

EXPOSURE SCENARIOS

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



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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 "dedciated" 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

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: [ISOPA Position and Interpretation of Use Descriptors.pdf](#)]

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 to provide as a description for the sector of use. A second optional set of use descriptors is available and

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

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 – 8/9]:** 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 substance.
- 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 [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.

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	PROC0a – Removal of solidified materials by mechanical means in containers, vessels, blenders	Not Applicable	ERC1 - Manufacture of Chemicals & ERC6c – Industrial use of monomers for polymerisation & ERC2 - Formulation of preparations	Not Applicable
		PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)			
		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 (drum filling, sampling, waste collection & transfer, charging, discharging) ⁵			
		PROC8b - Not enclosed dedicated transfer of chemicals (drum filling, sampling, waste collection & transfer, charging, discharging)			
		PROC 15 - Laboratory use			

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

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 ⁶	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	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & 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 (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing) ⁷			
		PROC8b - Not enclosed dedicated transfer of chemicals (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing)			
		PROC9 - Filling operations small containers			
		PROC15 - Laboratory use			

⁶ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

⁷ Not applicable for TDI

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 ⁸	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 & ERC3 - Formulations in materials & ERC6c - Production of Plastics	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 (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing) ⁹			
		PROC8b - Not enclosed dedicated transfer of chemicals (drum filling, sampling, waste collection & transfer, charging, discharging, dispensing)			
		PROC9 - Filling operations small containers			
		PROC15 - Laboratory use			

⁸ Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

⁹ Not applicable for TDI

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 ¹⁰	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC6c - Production of Plastics	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. automatic or manual closed moulding, sawing, 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, open sawing, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging) ¹¹			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC14 - Pressing (non enclosed rebonding)			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

¹⁰ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

¹¹ Not applicable for TDI

Rigid Foam Industry Use¹² [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 ¹³	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC6c - Production of Plastics	Not Applicable
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. automatic or manual closed moulding, sawing, 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, open sawing, maintenance, equipment cleaning, occasional interventions)			
		PROC5 - Open mixing			
		PROC7 - Spraying			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC15 - Laboratory use			
		PROC21 - PU article treatment (e.g. demoulding, trimming, repairing, cutting)			

¹² Not Applicable for TDI

¹³ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

Rigid Foam Professional Use¹⁴ [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 ¹⁵	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 (waste collection & transfer, charging, discharging)			
		PROC10 - Low energy spreading (e.g. One Component Foam use)			
		PROC11 - Non industrial spraying			

Rigid Foam Consumer Use¹⁶ [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

¹⁴ Not Applicable for TDI

¹⁵ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

¹⁶ Not Applicable for TDI and polyols

Coatings Industry Use [SU3]

Table 9: Coatings

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ¹⁷	Environmental Category ¹⁸	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC5 - use resulting in inclusion into/onto a matrix & 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 (sampling, waste collection & transfer, charging, discharging) ¹⁹			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operations small containers			
		PROC10 - Rolling or Brushing			
		PROC13 - Dipping			
		PROC15 - Laboratory use			

¹⁷ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

¹⁸ 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]

¹⁹ Not applicable for TDI

Coatings Professional Use [SU22]

Table 10: Coatings

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁰	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 (waste collection & transfer, charging, discharging)			
		PROC10 - Rolling or Brushing			
		PROC11 - Spraying ²¹			
		PROC13 - Dipping ²¹			

Coatings Consumer Use¹⁹ [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

²⁰ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²¹ Not Applicable for TDI

Adhesives & Sealants Industry Use [SU3]

Table 12: Adhesives & Sealants

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²²	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC5 - use resulting in inclusion into/onto a matrix & 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 (sampling, waste collection & transfer, charging, discharging) ²³			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operation			
		PROC10 - Rolling or Brushing			
		PROC13 - Dipping			
		PROC14 - Tableting, compression, extrusion, pelettisation			
		PROC15 - Laboratory use			

²² Product categories are not relevant and used in exposure assessments for workers exposure , i.e. SU3 and SU22

²³ Not applicable for TDI

Adhesives & Sealants Professional Use [SU22]

Table 13: Adhesives & Sealants

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁴	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 (sampling, waste collection & transfer, charging, discharging)			
		PROC10 - Rolling or Brushing			
		PROC11 - Spraying ²⁵			
		PROC13 - Dipping ²⁵			

Adhesives & Sealants Consumer Use²³ [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

²⁴ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²⁵ Not Applicable for TDI

Elastomers, TPU, Polyamide, Polyimide & Synthetic Fibres Industry Use [SU3]

Table 15: Elastomer, TPU, Polyamide & Polyimide Applications

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁶	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	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & 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) ²⁷			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging) ²⁷			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC9 - Filling operation			
		PROC14 - Tableting, compression, extrusion, pelettisation ²⁷			
	PROC15 - Laboratory use				

²⁶ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

²⁷ Not Applicable for TDI

Composite Material Based on Wood/Mineral/Natural Fibres Industry Use²⁸ [SU3]

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

Life Cycle Stage	Sector of Use Code	Process Category	Product Category ²⁹	Environmental Category	Article Category
Industry	SU3	PROC0a – Removal of solidified materials by mechanical means in containers, vessels, blenders ³⁰	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC5 - use resulting in inclusion into/onto a matrix	Not Applicable
		PROC0b – Cleaning production line area with high pressurised air ³⁰			
		PROC0c - Cleaning with production line area with brush ³⁰			
		PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging, blowline injections, blender operations)			
		PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sawing, sampling, maintenance, equipment cleaning, occasional interventions/inspections at enclosed areas)			
		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 mat dumping, sampling, maintenance, equipment cleaning, occasional interventions at open areas)			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC14 - Pressing			
		PROC15 - Laboratory use			
PROC21 - Post pressing use					

²⁸ Not Applicable for TDI

²⁹ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

³⁰ Only Applicable for MDI

Other Composite Material Industry 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 ³¹	Environmental Category	Article Category
Industry	SU3	PROC1 - Enclosed processes & no likelihood of exposure (including enclosed sampling, waste collection & transfer, charging, discharging)	Not Applicable	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & ERC5 - use resulting in inclusion into/onto a matrix & ERC6c - Production of Plastics	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)			
		PROC5 - Open Mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging) ³²			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC13 - Dipping			
		PROC14 - Pressing			
		PROC15 - Laboratory use			

³¹ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

³² Not Applicable for TDI

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 ³³	Environmental Category	Article Category
Public Domain	SU22	PROC2 - Enclosed continuous processes with occasional exposure (e.g. during sampling, sawing, sampling, 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)			
		PROC5 - Open Mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC14 - Pressing			

³³ Product categories are not relevant and used in exposure assessments for workers exposure, i.e. SU3 and SU22

Foundry Industry Use³⁴ [SU3]

Table 19: Foundry Applications

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	ERC2 - Formulation of preparations & ERC3 - Formulations in materials & 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)			
		PROC5 - Open mixing			
		PROC8a - Not enclosed non-dedicated transfers of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC8b - Not enclosed dedicated transfer of chemicals (sampling, waste collection & transfer, charging, discharging)			
		PROC15 - Laboratory use			

³⁴ Not Applicable for TDI

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

