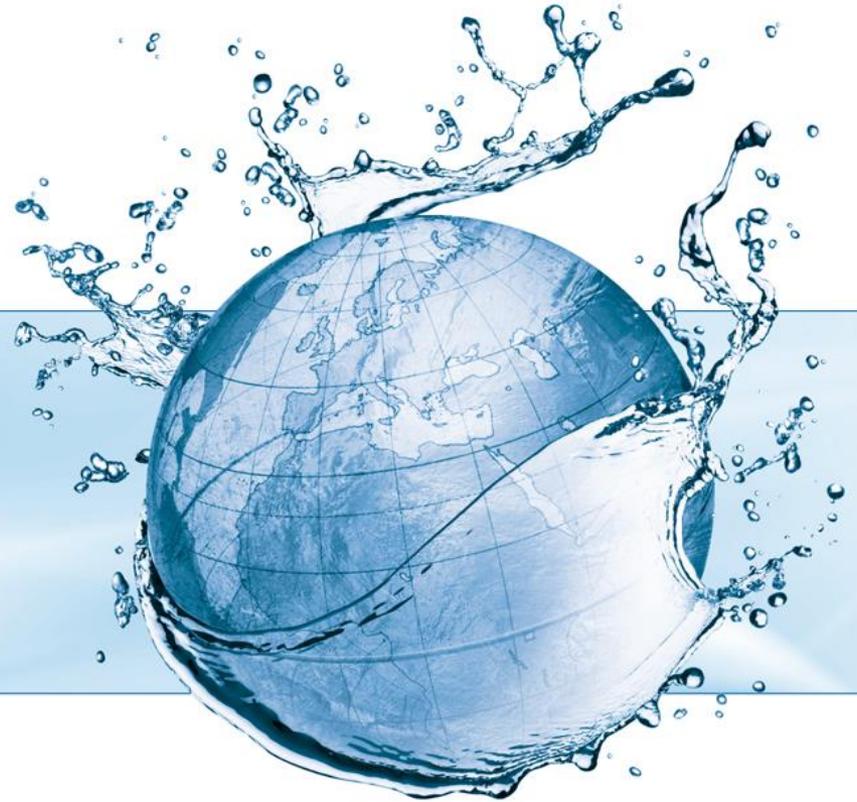


Technical Sales Representative Training



F. Audibert – R. Jombart
R. Duvillard – I. Francisco

RC export - May 2014



1 / EAUX DE PROCESS

- Stérilisation
- Dialyse
- Nettoyage
- Chaudières vapeur
- Préparation alimentaire
- Préparation pharmaceutique
- Rejets



2 / EAUX DE BASSINS

- Piscines collectives
- Bassins et fontaines d'ornement
- Balnéothérapie



3 / EAU DE CONSOMMATION HUMAINE

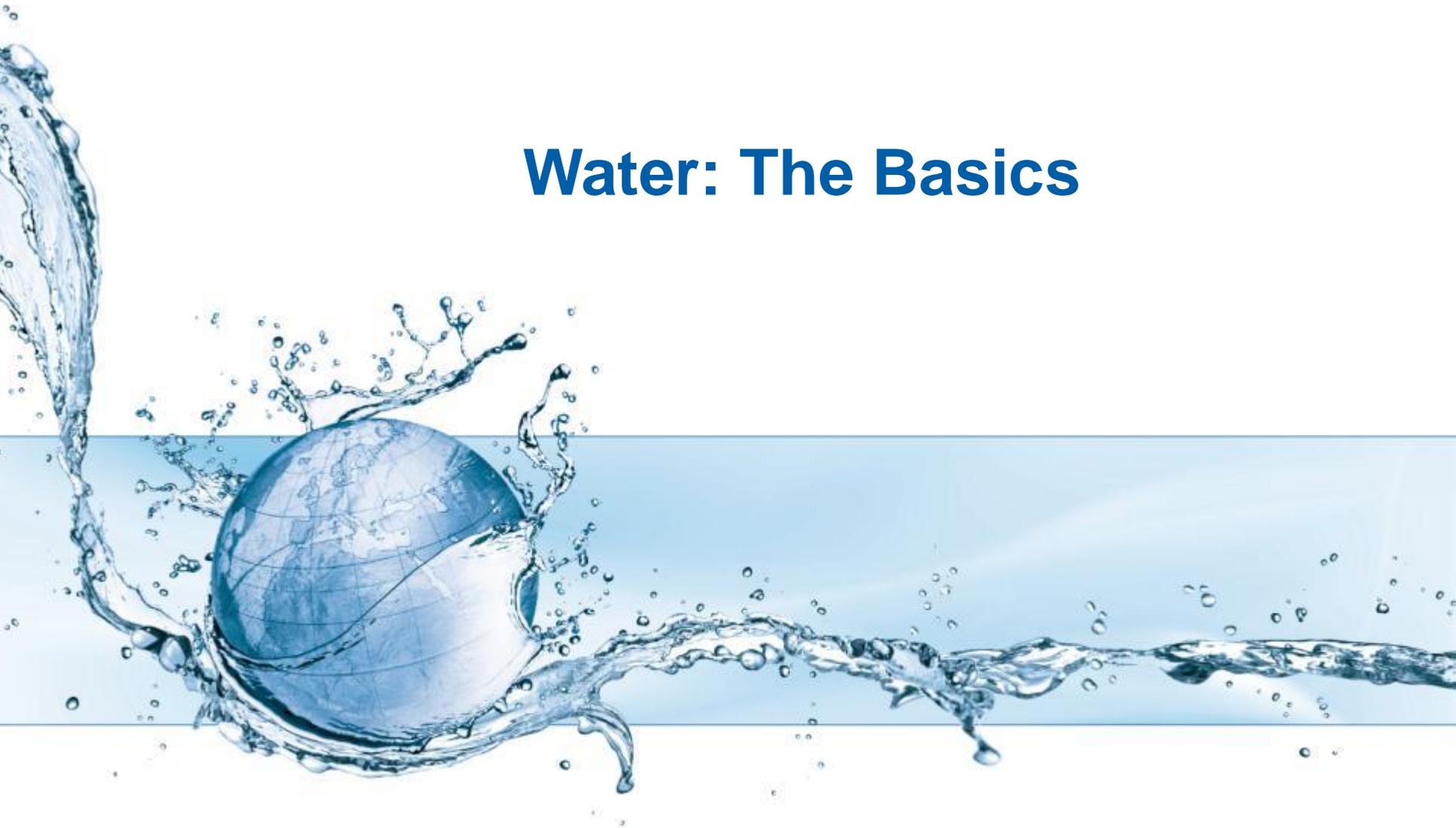
- Eau froide
- Eau chaude sanitaire



4 / EAU CLIMATIQUE CHAUD / FROID

- Chauffage
- Eau glacée
- Tours aéro-réfrigérantes
- Humidification
- Brumisation
- Drycooler

Water: The Basics

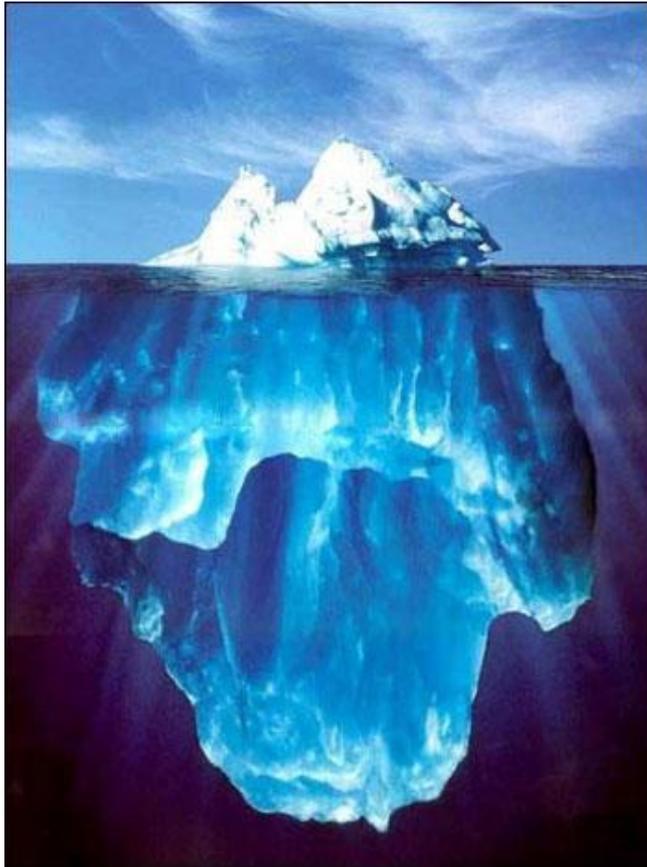


For You and Planet Blue.



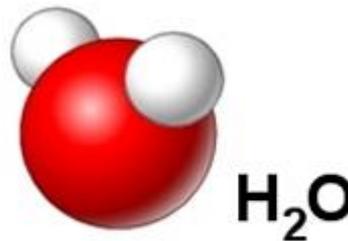
Composition of Water

For You and Planet Blue.



- **Living matter:**
 - bacteria, viruses
 - algae, fungi
- **Inert matter:**
 - suspended matter
 - colloidal particles
 - dissolved matter (gases, minerals, organic matter)

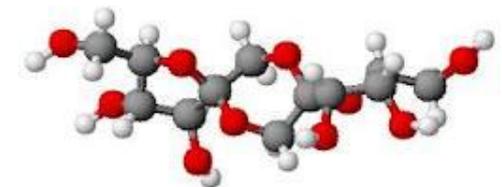
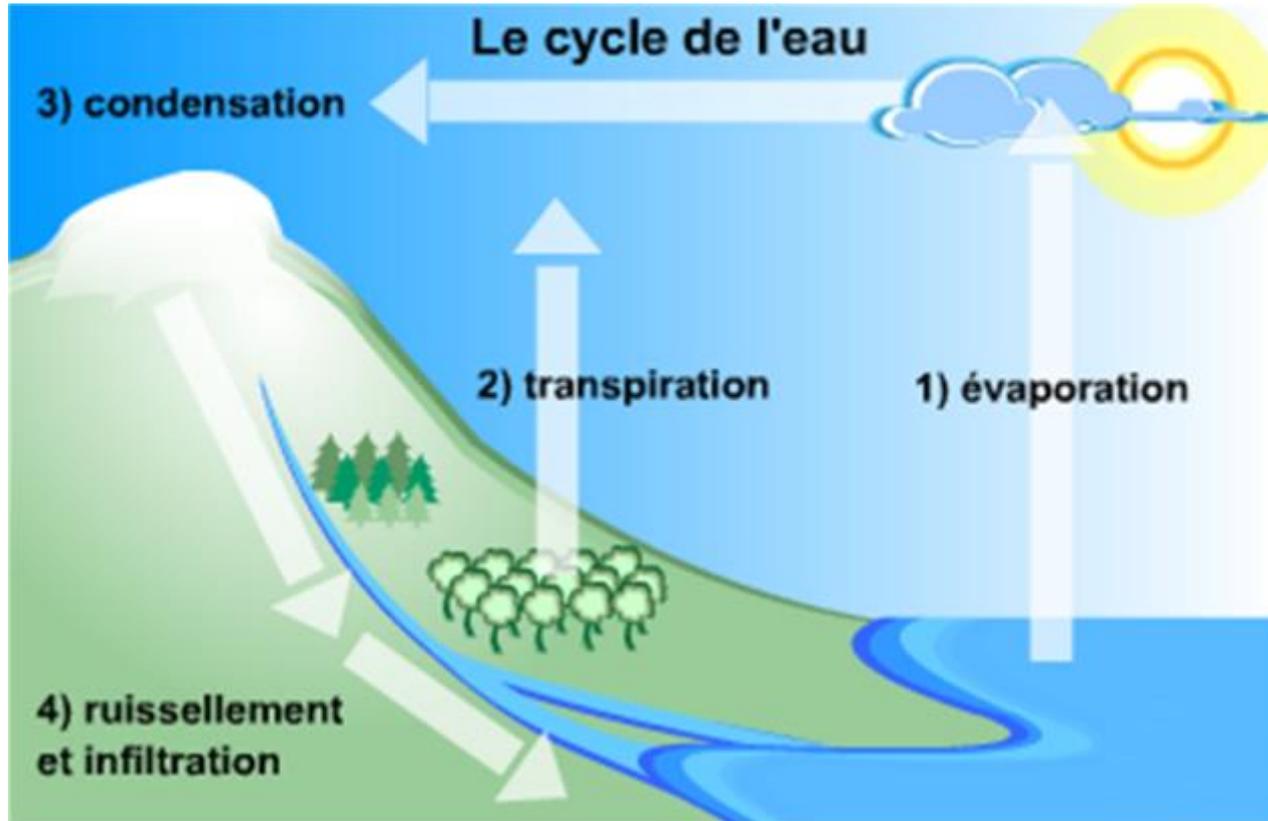
le saviez vous ?



**UNIVERSAL
SOLVENT**

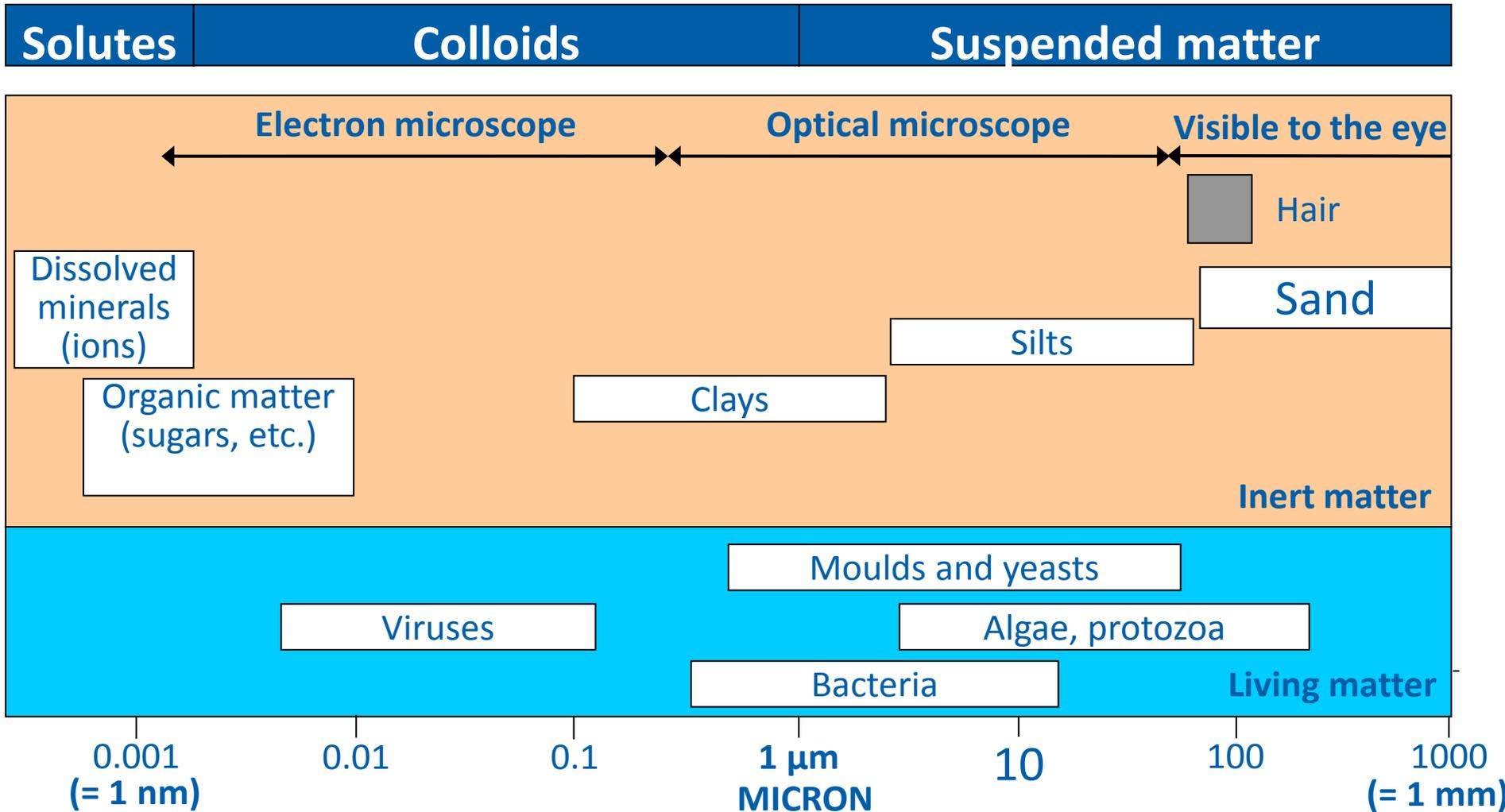
Composition of Water

For You and Planet Blue.



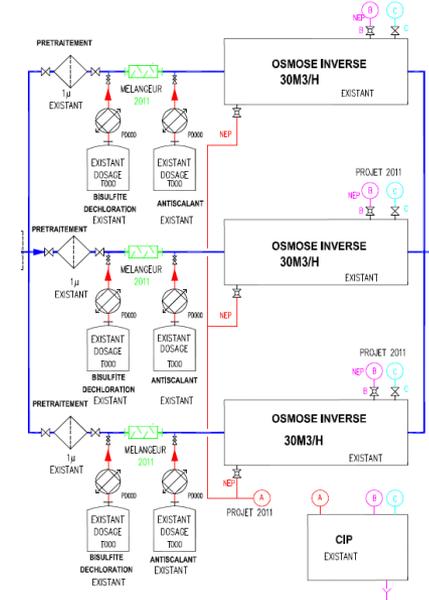
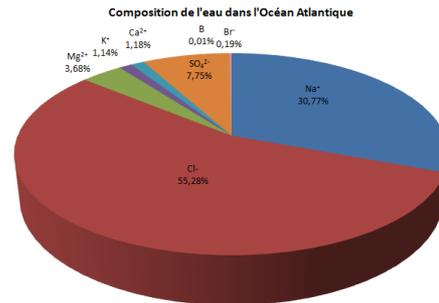
Composition of Water

For You and Planet Blue.



Water Treatment

For You and Planet Blue.



Customer requirements

Untreated water analysis

Water treatment solution

Water Analysis

For You and Planet Blue.



Analysis parameters

Physical

Temperature

Turbidity

Fouling index

Organoleptic characteristics

Mineralogical

Hardness (TH)

Alkalinity (TA / MOA)

Strong acid salts (SAS)

Alkali metals

Heavy metals

Silica

Physicochemical

pH

Conductivity

Microbiological

Moulds

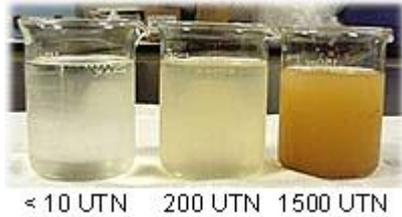
Fungi

Algae

Bacteria

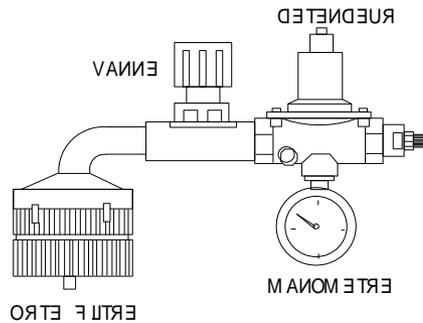
Viruses

Turbidity: level of transparency of water (unit = NTU).



Presence of **suspended matter**

Fouling index: **fouling capacity** of water

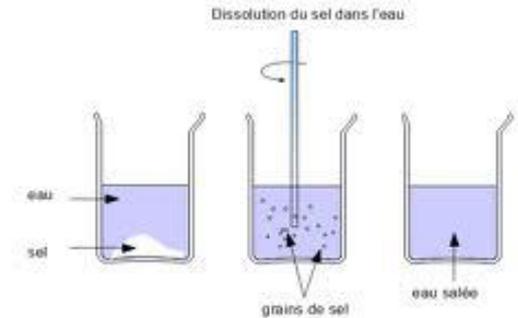


Presence of **colloids**

- Mineral salts dissolve in water and release **ions**.



Na⁺



- The main ions found in water:

CATIONS

- Calcium : Ca²⁺
- Magnesium : Mg²⁺
- Sodium : Na⁺
- Potassium : K⁺
- Iron : Fe²⁺, Fe³⁺
- Manganese : Mn²⁺
- Zinc : Zn²⁺
- Copper : Cu²⁺

TH

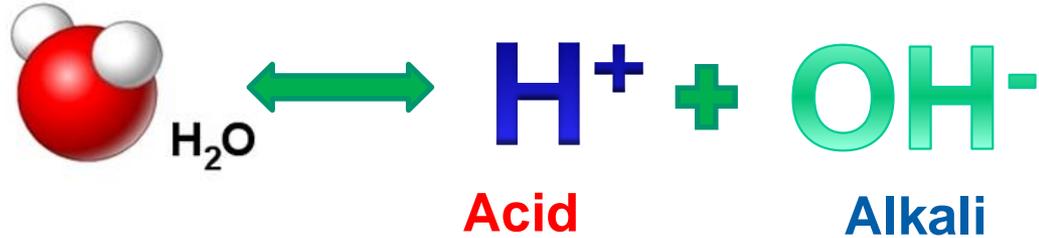
ANIONS

- Carbonates : CO₃²⁻
- Bicarbonates : HCO₃⁻
- Hydroxides : OH⁻
- Chlorides : Cl⁻
- Sulphates : SO₄²⁻
- Nitrates : NO₃⁻
- Phosphates : PO₄³⁻

MOA

SAS

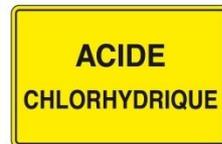
- **pH:** potential hydrogen



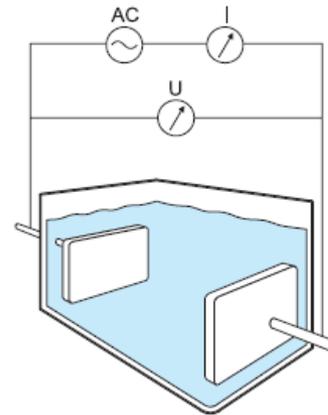
Alkaline
medium

neutral pH = 7

Acid medium



- Conductivity**



Minerality (mg/L)

demineralized water

"charged water"



Conductivity ($\mu\text{S}/\text{cm}$)



Conductivity



Resistivity

Conductivity: $1 \text{ S}/\text{cm} = 1\,000 \text{ mS}/\text{cm} = 1\,000\,000 \mu\text{S}/\text{cm}$

Resistivity: $1 \text{ M}\Omega.\text{cm} = 1\,000 \text{ k}\Omega.\text{cm} = 1\,000\,000 \Omega.\text{cm}$

$1 \mu\text{S}/\text{cm} \leftrightarrow 1 \text{ M}\Omega.\text{cm}$

$1 \text{ mS}/\text{cm} \leftrightarrow 1 \text{ k}\Omega.\text{cm}$

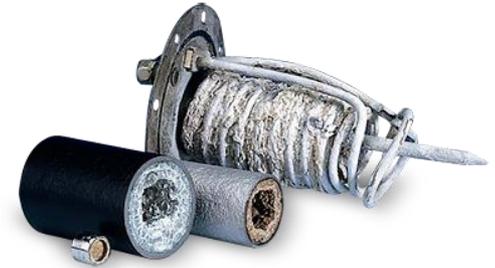
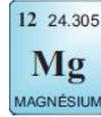
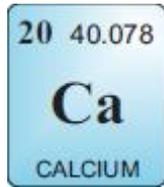
$1 \text{ S}/\text{cm} \leftrightarrow 1 \Omega.\text{cm}$

Water Analysis

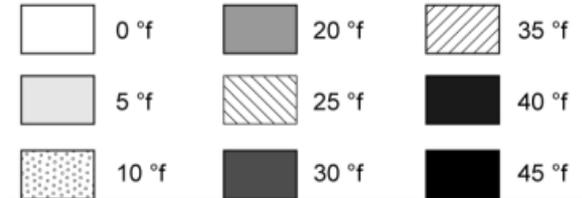
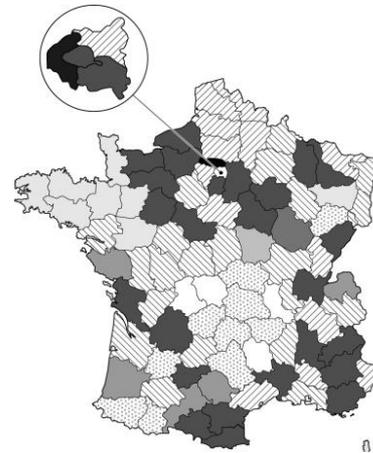
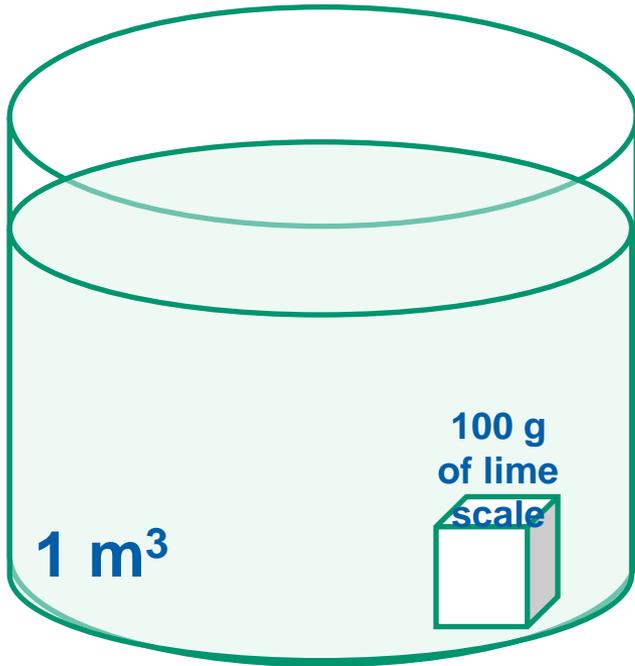
For You and Planet Blue.



- Hardness (TH):**



10° F



0	6	15	30	∞
Softened water	Little scale-forming water	hard water	very hard water	
↓	↓	↓	↓	
"aggressive"	water "ideal" for ≠ applications	"calcareous" water	rapidly scale-	

- **Scale formation**

Combination of factors: TH / MOA / Temperature / pH

Carbonate + Calcium

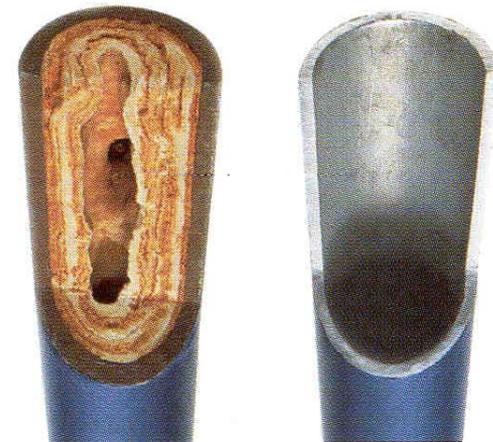


Solid substance which settles
= **lime scale**

T° and/or **pH** increases

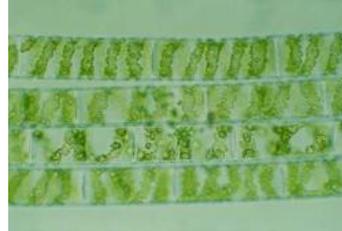


Lime scale deposit increases



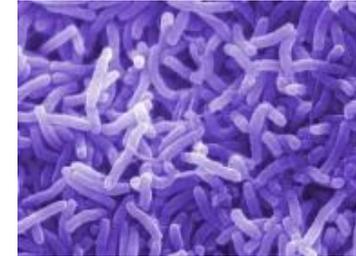
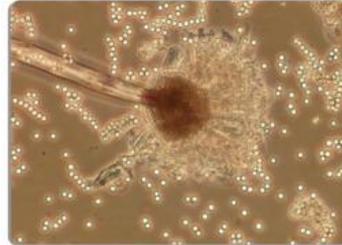
- **Micro-organisms**

→ **Diversity**

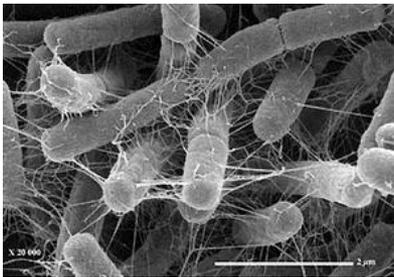


→ **Causes**

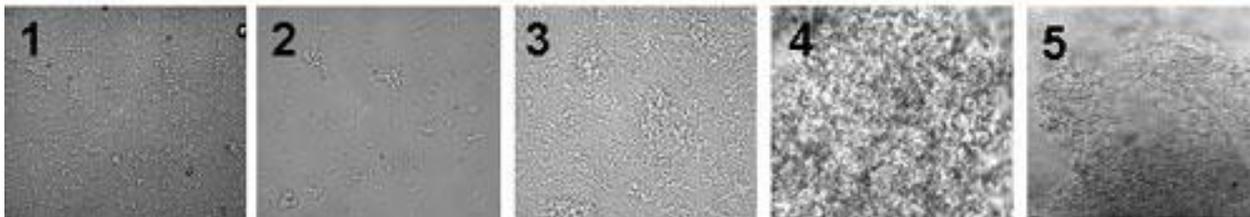
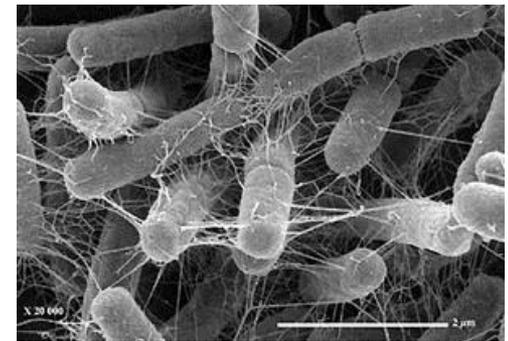
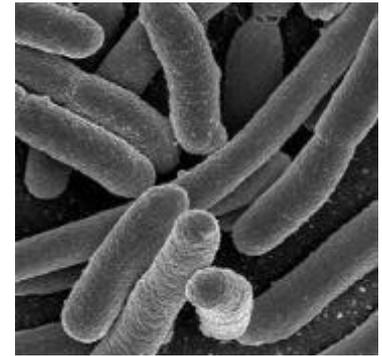
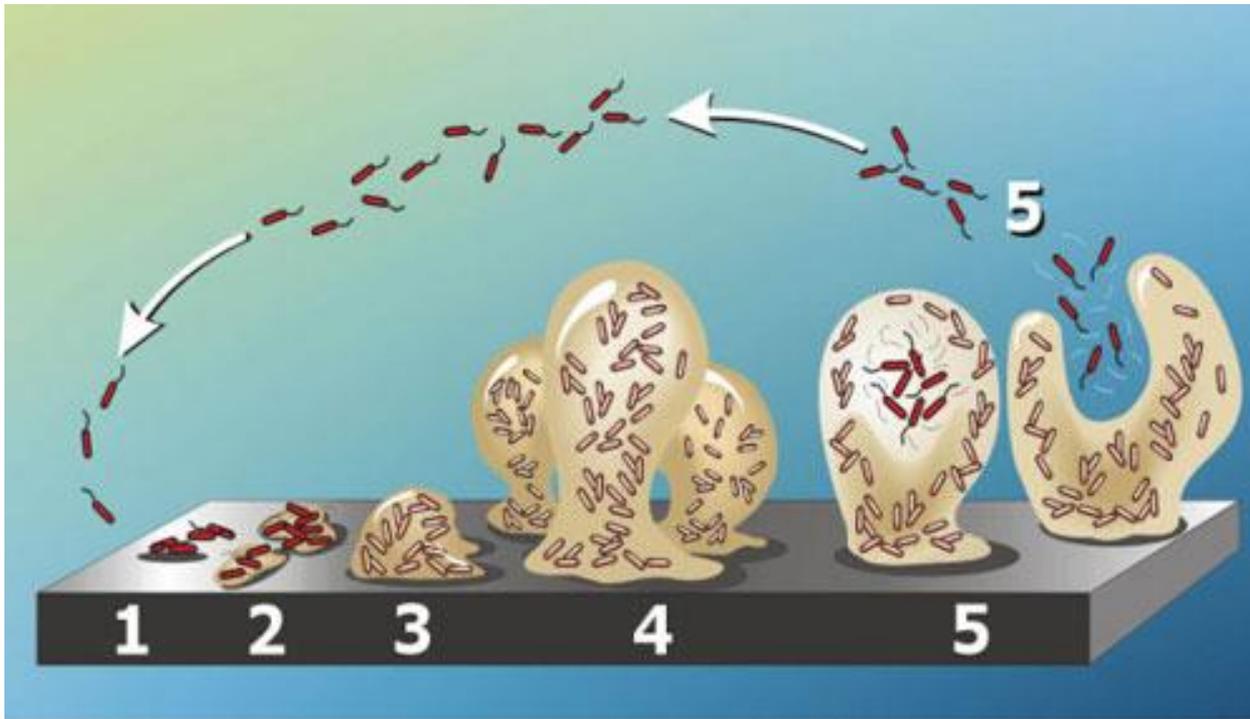
→ **Proliferation**



→ **Wide variety of consequences**



- **Formation of the biofilm**





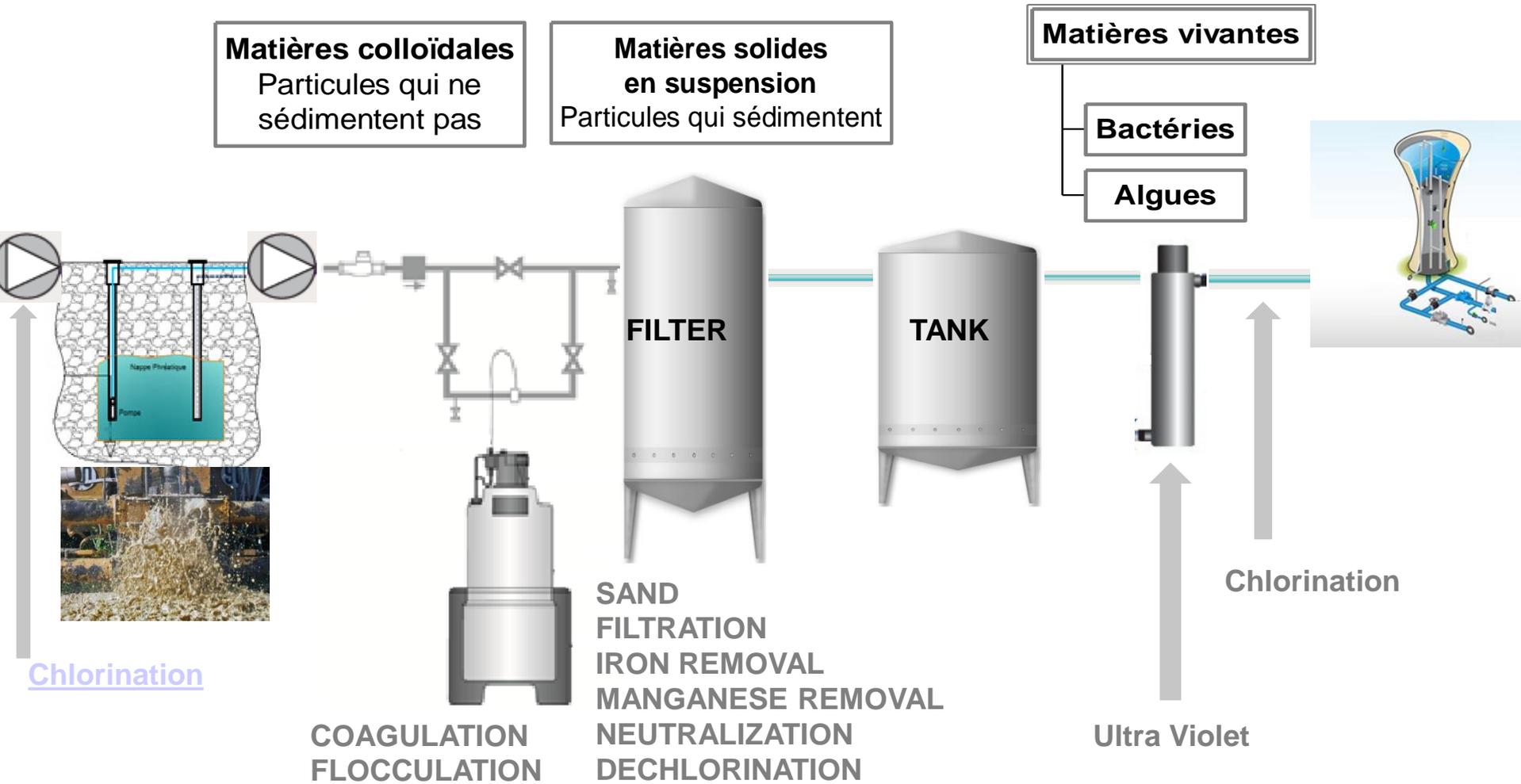
- Well water



- Tap water

Well Water

For You and Planet Blue.



Clarification des eaux de surface, de forage

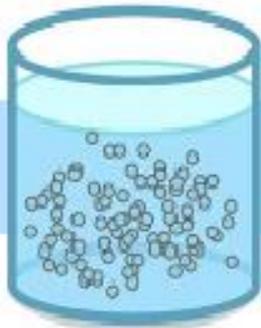
For You and Planet Blue.



Colloids

Turbidity
Silt Density Index

Heavy Metals

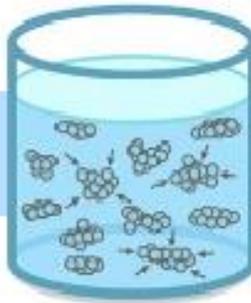


Surface and ground water

Non-efficient
Filters

Coagulation

« micro flocs »

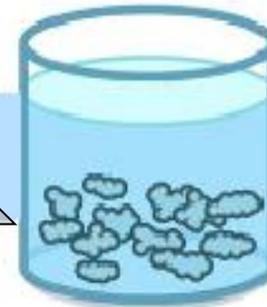


Sand Filtration

Addition of **coagulant**

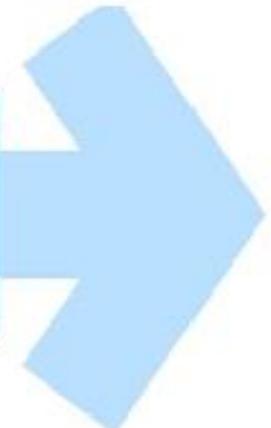
Flocculation

« Large Flocs »



Settling

Addition of **Floculant**



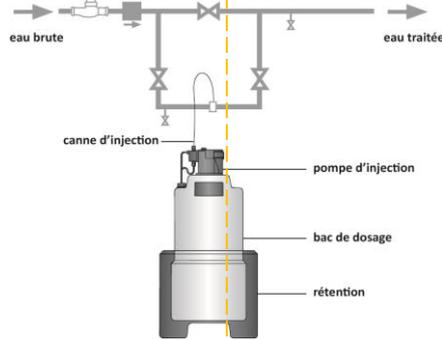
BWT range of coagulants / Flocculants

For You and Planet Blue.



Mineral coagulants

- BWT CM 114** Ferrous chloride
- BWT CM 217** Aluminium salts
- BWT CM 208** Aluminium salts



Dosages: 1 - 20 ppm (ground water)
15 – 250 ppm (surface water)

Critical parameters :

pH : 6,5 – 8,5 aluminium salts
5,5 – 7,5 ferrous chloride

High-speed stirring

Contact time: 1 à 3 minutes vs T°

Anionic Flocculants

Powder form	Molecular weight	Ionic load
BWT SN 130 F	++	+
BWT SN 330 F	+++	++
BWT SN 530 F	+++	+++



Dosages: 1 à 5 ppm (surface water)

Critical Parameters:

pH : 4,5 à 10

Moderate stirring

Contact Time : 3 to 5 minutes vs T°

Laboratory trial



Determine the most appropriate coagulant / flocculant combination



Etape Indispensable

1. Store **untreated water samples**
2. Test the products in place = **reference**
3. Test **BWT equivalent** products at the same dosages
4. **Vary the parameters** (pH before coagulation, time to effect, very different dosages etc.)
5. Compare the tests by **observations**



Good coagulation criteria:

Small visible flocs, sedimentation started, clear supernatant

Good flocculation criteria:

Size of the flocs, rapid sedimentation rate, mechanical stability

What you need:

EQUIPMENT:

- 1 jar-test kit (Flocculator with its four 1L beakers)
- Syringes (1-5-10 ml) and micropipette with tips (reagent injection)
- Turbidimeter

BWT COAGULANT – FLOCCULANTS SAMPLES

- BWT CM 114, BWT CM 208, BWT CM 217
- BWT SN 130 F, BWT SN 330 F, BWT SN 530 F

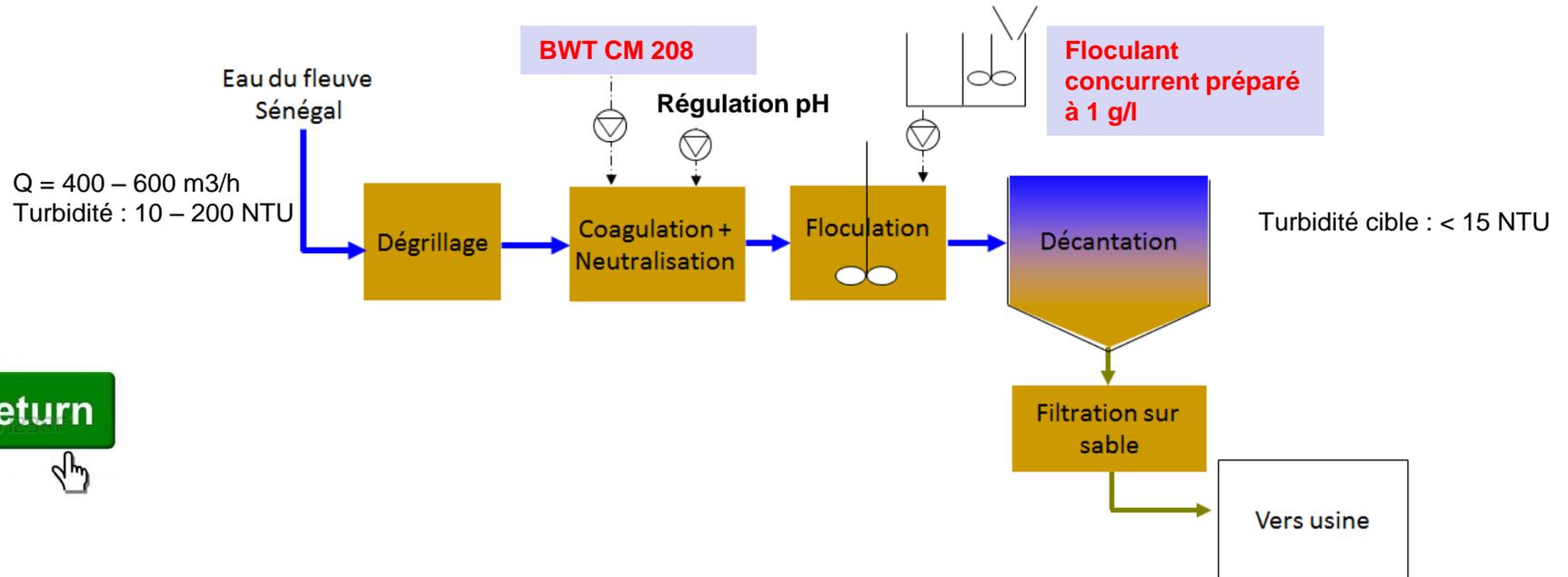
BWT TEST PROTOCOLS



For You and Planet Blue.



Country: Sénégal
 Agent: P.M.I. (Rodolphe Bassène)
 Customer Activity: Sugar Industry



Return



Dosages	Débit à traiter	Temps de fonctionnement	Consommation annuelle	Chiffre d'affaire
BWT CM 208 : 5 – 25 ppm	400 – 600 m ³ /h	180 jours / an 24h / 24	23 Tonnes	28 k€

1 > Sand filter:

Why FILTER ON SAND?

- To remove the suspended matter in the water

ADVANTAGE

- Depth filtration
- Large volume of water treated
- Set filtration threshold, around 50 μm ,
- The filtration threshold is fined down as the filter clogs (pressure loss increases)
- The sand is washable, no consumable

Rate of flow:

- Depends on water quality
- Dirty water = slow rate 4 m/h
- Clean water = fast rate 30 m/h

Calculation

- Desired flow rate m³/h
- Rate according to water quality m/h
- (Desired flow rate/rate according to water quality) = Filter surface area in m²
- $S = \pi r^2$ therefore $r = \sqrt{S/\pi}$
- Retains suspended matter: 2 kg/sand
// 4.5 kg/ sandhydro
- sand = surface filtration,
- Hydroanthracite = depth filtration.

SAND FILTRATION:

For You and Planet Blue.



A standard and made to measure range



0.6 to 1.6 m³/h
1000 filter



5 m³/h
1500 filter



2 to 6 m³/h
2000 filter
composite



3 to 12
m³/h
steel 2000
filter



4 to 140
m³/h
FV filter

Why remove iron or manganese?

WHO drinking water standard:

Iron: 0.2 ppm

Mn= 0.05 ppm

> **FV filter:**

- Iron oxidation: air (oxidation tower) or bleach
- washing (air + water required) for washing + filter bed for more effective distribution in the filtration load
- Manganese oxidation: potassium permanganate
- If low iron levels, possibility of using a 2000 filter, with frequent washing

Why neutralize?

Objective:
pH 6.5 to 8.5

➤ 2000 or FV filter:

- ❑ neutralize aggressive water (containing CO₂).
- ❑ TH & MOA increased



Why remove chlorine?

For specific process, osmosis, etc.

2000 or FV filter:

- Used to retain OM or chlorine
- .OM: adsorption – Cl₂: catalysis
- Min. layer height: 800 mm
- Rate of flow: 5 to 15 m/h
- Washing: 20 m/h

NB: 1 g activated carbon = 800 m²

[Return](#)



Why chlorinate?



Objective: remove bacteria / Fe and Mg oxidation

> **PROBOX** range

Temperature (°C, °K or °F)

pH

Redox

Chlorine

Chlorine dioxide

Bromine

Ozone

Oxygen

Hydrogen peroxide

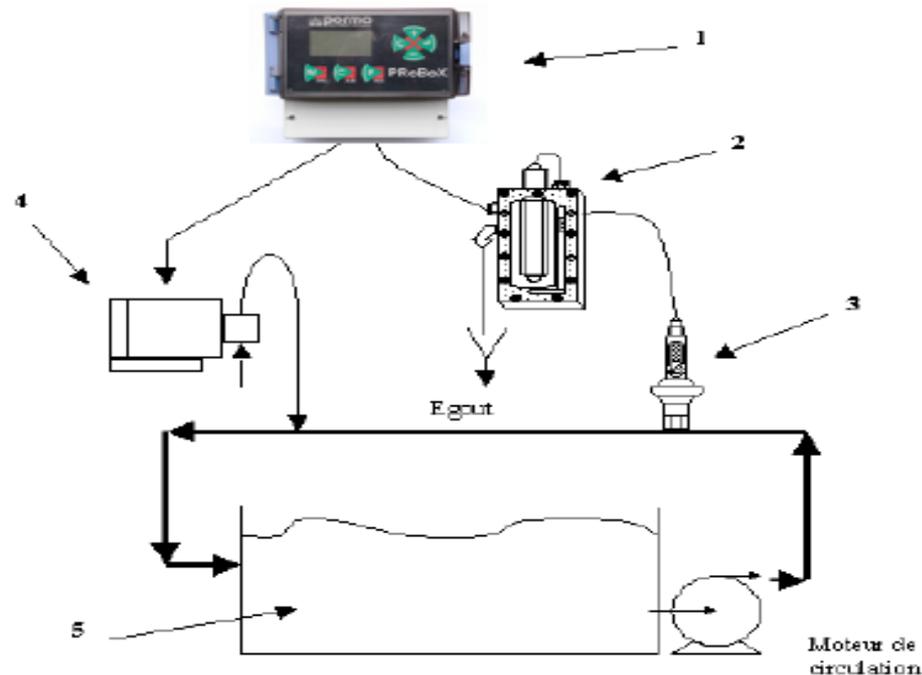
Peracetic acid

> Loop chlorination on tank

The most effective

Le système de mesure et de régulation complet se compose comme suit :

- ✓ La centrale d'analyse(s) et de régulation(s) PROBOX® (rep : 1)
- ✓ La chambre de mesure(s) et son (ses) capteur (s) (Rep : 2)
- ✓ La canne d'échantillon ou de prélèvement (Rep : 3)
- ✓ L'élément de dosage (pompe doseuse dans notre exemple) (Rep : 4)
- ✓ Bassin ou cuve à traiter (Rep : 5)



Tap Water

For You and Planet Blue.



T
R
E
A
T
M
E
N
T

Cold / hot domestic water supply

Closed system

Air conditioning system

Cooling tower

Steam generation

What do we treat essentially?

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection



2 > Closed circuit

- SoluTECH conditioning
- Ecofildeb EVOLUTION filter
- HW / IW type layout



3 > Air conditioning

- Atomization
- Spraying



4 > Cooling tower

- Conditioning



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection



Why FILTER?

- To protect the building's equipment from the sand



- To protect the softening water treatment

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

> Cristal range

- Flow rate: 3.5 to 32 m³/h
- Screen filter
- Nominal filtration rating: 90 microns



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

> Manual / Automatic Flash range

- Flow rate: 5 to 100 m³/h
- Permanent screen filter
- Nominal filtration rating: 90 microns
- Backwashing
- :
- Little-restrictive maintenance
- No consumables required



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection



Why SOFTEN?

- To protect the pipes



- To protect the heat exchanger systems



- To protect the valves, taps, etc.



1 > Cold / hot domestic water supply

- Filtration
- Softening**
- Disinfection



Role of a softener

- To remove calcium and magnesium in calcium carbonate or magnesium carbonate fully or partially
- Calcium and magnesium is measured by TH in °f
- 1 °f = 10 mg/l CaCO_3
- 1 °f = 4 mg/l Ca^{2+}
- 1°f = 2.1 mg/l Mg^{2+}

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection



Softener proportioning

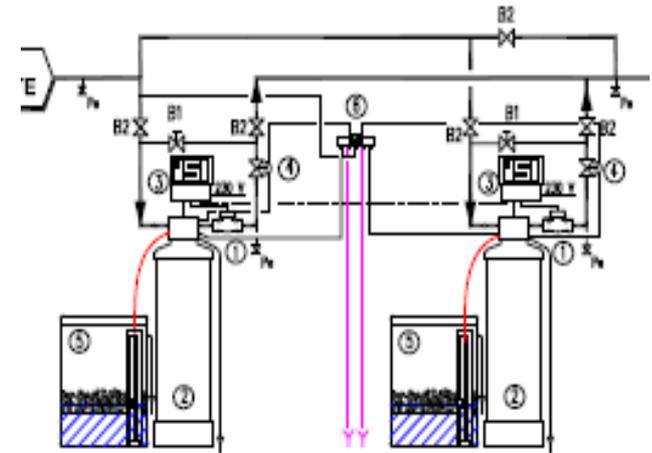
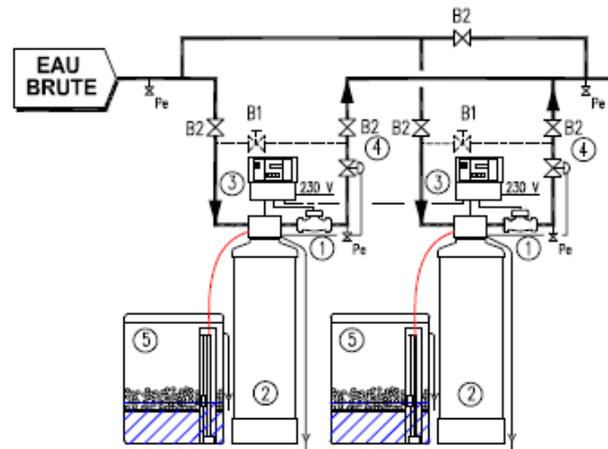
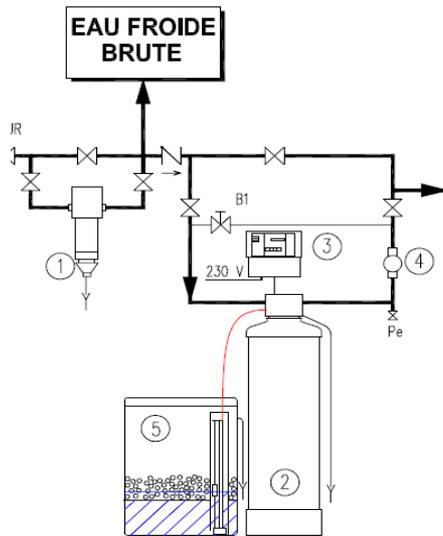
- Instant flow rate: softener valve diameter
Litres per second or more often m³/h
Parameter given per feed line diameter, flow rate given by the customer, number of housings
- Resin capacity: volume of softener resin
between regenerations
m³/day or m³/as required (softener cycle)
- Softener pressure loss must not exceed 10 mCE,
equivalent to 1 bar.
- Exchange capacity is 5.5°f per litre of resin. One litre of
resin removes 5.5°f TH

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection



STANDARD PLANT



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

Volume of resin in softener:

$$\text{Daily consumption} * \frac{T_{\text{Heau de ville}} - T_{\text{Heau adoucie}}}{\text{Pouvoir d'échange}}$$

Softener outlet peak flow rate:

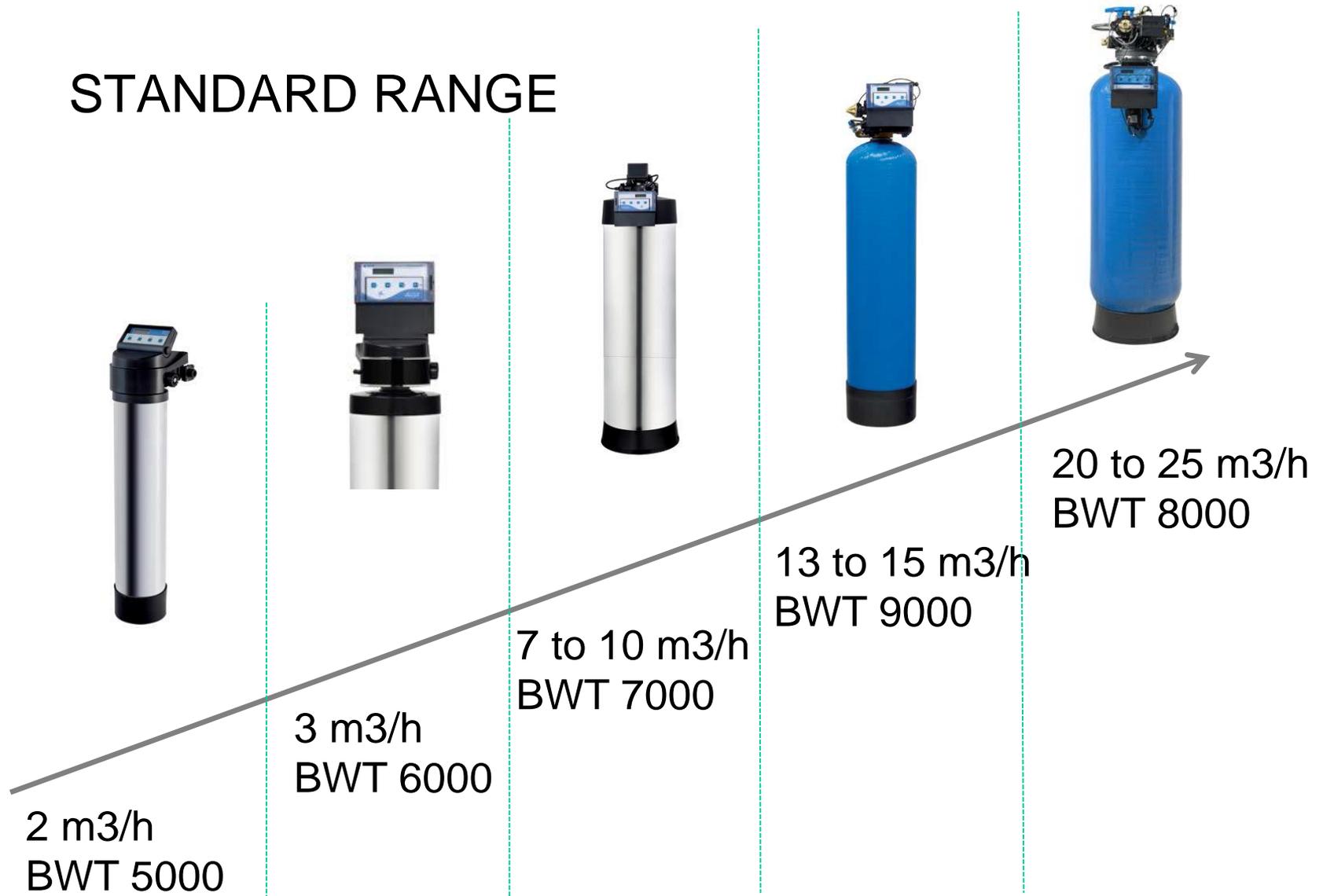
$$\text{Débit}_{\text{eau remitigée}} * \frac{T_{\text{Heau de ville}} - T_{\text{Heau adoucie}}}{T_{\text{Heau de ville}}}$$

Daily salt consumption:

$$\text{Volume of resin used by day} * 125 \text{ g/l}$$

BWT PERMO SOFTENER:

STANDARD RANGE



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

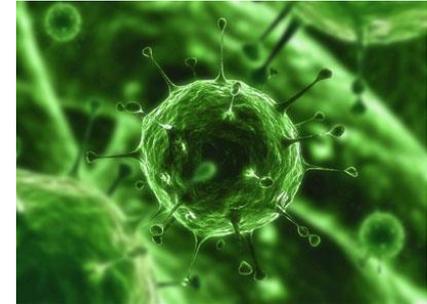
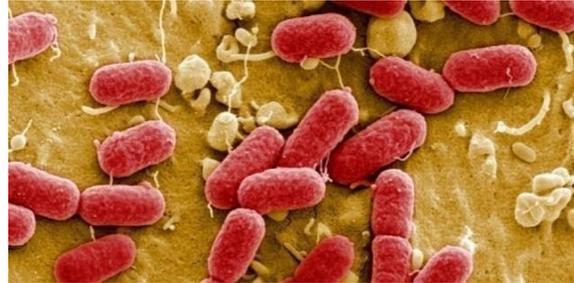


Why DISINFECT?

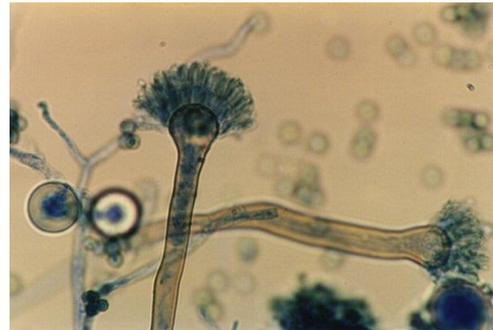
- To prevent transmission of diseases ("pathogenic" germs) such as legionnaire's disease.
- Clogging (biofilm).
- Reduced heat exchanger effectiveness.
- Activation of metal corrosion by certain bacteria.

Matières vivantes

Bactéries/Virus



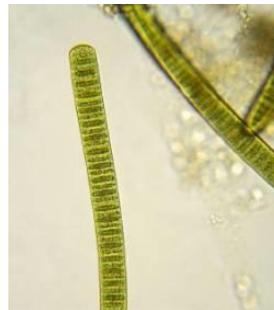
**Moisissures
Micro champignons**



**Vers
Paraméties
Amibes**



Algues



**Poissons
Mollusques**

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection**

Various disinfection methods

- Chemical:

Oxidants: **chlorines**, bromines, ozone, hydrogen peroxide, **chlorine dioxide**, etc.

Non-oxidizing agents: quaternary ammonium compound

- Physical:

Rise in water temperature

Steam: can sterilisation

UV

filtration

DISINFECTION

For You and Planet Blue.



ECOREDOX /
MULTICONTROL



ECOBIX ECS



BWT BIOX



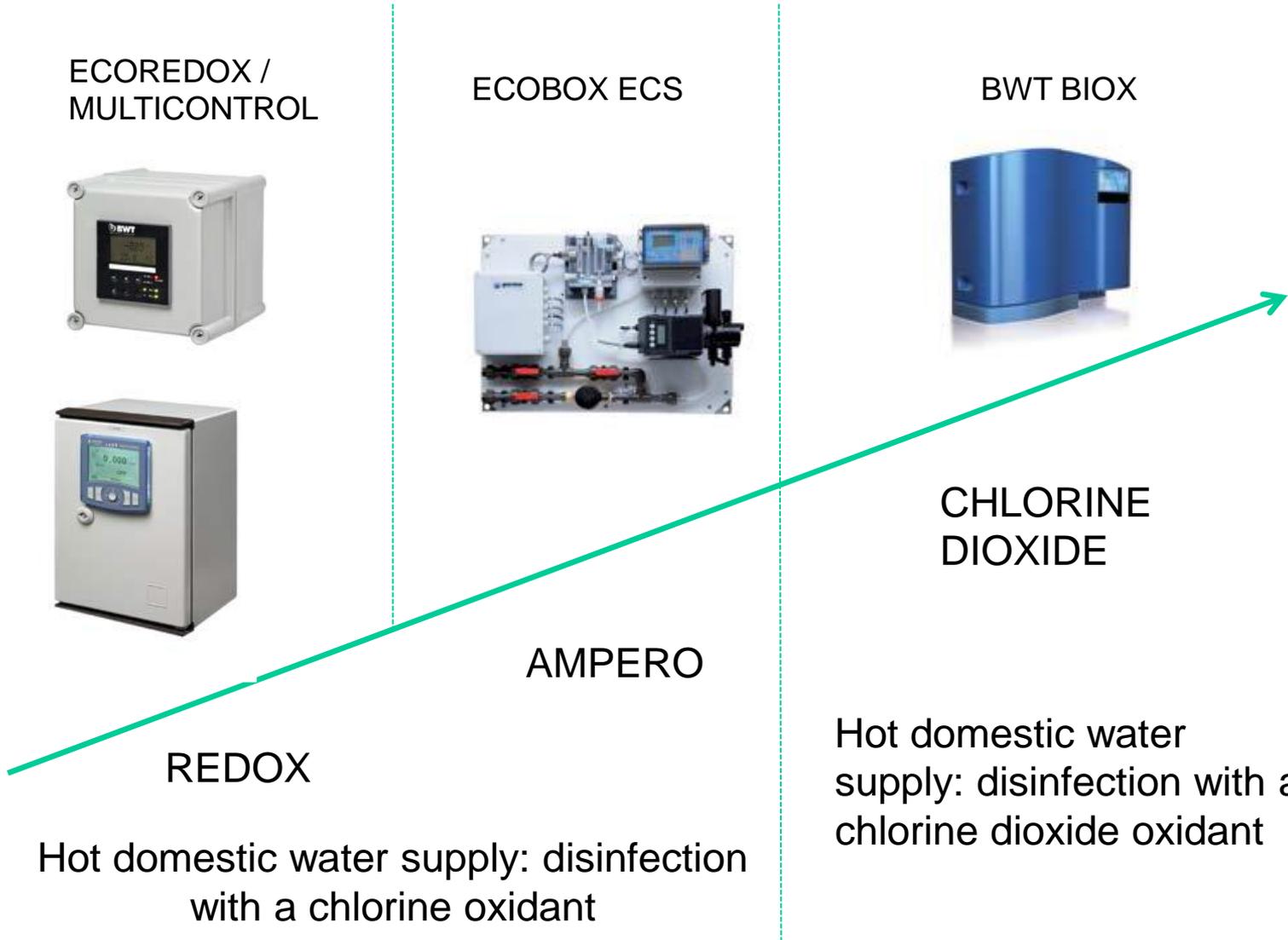
REDOX

Hot domestic water supply: disinfection
with a chlorine oxidant

AMPERO

CHLORINE
DIOXIDE

Hot domestic water
supply: disinfection with a
chlorine dioxide oxidant



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

Sodium hypochlorite disinfection method

- Injection of chlorine regulated between 0.8 and 1 mg/l
- Intermittent or continuous injection (frequency to be set according to bacteriological analyses)
- Automatic apparatus

BWT commercial solutions (stabilised sodium hypochlorite):

BWT CS-3004 (13.5%)

BWT DW-3002 (3.5%)

BEST BEFORE: 6 MONTHS!

1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection**

> Range for ECS: PERMO ECOBOX ECS

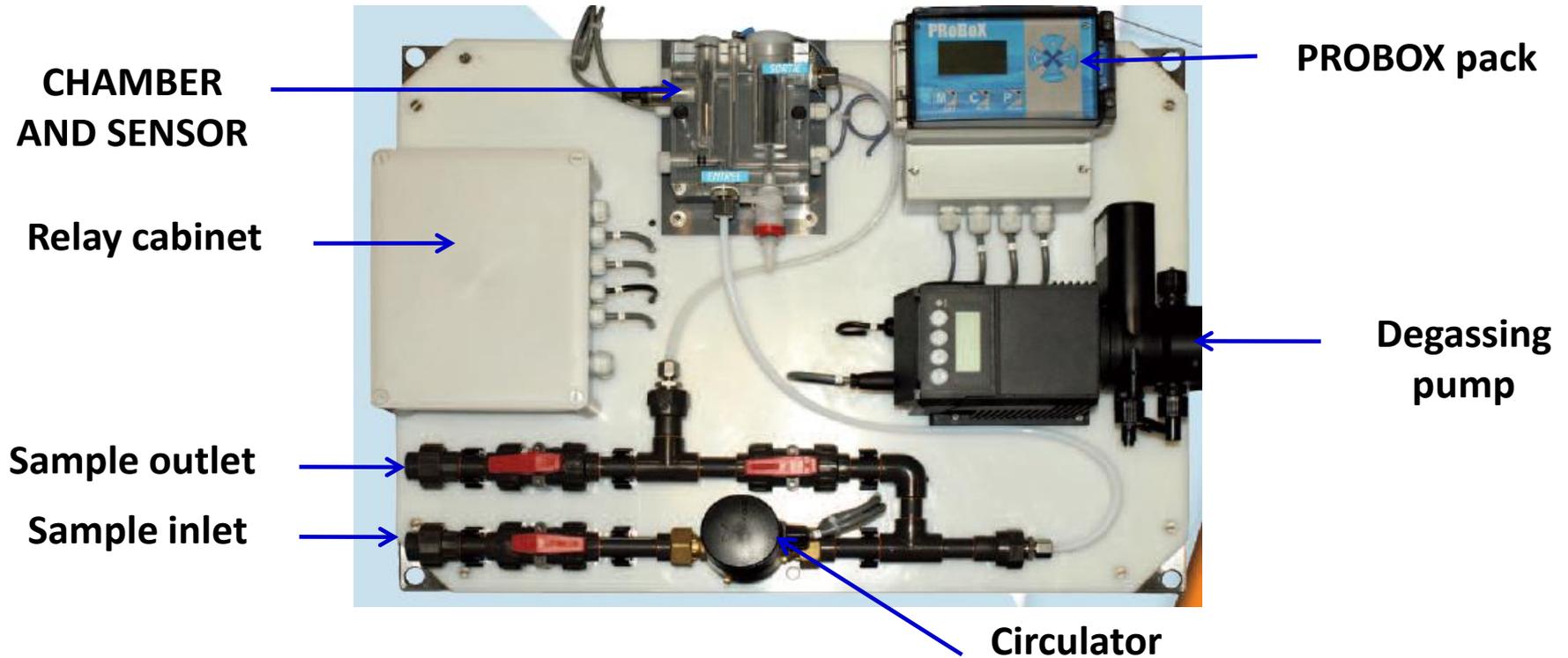
- Next-generation system for combating Legionella water supply systems
- INNOVATION: Amperometric sensor and analysis chamber resistant to 70° C; avoids discharge of water to the drains
- 0-10 ppm amperometric sensor
- Turnover sub loop integrated on the panel with circulator



1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

> Range for ECS: PERMO ECOBOX ECS

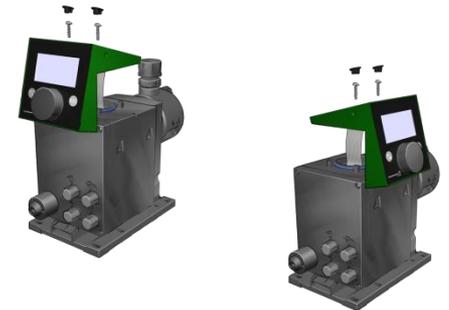


1 > Cold / hot domestic water supply

- Filtration
- Softening
- Disinfection

> DDA C chlorine pump

- Adaptable assembly and use
- Positionable display
- Feed pump control at 4-20 mA
- RecoLarge graphical display
- Over 25 languages
- Click wheel to access menu
- Intuitive menu structure



Return



2 > Closed Circuit

What is it for?

The water circulates within a fully closed circuit. Water loss is minimal. No contact between the water and the air.



Two types of circuits:

- Cooling system (iced water – cold water) – industrial and collective refrigeration
- Heating system (hot water)



cooling system applications:

Collective – public buildings / hospitals:

Air conditioning system

FOOD industry:

beer or wine production, pasteurisation, blowers, T° C control, must and wort cooling, etc.

CHEMICAL / PETROCHEMICAL / PHARMACEUTICAL

industries:

Solvent extraction, refining process, reactor cooling, etc.

MEDICAL fields:

Medical imaging, blood and organ processing and storage, MRI, operating theatre air conditioning systems, etc.

FOUNDRY industries:

Tool and mould cooling, etc.

PLASTICS industry:

Thermoforming, mould cooling, press hydraulics cooling, extrusion, PET blowing, etc.

PRINTING industry:

Cooling of print drums and impression cylinders, etc.

Heating system applications:

Collective – public buildings / hospitals:

Heating system / closed loop for heating domestic hot water

FOOD industry:

Filling, packaging, pasteurisation, T° C control, etc.

CHEMICAL / PETROCHEMICAL /

PHARMACEUTICAL industries:

Refining process, reactor heating, etc.

MEDICAL fields:

Product processing and storage, T° C control, etc.

PLASTICS industry:

Thermoforming, mould heating, etc.

PRINTING industry:

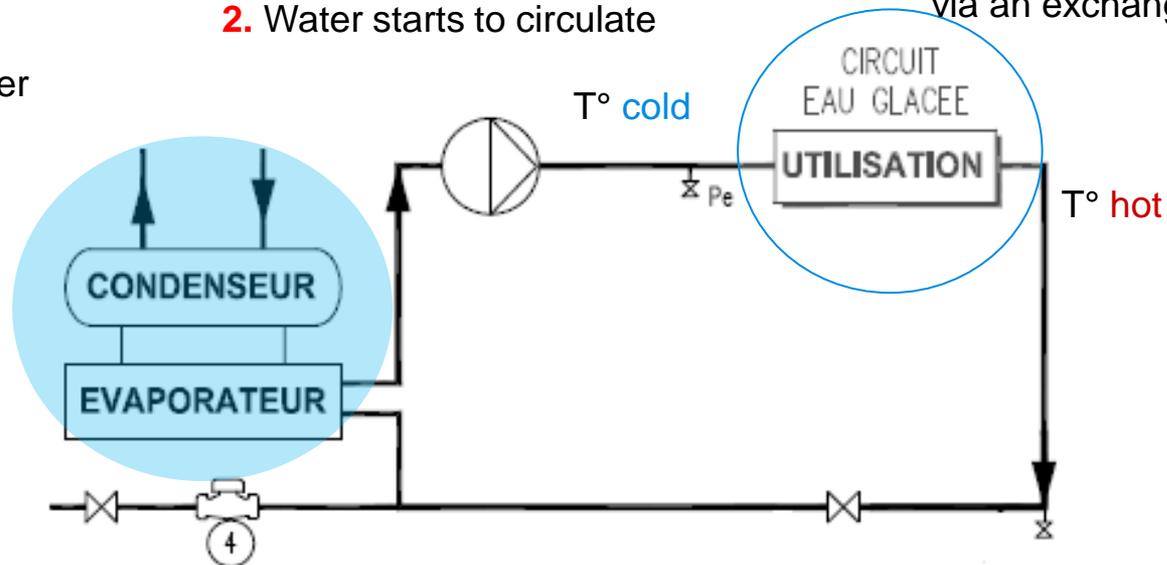
Heating of print drums and impression cylinders, etc.

> How a cooling system works:

Temperature of circulating water: between 5 and 20° C.

2. Water starts to circulate

3. Fluid cooled via an exchanger



1. System filled with new water

4. The heated circulating water is cooled by a cold source (refrigerated unit, air condensers, etc.)

> **Complex systems:**

- A series of different types of equipment
(boiler, exchanger, circulator, expansion vessel, feed lines, air-valves, valves, refrigeration units)
- Presence of several materials in a single system
Black steel, copper, aluminium, brass, synthetic materials
- Flow areas non-identical at all points of the system
Main manifold (large diameter) vs. exchangers (small diameter)
- Presence of hot points in the exchangers
- Closed system → **gradual accumulation of corrosion and silting up residues if the water is not treated**

> Risks relating to water in closed circuits



Pump, valve damages
holes
leakages

Causes:

- water pH
- Excessive chloride content
- Dissolved oxygen
- Presence of many metals



Corrosion



SILTING UP



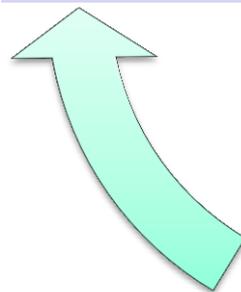
Energy Loss
Fouling
overheating



Causes:

- Filling water hardness non-compliant

Scale formation



Energy Loss
Bio-Fouling

Development of germs



Causes:

- Favourable environment (pH, temperature, dissolved oxygen)
- Dead points in the circuit

2 > Closed Circuit

> Treatment programme: **Prerequisites**

Filling water grade suitable for the systems

BWT solution:

Equipment used to pre-treat the water

- PERMO Softener (TH =0° F)
- Reverse osmosis unit if salinity, excessive strong acid salt content

Composants	Unités	Groupe réfrigérant : en circuit fermé
pH	plage de pH	7,2 – 9,5 ¹
Indice de stabilité de Ryznar	ISR	5,0 – 6,0
Conductivité	µmhos/cm	< 3000
Dureté totale [CaCO ₃]	ppm	< 10
Dureté calcium [CaCO ₃]	ppm	< 10
Alcalinité « M » (Totale) [CaCO ₃]	ppm	N/A
Alcalinité « P » (Totale) [CaCO ₃]	ppm	0
Cations		
Total fer [Fe]	ppm	< 0,5
Manganèse [Mn]	ppm	< 0,05
Cuivre [Cu]	ppm	< 0,05
Aluminium [Al]	ppm	< 0,1
Anions		
Chlore libre [Cl ₂]	ppm	0
Chlorure [Cl]	ppm	< 400
Sulfate [SO ₄]	ppm	< 300
Silice [SiO ₂]	ppm	< 150
Activité microbologique		
Bactéries sulfatoréductrices ²	Col./ml	< 1
Total bactéries aérobies	Col./ml	< 10 000
Solides		
Solides suspendus	ppm	< 10
Taille solide (filtres latéraux de < 5 µm recommandés)	µm	< 5

Examples of instructions for HUSKY refrigeration unit

- > Treatment programme: **Water conditioning range by SoluTECH**

SoluTECH

Injection of an additive (formulated product) with anti-corrosion and anti-scale forming properties into the system.

An all-in-one approach for all closed systems!

> Step 1: Leaching / passivation of circuit walls

Before commissioning:

- Used to remove soiling from the system after building work (welding residues, metal dust, etc.)
- Passivate metal walls for more effect protection from corrosion

Old circuits:

- Remove sludge
- Decontaminate the circuit
- Passivate

- Get off to a clean start!

SoluTECH LESSIVAGE ET DÉSEMBOUAGE

Nettoyant multi-actions spécifique circuits de chauffage collectif à problèmes



- Produit unique pour :
 - lessivages ou passivation avant mise en service,
 - désembouage (boues, tartres, oxydes),
 - décontamination bactérienne et anti-algue.Utilisable jusque 110 °C.
- Contient un inhibiteur spécifique de l'aluminium.
- Dosage indépendant de la qualité d'eau et du type de matériaux du réseau : 5 L/m³.
- Sans risque de surdosage et facile à contrôler (traceur).
- Ne nécessite ni neutralisation, ni passivation : la vidange suffit.
- Traceur bleu pour plus de sécurité,
- Vidangeable directement à l'égout.

- Adapté pour :
 - rinçage avant livraison de vos bâtiments : remise de chantier sans réserves sur la qualité d'eau,
 - rénovation, lors d'un remplacement de chaudière : évite d'embouer les nouveaux équipements et pérennise leurs rendements et vos économies d'énergies,
 - désembouage en cas de perte d'échange, boues, difficulté de circulation, bruits ...

Un choix facile : un produit unique qui résout l'ensemble des problèmes en une seule étape et rétablit les fonctions et rendements de vos équipements.

PROCÉDÉ CERTIFIÉ

Procédé de traitement complet sous ATEC pour réseaux de chauffage tous métaux



> Step 2: Corrosion/lime scale prevention treatment

SoluTECH PROTECTION INTÉGRALE

Traitement préventif polyvalent spécifique réseaux collectifs de chauffage



PROCÉDÉ CERTIFIÉ

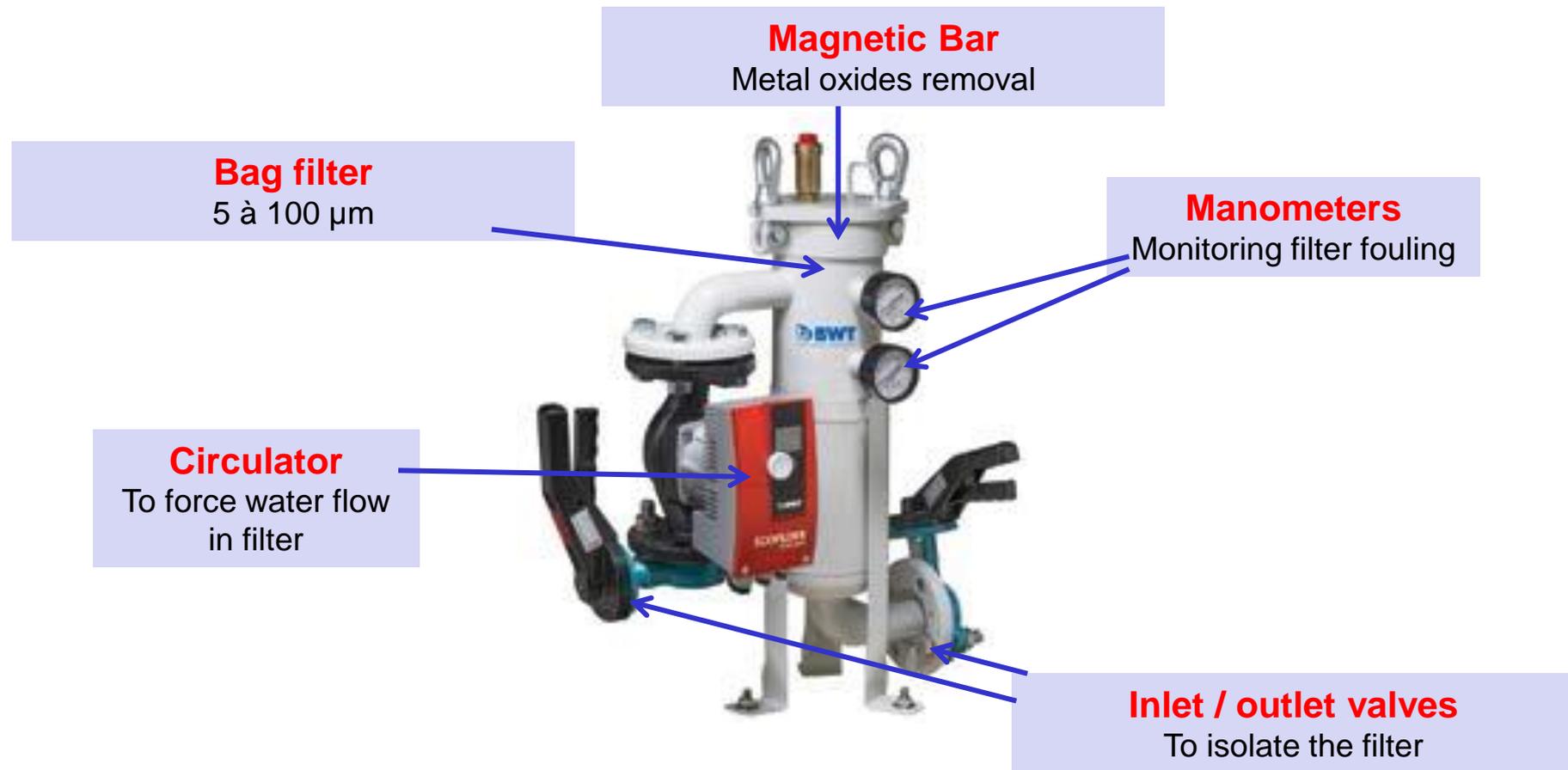
Procédé de traitement complet sous ATEC pour réseaux de chauffage tous métaux



- Produit unique contre :
 - le tartre,
 - la corrosion et les effets de pile entre métaux,
 - les boues, y compris organiques.
- Utilisable en basse température, ou chauffage classique jusqu'à 110 °C.
- Contient un inhibiteur spécifique de l'aluminium.
 - Dosage indépendant de la qualité d'eau et du type de matériaux du réseau : 5 L/m³.
 - Sans risque de surdosage et facile à contrôler.
 - Efficace 5 ans (en l'absence d'appoint supérieur à 10 % du réseau).

> **Badly clogged system: ECOFILDEB mud filter**

Removes sludge/mud and metal oxides without flushing !



> BWT Range: **ECOFILDEB** mud filter

Type	Ecofildeb 5/9	Ecolfildeb 10 /20	Ecofildeb 21/50
Flow rate	9 m ³ /h	20 m ³ /h	50 m ³ /h
Operating Pressure	10 bars		

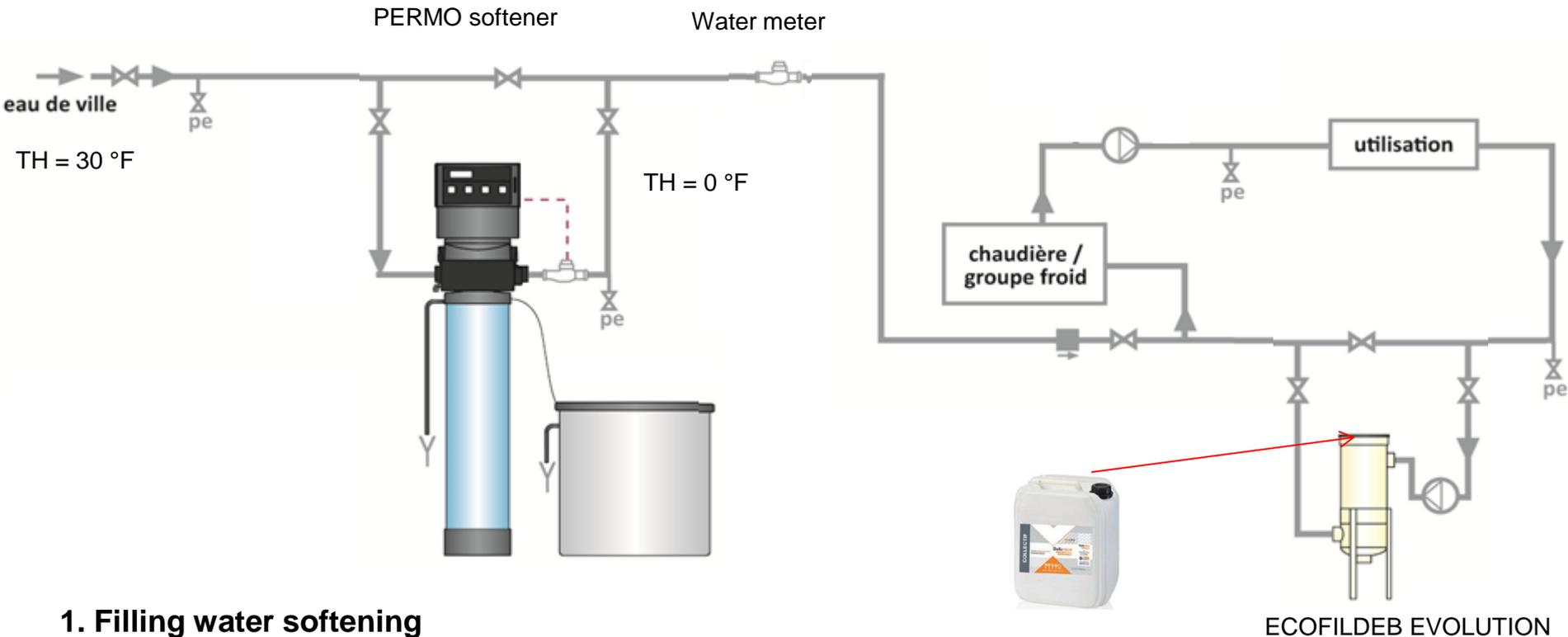
Sizing :

Flowrate to treat = 5 to 20 % of total circulating water flowrate in the loop

Circulating water flowrate	< 90 m³/h	< 200 m³/h	< 500 m³/h
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2 > Closed Circuit

> Summary: Standard plant layout



1. Filling water softening
2. Count water make-up/circuit volume
3. ECOFILDEB EVOLUTION filtration system
4. Injection of SoluTECH anticorrosion additive

> How to monitor the treatment programme

❑ Circulating water analysis

Control of the dosage of SoluTECH Protection

SOLUTECH CONTROL KIT



Routine water quality tests

- ✓ pH
- ✓ TH
- ✓ Iron

**MONITOR WATER STABILITY
ABSENCE OF CORROSION**

FREQUENCY: ONCE PER 3-MONTH!

Return



> What you need for the investigation phase

- Water make-up quality

PH, CONDUCTIVITY, TH, MOA, CHLORIDES, SULPHATES

- System characteristics

Hot water circuit:

	unit	circuit 1
Boiler brand		
Type		
Fuel		
Power	kW	
Recirculating water flow rate	m ³ /h	
Initial temperature	°C	
Return temperature	°C	
Circuit volume	m ³	
Circuit materials		

Cold water circuit:

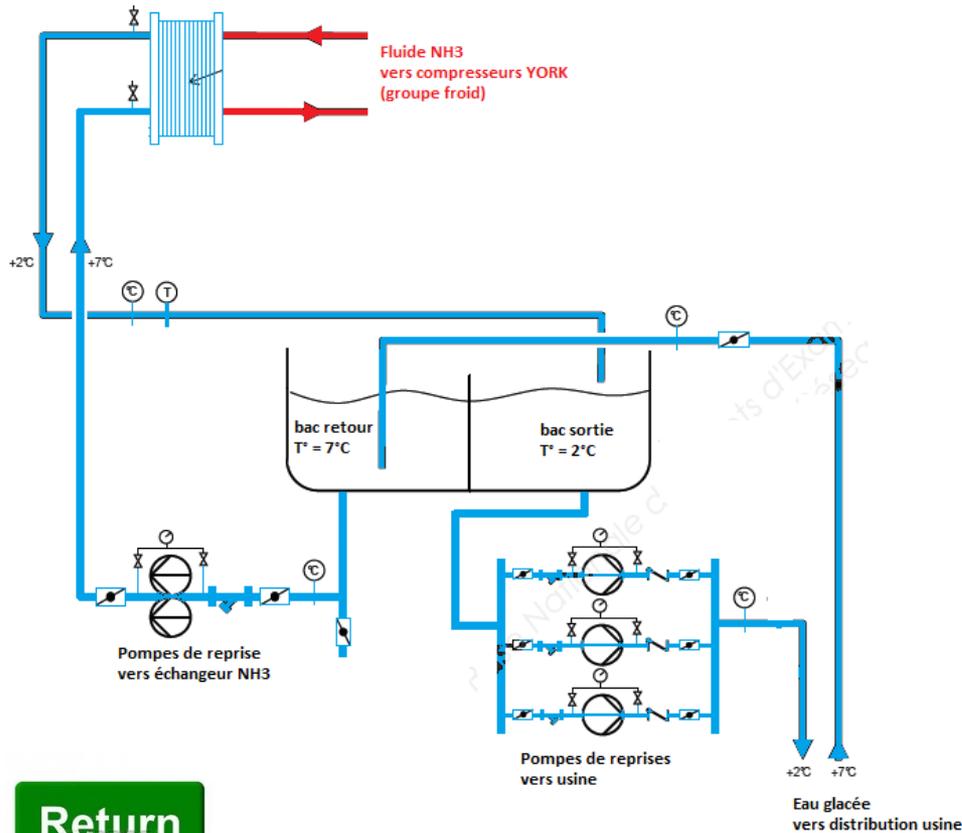
	unit	circuit 1
Refrigeration unit brand		
Power	kW	
Heat transfer fluid		
Operating pressure	bar	
Recirculating water flow rate	m ³ /h	
Initial temperature	°C	
Return temperature	°C	
Circuit volume	m ³	
Circuit materials		



For You and Planet Blue.



Pays: Algérie
Agent: POLYZI (Sofiane IGHIT)
Activité Client: Laiterie



Données clients:

Circuit frigorifique de production d'eau glacée

T° entrée : +7 °C

T° sortie: + 2°C

Q : 750 m³/h

Volume: approx. 100 m³

Matériaux: Inox

Appoint: eau adoucie

Traitement proposé :

- Anticorrosion / antitartre

BWT CC-1001: 5 L/m³

- Biocide:

BWT CS-3001: chocs de 200 ppm – 1 fois par 15 jours

Return



C.A. (eau glacée): 6,0 k€

C.A. (EG + TAR + VAP) : 55 k€

3 > Air conditioning / Washing

- Atomization
- Spraying
- Humidification



> USEFULNESS

- Prevents drying of ambient air in the presence of heating
- The humidifier provides for more comfortable breathing.
- Maintains hydrotimetry in specialized areas

3 > Air conditioning

- Atomization
- Spraying
- Humidification

> PRINCIPLE

- A humidifier is a device used to increase the level of humidity in the air.
- The water is sprayed in fine particles into the air from compressed air nozzles or swirlers.
- The smaller the aerosols, the better the system yield.
- If the water is not demineralised, mineral particles are released into the ambient air and settle in a fine white dust in the rooms and at the surface of objects.**

3 > Air conditioning

- Atomization
- Spraying
- Humidification

> APPLICATION

- Greenhouse



- Store / warehouse



3 > Air conditioning

- Atomization
- Spraying
- Humidification

> APPLICATION

- IT room



- Museum

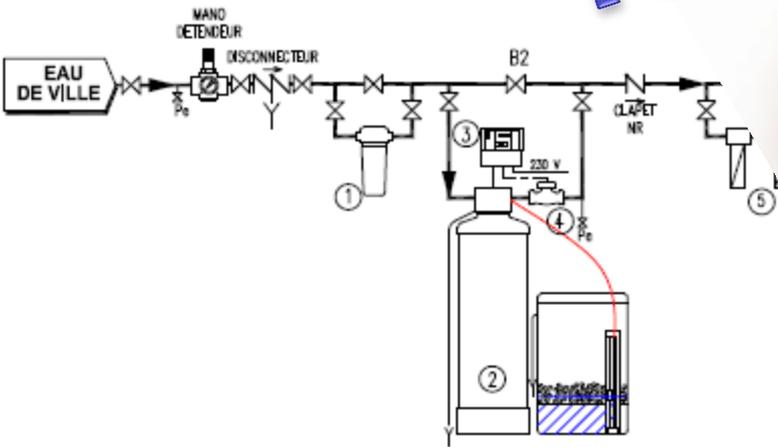


3 > Air conditioning

- Atomization
- Spraying
- Humidification

> Standard plant

REVERSE OSMOSIS

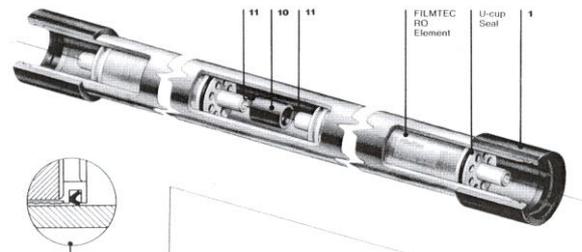


3 > Air conditioning

- Atomization
- Spraying
- Humidification

> How reverse osmosis works

- Reverse osmosis consists of sending water through a semi-permeable membrane at high pressure
- It lets water molecules through but stops suspended mineral or organic substances (100%) or dissolved mineral or organic substances (85% to more than 99% depending on the elements).
- This process converts untreated water to be treated partly into purified water (ultrafiltrate)



3 > Air conditioning

- Atomization
- Spraying
- Humidification

> Notion of water conductivity



Conductivity: ability of water to conduct an electric current

→ the more the water is "charged" in mineral elements, the more the current "passes", the higher the conductivity

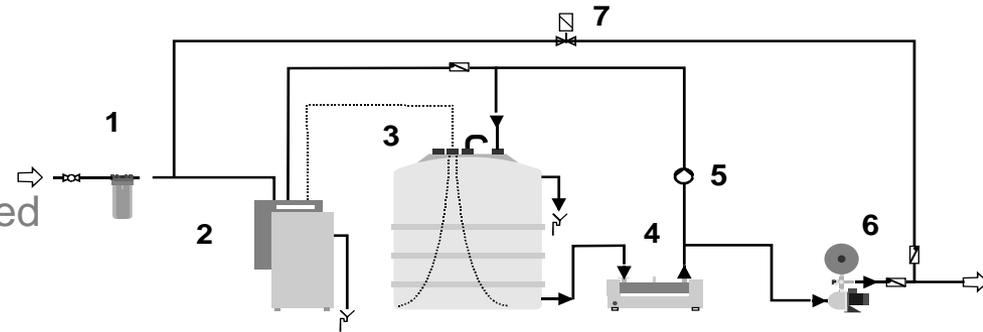
→ expressed in **microSiemens** per centimetre ($\mu\text{S}/\text{cm}$)

3 > Air conditioning

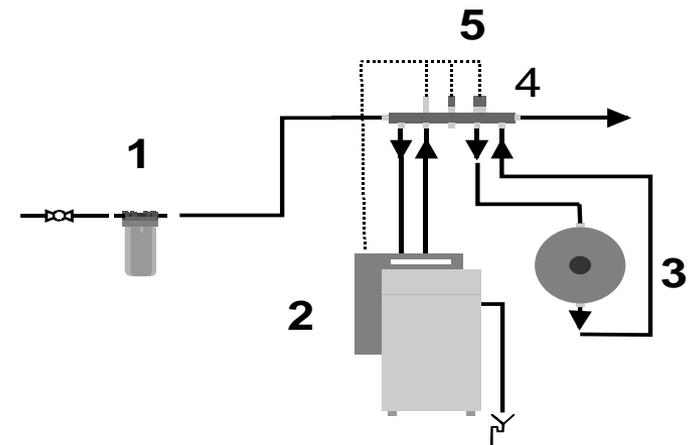
- Atomization
- Spraying
- Humidification

> Two methods

- On line operation:
Reverse osmosis unit directly connected to production, constant withdrawal flow rate, no storage.



- Off line operation:
reverse osmosis unit connected to a transfer tank, flow rate generally not constant .



3 > Air conditioning

- Atomization
- Spraying
- Humidification

> Permaq Eco reverse osmosis unit

- For production flow rates up to 130 l/h,
- Wall-mounted configuration
- Standard equipment

Control unit

High pressure pump

Osmosis membrane



3 > **Air conditioning**

- Atomization
- Spraying
- Humidification



> **Permaq Compact 14/18 reverse osmosis unit**

- Water purification for production flow rates up to 100 l/h.
- Very useful in environments lacking space:
- small laboratory facilities, kitchens, etc.
- Standard equipment

Measuring and control unit

High pressure pump

Reverse osmosis membranes

Pressure ball for on line and off line operation

Built-in resistivity meter

3 > **Air conditioning / Catering**

- Atomization
- Spraying
- Humidification



> **Permaq Compact 41 / 51 reverse osmosis unit**

- Water purification for production flow rates up to 130 l/h.
- Standard equipment

COMPACT 41 ON LINE: 3.5 l hydrophore drum.

COMPACT 51 OFF LINE: booster pump and 50 l reservoir.

Built-in flow meter and manometer for controlling production flow rate and pressure

3 > Air conditioning

- Atomization
- Spraying
- Humidification

> Permaq PICO reverse osmosis unit

- Water purification for production flow rates up to 2000 l/h
- Meets industrial process requirements

(cutting, washing, rinsing, aqueous preparations, etc.), hotel business – catering (washing, rinsing), air conditioning (atomization, humidification)

- Standard equipment

Control unit

High pressure pump

Reverse osmosis membranes

Built-in resistivity meter



REVERSE OSMOSIS UNIT: STANDARD RANGE

For You and Planet Blue.



CATERING



COMPACT
14/18



COMPACT
41/51

100 l/h
Less than 50
microS *

CLIMATIZATION



PERMAQ
ECO

100 to 150 l/h
Less than 30
microS *



COMPACT
14/18

LABORATORY CLIMATIZATION

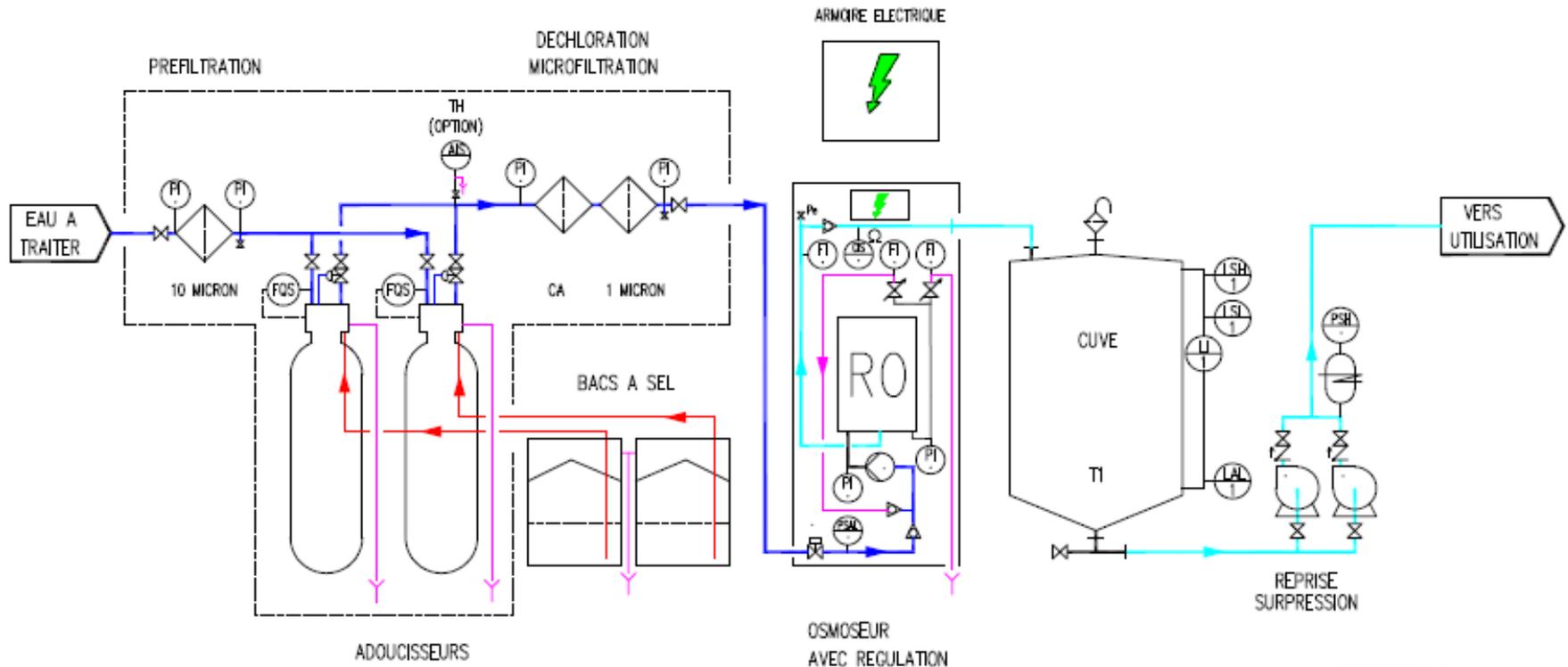


PERMAQ
PICO

160 l/h to 2 m³/h
Less than 15
microS *

* Depends on
water quality

REVERSE OSMOSIS UNIT CHAINING



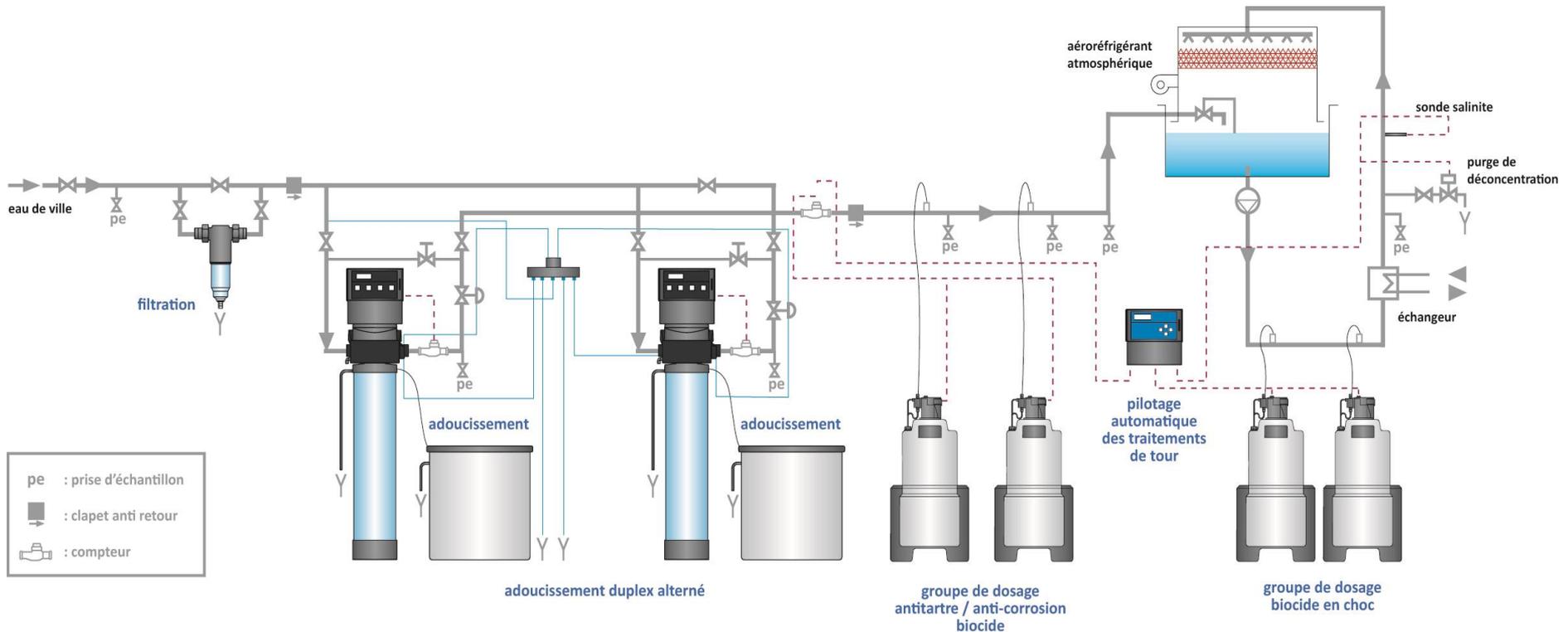
Return



4 > Cooling tower

- Principe
- Conditioning

> Installation



What for? Where can I find one?

For You and Planet Blue.



Cooling towers

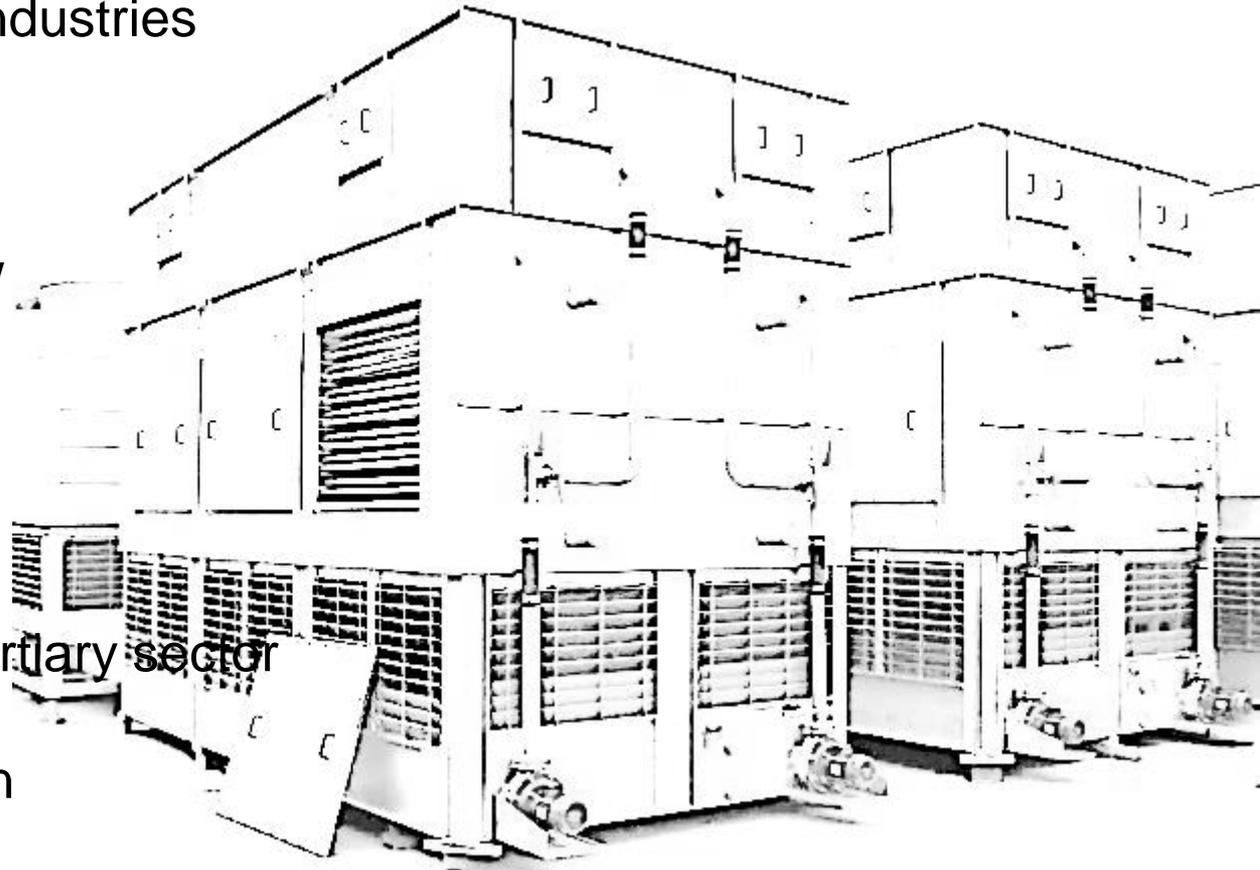
Widespread installation in industries for cold production.

Cooling systems which disperse water in an air flow produce the best cooling yield on the market

They are used:

- In air conditioning in the tertiary sector
- In process cooling
- In negative cold production

They use a lot of water and have a record of experiencing problems!



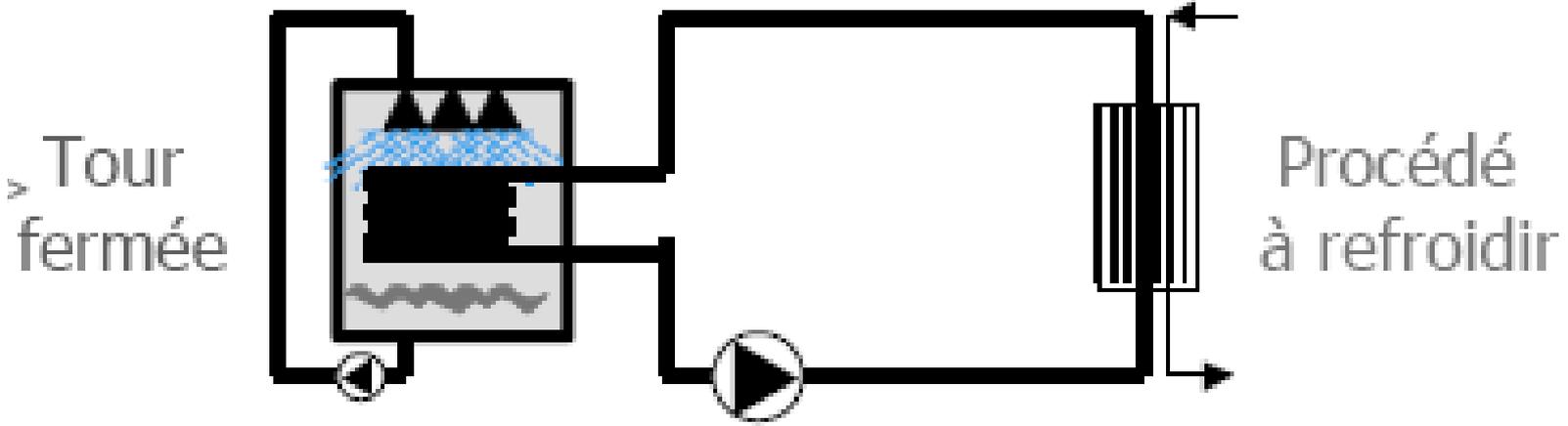
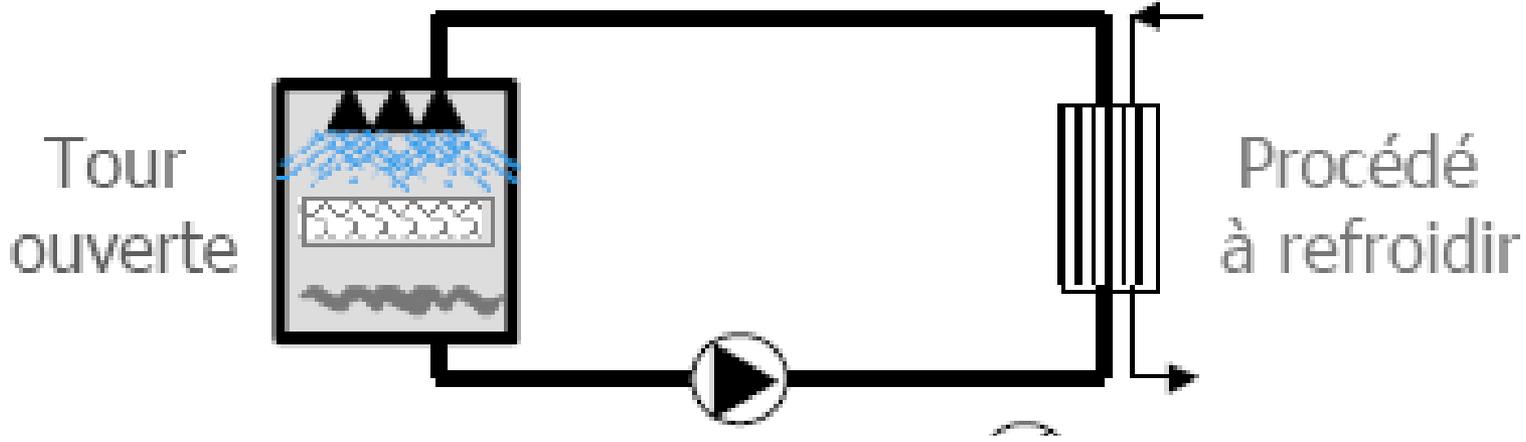
Cooling towers,
how do they
work?



Arrivée du
fluide chaud



How do they work?



Main problems encountered in a cooling system

For You and Planet Blue.



Heat is evacuated in the form of water droplets. Minerals concentrate in the system which may cause:

**LIMESCALE
SEDIMENTS
FUR**



**Heat exchange loss, weakening of facilities,
overconsumption of water and inhibitors, etc.**

Main problems encountered in a cooling system

For You and Planet Blue.



Continuous mass oxygen supply, the presence of several metals and the risk of formation of sludge lead to major **CORROSION** risk in this type of facilities



Damage to facilities, sludge formation, nutrients for bacteria, etc.

Main problems encountered in a cooling system

For You and Planet Blue.



The presence of oxygen, water renewal, atmospheric pollution and ideal temperature are favourable to the **DEVELOPMENT OF GERMS**, extremely common in this type of facilities.



Transmission of diseases (Legionella) biofilm development, fouling, biological corrosion, etc.

What is the appropriate treatment for cooling systems?

For You and Planet Blue.



Suitable **pre-treatment**

- Softener
- Reverse osmosis unit

Concentrates water in the facilities while minimizing scale formation



Pre-treatment on a cooling system offers 6 to 12 months' ROI

Equipment for testing water concentration in the system and managing outlet gates



MULTI2921



ARES



REDOX

REDOX
/AMPERO

Automated management of TAR with analysis C / Chlorine / T and regulation of corrosion inhibitor and oxidant product injection

Manages water and treatment product consumption while minimizing system clogging

What is the appropriate treatment for cooling systems?

For You and Planet Blue.



Corrosion and lime scale prevention treatment **BWT CS-1003**

Multimetal corrosion inhibitors
Resistant to various operating conditions
Easy to dispense
Effective on most water grades



Prevents corrosion and lime scale formation in facilities

What is the appropriate treatment for cooling systems?

For You and Planet Blue.



Suitable **biocide treatment**

- Organic chemical biocide such as BWT CS-3001 or CS-3002
- In combination with an oxidant chemical biocide such as BWT CS-3004 or BWT CS-3015



Prevents development of bacteria and biofilms

- Add PID COOLING TOWER layout

Why should the customer choose you?

Because you're kind?

Because you seem nice?

Because you get along?

No!

**They're looking for
something better,
something with an edge!**

Your Strength:

For You and Planet Blue.



Being able to offer



Formulated products



Equipment



Service and spare parts

Which are



Competitive



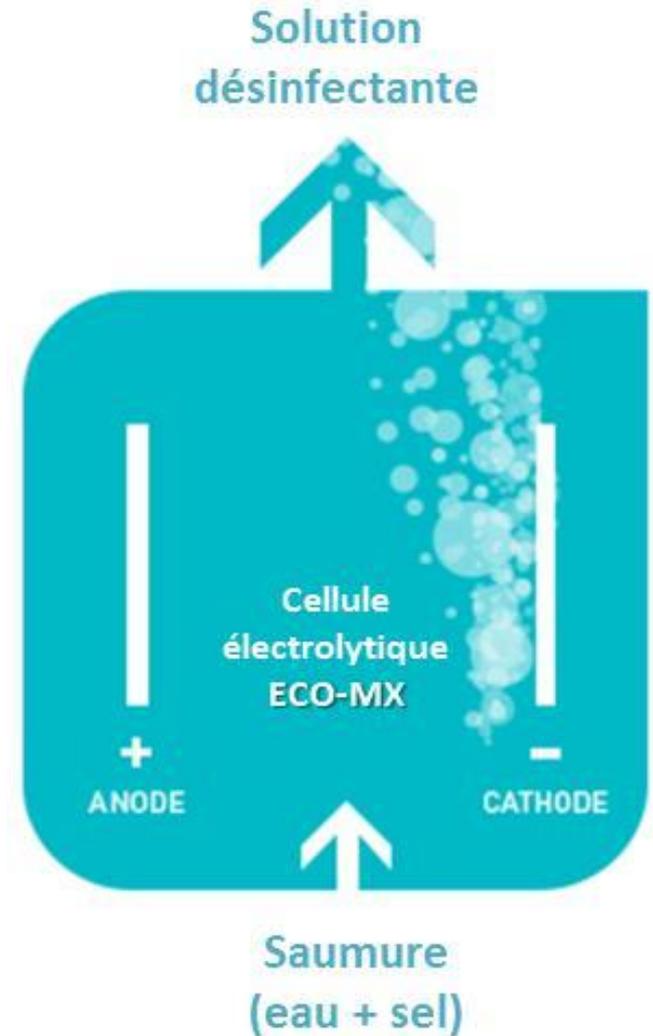
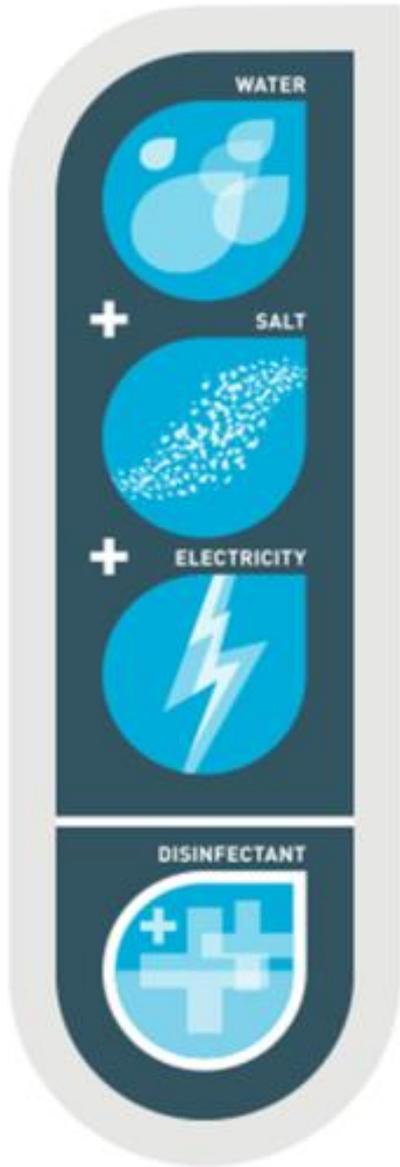
Environmentally friendly products



Innovative

Example: An innovative and brand new biocidal treatment

For You and Planet Blue.



CONVENTIONAL DISINFECTANT

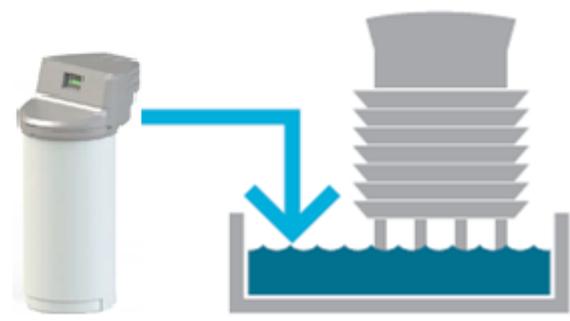


- Product costs €€€€
- Transport cost
- Oxidant degradation
- On-site delivery
- On-site chemical risk
- Effectiveness

GENERATION IN-SITU

PHASEOUT OF ENTIRE

Cooling tower



- On-demand, 100% operational
- No risk (< 1% conc.)
- Better biocide / algicide / biofilm effectiveness

OPERATING COSTS REDUCED BY 50% TO 80%

ECO-MX – Renowned References!

For You and Planet Blue.



GDF SUEZ



PSA PEUGEOT CITROËN



RioTinto

