

LCID Example 7 - Introduction

1) Purpose of the example

This example showcases some user-friendly features for the end-users of exposure scenario information included as annex into the SDS for the mixture. The end-users are in this case industrial plastic producers using reactive resin formulations. This annex might be a solution to create REACH-compliant mixture SDSs, for small- or medium-sized companies that sell limited product lines of end use products having similar formulations, uses, and hazard profiles. Particularly for those companies who do not have a sophisticated IT SDS authoring tool and want to simplify their annexes to the mixture SDS.

It also provides a case where the lead component (for the environment), because of its low PNEC in a given compartment, drives the OCs and RMMs even though it is present at a much lower concentration than the other hazard contributing component.

The user-friendly aspects of this example include:

- Exemplification of addressing a mixture classified as both a health and environmental hazard and has two environmental components contributing to the derivation of the Lead Components, OCs and RMMs and M_{safe} value for the product
- A reference to other relevant industry safe use literature is available on-line (via a hyperlink)
- Grouping similar OCs and RMMs, for ease of comprehension and avoiding repetitive phrases
- Displays OCs and RMMs in a table format which aids in legibility and distinguishes differences in OCs and RMMs in a manner that also reduces the length of the SDS itself
- Use of terminology and descriptions of industry-specific activities familiar to the audience; these are provided together with the standard PROC phrase text as required
- Use of pictograms, that like those used in the SUMI formats

2) Mixture description

a) Information on the mixture

COMPOSITION:	Hazardous components: Chemical XXX: $\leq 25\%$; Chemical AAA: <0.5 ; Chemical YYY: $\leq 1\%$; Chemical BBB: $<1\%$ Balance is non-hazardous component
CLASSIFICATION OF THE MIXTURE:	H226: Flammable liquid and vapour H315: Causes skin irritation H319: Causes serious eye irritation. H361d: Suspected of damaging the unborn child H335: May cause respiratory irritation H372: Causes damage to organs through prolonged or repeated exposure if inhaled H412: Harmful to aquatic life with long lasting effects
USE OF THE MIXTURE:	Industrial plastic manufacturing using reactive resin formulations Life Cycle Stage: Use at industrial sites (IS) Sector of Use: Manufacture of plastic products, including

	compounding and conversion (SU12) Process Categories: <ul style="list-style-type: none"> • Manufacture or formulation in the chemical industry in closed batch process with occasional controlled exposure or processes with equivalent containment conditions (PROC3) • Mixing or blending in batch processes (PROC5) • Industrial spraying (PROC7) • Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b) • Roller application or brushing (PROC10) • Treatment of articles by dipping and pouring (PROC13) • Tableting, compression, extrusion, pelletisation, granulation (PROC14) • Use as laboratory reagent (PROC15) Environmental Category: <ul style="list-style-type: none"> • Use of reactive process regulators in polymerization processes at industrial site (inclusion or not into/onto articles (ERC6d)
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b) Hazardous substances entering in the composition of the mixture

- Only Chemical XXX contributes to the Human Health hazard classification of the mixture.
- Chemical XXX and Chemical YYY contribute to the Environmental hazard classification of the mixture and the product's M_{safe} calculation.

Substance	DNEL(s) (systemic-LT) Lowest PNEC(s) [other limit values]	CLP classification
Chemical XXX	DNELs: Workers, short-term, local effects, inhalation: 350 mg/m ³ Workers, long-term, systemic, inhalation: 100 mg/m ³ Workers, long-term, systemic, dermal: 425 mg/kg bw d PNECs: Fresh water = 0.03 mg/L Marine water = 0.02 mg/L Water intermittent releases: 0.05 mg/L Sediment (fresh water) = 0.8 mg/kg d.w. Sediment (marine water) = 0.4 mg/kg d.w. Soil = 0.2 mg/kg d.w. STP = 5 mg/L d.w.	Acute Tox. 4 H332: Harmful if inhaled. Skin Irrit. 2 H315: Causes skin irritation. Eye Irrit. 2 H319: Causes serious eye irritation. Resp. Irrit. 3 H335: May cause respiratory tract irritation Asp. Tox. 1 H304: May be fatal if swallowed and enters airways. Repr. 2 Specific effect: Suspected of damaging the unborn child fertility or the unborn child. STOT Single Exp. 3 Affected organs: Liver Route of exposure: Inhalation H372: Causes damage to liver through prolonged or repeated exposure inhalation Aquatic Chronic 3 H412: Harmful to aquatic life with long lasting effects
Chemical YYY	PNECs: STP: 0.4 mg/L Soil: 9.0 mg/kg Fresh water: 0.0007 mg/L Marine water: 0.004 mg/L Sediment (fresh water): 10 mg/kg Sediment (marine water): 9 mg/kg	Aquatic Acute 1 H400: Very toxic to aquatic life Aquatic Chronic 3 H412 Harmful to aquatic life with long lasting effects

3) Outcome of the LCID methodology

CHEMICAL XXX	Lead Component: Human Health Component also driving local effects of eye and skin irritation
CHEMICAL YYY	Lead Component: Environment

4) Operation conditions (OC) and risk management measures (RMM)

For Health, use Lead Component, Chemical XXX's OCs and RMMs

For Environment, use Chemical XXX's **and** Chemical YYY's OCs and RMMs

M_{safe} calculation = 340 kg/day (incorporating both Chemical XXX and YYY's PNECs, concentrations, and biodegradability status)

5) Consolidated OC/RMM for inclusion in the mixture safety data sheet

For Health, under OC, limit the concentration of Chemical XXX to be: up to 25%, as required under PROCs 5, 10 and 15.

For Environment, use OC and RMMs for both Chemical XXX and Chemical YYY. This is because exposure controls are different due to the differences between the chemical natures of the two relevant components. Chemical XXX is a volatile organic compound and the RMMs for safe use conditions to the environment are related to these types of compounds. Chemical YYY is an inorganic compound and therefore the OCs and RMMs are different with regards to controlling exposure. Therefore, it was determined that both OCs and RMMs for both components would be relevant to the mixture.

Example 7 - Safety Data Sheet content

Extract of relevant safe use information derived by application of the LCID methodology

Safe Use of Mixtures Information for End-users	COMPANY LOGO
Title: Industrial plastic manufacturing using reactive resin formulations	

This document is intended to communicate the conditions of safe use for the product and should always be read in combination with the product's Safety Data Sheet and labels.

General description of the process covered

Covers the use of processing formulated polymers including exposures during rolling, brushing, spraying (automatic/robotic), dipping, immersion and pouring, casting, bulk, and material/drum/batch transfers, laboratory activities, equipment maintenance, and disposal of wastes.

Life Cycle Stage:	Use at industrial sites (IS)
Sector of Use:	Manufacture of plastic products, including compounding and conversion (SU12)
Process Categories:	Manufacture or formulation in the chemical industry in closed batch process with occasional controlled exposure or processes with equivalent containment conditions (PROC3) Mixing or blending in batch processes (PROC5) Industrial spraying (PROC7) Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b) Roller application or brushing (PROC10) Treatment of articles by dipping and pouring (PROC13) Tabletting, compression, extrusion, pelletisation, granulation (PROC14) Use as laboratory reagent (PROC15)
Environmental Category:	Use of reactive process regulators in polymerization processes at industrial site (inclusion or not into/onto articles) (ERC6d)

Worker Exposure

Operational Conditions and Risk Management Measures

Before any manual handling of resins, it is strongly recommended to refer to the Safe Handling Guides webpages: [XXXXXXX](#)

Scenario Subtitle	Duration	General Ventilation	Local Exhaust Ventilation	Protective Gloves	Respiratory Protection	Comments
PROC3: Closed mould resin injection and infusion processes, using vacuum and pressure such as vacuum assisted resin transfer moulding, LP and HP-RTM, liquid compression moulding and impregnation of sewer relining sleeves/ vacuum pressure impregnation (VPI). Pressing and crosslinking of SMC/BMC compounds in closed mould	>4 hrs	Good (30%)	No	Butyl; EN 374 90%	No	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374.

Scenario Subtitle	Duration	Ventilation	Local Exhaust Ventilation	Protective Gloves	Respiratory Protection	Comments
PROC 5: Casting and mixing operations in (semi-) open container. Examples are centrifugal casting, casting of polymer concrete and artificial marble and the manufacturing of SMC / BMC/ TMC compounds, artificial marble production, etc.	>4 hrs		Yes (inhalation 90%)	Butyl; EN 374 90%	No	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Use drum pumps. Carefully pour from container. Put lids on containers immediately after use.
PROC5: Mixing liquid and solid components / into final formulated resin in blending vessels; Examples are gelcoat blending and compounding, formulation of repair putties, bonding pastes, chemical anchoring, etc	>4 hrs	Enhanced (70%)	No	Butyl; EN 374 90%	No	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Use drum pumps. Carefully pour from container. Put lids on containers immediately after use.
PROC5: Preparation of material for application and preparation of final mixture in day tank; (liquid products) - batch, indoor.	>4 hrs		Yes (inhalation 90%)	Butyl; EN 374 90%	No	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Use drum pumps. Carefully pour from container. Put lids on containers immediately after use.
PROC7: All open mould applications where resins are applied by automated spraying or by robot in a spray cabin without direct worker involvement. Examples are fiber spray-up processes, gelcoat spraying and "chop-hoop" filament winding.	>4 hrs		Yes (inhalation 90%)	Butyl; EN 374 90%	95%	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Carry out in a vented booth or extracted enclosure. Inhalation: 95 %

Scenario Subtitle	Duration	General Ventilation	Local Exhaust Ventilation	Protective Gloves	Respiratory Protection	Comments
PROC7: All open mould applications where resins are applied by automated spraying or by robot in a spray cabin without direct worker involvement. Examples are fiber spray-up processes, gelcoat spraying and "chop-hoop" filament winding.	>4 hrs	≥90%	Yes (inhalation 95%)	Gloves APF 20 95%	97.5 % powered respirator with masks (BS EN 12942), Filter Type A1 (Organic Vapours, BP>65°C), P3 filter (aerosols EN143), (APF 40). For activities >1h, a constant flow airline breathing apparatus with hoods/helmets (BS EN 14594) is recommended (APF 200)	
PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities. Equipment cleaning and maintenance, open indoor.	1 - 4 hrs		Yes (inhalation 70%)	Butyl; EN 374 90%	95 % Mask type: FFP2, APF 10	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374.
PROC 8b: Handling of non-cured waste; Waste management / handling and storage of waste for removal for off-site treatment or for on-site treatment like incineration and/or biological waste water treatment.	>4 hrs		Yes (inhalation 90%)	Butyl; EN 374 90%	95% Mask type: FFP2, APF 10	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374.
PROC10: All open mould applications where resins are applied by brushing, rolling and other low energy spreading operations; Examples are hand lamination, gelcoat brushing, filament winding and continuous winding.	>4 hrs	Enhanced (70%)	Yes (inhalation 70%)	Butyl; EN 374 90%	95%	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Use long handled tools where possible.
PROC10: Roller application or brushing. Application of repair putties; Application of bonding pastes / adhesives	>4 hrs	Enhanced (70%)	Yes (inhalation 90%)	Gloves APF 20 95%	95%	Use long handled tools where possible.

Scenario Subtitle	Duration	General Ventilation	Local Exhaust Ventilation	Protective Gloves	Respiratory Protection	Comments
PROC13: Treatment of articles by dipping and pouring. Continuous processes with open impregnation steps, such as pultrusion with open impregnation baths and (semi-) continuous production of flat laminates, filament winding.	>4 hrs		Yes (inhalation 90%)	Gloves APF 20 95%	95%	
PROC14: Processes where curing of UP / VE resins takes place at high temperature. Examples are pultrusion with injection dies and processing of SMC / BMC / TMC, etc. (PROC14)	>4 hrs	Enhanced (70%)	Yes (inhalation 90%)	Butyl; EN 374 90%	Mask type: FFP2, APF 10	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374.
PROC15: Quality control work of samples from blending vessel; R&D work including handling of samples from 1 kg to 1 drum (PROC15)	>4 hrs		Yes (inhalation 90%)	Butyl; EN 374 90%	Mask type: FFP2, APF 10	Gloves: For splash protection: Butyl; EN 374. For immersion protection: Butyl; 0.7 mm or greater; EN 374. Vapour extraction units in the tank; semi-automatic process.



Environmental Exposure

Operational Conditions and Risk Management Measures

Environmental Category: Use of reactive process regulators in polymerization processes at industrial site (inclusion or not into/onto articles) (ERC6d)

Daily Amount used: 340 kg/day		
Operational Conditions (OCs) Indoors (Chemical XXX)		Risk Management Measures (RMMs)
Assessment method	EasyTRA 4.1.0.	
Release fraction to air from process	0.xx % (for XXX)	Clear spills immediately. Disposal - This material and its container must be disposed of in a safe manner.
Release fraction to wastewater from process	0.00xx % (for XXX)	
Release fraction to soil from process	0.00xx % (for XXX)	
STP	Yes	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil (Chemical YYY)
Water: One or more of the following measures (as set out in the BAT Reference Document on Non-Ferrous Metal Processes) to be taken for emissions to water:
<ul style="list-style-type: none"> • Chemical precipitation; used primarily to remove the metal ions • Sedimentation • Filtration: used as final clarification step • Electrolysis: for low metal concentration • Reverse Osmosis (OR): extensively used for the removal of dissolved metals • Ion Exchange: final cleaning step in the removal of heavy metal from process wastewater
Air: One or more of the following measures (as set out in the BAT Reference Document on Non-Ferrous Metal Processes) to be taken for emissions to air:
<ul style="list-style-type: none"> • Electrostatic precipitators using wide electrode spacing: $x-y \text{ mg/Nm}^3$ • Wet electrostatic precipitators: $< x \text{ mg/Nm}^3$ • Cyclones, but as primary collector: $< x \text{ mg/Nm}^3$ • Fabric or bag filters: high efficiency in controlling fine particulate (melting): achieve emission values $< x \text{ mg/Nm}^3$ • Membrane filtration techniques can achieve $< x \text{ mg/Nm}^3$ • Ceramic and metal mesh filters. PM10 particles are removed: $x \text{ mg/Nm}^3$ • Wet scrubbers: $< x \text{ mg/Nm}^3$
Soil: No measures to reduce emissions to soil
The release factors to both the water and air compartments after on-site treatment for ceramics, glass and varistors are: <ul style="list-style-type: none"> • Estimated fraction released to water (g YYY/tonne): xxxx • Estimated fraction release to air (g YYY/tonne): xx

Additional good practice advice

Where appropriate, replacement of task by automated and/or closed processes.

Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Clear transfer lines prior to de-coupling. Drain down and flush system prior to equipment break-in or maintenance.

Provide specific employee training to prevent/minimize exposures.

In case of potential exposure: Restrict access to authorised persons. Minimise number of staff exposed.

Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

Ensure good work practices are implemented.

Supervision in place to check that the RMMs in place are being used correctly and OCs followed.

Consider the need for risk-based health surveillance.

Avoid inhalation of the product. In case of vapours: Handle in a fume cupboard or under extract ventilation

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This is a generic document for communicating conditions of safe use of a product. This document relates only to conditions of safe use and is not specific to a product. When available, this safe use is ensured by evaluating the results of the chemical safety assessments as performed by the raw material suppliers. When no chemical safety assessment has been carried out by the supplier for an ingredient that contributes to the classification of the mixture, the formulator has performed a safety assessment himself.

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