

Environmental Safety Assessment

Ecological Product Evaluation

of

Toprinse clean

Environmental-Consulting Dr. Berger

February 2009

Ecological product evaluation for Toprinse clean

Status: February 2009

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

- Toprinse Clean is a neutral rinse additive, developed to accelerate the drying process on tableware for sparkling results. Toprinse Clean contains high performance wetting agents, which eliminate the need for additional hand drying.
- With proven cleaning performance and maximum environmental compatibility Toprinse Clean is certified by Nordic SWAN as an ecologically approved product, in compliance with the ecological requirements for raw material selection and packaging.
- Toprinse Clean is used in conjunction with the Ecoplus Future dispense system which monitors your warewashing operation and controls critical factors saving valuable resources like water and energy.

2.0 Product composition

- **Toprinse clean** contains: Non-ionic surfactants, solubilizer, organic acid, preservative, dye.

3.0 Ecological evaluation of the ingredients

3.1 Non-ionic Surfactants

Non-ionic surfactants on the basis of synthetic raw materials are contained. They are very well degradable (primary degradation).

The primary degradation step is followed by further degradation into carbon dioxide and water (final degradation/mineralization). According to the international criteria of the Organization for Economic Co-operation and Development (OECD) all these substances are classified as "easily and quickly degradable under real environmental conditions" (readily biodegradable).

The biodegradability of the surfactants contained in the product is in accordance with the requirements of the European Detergents Regulation No. 648/2004.

Test data

- Primary degradability (loss of washing activity, analytical detectability and surfactant characteristics): > 95 %.
- 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 easily degradable and classified as readily biodegradable since the limit values according to the OECD are accomplished.

(OECD - Guidelines for Testing of Chemicals - OECD 301 A-F: e.g. Closed Bottle Test, Modified OECD Screening Test and/or Manometric Respirometry-Test: EU-Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and 7th amendment EU-Directive 92/69/EWG, Annex V, Part C: Biodegradation.)

3.2 Solubilizer

The product contains an aromatic anionic organic compound on a petrochemical basis. There is no method available for testing of the primary biodegradability for anionic and non-ionic surfactants. For the biodegradability assessment, the mineralization into carbon dioxide and water must be used. This compound is easily and quickly degradable into carbon dioxide and water (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 easily degradable and classified as readily biodegradable since the limit values and kinetics (10 day-window) according to the OECD are accomplished.

(OECD - Guidelines for Testing of Chemicals - OECD 301 A_F: e.g. Closed Bottle Test, Modified OECD Screening Test and/or Manometric Respirometry-Test: EU-Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and 7th amendment EU-Directive 92/69/EWG, Annex V, Part C: Biodegradation.)

3.3 Organic acids

As a complexing agent and for pH-adjusting purposes the product contains naturally occurring organic acids, which are very well biodegradable into carbon

dioxide and water. According to the criteria of the OECD they are 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: EU-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 EU-Directive 92/69/EEC, Annex V, Part C.4: Biodegradation.)

3.4 Preservative

Benzoate is used as a preservative. This compound is very easily degradable into carbon dioxide and water, and according to the criteria of the OECD considered 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 easily degradable and classified as readily biodegradable since the limit values and kinetics (10 day-window) according to the OECD are accomplished.

(OECD - Guidelines for Testing of Chemicals - OECD 301 A-F: e.g. Closed Bottle Test, Modified OECD Screening Test and/or Manometric Respirometry-Test: EU-Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and 7th amendment EU-Directive 92/69/EWG, Annex V, Part C: Biodegradation.)

3.5 Auxiliary agents

The product contains less than 0,01 % of auxiliary agents, e.g. dyes. On account of the very low quantity they do not represent a hazard to the environment.

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. ... mg/l (and with this the product exhibits an exceptionally low bacterial toxicity).

Under normal application conditions this concentration is not attained in sewage. 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 %.

Toprinse clean is evaluated as follows:

- **Excellently biodegradable: aside from the very low quantity of dye all organic components fulfil the stringent requirements of the OECD for a classification as "readily biodegradable", i.e. they are readily and eventually completely biodegradable in the environment**
- **The contained preservative fulfil the stringent requirements of the OECD for a classification as "readily biodegradable", i.e. it is readily and eventually completely biodegradable in the environment**
- **Phosphate-free**
- **EDTA - / NTA - free**



(Dr. Harald Berger)
Umwelt-Consulting

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