



TECHNICAL BULLETIN

Activated Carbon

Emerging Pollutants - The role of activated carbons

The presence of active pharmaceutical ingredients, radio-opaque substances and endocrine disrupting chemicals in raw water sources is a relatively new emerging issue in relation to drinking water quality. However, the influence of pollutants on health and general well-being is becoming apparent with the incidence of carcinoma increasing and fertility rates being affected. A solution for the efficient removal of these substances from water use by production sites is required.

A study for the removal of these micro pollutants by powdered activated carbon has recently been undertaken by the Biberach University of Applied Science, at a full-scale water production plant in southern Germany. Jacobi Carbons were requested to be involved in the project and to develop specific activated carbon grades that met the treatment objectives.

For the fifteen key pharmaceuticals present in water, at levels higher than the detection limit, the removal rate using the powdered activated carbon AquaSorb® CB1-MW is greater than 50%. In some instances, depending on the nature of the compound to be removed, the removal rate measured is up to 97%. For the substances which are present at the highest concentrations, a comparison to other activated carbon was made; the results of which are shown in figure 1.

Extension of the study was made to investigate the possibility to remove radio-opaque substances, often used in medical investigations and industrial processes. Although the investigation has been limited to iodine containing substances, this provides a representative study, as these compounds are the most present and most persistent members of this substance group in water. Radio-opaque substances are highly polar molecules in comparison to the pharmaceuticals investigated within this study. Therefore they show significantly lower removal rates, as shown in figure 2. Nevertheless, activated carbon type, AquaSorb® CB1-MW has a significant impact on the levels of radio-opaque substances after treatment and is proven to be suitable for the removal of these compounds.

AquaSorb® CB1-MW is one product in the Jacobi Carbons CB-series of performance powdered activated carbons. If your requirement is for granular activated carbon (GAC), AquaSorb® 5000 is available for the same duty in a range of particle sizes to meet plant hydraulic characteristics.

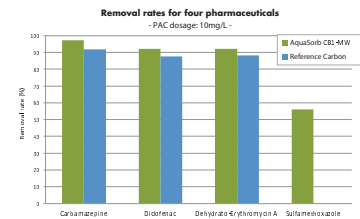


Figure 1: Removal efficiency of selected pharmaceutical products

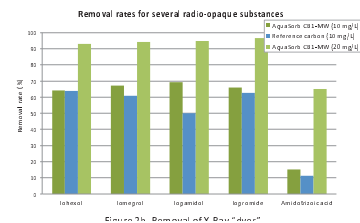


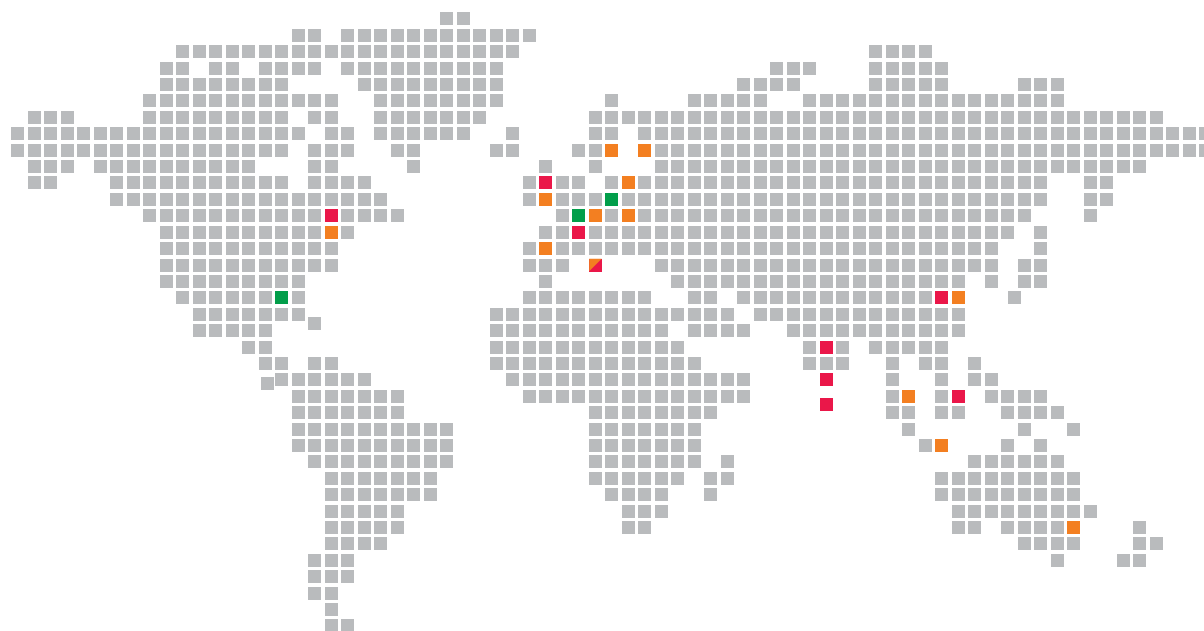
Figure 2: Removal efficiency of selected radio-opaque compounds





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