

PerfluorAd

cornelsen Ltd.

Treatment of PFCs in Aqueous Media



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The PFC challenge

Perfluorinated and polyfluorinated chemicals (PFCs) comprise an extensive group of closely related chemical compounds that were manufactured in large quantities over the course of several decades. Two of the best known PFCs are perfluorooctane sulfonate (PFOS) & perfluorooctanoic acid (PFOA), often also known as perfluorinated tensides (PFT).

These PFTs are fluorinated organic compounds in which the hydrogen atoms of the hydrocarbon skeleton are substituted fully by fluorine atoms. For this reason, they are among the strongest organic compounds and thus considered non-degradable because they persist for a long time in the environment. Their toxicological importance should not be underestimated.

The limits of conventional purification processes

Adsorption (generally on GAC) was the only technically feasible method to treat PFC-contaminated water. However, PFCs are typically considered to adsorb poorly as the residence time required within the GAC filters renders the process impractical

and costly.

Since 2006, Cornelsen has been exploiting its extensive experience in the design & implementation of water treatment technologies to research and trial a range of readily available adsorbents & ion exchangers for treatment of PFC contaminated water. It became obvious that development of a more efficient and economical process is required. In cooperation with the UMSICHT Fraunhofer Institute based in Oberhausen, Germany, Cornelsen has developed "PerfluorAd". PerfluorAd is a novel active ingredient for the efficient and cost effective treatment of PFC contaminated water.

The advantages of the PerfluorAd system

Unlike a conventional GAC treatment process where the treatment within cannot be influenced, Cornelsen's PerfluorAd ingredient is injected as a liquid into the flowing water within a stirring reactor vessel. The liquid form of the ingredient leads to a high degree of contact with the contaminant to which it can readily bond with and precipitate the PFC compounds. This

approach permits flexible adjustment of the quantity and application method of the additive to changing conditions within the untreated water. This permits optimisation of the process to target concentration levels and therefore optimise cost.

Typically, a relatively small GAC step is included as a buffer/polishing step downstream of the mixing reactor vessel. However, the life expectancy of the carbon will be considerable.

Economically viable treatment of PFC contaminated water.

Cornelsen Umwelttechnologie GmbH designs, builds and operates systems for the treatment of water contaminated with PFCs. These systems are mobile and are typically located on the customer premises. This is particularly applicable for PFC contaminated water from landfill seepage, waste water from fire extinguishing activities, groundwater etc.

The Cornelsen PerfluorAd treatment process can be combined with existing treatment systems to optimise performance.