

Fibre Optic Seepage monitoring system at Dar Khrofa Dam, Morocco

Early detection and precise location of leaks are important for reliable and safe monitoring of structures. Modern fibre-optic temperature measurement methods enable this monitoring along conventional fibre-optic cables. During the construction of a new dam, the glass fibres can be integrated and the temperatures within the structure can be measured.



Dar Khrofa Dam, Morocco

Based on the distributed fibre optic temperature measurements and the heat-pulse-method, hybrid fibre optic cable was installed at the Dar Khrofa earth fill dam for a seepage monitoring system. The sensor cable consists of fibres and copper strands that can be heated up for the Heat-Pulse-Method. This monitoring system can determine the zero temperature, the thermal conductivity and the temperature difference achieved by the heat-pulse. Potential temperature anomalies can be detected with a spatial resolution of 0.5 m.

For the Dar Khrofa dam, 450 m of cable were installed at the "Barrage Principal" and 270 m at the "Digue de Col". For both areas, the fibre optic cable was installed within the drainage layer along the perimeter of the dam core.

The first test and reference measurement was conducted the 25th of October 2018 in order to be able to determine any later changes of the leakage behaviour.

Further, a customized software for the monitoring system was installed, which is able to automatically monitor the temperatures at “Barrage Principal” and “Digue de Col” and to detect anomalies.



Construction of the Dar Khrofa Dam