

Sustainability in commercial laundering processes

Module 1
Usage of water

Chapter 6

Laundry waste water in the Netherlands

Learning targets

- This chapter will provide you with a survey on waste water legislation in the Netherlands
- The basic concept for the calculation of waste water load in the Netherlands is explained.
- The basic concept for the calculation of waste water costs in the Netherlands is explained
- A short overview of water consumption in Dutch Laundries is presented

Content

- Legislation in the Netherlands
- Waste water cost in the Netherlands
- Water consumption in Dutch Laundries



- Most laundry companies follow the AMvB textielreiniging
 - a universal and concise regulation containing all legislation with regard to the protection of the environment and protection of the workers in the textile care sector:
 - noise
 - waste water and water consumption
 - energy consumption
 - air pollution
 - safety (e.g. use of solvents)
 - soil protection



- Demands for waste water within the AMvB (implementation of directive 1991/271/EC)
 - no bad smell
 - should not damage the sewage system
 - should not interfere with the (municipal) sewage purification system and the sewage sludge processing
 - should not contain dangerous contaminants and laundry waste product if their presence in the waste water can be avoided

■ Practical

- for the protection of the municipal sewage system and the sewage purification system the following universal demands are applicable for waste water in the Netherlands
 - $6,5 < \text{pH} < 10$
 - $T < 30 \text{ }^{\circ}\text{C}$
- depending on the type of laundry (industrial workwear, cleaning cloths) more strict demands can be imposed by the local authorities (Waterschap)

Waste water legislation in the Netherlands IV

- The temperature and pH regulations are (very) difficult to comply with for laundries
- Some companies have therefore adapted demands (in consultation with the local authorities) to avoid the application of extra cooling processes at their sites
 - $T < 40\text{ }^{\circ}\text{C}$
 - $\text{pH} < 11$



- Other regulation with regard to waste water management regulations following from the AMvB are:
 - if the fresh water consumption of a company exceeds 5.000 m³ per year a company plan for reducing water consumption should be made and be available to the local authorities
 - the drain of the chemical storage room must be disconnected from the sewage system

Waste water costs in the Netherlands I



Education and Culture

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- The waste water costs are based on the COD (Chemical Oxygen Demand or CZV in Dutch) and the nitrogen content of the waste water. A number of specific contaminants (heavy metals, salts) also contribute to the waste water costs
- The costs are based on the number of the so-called contamination units or inhabitant equivalents (i.e.) and these can be measured or calculated
- The costs are based on the number of i.e.'s. The actual cost of an i.e. is determined by the local water authority (waterschap)

- Experimental determination of the number of contamination units (i.e)

$$i.e. = \frac{(COD + 4,57 * N_{Kjeldahl})}{49,6} * \frac{Q}{1000}$$

- depending on :
 - COD (in mg O₂ /l)
 - Nitrogen based on the Kjeldahl method (mg N/l)
 - Fresh water intake Q (in m³ / year)

Waste water costs in the Netherlands III



Education and Culture

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- Experimental determination of the number of contamination units (i.e.) of specific contaminants
 - disposal of 1 kg / year of chromium, copper, nickel, silver and zinc equals 1 i.e.
 - disposal of 100 g / year of arsenic, mercury and cadmium equals 1 i.e.
 - disposal of 650 kg / year of chloride and sulphate equals 1 i.e.
 - disposal of 20 kg / year of phosphor equals 1 i.e.

Waste water costs in the Netherlands IV



Education and Culture

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- Calculation of the number of i.e.'s
 - only allowed for laundries with less than 1000 i.e.'s
- The calculation is based on the annual intake of fresh water Q_y in m^3 :

$$i.e.=0,015*Q_y$$

Waste water costs in the Netherlands V



Education and Culture

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- Example of the calculation method
 - laundry with a fresh water intake of 40.000 m³ per year
 - calculated number of i.e.'s:

$$\text{i.e.} = 0,015 * 40.000 = 600$$

- cost per i.e. is about € 60,00 (depending on region)
- total costs € 60 * 600 = € 36.000,- per year

Water consumption in Dutch laundries I



Education and Culture

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- In the Netherlands a mutual agreement between government and a major part of the laundry sector has been closed, the so-called MJA-agreement in which the laundry sector show its commitment to minimizing the energy consumption.
- More than 60 of the (major) laundry sites participate in this agreement.
- Within this agreement the energy consumption of the participating laundries is monitored on a yearly base.
- As energy consumption in the laundry business is closely connected to water consumption, the water consumption is also monitored.
- In 2004 a mean value for the water consumption was measured of 13 l/kg textile.

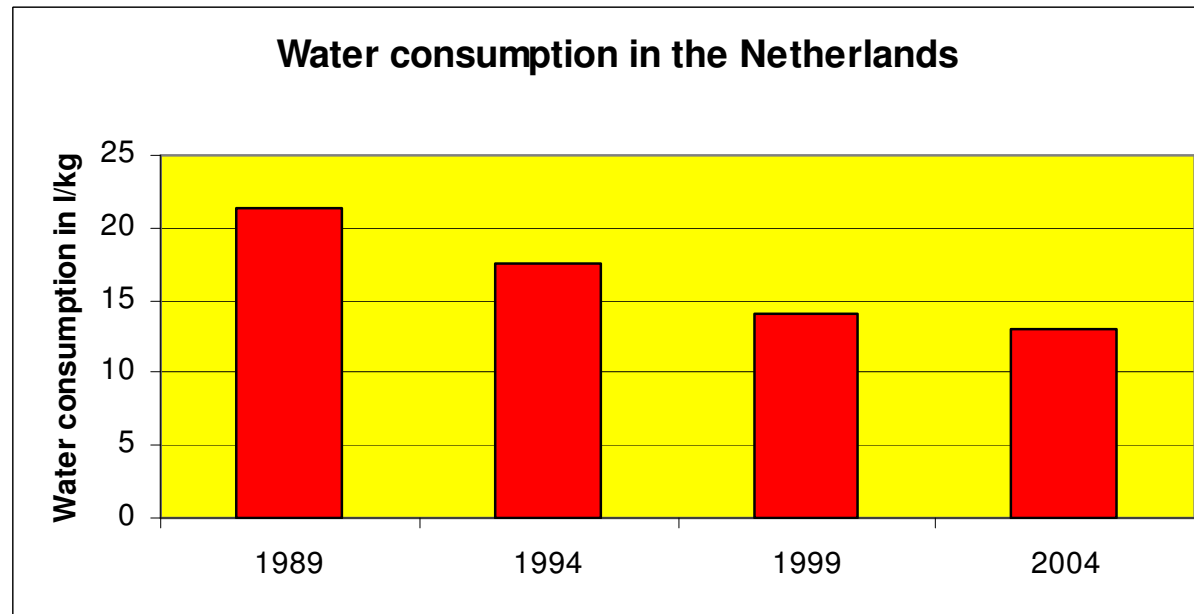
Water consumption in Dutch laundries II



Education and Culture

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- Development in water consumption within the last 15 years



- Main causes of the water consumption reduction:
 - more efficient washing processes
 - growing number of continuous batch washers
 - consultancy and knowledge transfer