# Sustainability in commercial laundering processes

Module 3
**Washing Process**

Chapter 4b

## Water and energy saving possibilities Sanoxy system

# Content

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- The Sanoxy system
- Main differences to standard tunnel washer process
- Water flow in Sanoxy system
- Wash performance
- Cost examples
- Problems?

# Learning targets

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- After finishing this chapter, you will
- Know the Sanoxy system and be able to explain the principle
- Know water flow of Sanoxy system
- Know the pre-conditions for application of Sanoxy, know how to change and know how to change back to the old system
- Know potential problems and know how to work out

# Objective and potential improvements



- Cleanliness and Hygiene – at minimum maintain existing quality, but preferably improve.
- Environment – reduce the impact of laundering soiled textiles by reducing water and energy consumption.
- Textiles – extend operating life by reducing chemical damage.
- Processing capacity – increase washing and drying capacity.

# The Sanoxy system provides

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- Significant Water and Steam savings – water consumption is reduced by 40 – 50%, steam by 20 – 30%.
- Better stain removal – most laundries report lower levels of rewash.
- Effective disinfection – PAA based rinse agent provides chemical disinfection.
- Shorter drying times – Towelling tumbler drying times are reduced by 10 – 30%, Pillow slips / Duvet covers by 30 – 50%.
- More than 130 customers – many satisfied users throughout Europe, and growing.

# Main differences with standard Tunnel washers

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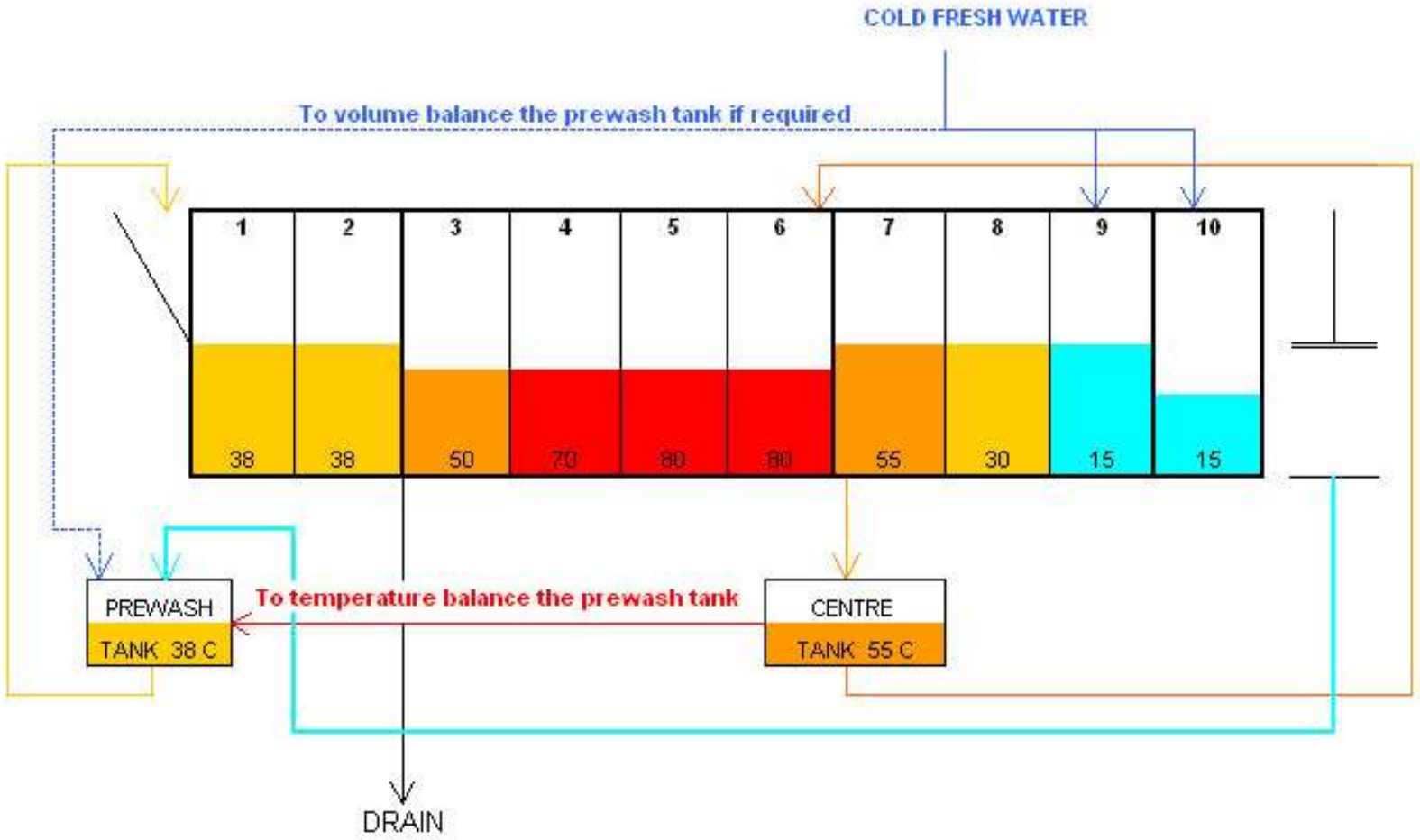
- Water flow – innovative changes are made to recycling of press water.
- Disinfection – occurs throughout the main wash and rinse sections, providing longer contact time.
- Rinsing – is warmer, 40 – 50 ℃, without the use of heat exchangers.
- Neutralising – only requires a single chemical. No Sour, Antichlor or rinse disinfection adjuncts.

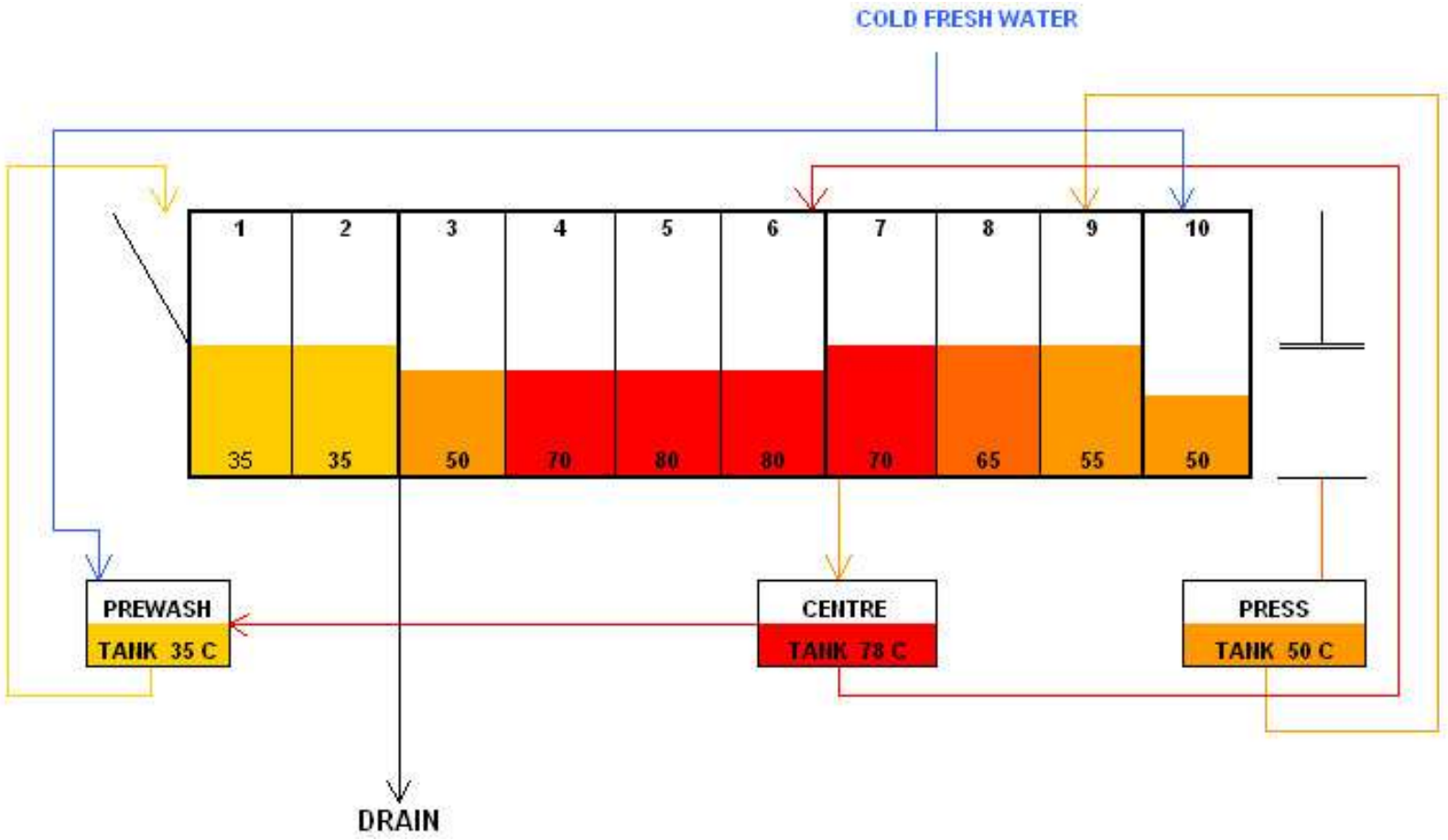
# Traditional Tunnel washer configuration





# Sanoxy system configuration





# Sanoxy system water flow

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- Prewash section – uses a combination of fresh and recovered rinse water.
- Main wash section – no change is made to water through this section.
- Rinse section – uses all the water recovered from the press.
- Finishing section – up to 0.5 litre per kg of textile of fresh water is used, if it is necessary to control temperature.

# Advantages of the Sanoxy system



- Temperature – remains the same, but with a lower mainwash pH which provides better bleaching, disinfection and dilution.
- Disinfection and Bleaching – occurs throughout the main wash and rinse sections, providing longer contact time.
- Warm rinsing – reduces steam consumption in the wash and tumble drying processes.
- Better hygiene – in the press area is achieved.
- Fewer chemicals – a single shot product ensures there is no need for Chlorine, Sour or Antichlor.

# Better hygiene



- Proven disinfection with 3.5 ml/ per kg of textile Sanoxy liquid at 50°C in rinse section. Supported by RKI accreditation.
- Better disinfection of press area through contact with final rinse water.
- Improved hygiene on conveyer belts from contact with load.

# Wash performance



- Longer contact time – in the rinse and main wash, at temperatures in excess of 50 °C, optimises use of active chemistry.
- Improved whiteness – numerous test piece results indicate better florescence and reflectance.
- Better stain removal – again supported by many test piece trials.

# Test piece analysis



- Whiteness – typically improves by 2 - 4 points.
- Ash content – is no worse than conventional rinsing.
- Tensile strength – better when compared against Chlorine based processes. LTC in the UK indicate that loss of tensile strength is typically half that of Chlorine processes.

# Cost example of conventional Tunnel washer

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- Water: 7 l/kg x € 3,50/$m^3$
- Steam (CBW): 0,55 kg/kg x € 30/tonne
- Steam (Dryer): 2,0 kg/kg x € 30/tonne
- Steam (Ironer): 1,0 kg/kg x € 30/tonne
- Detergent: 10 g/kg x € 1,35/kg
- Auxiliaries: PAA, $H_2O_2$, chlorine, acid, fungicide, etc.

# Cost example of Sanoxy Tunnel washer

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- Water: 4 l/kg x € 3,50/$m^3$
- Steam (CBW): 0,35 kg/kg x € 30/tonne
- Steam (Dryer): 1,75 kg/kg x € 30/tonne
- Steam (Ironer): 0,88 kg/kg x € 30/tonne
- Detergent: 7,5 g/kg x € 1,80/kg
- Auxiliary: 3,6 ml/kg Sanoxy Liquid x € 2,59/kg

# Cost comparison processing 10 tons per day

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- Conventional Tunnel washer
  - Water: € 245
  - Steam: € 1.065
  - Detergent: € 135
  - Auxiliaries: € 100

  Per day: € 1.545

  **Per year € 386.250**

- Sanoxy Tunnel washer
  - Water: € 140
  - Steam: € 894
  - Detergent: € 135
  - Auxiliaries: € 94

  Per day € 1.263

  **Per year: € 315.560**

  **SAVING: € 70.690**

# Will there be any problems?



- Build up of salts in rinse section? Test show that salts are typically below 1000 microsiemens. This is considered to be high by some, but experience has shown that this does not cause any problems.

- Will there be any issues with the Tunnel washer? Bronze or Alloy metals will be quickly destroyed. Only 316 Stainless steal or acid resistant PVC can be used. So it is imperative that old rubber tube and Bronze valves etc. should be replaced at the point of conversion.

# Will there be any problems? Cont.



- Skin irritation? Given that millions of tonnes of textiles have been washed using the Sanoxy system, one might expect the operators handling the textiles directly after the wash to be amongst the first to complain. THEY DON'T. Nor has there been an increase in complaints from Hospitals, where patients spend prolonged periods in contact with the textiles.
- Will the ironer be affected? From all the conversions to the Sanoxy system to date, around 5 installations have proven problematic. Changing the Chemistry from a single to a 2 shot system has overcome any ironer related issues.

# Frequently asked questions

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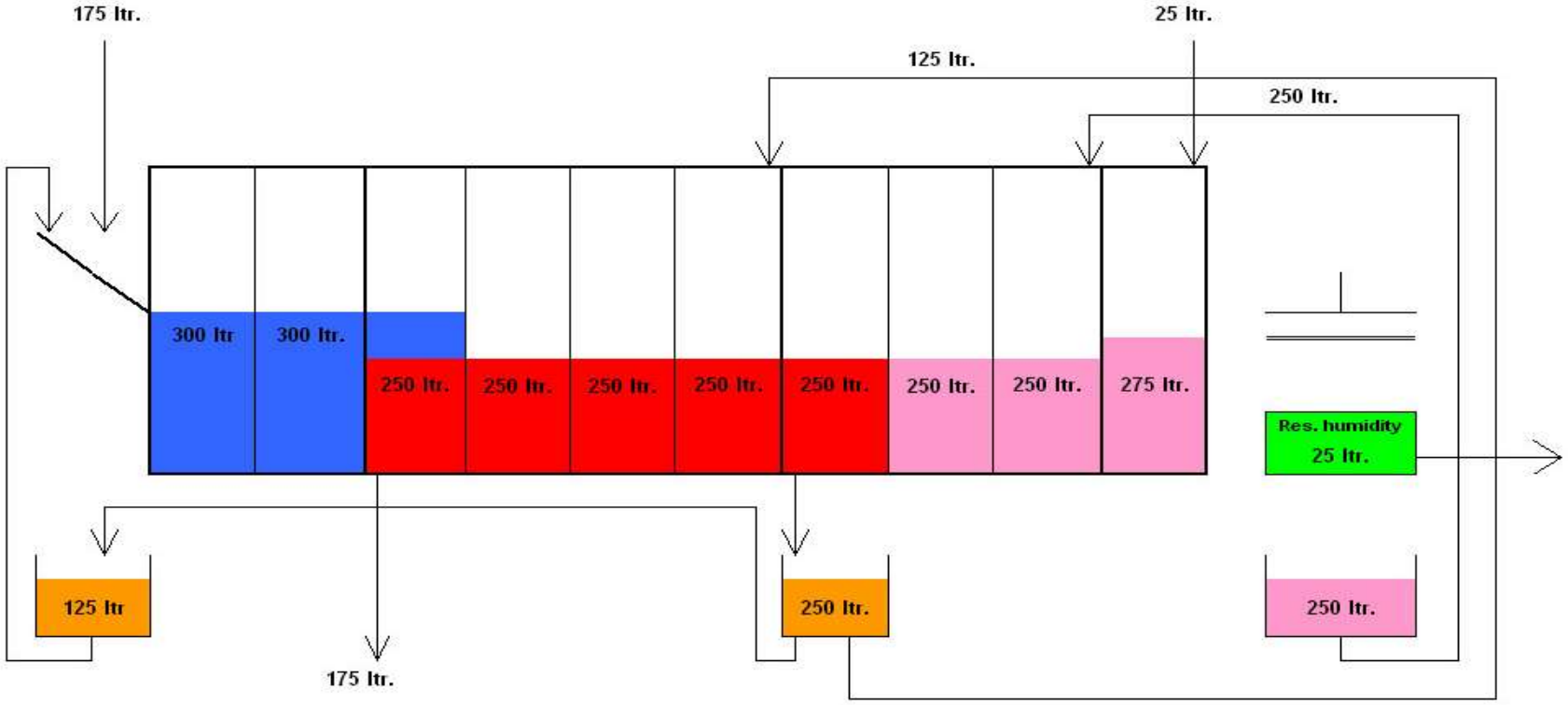
- How is the water flow changed? The illustration shows water flow around the machine and how much is typically used in each compartment. This will however vary from machine to machine.



# Frequently asked questions



- Does this system cause any damage? Theory might suggest that problems will arise in these areas. Practice suggests otherwise.

- Fabric
- Ironer clothing
- Press membranes
- Skin irritation and allergies

- If the Sanoxy system is correctly installed, set-up and maintained to the correct specification, problems are unlikely.

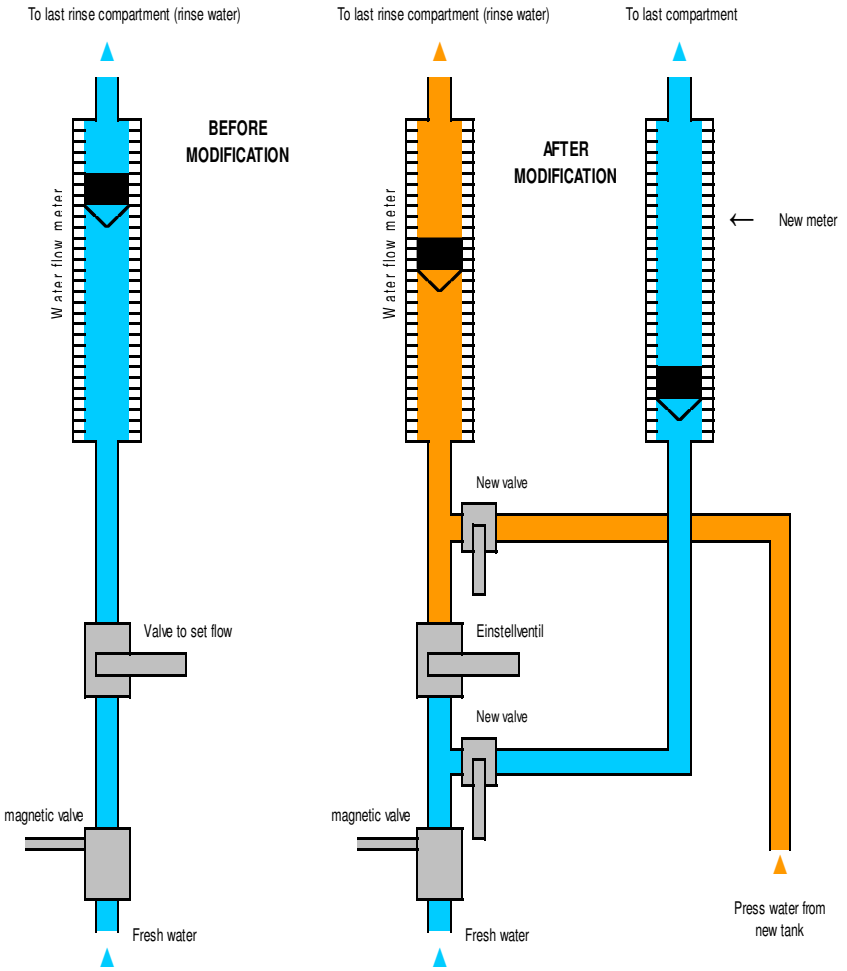
# Frequently asked questions



- How much will it cost to convert? This will depend on the specification. But as little as 2500 Euros.
- Kannegiesser, Senking and Lavatec can supply machines with this system ready installed. They can be programmed to use either configuration.
- All have been successfully converted retrospectively.

# Frequently asked questions

- How do we change back?
- In most cases it is a simple as changing a few valves.
- Alternatively reprogramming may be required.



# The ultimate answer

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- It works!

- UK: 80 installations
- France: 23 installations
- Germany: 15 installations
- Netherlands: 12 installations
- Belgium: 2 installations

- Hohenstein Innovation prize 2003
- RKI listing for disinfection

# Further innovation



- Sanoxy Plus.

- Recent trials in the UK, using filtered effluent water, have delivered even bigger reductions in water and steam consumption.

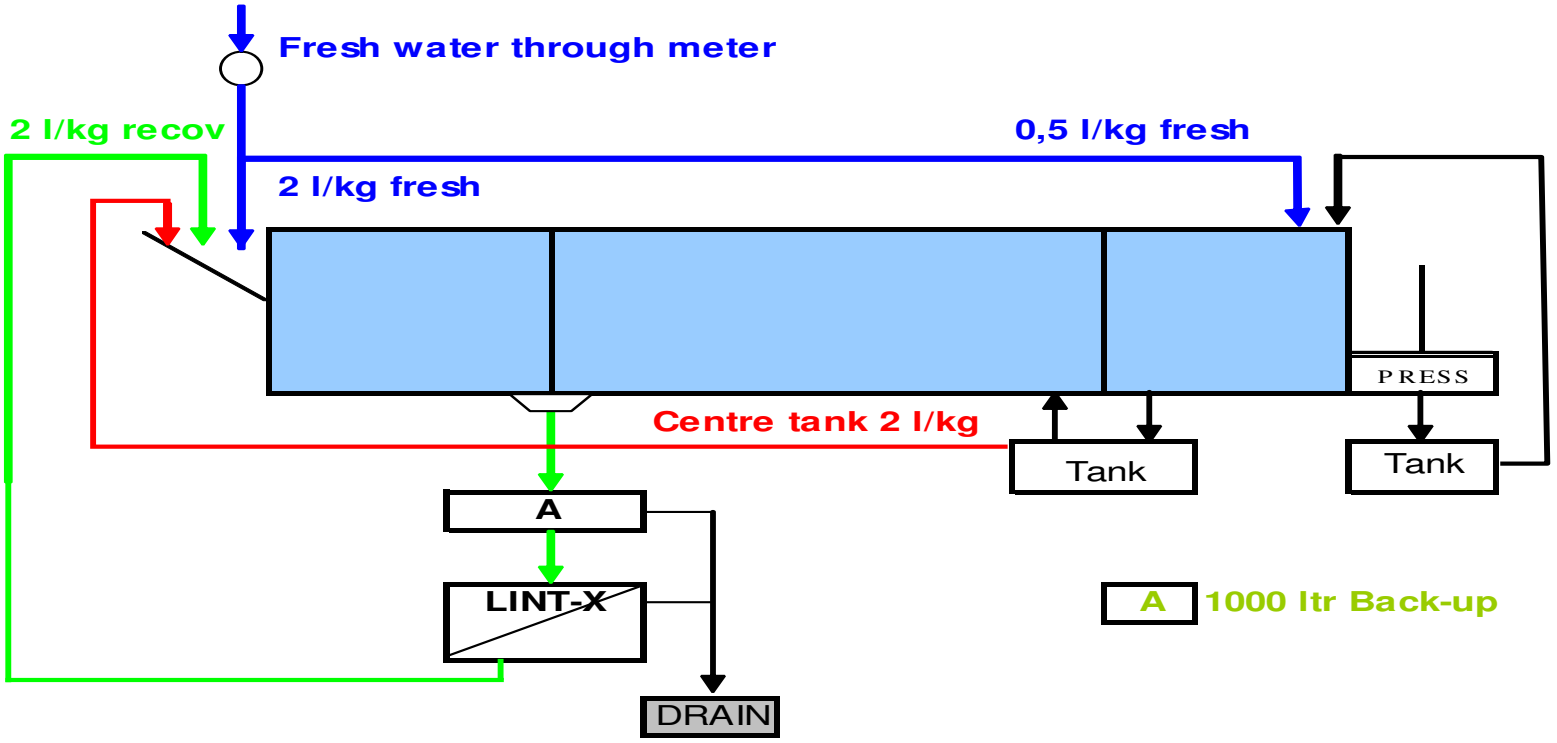
- Water consumption – as low as 1.8 litre per kg of textile, typically 2-2.5

- Steam consumption – as low as 2.5 kg per kg of textile, typically 3

# How Sanoxy Plus works.



- Water drained to sewer is collected and filtered (Tank A and Lint-X).
- This is introduced into the prewash section at 2 litre per kg of textile.
- Excess water from tank A overflows to sewer.



# Sanoxy Plus to date

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- Water consumption – 2.5 l/kg or less.
- Steam consumption –3 kg/kg or less.
- Higher prewash pH – better soil and stain removal.
- Whiteness – further improvement.

- 15 Systems installed in the UK.
- 3 systems installed in France.
- Another 8 scheduled installations in the UK.