

The logo for ATC (The technical committee of petroleum additive manufacturers in Europe) is displayed in a white box. It features the letters 'ATC' in a bold, teal, sans-serif font.

The technical committee  
of petroleum additive  
manufacturers in Europe

The logo for ATIEL (Driving Standards in Lubricant Technology) is displayed on a dark background. It features the word 'atiel' in a grey, lowercase, sans-serif font, with a yellow swoosh that starts under the 'i' and curves around the 'l'. A small yellow circle is positioned above the 'i'.

DRIVING STANDARDS  
IN LUBRICANT TECHNOLOGY

# ATIEL/ATC Generic Exposure Scenarios Explained

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EU Base oils & Lubricants Summit  
Budapest, September 2013

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- Features of the Lubricants' Sector and its supply chain
- Features of the approach adopted
  - Development of Generic Exposure Scenarios (GES) for mixture
- Key information requirements to apply the approach
  - Formulators and their Downstream Users
- Overview on the development of the GES
  - Human Health
  - Environment
- Application of the approach
- Conclusions and next steps

## Features of the Lubricant Sector

- Lubricants are complex mixtures  
Frequently contain up to 20 substances
- Lubricants are marketed for diverse applications:  
EU volume 5-6 Million tpa  
Industrial (~30%), professional (~65%), and consumer (~5%) use  
Totally closed to total loss; point use to wide dispersive  
Automotive Lubricants (51%), Industrial Lubricants - including Marine Engine Oil (20%), General Industrial Lubricants - including Greases and Metalworking fluids (29%) [Kline report, 2008]
- Formulators sell directly to distributors and end-users  
Products not generally sold to other formulators



## Overview of the Lubricants Supply Chain

### Additive Manufacturer & Formulator (Industrial)

- ZDDP (Manufactured)
- Calcium sulphonate (purchased EU)
- Hindered Phenol (manufactured)
- Performance package X (imported, non-classified)
- Base Oil X (purchased EU)

### Additive Package 'A'

### EU Lubricant Formulator (Industrial)

- Additive Package 'A' (purchased EU)
- Additive package 'B' (purchased EU/imported)
- Substance A/B/C (purchased EU/imported)
- Base Oil Y (manufactured/purchased EU)

### Formulated, branded lubricant

### Lubricant Use Groups (Industrial, Professional & Consumer)

- 120+ separate applications
- Consolidated into 6 Use Groups
- Based on similar Exposure patterns

## Features of the Lubricants' Supply Chain

- Short supply chain
  - Reasonably well-defined and structured sector
  - Limited number of manufacturers and major formulators
    - Well-organised at the regional level
  - Large number of smaller formulators
    - Loosely organised at the national level
  - Formulations oriented towards (a limited number of) specific end uses
    - Passenger vehicles; industrial machinery; aviation; marine; etc.
  - Stable formulations; not a high rate of change; not a trend for more hazardous mixtures over time
- *Characteristics that enable generic-based solutions for the sector to be scoped, trialled and refined*

## Options for communicating information on mixtures

- Append supplier ESs to own product SDS *X* *Resulting document cumbersome and complex*
- Consolidate information into own mixture ES *X* *Can be difficult to do. Have to wait for all information*
- Incorporate information into body of SDS *X / ✓* *Approach used for unclassified products*
- Create GES *✓* *Approach used for classified products*

# ATIEL/ATC Use Groups

ATIEL/ ATC Use Group	Description of Use	Sectors Covered
A	<b>Formulation of lubricant additives, lubricants and greases.</b> Includes material transfers, mixing, large and small scale packing, sampling, maintenance and associated laboratory activities.	i
B	<b>General use of lubricants and greases in vehicles or machinery.</b> Includes filling and draining of containers and enclosed machinery (including engines)	i, p, c
C	<b>Use in open systems.</b> Application of lubricant to work pieces or equipment by dipping, brushing or spraying (without exposure to heat), e.g. mould releases, corrosion protection, slideways	i, p, c
D	<b>Use of lubricants in open high temperature processes,</b> e.g. quenching fluids, glass release agents	i
E	<b>Handling and dilution of metalworking fluid concentrates</b>	i
F	<b>Use of lubricants in high energy open processes,</b> e.g. in high speed machinery such as metal rolling / forming or metalworking fluids for machining and grinding	i, p

# ATIEL/ATC Use Groups

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A	<b>Formulation of lubricant additives, lubricants and greases.</b> Includes material transfers, mixing, large and small scale packing, sampling, maintenance and associated laboratory activities.	i
B	<b>General use of lubricants and greases on machinery.</b> Includes filling and and enclosed machinery (e.g. lathes, ladders)	i, p, c
C	<b>Use in open systems</b> (without lubricant to work pieces or equipment), e.g. brushing or spraying (without lubricant), e.g. mould releases, corrosion protection	i, p, c
D	<b>Use in open high temperature processes,</b> e.g. heating fluids, glass release agents	i
E	<b>Handling and dilution of metalworking fluid concentrates</b>	i
F	<b>Use of lubricants in high energy open processes,</b> e.g. in high speed machinery such as metal rolling / forming or metalworking fluids for machining and grinding	i, p

Supported by Use Descriptors and mapping of typical OCs and RMMS (DUCC format)



## Key features of the approach

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

# Key information requirements to apply the approach - Formulators

- To check against GES boundary conditions
  - List of classified products mapped to GES Use Groups
  - Concentration level of components driving the classification
  - Identification of environmental Risk Determining Substance(s) (RDS)
- To verify incoming ES for raw materials driving mixture classification are within the boundary of the GES
  - Raw materials mapped to GES Use Groups

Human health

  - Comparison of GES OCs/RMMs against incoming ES, supported by raw material concentration, vapour pressure, DNEL

Environment

  - Verification that correct GES has been selected on basis of raw material Vapour pressure, Kow, Biodegradability, PNEC (aq)
  - Comparison of GES OCs/RMMs and safe use rates against incoming ES

## Key information requirements to apply the approach - DUs

### GENERAL

- Understanding of the intended use of product
  - GES titles supported by simple explanatory statements

### HEALTH

- Check that their own conditions of use (OCs and RMMs) are within the boundary of the communicated ES
  - Contributing Scenarios and associated PROCs

### ENVIRONMENT

- Check that the communicated RMMs (or equivalent) are in use
- Check that their DU use rate of a product (kg/day) is less than Msafe value found on the ES

## How were Health GESs developed ?

- Typical compositions and hazard classifications of products identified for each ATIEL Use Group
- Boundary conditions described using COSHH Essentials / EMKG control banding approaches and key Risk Determining Substances as the reference point
  - e.g. concentration of the relevant hazardous substances, definition of exposure reference values
- CSAs conducted for each ATIEL Use Group supported by typical OCs and RMMs mapped in the DUCG table and Boundary Conditions
  - using ECETOC TRA for exposure estimates and Cefic Worker CSA Template
- GES narratives developed from CSAs using standard phrases

## Health boundary conditions matrix - Screening (to check HH GES is applicable)

Row Number	Criteria / Boundary Condition	
		<b>B: General use in vehicles or machinery</b> B(i) - Industrial B(p) - Professional
<b>1</b>	Product Classification & Labelling (C&L) covered by one or more of the listed R phrases (DPD human health):	R43 R36; R41 R37 R38; R21 R20 R65; R66; R22 (see Note 1) Not classified
<b>2</b>	For products classified as R43 (skin sensitiser), sensitising component is within the listed concentration range:	Skin sensitiser (see Note 2) a) $\geq 0.1$ - 1% Strong b) $\geq 1$ - 3% Weak or Moderate

Check GES is a good fit for the product:

Use title

C&L of mixture

Concentration of skin sensitisers in mixture (if relevant)

# Health boundary conditions matrix

- Detailed (to confirm component ES within the

GES boundary

Row Number	Criteria / Boundary Condition	<b>B: General use in vehicles or machinery</b> B(i) - Industrial B(p) - Professional
3	Boundary concentration of health Risk Determining Substance(s) in mixture/formulation	Skin sensitisers: ≤ 1% of strong sensitiser ≤ 3% of weak/moderate sensitiser  Other hazardous components except CMRs: a) ≤ 25% (industrial) * b) ≤ 5% (professional) * * Based on generic 'vapour' and 'dermal' RV (see Row 4 (i) and (ii))  c) Other boundary conditions may be valid, if component OCs and RMMs are equal or less stringent than included in the GES.
4	Boundary Reference Value (RV), long term (8 hour) dermal and inhalation for health Risk Determining Substance(s)	(i) RV inhalation vapour: ≥ 5ppm OR Vapour Pressure ≤ 0.01 Pa.  (ii) RV dermal: ≥ 0.5 mg/kg bw/day

Boundary concentration:

1. Skin sensitisers, if relevant
2. Other hazardous components with defined concentrations (ind/prof) (except CMRs)
3. Other, if component OCs/RMMs equal or less stringent

Boundary reference value:  
- inhalation and dermal

## How were Environmental GESs developed?

- Information gathered from Members:
  - Potential Risk Determining Substances (RDS)
  - Typical use rates
  - Exposure data
  - Typical OCs and RMMs used
- Obtained volume data for lubricants' supply chain
- Developed SpERCs (Specific Environmental Release Categories) for industrial and professional use groups

## How were Environmental GESs developed?

- Generic RDSs
  - RDSs made generic by describing each as a set of key properties
  - Key properties identified were: Kow, vapour pressure, biodegradability and PNEC<sub>FW aqua</sub>
  - Generic cut-off points determined for each property
  - 40 different profiles created, identified by RDS code

RDS code assigned on basis of four substance characteristics				
Four substance parameters to determine RDS code				RDS Code
log Kow	VP (pa)	Biodegradability	PNEC mg/l	
<5	<1	Readily biodegradable	0.00001 ≤ - <0.0001	1.1
<5	<1	Readily biodegradable	0.0001 ≤ - <0.001	1.2
<5	<1	Readily biodegradable	0.001 ≤ - <0.01	1.3
TriPP, CAS 115-86-6, EC 204-112-2				1.3.1
<5	<1	Readily biodegradable	0.01 ≤ - <0.1	1.4
<5	<1	Readily biodegradable	0.1 ≤ - <1.0	1.5
<5	<1	Not biodegradable	0.00001 ≤ - <0.0001	2.1
<5	<1	Not biodegradable	0.0001 ≤ - <0.001	2.2

RDS codes assigned according to key parameters



## How were Environmental GESs developed?

- Generic Safety Assessments
  - Safety Assessments carried out for all RDS codes and lubricant use groups using ECETOC TRA tool
  - Inputs into TRA:
    - Release fractions
    - Volumes
    - Worst case properties within each RDS code
  - Output from TRA:
    - Msafe values - maximum amount that can be used safely under given conditions
    - Removal efficiencies

# How were Environmental GESs developed?

- GES compilation
  - TRA inputs and outputs provided as look-up tables
  - GES values selected from tables according to RDS code and lubricant use group
  - Values inserted alongside relevant OC/RMM standard phrases to create the GES

**Release fractions (RF) to three environmental compartments for different use groups: WASTE WATER**

RDS Code	ATIEL ATC Use group Release Fraction (RF) to water from process (after ty								
	Ai-add pack	Ai-lubes	Bi	Bp	Bc	Ci	Cp	Cc	Di
1.1	2.00E-10	2.00E-11	2.00E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	
1.2	2.00E-10	2.00E-11	2.00E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	
1.3	2.00E-10	2.00E-11	2.00E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	see
1.3.1	1E-10	1E-11	1E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	
1.4	2.00E-10	2.00E-11	2.00E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	
1.5	2.00E-10	2.00E-11	2.00E-11	5.00E-04	5.00E-04	2.00E-11	5.00E-04	5.00E-04	

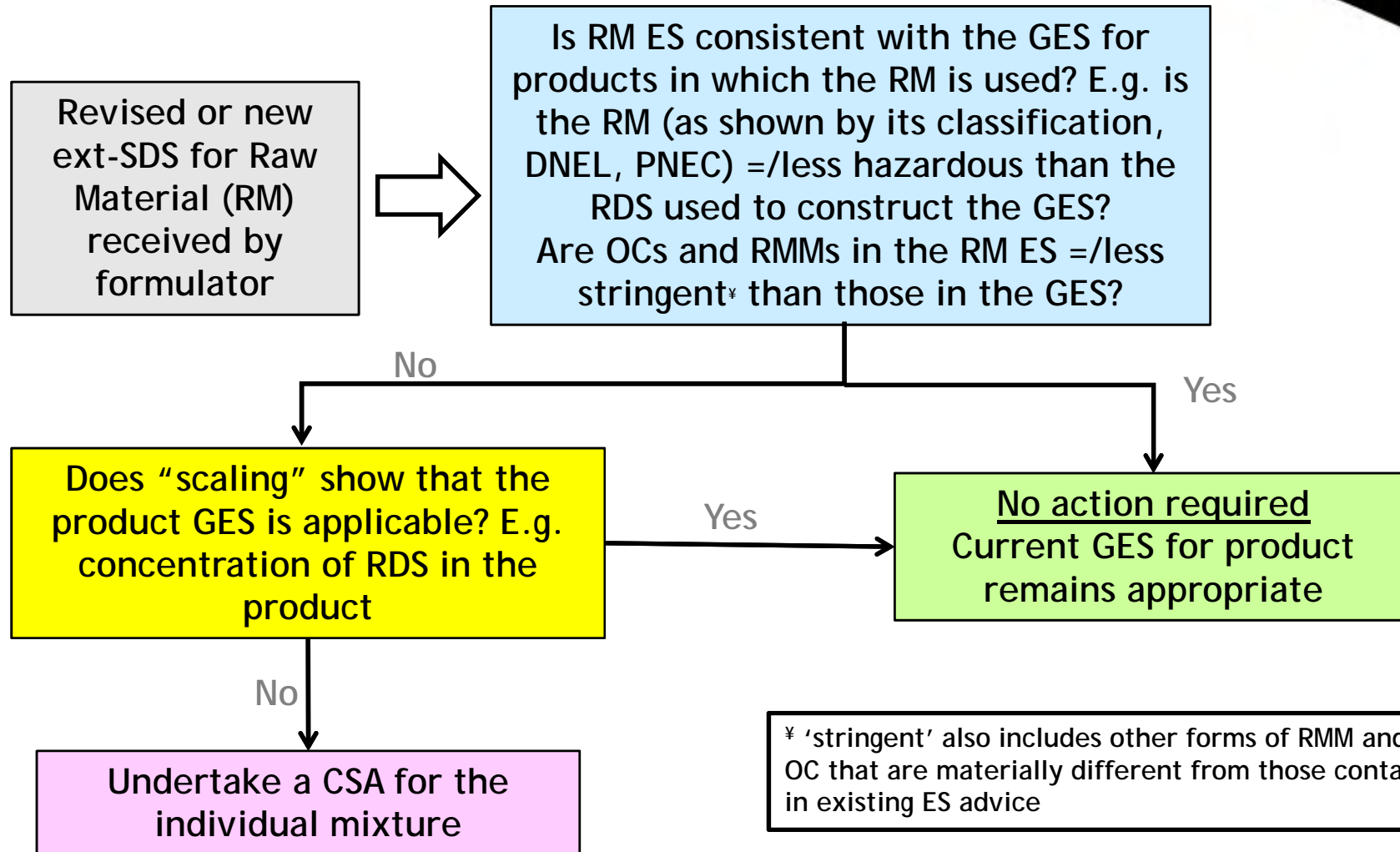
Example Input Table

Example Output Table

**Msafe values for generic products for different use groups at the product level using a treat rate of 2% except f**

RDS Code	ATIEL ATC Use group Msafe (kg day-1)								
	Ai-add pack	Ai-lubes	Bi	Bp	Bc	Ci	Cp	Cc	Di
1.1	66879	6694	1963	19	8	294.4	3	0.3	
1.2	668792	66942	19627	191	79	2944	28	3	
1.3	6687917	669420	196269	1911	793	29439	283	33	
1.3.1	485294116	1201229490	67209667	29351	9835	9729484	4873	3453	
1.4	66879165	6694195	1962694	19107	7934	294390	2835	325	
1.5	668791651	66941950	19626944	191071	79341	2943899	28348	3253	
2.1	33393	3343	1185	13	4	174	2	0.2	
2.2	333925	33425	11854	134	39	1737	15	2	

# Consistency check overview substance ext-SDS/ES vs.GES



¥ 'stringent' also includes other forms of RMM and/or OC that are materially different from those contained in existing ES advice

## Attaching GESs and checking raw materials - overview of process

- Step 1:
  - Allocate lubricant products to ATIEL-ATC use group(s)
  - Check that product meets product boundary conditions
  - Attach GES to product SDS for each required use group
- Step 2:
  - Allocate raw materials (RMs) to use groups
  - Link uses ↔ products ↔ raw materials
- Step 3:
  - Consistency check for uses
- Step 4:
  - Consistency check for human health
- Step 5:
  - Consistency check for environment
- Step 6:
  - Options if raw material ext-SDS is not consistent with the GES

Consistency checks  
between raw material  
ext-SDS and GESs

## Attaching GESs and checking raw materials - overview of process

- Step 1:
  - Allocate lubricant products to ATIEL-ATC use group
  - Check that product meets product boundary
  - Attach GES to product SDS for each req
- Step 2:
  - Allocate raw materials (RMs)
  - Link uses ↔ products
- Step 3:
  - Consistency
- Step 4:
  - Consistency check for human health
- Step 5:
  - Consistency check for environment
- Step 6:
  - Options if raw material ext-SDS is not consistent with the GES

Detailed flowcharts for each step

Consistency checks between raw material ext-SDS and GESs

## Conclusions

- Delivers sound, understandable advice to DUs now
  - No need to wait until 2018 Registrations for key information
- Enables formulators to provide useful safe use advice in a consistent manner to their customers
- Constrains the length of the ext-SDS to a manageable size
- Complements the nature of SH&E advice already being offered by lubricant suppliers e.g. technical advisory notes
- ATIEL/ATC has devoted significant time and effort to develop GESs and associated processes
- ATIEL/ATC solution will not necessarily be the one most suited to all supply chains
  - Needs collaboration within the sector/supply chain

## Roll out plan and documentation

- GES and supporting documentation now available via ATIEL web site
  - Guide to user document, GES narratives, Boundary condition matrix, SpERC documentation, Compliance flow charts etc.
  - Free of charge for members and non members alike
- New GES phrases to be incorporated into Cefic ECom Phrase library
  - Translations and metadata funded by ATIEL
- Website help
  - Supporting documents; FAQs, on-line help
- Workshop for members
  - Depending on demand
- Further challenges
  - Translation of key documents into European languages
  - Training and initial support for formulators in applying the approach that have not been directly involved in the development



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The technical association of the European lubricants industry

### Editorial update of Code of Practice

New Code of Practice Issue 18 delivers improvements in format and style plus consistency in language and terminology.



### Generic Exposure Scenarios

ATIEL and ATC (Additives Technical Committee) have developed Generic Exposure Scenarios and guidance documents to help lubricants companies comply with REACH - read more.

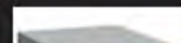


### Industry News

- > Court of Appeals review of hydraulic fracturing bans could open economic opportunity in New
- > API outlines flaws in BLM hydraulic fracturing proposal
- > July Petroleum Demand Hits Three-Year High

Role of the ATIEL Code of

ACEA 2012 Oil



> Debate - Target Youth mobile and safe





## REACH Introduction

**NOTE:** Before using any of the information on this website please read the [Disclaimer](#).

The information and resources on this website are organized according to your position in the lubricants supply chain (see chart below). Depending on your interest, please follow the main drop down menu or use the appropriate link(s) below.

- Supplier of base oils or lubricant additive substances;
- Formulator of lubricant additives and lubricant mixtures;
- End user of lubricant products

### Background

The lubricants, metal working fluids and greases industry sectors (represented by ATIEL, UGIL and EUGI) along with lubricant additive suppliers (represented by ATC) have worked together to develop a process for supporting the communication of the safe use of their products under REACH. This work, coordinated by the ATIEL/ATC REACH Working Group, includes the identification of Use Information and development of generic exposure scenarios (GES) for common lubricant end uses.

The objective of the GES is to offer everyone in the lubricants supply chain (right) a standardized format for their exposure scenarios and common language and terminology to use in those documents. The effect of this will be to help reduce the overall workload for all industry players to comply with REACH.

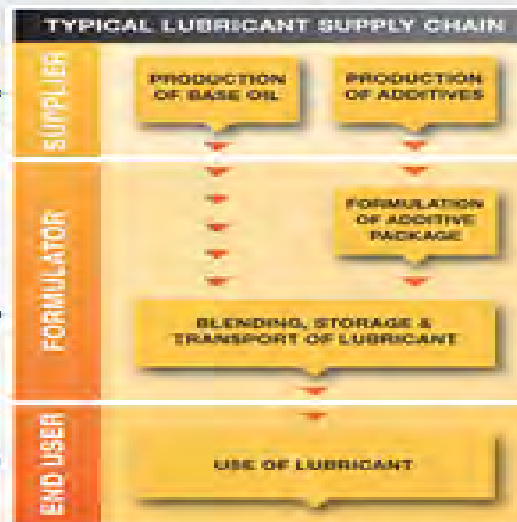
No one is obliged to follow these recommendations but doing so may greatly improve communication with your downstream users and/or upstream suppliers and help to ensure they receive documents in a format and using a set of terms they are already familiar with.

Using these recommendations should also make it much easier for formulators of lubricant products to develop exposure scenarios for their products (if necessary) and prepare the extended Safety Data Sheets (ed-SDS).

For further background information see the [REACH About resources/scenarios](#) section of the website.

Any questions?

If you have any questions about the Generic Exposure Scenarios please send them to: [geshaig@atiel.eu](mailto:geshaig@atiel.eu).



### Overview of Use Communication

This document provides simplified guidance to identified use communication in the lubricants supply chain - [click here](#).

The document is also available in a number of EU languages - [click here](#).

### REACH- Useful links

[European Chemical Agency \(ECHA\)](#)  
[European Chemical Industry Council \(CEFIC\)](#)  
[European Centre for Ecotoxicology & Toxicology of Chemicals \(ECETOC\)](#)  
[Downstream Users of Chemicals Coalition \(DUCO\) group](#)

### Specific Environmental Release Categories (SpERCs) Factsheets

ATIEL/ATC has developed Specific Environmental Release Categories (SpERCs) Factsheets that define actual conditions of use for operations at locations. You can download the SpERCs Factsheets [here](#).

### REACH Acronyms & Glossary

List of REACH acronyms commonly used in our website - [click here](#).

Thank you for your attention !