Henkel KGaA

Department of ecology

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Ecological certificate

for

Finale liquid

Status: June 2000

Ecological product evaluation for Finale liquid

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Ecological tests are carried out in the ecological institute at Henkel according to official and international OECD test methods. The ecological institute works in accordance with the OECD guideline for "Good Laboratory Practice" (GLP).

1.1 Application area and properties

- Quick and efficient sour to the desired pH-value
- Reduction of COD-values compared to acetic acid
- Suppresses foam in press area
- Handling advantages through 200 l- drums

2.0 Product composition

- Finale liquid contains: formic acid, defoamer

3.0 Ecological evaluation of the ingredients

3.1 Organic Acids

The product contains an organic acid which is very well biodegradable into carbon dioxide and water. According to the criteria of the OECD it is regarded as easily and quickly biodegradable under environmental conditions (readily biodegradable).

Test data

- Degradation into carbon dioxide and water:

  According to the internationally valid criteria of the OECD and the test methods used here, these components are classified as readily biodegradable since the limit values and kinetics (10-days-window) according to the OECD are accomplished.

  (OECD - Guidelines for Testing of Chemicals - Ready Biodegradability: OECD 301 A-F: e.g. Closed Bottle Test, Modified OECD Screening Test and/or

Manometric Respirometry Test: EEC-Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (84/449/EEC) and 7th amendment EEC-Directive 92/69/EEC, Annex V, Part C.4: Biodegradation.)

3.2 Defoamer

Silicones are contained in a small quantity of < 0,1%. Silicones are not biodegradable, however, on account of their water-insolubility they are mainly removed in sewage treatment plants. Parts that enter the soils via sewage sludge are subject to a slow abiotic decomposition.

Silicones are also largely utilized as a foam inhibitor in the water and sewage facilities and also in sewage treatment plants. To date, ecological problems resulting from application have not been encountered.

4.0 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 waste water 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 "biodegradable". 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 %.

Finale liquid is evaluated as follows:

- **Very well biodegradable**
- **The polymeric component is well removable in sewage treatment plants. Furthermore, the remaining organic ingredients are excellently biodegradable.**
- **Consider the pH- limiting value for wastewater discharges.**

(Dr. Harald Berger)

(Dipl.Ing.K.Richterich)