

EXPOSURE SCENARIOS

ISOPA communication in the supply chain on
Aromatic Diisocyanates (MDI & TDI) & Polyols



02 July 2014

TABLE OF CONTENT

INTRODUCTION	4
SUBSTANCES COVERED	5
PRODUCTS COVERED	5
PU USE DESCRIPTORS	6
MANUFACTURE OF CHEMICALS [SU3]/[SU8] [SU9]	8
USE OF MDI/TDI/POLYOLS AS INTERMEDIATE FOR MANUFACTURING OTHER SUBSTANCES [SU3]/[SU8/9]	9
FORMULATING, REPACKAGING & DISTRIBUTION [SU3]/[SU10]	10
FLEXIBLE FOAM INDUSTRY USE [SU3]	11
RIGID FOAM INDUSTRY USE [SU3]	12
RIGID FOAM PROFESSIONAL USE [SU22]	13
RIGID FOAM CONSUMER USE [SU21]	14
COATINGS INDUSTRY USE [SU3]	15
COATINGS PROFESSIONAL USE [SU22]	16
COATINGS CONSUMER USE [SU21]	16
ADHESIVES & SEALANTS INDUSTRY USE [SU3]	17
ADHESIVES & SEALANTS PROFESSIONAL USE [SU22]	18
ADHESIVES & SEALANTS CONSUMER USE [SU21]	18
ELASTOMERS, TPU, POLYAMIDE, POLYIMIDE & SYNTHETIC FIBRES INDUSTRY USE [SU3]	19
COMPOSITE MATERIAL BASED ON WOOD/MINERAL/NATURAL FIBRES INDUSTRY USE [SU3]	20
OTHER COMPOSITE MATERIAL INDUSTRY USE [SU3]	21
OTHER COMPOSITE MATERIAL PROFESSIONAL USE [SU22]	24
FOUNDRY INDUSTRY USE [SU3] TABLE 19: FOUNDRY APPLICATIONS	22
ANNEX 1 – COMMUNICATION TO REACH CONSORTIUM REGARDING THE PROPOSED USE DESCRIPTORS.	25

Version	Revision Date	Revisions
0	05.10.09	
1	18.11.09	Added ERC3 to Table 3 [Formulating] Added ERC2 & 3 to Table 4/5/8/11/14/15/16/18 [SU 3 Flexible/Rigids/Coating/Adhesives/ Elastomers & TPU Composites/Other Composites/Foundry] Removed PROC 9 from Table 2 [SU 8/9 Manufacturing] Removed PC 10 from Consumer uses , since no more available in R12Draft Version 2.0 07.11.09 Updated Introduction and PU Use Descriptor text Added Section "Substances covered"
2	04.12.09	Deleted PROC 6 calendaring for Elastomers & TPU
3	19.01.10	Added polyamide, polyimide, synthetic fibres to title of table 14 Added Resin Manufacturing to Formulation Title/Table 3 Added ERC 6c for Formulation (Table 3) Updating PROC description to cover Resin Manufacturers exposure scenario's (table 3) Adapted Definitions under A, B and C on page 6
4	04.03.10	Deleted PROC 9 for professional use coatings and adhesives, since no

		"dedicated" filling lines are expected to be available for this use and filling operations are covered under PROC8a.
5	25.05.10	Delete PROC 9 for professional use of coatings and adhesives
6	02.07.10	General Update
		Pg 7 : Text on Group A and C
		Added new ES/table : "Use of MDI/TDI/Polyol as intermediate to Manufacturing of other substances"
		Added footnote for SPERC according to CEPE's UD to table 9 Coatings Industrial uses
		Changed PROC 24 in PROC 0a in Table 2
		Changed PROC 7 in table 16 into PROC0a [Cleaning Blender, including high pressure] and PROC0b [cleaning production area with high pressure air]
		Replaced PROC10 [cleaning with brush] for composite wood with PROC0c
7	28.02.11	<p>General update, following revision of the CSRs:</p> <ul style="list-style-type: none"> - Changed sawing to at sawing stations for PROC2 & 4 for Flexible, Rigids and Composite Wood/... - Table 5 Flexibles: Added PROC 7 - Added "& manufacturing of other Polymers" to Elastomers, TPU, Polyamide, Polyimide, Synthetic Fibres - Table 16: Added "Activities close to formerline" for PROC4 - Table 19 Foundry: Updated Use Descriptor to be aligned with Foundry industry association: added PROC4 and PROC14, updated PROC5 -
8	09.05.13	<p>General Update, following CoRAP review Estonia:</p> <ul style="list-style-type: none"> - Define ES numbers in line with CSR - Change PROC0a for ES1 & 9 into PROC24 - Change PROC0b for ES 9 into PROC7 - Change PROC0c for ES9 into PROC10 - Delete PROC4 and move activities covered to PROC2 and use data from deleted PROC4 for PROC2 - Add Professional use for ES9 - Add PROC10 to ES5,8 & 11 - Add PROC11 to all ES, except ES1,2&3 - Add PROC4 & PROC7 for ES11 industrial use - Use only 1 ERC per ES - Add PROC 8b for all professional uses - For all PROC8a & 8b include transfer of solid MDI

Introduction

The REACH Regulation entered into force on June 1st 2007. REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals and will replace about 40 current items of legislation.

The stated aims of REACH are to:

- Improve the protection of human health and the environment from the risks that can be posed by chemicals;
- Enhance the competitiveness of the EU chemicals industry, a key sector for the economy of the EU;
- Promote alternative methods for the assessment of hazards of substances;
- Ensure the free circulation of substances on the internal market of the European Union.

REACH requires any Legal entity manufacturing in and/or importing into the EEA to register the chemical substances to which REACH applies when the volume is at or above 1 tonne per year. Registration applies to new and existing or phase-in substances and has to be done with the European Chemicals Agency in Helsinki.

- Phase-in substances can benefit from delayed registration requirements: The first step was for each manufacturer/importer to submit a pre-registration to the Agency in the period 1/06/2008 to 30/11/2008. The Agency has then published a list of pre-registered substances. All manufacturers/importers who notified their intention to register the same substance will participate in the Substance Information Exchange Form (SIEF)
- The second step will be the submission of a registration dossier for each substance according to the following timetable and volume band of the manufactured and/or imported substance:
 - 30/11/2010 - More than 1.000 tons per year (plus CMR Cat 1 or 2 more than 1 ton/year or R50-53 more than 100 ton/year)
 - 31/05/2013 - More than 100 tons per year
 - 31/05/2018 - More than 1 ton per year

The purpose of this document is to confirm the currently identified uses of Methylene diphenyldiisocyanate (MDI), Toluene diisocyanate (TDI) and associated polyols for applications, which ISOPA members will endeavour to support in their substance registrations. The identified end uses are the result of an extensive two step information exchange process:

- An initial alignment of uses between ISOPA and Polyurethane Downstream Industry Associations
- A communication between ISOPA members and their downstream users which followed in a re-alignment of the identified uses.

Under REACH, an exposure scenario consists of the combination of four elements: substance properties, product properties, operational conditions (conditions of use) and risk management measures.

Substances covered

ISOPA members will register all the manufactured/imported MDI, TDI and polyol substances and their precursors that are subject to the registration requirements of REACH (see details Title II: "Registration of substances" of Regulation (EC) No 1907/2006). Typical examples are: TDI 80, 4,4'-MDI and polyols used for the manufacture of rigid insulation foam.

MDI/TDI Exceptions

Some prepolymeric/polymeric MDI/TDI substances meet the definition of polymers under REACH. As such, these substances are exempt from registration requirements under Title II of Regulation (EC) No 1907/2006. Therefore END-USE communication and Use Descriptors on these substances are strictly spoken not required.

However, as these prepolymeric/polymeric MDI/TDI substances meet the criteria for classification as dangerous, they are still subject - amongst others - to Title IV - "Information in the Supply Chain" - of REACH (Article 31). In practical terms it means that the supplier shall provide the recipient of the substance in its own or in a preparation with a safety data sheet, compiled in accordance with Annex II.

Polyol Exceptions

A large number of **polyether and ester polyols** also meet the definition of polymers under REACH. These "polymeric" polyols are equally exempt from registration requirements under Title II of Regulation (EC) No 1907/2006 and from the END-USE communication process. Polyols used in Flexible foam, Coatings, Adhesives and TPU applications are typical examples of "polymeric" polyols. However, the polymer definition should always be checked on case by case basis.

The main difference with "polymeric MDI" is that the "polymeric polyols" do not meet the criteria for registration as dangerous, hence an e-SDS is not strictly required and when it is provided its content and quality will be more subject to the individual suppliers' preferences.

Products covered

The Supply Chain communication with Downstream Users is done at the commercial product level. The commercial isocyanates and polyols can be substances on their own or preparations containing one or more substances that are subject to registration.

On the other hand, the registration dossier preparations are done at the substance level but the test data will be applicable to all products containing these substances or containing similar substances (read across). Thus test data obtained for the MDI/TDI/polyol substances will be applicable at large to prepolymer/polymeric MDI/TDI/polyol substances, respectively.

Since Responsible Care has always been of utmost importance to the ISOPA members, the Downstream Users can rest assured that the SDSs of prepolymer/polymeric MDI/TDI/polyol substances will be

extended equally with the appropriate Exposure Scenarios and Risk Management Measures in order to cover all worst case scenarios as it will be derived from the registration of the MDI/TDI/polyol substances that are subject to Title II of REACH.

This way, ISOPA members can be assured that:

- All MDI/TDI/polyol products are covered and can be used in a safe way, even if it is not strictly required to demonstrate safe use under REACH;
- All MDI/TDI/polyol products will be treated in a harmonised way regarding the communication in Safety Data Sheets, which will include requirements for safe use and best practise/product stewardship guidance.

PU Use Descriptors

Manufacturers/Importers (M/I) of chemicals, i.e. suppliers and formulators, as well as Downstream Users (DU), i.e. our customers, are mutually interested in having available exposure scenarios covering the use of substances in the PU supply chain that are based on MDI, TDI and polyols. To support M/I (substance registrants) in preparing their chemical safety assessments and reports, ISOPA has been communicating with PU Downstream Industry Associations and with the individual downstream users. As a result ISOPA have defined their identified uses according to the Use Descriptor System recommended by ECHA¹ in support of consistency of communication of uses in the supply chain. The supported uses have also been reviewed by the contractor who will produce the Generic Exposure Scenario's and Chemical Safety Reports. This alignment of uses has been an ongoing iterative process with Downstream User associations and taking account of individual customer input and new guidance from ECHA, e.g. latest update of R12 Guidance Version 2, 26.03.2010. [Link: http://guidance.echa.europa.eu/guidance4_en.htm]

The Use Descriptors have been developed by application sectors and for all exposure scenarios where the substance is likely still to be present at levels > 0.1%, e.g. excluding uses once the PU foam article is produced.

You can access the related tables directly from the respective line in the Table of Content above.

If you are a user of any of the covered substances and you do not agree with the Use Descriptors of your application, we urge you to contact your trade/industry association. If your trade/industry association shares your view, we recommend to describe the discrepancy in the template provided in Annex 1 and send it to the ISOPA Office Manager [kde@isopa.org].

ISOPA has developed also a position paper explaining why certain Use Descriptors have or have not been taken into account or how ISOPA interprets certain Use Descriptors. It is recommended to first read this document before contacting your trade/industry association.

[Link: [REACH Communication in the supply chain - ISOPA response to trade associations](#)]

According to ECHA Guidance document on Use Descriptors [R12 Version 2, 26.03.2010] there are 3 Main Sectors of Use [SU 3, 22 & 21] which represent the minimum level of detail required for a registrant

¹ Chapter R12: Use Descriptors, draft version 2.0 June 2009

to provide as a description for the sector of use. A second optional set of use descriptors is available and are meant to describe more specifically the sector of use. ISOPA however, considers these sectors of use to be covered under [SU3] [industrial uses], except for SU10, unless in future there is a clear need to describe a certain sector of use.

The identified end uses have been grouped as following:

- A. **1/2. Chemicals Manufacturing uses [SU3 - SU8/9]:** This is only of relevance to the manufacturers of MDI, TDI and polyols, e.g. members of ISOPA .
- 3. Chemical Manufacturing uses [SU3 – SU8/9]:** This refers to the manufacturers or downstream users of MDI/TDI/Polyols which will use these substances as an intermediate for the manufacturing of another substances or (pre)polymers.
- B. **Formulating uses [SU3 - SU10]:** This is only of relevance to industrial formulators of preparations (e.g. system houses) to describe their uses of the substances. “Formulating” may also be relevant for producers of modified isocyanates (e.g. specialised system houses and resin makers). In the latter case, parties should consider whether they are manufacturers themselves of substances and have REACH registration obligations. - It is not relevant to downstream users that self-formulate preparations for internal consumption for manufacturing PU articles. These self-formulators fall under SU3.
- C. **1. Industrial [SU3], 2. Professional [SU22] and 3. Consumer [SU21] end-uses:** Users of MDI, TDI, polyol and formulated (e.g. polyol) preparations who manufacture themselves PU products/articles, i.e. the “common” downstream user in PU industry. The uses have been grouped by industry sector: Flexible Foam, Rigid Foam, Coatings, Adhesives & Sealants, Elastomers & TPU, Composite Materials made from wood/natural/mineral fibres, Other Composite Materials, and Foundry Industries.

Where appropriate, separate uses have been defined for Industrial, Professional and Consumer users.

Table 1: ISOPA Sectors of Use (SU) based on Use Descriptor System

Group	SU Descriptor	Sectors of Use	Description
A1	[SU3]/[SU8]	Manufacture of Chemicals	Manufacture of MDI, TDI , polyols
A2	[SU3]/[SU9]	Manufacture of Chemicals	Manufacture of MDI, TDI, polyols
A3	[SU3]/[SU8 / SU9]	Manufacture of Chemicals	Manufacturing of other substances or prepolymers [use of MDI, TDI, polyols as intermediate]
B	[SU3]/[SU10]	Formulation	Formulation of preparations and/or re-packaging
C1	[SU3] ²	Industrial uses	End uses of substances as such or preparations at industrial sites
C2	[SU22]	Professional uses	Public Domain (craftsmen)
C3	[SU21]	Consumer uses	Private Households (General Public)

² **SU3** (Industrial manufacture) may include: SU2b, SU11, SU12, SU13, SU16, SU17, SU18, SU19, SU20, SU23 applications.

SU22 (Public domain – e.g. craftsmen) may include: SU2, SU10, SU12, and SU13. We consider all this non-main SU descriptors as covered by the main SU descriptors.

ES1: Manufacture of Chemicals [SU3]/[SU8] [SU9]

ONLY APPLICABLE FOR SYNTHESIS OF MDI/TDI/POLYOLS, NOT FOR DOWNSTREAM USES OF MDI/TDI/POLYOLS FOR MAKING PU PRODUCTS

Table 2: Chemical manufacturing of Methylene diphenyldiisocyanate (MDI), Toluene diisocyanate (TDI) and polyols for PU applications

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³	Environmental Category	Article Category
Industrial Use - Manufacturing	SU 3/ SU8-SU9	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC1 - Manufacture of Chemicals	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment breaks)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. during use, sampling, maintenance, equipment breaks)			
		PROC5 -Open Mixing ⁴			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging) ⁵			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging)			
		PROC 15 - Laboratory use			
		PROC24 - Removal of solidified materials by mechanical means in containers, vessels, blenders ⁶			

³ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

⁴ Not applicable for MDI and TDI

⁵ Not applicable for TDI

⁶ Only applicable for MDI

ES2: Use of MDI/TDI/Polyols as Intermediate for Manufacturing other Substances [SU3]/[SU8/9]

Table 3: Use as intermediate

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ⁷	Environmental Category	Article Category
Industrial Use – Manufacturing use as intermediate	SU3/ SU8- SU9	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging via pipeline, filtering, sieving, discharging, storage)	Not Applicable	ERC6a – Use of intermediates	Not Applicable
		PROC2 - Enclosed continuous processes (mixing, heating refluxion, distillation) with occasional exposure (e.g. during sampling, charging, discharging, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes (mixing, heating refluxion, distillation) with occasional exposure (e.g. during sampling, waste collection & transfer, charging, discharging, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes (mixing, heating refluxion, distillation, filtering, waste collection & transfer) with opportunity for exposure (e.g. during use, sampling, maintenance, equipment breaks)			
		PROC5 - Open processes (mixing)			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing) ⁸			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing)			
		PROC9 - Filling operations small containers			
		PROC15 - Laboratory use			

⁷ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

⁸ Not applicable for TDI

ES3: Formulating, Repackaging & Distribution [SU3]/[SU10] - ONLY APPLICABLE TO INDUSTRIAL FORMULATORS, PACKAGERS AND DISTRIBUTORS THAT DO NOT MANUFACTURE PU ARTICLES

Table 4: Physical reformulating/repackaging for further supply downstream

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ⁹	Environmental Category	Article Category
Industrial Use - Formulating and packaging	SU3/ SU10	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging via pipeline, filtering, sieving, discharging, storage)	Not Applicable	ERC2 - Formulation of preparations	Not Applicable
		PROC2 - Enclosed continuous processes (mixing, heating refluxion, distillation) with occasional exposure (e.g. during sampling, charging, discharging, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes (mixing, heating refluxion, distillation) with occasional exposure (e.g. during sampling, waste collection & transfer, charging, discharging, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes (mixing, heating refluxion, distillation, filtering, waste collection & transfer) with opportunity for exposure (e.g. during use, sampling, maintenance, equipment breaks)			
		PROC5 - Open processes (mixing)			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing) ¹⁰			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing)			
		PROC9 - Filling operations small containers			
		PROC15 - Laboratory use			

⁹ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

¹⁰ Not applicable for TDI

ES4: Flexible Foam Industry Use [SU3]

Table 5: Flexible Foam Applications (not excluding semi-rigid or semi-flexible applications)

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ¹¹	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC6c - Production of Plastics	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. automatic or manual closed moulding, at sawing stations, sampling, charging, discharging, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. closed moulding, sawing in cabinet, blending, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. open moulding, pouring on conveyor or in box, at sawing stations, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open mixing			
		PROC7 - Spraying ¹²			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ¹²			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC14 - Pressing (non enclosed rebonding)			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

¹¹ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

¹² Not applicable for TDI

ES 5: Rigid Foam Industry Use¹³ [SU3]

Table 6: Rigid Foam Applications (not excluding semi-rigid or semi-flexible applications)

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ¹⁴	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC6c - Production of Plastics	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. automatic or manual closed moulding, at sawing stations, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. closed moulding, sawing in cabinet, blending, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. open moulding, pouring on conveyor or in box, at sawing stations, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open mixing			
		PROC7 - Spraying			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC10 - Low energy spreading (e.g. One Component Foam use)			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

¹³ Not Applicable for TDI

¹⁴ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

ES5: Rigid Foam Professional Use¹⁵ [SU22]

Table 7: Rigid Foam Applications (not excluding semi-rigid or semi-flexible applications)

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ¹⁶	Environmental Category	Article Category
Public Domain	SU22	PROC3 - Enclosed batch processes with occasional exposure (e.g. cavity filling)	Not Applicable	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. cavity filling)			
		PROC5 - Open mixing			
		PROC8a - Not Enclosed Transfer of chemicals, including solid MDI (waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing)			
		PROC10 - Low energy spreading (e.g. One Component Foam use)			
		PROC11 - Non industrial spraying			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

¹⁵ Not Applicable for TDI

¹⁶ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

ES5: Rigid Foam Consumer Use¹⁷ [SU21]

Table 8: Rigid Foam Applications (not excluding semi-rigid or semi-flexible applications)

Life Cycle Stage	Sector of Use Code	Process Category	Product Category	Environmental Category	Article Category
Private Households	SU21	Not Applicable	PC32 - Polymer Preparations and Compounds	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable

¹⁷ Not Applicable for TDI and polyols

ES6: Coatings Industry Use [SU3]

Table 9: Coatings

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ¹⁸	Environmental Category ¹⁹	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC6c - Production of Plastics &	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open Mixing			
		PROC7 - Spraying			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ²⁰			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operations small containers			
		PROC10 - Rolling or Brushing			
		PROC13 - Dipping			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ²⁰			

¹⁸ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

¹⁹ These ERC's are assumed to cover the SpERC's identified by CEPE [**SpERC M1** – Manufacture of organic solvent-borne coatings and inks & **SpERC M2** – Manufacture of organic solvent-borne coatings and inks & **SpERC M3** – Manufacture of powder coatings and inks & **SpERC M4** – Manufacture of liquid coatings and inks]

²⁰ Not applicable for TDI

ES6: Coatings Professional Use [SU22]

Table 10: Coatings

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²¹	Environmental Category	Article Category
Public Domain	SU22	PROC5 - Open Mixing	Not Applicable	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable
		PROC8a - Not Enclosed Transfer of chemicals, including solid MDI (waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ²²			
		PROC10 - Rolling or Brushing			
		PROC11 - Spraying ²²			
		PROC13 - Dipping ²²			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ²²			

ES6: Coatings Consumer Use²² [SU21]

Table 11: Coatings

Life Cycle Stage	Sector of Use Code	Process Category	Product Category	Environmental Category	Article Category
Private Households	SU21	Not Applicable	PC9a - Coatings, paints	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable

²¹ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²² Not Applicable for TDI

ES7: Adhesives & Sealants Industry Use [SU3]

Table 12: Adhesives & Sealants

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²³	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC6c - Production of Plastics to a matrix	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open Mixing			
		PROC7 - Spraying			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ²⁴			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operation			
		PROC10 - Rolling or Brushing			
		PROC13 - Dipping			
		PROC14 - Tableting, compression, extrusion, pelettisation			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ²⁴			

²³ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²⁴ Not applicable for TDI

ES7: Adhesives & Sealants Professional Use [SU22]

Table 13: Adhesives & Sealants

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁵	Environmental Category	Article Category
Public Domain	SU22	PROC4 - Open batch/continuous processes with occasional exposure (e.g. during use, maintenance/cleaning/incidental interventions)	Not Applicable	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable
		PROC5 - Open Mixing			
		PROC8a - Not Enclosed Transfer of chemicals including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ²⁶			
		PROC10 - Rolling or Brushing			
		PROC11 - Spraying ²⁶			
		PROC13 - Dipping ²⁶			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ²⁶			

ES7: Adhesives & Sealants Consumer Use²⁶ [SU21]

Table 14: Adhesives & Sealants

Life Cycle Stage	Sector of Use Code	Process Category	Product Category	Environmental Category	Article Category
Private Households	SU21	Not Applicable	PC1 - Adhesives, Sealants	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable

²⁵ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²⁶ Not Applicable for TDI

ES8: Elastomers, TPU, Polyamide, Polyimide, Synthetic Fibres & manufacturing of other polymers Industry Use [SU3]

Table 15: Elastomer, TPU, Polyamide & Polyimide Applications

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁷	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging, waste collection & transfer)	Not Applicable	ERC6c - Production of Plastics	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (e.g. during casting, other open uses, sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open Mixing			
		PROC7 - Spraying (in cabinet) ²⁸			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ²⁸			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operation			
		PROC10 - Rolling or Brushing ²⁸			
		PROC14 - Tableting, compression, extrusion, pelettisation ²⁸			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ²⁸			

²⁷ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²⁸ Not Applicable for TDI

ES9: Composite Material Based on Wood/Mineral/Natural Fibres Industry Use²⁹ [SU3]

Table 16: Composite Materials [Composite Wood, Mineral/Natural Fibres]

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³⁰	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging, blowline injections, blender operations)	Not Applicable	ERC5 - use resulting in inclusion into/onto a matrix	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during activities close to formerline & the mat, sampling, maintenance, equipment cleaning, occasional interventions/inspections at enclosed areas, at sawing stations)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC7 - Spraying - Cleaning production line area and blenders/vessels with high pressurised air)			
		PROC7 - Spraying on substrate e.g. open dry blending system			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC10 - Rolling & brushing (Cleaning with production line area with brush)			
		PROC14 - Pressing			
		PROC15 - Laboratory use			
		PROC21 - Post pressing use			
		PROC24 - Removal of solidified materials by mechanical means in containers, vessels, blenders			
PROc24 - Sawing					

²⁹ Not Applicable for TDI

³⁰ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

ES9: Composite Material Based on Wood/Mineral/Natural Fibres Professional Use³¹ [SU22]

Table 16: Composite Materials [Composite Wood, Mineral/Natural Fibres]

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³²	Environmental Category	Article Category
Industry	SU3	PROC2 - Enclosed continuous processes with occasional exposure (e.g. during activities close to formerline & the mat, sampling, maintenance, equipment cleaning, occasional interventions/inspections at enclosed areas, at sawing stations)	Not Applicable	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open Mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging) , including solid MDI			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC10 - Rolling & brushing (Cleaning with production line area with brush)			
		PROC11 Spraying (Cleaning with high pressurised air, spraying on substrate)			
		PROC14 - Pressing			
		PROC21 - Post pressing use			
		PROC24 - Removal of solidified materials by mechanical means in containers, vessels, blenders			

³¹ Not Applicable for TDI

³² Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

ES10: Foundry Industry Use³³ [SU3]

Table 19: Foundry Applications

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³⁴	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC5 - use resulting in inclusion into/onto a matrix	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions, checking quality of sand mix)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions, checking quality of sand mix)			
		PROC4 - Open batch/continuous processes with opportunity for exposure (Core-sand preparer)			
		PROC5 - Open mixing (Core-sand preparer)			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC14 - Pressing (core maker & core installer)			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

³³ Not Applicable for TDI

³⁴ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

ES11: Other Composite Material Industry & Professional Use [SU3]

Table 17: Other Composite Materials [e.g. Automotive/Aerospace composites, electrical parts, pipe repair]

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³⁵	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC5 - use resulting in inclusion into/onto a matrix	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, sawing, sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure			
		PROC5 - Open Mixing			
		PROC7 - Spraying ³⁶			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ³⁷			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC10 - Rolling & brushing ³⁶			
		PROC13 - Dipping			
		PROC14 - Pressing			
		PROC15 - Laboratory use			
PROC21 - Post pressing use ³⁶					

³⁵ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

³⁶ Not Applicable for TDI

ES11: Other Composite Material Professional Use [SU22]

Table 18: Other Composite Materials [e.g. Automotive/Aerospace composites, electrical parts, pipe repair]

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ³⁸	Environmental Category	Article Category
Public Domain	SU22	PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, sawing, sanding, maintenance, equipment cleaning, occasional interventions)	Not Applicable	ERC8c - Indoor use & ERC8f - Outdoor use	Not Applicable
		PROC3 - Enclosed batch processes with occasional exposure (e.g. during sampling, maintenance, equipment cleaning, occasional interventions)			
		PROC4 - Open batch/continuous processes with opportunity for exposure ³⁹			
		PROC5 - Open Mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals, including solid MDI (sampling, waste collection & transfer, charging, discharging) ³⁹			
		PROC10 - Rolling & brushing ³⁹			
		PROC13 - Dipping ³⁹			
		PROC14 - Pressing			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting) ³⁹			

³⁸ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

³⁹ Not applicable for TDI

