



## ATIEL/ATC Generic Exposure Scenarios ENES 5 Breakout Session

ATC represented by Sara Brennan (Afton Chemical)

ATIEL represented by Alison Margary and Joy Worden (Shell)

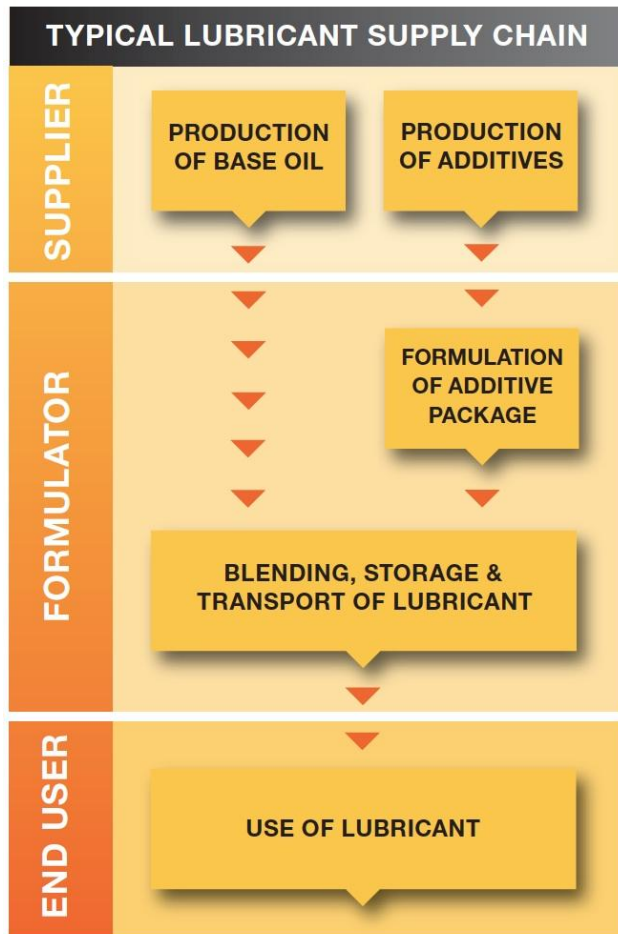


Technical Committee of Petroleum Additive Manufacturers in Europe

## Contents

- Overview of the ATIEL/ATC GES mixtures approach (Alison)
- Example 1: Lubricant additive formulation (ATC) (Sara)
- Example 2: Lubricant end use formulation (ATIEL) (Alison and Joy)
- Conclusions and discussion (Sara - all)

# Features of the Lubricants' Supply Chain



- Well-defined and structured sector
  - Limited number of manufacturers and major formulators
  - Large number of smaller formulators
  - Formulations oriented towards specific end uses
  - Stable formulations during life cycle
  - Formulators sell directly to distributors and end-users
- *Characteristics that enable generic-based solutions for the sector to be scoped, trialled and refined*

## How were GESs developed ?

- Mapping of product types to typical uses
- Assignment of adequate use descriptors (SUs, PCs, PROCs and ERCs)
- Grouping by main conditions of use
  - Open vs. closed processes,
  - High temperature, high energy processes
  - Other risk factors (aerosol formation)
  - Exposure potential (dermal, inhalation, ingestion)
  - Typical Operational Conditions and Risk Management Measures
- Results:
  - Use and application table
  - DUCC Table

# ATIEL/ATC Use Groups

ATIEL/ ATC Use Group	Description of Use	Sectors Covered
A	<p><b>Formulation of lubricant additives, lubricants and greases.</b> Includes material transfers, mixing, large and small scale packing, sampling, maintenance and associated laboratory activities.</p>	Industrial
B	<p><b>General use of lubricants and greases in vehicles or machinery.</b> Includes filling and draining of containers and enclosed machinery (including engines)</p>	Industrial, Professional, Consumer
C	<p><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</p>	Industrial, Professional, Consumer
D	<p><b>Use of lubricants in open high temperature processes,</b> e.g. quenching fluids, glass release agents</p>	Industrial
E	<p><b>Handling and dilution of metalworking fluid concentrates</b></p>	Industrial
F	<p><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</p>	Industrial, Professional



# ATIEL/ATC Use and Application Table

LUBRICANT APPLICATION		ATIEL-ATC LUBRICANT USE GROUP
Family	Specific application	
Engine oils	Passenger car (gasoline & diesel)	B
Industrial oils (hydraulic, compressor, etc)	Hydraulic fluids (general)	B
Metalworking	Quenching fluids (oil based)	D
Metalworking	Soluble oil machining/grinding fluids - concentrate	E
Metalworking	Soluble oil machining/grinding fluids - diluted	F
Metalworking	Corrosion protection - oil based	C
Metalworking	Corrosion protection - water based - diluted	C
Total loss lubrication	Glass release agents	D

# ATIEL/ATC Use Groups: DUCC-Table

Code	Short ES title	Short description of process or activity	Use Descriptors							Life Cycle Stage(s)						Exposure Modifier				RMM		Code		
			SU	PROC	PC	PC sub	ERC	SPERC	AC	Manufacture	Formulation	end use			Service Life	duration and frequency (exposure time)	Outdoor		Indoor		Resp. Prot.		Eye prot.	Hand Prot.
												Industrial	Professional	Consumer			w LEV	wo LEV						
B(i)	General industrial use, closed processes	Initial factory fill (Oils) from header tank	SU 3	PROC 9	PC 16, 17, 24	n/a	ERC 4, 7	B(i): ATIEL-ATC SPERC 4.Bi.v1	n/a			x			n/a	Daily 8 hour	No	Yes	Yes	No	No	No		
		Initial factory fill (Oils) from containers		PROC 8b								x			n/a	Daily 1 - 4 8-hour	No	Yes	Yes	No	Yes	Yes		
		Initial factory fill (greases)		PROC 2, 9								x			n/a	Daily 4 - 8 hour	No	No	Yes	No	No	No		
		Use in a closed system		PROC 1								x			n/a	Daily None	Yes	No	Yes	No	No	No		
		Maintenance activities		PROC 8b								x			n/a	Daily 1 - 4 hour	No	No	Yes	No	Yes	Yes		
		Waste Disposal		PROC 8b								x			n/a	Daily <15 mins	No	No	Yes	No	Yes	Yes		
		Material storage		PROC 1, 2								x			n/a	Daily 8 hours	Yes	Closed	Closed	No	No	No		
B(p)	General professional use, closed processes	Use as a lubricant/grease in a closed system	SU 22	PROC 1	PC 16, 17, 24	n/a	ERC 9a, 9b	B(p): ATIEL-ATC SPERC 9.Bp.v1	n/a				x		n/a	Daily None	Yes	No	Yes	No	No	No		
		General exposure during maintenance work including draining, refilling.		PROC 8a, 8b, 20									x		n/a	Daily 1 - 4 hour	Yes	No	Yes	No	Yes	Yes		
		Disposal of waste product & used containers		PROC 8a, 8b									x		n/a	Daily <15 mins	Yes	No	Yes	No	Yes	Yes		
		Material storage		PROC 2									x		n/a	Daily 8 hours	Yes	Closed	Closed	No	No	No		
B(c)	General consumer use, closed processes	Use as a lubricant in a closed system, including filling, draining and maintenance	SU 21	n/a	PC 24	n/a	ERC 9a, 9b	B(c): ATIEL-ATC SPERC 9.Bc.v1	n/a					x	n/a	Weekly or less <15 mins	Yes	No	Yes	No	No	No	B (c)	



# Human Health Contributing Scenarios

- Typical compositions and hazard classifications of products identified for each ATIEL Use Group
- Boundary conditions described using 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 DUCC table and Boundary Conditions
  - using ECETOC TRA for exposure estimates and CEFIC Worker CSA Template
- GES narratives developed from CSAs using standard phrases



## Environmental Contributing Scenarios

- Information gathered from Members:
  - Potential Risk Determining Substances (RDS)
  - Typical use rates
  - Exposure (Emission) 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

# 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:**  
Verification check for uses
- **Step 4**  
Verification check for human health
- **Step 5**  
Verification check for environment
- **Step 6**  
Options if raw material ext-SDS is not consistent with the GES
- **Step 7**  
Actions if RM registered as Intermediate under SCC, but full Registration required

Tested with large/SME formulators - positive



Consistency checks between raw material ext-SDS and GESs



<http://atiel.org/>

[Home](#)
[About Us](#)
[Our activities](#)
[Code of Practice](#)
[REACH](#)
[News & Info](#)
[Industry Info](#)

[Introduction](#)  
[Info for Suppliers](#)  
[Info for Formulators](#)  
[Info for End Users](#)  
[About exposure scenarios](#)  
[FAQs](#)



The technical association of the European lubricants industry

**NEW: Code of Practice Issue 19**

ATIEL has introduced a new version of its Code of Practice, Issue 19, to bring it into line with the latest ACEA 2012 Oil Sequences - [read more](#).



**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**

- > [API urges speedy approval of U.S. LNG exports](#)
- > [Industry, Consumer Groups say EPA took steps to protect consumers from blend wall, but more](#)
- > [API Unveils Study of State Economic Gains from LNG Exports](#)
- > [PRESS RELEASE: Automobile industry and motoring clubs join forces to address youth road](#)
- > [EU, US and Japan HDV manufacturers work on global approach to fuel efficiency](#)
- > [PRESS RELEASE: European automotive industry calls for action on South Korean market access](#)

**Role of the ATIEL Code of Practice**

Read the presentation by Adri van de Ven & Peter Tjan to the UNITI Mineral Oil Technology Congress, Stuttgart, April 2013.



**ACEA 2012 Oil Sequences**

ACEA has launched its European Oil Sequences 2012, with specific measures to address the increasing use of biofuels - [read more](#).




Search...

[Home](#)
[About Us](#)
[Our activities](#)
[Code of Practice](#)
[REACH](#)
[News & Info](#)
[Useful Links](#)

[Introduction](#)
[Info for Suppliers](#)
[Info for Formulators](#)
[Info for End Users](#)
[About exposure scenarios](#)
[FAQs](#)

## REACH: Introduction

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

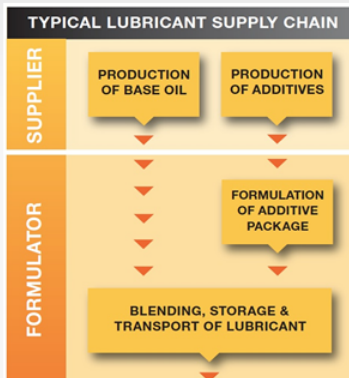
The information and resources on this website are organised according to your position in the lubricants supply chain (see chart below). Depending on your interest, please follow the main drop down menu or use the appropriate link(s) below:

- **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 grease industry sectors (represented by ATIEL, UEIL and ELGI) 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 standardised format for their exposure scenarios and common



### Overview of Use Communication

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

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

### REACH: Useful links

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

### Specific Environmental Release Categories (SpERCs) Factsheets

↓ ATIEL/ATC has developed 'Specific Environmental Release Categories' (SpERCs) Factsheets that reflect actual conditions of use for applications of lubricants. You can download the SpERCs Factsheets [here](#).

### REACH Acronyms & Glossary

↓ List of REACH acronyms commonly used on this website.



## REACH: Information for Formulators

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

This information is for Formulators of lubricant additives and lubricant mixtures.

The ATIEL/ATC Generic Exposure Scenario (GES) process has been designed to support the communication of safe use information for classified products by attaching a 'medium' exposure scenario to their safety data sheet. The controls identified within each GES are expected to be sufficient to address the risks associated with all typical components regardless of whether these components have already been registered and an exposure scenario received from your supplier.

ATIEL/ATC's expectation is that most lubricant products should fit within the boundary conditions of the relevant GES specified in this process. However, for products that do not fit the boundary conditions it will be necessary to develop an exposure scenario specific to that product, and the GES provides a starting point. The GES have been prepared based on typical hazard classifications and typical component substance concentrations in finished products used in typical applications.

### How to apply the ATIEL/ATC GES Process

An overview of the process is given below together with links to the relevant supporting documents and further explanation. Please also refer to the step-by-step guidance to this process on the right.

#### Detailed process description

*Document 0: Guidance for Applying the Generic Exposure Scenario (GES) Process (pdf)*

Guide to identifying whether a GES is required for a lubricant or lubricant additive product and selecting the appropriate GES – provides additional background and guidance to help you follow the GES Process Flow Charts (below).

*Document 1: GES Process Flow Charts (pdf)*

Graphical step-by-step process for application and maintenance of the GES. This document should be used in conjunction with the guidance document above.

#### Supporting information needed to apply the process

(document numbers are consistent with those referenced in Document 0)

*Document 2: Lubricant Applications Table (pdf)*

Use this document to map the applications of your products to the ATIEL/ATC Use Groups.

*Document 3: Lubricant DUCC Table (pdf)*

### Overview of Use Communication

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

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

### Key steps to follow the ATIEL/ATC GES process

(Please read [Document 0](#) before you start and refer to it and [Document 1](#) as you go through the process)

#### STEP 1

Allocate lubricant products to ATIEL/ATC use group(s): [Document 2](#) and [Document 3](#)

Check product meets boundary conditions:  
a. Human Health: [Document 4](#) (Rows 1 & 2)  
b. Environment: [Documents 6](#) and [Document 7](#)

Attach GES to product SDS for each required use group: [Document 5a](#) and [Document 5b](#)

#### STEP 2

Allocate raw materials (RMs) to use groups:

[Document 3](#)

Link uses > products > raw materials.

#### STEP 3

Consistency check for uses:

[Document 3](#)



Technical Committee of Petroleum Additive Manufacturers in Europe

# ATC Demonstration of GES Example 1

Safe use information for mixtures.  
ATIEL-ATC GES Approach



- **Scope:** How to define and communicate information on safe use of (substances in) mixtures: discussion on the possible methodologies.
- **Objective:** To demonstrate the process we use to compile GESs as well as the practical problems encountered with process
- **Reference documents:**
  - Example completed GES
  - Document 1: ATIEL-ATC GES Process Flow Chart
  - Document 4: ATIEL-ATC Health Boundary Conditions Matrix
  - Document 7: ATIEL-ATC Environmental GES Values Table

# Worked Example



Technical Committee of Petroleum Additive Manufacturers in Europe

- The first example that will be demonstrated today is that of an additive pack. This is the GES process that the formulator of the additive pack goes through.

Component	Additive Pack	Finished Lubricant	Hazard Classification (Components)
Mineral oil	qa	qa	Non-hazardous
Extreme pressure additive	10 – 19.9	1 – 4.9	R53
Anti-wear additive	1 – 2.4	0.1 – 0.5	Xi, R36/38, R43 N, R51/53
Dispersant	5 – 9.9	1 – 4.9	Non-hazardous
Antioxidant	1 – 2.4	0.1 – 0.5	Xi, R38, N, R50/53

Typical  
“generic”  
formulation

Product	Hazard Classification
Additive pack	Xi, R43, R52/53
Finished lubricant	R52/53

Classification of the example additive pack and also of the finished lubricant





## Introduction and Application

- All documentation is available freely on the ATIEL website: [www.ATIEL.org](http://www.ATIEL.org).
- Start by reading Document 0 (background reading) and then working through the process flow in Document 1.
- When we work through the example we can see that the product is classified for both Health (R43) and the Environment (R52/53)
- First we select the relevant Use Group(s). As an ‘Addpack’ supplier we always include Use Group A to address Formulation (as this is an additive for inclusion in a lubricant mixture)
- For the other Use Groups, we use Document 2 to look up the end use application of the additive, in this case automobile gear oil - this indicates that Use Group B is relevant.



Transmission fluids	Axle lubricants - trucks	B
Transmission fluids	Automobile gear oils	B
Transmission fluids	Industrial gear oil (closed)	B

# Use and Human Health



Technical Committee of Petroleum Additive Manufacturers in Europe

- Full details of the Use Groups covered are included in the ‘DUCC table’ in [Document 3](#). For this example we will select Group A(i) Industrial formulation of lubricant additives and lubricants.
- [Document 4](#). is where we check the boundary conditions to see if the Human Health section of the GES is relevant to the mixture.

Our example gear additive package falls within the conditions of the boundary matrix of the GES (rows 1 and 2).

Rows 3 and 4 in Document 4 are for checking the health related information received in a raw material ext-SDS is consistent with the health part of the GES(s). This aspect will be covered in the next example from ATIEL .

HEALTH BC FOR USE WITH STEP1a 8					
Row Number	Criteria / Boundary Condition	A: Formulation of additive packages, lubricants & greases			B: Ge vehicl B(i) - Inc B(p) - Pr
		A(i) - Industrial	a) A(i) AddPack with Nil or Low sensitiser concentration	b) A(i) AddPack with High sensitiser concentration	
1	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	R43 R36; R41 R37 R38; R21 R20 R65; R66; R22 (see Note 1) Not classified	R43 R36; R41 R37 R38; R21 R20 R65; R66; R22 (see Note 1) Not classified	R43 R36; R41 R37 R38; R21 R20 R65; R66; R22 (see Note 1) Not classified
2	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	Skin sensitiser (see Note 2) a) $> 1$ - 50% Strong b) $> 3$ - 50% Weak or Moderate	Skin sensitiser (see Note 2) a) $> 1$ - 50% Strong b) $> 3$ - 50% Weak or Moderate	Skin sensitiser (see Note 2) a) $> 1$ - 50% Strong b) $> 3$ - 50% Weak or Moderate



## GES Groups

- Document 5a (Group A) and Document 5b (Groups B-F) contain the GES narratives by groups.
- For our example we need 5a as we are only concerned with Group A. The GES relevant to our example is A(i) AddPack, Nil-Low Sensitiser.

- The GES template is just two pages long which makes it user friendly.

- We have completed the Human Health component now and so to complete our GES we now need to look at the Environment.

ATIEL/ATC Use Group A (incl) - AddPack Generic Exposure Scenario based on boundary conditions including Nil or Low Sensitiser Concentration		
<b>Section 1</b>	<b>System Boundary Title</b>	
<b>1a</b>	<b>Formulation &amp; packaging of substances and mixtures (GEST2_1 - Industrial) (200)</b>	
<b>Use Scenario</b>	Formulation and packaging of substances and mixtures (Industrial) (200)	
<b>Process, task, activities involved</b>	Formulation and packaging of substances and mixtures (Industrial) (200)	
<b>Section 2</b>	<b>General of worker activities</b>	
<b>2a</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2b</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2c</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2d</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2e</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2f</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2g</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2h</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2i</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2j</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2k</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2l</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2m</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2n</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2o</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2p</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2q</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2r</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2s</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2t</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2u</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2v</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2w</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2x</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2y</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>2z</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3a</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3b</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3c</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3d</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3e</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3f</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3g</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3h</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3i</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3j</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3k</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3l</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3m</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3n</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3o</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3p</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3q</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3r</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3s</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3t</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3u</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3v</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3w</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3x</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3y</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>3z</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4a</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4b</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4c</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4d</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4e</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4f</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4g</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4h</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4i</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4j</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4k</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4l</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4m</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4n</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4o</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4p</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4q</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4r</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4s</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4t</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4u</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4v</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4w</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4x</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4y</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	
<b>4z</b>	<b>Formulation and packaging of substances and mixtures (Industrial) (200)</b>	



# Environment

- [Document 6](#) provides the parameter values for a range of risk determining substances (RDSs) applied to pre-assign the appropriate GES code. If the product contains more than one listed RDS the “worst case” component should be assigned as the RDS to use for the GES.
- For our example 2,6-Di-tertiary butylphenol is the RDS.

DSD Classification	GHS classification (optional)	Parameter values as input to GES code				GES code (see tab GES Assignment codes)
		log Kow	VP (pa)	Biodegradability	PNEC FW aqua mg/l	
R10-20-36/37/38-51/53		3.63	300	readily biodegradable	0.12	3.5
R50/53	Chronic 1 M factor =10	7.5	0.000000026	not biodegradable	0.00003	6.1
N; R50/53		5.0 - 5.2	0.39	not biodegradable	0.000199	6.2
R50/53	Chronic 1	4.48	0.938	not biodegradable	0.00045	2.2

- The table provides the GES code (2.2) plus the log Kow, VP, PNECfw(aq) and biodegradability upon which the code is based.
- In the event that the environmental RDS component is not listed the required GES Code can be found in [Document 7](#).
  - You will need to independently determine the above values (log Kow, VP, PNECfw(aq) and biodegradability) for your unlisted RDS substance.

- When the correct GES Code has been identified, also use [Document 7](#) to identify the following:

GES	Parameter	Value	Units	Notes
A(i)	Release fraction (air)	5.00E-07		
	Release fraction (water)	2.00E-10		Default value (based on 20% treat rate)
	STP removal	0.09	%	
	Msafe RDS	66785	kg/day	
	Msafe product	333925	kg/day	Default value (based on 20% treat rate)
	Treat rate (actual)	0.5	%	
	Validity limit	70	%	Maximum treat rate
	REF EU tonnage (substance)	1.00E+04		
	REF emission days	300	days/year	

- The parameters in the table are found by looking at the GES code we determined for each section. These are the values for GES 2.2.
- The values highlighted are the values we need to input into our GES.
  - If actual treat rate is known some values may be scaled accordingly.

# Verification Check



Technical Committee of Petroleum Additive Manufacturers in Europe

- The GES can now be added to the extended-SDS
- On receipt of component ES, carry out the verification check that the GES remains valid

ATIEL/ATC Use Group A (Ind) - AddPack Generic Exposure Scenario based on boundary conditions including Nil or Low Sensitiser Concentration		Control of environmental exposure	
<b>Section 1</b>	<b>Exposure Scenario Title</b>	Control of environmental exposure	
<b>Title</b>	<b>Formulation &amp; (re)packing of substances and mixtures (GEST2_1) - Industrial (G25)</b>	<b>Exposure</b>	300
<b>Use Descriptor</b>	<b>Industrial Bulk Bags</b>	<b>Exposure</b>	10
<b>Process Categories</b>	<b>PRO01, PRO02, PRO03, PRO04, PRO05, PRO06, PRO07, PRO08, PRO09, PRO10, PRO11, PRO12, PRO13, PRO14, PRO15, PRO16, PRO17, PRO18, PRO19, PRO20, PRO21, PRO22, PRO23, PRO24, PRO25, PRO26, PRO27, PRO28, PRO29, PRO30, PRO31, PRO32, PRO33, PRO34, PRO35, PRO36, PRO37, PRO38, PRO39, PRO40, PRO41, PRO42, PRO43, PRO44, PRO45, PRO46, PRO47, PRO48, PRO49, PRO50, PRO51, PRO52, PRO53, PRO54, PRO55, PRO56, PRO57, PRO58, PRO59, PRO60, PRO61, PRO62, PRO63, PRO64, PRO65, PRO66, PRO67, PRO68, PRO69, PRO70, PRO71, PRO72, PRO73, PRO74, PRO75, PRO76, PRO77, PRO78, PRO79, PRO80, PRO81, PRO82, PRO83, PRO84, PRO85, PRO86, PRO87, PRO88, PRO89, PRO90, PRO91, PRO92, PRO93, PRO94, PRO95, PRO96, PRO97, PRO98, PRO99, PRO100</b>	<b>Exposure</b>	100
<b>Environmental Review Categories</b>	<b>ERC1</b>	<b>Exposure</b>	100
<b>Health Environmental Review Categories</b>	<b>ATIEL/ATC/EMRC 2 A+&amp;L1</b>	<b>Exposure</b>	100
<b>Industrial Formulation of lubricant additives, lubricants and greases</b>	<b>Includes material transfer, mixing, large and small scale analysis, reactions, characterization</b>	<b>Exposure</b>	100
<b>Operational conditions and risk management measures</b>		<b>Exposure</b>	100
<b>Section 2</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Product characteristics</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Product description</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Control of worker exposure</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Frequency and duration of use</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Human factors not influenced by risk management</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Other Operational Conditions affecting worker exposure</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Contributing Scenarios</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Risk Management Measures</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>General measures applicable to all activities (C015)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>General measures (DE1)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Use of contained systems (C030)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Temperature (C0111) PRO03</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Mixing operations (closed systems) (C030)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Batch processes at elevated temperatures (C018)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Mixing operations (open systems) (C030)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Batch processes at elevated temperatures (C018)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Mixing operations (open systems) (C030)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Batch processes (open systems) (C030)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Process sampling (C02)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Bulk transfers (C014)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Delivered Media (C014) PRO03</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Drum/batch transfers (C08)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Non-adequately sealed (C08) PRO04a</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Equipment cleaning and maintenance (C03)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>PRO03 PRO04</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Drum and small package filling (C08) PRO03</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Laboratory activities (C03)</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>PRO03 PRO04 PRO05</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Storage (C08) PRO01, PRO02</b>	<b>Control of worker exposure</b>	<b>Exposure</b>	100
<b>Section 2.2</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100
<b>Exposure used</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100
<b>EU tonnage (tonnes per year) (ATE5)</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100
<b>Fraction of EU tonnage used in region (A1)</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100
<b>Fraction of Regional tonnage used locally (A2)</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100
<b>Products and duration of use</b>	<b>Control of environmental exposure</b>	<b>Exposure</b>	100





Technical Committee of Petroleum Additive Manufacturers in Europe

# ATIEL Demonstration of GES Example 2

Safe use information for mixtures.  
ATIEL-ATC GES Approach



## Example 2 - GES for finished lubricant product

- Synthetic Hydraulic Oil
- Classified R20 R52/53
- Use group B - use of lubricants and greases in vehicles and machinery (closed systems) - Industrial

Information on classified components:

Ingredient	CAS no	%	Classification	
			67/548/EEC	Reg EC No. 1272/2008 (CLP)
Dec-1-ene, dimers, hydrogenated	68649-11-6	>=50 - <75	Xn; R20, R65	Acute tox. 4 H332 Asp. Tox 1. H304
Tris (methylphenyl) phosphate	1330-78-5	>=0.5 - <2.5	Repr. Cat 3; R62 N; R50/53	Repr. 2, H361f Aquatic Acute 1, H400 Aquatic Chronic 1, H410
n-phenyl-1-naphthylamine	90-30-2	>=0.25 - <1	Xn; R22, R48/22 R43 N; R50/53	Acute tox. 4, H302 Skin Sens. 1, H317 STOT RE2, H373 Aquatic chronic 1 H410



## Example 2 - GES for finished lubricant product



Technical Committee of Petroleum Additive Manufacturers in Europe

**Action 1:** Assign relevant GES to products, if appropriate

**Action 2:** Verify contents of the GES  
By checking against the incoming raw  
Material/component ES details



# Example 2 - GES for finished lubricant product

## Allocate lubricant products to ATIEL/ATC Use groups

**STEP 1**

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

- From Document 2:

LUBRICANT APPLICATION		ATIEL-ATC LUBRICANT USE GROUP
Family	Specific application	
▼	▼	▼
Industrial oils (hydraulic, compressor, etc)	Hydraulic fluids (general)	B



# Example 2 - GES for finished lubricant product



Technical Committee of Petroleum Additive Manufacturers in Europe

## Allocate lubricant products to ATIEL/ATC Use groups

### STEP 1

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

- From Document 3: Use Group B(i) - General industrial use of lubricants and greases in vehicles or machinery (closed systems) - Industrial

ATIEL-ATC Group B [i]	<b>General industrial use of lubricants and greases in vehicles or machinery.</b> Includes filling and draining of containers and enclosed machinery (including engines)	Initial factory fill from header tank; Lubricating Oil	SU 3	PROC 9	PC 16, 17, 24	n/a	ERC 4, 7	B(i): ATIEL-ATC SPERC 4.Bi.v1
		Initial factory fill by pouring from containers; Lubricating Oil		PROC 8b				
		Initial factory fill by injection of greases.		PROC 2, 9				
		Use as a lubricant/grease in a closed system		PROC 1				
		Maintenance activities industrial settings. General exposure during maintenance work including draining, refilling and R&D (e.g. engine testing).		PROC 8b				
		Material storage		PROC 1, 2				



## Step 1a:

### Is the product classified for human health?

- Yes - classified as R20
- From Document 4 (Health Boundary Conditions Matrix) under Use Group B check:
  - Row 1: if R20 is included in Row 1
  - Row 2: Is the product a sensitiser? No, therefore sensitiser concentrations in Row 2 do not apply
- **Conclusion: GES for Use Group B applies**

**STEP 1**

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

Row Number	Criteria / Boundary Condition	B: General use in vehicles or machinery B(i) - Industrial B(p) - Professional
1	Product Classification & Labelling (G&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 <input checked="" type="checkbox"/>
2	For products classified as R43 (skin sensitiser), sensitising component is within the listed concentration range:	Skin sensitiser (see Note 2) a) ≥ 0.1 - 1% Strong b) ≥ 1 - 3% Weak or Moderate <input checked="" type="checkbox"/>



# STEP 1

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**



## ATIEL/ATC Use Group B (ind) - Generic Exposure Scenario based on Boundary Con

<b>Section 1</b>	<b>Exposure Scenario Title</b>
Title	<b>General use of lubricants and greases in vehicles or machinery [ATU01] - Industrial [G26]</b>
Use Descriptor	Sector of Use: Industrial (SU3) Process Categories: PROC1, PROC2, PROC8b, PROC9
	Environmental Release Categories: ERC4, ERC7 Specific Environmental Release Categories: ATIEL-ATC SPERC 4.Bi.v1
Processes, tasks, activities covered	Covers general use of lubricants and greases in vehicles or machinery in closed systems. Includes draining of containers and operation of enclosed machinery (including engines) and associated use and storage activities. [ATU06]

### Section 2 Operational conditions and risk management measures

#### Section 2.1 Control of worker exposure

<b>Product characteristics</b>	
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

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]
General exposures (closed systems) [CS15]. <b>PROC1</b>	No other specific measures identified. [E120]
Initial factory fill of equipment [CS75]; Use in contained systems [CS38]. <b>PROC2, PROC9</b>	No other specific measures identified. [E120]
Initial factory fill of equipment [CS75]; (open systems) [CS108] <b>PROC8b</b>	Provide a good standard of general or controlled ventilation (10 to 15 air changes per hour) [E40]. Avoid carrying out operation involving exposure for more than 4 hours [OC28]
Operation of equipment containing engine oils and similar [CS26]; Use in contained systems [CS38]. <b>PROC1</b>	No other specific measures identified. [E120]
Equipment cleaning and maintenance [CS39]. <b>PROC8b</b>	Drain down system prior to equipment break-in or maintenance [E65]. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) [E11] Wear chemically resistant gloves (tested to EN374) in combination with specific activity training [PPE17]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Equipment cleaning and maintenance [CS39]. ; Operation is carried out at elevated temperature (> 20°C above ambient temperature) [OC7] <b>PROC8b</b>	Drain down system prior to equipment break-in or maintenance [E65]. ; Provide extract ventilation to emission points when contact with warm (>50 deg C) lubricant is likely [E67]. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls [PPE18]. Retain drain downs in sealed storage pending disposal or for subsequent recycle [ENVT4].
Storage [CS67] <b>PROC1, PROC2</b>	Store substance within a closed system [E84]



# Verification check

- Verify incoming raw material Exposure Scenario against the GES
- Map all raw materials to the ATIEL/ATC use groups (Document 3)
- Link uses to products to raw materials
- In this example, all components of the ‘Synthetic Hydraulic Oil’ should be mapped to ‘Use Group B (industrial)’
  - Component 1: Dec-1-ene, dimers, hydrogenated
  - Component 2: Tris(methylphenyl) phosphate
  - Component 3: n-phenyl-1-naphthylamine



# Verification check

- Received a REACH SDS with Exposure Scenarios for component 3 - n-phenyl-1-naphthylamine (R22, R48/22, R43; R50/53)
- Use check against incoming SDS:
  - SDS Section 1.2: Additive for lubricants
  - Exposure Scenario: ES2 General industrial use
    - PC17 Hydraulic fluids, PC24: Lubricants, greases, release products
    - PROCs: 1, 2, 8a, 8b, 9
    - ERC4 and ERC7
- SDS includes ES relevant to Use Group B(i)

## STEP 3

Consistency check for uses:

Document 3

## Verification check

### 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC8a, PROC8b, PROC9

#### Product characteristics

Concentration of the Substance in Mixture/Article : 1 - 100 %

Physical Form (at time of use) classification : Solid, medium dustiness  
: PROC1, PROC2, PROC8a, PROC8b, PROC9

#### Amount used

classification : Covers the percentage of the substance in the product up to 100 % (unless stated differently), PROC1, PROC2, PROC8a, PROC8b, PROC9

#### Frequency and duration of use

Exposure duration classification : > 4 h  
: Covers daily exposures up to 8 hours (unless stated differently), PROC1, PROC2, PROC8a, PROC8b, PROC9

#### Human factors not influenced by risk management

: None known.

#### Other operational conditions affecting workers exposure

: Handle in accordance with good industrial hygiene and safety practice., Assumes a good basic standard of occupational hygiene is implemented.

#### Technical conditions and measures

Technical conditions and measures : Provide extraction ventilation at points where emissions occur.

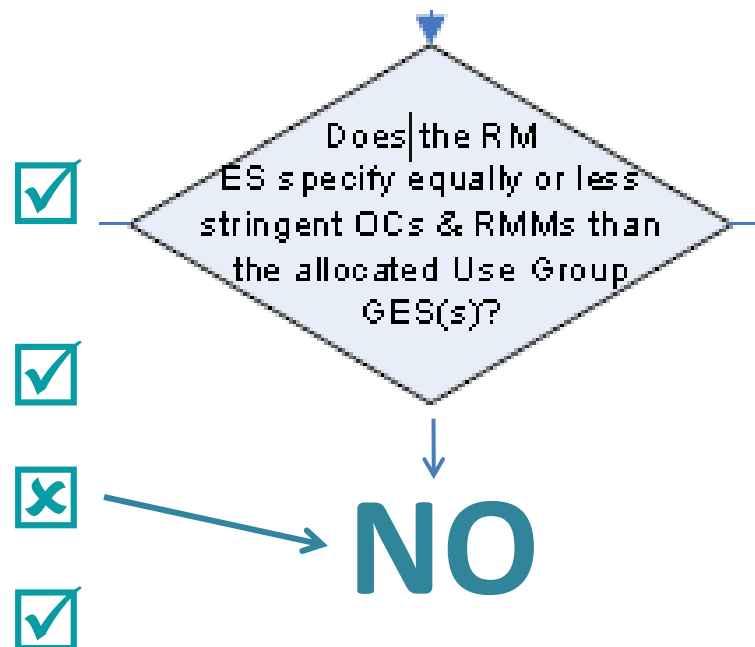
#### Conditions and measures related to personal protection, hygiene and health evaluation

Protective equipment : Wear suitable gloves tested to EN374., PROC1, PROC2, PROC8a, PROC8b, PROC9

### STEP 4

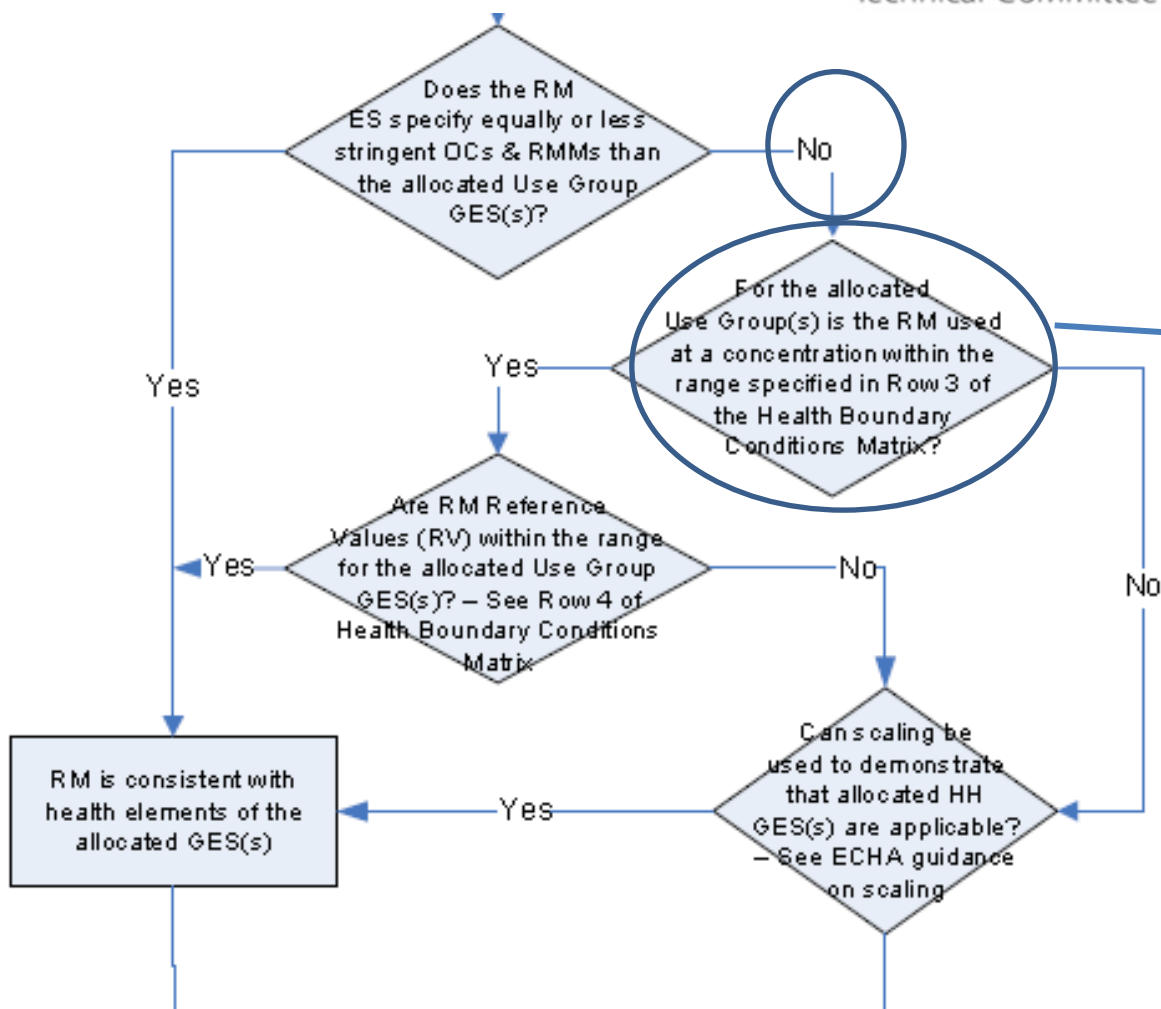
Consistency check for human health:

Document 4 (Rows 3 and 4), Document 5b, and Document 8





## Verification check



### STEP 4

Consistency check for human health:

Document 4 (Rows 3 and 4), Document 5b,

and Document 8

### From Document 4:

**Skin sensitisers:**  
 $\leq 1\%$  of strong sensitiser  
 $\leq 3\%$  of weak/moderate sensitiser

**Other hazardous components except CMRs:**

a)  $\leq 25\%$  (industrial) \*  
 b)  $\leq 5\%$  (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.

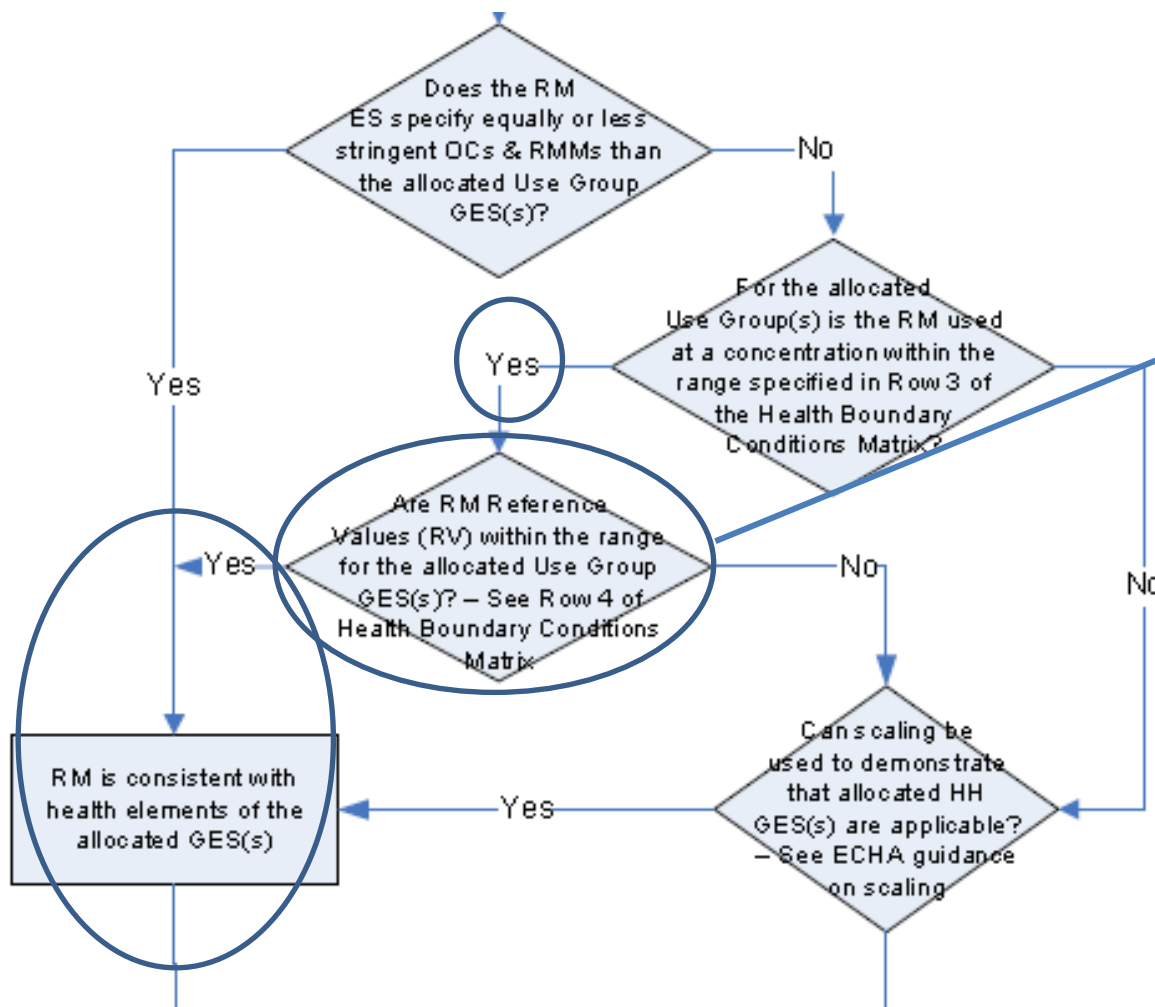


# Verification check

## STEP 4

Consistency check for human health:

Document 4 (Rows 3 and 4), Document 5b,  
and Document 8



## From Document 4:

**(i) RV inhalation vapour:**  
 $\geq 5\text{ppm}$  OR Vapour Pressure  
 $\leq 0.01\text{ Pa}$ .

**(ii) RV dermal:**  
 $\geq 0.5\text{ mg/kg bw/day}$

## Raw material DNELs:

Skin contact

Long-term exposure, systemic, dermal  
 Value: 0,12 mg/kg bw/day



Inhalation

Long-term exposure, systemic, inhalative  
 Value: 0,41 mg/m<sup>3</sup>

## Raw material VP:

: 0,000011 hPa (20 °C)

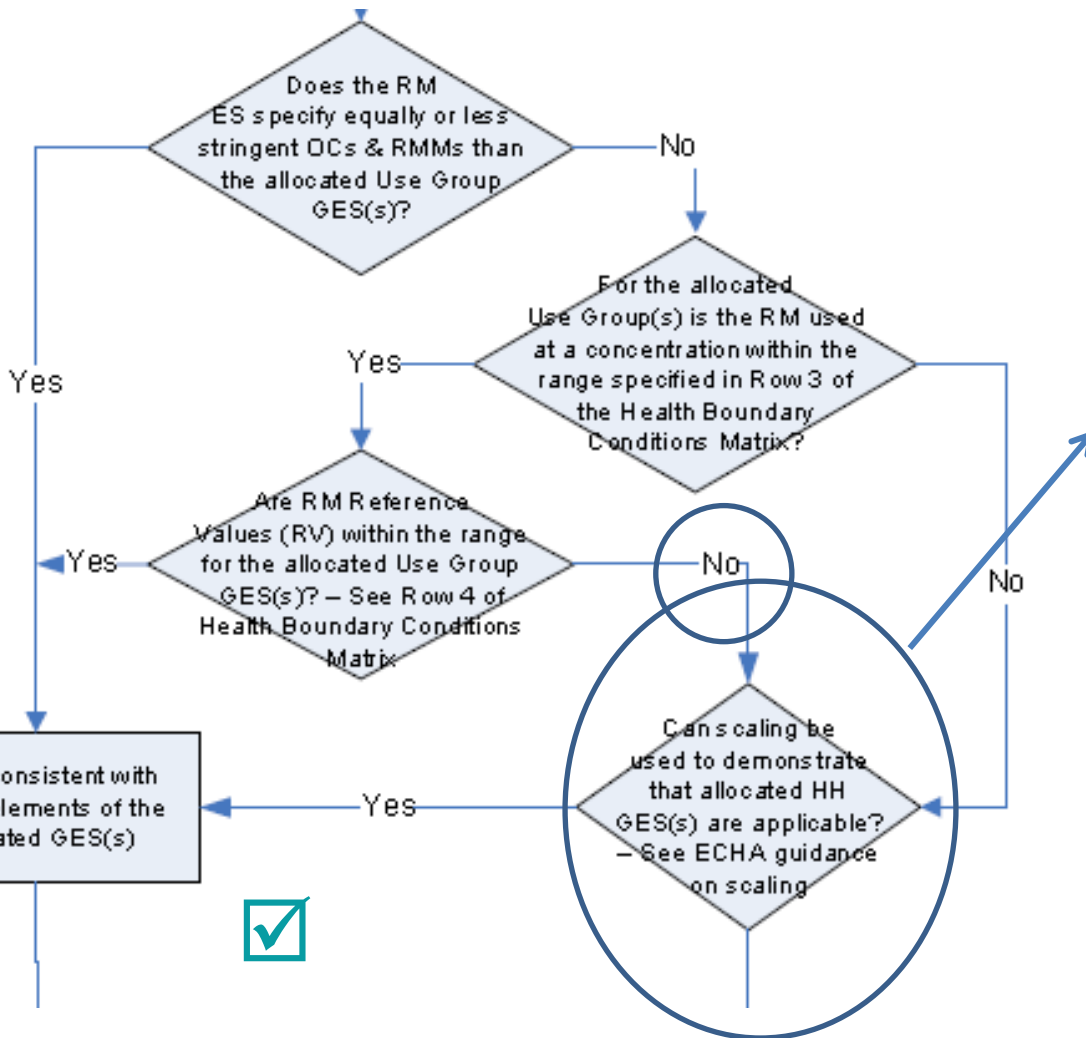


# Verification check

## STEP 4

Consistency check for human health:

Document 4 (Rows 3 and 4), Document 5b,  
and Document 8



If the outcome was No:

Apply scaling:

ECETOC TRA model applied by supplier

Actual concentration in Product: <1% = 90% exposure reduction

Replaces LEV with 90% exposure reduction



If elevated temperature, GES indicates LEV is required

## Example 2

### Environmental GES

Compilation of environmental GES for example 2 -hydraulic fluid

#### Process overview

1. Identify which component in formulation drives risk for environment
2. Look up relevant Operating Conditions (OCs) for that component from prepared tables
3. Insert values into GES template
4. Verify GES by comparison with details found in Raw Material ES

# Example 2 RDS

## STEP 1

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

## Identification of potential risk determining substances (RDS)

- Based on concentration and classification there are 2 potential RDSs in product:

Tris (methylphenyl) phosphate	1330-78-5	>=0.5 - <2.5	Repr. Cat 3; R62 N; R50/53	Repr. 2, H361f Aquatic Acute 1, H400 Aquatic Chronic 1, H410
n-phenyl-1-naphthylamine	90-30-2	>=0.25 - <1	Xn; R22, R48/22 R43 N; R50/53	Acute tox. 4, H302 Skin Sens. 1, H317 STOT RE2, H373 Aquatic chronic 1 H410

- Both substances are listed in Document 6 Environmental Classified Substance Table:

Substance Name	CAS #	EC #	DSD Classification	GHS classification (optional)	Parameter values as input to GES code				GES code (see tab GES Assignment codes)
					log Kow	VP (pa)	Biodegradability	PNEC FW aqua mg/l	
Tricresyl phosphate	1330-78-5	215-548-8	R50/53		5.93	300	not biodegradable	0.000146	8.2
Phenyl alpha naphthylamine	90-30-2		R22-43-50/53(Mf1)		4.28	0.0011	not biodegradable	0.0002	2.2

- Note RDS codes (GES 8.2 and 2.2 for this example)

**STEP 1**

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
 a. Human Health: **Document 4** (Rows 1 & 2)  
 b. Environment: **Documents 6** and **Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

# Determine RDS for formulation

- Look up Msafe values for RDS code x Use in 'Document 7- GES values table':
  - Eg. n-phenyl-1-naphthylamine code 2.2:

RDS Code	Ai-add pack	Ai-lubes	Bi	Bp
1.1	13375.8	133.9	39.3	0.4
1.2	133758.3	1338.8	392.5	3.8
1.3	1337583.3	13388.4	3925.4	38.2
1.3.1	48529411.6	12012294.9	672096.7	146.8
1.4	13375833.0	133883.9	39253.9	382.1
1.5	133758330.2	1338839.0	392538.9	3821.4
2.1	6678.5	66.9	23.7	0.3
2.2	66785.1	668.5	237.1	2.7
2.3	667850.8	6685.0	2370.9	26.8

- Adjust  $M_{safe}^{100\% \text{ product}}$  to  $M_{safe}^{\text{max. formulation conc.}}$

Ingredient	CAS no	%	RDS code	Msafe kg/day	
				100% product	Formulation
(n-methylphenyl) phosphate	1330-78-5	>=0.5 - <2.5	8.2	5206	208240
n-phenyl-1-naphthylamine	90-30-2	>=0.25 - <1	2.2	237.1	23700

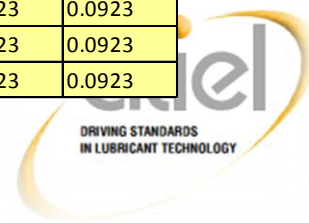
- Lowest  $M_{safe}^{\text{formulation}}$  is RDS for that product



# Operating conditions RDS/Use

- To compile GES - look up following values from Document 7 - ‘GES Values Table’
  - EU tonnage
  - Msafe (as in previous step)
  - Release fraction to water (scale to concentration)
  - Removal efficiency in sewage treatment
  - eg...

RDS Code	ATIEL ATC Use group Estimated substance removal from wastewater via domestic sewage treatment (%) - FSTP											
	Ai-add pack	Ai-lubes	Bi	Bp	Bc	Ci	Cp	Cc	Di	Ei	Fi	Fp
1.1	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497
1.2	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497
1.3	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497
1.4	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497
1.5	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497	87.3497
2.1	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
2.2	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
2.3	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
2.4	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923
2.5	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923	0.0923



# GES Template



## STEP 1

Allocate lubricant products to ATIEL/ATC use group(s): **Document 2** and **Document 3**

Check product meets boundary conditions:  
**a. Human Health: Document 4 (Rows 1 & 2)**  
**b. Environment: Documents 6 and Document 7**

Attach GES to product SDS for each required use group: **Document 5a** and **Document 5b**

- Insert values from look-up tables into use group 'Bi' GES template

- 'RED' values are from tables
- Other values are pre-filled on template for this Use

Section 2.2	Control of environmental exposure
<b>Amounts used</b>	
EU tonnage (tonnes per year) [ATE09]	2.63E+03
Fraction of EU tonnage used in region [A1]	0.1
Fraction of Regional tonnage used locally [A3]	0.1
<b>Frequency and duration of use</b>	
Emission days (days/year) [FD4]	300
<b>Environmental factors not influenced by risk management</b>	
Local freshwater dilution factor [EF1]	10
Local marine water dilution factor [EF2]	100
<b>Other given operational conditions affecting environmental exposure</b>	
Negligible wastewater emissions as process operates without water contact. [OOC20]	
Release fraction to air from process (after typical onsite RMMs) [ATE11]	5.0 E-05
Release fraction to wastewater from process (after typical onsite RMMs and before (municipal) sewage treatment plant); [ATE12]	2.00E 11
Release fraction to soil from process (after typical onsite RMMs): [ATE13]	0
<b>Technical conditions and measures at process level (source) to prevent release</b>	
Common practices vary across sites thus conservative process release estimates used [TCS1]	
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	
Treat air emission to provide a typical removal efficiency of (%):	70
Prevent discharge of undissolved substance to or recover from onsite wastewater. [TCR14]	
User sites are assumed to be provided with oil/water separators or equivalent and for waste water to be discharged via public sewer system. [ATE14]	
<b>Organisational measures to prevent/limit release from site</b>	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
<b>Conditions and measures related to municipal sewage treatment plant</b>	
Estimated substance removal from wastewater via domestic sewage treatment (%) - F <sub>STP</sub> [STP3]	9.00E-02
Assumed domestic sewage treatment plant flow (m <sup>3</sup> /d) [STP5]	2.00E+03
Maximum allowable site quantity (MSafe) based on OCs and RMMs as above (kg/day): [ATE15]	2.37E+04
<b>Conditions and measures related to external treatment of waste for disposal</b>	
External treatment and disposal of waste should comply with applicable local and/or national regulations. [ETW3].	
<b>Conditions and measures related to external recovery of waste</b>	
External recovery and recycling of waste should comply with applicable local and/or national regulations. [ERW1]	
<b>Other environmental control measures additional to above</b>	
None specified [ATE16]	





# Verification of GES with Raw Material ES

Check: Log Kow, vapour pressure, biodegradability and PNEC and on Raw Material (RM) SDS are consistent with RDS Table

	Log Kow	VP (Pa)	Ready Biodeg	PNEC mg/l)
RDS code 2.2	<5	< 1	Not	0.0001 <sub>≤</sub> - <0.001
RM -SDS	4.2	0.0011	Not	0.0002

## CONCLUSION

The RDS code selected for GES is consistent with properties of RM

# Verification of GES with Raw Material ES

- Comparison of OCs and RMMs

	RF air	Rf water	RF soil	Msafe	RMM water
Atiel /ATC GES	0.0005	1.0 E-11	0	237 kg/day	Oil water separation STP with efficiency value
RM -ES	Measured value 0.00048 kg/d	100% and emission to sewage 0 kg/day	0% and emission to soil 17.5 kg/day	155 kg/day	'Product must not be released into water without pre-treatment'

## CONCLUSION:

- Difficult to interpret RM -ES. Conflicting values for releases
- Direct comparison between RM-ES and Atiel /ATC GES is challenging





Technical Committee of Petroleum Additive Manufacturers in Europe

# Conclusions and Discussion

Safe use information for mixtures.  
ATIEL-ATC GES Approach



# Frequently Asked Questions (FAQ)



Technical Committee of Petroleum Additive Manufacturers in Europe

- There are [FAQs](#) available on the ATIEL website which cover the GES approach. Guidance and all the documents previously mentioned are also available on the ATIEL website. Some additional FAQs may be as below:
- **How much level of expertise will I need to apply this approach?**
  - A person who is competent to author regular SDS should be able to apply this approach. Positive feedback received from lubricants formulators outside the core group. Awaiting further response before deciding on extent of additional training material.
- **How long does it take to apply this approach?**
  - Once the background documents have been read and understood the GES approach is straightforward to apply. More challenging is the verification of the GES against incoming raw material ES as quality of incoming information is variable.



# Frequently Asked Questions (FAQ)



Technical Committee of Petroleum Additive Manufacturers in Europe

- **What languages are the GES available in?**
  - The GES are available in English only, however the vast majority of the phrases used are available in the ECom library. Specific phrases which were not in the ECom phrase library have been translated by ATIEL/ATC.
- **Is this process able to be automated by computer?**
  - There are IT implications with automating the process but some companies are automating the process so it can be done.



# Minimum Input Required



Technical Committee of Petroleum Additive Manufacturers in Europe

- The GES approach can be applied without much data needed up front.
- Human health - hazard classification.
- Environment:
  - PNEC<sub>fw</sub>(aq)
  - Log K<sub>ow</sub>
  - Vapour pressure
  - Biodegradability
- These are provided by ATIEL/ATC for a large number of the typical Risk Determining Substances (RDS).



## Advantages of GES approach:

- Delivers clear, concise, consistent advice to downstream users from all lubricants' suppliers.
- Constrains the length of the e-SDS annex to a manageable size.
- GESs are inherently conservative but not unrealistic.
- Unnecessary to have all the information available for the incoming raw materials to generate the GES.
- CMR and respiratory substances are outside the boundary of the HH GES approach which limits applying generic information to products which are highly hazardous.

## Practical Issues of GES Approach:

- Need to define the conditions of safe use for a large number of components that have a wide range of hazard and physical-chemical properties. There will therefore be some mixtures that the GES approach will not 'fit'.
  - However we believe it covers the vast majority.
- It was designed for ATIEL/ATC sector so the content may not be suitable for other sectors.
  - Other sectors with more complex supply chains may find the development of GES inappropriate.



# Questions Discussion



Technical Committee of Petroleum Additive Manufacturers in Europe

- Now we have explained the ATIEL-ATC approach and demonstrated our example formulations are there any questions that have not already been addressed?



**Thank you for your participation**

