

Annex XV dossier

PROPOSAL FOR IDENTIFICATION OF A SUBSTANCE AS A CMR CAT 1A OR 1B, PBT, vPvB OR A SUBSTANCE OF AN EQUIVALENT LEVEL OF CONCERN

Substance Name: imidazolidine-2-thione (2-imidazoline-2-thiol)

EC Number: 202-506-9

CAS Number: 96-45-7

Submitted by: Swedish Chemicals Agency

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ABBREVIATIONS AND ACRONYMS

The list includes abbreviations and acronyms used in this report and in its confidential annex.

CMR	Carcinogenic, Mutagenic and toxic for Reproduction
CSR	Chemical Safety Report
DNEL	Derived No Effect Level
EBDC	Ethylenebisdithiocarbamate
EC	European Commission
ECHA	European Chemicals Agency
ETU	Ethylene thiourea
EU	European Union
GRGs	General Rubber Goods
NIOSH	the US National Institute of Occupational Safety and Health
NOAEL	No Observed Adverse Effect Level
RCRs	Risk Characterisation Ratios
RMO	Risk Management Option
SVHCs	Substances of Very High Concern
US NTP	US National Toxicology Program

**PROPOSAL FOR IDENTIFICATION OF A SUBSTANCE AS A CMR CAT 1A OR 1B,
PBT, VPVB OR A SUBSTANCE OF AN EQUIVALENT LEVEL OF CONCERN**

Substance Name: imidazolidine-2-thione (imidazoline-2-thiol)

EC Number: 202-506-9

CAS Number: 96-45-7

- The substance is proposed to be identified as substance meeting the criteria of Article 57 (c) of Regulation (EC) 1907/2006¹ (REACH) owing to its classification as toxic for reproduction category 1B², which corresponds to classification as toxic for reproduction category 2³.

Summary of how the substance meets the criteria set out in Article 57 (c) of REACH (Repr. 1B)

The substance is covered by Index number 613-039-00-9 in Regulation (EC) No 1272/2008⁴ and classified in Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) as toxic for reproduction, Repr. 1B (H360D: “May damage the unborn child”). The corresponding classification in Annex VI to this regulation, part 3, Table 3.2 (the list of harmonised classification and labelling of hazardous substances from Annex I to Council Directive 67/548/EEC⁵) is Repr. Cat. 2, R61 (“May cause harm to the unborn child”).

Therefore, this classification of the substance in Regulation (EC) No 1272/2008 shows that it meets the criteria for classification as toxic for reproduction in accordance with Article 57 (c) of REACH.

Registration dossier(s) submitted for the substance? Yes

¹ REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

² Classification in accordance with Regulation (EC) No 1272/2008 Annex VI, part 3, Table 3.1 List of harmonised classification and labelling of hazardous substances.

³ Classification in accordance with Regulation (EC) No 1272/2008, Annex VI, part 3, Table 3.2 List of harmonized classification and labelling of hazardous substances (from Annex I to Council Directive 67/548/EEC).

⁴ REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

⁵ Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

PART I

JUSTIFICATION

1 IDENTITY OF THE SUBSTANCE AND PHYSICAL AND CHEMICAL PROPERTIES

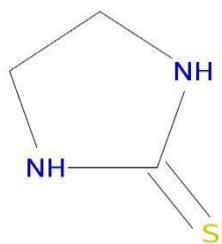
1.1 Name and other identifiers of the substance

Table 1: Substance identity

EC number:	202-506-9
EC name:	imidazolidine-2-thione*
CAS number (in the EC inventory):	96-45-7
CAS number(s):	96-45-7 Deleted CAS numbers: 96-46-8, 12261-94-8 26856-29-1, 71836-04-9 90613-75-5, 875479-38-2
CAS name:	2-imidazolidinethione
IUPAC name:	imidazolidine-2-thione
Index number in Annex VI of the CLP Regulation	613-039-00-9
Molecular formula:	C ₃ H ₆ N ₂ S
Molecular weight range:	102.1581 g/mol
Synonyms:	ethylene thiourea ETU 2-imidazoline-2-thiol

*Please note that the proposal in this dossier concerns imidazolidine-2-thione (imidazoline-2-thiol), including any of its tautomeric forms

Structural formula:



1.2 Composition of the substance

Name: imidazolidine-2-thione (imidazoline-2-thiol)

Description: -

Degree of purity: 80 – 100 % (w/w). The substance is a monoconstituent substance.

1.3 Physico-chemical properties

Not relevant for the current proposal.

2 HARMONISED CLASSIFICATION AND LABELLING

The substance is covered by Index number 613-039-00-9 in Annex VI, part 3 of Regulation (EC) No 1272/2008 as follows:

Table 2: Classification according to part 3 of Annex VI, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) of Regulation (EC) No 1272/2008.

Index No	International Chemical Identification	EC No	CAS No	Classification		Labelling		Specific Conc. Limits, M-factors
				Hazard Class and Category Code(s)	Hazard statement code(s)	Pictogram Signal Word Code(s)	Hazard statement code(s)	
613-039-00-9	ethylene thiourea; imidazolidine-2-thione; 2-imidazoline-2-thiol	202-506-9	96-45-7	Repr. 1B	H360D ***	GHS08	H360D ***	
				Acute Tox. 4 *	H302	GHS07 Dgr	H302	

* Indicates that the classification corresponds to the minimum classification for a category.

*** **In order not to lose information from the harmonised classifications for fertility and developmental effects under Directive 67/548/EEC, the classifications have been translated only for those effects classified under that Directive.**

H360D: May damage the unborn child

H302: Harmful if swallowed

Table 3: Classification according to part 3 of Annex VI, Table 3.2 (the list of harmonised classification and labelling of hazardous substances from Annex I to Council Directive 67/548/EEC) of Regulation (EC) No 1272/2008.

Index No	International Chemical Identification	EC No	CAS No	Classification	Labelling	Concentration Limits	Notes
613-039-00-9	ethylene thiourea; imidazolidine-2-thione; 2-imidazoline-2-thiol	202-506-9	96-45-7	Repr. Cat. 2; R61 Xn; R22	T R61; R22 S45; S53		E

Note E: Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'.

R61: May cause harm to the unborn child

R22: Harmful if swallowed

3 ENVIRONMENTAL FATE PROPERTIES

Not relevant.

4 HUMAN HEALTH HAZARD ASSESSMENT

See section 2 on harmonised classification and labelling.

5 ENVIRONMENTAL HAZARD ASSESSMENT

Not relevant.

6 CONCLUSIONS ON THE SVHC PROPERTIES

6.1 CMR assessment

The substance is covered by Index number 613-039-00-9 in Regulation (EC) No 1272/2008 and classified in Annex VI, part 3, Table 3.1 (the list of harmonised classification and labelling of hazardous substances) as toxic for reproduction, Repr. 1B (H360D: “May damage the unborn child”). The corresponding classification in Annex VI to this regulation, part 3, Table 3.2 (the list of harmonised classification and labelling of hazardous substances from Annex I to Council Directive 67/548/EEC) is Repr. Cat. 2, R61 (“May cause harm to the unborn child”).

Therefore, this classification of the substance in Regulation (EC) No 1272/2008 shows that it meets the criteria for classification as toxic for reproduction in accordance with Article 57 (c) of REACH.

PART II

INFORMATION ON USE, EXPOSURE, ALTERNATIVES AND RISKS

1 INFORMATION ON MANUFACTURE, IMPORT/EXPORT AND USES

ETU is prepared by the action of ethylenediamine upon carbon disulphide in aqueous alcohol (The Merck Index, 1983 cited in HSDB, 2010).

ETU was registered under REACH within the tonnage band 100 – 1000 t/y and the registered uses are as a vulcanisation agent (as such or in mixture) in the production of GRGs (General Rubber Goods) and tyres (ECHA, 2013).

See Confidential Annex, Section 2 for the total tonnage for ETU in the EU and for specific tonnages as documented in the registration dossiers.

The Use Descriptors for the identified uses of ETU reported in the registration (ECHA, 2013) are as follows:

Manufacture	
Manufacture - synthesis	<p><u>Process category (PROC):</u></p> <p>PROC 2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 1: Manufacture of substances</p>
Manufacture of master batches	<p><u>Process category (PROC):</u></p> <p>PROC 2: Use in closed, continuous process with occasional controlled exposure</p> <p>PROC 3: Use in closed batch process (synthesis or formulation)</p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 1: Manufacture of substances</p>
Formulation	

<p>Industrial formulation of a predispersed preparation of ETU</p>	<p><u>Process category (PROC):</u></p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10: Roller application or brushing</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Chemical product category (PC):</u></p> <p>PC 32: Polymer preparations and compounds</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 2: Formulation of preparations</p> <p>ERC 3: Formulation in materials</p>
<p>Industrial use as vulcanisation agent (as such or in mixture) for GRGs</p>	<p><u>Process category (PROC):</u></p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10: Roller application or brushing</p> <p>PROC 13: Treatment of articles by dipping and pouring</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Chemical product category (PC):</u></p> <p>PC 32: Polymer preparations and compounds</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 3: Formulation in materials</p> <p>ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p>
<p>Uses at Industrial Sites</p>	
<p>Industrial use - in GRG</p>	<p><u>Process category (PROC):</u></p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 7: Industrial spraying</p>

	<p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10: Roller application or brushing</p> <p>PROC 12: Use of blowing agents in the manufacture of foam</p> <p>PROC 13: Treatment of articles by dipping and pouring</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Chemical product category (PC):</u></p> <p>PC 32: Polymer preparations and compounds</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p> <p><u>Sector of end use (SU):</u></p> <p>SU 11: Manufacture of rubber products</p> <p><u>Subsequent service life relevant for that use?:</u> no</p>
<p>Industrial use - in tyres</p>	<p><u>Process category (PROC):</u></p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10: Roller application or brushing</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Chemical product category (PC):</u></p> <p>PC 32: Polymer preparations and compounds</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p> <p><u>Sector of end use (SU):</u></p> <p>SU 11: Manufacture of rubber products</p> <p><u>Subsequent service life relevant for that use?:</u> no</p>
<p>Industrial use as vulcanisation</p>	<p><u>Process category (PROC):</u></p> <p>PROC 5: Mixing or blending in batch processes for formulation of preparations and articles</p>

<p>agent (as such or in mixture) for GRGs</p>	<p>(multistage and/or significant contact)</p> <p>PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10: Roller application or brushing</p> <p>PROC 13: Treatment of articles by dipping and pouring</p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Chemical product category (PC):</u></p> <p>PC 32: Polymer preparations and compounds</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 3: Formulation in materials</p> <p>ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p> <p><u>Sector of end use (SU):</u></p> <p>SU 11: Manufacture of rubber products</p> <p><u>Subsequent service life relevant for that use?:</u> yes</p>
<p>Article Service Life</p>	
<p>Manufacture - synthesis</p>	<p><u>Environmental release category (ERC):</u></p> <p>ERC 1: Manufacture of substances</p> <p><u>Article category related to subsequent service life:</u></p> <p>AC 10: Rubber articles</p>
<p>Industrial use as vulcanisation agent (as such or in mixture) for GRGs</p>	<p><u>Process category (PROC):</u></p> <p>PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>PROC 21: Low energy manipulation of substances bound in materials and/or articles</p> <p><u>Environmental release category (ERC):</u></p> <p>ERC 3: Formulation in materials</p> <p>ERC 6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers</p> <p><u>Article category related to subsequent service life:</u></p> <p>AC 1: Vehicles</p> <p>AC 2: Machinery, mechanical appliances, electrical/electronic articles</p> <p>AC 10: Rubber articles</p>

The following uses were cited for ETU in the US NTP (2011): *“Ethylene thiourea is used primarily as an accelerator for vulcanizing polychloroprene (neoprene) and polyacrylate rubbers (IARC 1974, 2001, HSDB 2009). Neoprene rubbers are used almost exclusively in industrial applications, including industrial and mechanical goods, automotive products, wire and cable production, construction, and adhesives (IARC 1974). Polyacrylate rubbers are used in products such as seals, o-rings, and gaskets for automotive and aircraft applications. Ethylene thiourea is also used in electroplating baths, as an intermediate in antioxidant production, and in dyes, pharmaceuticals, and synthetic resins”*.

In a 2012 project report titled “Survey and health assessment of thiourea compounds in chloroprene rubber” from the Danish Environmental Protection Agency, the following applications for neoprene rubber were reported:

“Chloroprene rubber, which is also known as “neoprene”, is a synthetic rubber that is used for both technical and consumer products. Typically, chloroprene rubber with a cell structure that makes the material heat-insulating is used in consumer products, and this study indicates that relatively few different types of chloroprene rubber are used for consumer products. A wide range of consumer products made of chloroprene rubber are marketed in Denmark. The main application areas are water sports products and other leisure activity products such as wetsuits, trunks, hoods, gloves and socks, and waders and boots. Chloroprene rubber is also used for many types of bandages and corsets, and as a lining in many types of leisure sandals. The use of these types of products causes the skin to be in prolonged contact with the chloroprene rubber. Chloroprene rubber is also used in a variety of products typically in short-term contact with the skin, such as bags and pouches for various purposes, aprons, balls, tea cups and storage bags. The use of chloroprene rubber for these purposes appears to be increasing. Some jackets and gloves which claim to contain “neoprene” actually contain chloroprene rubber-like textiles” (DK EPA, 2012).

Information on the total use of ETU in the Nordic countries from the SPIN database⁶ is as follows

Country	Year	No. of preparations	Tonnes
Sweden (SE)	2011	9	10
	2010	8	<0.1
	2009	6	<0.1
	2008	3	<0.1
Denmark (DK)	2011	18	<0.1
	2010	31	0.9
	2009	30	0.9
	2008	32	1
Finland (FI)	2011	confidential	confidential
	2010	<i>idem</i>	<i>idem</i>
	2009	4	0.2
	2008	4	0.9
Norway (NO)	2011	data not available	data not available
	2010	<i>idem</i>	<i>idem</i>
	2009	<i>idem</i>	<i>idem</i>
	2008	6	0.2

2 CURRENT KNOWLEDGE ON ALTERNATIVES

A practical alternative to ETU is in the pipeline of MLPC International. Already in the beginning of 2012, the company presented a preferred replacement for ETU⁷, which is claimed to be safer, and

⁶ SPIN database. Substances in Preparations In Nordic countries. <http://90.184.2.100/DotNetNuke/default.aspx>, accessed 2013-05-28.

⁷ MLPC International develop first viable alternative to the ETU rubber accelerator. 03 February 2012. <http://hubronspeciality.com/2012/02/mlpc-international-develop-first-viable-alternative-to-the-etu-rubber-accelerator/>, last accessed 2013-05-29.

with better properties and productivity than that of ETU⁸. Another company, PMC Rubber Chemicals India Pvt Ltd., markets a product composed of tetramethyl thiuram monosulphide as having better processing safety and similar curing activity as ETU⁹.

A consortium including European SME (Small and Medium Enterprises) synthetic rubber manufactures and association groups (like European Tyre and Rubber Manufacturer's Association (ETRMA)) initiated the "SafeRubber" project with an aim to develop a safer alternative replacement for thiourea based accelerators in the production process of chloroprene rubber with a particular focus on ETU. This project has also received funding from European Community's 7th Framework Programme. The project's progress was scheduled to be presented in the International Rubber Conference in Paris, 20-22 March 2013¹⁰.

3 RISK-RELATED INFORMATION

Oral, inhalation, and dermal contact are the routes of potential human exposure to ETU (HSDB, 2010). Thiourea-based accelerators, primarily ETU, are used in the vulcanisation of polychloroprene rubber, as it produces the highest performance rubber cure system (SafeRubber, 2013). Accelerators mostly account for 0.2 – 1% of the total weight of the raw material for rubber (DK EPA, 2012). During the curing process ETU is converted to other compounds and only trace amounts remain in the cured rubber products (IARC, 1974 cited in NTP 2011). ETU is also an environmental degradation product, a metabolite, and an impurity of ethylenebisdithiocarbamate (EBDC) fungicides like mancozeb, maneb, and zineb (IARC, 2001).

DNELs (Derived No Effect Levels) have been derived for ETU by the registrant based on thyroid effects (since these were the critical effects, observed at lower experimental doses). A NOAEL (No Observed Adverse Effect Level) of 1.7 mg/kg bw/d for thyroid toxicity from an oral repeated dose 90-day toxicity study in rats (Freudenthal et al., 1977) was used to derive DNELs for consumers and workers. The DNELs for long-term systemic effects of ETU to the general population are 0.0085 mg/kg bw/d via oral route, 0.85 mg/kg bw/d via dermal route, and 0.3 mg/m³ via inhalation route. The DNELs for long-term systemic effects of ETU to workers are 1.2 mg/m³ via inhalation route and 1.7 mg/kg bw/d via dermal route.

Worker Exposure

According to a national survey by NIOSH from 1981 to 1983, approximately 10,749 industrial workers in the US were potentially exposed to ETU (NIOSH, 1990 cited in NTP, 2011). In the UK,

⁸ Presentation by Yarzabal I. MLPC International. Available online at: <http://www.docin.com/p-598031112.html> (Chinese version) last accessed 2013-05-29.

⁹ PMC Rubber Chemicals India Private Limited. Product Data Sheet. http://www.pmc-rc.com/PDS/PMC%20PDS%20ACCICURE%20MS%20_06.pdf, last accessed 2013-05-29.

¹⁰ International Rubber Conference, March 20-22, 2013. http://www.irc2013.com/ressources/pages/PROGRAMME-ENTIER_IRC_2.pdf, last accessed 2013-05-29.

“Samples taken in an ethylene thiourea manufacturing facility in 1976 found concentrations in personal air samples of up to 330 $\mu\text{g}/\text{m}^3$ and background levels in the range of 10 to 240 $\mu\text{g}/\text{m}^3$ (Smith 1984). In a second ethylene thiourea manufacturing facility, sampled in 1980, concentrations in personal samplers ranged from 120 to 160 $\mu\text{g}/\text{m}^3$ ” (NTP, 2011).

During occupational exposure, powdered ETU can quickly reach a harmful concentration to pose an inhalation risk on spraying or when dispersed (ICSC, 2005).

A number of the PROCs reported in the registrations of ETU (see Section 1) indicate potential for exposure of workers (eg. PROCs 5, 7, 10, 13, 14).

See Confidential Annex, Section 2 for Risk Characterisation Ratios documented by the registrant in the Chemical Safety Report.

Consumer Exposure

The following chloroprene rubber products from the Danish market were evaluated for the migration of thiourea compounds: T-shirt, socks, bathing shoes, full-length and short wetsuit for kids; flip-flop and sport sandals for adults, wrist brace, elbow and thigh support, kayaking gloves and hood, and sleeve for I-PAD. *“Surprisingly, ETU was not found in any of the materials. There are two possible explanations: either ETU was not used as an accelerator in any of the studied products, or ETU may degrade through the polymerization of the chloroprene rubber so that it is present in the finished material in concentrations below the detection limit”*, which was 2 mg/kg (DK EPA, 2012).

Since ETU is a metabolite of EBDC fungicides, a group of widely used pesticides, it is found in food products which thus contribute to the exposure of the general population. This exposure is however not relevant under the scope of REACH. ETU has eg. been detected in beer (0.026 – 0.07 ppm), wine (0.037 ppm) and cigarette smoke (16 $\mu\text{g}/\text{gm}$ tobacco). In samples of pears and lamb’s lettuce from German market, ETU was found at 0.205 ppm and 0.367 ppm, respectively. (NTP 2011).

There are thus no indications for exposure, and risk, for consumers using rubber goods, which were produced using ETU. The general population is exposed to low amounts of ETU via food products, however the origin of ETU is from pesticides and thus not within the scope of REACH.

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