

# **Laundry engineering**

**Basic laundry designing parameters**

# 1. Laundry building

- **1.1. Surface - 0,8 - 1,2 m<sup>2</sup> / kg/h capacity (for production hall only)**
- **1.2. Height – 3,5 m /minimum/ or – otherwise – accordingly to technological requirements**
- **1.3. Ventilation of the production hall**
  - **To remove excess of heat from the machines acc to the national standards**
  - **Average 6 – 8 air exchanges per hour**

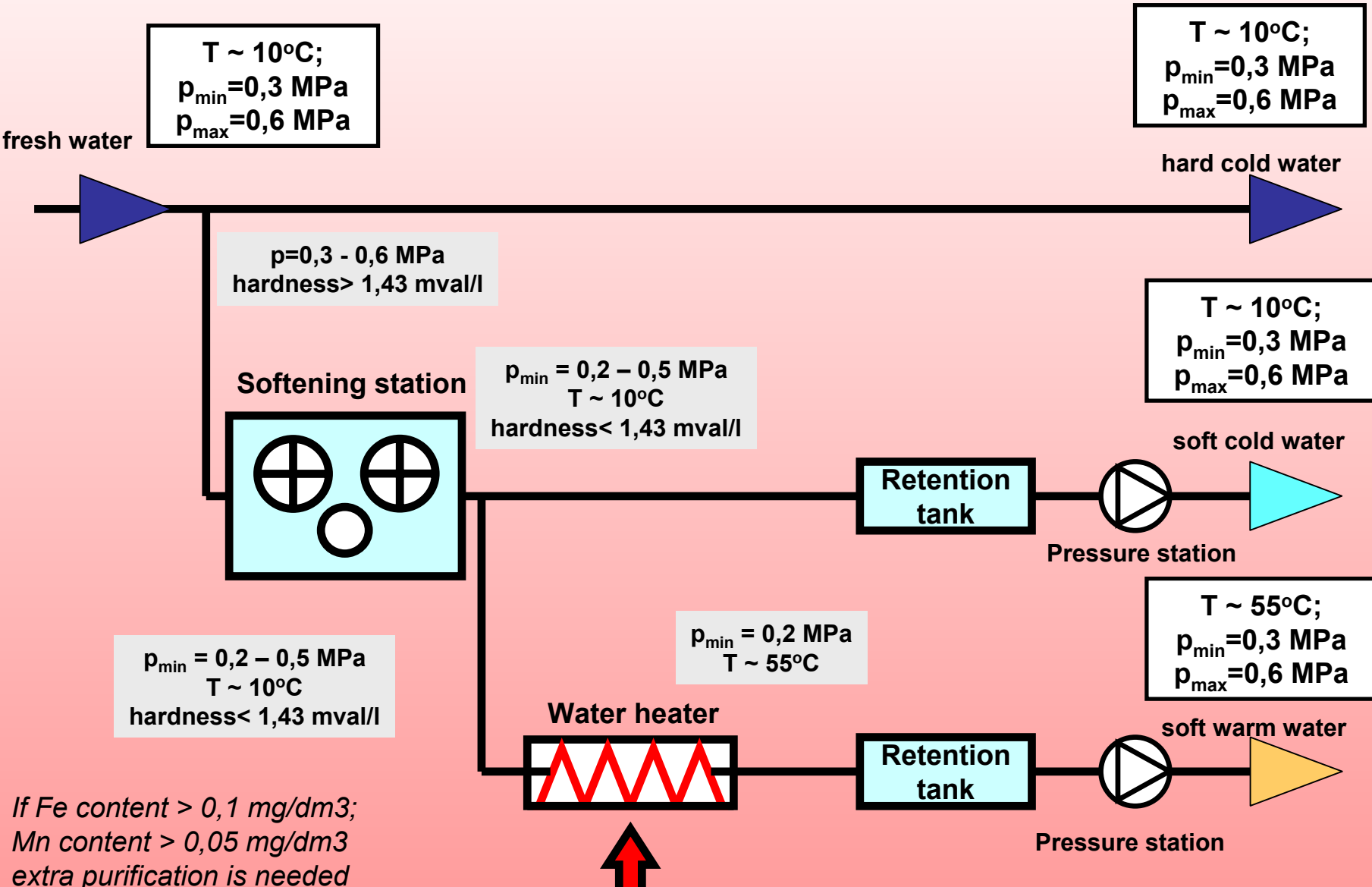
# 2. Laundry installations

## 2.1. Water for technology

- Hardness above 1,45 mval/dm<sup>3</sup> (some hard water can be needed as well)
- Fe content – less than 0,1 mg/dm<sup>3</sup>
- Mn content – less than 0,05 mg/dm<sup>3</sup>
- pressure /inlet to the machines/ 0,3 – 0,6 MPa
- consumption
  - A) washer –extractors 20 – 25 dm<sup>3</sup>/kg of linen
  - B) tunnel batch washers 6 – 10 dm<sup>3</sup>/kg of linen

*Basic system on the following slide*

# Laundry. Water preparation



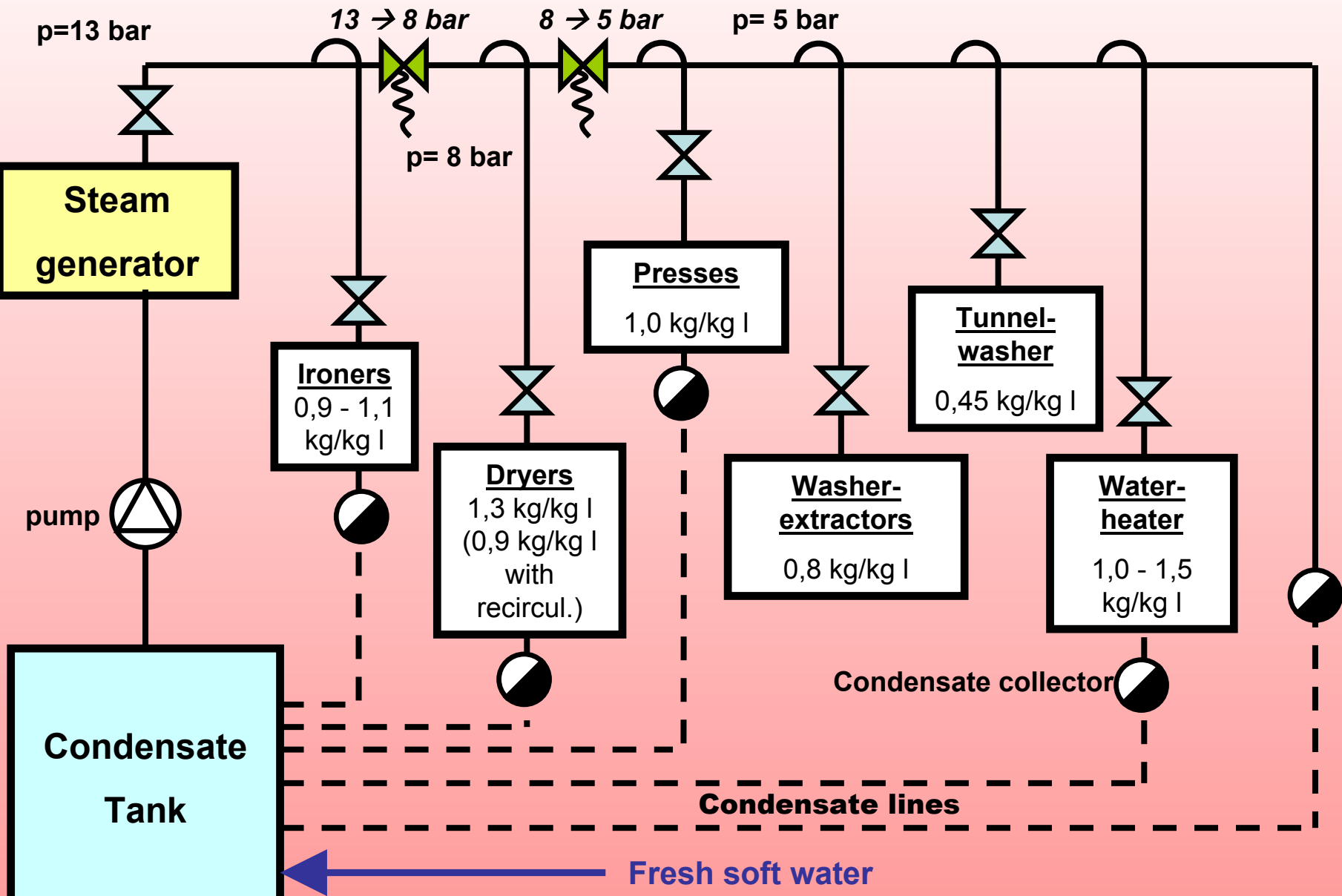
# 2. Laundry installations

## 2.2. Steam for technology

- **source - municipal, boiler or steam generator**
- **pressure at the outlet (of the boiler)  $p=16$  bar**
- **working pressure  $p = 13 / 8 / 5$  bar**
- **consumption : ca 2,5 – 3,5 kg/kg linen**
- **return of condensate : ca 65 % of total steam consumption**

*Basic system on the following slide*

# Laundry. Steam distribution



# 2. Laundry installations

## 2.3. Waste water

- - amount → is the consequence of the consumption
- - quality :
  - pH - 8 – 12
  - Temp. - 30 – 90 °C
  - Detergents - 20 – 50 mg/dm<sup>3</sup>
  - BOD 5 - 50 – 600 mg O<sub>2</sub>/dm<sup>3</sup>
  - COD - 500 – 5000 mg O<sub>2</sub>/dm<sup>3</sup>
- – treatment - in two ways
  - Drain to municipal sewers
  - Reuse (even partly) as feeding water for washers

# 2. Laundry installations

## 2.3. Waste water

- **regeneration of the waste water**
  - **System 1 - chemical regeneration**
  - **System 2 – bio-chemical regeneration**
  - **Other**

*The following slides will present the examples of the complex methods*



# 2.3 Waste water regeneration

**system no. 1**

**FM**  
mechanical filtration  
d<0,3mm

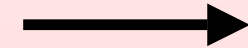
**N**  
neutralization

**UF**  
ultra filtration  
d=0,01-0,2 µm

**UO**  
reversed osmosis  
d=0,001-0,01 µm  
nano filtration

Selective ionic  
exchange

waste water from the laundry



solid parts  
d > 0,3mm



HCL acid addition



UF concentrate



Dissolved substances - salts



UO concentrate  
- organic salts



Heavy and/or colour metals

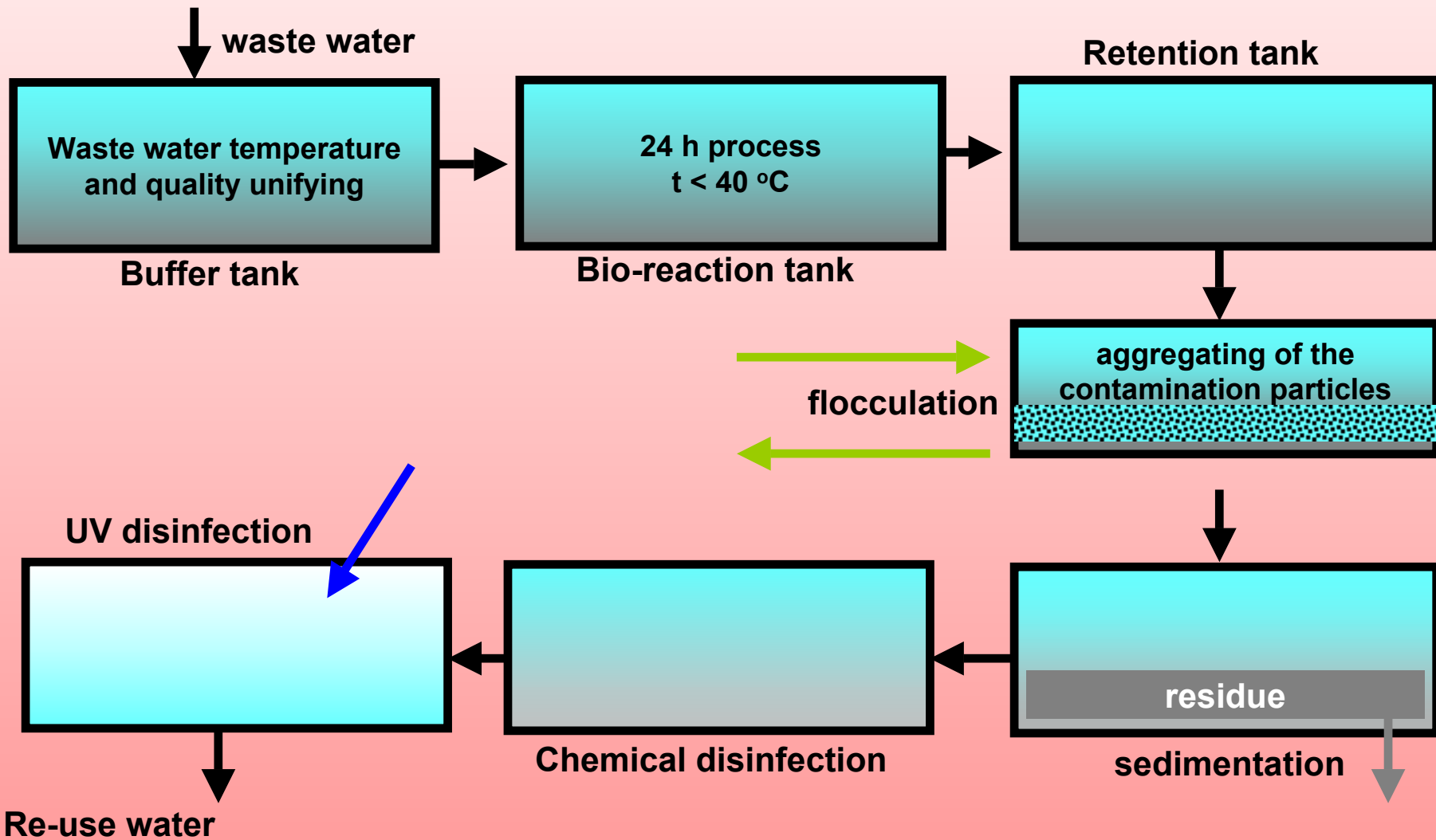


Fe, Pb, Mn, Cu, Ni ions

Regenerated water for re-use

## 2.3 Waste water regeneration

system no. 2



# 2. Laundry installation

- **2.4. Compressed air**

- **pressure** -  $p = 8 - 10$  bar
- **consumption** -  $0,3 - 0,5$  Nm<sup>3</sup>/kg linen

- **2.5. Electricity (for technology)**

- **total power installed**  
 $0,20 - 0,60$  kW per 1kg linen/h
- **energy consumption**  
 $0,15 - 0,30$  kWh / kg linen