

Geomembranes for Canal Lining – Rehabilitation of a Hydropower Channel

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Abstract

Over a number of decades the geosynthetics industry has developed a wide range of materials that are used for multiple canal applications to reduce seepage. Their performance compared with traditional solutions using mineral layers has been demonstrated. The choice of the appropriate material is related to different scenarios:

- New canal lining or refurbishment
- Surface conditions (roughness)
- Covered or uncovered application
- Weather conditions during installation and operation
- Cost of installation/system

White surfaced geomembranes manufactured with LLDPE were chosen for the refurbishment of the “Schütt” hydropower channel in Austria taking the above into account.

The main consideration for the refurbishment was the low water speed due to the degradation of the existing concrete liner over the service life. Thus, an exposed geosynthetic liner material providing the smoothest upper surface was the preferred choice. The geomembrane had to provide not only a flat and flexible surface, but also sufficient robustness/strength to cope with the high speed of the water during the service life. The installation of the geomembrane is given in Figure 1.



Fig. 1. Installation phase

Despite adverse weather conditions during the installation the project was delivered on time. The liner system has proven its performance. Figure 2 shows the channel in operation.



Fig. 2. Operation phase

The use of geosynthetics enabled a low carbon footprint for this system which is now delivering energy from natural resources .

The renewable energy generated from this hydropower application is used by 17,000 domestic homes. The project is located in a natural protection area Natura 2000 and is harmonized into the landscape.