



Developing Mixture Exposure Scenarios – a perspective from the lubricants’ sector

- ATIEL-ATC GES Working Group for ENES3 – 20 November 2012

The Lubricants, Metal Working Fluids and Grease suppliers (represented by ATIEL, UEIL and ELGI respectively) and Lubricants Additive suppliers (represented by ATC) have worked together to develop a process for supporting the communication of safe use for their formulated products under REACH.

The features of the lubricants’ supply chain lend themselves to the development of generic-based solutions for common lubricant end use mixtures, including:

- Short supply chain
- Reasonably well-defined and structured sector
- Formulations oriented towards a limited number of specific end uses (e.g. passenger vehicles, industrial machinery, aviation, marine)
- Stable formulations without a high rate of change

The sector has identified 120+ separate applications for lubricants which have been consolidated into 6 use groups based on similar exposure patterns. For each use group typical compositions and hazard classifications have been identified for which generic exposure scenarios have been developed building on the approach described in the Cefic Generic Exposure Scenario (GES) and environmental SpERC guidance and consistent with ECHA guidance.

The usefulness of DPD+ and Critical Component Analysis methodologies were evaluated and adapted to account for the advice that the sector already provides, arising from known hazards/risks of lubricants products. The mixture GES for each use group can be traced back to a generic CSA that is based on typical good practice and developed around key risk determining substances.

The key features of the approach include:

- Development of Generic Exposure Scenarios for each Use Group centred on CSA-based verification of conditions of use
- Description of the safe use conditions for classified formulated mixtures aimed at providing reliable safe use advice
- Based on worst case classification (excluding CMRs)
 - o As a consequence are inherently conservative, but support provision of good practice advice with the agreement of the industry sector
- Introduce major efficiency steps
 - o GES may be applied to all classified mixtures that are within the boundary of application
 - o Estimate >90% classified lubricants mixtures are covered
- Safe use information for non-classified mixtures but containing hazardous substances listed in Section 3 of the SDS, communicated via the main sections of the SDS
 - o Supporting the DU expectation that exposure scenarios are relevant for classified products only

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EXAMPLE MIXTURE GES

ATIEL/ATC Use Group B (prof) - Generic ES based on Boundary Conditions	
Section 1	
Exposure Scenario Title	
Title	General use of lubricants and greases in vehicles or machinery [ATU01] - Professional [G27]
Use Descriptor	Professional (SU22) PROC1, PROC2, PROC8a, PROC8b, PROC20 ERC9a, ERC9b Specific Environmental Release Categories: ATIEL-ATC SPERC 9.Bp.v1
Processes, tasks, activities covered	Covers general use of lubricants and greases in vehicles or machinery in closed systems. Includes filling and draining of containers and operation of enclosed machinery (including engines) and associated maintenance and storage activities. [ATU06]
Section 2	
Operational conditions and risk management measures	
Section 2.1	
Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa [OC3].
Concentration of substance in product	Covers use of substance/product up to 100% (unless stated differently) [ATG01]
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2]
Other Operational Conditions affecting worker exposure	Assumes use at not > 20°C above ambient, unless stated differently [G15] Assumes a good basic standard of occupational hygiene is implemented [G1].
Contributing Scenarios	
Risk Management Measures <i>Note: list RMM standard phrases according to the control hierarchy indicated in the ECHA template: 1. Technical measures to prevent release, 2. Technical measures to prevent dispersion, 3. Organisational measures, 4. Personal protection.</i>	
General measures applicable to all activities [CS135]	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop [E3] Use suitable eye protection. [PPE26] Avoid direct eye contact with product also via contamination on hands. [E73]
Operation of equipment containing engine oils and similar [CS26]; Use in contained systems [CS38] PROC1	No other specific measures identified [E120].
Material transfers [CS3]. ; Non-dedicated facility [CS82] PROC8a	Avoid carrying out activities involving exposure for more than 4 hours [OC28] Wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17].
Equipment cleaning and maintenance [CS39]. ; Dedicated facility [CS81] PROC8b, PROC20	Drain down system prior to equipment break-in or maintenance [E65]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENV4].
Storage [CS67] PROC1, PROC2	Store substance within a closed system. [E84]
Section 2.2	
Control of environmental exposure	
Amounts used	
EU tonnage (tonnes per year) [ATE09]	<i>insert value from Environmental GES values table</i>
Fraction of EU tonnage used in region [A1]	0.1
Fraction of Regional tonnage used locally [A3]	0.1
Frequency and duration of use	
Emission days (days/year) [FD4]	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
Other given operational conditions affecting environmental exposure	
Negligible wastewater emissions as process operates without water contact. [OOC20]	
Release fraction to air from process (after typical onsite RMMs) [ATE11]	<i>insert value from Environmental GES values table</i>

EXAMPLE MIXTURE GES

Release fraction to wastewater from process (after typical onsite RMMs and before (municipal) sewage treatment plant): [ATE12]	5.00E-04
Release fraction to soil from process (after typical onsite RMMs): [ATE13]	1.00E-03
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1]	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Prevent discharge of undissolved substance to or recover from onsite wastewater. [TCR14]	
Organisational measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
Estimated substance removal from wastewater via domestic sewage treatment (%) - F_{STP} [STP3]	<i>insert value from Environmental GES values table</i>
Assumed domestic sewage treatment plant flow (m ³ /d) [STP5]	2.00E+03
Maximum allowable site quantity (MSafe) based on OCs and RMMs as above (kg/day): [ATE15]	<i>insert value from Environmental GES values table</i>
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
Other environmental control measures additional to above	
None [ATE16]	
Section 3	Exposure Estimation
3.1. Health	
The operational conditions and risk management measures that are identified in the exposure scenario are the outcome of a quantitative and qualitative assessment for the product. [ATH01]	
3.2. Environment	
Used ECETOC TRA model. [EE1]	
Section 4	Guidance to check compliance with the Exposure Scenario
4.1. Health	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. [G23]	
4.2. Environment	
Guidance is based on assumed operating conditions which may not be applicable to all sites: thus scaling may be necessary to define appropriate site-specific risk management measures [DSU1].	
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].)	
If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. [DSU8]	
For further information see www.ATIEL.org/REACH_GES [ATG02]	