

Environmental Safety Assessment

Ecological Product Evaluation

of

HYGENIL ALCA

Environmental-Consulting Dr. Berger

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Ecological product evaluation for HYGENIL ALCA

Status: December 2013

Ecological assessments are carried out by Environmental Consulting Dr. Berger on the basis of ecological raw-material data. These data are generated according to official and international standard test-methods.

1.0 Application area and properties

- The product is a liquid booster to raise the alkalinity of the wash bath to assist in the removal of soiling on the fibres.
- With **HYGENIL ALCA** you obtain better results on protein and fat stains.

2.0 Product composition

- **HYGENIL ALCA** contains: below 5% polycarboxylates, further ingredients: sodium hydroxide.

3.0 Ecological evaluation of the ingredients

3.1 Alkali lyes

The product contains sodium hydroxide as alkali component.

The alkali characteristics require special evaluation: Lyes (OH⁻-ions) are neutralised through acids (H⁺-ions) without causing any damage, since water is formed. A damaging effect in sewage treatment plants is therefore only possible if an excess of acids and/or lye's results from all discharges.

Acids and lye's can cause damage at the point of discharge into a sewage channel system if the channel material contains concrete. Therefore, a fixed pH range of pH 6-10 is usually prescribed for sewage discharge.

During discharge of small quantities of this product, the sewage will not exceed these limit values if it is discharged together with sufficient quantities of other sewage. Under these conditions there is no hazard to the sewerage system. Strong peak loads must be avoided.

3.2 Polycarboxylates

The product contains no phosphates. Phosphates contribute considerably to over-fertilization (eutrophication) and therefore to water pollution, particularly in lakes, and are only partially removed in sewage treatment plants.

The product contains an organic polymer as a co-builder. Like most synthetic polymers this polymeric compound is poorly biodegradable; however, more than 90% is precipitated in sewage treatment plants. Thus only a very small portion enters surface waters while the major part remains in the sewage sludge. It does not impair the usability of the sewage sludge in agriculture.

Remaining residues in surface waters are practically inert and do not endanger the aquatic organisms. Furthermore they do not impair the use of the water for drinking water production.

4.0 Compatibility of the product in aerobic sewage treatment plants

The compatibility of the product in sewage treatment plants is dependent of its bacteria toxicity. It was shown that the respiration inhibition test with *Pseudomonas putida* (DIN 38412 part 27, corresponding to OECD-guideline 209), an acute bacteria test with a 30 minutes incubation of the test substance, is especially suited for predicting limit concentrations in sewage treatment plants.

The bacterial toxicity of the product is calculated assuming additivity of the toxic properties of the individual raw materials.

For this product the toxic threshold concentration for sewage treatment plants, which must not be exceeded, is approx. 300 mg/l.

Under normal application conditions this concentration is not attained in sewage, provided that it is diluted with other waste-water. Under unfavourable conditions, e.g. intermittent release of great quantities of the products and at the same time small sewage treatment plants, disturbances of the function of the treatment plant cannot be excluded if the above-mentioned limit-concentration is exceeded. Therefore concentrates may not be discharged into the wastewater.

These data only correspond to aerobic wastewater treatment plants.

For anaerobic wastewater treatment no data are available. If you have questions, please contact our account manager.

5.0 Overall evaluation

In Germany and in other European countries municipal and commercial sewage is cleaned in biological sewage treatment plants, before it enters into river water.

Depending on biodegradability (break down) or mechanical elimination of substances in the wastewater there remains a more or less residual load for the self-purification process in the river. For an ecological evaluation therefore information on the biodegradability and elimination are important criteria.

The degradability values of all individual organic components are added up, taking into consideration the proportions in the present product (see individual evaluation). It is then determined which degradation value would be obtained if the product as a whole was tested in an OECD test on ready biodegradability. If the limit for classification as "readily biodegradable" is exceeded, this product is classified as "well biodegradable" or better. Consequently, the BOD/COD ratio is > 60 %. However, it is still possible that some individual components contained in small quantities do not attain this limit while others contained in greater quantities exceed this limit to such an extent that they conceal the first-mentioned. Therefore, we also inform about the quantity of these smaller fractions by differentiating the term "biodegradable" in the overall evaluation.

We also provide information if the ingredients are not classified as "readily biodegradable", but are almost as well removable in sewage treatment plants as communal mixed sewage. For these fractions, the BOD/COD ratio is < 60 %.

HYGENIL ALCA is evaluated as follows:

- **Predominantly inorganic product**
- **The polymeric component is well removable in sewage treatment plants**
- **Phosphate-free**
- **Consider maximum permissible limits for pH – values !**



(Dr. Harald Berger)
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