

Cross-media effects:

The dosage of 1 litre of solution requires 1 Wh. Side effects on air are not observed and not expected. As a result of the elimination of biolayers the redox potential increases in the water. Biotensides are adsorbed in the removed biolayer.

Technical considerations relevant to applicability:

Catalytic disinfection is applicable for treatment of fresh water, circulating water, cooling water and in paper slurry. It is possible to install this in new or existing plants.

Economics:

For a paper output of 10 kt/yr in a closed water loop, 5 000 – 10 000 EUR/yr are required (write-off and operating). In an open water loop the costs are higher depending on the waste water volume.

By using the technique in an existing plant in the first year the consumption of the solution is considerably higher than in the following years. The costs for one temporary treatment are about 10 000 EUR.

Driving force for implementation:

Implementation of catalytic disinfection stops formation of toxic gases and odour, especially of hydrogen sulphide, and of microbiologically induced corrosion. Use of other biocides is not necessary. In some cases it was possible to reduce the consumption of flocculants.

Cross-media effects

Reduction of harmful additives in paper processing will result in less impact on water and waste compartments. It can also be beneficial from the perspective of life cycle management. By using environmentally sound product aids, harmful substances can be prevented from ending up in the product, which in turn might be used as a raw material in recovered fibre processing.

Economics

No data available.

Driving force for implementation

Some water authorities set requirements to minimise the contribution of additives to the COD load after treatment. Requirements for reduction of releases of biocides can also be found. Biodegradable, non-toxic and non-bioaccumulating chemicals should generally be favoured whenever possible. Chemicals suspected to pose a risk to humans or the environment should be avoided, especially those with ozone-depleting effects, suspected endocrine disruptors, and CMR substances. Directive 2008/105/EC of the European Parliament and the Council of 16 December 2008 on environmental quality standards in the field of water policy [263, Directive 2008/105/EC 2008] (Daughter Directive to Article 16 of the EU Water Framework Directive) includes in its Annex II 'List of priority substances in the field of water policy' and in Annex III 'Substances subject to review for possible identification as priority substances or priority hazardous substances'. For such substances the environmental objectives of Articles 1 and 4 of the EU Water Framework Directive [264, WFD 2000/60/EC 2000] apply.

Example plants

A limited number of plants in Europe, e.g. RCF NL 1, RCF DE 6, Papierfabrik Vreden GmbH, RCF DE 7 and Hakle-Kimberly Deutschland GmbH.

Reference literature

[11, Braunsperger et al. 1996], [68, IFP 1997], [89, RFC NL 1 2010], [165, ZELLCHEMING 2008], [263, Directive 2008/105/EC 2008], [264, WFD 2000/60/EC 2000].