# Specific Worker Exposure Descriptions (SWEDs) Use Guidance

Specific Worker Exposure Descriptions (SWEDs) for professional workers have been developed to address the challenge of chemical safety assessment of Hydrocarbon Solvent Production Association (HSPA) and Oxygenated Solvent Producers Association (OSPA) substances under EU REACH. The SWED codes include the description of Risk Management Measures (RMMs) and Operational Conditions (OCs), and were developed using ECETOC TRA concentration bands, vapour pressure bands, and Modifying Factors (MF) for various individual RMMs. The relationship between SWEDs and RMMs was validated by calculating the overall Risk Characterisation Ratio (inhalation plus dermal) to ensure that safe use could be achieved for at least 90% of HSPA and OSPA substances.

SWEDs were developed for 12 professional Process Categories (PROCs). Please note the following:

- As a basis for the risk assessment, by default, all the ESIG SWEDs include the use of gloves, employee training, and good ventilation as this is considered a good basic standard of occupational hygiene practice.
- All ESIG SWEDs using Respiratory Protection (RPE) are labelled with an **'R'** in the SWED name, for example, ESIG_SWED_PW_5_I-e-R_RPE(90%)_1-4h_v1. The letter 'e' refers to the highest letter for that Level I SWED, which indicates the highest level of exposure control. The reason for this is that RPE should be the last resort RMM used in the workplace to protect workers.
- A similar naming convention is used for all Levels I-IV SWEDs.

| Process Category (PROC) | Description | Number of SWEDs Developed |
|---|---|---|
| **PROC 5** | Mixing or blending in batch processes | Level I - 5<br>Level II - 5<br>Level III -4<br>Level IV - 1 |
| **PROC6** | Calendering operations | Level I - 5<br>Level II - 5<br>Level III -4<br>Level IV - 1 |
| **PROC 8a** | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 1 |
| **PROC 8b** | Transfer of substance or mixture (charging and discharging) at dedicated facilities | Level I - 4<br>Level II - 7<br>Level III - 3<br>Level IV - 1 |
| **PROC 9** | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 2 |
| **PROC 10** | Roller application or brushing | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 1 |

| Process Category (PROC) | Description | Number of SWEDs Developed |
|---|---|---|
| PROC 11 | Spraying | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 1 |
| PROC 12 | Use of blowing agents in manufacture of foam | Level I - 5<br>Level II - 5<br>Level III -4<br>Level IV - 1 |
| PROC 13 | Treatment of articles by dipping and pouring | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 2 |
| PROC 14 | Tabletting, compression, extrusion, pelletisation, granulation | Level I - 5<br>Level II - 5<br>Level III -4<br>Level IV - 1 |
| PROC 15 | Use as laboratory reagent | Level I - 4<br>Level II - 3<br>Level III - 3<br>Level IV - 2 |
| PROC 28* | Manual maintenance (cleaning and repair) of machinery | Level I - 5<br>Level II - 4<br>Level III - 3<br>Level IV - 1 |

**Suggested SWED Implementation Steps**

**STEP 1.** Identify the vapour pressure and systemic effect – long-term exposure Derived No Effect Level (DNEL) of your substance.

- Before using the SWED please identify the vapour pressure of the substance as this will help you determine what level of SWED you require.
- The SWEDs are divided into Low (<500Pa), Medium (500 - 10000 Pa), and High (>10000 Pa) volatility bands based on vapour pressure (at 25°C) and bands listed in the ECETOC TRA.
- You will also need to identify the substance DNEL as this information will help you identify the optimal LEVEL SWED for the substance. The DNELs are divided into High (>100ppm), Medium (10ppm-100ppm), and Low (0.6ppm-10ppm)[1]. Please note that these bands will cover most solvent substances, but not all.

**STEP 2.** Identify the PROC of interest from the 12 PROCs for which a SWED has been developed.

- The SWEDs were developed for individual (PROCs) activities, so when you select a PROC only SWEDs developed for that particular activity are available for use.

**STEP 3.** Fit the defined vapour pressure and DNEL on the Matrix for the specific PROC to identify the potential level of control needed.

[1] Conversion: DNEL mg/m3 = (DNEL ppm) x (molecular weight mg/mmol) / 24.45

- This is just an indication of the level of control and the assessor will need to ensure that the right level of control is selected by following the next few steps.

**PROCs 5, 6, 12, 14**

| Volatility | | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level I | Level I | Level 0 | Level 0 |
| | Medium 10ppm - 100ppm | Level III | Level I | Level 0 | Level 0 |
| | Low 0.6ppm - 10ppm | Level IV | Level III | Level II | Level 0 |

**PROCs 8a, 10, 28**

| Volatility | | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level I | Level I | Level 0 | Level 0 |
| | Medium 10ppm - 100ppm | Level III | Level I | Level I | Level 0 |
| | Low 0.6ppm - <10ppm | Level IV | Level III | Level II / III | Level 0 |

**PROC 8b**

| Volatility | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level I | Level 0 | Level 0 | Level 0 |
| | Medium 10ppm - 100ppm | Level II | Level I | Level 0 | Level 0 |
| | Low 0.6ppm - 10ppm | Level IV | Level III | Level II | Level 0 |

**PROC 9, 13**

| Volatility | | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level I | Level 0 | Level 0 | Level 0 |
| | Medium 10ppm - 100ppm | Level III | Level I | Level 0 | Level 0 |
| | Low 0.6ppm - 10ppm | Level IV | Level III | Level II | Level 0 |

**PROC 11**

| Volatility | | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level III | Level I | Level I | Level 0 |
| | Medium 10ppm - 100ppm | Level IV | Level III | Level I | Level 0 |
| | Low 0.6ppm - 10ppm | Manual RMM | Level III | Level III | Level 0 |

**PROC 15**

| Volatility | | High (>10,000 Pa) | Medium (500 - 10000 Pa) | Low (<500 Pa) | Negligible (<0.001 Pa) |
|---|---|---|---|---|---|
| Inhalation long-term worker DNEL | High >100ppm | Level 0 | Level 0 | Level 0 | Level 0 |
| | Medium 10ppm - 100ppm | Level I | Level 0 | Level 0 | Level 0 |
| | Low 0.6ppm - 10ppm | Level III | Level II | Level II | Level 0 |

**STEP 4.** Identify the minimum Level of control (0, I, II, III, or IV) required, with Level 0 not requiring any RMMs and Level IV requiring the maximum level of control.

**STEP 5.** If the lowest level of control cannot demonstrate safe use, then move on to the next sub-level until safe use can be demonstrated. For example, for PROC 5 there are 5 SWEDs in Level I. The first two ESIG_SWED_PW_5_I-a_Out_v1 **AND** ESIG_SWED_PW_5_I-b_GV_v1 have equivalent levels of control but one activity is conducted outdoors and the other indoors with Good Ventilation (GV). These are listed as sub-levels **I-a** and **I-b** in the SWED titles. There are also sub-levels I-c, I-d, and I-e for this PROC and for this Level I. A similar approach was implemented for all other SWEDs developed by ESIG.

**STEP 6.** Determine if the RMMs for the control level are suitable conditions of use for the activity. If this is not the case, then please select the appropriate sub-level SWED required.

**STEP 7.** Select the most appropriate SWED in CHESAR for the selected PROC. Once selected the appropriate RMMs will automatically be implemented.

**STEP 8.** Reduce the  if in Step 7 the conditions of use do not allow you to demonstrate safe use for the activity.

**STEP 9.** If in step 8 the conditions of use cannot be used for the activity with a reduced concentration, then select a higher level of control and reduce the concentration to demonstrate safe use.

**STEP 10.** If safe use cannot be demonstrated (i.e., RCR ≥1) then use the manual selection option in CHESAR and adjust the RMMs and operational conditions. Ensure that these adjustments are justifiable and include text in the justification box.

**Abbreviations**

<15min – maximum duration of the activity is 15min

15min–1h – maximum duration of the activity is 1hour

1-4h maximum duration of the activity is 4 hours

GV – Good Ventilation

EV – Enhanced Ventilation

LEV – Local Exhaust Ventilation

Out – Outdoor

PRE(90%) - Respiratory Protection Equipment providing 90% inhalation exposure reduction

PRE(95%) - Respiratory Protection Equipment providing 95% inhalation exposure reduction

PW – Professional Worker

DNEL - Derived No Effect Level

HSPA - Hydrocarbon Solvent Production Association

MF - Modifying Factors

OCs - Operational Conditions

OSPA - Oxygenated Solvent Producers Association

PPM – Parts per Million

PROC – Process Category

RCR - Risk Characterisation Ratio

RMMs - Risk Management Measures

RPE - Respiratory Protection Equipment

SWEDs - Specific Worker Exposure Descriptions