

HUNTSMAN

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ATTACHMENT #35 - ENVIRONMENTAL ASSESSMENT

Date: July 24, 2003

Name & Address
of Notifier:

Huntsman Ethylenamines, Ltd.
P.O. Box 15730
7114 North Lamar Boulevard
Austin, Texas 78761

Description of
Proposed Action:

This Environmental Assessment (EA) is being provided pursuant to and in accordance with the provisions of 21 CFR 25.40 in support of a Food Contact Notification (FCN) dated July 24, 2003.

- a. Requested action: Approval of Food Contact Notification (FCN) dated July 24, 2003
- b. Need for action: The proposed food contact substance (FCS) is not already sanctioned for the intended use.
- c. Locations of use/disposal: The FCS is intended to be used as a wet-end processing additive in the manufacture of paper pulp. Specifically, the FCS will be used to facilitate the washing of brown stock in the chemical digestion process to produce pulp. The FCS would be used at a level of about 1-2 kg/1000 kg wood pulp (dry pulp basis). This unit operation (brown stock washing) occurs in the process after the chemical digestion step and prior to any bleaching steps. The additive is intended to enhance the separation of the cellulose fibers (brown stock) from the lignin, spent digestion chemicals, and water (black liquor) after the digestion process.

The notifier is the manufacturer of the FCS which will be manufactured at

The notifier is, therefore, providing detailed information on disposal from the manufacturing site based upon the notifier's actual manufacturing and disposal procedures.

However, insofar as disposal from the eventual user's site is concerned, the FCS will potentially be used by numerous pulp/paper manufacturing sites throughout the United States. The submitter does not at this time have specific information on the number or locations of these sites nor on the actual details of the manufacturing/disposal procedures at each of these sites. However, it is known that the potential users of the FCS are large paper mills that are known to operate in accordance with applicable federal, state and local municipal environmental/waste disposal laws, rules and regulations. These sites typically operate under U.S. EPA NPDES as well as state permits utilizing either on site treatment facilities of their own or discharge in local municipal treatment facilities

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Identification of the substances that are the subject of the proposed action:

The FCS substance is indicated as 1,2-Ethandiamine, N-(2-aminoethyl)-N'-[2-[(aminoethyl)amino]ethyl]-, CAS #112-57-2.

However, as also described in the FCN's Safety Narrative, as discussed with the agency during a pre-notice conference on March 4, 2003, while the chemical identity of the FCS substance is traditionally indicated as if it was a single discrete entity; namely, 1,2-Ethandiamine, N-(2-aminoethyl)-N'-[2-[(aminoethyl)amino]ethyl]-, CAS #112-57-2, commonly known as tetraethylenepentamine (TEPA), in fact TEPA is composed of four isomers as set forth in the following table

Table 1

Isomer	Typical Concentration	Maximum Concentration
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Introduction of substances into the environment.

a. Introduction of FCS into the environment as a result of the manufacture:

The FCS is currently manufactured by the notifier. There will be no additional release of the FCS from the manufacturing site due to the potential new use of the FCS as described in the FCN []. This information is considered to be proprietary marketing data. It is provided in Attachment #36 entitled "Confidential Information"

Insofar as introduction of the FCS into the environment as a result of manufacture is concerned, effluent from the manufacturing site is collected and treated prior to disposal. It is not possible to precisely quantitate the concentration of the FCS per se because waste from this site is commingled but effluent disposed is in compliance with all applicable federal, state and municipal laws, rules or regulations. The facility operates under an EPA NPDES permit. Therefore, any discharge from the facility should not constitute a risk to the environment.

b. Introduction of substances into the environment as a result of use/disposal:

1. Estimate of maximum of yearly market volume of the FCS for the proposed use based on total fifth year production estimates: [] - This information is considered to be proprietary marketing data. It is provided in Attachment #36 entitled "Confidential Information".

- 2 The percent of that amount that will enter the waste stream at the site where the FCS is used to manufacture paper and paperboard

The FCS is intended to be used as a wet end processing additive in the manufacture of paper pulp. Specifically, the FCS will be used to facilitate the washing of brown stock in the chemical digestion process to produce pulp. The FCS will be used at a level of approximately 1 – 2 kg wood pulp (dry pulp basis). This unit operation (brown stock washing) occurs in the process after the chemical digestion step and prior to any bleaching steps. The FCS is intended to enhance the separation of the cellulose fibers (brown stock) from the lignin, spent digestion chemicals, and water (black liquor) after the digestion process. The FCS is water soluble and is intended to remain with the black liquor, which is reprocessed in black liquor evaporators (water recovery) and then fed to the recovery boiler (recovery of inorganic chemicals), where the organic material including any residual FCS is burned for fuel. Any fraction of the FCS that might go forward with the cellulose fibers (pulp) is subsequently used to produce paper products and, therefore, not released into the environment from the manufacturing sites.

Based on the foregoing description of the production process involved, there is no discharge of the FCS from the paper pulp manufacturing sites.

- 3 A MSDS is provided as Attachment #1

Fate of substances released into the environment

a Physical/chemical properties:

- Density, g/ml, 20° C 0.991
- Boiling Point, 760 mm Hg, ° C 332
- Assay Wt% (TEPA + Impurities from Section II B3) 95.0 min
- Amine value, mg/KOH/g 1343
- Water, wt. % 0.5 max
- Solubility in Water miscible
- Solubility in Ethanol miscible

Melting Point of 99% Pure CAS #112-57-2. 30 °– 46°C

Vapor Pressure of 99% Pure CAS #112-57-2 < 0.01-0.1 hPa @ 20°C

Partition Coefficient (log Kow) of 99% Pure CAS #112-57-2 3.16

Solubility in Water of 99% Pure CAS #112-57-2 100% @ 20°C

b Environmental Depletion Mechanisms

Photodegradation: There is no specific photodegradation data available, however, based upon atmospheric half-life estimating software, in an assessment made, as stated in the SIDS data summary (Attachment 2), the estimated half-life of TEPA is approximately 12 hours

Biodegradation: No specific biodegradation data available but the FCS is not expected to be readily biodegradable. It is also not expected to bioaccumulate.

The basis for the conclusion that the FCS is not expected to bioaccumulate is based on: (1) The log Pow; (2) its high water solubility; (3) it is expected to be completely protonated at neutral pH

Environmental effects of released substances.

Acute Toxicity To Fish (Rainbow Trout) 96 Hour NOEC: 100 mg/l (based on study conducted by Dow Chemical Europe, June 27, 1988); 310 mg/l (cited in SIDS data summary, Attachment #2)

Acute Toxicity to *Daphnia*. 24 Hour NOEC: 32 mg/l (based on study conducted by Dow Chemical Europe, June 27, 1988); 14.6 mg/l (cited in SIDS data summary, Attachment #2)

Toxicity to Algae: EC50 2.1 – 6.8 mg/l (cited in SIDS data summary, Attachment #2);

PEC/PNEC ratios for TETA have been calculated and are lower than 1. Based on SAR it is believed that the TETA data is relevant to the FCS (TEPA) (cited in the Hazard & Exposure Information Under ICCA, Attachment #3).

Use of resources and energy

The FCS improves the yield in the manufacture of pulp, thereby having an energy and resource savings by virtue of these improved/increased process yields; that is, more pulp being produced by the same unit operation. Therefore, even though the FCS is not a direct replacement for any existing substance its use does result in environmental benefits through this more effective and efficient production of pulp/paper which, therefore, requires less raw material for the production of equivalent amounts of pulp/paper, reduces total process water and energy consumption, and reduces effluents as a result of more efficient washing of the pulp. In addition, the use of the FCS also results in capturing materials for recycle and fuel use that are otherwise released as effluents

The use of the FCS does not effect recycling. Any paper or paper precuts manufactured through the use of the FCS are, where otherwise suitable for recycling are still suitable for the production of recyclables.

Mitigation Measures

Mitigation measures to the proposed action need not be considered because no potential adverse effects have been identified

Alternatives to the proposed action:

Alternatives to the proposed action need not be considered because no potential adverse effects have been identified.

List of Preparers:

Alan Croft, Ph D., Sr. Research Associate
Anne Chappelle, Ph.D., D.A.B.T.: Toxicologist

Certification

The undersigned official certifies that the information presented is true, accurate, and complete to the best of the knowledge of Huntsman Ethyleneamines, Ltd.

7-24-03

Date



References:

- Technical Report – Dow Chemical Europe – Tetraethylenepentamine: Acute Toxicity Evaluation With *Daphnia Magna* (June 27, 1988).
- Technical Report – Dow Chemical Europe – Tetraethylenepentamine Static Acute Evaluation With *Salmo Gairdneri* (June 1988)

Attachments:

- Attachment #1 - MSDS
- Attachment #2 - SIDS Initial Assessment Report For 13th SIAM for Tetraethylenepentamine. Prepared by Dr. Oscar Hernandez, U S EPA, (Nov. 6 – 9, 2001)
- Attachment #3 - Hazard & Exposure Information Under ICCA and SIDS Summary for Tetraethylenepentamine, Prepared by the Ethyleneamines Product Stewardship Discussion Group, November 2001