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Managementsystem  
VTB



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according to  
DIN EN ISO 9001  
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Ecological Evaluation

of

**Eltra**



## **Ecological product evaluation for Eltra**

Status: November 2003

Ecological assessments are carried out in the ecological department of Henkel on the basis of ecological raw-material data. These data are generated according to official and international standard test-methods. The quality management-system of the ecological department is certified according to ISO 9001 and 14001.

### **1.0 Application area and properties**

- washes with proven hygiene results and bleaches at the same time
- for hygienic washing starting at 60°C
- for coloured, white textiles and synthetics, mixed fabrics and cotton
- excellent washing results starting at 60°C
- bleaches textiles safely
- active oxygen removes unpleasant smell from textiles starting at 30°C
- biologically effective on protein and heavy dirt
- for both soft and hard water, for all washing machines

### **2.0 Product composition**

- Eltra contains:  
15-30%: oxygen based bleaching agent, zeolite,  
5-15%: anionic surfactants,  
<5%: soap, non-ionic surfactants, polycarboxylates, phosphonates,  
contains enzymes (protease + amylase),  
further ingredients: antigreying agents, TAED, silicates, soda, optical brighteners,  
defoamer, dye, perfume.

### **3.0 Ecological evaluation of the ingredients**

#### **3.1 Surfactants**

The product contains soap as well as non-ionic surfactants and an anionic surfactant on petrochemical basis. These surfactants are very well degradable (primary degradation); their degradability is considerably better than required for the primary degradability of surface active substances in the EEC-Detergent directive.

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

### Test data

- Primary degradability (loss of washing activity, analytical detectability and surfactant characteristics): > 95 %.

Council Directive 73/404/EEC on the approximation of the laws of the member states relating to detergents and amendments for the biodegradability testing 82/243/EEC (anionic surfactants) and 82/242/EEC (non-ionic surfactants)

- Ultimate degradation:

According to the internationally valid criteria of the OECD and the test methods used herein, these components are easily degradable and 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 - 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 and 7th amendment Directive 92/69/EEC, Annex V, Part C: Biodegradation.)

## **3.2 Bleaching agent**

An inorganic oxygen carrier is used as a bleaching agent; it decomposes into borax, a natural frequently occurring mineral, during the washing process and/or at the latest in water. This mineral is not removed in sewage treatment plants. This product contains no available chlorine.

## **3.3 Builder**

Zeolite A, a crystalline insoluble inorganic compound, is contained as a builder.

Zeolite A (Sasil<sup>®</sup> sodium aluminosilicate) is a mineral which, among other things, softens the water and can in particular replace functions of the phosphates. Its composition resembles that of minerals, and like sand it is almost completely removed in sewage treatment plants. Henkel and, by order of the Federal Government, different university institutes as well as the German Federal Environmental Agency have thoroughly examined the ecological behaviour of Sasil<sup>®</sup>.

The results were positive and led to a legal regulation in Germany for the limitation of phosphate application in detergents. As a result of this regulation, in Germany the phosphate content in waters due to detergents was reduced from approx. 40 % to approx. 6 % (status 1989).

(Materialien 4/79: Die Prüfung des Umweltverhaltens von Natriumaluminiumsilikat Zeolith A als Phosphatersatzstoff in Wasch- und Reinigungsmitteln (15 individual reports) (Examination of the environmental behavior of sodium aluminosilicate zeolite A as a phosphate substitute in washing and cleaning agents (15 individual reports)). Federal Environmental Agency Berlin 1979 and "Standing Committee Phosphates and Water" of the specialized group Water Chemistry in the Gesellschaft Deutscher Chemiker (Association of German chemists): Compendium "Auswirkungen der Phosphathöchstmengeverordnung für Waschmittel auf Kläranlagen und in Gewässern" (Effects of the phosphate maximum quantity regulation for detergents on sewage treatment plants and in waters). Sankt Augustin: Academia Verlag Richarz, 1989).

### 3.4 Builder (phosphate substitute)

The product contains no phosphates. Phosphates contribute considerably to over-fertilisation (eutrophication) and therefore to water pollution, particularly in lakes; only 40 % of phosphates are removed in sewage treatment plants.

The product contains an organic polymer as a co-builder. The environmental behaviour of this substance was examined intensively:

Like most synthetic polymers this polymeric component is poorly degradable; however, more than 90 % is precipitated in sewage treatment plants; thus only a very small proportion enters the waters while the greatest part remains in the sewage sludge. It does not impair the usability of the sewage sludge in agriculture.

Residues in waters are practically inert and do not endanger the aquatic organisms; they do not impair the use of the water for drinking water production.

### 3.5 Mineral salts

The alkaline mineral salts are used to obtain a good washing success and good storability and to improve the free-flowing behaviour and therefore the dispensability of powder products. In nature these salts also occur in large quantities:

- Carbonates: They adjust the alkalinity, thus improving the cleansing effect.
- Sulphates: They improve the powder characteristic, e.g. the free-flowing behaviour.
- Silicates: They are used for the protection of washing machines against corrosion.

Salts with critical characteristics are not contained.

### 3.6 Phosphonic acid

Small quantities of phosphonic acid (< 0,4%) are contained which are not biodegradable. Phosphonic acids are organic compounds which contain phosphorus in a stable bond, i.e. in contrast to the inorganic phosphate the phosphorus bound in such a way is not available as a nutrient for algae and therefore as a cause of eutrophication symptoms. In conventional fully biological sewage treatment plants they are partially removed by adsorption onto the sewage sludge. Approx. 90 % are precipitated in sewage treatment plants with a phosphate precipitation stage. The residues entering the waters are subject to slow abiotic decomposition. They are nontoxic for aquatic organisms. They can complex heavy metals, but adsorb strongly at suspended materials and sediments, so that, in contrast to other organic complexing agents, a theoretically possible mobilisation of heavy metals does not occur in practice, and phosphate precipitation stages in sewage treatment plants are not disturbed.

### 3.7 Bleaching activator

A nitrogen-containing organic compound is used for activation of the oxygen. It is easily and quickly 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 (terminus technicus: readily biodegradable) since the limit values according to the OECD are exceeded.

(Closed Bottle Test and/or Modified OECD Screening Test: EEC-Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (Off. J. 196, 16.08.1967, p. 1) and 6th amendment EEC-Directive 84/449/EWG, Annex V, Part C: Biodegradation.)

### 3.8 Biological stain remover

For better removal of protein and starch-containing soil, the product contains low quantities of enzymes which also occur in the normal metabolism of living beings (bacteria, plants, animals). According to the criteria of the OECD they are 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: EEC-Directive on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and 7th amendment EEC-Directive 92/69/EWG, Annex V, Part C: Biodegradation.)

### **3.9 Auxiliary agents**

The product contains less than 0,4 % of different auxiliary agents, e.g. dyes, perfume oils etc. On account of the very low quantity, they do not represent a hazard to the environment.

### **4.0 Toxic effects on sewage treatment plant bacteria (aerobic)**

For this product the toxic threshold concentration for sewage treatment plants which must not be exceeded is approx. > 100 mg/l. Under normal application conditions this concentration is not attained in sewage.

### **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 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 %.

**Eltra is evaluated as follows:**

- **The degradation requirements of the Detergents and Cleaners Act respectively the EU Detergents Directives 82/242/EEC (non-ionic surfactants) and 82/243/EEC (anionic surfactants) are exceeded**
- **The polymeric component is well removable in sewage treatment plants. Furthermore, the remaining organic ingredients are very well biodegradable**
- **It fulfils the voluntary industrial agreement to renounce APEO**
- **Phosphate-free**
- **Chlorine-free, no formation of chlororganic compounds**
- **Consider the pH- limiting value for wastewater discharges**

  
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