

# Proprietary Spring Filter Technology Protects Heat Exchangers, Pumps and Chillers throughout the 124 miles of the Channel Tunnel Chilled Water Loop



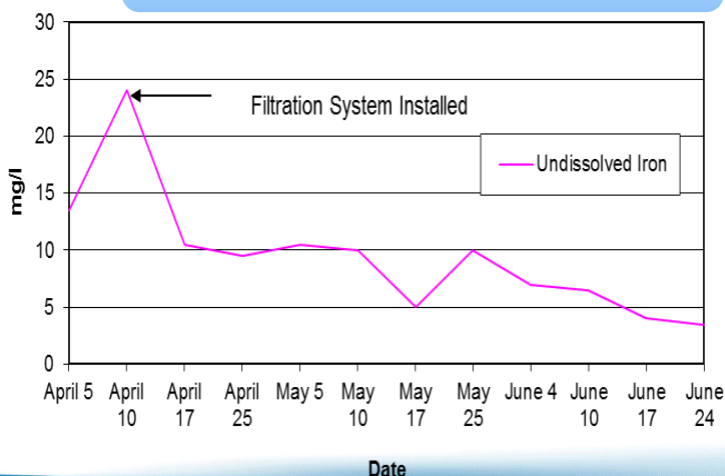
HVAC



**Proprietary ZGF Spring Filter element**



**One of Six Filter Containers  
Total Flowrate: up to 15,000 gpm**



## Customer Challenge:

Daily operation of the Channel Tunnel generates an enormous amount of heat. It is estimated that train movements, lights, and communication networks generate about 45 megawatts of heat, the equivalent power requirement for a small town.

The cooling water system required to dissipate all this heat is immense including over 124 miles of 12" and 16" chilled water pipework, running throughout the length of the tunnel and connected to cooling towers on the UK and French sides of the English Channel.

The cooling water must be filtered sufficiently to maintain suspended solids below 5 mg/l. Filtration system requirements also include the following.

1. System capable of filtering the entire flow rate of 880 l/s (~14,000 gpm).
2. Automatic, self-cleaning without the addition of an external water supply.
3. Minimum backwash volumes in that make up water is softened.
4. Minimal maintenance.
5. No introduction of oxygen into the system.

## ZGF Solution:

ZGF's partner, Cross Manufacturing Company, provided a custom system featuring patented Spring Filter elements capable of supplying **up to 15,000 gpm of filtered water on a continuous basis**. The ZGF Spring Filter elements are installed in six shipping containers.

The filtration system has been designed to satisfy all the requirements.

## Results:

- Within two months of operation, the suspended solids level was below the suspended solids specification.
- The Spring Filter elements have maintained the suspended solids in the chilled water loop below the 5 mg/l specification.
- The filtration system has operated continuously with minimal maintenance.