

## CASE HISTORY

SEMICONDUCTOR  
SOLAR  
PHARMA  
POWER GENERATION  
FOOD & BEVERAGE  
PULP AND PAPER  
CHEMICAL  
OIL AND GAS  
MINING  
AEROSPACE AND TRANSPORT  
METAL FINISHING  
MUNICIPAL  
**GENERAL**



# Toveko Filters

Bergeå – The Environmentally-friendly Industrial Laundry

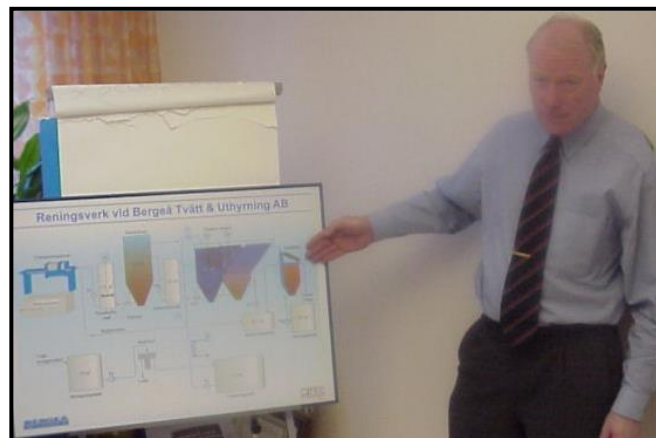


## The Client

Bergeå is a well-known industrial laundry with a diverse client base that includes steel mills, dentists, pharmacies etc. Every week Bergeå washes approximately 11,000 garments, 8,000 towels and 4,000 carpets. Nowadays washing is always performed using water, detergent and a detergent booster. Wastewater from this process contains both heavy metals and oil. Bergeå has been in business for more than 60 years and that experience has been put to good use. "Environmental awareness and the utilisation of "state of the art" technology are key factors in our ability to develop and expand the company" says Lars Brodén, Managing Director. Two areas have received particular attention; automation and environment. "It is very important to be at the forefront when it comes to protecting the environment from exposure to poisonous discharges" says Lars Brodén.

"We are officially certified in accordance with ISO 14001 and ISO 9001. Our clients are professionals and they demand the same when purchasing our services. Recently we have invested in a new complete wastewater cleaning plant. We only purchase the best systems and components. It is not the price that is the key factor when we make investments, but the outcome of the investment," says Lasse Söderberg, Production Manager. Only the best is good enough for Bergeå.

Future investment plans include extension of the plant to enable full water re-use. "The goal is that this should be completed during 2003," says Lars Brodén.



M.D. Lars Brodén shows the basic design of the new cleaning plant

## The wastewater treatment plant

Water, detergent and a detergent booster are used in the washing sequence. The wastewater from the washing machines is pumped to a reception tank from where it is transferred to an equalisation tank via a fibre sieve. The equalisation tank provides an intermediate storage capacity from where the water is pumped into the combined precipitation/flocculation/sedimentation unit, the Dunker Lamella. The overflow from which enters the Toveko CX filter for final polishing. The filter effluent is discharged into the community sewage.

The whole treatment plant was designed and built by Finnish CITEK (Creative and Intelligent Technology) and handles up to 5m<sup>3</sup>/h of effluent over 10 hours per day. The major components are:

1. Reception tank
2. Fibre sieve
3. Equalisation tank
4. Integrated precipitation/flocculation/sedimentation lamella type
5. Sand filter Toveko CX type S-75

Most of the suspended solids are separated in the lamella. The sludge goes to a thickener via a sludge buffer tank and is dosed with before dewatering in the chamber filter press. The dry sludge cake is removed off-site for final disposal.

Major components for sludge treatment are:

1. Buffer tank for sludge
2. Sludge Thickener
3. Polymer dosing station
4. Sludge flocculation tank
5. Chamber filter press



Lasse Söderberg, Production Manager, with the Toveko filter

## The Results

The filtration result is exceptionally good fulfilling the requirements set by the local community with a good margin. Below are analysis results:

| Element                          | Guaranteed max. value (mg/l) | Plant influent | Post - filter (mg/l) | Percentage reduction (%) |
|----------------------------------|------------------------------|----------------|----------------------|--------------------------|
| Pb                               | 0,075                        | 0,351          | 0,0127               | 96                       |
| Cd                               | 0,005                        | 0,00532        | 0,000624             | 88                       |
| Co                               | -                            | 0,0703         | 0,0184               | 74                       |
| Cu                               | 0,5                          | 0,934          | 0,114                | 88                       |
| Cr                               | 0,1                          | 0,12           | 0,00609              | 95                       |
| Hg                               | -                            | 0,00002        | 0,00002              | 3                        |
| Ni                               | 0,1                          | 0,249          | 0,0294               | 88                       |
| Zn                               | 0,5                          | 3,82           | 0,31                 | 92                       |
| Extracted Aliphatic hydrocarbons | -                            | 14             | 7,3                  | 48                       |
| Non-polar aliphatic hydrocarbons | 50                           | 2,1            | 0,74                 | 65                       |
| pH                               | 6-11                         | 9,22           | 6,5                  |                          |
| Conductivity (µS)                | 1500                         | 140            | 230                  |                          |

The results show very clearly how high the discharge quality is. All results are well within the required discharge quality, providing substantial feeling of “comfort”.

Since TOVEKO filters react automatically to changes in the quality of the incoming flow, they do provide an ideal solution in cases where the plant is un-manned for most of the time.

The unique sand washer is ideal for applications in which oil has to be removed since the vigorous action in the washer ensures the sand is cleaned thoroughly. Indeed, there are a substantial number of filters that have been in use for some years specifically to remove oil from wastewater.

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