



**VIDA**  
value-added innovation  
in food chains

**Water reuse in the food sector:  
demonstrating cloth filtration as a viable and economic  
pre-treatment process for R/O membrane filtration**

*Paving the way towards multiple water reuse schemes*






Co-funded by the Horizon 2020 Framework Programme of the European Union under grant agreement n° 777795. This document reflects only the author's view and the Commission is not responsible for any use that may be made of the information it contains.



**Contents**

<b>01.</b> Introduction	<b>02.</b> Water reuse	<b>03.</b> Cloth filtration	<b>04.</b> Project set- up
----------------------------	---------------------------	-----------------------------------	----------------------------------




2

## Contents

<b>01.</b> Introduction	<b>02.</b> Water reuse	<b>03.</b> Cloth Filtration	<b>04.</b> Project set-up
----------------------------	---------------------------	--------------------------------	------------------------------


3




## Introduction

**Our consortium:**

- **Brightwork BV** [www.brightwork.nl](http://www.brightwork.nl)
  - Technology development and strategic consultancy in (waste)water, sludge and resource recovery
  - Achievements in technology development:
    - New filter design for large capacities
    - Cellulose assisted dewatering of sludge
    - Sand-Cycle monitoring and control



- **Nedaq VOF**
  - Technical consultant in water and waste water treatment
- **Nordic Water Benelux BV**
  - Premium supplier in the Benelux of Nordic Water products, e.g. DynaSand filtration

4





## Contents

**01.**  
Introduction

**02.**  
Water reuse

**03.**  
Cloth filtration

**04.**  
Project set-up

5





## Water reuse

**Big issue in the food industry due to:**

- Decreasing availability of good process water
- Increasing costs of production and treatment of process (waste) water
- Growing emphasize on sustainability and resource recovery
- Risk mitigation



**Increasing European demand for robust and economic technologies in water reuse schemes**



*Dutch food industry annual water consumption exceeds 270 million m<sup>3</sup> (CBS, 2016)<sup>1</sup>*

<sup>1</sup> <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82883NED/table?fromstatweb>

6

## Contents

**01.**  
Introduction

**02.**  
Water reuse

**03.**  
Cloth  
filtration

**04.**  
Project set-up

7




## Cloth filtration technology

### Applications

- Surface water treatment
- Extensive phosphate removal

### References

- Steel industry:
  - Pre-treatment before RO water reuse system
  - Inorganic wastewater
  - Chemical coagulation (PAC + Polymer) & cloth filtration
  - NTU & SS removal

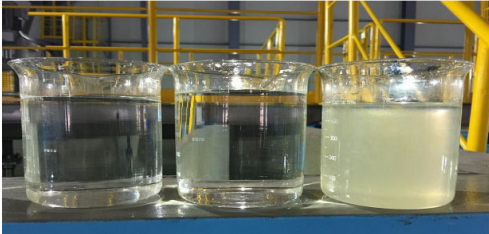



Figure 1 – Cloth filtration plant with chemical coagulation at Hyundai Steel (Dang-jin, South-Korea).  
 Below from left to right: raw water, treated water and backwash water.

8

Logo of the European Union and VIDA (value-added innovation in food chains) are located in the top right corner.

### Cloth filtration operating principle

- Outside in filtration
- Pile cloth fibre media in cassettes
- Mounted in partly or fully submerged drumfilter
- Accumulation of pollutants
- Automatically backwash (vacuum cleaner principle)



A 3D perspective rendering of a drum filter system. It features a large horizontal drum with a central shaft, surrounded by several smaller drums. The system is mounted on a concrete base. A central collection point is visible where filtered liquid is gathered.

9



Logo of the European Union and VIDA (value-added innovation in food chains) are located in the top right corner.

### Cloth filtration operating principle



Two photographs illustrating the cloth filtration process. The left image shows a filter cassette submerged in a tank of yellow liquid, with bubbles visible. The right image shows a white, fibrous cloth filter media mounted on a black frame, demonstrating its structure.

10

## Contents



**01.**  
Introduction

**02.**  
Water reuse

**03.**  
Cloth filtration

**04.**  
Project set-up

11

## Project set-up

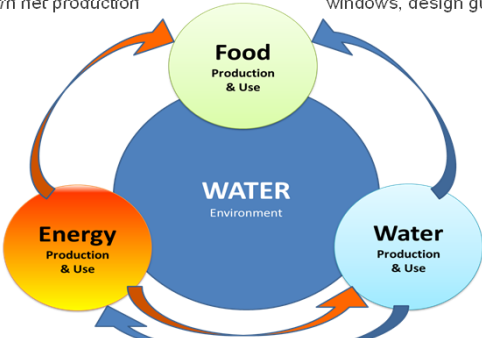
**Aim: demonstrating cloth filtration as a viable and economic RO pretreatment step**

*Phase 1*

- Functional testing at Leeuwarden demosite
- Getting familiar with operational parameters
- Capacity 5 m<sup>3</sup>/h net production

*Phase 2*

- Performance testing in the food sector
- Stability performance under varying operating windows, design guidelines, CAPEX, OPEX



The diagram illustrates a circular flow between three sectors: Food Production & Use (top, green circle), Energy Production & Use (left, orange circle), and Water Production & Use (right, blue circle). These three sectors are surrounded by a central blue circle labeled 'WATER Environment'. Arrows indicate a clockwise cycle: Energy Production & Use feeds into Food Production & Use, Food Production & Use feeds into Water Production & Use, and Water Production & Use feeds into Energy Production & Use. Additionally, there are bidirectional arrows between each sector and the central 'WATER Environment'.

12



**Thank you! Any questions?**



 clúster aragonés de **alimentación**

















13