLC Experience

KMU LOFT Cleanwater is the pioneer of process water treatment with the vacuum evaporation with MVR.

From the beginning in 1990, the company has sold systems comprising pre and post treatment and has been active worldwide.

2.800	MVR systems sold
> 30	Countries with MVR systems in operation
> 12.000	Process waters assessed
> 10.000	Process waters analyzed in lab
> 260	Process waters types treated with MVR systems
> 30	Industry segments served with MVR systems

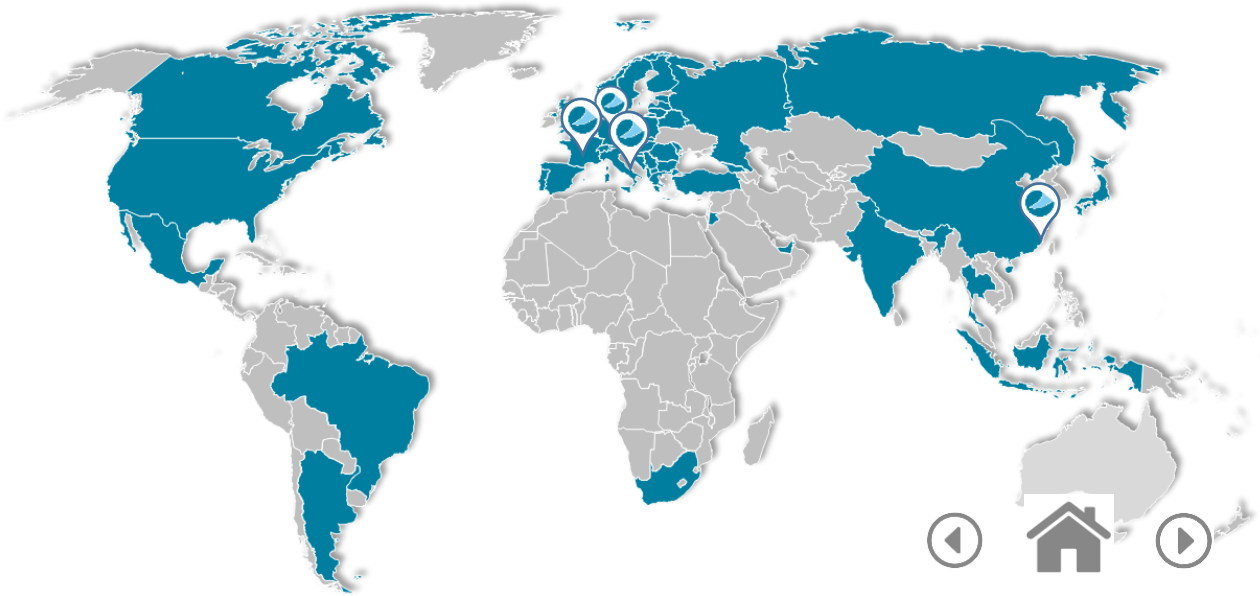
KLC Group – Globally and in South Africa

KLC is all about people. Whether they have been trained at a university or in the workshop. We are a unique group of experts in all levels and matters of industrial water treatment centered around MVR based systems.
125 employees, **17** nationalities, **20** languages, **> 60%** Bachelors & Masters (or equivalent), Ph.D.

Subsidiaries in France, Italy and China.
Partners all over the world.
In South Africa we cooperate with TALBOT – 2 projects in large international clients were realized together

We are eager to help South Africa to:

- Close Loops in industrial water management
- Avoid discharge of toxic matters into rivers or ground water
- Enable sustainable production process



KMU LOFT Cleanwater

KLC References in 20+ Industries


Automotive / Aerospace


Metalworking / -production


Disposal


Surface Technology


Machinery / Plant engineering


Chemical / Pharma


Electronic and optical devices production


Energy


Electro-mobility/ Battery production

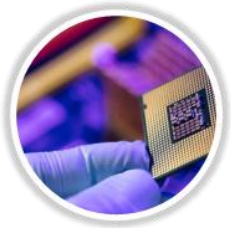

Food and beverage


Plastics


Transport/Traffic


Paper / Packaging / Printing


Cosmetics / Health


Microelectronic


Furniture


Glass and ceramic


Raw material extraction


Textile


Wood

KMU LOFT
Cleanwater

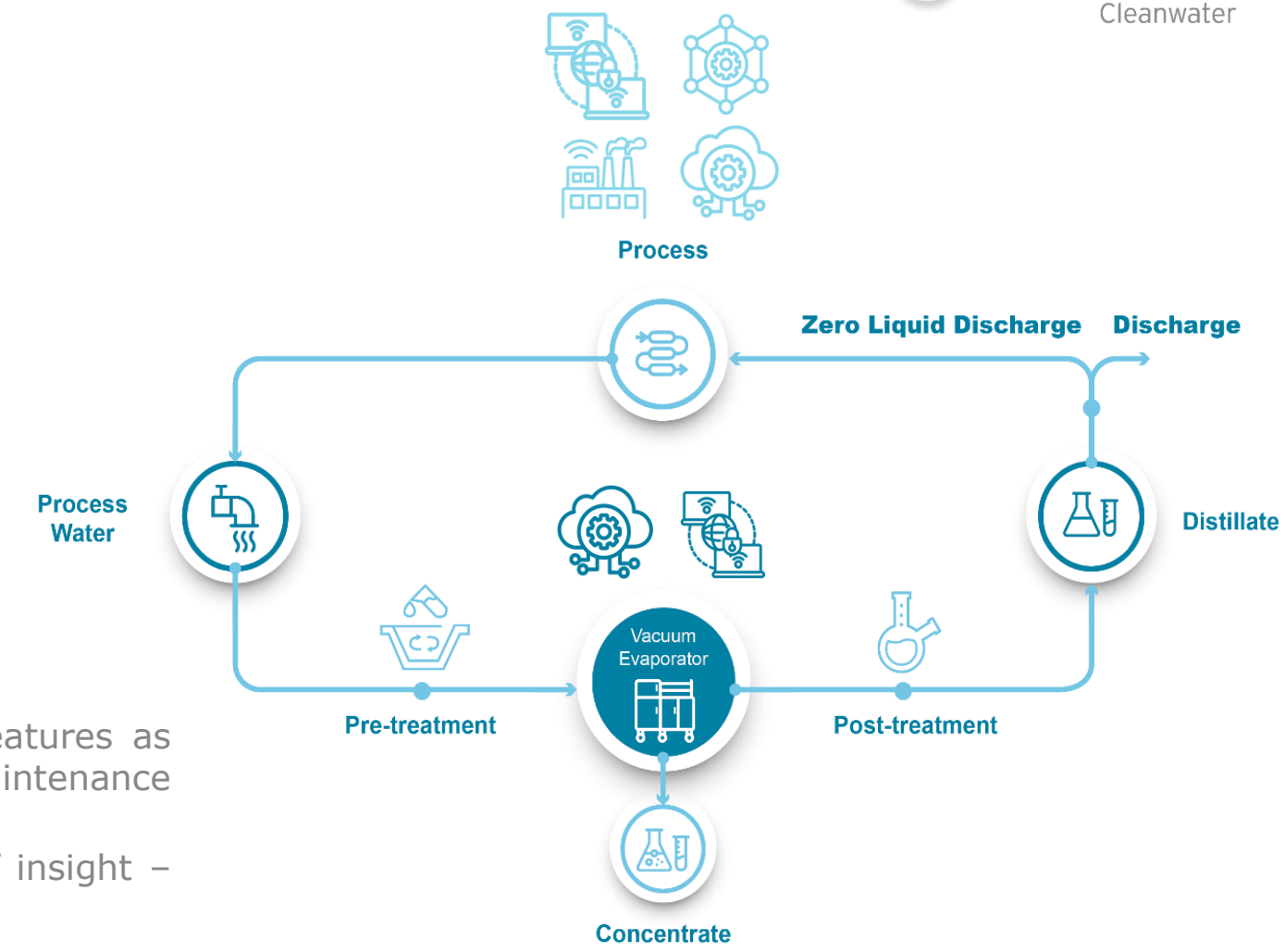
KLC Solutions

Based on 2.800 systems sold and a comprehensive experience with water treatment processes with the MVR at their core, KLC defines a suitable and efficient process chain best suited to the customer process water.

KLC 4.0

KLC 4.0 is the summary of all technical features as well as products and services for remote maintenance and control of KLC systems.

KLC 4.0 allows for new levels and depth of insight – worldwide including cloud-based offers.



Energy Balance Simple & MVR Evaporation

Energy need to heat 1m³ of water by 1K = 1.16 kWh/m³

Energy need to turn water into steam = 630 kWh/m³

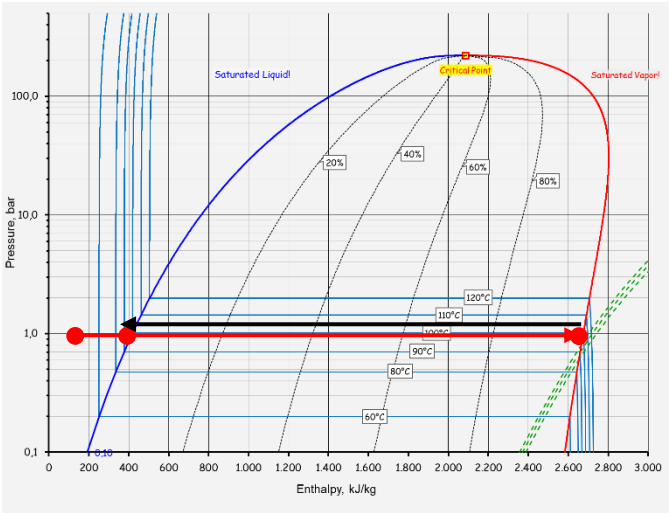
Atmospheric Evaporation

100 °C - 20 °C = 80 K
(boiling temp.) (ambient temp.)

= 80 K x 1,16 kWh/m³ K

= ~93 kWh/m³
+ 630 kWh/m³
(Evaporation energy escapes)
+ Losses!

= ~723 kWh/m³ just evaporation



Evaporation of the liquid at Ambient pressure:

- increasing first Temperature to 100°C — 93 kWh/m³
- Change of phase from liquid to Steam at 100°C — 630 kWh/m³
- No Energy recovery
- In order to recover Water a Cooling system has to be used for cooling — 700 kWh/m³

= ~1500 kWh/m³ Total (Heating-Evaporating-Cooling)

Energy Balance Simple & MVR Evaporation

Energy need to heat 1m³ of water by 1K = 1.16 kWh/m³

Energy need to turn water into steam = 630 kWh/m³
Energy recovered during condensation = 630 kWh/m³

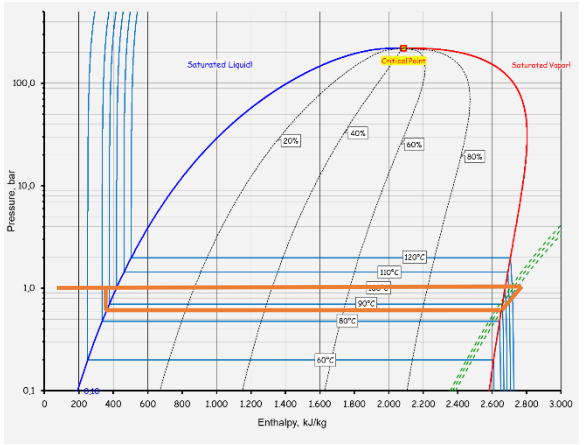
MVR - Vacuum-Evaporator

85 °C - 20 °C = 65 K
(boiling temp.) (waste water temp.)

= 65 K x 1,16 kWh/m³ K = 76 kWh/m3

Work of Blower to Keep system running
= 25-50 kWh/m³
+ initial heating energy)

= ~25-80 kWh/m³
(depends on water matrix)

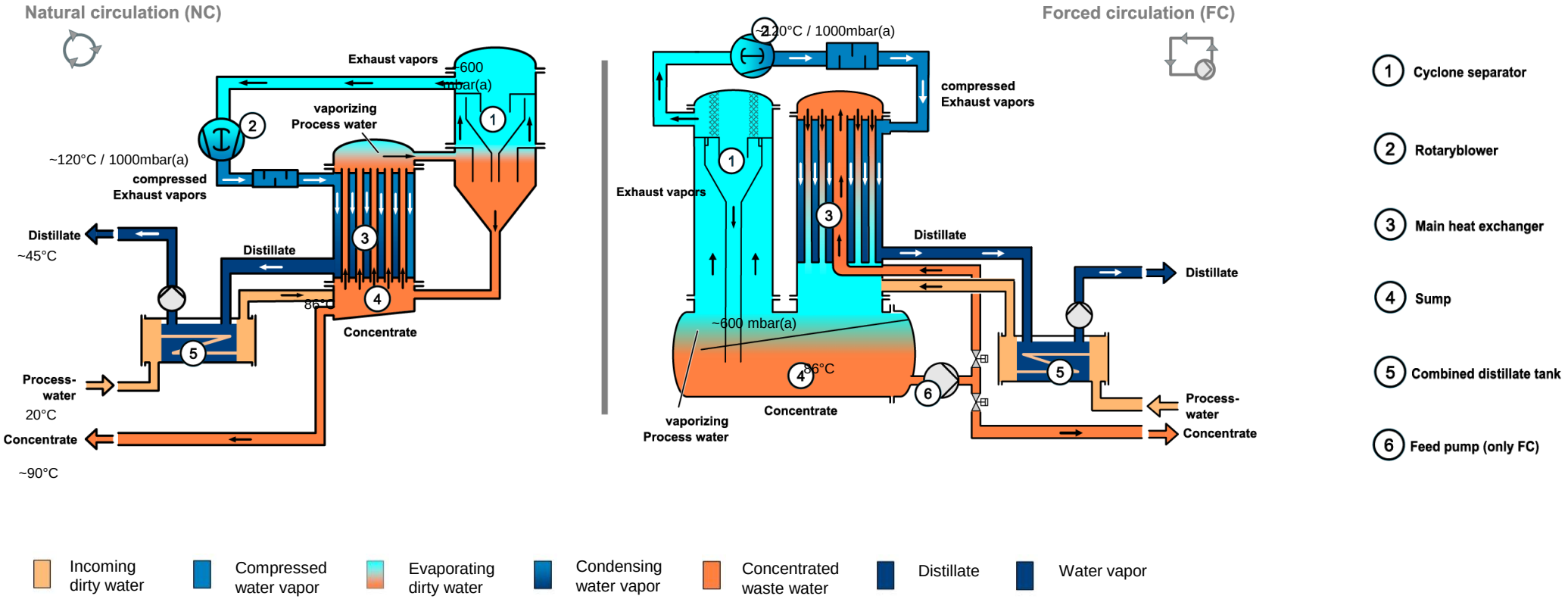


Evaporation of the liquid at lower pressure:

- increasing first Temperature to ~85°C — 76 kWh/m³
  (Just one time until system reach working temperature)
- Change of phase from liquid to Steam at ~85°C — Net 0 kWh/m³
  (Condensation energy is completely transferred to Evaporation chamber)
- Keeping the system running — 25-50 kWh/m³
  (Blower work: keep 2 chambers under different Pressures – Moving Steam – compressing Steam)
- Energy recovery From condensation and Distillate temperature

= ~25-80 kWh/m³ Total (Heating-Evaporating-Cooling)

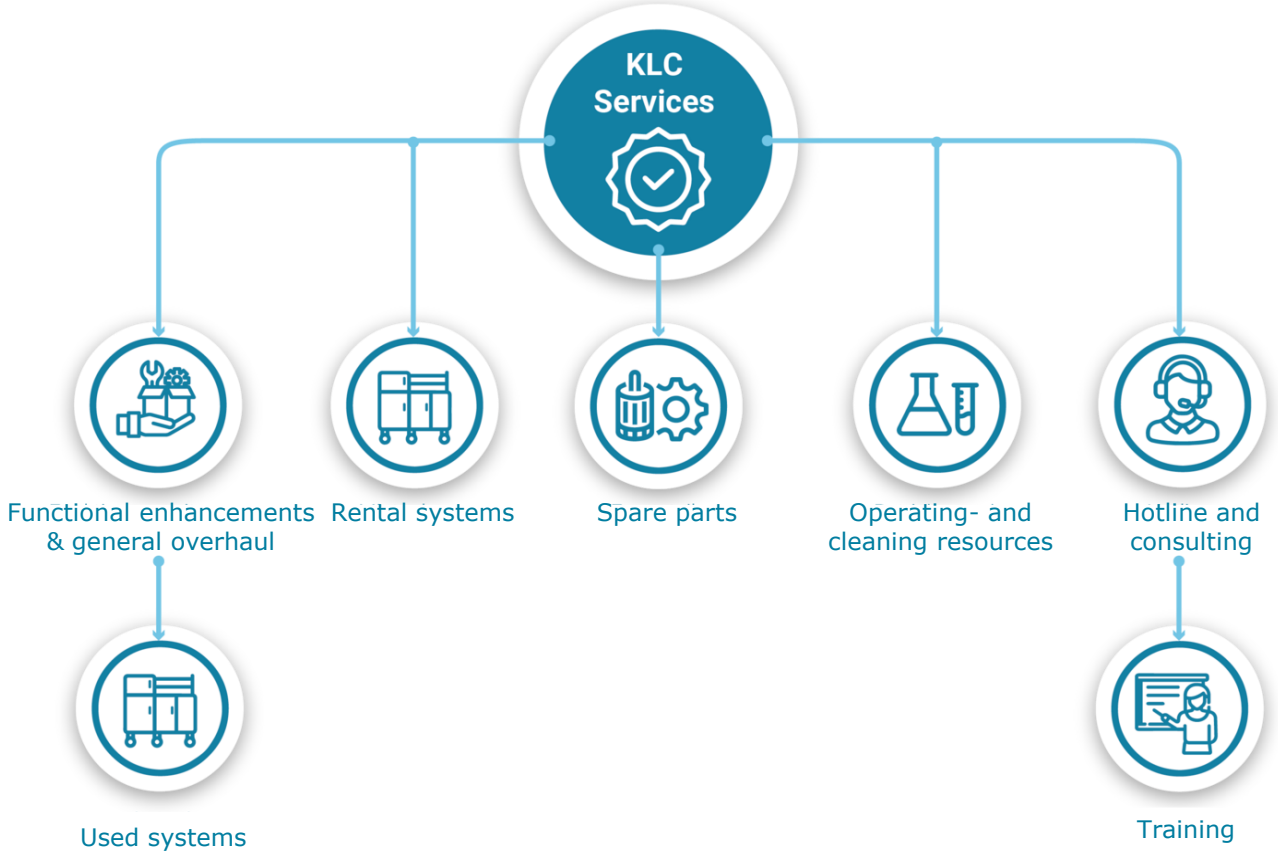
MASTER Line – the benchmark of MVR evaporators



KLC Life Cycle Services

KLC Life Cycle Services support customers and KLC systems in the field throughout the life of the installations.

The set of KLC products and services assures best operational results and the economic and technical long levity of the investment as well as all necessary adaptations to new requirements.



THANK YOU FOR YOUR ATTENTION!

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