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Revision of the European Ecolabel Criteria for Lubricants

Technical Report 2.0:
Draft criteria proposal for revision of EU Ecolabel criteria

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1 INTRODUCTION

The objective of this project is to revise the existing EU Ecolabel criteria (Commission Decision 2011/381/EU[1]) for lubricant product group. The criteria were for the first time established in 2001 and the Decision currently in force is valid until the end of December 2018.

This technical report is intended to provide background information for the revision of the existing EU Ecolabel criteria for lubricants. The study has been carried out by the Joint Research Centre (JRC) with the technical support of LEITAT. The work is being developed for the European Commission's Directorate General for the Environment.

The main purpose of the technical report is to summarise the results of the preliminary analysis of the current criteria and to discuss if the criteria are still appropriate and up-to-date or if they should be revised, amended or some of them removed; and finally, and if any new criteria should be added.

This technical report is supported and complemented by the preliminary report[2] published in December 2016. The preliminary report includes scope and definition, market analysis, and technical analysis. Moreover, a first draft revision of the technical report (TR1.0)[3] was published in December 2016 and has built the basis for the first Ad-hoc Working Group meeting (AHWG1) which took place in February 2017.

The current revised technical report (TR2.0) provides an update on the criteria revision, based on new information collected during the revision and provided by the involved parties (i.e. through stakeholders' discussion at the 1st AHWG meeting, further stakeholder inputs following the meetings and additional desk research).

This report consists of:

- **Introduction** (Chapter 1): this section describes the goal and content of the document, the sources of information and the next steps in the project. It also summarizes the preliminary report and the main conclusions obtained regarding the scope definition and the key environmental aspects related to the product group of lubricants. This chapter has been complemented considering the input received in the 1st stakeholder consultation and additional research.
- **Assessment and verification** (Chapter 2)**:** this section includes information on the type of documentation required to show compliance with the criteria that shall be provided by applicants and recognised by Competent Bodies.
- **Criteria proposal** (Chapter 3)**:** this section presents the second draft of the proposed revised EU Ecolabel criteria for the lubricants product group. The proposal is written in a blue box and subsequently a rationale is given. Changes from the first criteria proposal are provided in blue text. Under each criterion, discussions are chronologically presented under the following headlines:
    - Summary of the rationale and technical data discussed in the preliminary report and the first stakeholder questionnaire that lead to the first criteria proposal, presented in the 1st AHWG meeting.

[1] Commission Decision No 2011/381/EU of the European Parliament and of the Council of 24 June 2011 establishing the ecological criteria for the award of the EU Ecolabel to lubricants, available online at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011D0381

[2] Preliminary Report. Revision of European Ecolabel Criteria for Lubricants. December 2016. See: http://susproc.jrc.ec.europa.eu/Lubricants/documents.html.

[3] Draft Technical report EU Ecolabel Lubricants. December 2016. See: http://susproc.jrc.ec.europa.eu/Lubricants/documents.html.

  - The outcomes of and suggestions made by the stakeholders during the 1st AHWG meeting and the subsequent commenting period.
  - Further research carried out on the points addressed by the stakeholders or any other point of relevance and main changes of the criterion in the second proposal.
- **Impact of changes to criteria** (Chapter 4): this section consists of a summary of the main changes proposed for the revised criteria and potential implications on current licence holders and applicants.
- **Appendix 1 and 2** include complementary detailed evidence to the rationale included in criteria1 and 5 respectively.
- **Annex I** includes the Substitution information and Derogation request form that stakeholders should fulfil to communicate the substances not compliant with article 6 (6) of the EU Ecolabel Regulation and that cannot be replaced.
- **Annex II** includes the existing EU Ecolabel criteria in order to allow the reader to consult the text in force.
- **Separated annex** published along with this TR2.0 is a table including all of the comments received during the first consultation, together with responses and explanations on how they have been addressed in this TR2.0.

1.1 METHODOLOGY AND SOURCES OF INFORMATION

The approach followed in the revision of the EU Ecolabel for lubricants consists of the following elements:

- analysis of the current scope and criteria and a review of any relevant legislation;
- analysis of the lubricant market from a global and European perspective;
- technical analysis, in which environmental and health impacts are studied.

A brief description of these above-mentioned elements is given below:

Revision of the scope and definition: an overview of existing technical categories, and relevant legislation and standards has been done in order to identify aspects of the current criteria, which may require revision. Moreover, stakeholder feedback was obtained through a questionnaire on the current scope and definition. Other labelling schemes and other initiatives related to lubricants have been analysed in order to identify potential areas for harmonization.

Market analysis: the trend of global and European lubricant market has been analysed. Key figures and data have been collected in order to properly understand the current market of lubricants and the potential intake of the EU Ecolabel. The main source used for this work has been *Lubricants Market Analysis and Segment Forecasts to 2022*[4].

Technical analysis: the aim of the technical analysis is to provide information about potential impact of lubricants on the environment and human health. The entire life cycle of a lubricant has been assessed in order to identify the life cycle stages with the highest environmental impacts and those with the highest improvement potential. In addition, analysis of the main hazardous substances used in the lubricant sector has been done, and an identification of their environment and human health impacts has been conducted.

[4] Lubricants Market Analysis and Segmented Forecasts to 2022. Grand view Research, Inc. 2015

For this task, a critical review of published LCA studies has been performed. 12 Life Cycle Assessment studies (LCAs) have been screened in order to evaluate the quality of the reports and classify them depending on four parameters: the scope, data, impact categories evaluated and conclusions/findings. Supplementary information was sought about the sustainability considerations in the different cycle stages in order to cover all key aspects of the life cycle of lubricants. Moreover, the software SimaPro 8.0. and database Ecoinvent 3 has been used for analysing some of the cycle stages of lubricants.

In addition, a prioritisation methodology has been designed in order to consider all the multidimensional (e.g. market, technical, environmental, health) aspects that influence this revision. The prioritisation methodology has served as a basis to prepare a proposal of the revised scope attending to aspects including market, technical and environmental aspects, as well as to help us to identify the environmental hotspots associated to the categories included in the scope in order to set the revised criteria that target the main relevant environmental hotspots associated to this product group.

Two questionnaires have been sent out to all registered stakeholders in the initial stage of the revision process. A first questionnaire has been done about the current scope and definition, including also questions about the current criteria. The answers of the stakeholders (44 in total) have been presented in the preliminary and technical reports. In addition, a survey on *data requirements for criteria 3, 4 and 5* has been sent to stakeholders with the aim to obtain information on the current values of aquatic toxicity, biodegradation and bioaccumulation, and removability for current and potentially labelled products.

The information obtained during this preliminary phase of the revision process has been included in the preliminary report[2] published along with the 1st technical report, and constituted the basis of the 1st revised criteria proposal.

Both documents (preliminary report and technical report) have served as a basis for discussions with stakeholders in the AHWG meetings. The opinions of the stakeholders have been considered and their comments are included in this 2nd version of the technical report. In addition, competent bodies (CB) have been contacted to obtain additional information on certified lubricant products, and a number of stakeholders (lubricants producers, ingredients suppliers, other experts) have been consulted to submit information on technical performance details, as well as product composition. This additional information and evidence form the basis of the second criteria proposal included in this report.

1.2 Summary of the preliminary report and link to the EU Ecolabel criteria

The preliminary report summarises the analysis conducted in the initial stage of the revision of the criteria for the lubricants product group. This includes updating and revising the scope and definitions, analysis of the lubricants market, and a review of the scientific evidence to identify the main environmental impacts of lubricants. The sections below provide a summary of the findings from the preliminary report with a focus on the scope and on the key environmental aspects. Further details can be found in the report which is available at the project website: http://susproc.jrc.ec.europa.eu/Lubricants/documents.html.

The section has been updated for the TR2.0 considering the input received in the 1st stakeholder consultation and additional research

1.2.1 Product group name, scope and definitions

Product group name:
Lubricants
Second revised product group definition proposal:
A lubricant means a product capable of reducing friction, adhesion, heat, wear and corrosion when introduced between two solid surfaces in relative motion and capable to transmit power. The most common ingredients are base fluids and additives.

Second revised scope proposal:
Total Loss Lubricants (TLL): chainsaw oils, wire rope lubricants, concrete release agents, open gear oils, stern tube oils, total loss greases and other total loss lubricants. Partial Loss Lubricants (PLL): 2-stroke oils, temporary protection against corrosion and partial loss greases. Accidental Loss Lubricants (ALL): hydraulic systems, metalworking fluids, closed gear oils and accidental loss greases. Note: Where grease can be used in both, i.e. TLL and PLL applications, as in the case in a multifunctional grease, criteria for TLL category shall apply. If grease can be used as PLL and ALL, but not as TLL, then the criteria for ALL category shall apply.

Second revised complementary definitions proposal:
'**Base fluid**' means a lubricating fluid whose flow, ageing, lubricity and anti-wear properties, as well as its properties regarding contaminant suspension, have not been improved by the inclusion of additive(s); '**Substance**' as defined in Regulation No 1907/2006, means a chemical element and its compounds in the natural state or obtained by any production process, including any additive necessary to preserve the stability of the products and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition; '**Thickener**' means one or more substances in the base fluid used to thicken or modify the rheology of a lubricating fluid or grease;

Second revised complementary definitions proposal:

'**Main component**' means any substance accounting for more than 5 % by weight of the lubricant;

'**Additive**' means a substance or mixture whose primary functions are the improvement of the flow, ageing, lubricity, anti-wear properties or of contaminant suspension;

'**Total Loss Lubricant (TLL)**' means a lubricant product that is fully released to the environment during use.

'**Partial Loss Lubricant (PLL)**' means a lubricant product that is partially released to the environment during use.

'**Accidental Loss Lubricant (ALL)**' means a lubricant product that is used in closed systems. These products can be released to the environment only incidentally.

'**Chainsaw oil**' means a lubricant product that is used to lubricate the bar and chain on all types of chainsaw. A chainsaw is a portable, mechanical saw that cuts with a set of teeth attached to a rotating chain that runs along a guide bar; it is used in activities such as tree felling, limbing, bucking, pruning, cutting firebreaks in wildland fire suppression and harvesting firewood. They are mostly covered under ISO 6743 family A, Total loss systems.

'**Wire rope lubricant**' means a lubricant product that is used to lubricate wire ropes which consist of several strands of metal wire twisted into a helix. They are mostly covered under ISO 6743 family A, Total loss systems.

'**Concrete release agent**' means a lubricant product that is used in the construction industry to prevent the adhesion of freshly placed concrete to the forming surface, usually plywood, overlaid plywood, steel or aluminium.

'**Gear oil**' means a lubricant made specifically for transmissions, transfer cases, and differentials in automobiles, trucks, and other machinery. Open gear lubricants are used in open gears. Open gears are exposed to challenging conditions include outdoor environment, extended service operation, dust, silica, water, extreme heat and extreme pressures. Open gear oils must be specially formulated to keep equipment operating at maximum efficiency. Closed gear oils are used in closed gears. Closed gears are those gears contained within a closed box, in such a way that a lubricant loss in the environment can only happen accidentally. They are mostly covered under ISO 6743 family C, Gears.

'**Stern tube oil**' means the lubricant used in stern tube which is a narrow hole in the hull structure at the rear end (aft peak) of the ship, through which the propeller shaft passes and connects the engine and propeller.

'**Grease**' means a semisolid lubricant. Grease generally consists of a thickener, generally soap, with mineral or bio-based oil. The characteristic feature of greases is that they possess a high initial viscosity, which upon the application of shear, drops to give the effect of an oil-lubricated bearing of approximately the same viscosity as the base oil used in the grease. This change in viscosity is called shear thinning. Depending on application of the grease, there will be total, accidental or partial loss greases. They are mostly covered under ISO 6743 family X.

'**Other total loss lubricants**' means other lubricants not specified under the TLL but that are fully released to the environment during use.

'**2 stroke oil**' means oil used in two-stroke engines; sometimes called two-cycle oil or simple 2T oil. These are a special case of motor oils used in crankcase compression two-

Second revised complementary definitions proposal:

stroke engines. They are mostly covered under ISO 6743 family E, Internal combustion engine oils.

'**Temporary protection against corrosion**' means oils, solutions, and emulsions that are applied onto a metal surface as a thin film in order to protect water and oxygen from coming in contact with the metal surface. They are mostly covered under ISO 6743 family R, Temporary protection against corrosion.

'**Hydraulic systems**' also called hydraulic fluids or hydraulic liquids means the medium by which power is transferred in hydraulic machinery. They are mostly covered under ISO 6743 family H, Hydraulic systems.

'**Metalworking fluid**' means oil, emulsion or solution designed for metalworking processes, such as cutting and forming, which main roles are cooling, reducing friction, removing metal particles, and protecting the work pieces, the tool, and the machine tool from corrosion. They are mostly covered under ISO 6743 family M, Metalworking.

'**LuSC-list**' or Lubricant Substance Classification list is a list of substances and brands that have been assessed by a competent body on its biodegradation/bioaccumulation, aquatic toxicity, renewability and non-presence of excluded substances. The assessment is based only on a maximum treat rate allowed in a lubricant. The list is published on the EU Ecolabel website and the data can be used directly in the application form.

"**LoC**" or Letter of Compliance means a letter emitted by one of the EU ecolabel competent body indicating the assessment of a substance or brand used in a lubricant. It contains the same information as listed on the LuSC-list.

'**Critical concentration for the aquatic toxicity**' means the concentration of a substance at and above which injurious to an aquatic organism in an exposure to that substance.

'**Acute aquatic toxicity**' means the intrinsic property of a substance to be injurious to an aquatic organism in a short-term aquatic exposure to that substance.

'**Chronic aquatic toxicity**' means the intrinsic property of a substance to cause adverse effects to aquatic organisms during aquatic exposures which are determined in relation to the life-cycle of the organism.

'**M-factor**' means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present.

'**Degradation**' means the decomposition of organic molecules to smaller molecules and eventually to carbon dioxide, water and salts.

'**Readily biodegradable**' means a substance which in 28-day ready biodegradation tests:

- achieves at least 70 % of degradation for tests based on dissolved organic carbon: 70 %;
- achieves at least 60 % of degradation for tests based on oxygen depletion or carbon dioxide generation.

These levels of biodegradation must be achieved within 10 days of the start of degradation which point is taken as the time when 10 % of the substance has been degraded, unless the substance is identified as an UVCB or as a complex, multi-constituent substance with

Second revised complementary definitions proposal:

structurally similar components. In this case, and where there is sufficient justification, the 10-day window condition may be waived and the pass level applied at 28 days.

- In those cases, where only BOD and COD data are available, when the ratio of BOD5/COD is ≥ 0,5.

'**Inherently biodegradable**' means a substance, which achieves the following level of degradation:

> 70 % after 28 days for inherent biodegradation test, or

> 20 % but < 60 % after 28 days based on oxygen depletion or carbon dioxide generation.

'**Non-biodegradable**' means a substance which fails the criteria for ultimate and inherent biodegradability.

'**Highly insoluble**' means a substance which has a water solubility < 10µg/l according to OECD 105.

'**Slightly soluble**" means a substance which has a water solubility < 10mg/l according to OECD 105.

'**Bioconcentration factor**' (BCF) means the ratio of chemical concentration in an organism to that in surrounding water.

'**EC50**' is median effective concentration. It is the concentration that is estimated to cause some defined toxic effect to 50% of the test organisms; (e.g., death, immobilization, or serious incapacitation).

'**IC50**' means the inhibiting concentration for a 50% effect on the test organisms. It represents a point estimate of the concentration of test materials that can cause a 50% impairment in a quantitative biological function (e.g. reduced growth, impairment of the reproductive). These potential impacts do not kill the organism but may reduce the total population over time thereby decreasing aquatic productivity.

'**LC50**' means median lethal concentration. It is the concentration of material that is estimated to be lethal to 50% of the test organisms.

'**Octanol/water partition coefficient**' (Kow) means the ratio of a chemical's solubility in n-octanol and water at equilibrium.

'**NOEC**' means 'no observed effect concentration'. It is the highest concentration at which no effect on test organisms is observed over a relatively long period in a chronic aquatic toxicity test.

'**Biochemical Oxygen Demand**' (BOD) means the quantity of oxygen utilized by micro-organisms growing under aerobic (oxygenated) conditions for the biochemical oxidation of organic substances under standard laboratory procedures which is usually 5 days (hence BOD5) but can be longer for specific purposes. BOD is usually expressed as a concentration (e.g., mg/l).

'**Chemical Oxygen Demand**' (COD) means the quantity of oxygen utilized in the chemical oxidation of an organic substance in water, as determined using a strong oxidant, under standard laboratory procedure, usually expressed in milligrams per litre (e.g., mg/l).

'**Theoretical Oxygen Demand**' (ThOD) is the calculated amount of oxygen required to oxidise an organic substance to its final oxidation products. However, there are some

Second revised complementary definitions proposal:
differences between standard methods that can influence the results obtained: for example, some calculations assume that nitrogen released from organics is generated as ammonia, whereas others allow for ammonia oxidation to nitrate. Therefore in expressing results, the calculation assumptions should always be stated.

Rationale of the proposed name, scope and definitions

The existing **definition** [i.e. 'lubricant' means a preparation consisting of base fluids and additives] is quite broad, nevertheless there exist more complex lubricant compositions, which do not consist of base fluids and additives only but can be emulsions (e.g. metalworking fluids, and demoulding agents) or solid state compounds (e.g. fine powders to reduce friction) and therefore are not covered by the existing EU Ecolabel definition based on composition. This definition was proposed to be amended for the first proposal to include a reference to the functionality of the product with the aim to better explain which products are meant.

In the first proposal, no changes were introduced with regard the complementary definitions, contained in the current criteria text, since they were considered to be still valid.
In addition, for the lubricant types to be covered under the scope during this revision it was suggested in the preliminary report to use the nomenclature of the lubricant families contained in the ISO 6743 classification, with the aim to better indicate what are the types of lubricants considered under the scope and to set clearer minimum technical performance requirements (to define a standard test per family or sub-family).

With regard to the **scope**, in the first survey it was proposed to extend the scope to cover the categories of the ISO 6743 currently not covered by the existing criteria (to increase the market share of the potential EU Ecolabel products). The preliminary report revealed that the existing scope only represents a 16% of the total lubricants market.

For this revision, it was suggested to keep a focus on the total loss (lubricants physically released to the surrounding, their entry into environment is unavoidable and they are irretrievable), and high risk (of accident) lubricants (lubricants used in confined systems which are susceptible to accidental losses) and to extend the scope in order to cover a higher market share. In addition, the preliminary report highlighted that the environmental impacts of a lubricant product can occur in any stage of its life cycle (e.g. during raw material extraction or at the end of life), and not only from its potential release to the environment.

For this reason, it was considered reasonable to extend the scope to other lubricants not currently covered and that presents risk of accidental losses (accidental loss lubricants), and to other risks lubricants which are associated with other environmental impacts than those related to its potential release.

The approach proposed for the first AHWG meeting was to maintain the current lubricants included in the EU Ecolabel, and to extend the scope by taking into account the potential impact on the environment and human health during use and end-of-life, and the market share of each ISO family. The inclusion of all lubricant families in the same revision was considered impracticable due to the unfeasibility of developing criteria for such a wide number of categories in one revision process. In the light of the technical analysis, to set scope proposal a prioritizing methodology was defined in order to select the lubricants to be included in the new scope. The relevant points of the prioritization methodology were the following:

- potential for release to the environment,

- concerns regarding other aspects, like human health, disposal, possibility of recovery and reuse
- market share and target end-consumers.
- availability of other environmental labelling schemes

Several lubricant families currently not covered under the EU Ecolabel but that are included in other labelling schemes were found. For instance temporary protection against corrosion lubricants, named as "anti-rust lubricating oil" and 4-stroke engine oils are addressed in the Korea Ecolabel.

In the light of the prioritization methodology, the initial proposal on widening the scope was defined for the first AHWG meeting. The following lubricant families that are currently excluded from the EU Ecolabel scope and that were identified as being susceptible to be included during the revision process were:

- *metalworking fluids (MWFs)*: the metalworking fluids could be important due to accidental losses and due to the impact on human health from the worker's exposure point of view. Also the impacts linked with waste could be relevant from an environmental point of view.
- *temporary protection against corrosion*: they are often used in open systems and in environmentally sensitive areas. Sometimes they are not recovered after use and waste lubricant can be lost into the environment.
- *4-stroke engine oils*: they represent a high market share. In addition, they normally target end consumers and they present the issue of collecting of waste oil (especially at particular level).

Additional details of the first proposal can be consulted in the first technical report[3].

- **Outcomes from and after the 1st AHWG meeting**

At the first consultation, a number of stakeholders provided general feedback on the proposed scope. Differing views on this was observed. One stakeholder asked that 'no other classes of lubricants should be added to the EU Ecolabel'. However, the current share of the lubricant market that is allowed to apply for EU Ecolabel is very low. As indicated above, in the first technical report it was proposed that the scope is widened, so that more lubricants have the opportunity to get into the EU Ecolabel scheme, which will lead to more environmentally friendly lubricants in additional applications. The extension proposal was based on environmental aspects and other relevant aspects (e.g. market share, availability of criteria in other schemes for a specific type of lubricants, etc).

Other comments point out the need to focus only on the 'environmentally problematic lubricants in order to substitute them with better ones'.

Several stakeholders agreed with the alignment between the EU Ecolabel and the ISO 6743 standard. It was further asked to include a clear definition for synthetic base oil, or synthetic in general.

Several stakeholders support the inclusion of the **4-stroke engine oils**, as well as additional categories, like heat transfer fluids (covered under ISO Q) in the EEL scheme. However, a higher number of stakeholders from different affiliations, during and after the meeting argued against the inclusion of 4T engine oils (one of them also against 2T) within the EU Ecolabel scope. Some expressed the opinion that more important from the environmental point of view is the efficiency of the engine itself rather than the environmental performance of the lubricating oil. Most of the stakeholders against the inclusion of 4T claimed that the different nature of engine oils might require setting very different requirements and exemptions for such engine

oils, leading to an impact on the identity of the label. The development of a separate set of criteria for 4T oils as a new product group under the EU Ecolabel was suggested by several stakeholders.

Other stakeholders suggest making differentiation between 2T and 4T engine oils for marine environment and for terrestrial environment. They indicate that the oils used in marine applications can enter the aquatic environment.

Regarding **metalworking fluids** and their inclusion in the scope, there are stakeholders indicating that this product category should not be included in the EU Ecolabel because either the biocide content (preservative to ensure life-span of the product) in water-based MWF will make it impossible to comply with the EU Ecolabel requirements, or the fact that MWF are a dangerous waste, would give the wrong impression on the extension of the scope. The possibility to create a new category specific for MWF was also mentioned.

A number of stakeholders suggest different changes in the **marine lubricants**. A stakeholder indicated that stern tube oils were wrongly assigned to the ISO family T, turbine oils. Other comments indicated that stern tube oils should not be treated as total loss as their loss into the ocean is incidental.

Several stakeholders bring the topic of the handling of overlaps, **greases** and total loss lubricants, as example. *How to handle properly a grease product which can have several applications and thus belongs to more categories, for instance total loss and partial loss applications*

Other stakeholder signalizes, that ISO family X for greases does not fully cover all the grease types; it covers the greases thickened with classical thickeners, as LiHSA, but more recent thickeners as inorganic bentonites or organic polyureas, are not covered under the ISO.

Full received comments and the respective answers can be consulted in the separated annex of comments published along with this report.

- **Further research and main changes in the second proposal**

Scope and definitions:

A main driver of the current revision has been the broadening of the scope. While coping with the inclusion of additional lubricants and in parallel deepening the analysis of the different criteria percent renewability, aquatic toxicity, biodegradation, it has become more clear that two approaches are possible: either **1)** to extend *ad infinitum* the current categories approach, a new category for virtually each additional lubricant group to be added to the scope (now or in the future), or **2)** to adapt the current system to a new one, with the same foundation, a new system that allows to easily allocate new lubricant product groups. The latter one has been considered optimal, systematic and more efficient. Therefore, it is suggested to modify the scoping method grouping the lubricants in three categories, from more to less lubricant loss: Total loss, Partial loss, and Accidental loss **(ALL, PLL, and TLL):**

'Accidental Loss Lubricant, ALL' means lubricant products that can be released in the environment only incidentally. Although the possibility of spillage is lower, the amount of impact generated could be important.

'Partial Loss Lubricant, PLL' means lubricant products that are partially released to the environment during use. This lubricant category is in-between; the products are not completely released into the environment, though they are always partially dumped into the environment. For this reason, standards regarding aquatic toxicity or biodegradability are more important in general for this product category.

'Total Loss Lubricant, TLL' means lubricant products that are fully released to the environment during use. This lubricant category goes completely into the environment; sometimes it is into the land or the forest, as in chainsaw oils; on other occasions it is in the fields, with the risk of permeating to the groundwater and polluting the sources, as it is the case of drilling equipment greases; they can also go directly into the ocean, as it is the case for wire rope lubricants, stern tube oils and greases.

includes the lubricants subcategories or applications proposed to be included in this revision and also other subcategories that could fit under the three main categories and that could be discussed for future revisions. For most of the subcategories mentioned in the table their specific ISO family to which they belong is specified.

The category 'other total loss lubricants' remains open as in current text in force. With this regard, it is suggested that the User Manual could include a quick Question / Answer information to be used in case of doubt. If an applicant comes to a Competent Body with a specific application of a lubricant that has not been specified in the scope and the CB is unsure if it could fit under 'other total loss lubricant' or is out of the scope, the 'recyclability question' can help. To the question: *can the product be recycled?* If the answer is no, then it is very likely a TLL and therefore could fits under 'other total loss lubricant' category.

Table 1.1: Listing of a number of specific lubricant applications

	Accidental Loss Lubricants	Partial Loss Lubricants	Total Loss Lubricants
Proposed EU Ecolabel scope	- Enclosed gears oils (ISO C) - Hydraulic systems (ISO H) - **Metalworking fluids (ISO M)(new under this revision)** - ALL greases (e.g. overhead lines wire greases, enclosed gear greases) (ISO X)	- Two stroke oils (ISO E) - **Temporary protection against corrosion (ISO R) (new under this revision)** - PLL greases (e.g. railway pantographs greases, harbour slideway greases, some of open gear-bearing greases) (ISO X)	- Chainsaw oils, wire rope lubricants, (ISO A) - Concrete release agents - Open gear oils (ISO C) - TLL greases (e.g.drilling equipment greases, wheel flange railway greases, cotton picker spindle machinery greases, some open gear greases, stern tube greases) (ISO X) - Stern tube oils - Other total loss lubricants not specified within the scope (e.g. pneumatic tools (ISO P), rough applications, axles, railway points (ISO A))
Out of the scope	- Mould release (except concrete release) - Compressor oils (vacuum oils, screw, gas, rotary, piston, etc.) (ISO D) - Four stroke oils (ISO E) - Spindle bearings, bearings and associated clutches (ISO F) - Slideway oils (ISO G) - Heat transfer fluids, insulating oils (ISO Q) - Turbines (ISO T) - Heat treatment oils, quenching oils (ISO U)		

The scope is currently organized in 5 categories, whilst the proposed scope is organized in 3 groups. Table 1.2 shows the correspondence for each lubricant group in the existing scope in force to the new proposed scope:

Table 1.2: Correspondence among lubricants in current scope and new proposed scope

	Current scope	Proposed scope
Cat 1	Hydraulic fluids	ALL, Hydraulic systems
Cat 1	Tractor transmission oils	ALL, Hydraulic systems
Cat 2	Greases	PLL, ALL, or TLL greases depending on application
Cat 2	Stern tube greases	TLL, greases
Cat 3	Chainsaw oils	TLL, Chainsaw oils
Cat 3	Concrete release agents	TLL, Concrete release agents
Cat 3	Wire rope lubricants	TLL, Wire rope lubricants
Cat 3	Stern tube oils	TLL, Stern tube oils
Cat 3	Other total loss	TLL, Other total loss lubricants
Cat 4	Two-stroke oils	PLL, Two-stroke oils
Cat 5	Industrial gear oils	TLL, Open gear oils (open applications) and ALL, Closed gear oils (closed applications)
Cat 5	Marine gear oils	ALL, Closed gear oils

The proposed approach for classifying the lubricants according the loss potential is clear and it does not differentiate where the environmental impact occurs (field, river, forest, etc). Splitting according to the different places within the environment a lubricant might end up, would be, on one side making the scheme significantly more complex with little reward, and on the other side, it would be difficult to discern whether a lubricant total loss product, for instance in a farm field would terminate and biodegrade there, or it would be brought to the river nearby (with the rain).

The idea of splitting the EU Ecolabel lubricants in three big groups depending on their loss potential is an effective way of coping with the suggestion of stakeholders. One clear advantage of this approach is that the main categories are comprehensive enough and any new lubricant that would be explored in future revisions for its potential introduction within the scope, can be easily placed within one of these three categories.

In relation to the **engine oils,** 2-stroke engine oils are mixed with the fuel (gasoline) and as a mixture they are partially lost into the environment due to the very simple functioning of the 2-cycle engine. For this reason, it makes a lot of sense to allow companies willing to develop ester-based lubricant oils for 2T engines, to do so and to have a possibility to obtain the EU Ecolabel recognition. The 4T engine oils are not directly lost into the environment, if properly collected after use (typically ranging between 15.000 and 30.000 km in Passenger Car Engine Oils, PCEO).

It is therefore advisable to maintain 2T engine oils in the PLL, as they are now in the current EEL. With regard the 4T oils, against all the comments received during the first consultation it is proposed not to include 4T engine oils during this revision and to focus on the existing scope and potential inclusion of less controversial lubricants (e.g. metalworking fluids and/or antirust agents) in order to keep the current identity of the existing label and the current revision timeline. However, keeping in mind that there also benefits for this type of oils to be considered under the EU Ecolabel scheme. It is proposed that if interest from industry side on having a label specific for automotive oils it would make sense to consider them in the future.

Regarding **metalworking fluids** (MWF), they can be generally classified in neat oils and water soluble MWF. At the same time, water soluble MWF can be split in two types: the solutions and the emulsions. The MWF that are simply water solutions, are named historically 'synthetic MWF'. The emulsion type MWF are sometimes split in two sub-types depending on the relative oil/water proportion: the semi-synthetic MWF contains a lower proportion of oil, whilst the miscible oil MWF contains a higher oil proportion.

All water soluble lubricants need a preservative in order to maintain product stability, and it is needed derogation for biocides**.** The scope extension to MWF proposed in the first proposal continues to be suggested. It is proposed for MWF to be classified in category Accidental Loss lubricants, as they may incidentally end up in the environment.

With regard the **stern tube oils** that refer to oils used in the stern tube of a ship, and surroundings; all these oils do have the ability to be released gradually and completely into the ocean waters, therefore they are categorized in total loss. Information regarding this point can be found for example, in the article in the sector magazine 'Professional Mariner'[5], published in April 2014, a few months after the VGP[6] entered into force. This article analyzed the enforcement of VGP and it is stated "*The EPA notes that the majority of oceangoing ships operate with oil-lubricated stern tubes and use lubricating oils in on-deck and underwater machinery. Oil leakage from stern tubes, once considered a part of normal 'operational consumption' of oil, results in millions of liters of oil released into the water every year. A typical stern tube system holds 400 gallons to 800 gallons (1,500L to 3,000L) of oil and the average vessel leaks about 1.6 gallons or 6 liters of oil per day*". This information clearly indicates that the stern tube oils cannot be considered neither incidental nor partial loss, but total loss.. Therefore, stern tube oils continue to be suggested to be included total loss systems.

Gear oils were grouped previously in category 5; in the second revision, they have been separated into open gears, that are now in category TLL as they go into the environment, and in closed gears (a majority of the gear oils) that are in ALL.

Temporary protection against corrosion or, in short, temporary corrosion protection TCP, are lubricant oils or greases that have many different applications. They are usually applied when Company A has completed the value chain on a specific metal part, then a TCP is applied, the metal part is packed and it is sent to the next Company B. Company B may clean up the metal part and save the protective oil for recycling or disposal, though part of it can go the water system emulsified in fine particles. For this reason, it has been finally placed in the category PLL.

[5] Professional Mariner, April 2014, Gary Wollenhaupt; Vessel operators make the switch to EA, [http://www.professionalmariner.com/April-2014/environmentally-acceptable-lubricants/]
[6] VGP – US Vessel General Permit

In relation to **greases**, in general, this is a category with a wide area of application. Many types of grease will be applied as total loss lubricant; though other greases will be an accidental loss, which are the greases in closed systems or accidental loss. It is also possible to find PLL grease applications, though these are less likely.

In the special case when one single grease product has different applications, for instance a total loss and a partial loss application, it has been suggested to take always the worst case approach in order to decide where that particular grease product belongs. A text has been included in the general assessment and verification section in order to reflect that in that situation the grease shall comply with the stricter requirements. As precautionary principle, when a grease product can have different applications, it shall be treated for EU Ecolabel purposes within the 'worst' category; for instance, a grease going to ALL and PLL, it is proposed to be treated as a PLL. A multifunctional grease goes to multiple ALL, PLL or TLL applications, therefore this multifunctional grease it is suggested to be treated as TLL.

In relation to the use of **ISO 6743 families**, stakeholders pointed out that some of them are not fully developed and therefore for several categories the ISO do not reflect all available lubricants for these categories. However the initial aim is was not to limit the scope to the ISO families, but to better define the covered categories. To avoid confusion, in the second revised proposal the ISO families are not specified in the scope text. In addition, in order to better define the covered categories, a definition for each category has been included in the complementary definitions section and only is in the case where a ISO family has been developed for a specific category, that a reference to it has been included in the definition text.

In summary, **main changes introduced within the scope and definitions** section for the second proposal are the following:

- Minor changes have been introduced in the definition in order to align to other EU Ecolabel product groups wording (i.e. products and ingredients). In addition, the lubricants included in the scope have been further defined in order to better indicate what the types of lubricants considered under the scope are.
- The existing five categories have been restructured in 3 main categories (TLL, PLL, and ALL) according to the potential of the lubricant to be released during use.
- The revised structure is simpler, as it allows the requirements to be set according to the impact associated for each main category and are comprehensive enough to allow the incorporation of new lubricant products in future revisions, avoiding the need for adding a new category for a new lubricant group.
- Definitions of the lubricants covered have been included. The ISO 6743 families has been used in order to better define the families included in each main category, however the limitations associated to these ISO standards (i.e some families are not fully developed and are not comprehensive enough to cover all products in the market, other families cover lubricants presenting applications that could be classified in several of the three suggested main groups…) have been considered and how to address these situations have been further explained in the scope text.
- Clarification on how to address other total loss lubricant category is proposed to be included in the User Manual.
- **Metalworking fluids** continue to be proposed for this second criteria version and have been included in the as ALL category.
- **Temporary protection against corrosion** also continues to be proposed and have been included as PLL
- **4T engine oils** proposed in first proposal have been finally withdrawn in spite of all the comments received during the first consultation. Focus is placed on the existing scope

and potential inclusion of less controversial lubricants (e.g. metalworking fluids and/or temporary protection against corrosion) in order to keep the current identity of the existing label and the current revision timeline. It is proposed that a label specifically for automotive oils could be considered in the future, if there is interest from the industry stakeholders.

- Complementary definitions section has been further completed with other relevant terms (most of them included in the existing User Manual).

Questions to stakeholders
• Do the definitions reflect properly the categories covered under the scope? How to improve them? • For new the new additions in this revision (MWFs and Temporary protection against corrosion) stakeholders are asked to provide information on the ability of products on the market able to comply with proposed criteria. • Do you find the revised categorisation proposal adequate?

1.2.2 Key environmental aspects and relation with the criteria proposal

A robust quantification of the overall environmental impact of lubricants would entail a detailed Life Cycle Assessment (LCA), with a scope covering manufacturing, use and fate at end of life, and with system boundaries encompassing petroleum, petrochemical, oleochemical and engineering industry activities. This would be a complex process, due to the very broad scope required, and also to some particular issues which are characteristic of the industry and the applications. One complication is that lubricants are typically manufactured as co-products in integrated product networks, based on petroleum refining, oleochemical refining or chemical processing.

In spite of the above-mentioned limitations the environmental assessment described in the chapter 3 of the preliminary report[2] helped identify the main areas of environmental concern from a life cycle perspective. This section summarises the main conclusions that can be extracted from the results revealed by LCA literature review and the supplementary environmental evidence.

In general, considering a cradle-to-grave approach, studies indicate that the release to the environment during use and disposal stages can be critical from an environmental point of view. Nevertheless, most LCAs studies only cover cradle-to-gate scope and for this reason a quantification of the relevance of these stages is not feasible.

A summary of the main impact(s) according the life cycle stages is provided below:

Raw material extraction, transport and processing

Raw materials can be of high importance, since the extraction and processing (especially due to energy consumption) of these materials can have relevant impacts. Moreover, the composition of lubricants will condition the potential impact to the environment during and after their use, since formulation is related to inherent biodegradability and toxicity of the product.

Comparing **different base fluids:**

- In general **vegetable oil** (studies focus mainly in rapeseed and soybean base oils) brings advantages due its renewable origin and higher biodegradability. The highest impacts for vegetable oils are due to agriculture stage, so impacts highly depend on the various factors related to the cultivation of the crop. LCA comparative studies indicate lower energy consumption during processing and lower impacts for the global warming potential than mineral and synthetic oils.
- Regarding **synthetic oils (**studies focus mainly in PAOs lubricants), the refining/synthesis phase is the main contributor of impacts. The environmental impact of synthetic oils can be higher in the production phase, since greenhouse emissions of PAO are almost twice higher than those of mineral base oil, due to higher quantities of refinery gas burned for heat consumption and, in general, to a more energy consuming production process. However the characteristics of these lubricants allow a longer life of the lubricant and require less oil changes, leading to a decrease of environmental impacts per distance covered. Moreover, while they appear chemically similar to mineral oils refined from crude oil, PAOs do not contain the impurities or waxes inherent in conventional mineral oils.
- For **mineral base oil**, the highest contribution is due to the extraction phase.
- **Re-refined oils** bring environmental advantages. With modern re-refining technologies, CO_2 emissions can be reduced by more than 50% as compared to the conventional production of base oil.
- The environmental impact of **water base fluid** could occur mainly during the disposal of waste fluids.

In relation to **additives** (being between 0,1- 20% of formulation by weight), despite not being covered in most of LCA studies, they can have relevant contribution to life cycle impact of lubricants for some impact categories where impact from additives can be up to 50% of the total impact (in particular for carcinogens and mineral extraction).

With regard to **transport,** the relative impact seems to be of low relevance.

Manufacturing of lubricant, packaging and distribution

Manufacturing comprises blending of substances and it is a less complex process and with lower environmental impact than the processing of raw materials (where energy consumption is more relevant), although it can have significant contribution to some impact categories.

There is a broad range of types of **packaging** used, depending on the different applications and typologies of lubricants. Certain measures such as using recycled and recyclable, environmentally friendly materials, design for a correct use/application/resistance to spillage and correct disposal might be easy to implement while bringing environmental benefits and circular economy principles to this product.

Use phase

The **use** stage of a lubricant product will highly determine its potential environmental impact, considering the probability of release to the environment and the consequences in terms of toxicity and impact on human health and the different environmental systems (especially for losses in sensitive areas). This impact is highly important since approximately 50% of all traditional lubricants are released into the environment during use, spills, or disposal. Any release of used oil to the environment, by accident or otherwise, threatens ground soil and surface waters with oil contamination endangering drinking water supply and aquatic organisms.

End-of-life

LCA studies indicate the disposal of used oil as the critical phase of the lubricant life cycle, which should be paid greater attention to in order to reduce potential environmental impact. Uncontrolled disposal of lubricant has adverse effect on the soils, aquatic life and drinking water. 50% of used oils will become waste oils potentially recoverable (the rest is lost during use; through leakages, exhaust emissions, etc.). Waste oils (WO) are hazardous waste as they contain additives, metals from engine wear, unburned fuel, polyaromatic hydrocarbons (PAH), particulates and water. Proper collection and subsequent re-refining is the best option from an environmental point of view; it has lower impacts than disposal (burning) and also it has associated environmental savings with respect to using new raw material for a lubricant.

- **Outcomes from and after the 1st AHWG meeting:**

Some stakeholders pointed out the limitation of the existing evidence on LCA leading to inconclusive information in relation to which base fluid would be preferable in terms of environmental performance. Stakeholders asked for more LCA evidence and information about the impacts of different lubricants base fluids.

- **Further research:**

Unfortunately, due to the varying scope and system boundaries of the available LCA studies and the particular issues which are characteristic of this industry, it has not been possible to perform a robust comparison between different base oils in the market. Moreover, current life cycle impact method does not cover properly toxicity and biodegradability, important issues to consider in case of spillage of the lubricant in the environment. For this reason, other environmental sources of information have been further investigated.

Nearly 50% of all lubricants sold worldwide pollute the environment, through spillage, evaporation, and total loss applications. Therefore it is proposed to the focus in lubricants that are released to the environment during use. Against this, sources of information assessing biodegradability and toxicity which are environmental aspects of high relevance for lubricates which are lost into the environment. Following conclusions are drawn from this further assessment:

The biodegradability is mainly related with the **base fluid**, and not with the additives included in the formulation.[7]

- Vegetable oils are used in environmentally sensitive areas because they are biodegradable and have low toxicity. Moreover, due to their characteristics, they are perfect for total loss applications since the damage to the environment is low.[8]
- Synthetic oils have advantages over mineral oils, because the composition of the synthetic oils can be controlled, avoiding the use of harmful substances. Some of the newest synthetic lubricants from a mineral base oils have shown higher biodegradability than mineral lubricants: esters, PAO and PAG.[9]
- Re-refining of base oils causes less environmental impact than processing of base oil from crude oil. Comparison of the re-refined oils use with the synthetic oils use in

[7] Eisentraeger, A., Schmidt, M., Murrenhoff, H., Dott, W., & Hahn, S. (2002). Biodegradability testing of synthetic ester lubricants—effects of additives and usage. Chemosphere, 48(1), 89-96.

[8] OECD series on emission scenario documents Number 10: Emission scenario document on lubricants and lubricant additives. Environment directorate joint meeting of the chemicals committee and the working party on chemicals, pesticides and biotechnology, ENV/JM/MONO(2015)4, available online: http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ENV/JM/MONO(2015)4&doclanguage=en

[9] Mitigating Environmental Impact of Petroleum Lubricants- Ignatio Madanhire · Charles Mbohwa

lubricants shows that re-refined oils are a better environmental option (at least compared with the 30% of lubricant replaced used in the study).[10] However re-refined oils present high toxicity and low biodegradability, for this reason they are environmentally suitable only for non-total loss applications.

As a conclusion, mineral oils are not the best performing option for lubricants released to the environment during use due to their inability to biodegrade, and to the fact they remain in the ecosystem for a long time. This is very important, as release to the environment during use and disposal stages is critical from a lifecycle point of view. The use of non-biodegradable oils is especially problematic for lubricants used for total loss applications. Renewable oils, due to their natural origin and synthetic oils that can be fine-tuned during its synthesis to have a proper biodegradability and toxicity level seems to be best options for loss lubricants.

It is important to note that not all renewable raw materials are sustainable, there are different issues influencing the sustainability of the bio-based products. In particular, vegetable oils large impacts are produced during the agricultural stage, acting in the production method the environmental performance of vegetable lubricants could improve: cultivation practices, energy used in the production process, use of significant amounts of water, fertilizers and pesticides, etc. In this case, the most effective way of improving environmental performance is to encourage farmers to use good, sustainable agricultural practices. Therefore, some of the disadvantages associated to bio-based could be overcome by introducing criteria addressing aspects related to the sourcing. The impact of raw materials used could be reduced ensuring that vegetable oils comes from a sustainably management plantation, avoiding the impact of using pesticides or the unsustainable crop overexploitation.

In the light of the preliminary report information, the feedback received and further evidence, the main environmental areas of relevance and the areas of improvement of the existing criteria that will be further investigated and addressed in more detail in this TR2.0 are summarised in the following table:

[10] Ecological and energetic assessment of re-refining used oils to base oils: Substitution of primarily produced base oils including semi-synthetic and synthetic compounds. GEIR - Groupement Européen de l'Industrie de la Régénération, 2005, available online: http://www.geir-rerefining.org/documents/LCA_en_short_version.pdf.

Table 1.3: Link between the environmental aspects identified (LCA and non-LCA impacts) and the EU Ecolabel criteria

Existing EU Ecolabel criteria	Criteria second revised proposal	Environmental aspects	
Criterion 1. Excluded or limited substances and mixtures	Criterion 1. Excluded or limited substances	Hazardous substances Emission to soil/ water	It limits the hazardous substances that can be included in the product, limiting environmental and health risks for users.
Criterion 2. Restricted substances			
Criterion 3. Additional aquatic toxicity requirements	Criterion 2. Aquatic toxicity		It ensures that the overall aquatic toxicity is limited.
Criterion 4. Biodegradability and bioaccumulative potential	Criterion 3. Biodegradability and bioaccumulative potential		It ensures that the ingredients are biodegradable and will not persist in water.
Criterion 5. Renewable raw material	Criterion 4. Raw materials	Raw materials extraction and processing	It promotes more sustainable alternatives to mineral for loss applications oils.
	Criterion 5. Origin and traceability of vegetable oils		It ensures that the vegetable oils used for the lubricant manufacturing comes from a sustainably management plantation.
	Criterion 6. Packaging	Raw materials extraction and processing Spillage during use phase	It ensures prevention of spillage during use and promotes the use of recycled plastics.
Criterion 6. Minimum technical performance	Criterion 7. Minimum technical performance	Efficiency during use	It guarantees that the product meets certain quality (technical performance) requirements foreseen for the different applications.
	Criterion 8. Consumer information	Waste generation and disposal	It reminds consumers to dispose of the packaging in a responsible manner.
Criterion 7. Information on EU Ecolabel	Criterion 9. Information on EU Ecolabel		It informs consumers on the environmental benefits associated to the product, in order to encourage the purchase of the product.

1.3 PROPOSED FRAMEWORK FOR THE REVISION OF THE EU ECOLABEL CRITERIA AND MAIN CHANGES

The proposed criteria are aimed to cover the different life stages and assessing the hot spots and key parameters identified in the preliminary report.

For the first AHWG meeting some criteria were suggested to be merged due to technical reasons, whereas other criteria have been modified in content but maintaining the structure. Moreover, some additional criteria were proposed in order to cover certain aspects not addressed through the current criteria and to be consistent with the revised scope. After the first AHWG consultation the criteria proposal was modified according the stakeholder comments and further research. The following table shows the changes in the criteria structure proposed along the revision:

Table 1.4: Comparison of the criteria structure

Existing EU Ecolabel criteria	Criteria 2nd proposal
Criterion 1. Excluded or limited substances and mixtures	Criterion 1. Excluded or limited substances
Criterion 2. Restricted substances	
Criterion 3. Additional aquatic toxicity requirements	Criterion 2. Aquatic toxicity
Criterion 4. Biodegradability and bioaccumulative potential	Criterion 3. Biodegradability and bioaccumulative potential
Criterion 5. Renewable raw material	Criterion 4. Raw materials
	Criterion 5. Origin and traceability of renewable raw materials
	Criterion 6. Packaging
Criterion 6. Minimum technical performance	Criterion 7. Technical performance
	Criterion 8. Consumer information regarding use and disposal
Criterion 7. Information on EU Ecolabel	Criterion 9. Information on EU Ecolabel

2 ASSESSMENT AND VERIFICATION

Assessment and verification

The specific assessment and verification requirements are indicated within each criterion.

Where the applicant is required to provide the competent bodies with declarations, documentation, analyses, test reports, or other evidence to show compliance with the criteria, these may originate from the applicant and/or their supplier(s), as appropriate.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council[11].

Where appropriate, test methods other than those indicated for each criterion may be used if the competent body assessing the application accepts their equivalence.

Where appropriate, competent bodies may require supporting documentation and may carry out independent verifications or site visits.

As a prerequisite, the product shall meet all applicable legal requirements of the country or countries in which the product is intended to be placed on the market. The applicant shall declare the product's compliance with this requirement.

The Lubricant Substance Classification list (LuSC list), available on the EU Ecolabel website, contains substances and brands that have been assessed by a competent body on its biodegradation/bioaccumulation, aquatic toxicity, renewability and non-presence of excluded substances which data can be used directly in the application process.

The list of all ingoing substances at or above the concentration of 0,010% weight by weight shall be provided to the competent body, indicating the trade name (if existing), the chemical name, the CAS no., the ingoing quantity, the function and the form present in the final product formulation.

All ingoing substances present in the form of nanomaterials shall be clearly indicated in the list with the word 'nano' written in brackets.

For each ingoing substance listed, the Safety Data Sheets (SDS) in accordance with Regulation (EC) No 1907/2006 of the European Parliament and of the Council[12] shall be provided. Where an SDS is not available for a single substance because it is part of a mixture, the applicant shall provide the SDS of the mixture.

(b) Measurement thresholds

Compliance with the ecological criteria is required for the final product and its constituent substances that are intentionally added and/or are formed intentionally after any chemical reaction in the applied lubricant, as specified below:

- to the applied lubricant for criteria xxx (to be completed in a final stage);

[11] Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93 (OJ L 218, 13.8.2008, p. 30).

[12] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (OJ L 396, 30.12.2006, p. 1).

Assessment and verification
- to each stated substance intentionally added or formed at or above 0,010 % (w/w) for criteria xxx (to be completed in a final stage); - to each stated substance intentionally added or formed above 0,10 % (w/w) for criteria xxx (to be completed in a final stage). In addition the total fraction of the stated substances where the formulated criteria x and y do not apply shall remain below 0,5 % (w/w). **Note:** Where grease can be used in both, TLL and PLL applications (as in the case of multifunctional grease), criteria applicable to TLL sub-group shall apply. If grease can be used as PLL and ALL, but not as TLL, then the criteria applicable to PLL sub-group shall apply.

Rationale of proposed General text on Assessment and Verification

The assessment and verification text refers to the different type of evidence that is considered relevant as a proof of compliance for each criterion. The text has been revised to harmonize it as far as appropriate, with the text which is included in the most recently adopted EU Ecolabel criteria.

The EU Ecolabel Regulation (EC) No 66/2010 indicates that competent bodies shall preferentially recognize verifications performed by bodies which are accredited under the EN 45011. However, this standard is nowadays phased-out since it has been substituted by ISO/IEC 17065:2012: Conformity assessment - Requirements for bodies certifying products, processes and services. For this reason certification bodies are no longer accredited in accordance with these requirements. A new statement has been included in the text making reference to the Regulation (EC) 765/2008 of the European Parliament and of the Council.

Where appropriate, test methods other than those indicated for each criterion may be used if the component body assessing the application accepts their equivalence.

In addition a reference to the possibility to use the LuSC list has been introduced.

Furthermore, a note have been included clarifying that in the special case when one single grease product has different applications, the precautionary principle applies and it shall be treated for EU Ecolabel purposes within the 'worst' category.

3 CRITERIA PROPOSAL

3.1 CRITERION 1: Excluded or limited substances

Second proposal for criterion 1: Excluded or limited substances

1 (a) Hazardous substances

(i) Final product

The final product shall not be classified and labelled as being acutely toxic, a specific target organ toxicant, a respiratory or skin sensitiser, carcinogenic, mutagenic or toxic for reproduction, or hazardous to the aquatic environment, as defined in Annex I to Regulation (EC) No 1272/2008 and in accordance with the entire list of hazards categories included in Table 1.

(ii) Substances

The product shall not contain substances that meet the criteria for classification as acutely toxic, hazardous to the aquatic environment, respiratory or skin sensitiser, carcinogenic, mutagenic or toxic for reproduction in accordance with Annex I to Regulation (EC) No 1272/2008 at a concentration limit as specified in Table 1 columns a) and b) for each hazard category.

Where stricter, the generic or specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008 shall take precedence.

Table 1. Restricted hazard classifications and their categorisation

Hazard categories	**a)** Concentration limit of or above 0,010 % weight by weight per substance in the final product	b) Concentration limit of or below the half of the relevant concentration* that would lead to classification of the final product[13]
Carcinogenic, mutagenic or toxic for reproduction		
Category 1A and 1B		
H340 May cause genetic defects	✓	
H350 May cause cancer	✓	
H350i May cause cancer by inhalation	✓	
H360F May damage fertility	✓	
H360D May damage the unborn child	✓	
H360FD May damage fertility. May damage the unborn child	✓	
H360Fd May damage fertility. Suspected of damaging the unborn child	✓	
H360Df May damage the unborn child. Suspected of damaging fertility	✓	
Category 2		
H341 Suspected of causing genetic defects	✓	
H351 Suspected of causing cancer	✓	
H361f Suspected of damaging fertility	✓	
H361d Suspected of damaging the unborn child	✓	
H361fd Suspected of damaging fertility. Suspected of damaging	✓	

[13] The concentration limit allowed corresponds to the concentration limit of or below the half of the generic cut-off values and/or concentration limits triggering classification of the mixture in accordance with the guidelines in Regulation (EC) No 1272/2008.

the unborn child		
H362 May cause harm to breast fed children	✓	
Acute toxicity		
Category 1 and 2		
H300 Fatal if swallowed	✓	
H310 Fatal in contact with skin	✓	
H330 Fatal if inhaled	✓	
H304 May be fatal if swallowed and enters airways		✓[14]
Category 3		
H301 Toxic if swallowed	✓	
H311 Toxic in contact with skin	✓	
H331 Toxic if inhaled	✓	
EUH070 Toxic by eye contact	✓	
Specific target organ toxicity (STOT)		
Category 1		
H370 Causes damage to organs	✓	
H372 Causes damage to organs through prolonged or repeated exposure	✓	
Category 2		
H371 May cause damage to organs		✓
H373 May cause damage to organs through prolonged or repeated exposure		✓
Category 3		
H335 May cause respiratory irritation		✓[15]
H336 May cause drowsiness or dizziness		✓[15]
Respiratory and skin sensitisation (where applicable)		
Category 1A/1/1B		
H317: May cause allergic skin reaction		✓
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled		✓
Skin corrosion/irritation		
Category 1		
H314 Causes severe skin burns and eye damage		✓
Category 2		
H315 Causes skin irritation		✓
Serious eye damage/eye irritation		
Category 1		
H318: Causes serious eye damage		✓
Category 2		
H319 Causes serious eye irritation		✓
Hazardous to the aquatic environment		
Category 1 and 2		
H400 Very toxic to aquatic life	✓	
H410 Very toxic to aquatic life with long-lasting effects	✓	
H411 Toxic to aquatic life with long-lasting effects		✓
Category 3 and 4		
H412 Harmful to aquatic life with long-lasting effects		✓
H413 May cause long-lasting effects to aquatic life		✓
Hazardous to the ozone layer		
H420 Harms public health and the environment by destroying ozone in the upper atmosphere	✓	

[14] In the allocation of this H-phrase to a mixture (final product in the sense of this criterion), the CLP Regulation considers both the viscosity of the mixture and also the concentration of the component. The consideration of the viscosity is omitted from the criteria for the EU Ecolabel and only the concentration is considered.

[15] According to section 3.8.3.4.5 to CLP Regulation, care shall be exercised when extrapolating toxicity of a mixture that contains Category 3 ingredient(s) specific Target Organ Toxicant after single exposure. The reference value for the extrapolation of the toxicity of mixtures in Category 3 has been set at 20%.

Supplemental hazard information – Health hazards		
EUH029 Contact with water liberates toxic gas	✓	
EUH031 Contact with acids liberates toxic gas	✓	
EUH032 Contact with acids liberates very toxic gas	✓	
EUH066 Repeated exposure may cause skin dryness or cracking	✓	

* Total concentration of the relevant classified substances.

This criterion does not apply to substances covered by Article 2(7)(a) and (b) of Regulation (EC) No 1907/2006 which set out criteria for exempting substances within Annexes IV and V to that Regulation from the registration, downstream user and evaluation requirements. In order to determine whether that exclusion applies, the applicant shall screen any ingoing substance present at a concentration above 0,010% weight by weight.

Assessment and verification: the applicant shall demonstrate compliance with this criterion for the final product and for any ingoing substance present at a concentration of or above 0,010% weight by weight in the final product. The applicant shall provide a signed declaration of compliance supported by declarations from suppliers, if appropriate, or SDS confirming that none of these substances meets the criteria for classification with one or more of the hazard statements listed in Table 1 in the form(s) and physical state(s) in which they are present in the product.
For substances listed in Annexes IV and V to Regulation (EC) No 1907/2006, which are exempted from registration obligations under points (a) and (b) of Article 2(7) of that Regulation, a declaration to this effect by the applicant shall suffice to comply.
The applicant shall provide a signed declaration of compliance supported by declarations from suppliers, if appropriate, or SDS confirming the presence of ingoing substances that fulfil the derogation conditions.

1 (b) Specified restricted substances
The substances listed below shall not be included in the product formulation above the concentration of 0,010% (w/w) of the final product:

- substances appearing in the Union List of priority substances in the field of water policy in Annex X to Directive 2000/60/EC of the European Parliament and of the Council16 as amended by laid in Decision No 2455/2001/EC of the European Parliament and of the Council[17] and the OSPAR List of Chemicals for Priority Action (http://www.ospar.org/work-areas/hasec/chemicals/priority-action);
- organic halogen compounds and nitrite compounds;
- metals or metallic compounds with the exception of sodium, potassium, magnesium and calcium. In the case of thickeners, also lithium and/or aluminium compounds may be used up to concentrations limited by the other criteria included in the Annex to this Decision.

Assessment and verification: the applicant shall provide a signed declaration of compliance supported by declarations from suppliers, if appropriate, confirming that the listed substances are not present in the product formulation above the limits set.

1 (c) Substances of very high concern (SVHCs)

[16] OJ L 327, 22.12.2000, p. 1.

[17] OJ L 331, 15.12.2001, p 1.

The final product shall not contain any ingoing substances that have been identified in accordance with the procedure described in Article 59(1) of Regulation (EU) No 1907/2006, which establishes the candidate list for substances of very high concern.

Assessment and verification: the applicant shall provide a signed declaration of compliance supported by declarations from their suppliers, if appropriate, or SDS confirming the non-presence of all the candidate list substances. Reference to the latest list of substances of very high concern shall be made on the date of application.

Rationale of the proposed criterion text

Technical analysis showed that the chemicals used in the formulation of the product contribute significantly to the overall environmental impact of lubricants. The aim of the existing criteria in force (i.e. *1 Excluded or limited substances and mixtures* and *2 Exclusion of specific substances)* is to exclude or limit toxic or harmful substances, thus ensuring that the EU Ecolabel is only awarded to the least environmentally impacting products.

In the first proposal, these two existing criteria in force were merged under a single criterion: *Excluded or limited substances and mixtures*. The first proposal consisted in the 3 sub-requirements summarized below:

- *Requirement 1 (a) Hazardous substances*, which is directly linked to the requirements given in the EU Ecolabel Regulation (EC) No 66/2010 in Article 6(6) which states: "*the EU Ecolabel may not be awarded to goods containing substances or preparations/mixtures meeting the criteria for classification as toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction in accordance with Regulation (EC) No 1272/2008"*..

The interpretation of the above requirement with regards to the excluded hazard categories as per Regulation (EC) No. 1272/2008 and the Hazardous Task Force[18] work (which is used to implement the given requirement in a more practicable and harmonized across different product groups way) can be found in the 1st Technical Report (p. 19-20). Moreover, according to the current EU Ecolabel criteria for lubricants, the existing criterion in force *1 (a) Hazardous substances and mixtures* also include the following hazard statements:

- EUH029: Contact with water liberates toxic gas,
- EUH031: Contact with acids liberates toxic gas,
- EUH032: Contact with acids liberates very toxic gas,
- H314: Causes severe skin burns and eye damage,
- H315: Causes skin irritation,
- H319: Causes serious eye irritation,
- EUH066: Repeated exposure may cause skin dryness or cracking
- and H336: May cause drowsiness or dizziness.

In relation to derogations from this requirement, in existing criterion in force, there are no derogations given for specific substances but a general derogation for classified ingredients contained in the lubricant is given for a concentration of up to the limit that would trigger the classification of the final product according to the Regulation (EC) No 1272/2008 or Directive 1999/45/EC. This means that existing criterion in force *1 (a) Hazardous substances and*

[18] Hazardous Task Force is a group formed by the EC JRC, representatives of competent bodies, industry and NGOs, which work on the improvement of implementation of the requirement on hazardous substances contained in the EU Ecolabel Regulation.

mixtures only applies to the candidate lubricant (mixture) irrespective of the classifications of its components (i.e., substances included within the candidate lubricant), except for SVHC substances (Cat 1A/Cat 1B CMRs) which are subject to a maximum threshold of 0,010%.

In order to set a criterion with strict interpretation of the requirement contained in the EU Ecolabel Regulation, it was suggested in the first proposal to restrict the EU Ecolabel hazards at substance level. Therefore the text was aligned to the recently voted detergents product group. It was proposed to eliminate the general derogation to the lowest classification limit that would trigger the classification of the final product and to grant derogations only to specific substances or group of substances following a thorough analysis. This is the approach followed in the recently voted products. Stakeholders were asked to provide information on the derogation needs according to the first revised proposal.

- *Requirement 1 (b) Specified excluded and restricted substances*

This sub-requirement was based on the existing criterion *2 Exclusion of specific substances,* which asks that several groups of substances (OSPAR List, organic halogen compounds, nitrite compounds and metallic compounds) are restricted above specified concentrations in the final product. No changes were proposed compared to the current criteria in force for the first AHWG meeting.

- *Requirement 1 (c) Substances of very high concern (SVHCs)*

Sub-criterion (c) is also directly linked to the EU Ecolabel Regulation (EC) No 66/2010, which states that no substances of very high concern (SVHC) can be present in EU Ecolabel products. "*No derogation shall be given concerning substances that meet the criteria of Article 57 of Regulation (EC) No 1907/2006 (REACH) and that are identified according to the procedure described in Article 59(1) of that Regulation, present in mixtures, in an article or in any homogeneous part of a complex article in concentrations higher than 0,1 % (weight by weight)*".

In the first proposal, it was suggested to align the wording to detergents product group restricting totally the presence of SHVC in the final product. However, if derogation requests are received for SVHC presence in the final product below 0.010% w/w (which is existing limit in force for lubricants), reformulation of the requirement was suggested to be considered.

The updated list of SVHCs is available on the European Chemicals Agency website: http://echa.europa.eu/web/guest/candidate-list-table. The applicant is asked to refer to the latest version of this list at the date of application.

- **Outcomes from and after the 1st AHWG meeting**

Comments received from stakeholders during and after the 1st AHWG meeting were mainly focused on the difficulty to apply the approach of restricting the EU Ecolabel hazards at substance level. Further, they referred to the impact of the revised requirement on the LuSC list[19] and the potential loss of current licenses if the proposed criterion is implemented. Other stakeholders, especially CBs agreed to follow a similar approach than the rest of product groups

[19] "LuSC-list" or Lubricant Substance Classification list is a list of substances and brands that have been assessed on its biodegradation/bioaccumulation, aquatic toxicity, renewability and exclusion lists of substances by a competent body. The assessment is only based on a maximum treat rate allowed in a lubricant. The list is published on the EU Ecolabel website and the data can be used directly in the application form. More information available on line at: http://ec.europa.eu/environment/ecolabel/documents/lusclist.pdf

under the EU Ecolabel seeking for harmonization. NGOs suggested investigating the approach followed in Blue Angel, which seems to be a kind of compromise solution.

- **Further research and main changes in second proposal:**

Against this background the possibility to set a more harmonized approach with other product groups under the EU Ecolabel while not compromising the current licenses has been explored further.

Since no derogation request was received in the first call for derogations, stakeholders and CBs have been further consulted. In order to evaluate the impact of the revised requirements on the number of the current EU Ecolabel products and on the LuSC list; and the possible derogations needs.
Unfortunately, not much feedback has been received with this regard. All the gathered evidence with this regard can be found in Appendix 1.

Additionally, the **approach followed in Blue Angel**[20] has also been explored. A comparative assessment has been carried out in order to elucidate which elements are in common between both environmental schemes for lubricants related to overall restriction to hazard classifications.

[20] Basic criteria for award of the Blue Angel Eco-label for Biodegradable Lubricants and Hydraulic Fluids according to RAL-UZ 178. More information available online at:
https://www.blauer-engel.de/en/products/business/schmierstoffe-hydraulikfluessigkeiten/hydraulikfluessigkeiten

Table 3.1: Comparative assessment between Blue Angel approach and the EU Ecolabel for lubricants related to overall restriction to hazard classifications

EU ECOLABEL		BLUE ANGEL			
Carcinogenic, mutagenic or toxic for reproduction					
Category 1A and 1B	**Category 2**	**Final products may not contain any substance classified as**	**Substances may only be contained in the final product up to a maximum of half of the relevant concentration that would lead to classification of the final product in the following hazard class**	**Generic cut-off values and/or concentration limits triggering classification of the mixture**	**Maximum concentration allowed according to the Blue Angel approach[21]**
H340	H341	SAME HAZARD STATEMENTS	-	Not applicable	
H350	H351				
H350i					
H360F	H361f				
H360D	H361d				
H360FD	H361fd				
H360Fd	H362				
H360Df					
Acute toxicity					
Category 1 and 2	**Category 3**	SAME HAZARD STATEMENTS	-	Not applicable	
H300	H301				
H310	H311				
H330	H331				
H304	EUH070	-	H304, **H302, H312, H332**	H304: ≥10% H302, H312, H332: ≥1%	H304: ≤ 5% H302, H312, H332: ≤ 0,5%
Specific target organ toxicity (STOT)					
Category 1	**Category 2**	H370	H371	H371: ≥1%	H371: ≤ 0,5%
H370	H371				
H372	H373	H372	H373	H373: ≥1%	H373: ≤ 0,5%
Category 3		-	**H335**, H336	H335 and H336: Expert judgments shall be exercised[22].	H335 and H336: Expert judgments shall be exercised[22].
H336					
Respiratory and skin sensitisation (where applicable)					
Category 1A	**Category 1/1B**	-	H334, H317	H334: ≥ 0,1% H317: ≥ 0,1%	H334: ≤ 0,05% H317: ≤ 0,05%
H317					
H334					
Skin corrosion/irritation					
Category 1	**Category 2**	-	H314, H315	H314: ≥1%	H314: ≤ 0,5%

[21] The maximum concentration allowed according to the Blue Angel approach corresponds to a maximum of half of the generic cut-off values and/or concentration limits triggering classification of the mixture.

[22] According to the Blue Angel approach, the reference value for the extrapolation of the toxicity of mixtures in Category 3 has been set at 20%.

EU ECOLABEL		BLUE ANGEL			
H314	H315			H315: ≥1%	H315: ≤ 0,5%
Serious eye damage/eye irritation					
Category 1	**Category 2**	-	**H318**, H319	H318: ≥1% H319: ≥1%	H318: ≤ 0,5% H319: ≤ 0,5%
-	H319				
Hazardous to the aquatic environment					
Category 1 and 2	**Category 3 and 4**	H400, H410	H411, H412, H413	H411: ≥1%	H411: ≤ 0,5%
H400	H412				
H410	H413			H412: ≥1%	H412: ≤ 0,5%
H411				H413: ≥1%	H413: ≤ 0,5%
Hazardous to the ozone layer					
H420		-	-	Not applicable	
Supplemental hazard information – Health hazards					
EUH029		-	-	Not applicable	
EUH031					
EUH032					
EUH066					

The hazard statements not included in the Blue Angel are shown in blue.
The hazard statements not included in the EU Ecolabel are shown in red.

Comparing both schemes, it should be noted that there are some restricted hazard statements not currently included in the EU Ecolabel for lubricants such as: H318, H335:, H302, H312 and H332, while other hazards are included EU Ecolabel and are not considered in Blue Angel (EUH070, H420, EUH029 , EUH031 , EUH032 , EUH066). However in general, if the allowed concentrations are examined, the Blue Angel approach establishes more flexible criteria compared to the harmonised approach followed in several EU Ecolabel product groups. In the EU Ecolabel, specific substances and their hazards are derogated from EU Ecolabel article 6 (6) where no substitution is possible. In the Blue Angel approach, among the whole profiles considered, some hazards (of relative less concern) are derogated for total concentration of substances in the final product up to a maximum of half of the relevant concentration that would lead to classification of the final product.

Against this background it is suggested in this second revised proposal:

- **To continue exploring the possibility to set the criteria at a substance level** as made for other product groups under the EU Ecolabel while not compromising the current licenses.
- Considering the lack of information with regard substances that might need derogations for lubricants product at this stage and that going from product level to substance level in one step may be too prescriptive, it is considered adequate for this revision to **align to the Blue Angel approach as a first step**. However **additional information on specific substances which fulfil the conditions for derogation continues to be requested.** In addition, the hazard statement H319 (Eye irritation category 2) was currently included in the existing list of restricted hazard statements according to the EU Ecolabel for lubricants, and the hazard statement H318 (Serious damage to eyes category 1) was not included. Therefore. H318 it is suggested to be added in line with Blue Angel.
- Therefore, in the second revised proposal, **Table 1 has been modified** to include a column that reflects the Blue Angel approach and where certain hazards are derogated up to a maximum of half of the relevant concentration that would lead to classification of the final product.

- In addition, it is to note that **no relevant changes have been introduced in criteria 1b) and 1c)**.

Rationale of proposed "assessment and verification"

With regard to the first proposal for the **assessment and verification**, the text for each of the sub-requirements was aligned to the recently voted detergents product group.

No comments have been received in the first consultation with this regard. No changes have been introduced for the second proposal. However the text may be modified subject to further discussions on the final formulation of this criterion.

Questions to stakeholders
• In order to finalise the proposal, Competent Bodies and stakeholders are sked to give their opinion on the alignment to the Blue Angel approach, Competent Bodies are asked to respond to the "excel survey" called "Hazard profile assessment of substances" (if not responded yet), • Manufacturers and supplier are asked to: ▪ provide information on the **hazardous substances and/or functional groups of substances** above 0.01% with any of the EU Ecolabel hazards which potentially require derogation due to difficulties to substitute them. **Derogation form has been included in ANNEX I,** ▪ with regard to biocides used in water-based metalworking fluids, hydraulic fluids and mould release – provide information on the concentration used, ▪ in relation to the total restriction of SVHC in criterion 1c) – communicate if there are SVHC presents in the final product below 0.010% w/w.

3.2 CRITERION 2: Aquatic toxicity

Second proposal for criterion 2: Aquatic toxicity

The applicant shall demonstrate compliance by meeting the requirements of either criterion 2.1. or 2.2.

Criterion 2.1. – Requirement for the lubricant and its main components

The critical concentration for the aquatic toxicity for both the freshly prepared lubricant and for each main components shall not exceed values specified in Table 2:

Table 2. Aquatic toxicity values for both freshly prepared lubricant and for each main component

		ALL	PLL	TLL
Aquatic toxicity for the freshly prepared lubricant	Acute aquatic toxicity OR	>100 mg/L	>1000 mg/L	>1000 mg/L
	Chronic aquatic toxicity	>10 mg/L	>100 mg/L	>100 mg/L
Aquatic toxicity for each main component	Acute aquatic toxicity OR	>100 mg/L		
	Chronic aquatic toxicity	> 10 mg/L		

Acute aquatic toxicity data for each main component shall be provided on each of the following two trophic levels:

- crustacean (preferred species Daphnia),
- aquatic plants (algae preferred)[23].

In case acute aquatic toxicity data for each main component is missing, existing chronic aquatic toxicity tests shall be accepted for each of the following two trophic levels:

- crustacean (preferred species Daphnia)
- fish.

Acute aquatic toxicity data for the lubricant shall be provided on each of the following three trophic levels:

- crustacean (preferred species Daphnia),
- aquatic plants (algae preferred),
- and fish.

In case acute aquatic toxicity data for the applied lubricants is missing, existing chronic aquatic toxicity test shall be accepted for each of the following two trophic levels:

- crustacean (preferred species Daphnia),
- fish.

Criterion 2.2. – Requirement for each substance present above 0,10 % (w/w)

Substances exhibiting a certain degree of aquatic toxicity are allowed up to a cumulative mass concentration indicated in Table 3.

Table 3. Aquatic toxicity values for substances present above 0,10% (w/w) in the final product

[23] The aquatic plant growth inhibition tests are normally considered as chronic tests but the EC50s are treated as acute values for classification purposes.

		Cumulative mass percentage (% weight by weight in the final product)		
		ALL	**PLL**	**TLL**
Substance classified as not hazardous to the aquatic environment according to CLP	Acute aquatic toxicity **>100 mg/L** or Chronic aquatic toxicity > **10 mg/L**	**Not limited**		
Substance classified as chronic aquatic hazard category 3 according to CLP[24]	Acute aquatic toxicity **>10 to ≤ 100 mg/L** or **1 mg/L** < Chronic aquatic toxicity **≤ 10 mg/L**	≤ 10	≤ 20	≤ 2
Substance classified as chronic aquatic hazard category 2 according to CLP[24]	Acute aquatic toxicity **>1 to ≤ 10 mg/L** or **0,1 mg/L** < Chronic aquatic toxicity **≤ 1 mg/L**	**≤ 2,5**	**≤ 0,6**	**≤ 0,4**
Substance classified as chronic aquatic hazard category 1 according to CLP[24] **Substance classified as acute aquatic hazard category 1 according to CLP**	Acute aquatic toxicity**≤ 1 mg/L** or Chronic aquatic toxicity **≤ 0,1 mg/L**	**≤ 0,1/M (*)**	**≤ 0,1/M (*)**	**≤ 0,1/M (*)**

(*) M-factors for highly toxic components of mixtures shall be applied in accordance with Article 10 of Regulation (EC) No 1272/2008 as described in section 4.1.3.5.5.5.

Chronic aquatic toxicity for each substance present above 0,10% (w/w) shall be provided on each of the following two trophic levels:

- crustacean (preferred species Daphnia),
- and fish

In case chronic aquatic toxicity data is missing, acute aquatic toxicity tests shall be provided for each of the following two trophic levels:

- crustacean (preferred species Daphnia),
- aquatic plants (algae preferred).

Assessment and verification: the applicant shall provide high quality test reports or literature data (testing according to acceptable protocols and GLP) including the references demonstrating compliance with the requirements set in sub-criteria 2.1 or 2.2.

For determining acute aquatic toxicity data, the tests carried out according to and using relevant test species mentioned in the following guidelines shall be accepted:

- ISO/DIS 10253 or OECD Test Guideline 201 or Part C.3 of the Annex to Council Regulation (EC) No 440/2008 (1) for algae,
- ISO TC 147/SC5/WG2 or OECD Test Guideline 202 or Part C.2 of the Annex to Regulation (EC) No 440/2008 for daphnia,
- OECD Test Guideline 203 or Part C.1 of the Annex to Regulation (EC) No 440/2008 for fish,

[24] And the substance is not rapidly degradable and/or the experimentally determined BCF ≥ 500 (or, if absent, the log Kow ≥ 4) according to the criteria outlined in the CLP guidance for classifying and categorizing substances as "hazardous to the aquatic environment". Such considerations summarised in Table 4.1.0 of CLP Regulation also apply here.

- Equivalent test methods as agreed with a competent body are also permitted,
- According to Annex XI of REACH regulation, if no experimental data exists, results of (Q)SARs[25] may be used. QSARs shall be accepted to fill data gap in only one of the three trophic levels rather having to perform the test.

Only acute aquatic toxicity (72 or 96 hr)Er C50 for algae[26], (48hr)EC50 for daphnia and (96hr)LC50 for fish are accepted.

For determining chronic aquatic toxicity data, the tests carried out according to and using relevant test species mentioned in the following guidelines shall be accepted:

- Part C.20 of the Annex to Regulation (EC) No 440/2008 or OECD Test Guideline 211 for daphnia,
- Part C.14 or OECD Test Guideline 215 for fish ,
- Equivalent test methods as agreed with a competent body are also permitted,
- According to Annex XI of REACH regulation, if no experimental data exists, results of (Q)SARs[25] may be used. QSARs shall be accepted to fill data gap in only one of the three trophic levels rather having to perform the test.

Only chronic toxicity test results in the form of No Observed Effect Concentration (NOEC) data shall be accepted.

Either marine or freshwater toxicity data are accepted for determining acute or chronic aquatic toxicity. The tests in marine water are carried out according to and using relevant test species mentioned in the above guidelines.

In the case of slightly soluble substances or preparations (< 10 mg/L) the method of the water-accommodated fraction (WAF) can be used in the aquatic toxicity determination. The established loading level, sometimes referred to as LL50 and related to the lethal loading, may be used directly in the classification criteria. The preparation of a water-accommodated fraction shall follow the recommendations set out according to one of the following guidelines: ECETOC Technical Report No 20 (1986), Annex III to OECD 301 (1992) and the OECD 310 test guidelines or the ISO Guidance document 10634 (1995), or ASTM D6081-98 (Standard practice for Aquatic Toxicity Testing for Lubricants: Sample Preparation and Results Interpretation or equivalent methods).

In addition, demonstration of the absence of toxicity for a substance at its limit of water solubility shall be deemed to have met the requirements of this criterion. An aquatic toxicity study does not need to be conducted when:

- the classification of the substance, base fluid or additive is already stated on the Lubricant Substance Classification list (LuSC-list), or
- a valid letter of compliance from a competent body can be submitted, or
- the substance is unlikely to cross biological membranes MM > 700 g/mol or a molecular diameter > 1,5 nm (> 15 Å), or
- the substance is a polymer and its molecular weight fraction below 1 000 g/mol is less than 1 %, or
- the substance is highly insoluble in water (water solubility < 10 µg/l),

as such substances are not regarded as toxic for algae and daphnia in the aquatic system.

[25] Practical guide How to use and report (Q)SARs is available on-line at webpage: https://echa.europa.eu/documents/10162/13655/pg_report_qsars_en.pdf/407dff11-aa4a-4eef-a1ce-9300f8460099 and Chapter R.6: QSARs and grouping of chemicals, available on-line at webpage: https://echa.europa.eu/documents/10162/13632/information_requirements_r6_en.pdf/77f49f81-b76d-40ab-8513-4f3a533b6ac9.

[26] For algae, test duration is normally 72 hours. However, shorter or longer test durations may be used provided that all validity criteria can be met. The test period may be shortened to at least 48 hours to maintain unlimited, exponential growth during the test as long as the minimum multiplication factor of 16 is reached. The aquatic plant growth inhibition tests are normally considered as chronic tests but the EC50s are treated as acute values for classification purposes.

The water solubility of substances shall be determined where appropriate according to OECD Test Guideline 105 or Part A.6 of the Annex to Regulation (EC) No 440/2008 or equivalent test methods. The molecular weight fraction below 1 000 g/mol of a polymer shall be determined according to Part A.19 of the Annex to Regulation (EC) No 440/2008 or OECD Test Guideline 119 or equivalent test methods.

Rationale of the proposed criterion text

According to the technical analysis lubricants have potential to cause disturbances in aquatic ecosystems when they cause emissions to water during their life cycle or due to accidental spillages. The aim of the existing criteria in force (i.e. *3. Additional aquatic toxicity requirements)* is to limit the aquatic toxicity of the ingredients used in lubricant product group. In the first revised proposal, the criterion was suggested to be kept, however some modification were suggested.

In order to decrease the animal tests it was suggested to maintain existing criterion 3.1 (requirements for the product and main components) only for greases when unknown substances are present in the mixture (up to 5% by weight in the lubricant) or reliable aquatic toxicity data of the mixture exists. For the other lubricants categories (and when adequate toxicity data are available for greases components) it was suggested to apply requirement 2.2 (existing 3.2).

In addition, revised thresholds for aquatic toxicity for the freshly prepared lubricant were proposed in order to harmonize the ambition level between both sub-criteria (i.e 3.1 and 3.2). However this change led to less strict values in criterion 2.1 and therefore the limits were reverted to the existing values in force after the first criteria publication, before the 1st AHWG, as also agreed at the meeting with the stakeholders.

With regard the threshold for sub-criterion 2.2, Competent bodies and stakeholders were consulted to explore the level of ambition of existing criteria on aquatic toxicity. Data on aquatic toxicity of 47 Ecolabelled products from 10 different countries was obtained. Based on the feedback received it was proposed for the first draft to make the aquatic toxicity thresholds currently in force stricter. For instance, for several categories (1, 3 and 5) the value of chronic hazard limit was halved.

- **Outcomes from and after the 1st AHWG meeting**

Main comments received from stakeholders during and after the 1st AHWG meeting are summarized below:

- With regard to the chronic aquatic toxicity tests, several stakeholders expressed concern; since also in the criterion currently in force is not entirely clear for them what is really needed to demonstrate compliance with the criterion and whether both acute and chronic toxicity data must be submitted.
- It was suggested to keep the possibility to test mixtures (existing criterion 3.1) for all product categories, not only for greases, as it is allowed in the existing criteria in force.
- Concerning the proposed thresholds limit values for criterion 2.2 in TR1.0, stakeholders mentioned that they were too strict; and would lead to significant decrease in the number of current EEL products, which would not comply with these new limits.
- One stakeholder commented that in the case of greases, if the threshold values for the aquatic toxicity regarding the content of harmful substances decrease from 25% to 20%,

complex greases will not be able to comply due to the content of soaps. It was proposed to decrease the allowed toxic content in the greases formulation, but not the content of harmful substances. This approach is included in the second proposal.

Additional data have been provided by Competent Bodies on aquatic toxicity. In total, data of 149 currently EU Ecolabelled products from 11 different countries was obtained, **which represents approximately the 40% of the total EEL products available on the market.** Therefore, in this second revised proposal threshold values have been amended based on the analysis of this additional data.

- **Second proposal**

Against this background the additional work after the first consultation has been focused on the compilation of additional data, especially on existing EU Ecolabel products on specific categories in which companies claimed that they would have difficulties to comply with the first revised proposal and in order to obtain reliable statistics and reformulation, if applicable, of the limit values proposed. Stakeholders and CBs have been asked to provide more data regarding aquatic toxicity data for each substance present above 0,10 % (w/w) (existing requirement 3.2).

Based on the outcome of the analysis, it was found that generally the values proposed first in criterion 2.2 (and the currently valid values of 3.2) are higher than the values for most of the samples investigated. This supports the proposal for stricter aquatic toxicity limits. The outcome of this research are summarized in the tables below (updated values compared to the values included in TR1.0 are given in blue). Percentiles show the percentage of values that are at or below a certain value (e.g. the 50th percentile value indicates that 50% of the values are at or below that value).

Table 3.2: Criterion 2.2 Aquatic toxicity descriptive statistics and existing limits – Lubricant Category 1

NUMBER OF EU ECOLABEL PRODUCTS INFORMATION RECEIVED	AQUATIC TOXICITY (Existing criterion 3.2 only)	Aquatic toxicity (cumulative mass percentages (%w/w) of substances present within the candidate lubricant)				
		Existing Cat. 1 (ALL)				
		range	average	50th percentile	75th percentile	current limit
68	HARMFUL (E)	0 – 0,70	0,23	0,25	0,38	≤ 20
	TOXIC (F)	0 – 2,60	0,23	0,09	0,30	≤ 5
	VERY TOXIC (G)	0 – 0,08	0,01	0	0	≤ 0,1 / M

Table 3.3: Criterion 2.2 Aquatic toxicity descriptive statistics and existing limits – Lubricant Category 2

NUMBER OF EU ECOLABEL PRODUCTS INFORMATION RECEIVED	AQUATIC TOXICITY (Criterion 3.2 only)	Aquatic toxicity (cumulative mass percentages (%w/w) of substances present within the candidate lubricant)				
		Existing Cat. 2 (PLL)				
		range	average	50th percentile	75th percentile	current limit
25	HARMFUL (E)	0 – 18,49	7,51	5,05	13,02	≤ 25
	TOXIC (F)	0 – 0,52	0,05	0	0	≤ 1
	VERY TOXIC (G)	0	0	0	0	≤ 0,1 / M

Table 3.4: Criterion 2.2 Aquatic toxicity descriptive statistics and existing limits – Lubricant Category 3

NUMBER OF EU ECOLABEL PRODUCTS INFORMATION RECEIVED	AQUATIC TOXICITY (Criterion 3.2 only)	Aquatic toxicity (cumulative mass percentages (%w/w) of substances present within the candidate lubricant)				
		Existing Cat. 3 (TLL)				
		range	average	50th percentile	75th percentile	current limit
37	HARMFUL (E)	0 – 2,00	0,51	0,2	0,6	≤ 5
	TOXIC (F)	0 – 0,50	0,11	0	0,3	≤ 0,5
	VERY TOXIC (G)	0	0	0	0	≤ 0,1 / M

Table 3.5: Criterion 2.2 Aquatic toxicity descriptive statistics and existing limits – Lubricant Category 4

NUMBER OF EU ECOLABEL PRODUCTS INFORMATION RECEIVED	AQUATIC TOXICITY (Criterion 3.2 only)	Aquatic toxicity (cumulative mass percentages (%w/w) of substances present within the candidate lubricant)				
		Existing Cat. 4 (PLL)				
		range	average	50th percentile	75th percentile	current limit
1	HARMFUL (E)	-	4	4	4	≤ 25
	TOXIC (F)	-	0	0	0	≤ 1
	VERY TOXIC (G)	-	0	0	0	≤ 0,1 / M

Table 3.6: Criterion 2.2 Aquatic toxicity descriptive statistics and existing limits – Lubricant Category 5

NUMBER OF EU ECOLABEL PRODUCTS INFORMATION RECEIVED	AQUATIC TOXICITY (Criterion 3.2 only)	Aquatic toxicity (cumulative mass percentages (%w/w) of substances present within the candidate lubricant)				
		Existing Cat. 5 (ALL)				
		range	average	50th percentile	75th percentile	current limit
18	HARMFUL (E)	0 – 19,00	1,16	0,04	0,25	≤ 20
	TOXIC (F)	0 – 3,55	0,57	0,4	0,83	≤ 5
	VERY TOXIC (G)	0	0	0	0	≤ 1 / M

Based on these values, criterion 2.2 has been revised. The following aquatic toxicity threshold values (cumulative mass percentages (%w/w) of substances present within the candidate lubricant) are proposed for the revised criteria for *aquatic toxicity*. Second revised threshold values have been proposed only for existing category 2, 3 and 4 values on Chronic hazard category 2 have been relaxed compared to first proposal (blue text in **Table 3.7**), rest of values have been kept as in the first proposal. The comparison of the revised and the existing thresholds in force are given in **Table 3.7**. Compared to existing criteria in force the ambition level has considerably increased, for in instance, for several categories (1, 3 and 5) the value of chronic hazard limit was halved.

Table 3.7: Criterion 2.2 Second proposed threshold values for the aquatic toxicity, existing limits and number of EU Ecolabeled products affected (out of 147 products for which updated information was received)

Aquatic toxicity		Cumulative mass percentages (%w/w) of substances present within the candidate lubricant)														
		CATEGORY 1 (ALL)			CATEGORY 2 (PLL)			CATEGORY 3 (TLL)			CATEGORY 4 (PLL)			CATEGORY 5 (ALL)		
		current limit	revised proposed limit	number of current eu ecolabelled products affected	current limit	revised proposed limit	number of current eu ecolabelled products affected	current limit	revised proposed limit	number of current eu ecolabelled products affected	current limit	revised proposed limit	number of current eu ecolabelled products affected	current limit	revised proposed limit	number of current eu ecolabelled products affected
Not hazardous to the aquatic environment	Acute aquatic toxicity **>100 mg/L** or Chronic aquatic toxicity**>10 mg/L**	NOT LIMITED														
Chronic hazard category 3	Acute aquatic toxicity **>10 to ≤ 100 mg/L** or **1 mg/L** < Chronic aquatic toxicity **≤ 10 mg/L**	≤ 20	**≤ 10**	0	≤ 25	**≤ 20**	0	≤ 5	**≤ 2**	0	≤ 25	**≤ 20**	0	≤ 20	**≤ 10**	1
Chronic hazard category 2	Acute aquatic toxicity **>1 to ≤ 10 mg/L** or **0,1 mg/L** < Chronic aquatic toxicity **≤ 1 mg/L**	≤ 5	**≤ 2,5**	**1**	≤ 1	**≤ 0,6**	**0**	≤ 0,5	**≤ 0,4**	**3**	≤ 1	**≤ 0,6**	**0**	≤ 5	**≤ 2,5**	1
Chronic category 1 **Acute category 1**	Acute aquatic toxicity**≤ 1 mg/L** or Chronic aquatic toxicity **≤ 0,1 mg/L**	≤ 0,1/M	**≤ 0,1/M**	0	≤ 0,1/M	**≤ 0,1/M**	0	≤ 0,1/M	**≤ 0,1/M**	0	≤ 0,1/ M	**≤ 0,1/M**	0	≤ 1/M	**≤ 0,1/M**	0

In summary, based on the comments received during and after the 1st AHWG meeting and further research carried out, main changes for second proposal are summarized below:

- For both requirements 2.1 and 2.2, the unification of the previous categories 1 and 5 by ALL, category 2 by TLL and categories 2 and 4 by PLL, did not lead to any additional modifications as the thresholds for the merged categories are the same.
- **With regard criterion 2.1**, no changes have been proposed in the thresholds on aquatic toxicity for criterion 2.1. These values were firstly modified in order to harmonise the ambition level of 2.2. This lead to a lower level of stringency and therefore the values were reverted to the existing values in force before the AHWG1.
- Based on some barriers identified, it is proposed to maintain the option of testing the lubricant and its main components (criterion 2.1) **for all categories** because the full set of aquatic data will probably not be available for every ingredient for all categories and not only for greases as suggested in the first proposal. Many of the additives used in lubricants only circulate in commerce as integral parts of more complex and highly competitive chemical mixtures and details of the intrinsic chemical identities and proportions of these mixed substances are almost always confidential, protected via formal patents or other Intellectual Property Rights, and this manufacturing paradigm is extremely unlikely to change in the future, due to the very proprietary nature of the lubricants sector in general. Moreover the letter of Access usually restricts the use of this "data" to the REACH registration dossier, not being able to be used for other purposes such as the EU Ecolabel.
- Refinement of the strictness of the threshold **values proposed for criterion 2.2**. Most of the thresholds are suggested to be maintained as in the first proposal as the new data revealed minor impact on EU Ecolabel products. However some minor modifications have been introduced to reflect the new data received. Main changes are summarized below:
    - Threshold values for category ALL have been maintained in comparison with the threshold values presented in the TR1.0. According to the data received (40% of the existing licences) all the assessed licences would be able to comply with the revised thresholds.
    - Threshold values on chronic hazard category 2 (F) for category PLL have been relaxed compare to the first proposal from a cumulative mass percentage equal to or less than ≤ 0,5% to ≤ 0,6%. Also in this case, all the assessed licences would be able to comply with the revised thresholds.
    - Finally, threshold values on chronic hazard category 2 (F) for category TLL have also been relaxed compare to the first proposal from a cumulative mass percentage equal to or less than ≤ 0,3% to ≤ 0,4%. According to the data received (37 currently EU Ecolabelled products for lubricants category 3) only 2 existing licenses would not be able to comply with the revised thresholds.
- For both requirements 2.1. and 2.2, clarification of the criterion formulation regarding the situation when chronic data can be provided has been included.

Rationale of proposed "assessment and verification"

With regard to the first proposal for the assessment and verification it was initially suggested in the first revised proposal to align section 4.1 of Annex I to CLP Regulation and to request the toxicity data for three trophic levels. In addition it was suggested to include the use of QSARs if no experimental data exist.

- **Outcomes from and after the 1st AHWG meeting**

Main comments received from stakeholders during and after the 1st AHWG meeting with regard the assessment and verification section are summarized below:

- Stakeholders were not in favour of testing substances at all the three trophic levels.
- Clarification is needed if QSARs could be applied if no experimental data exists.
- There was a general agreement that the assessment and verification currently in force should be kept.

- **Further research and main changes in second proposal**

According to the standard information requirements for the registration dossier as given in REACH regulation (Annex VII, VIII and IX of REACH), acute aquatic toxicity data for each main component shall be provided for each of the following two trophic levels: aquatic plants (algae preferred) and crustacean (preferred specie Daphnia).

Consequently, the second proposal, in order to reduce the number of tests on animals as requested by stakeholders, for **assessment and verification** of the criterion 2.1 and 2.2 is proposed to be kept as it is in the **existing EU Ecolabel decision**. Therefore, chronic aquatic toxicity data is proposed to be maintained and shall be provided for the following two trophic levels: fish and crustacean (preferred specie Daphnia).
In addition, some partial modifications are included in the text:

- The replicates of the OECD Test Guidelines have been included for some existing test methods (Reproduction Toxicity test method – Part C.20 for daphnia and growth toxicity test method – Part C.14 for fish) according to Regulation (EC) No 440/2008 laying down test methods pursuant to REACH regulation.
- Clarification on the use of QSARs if no experimental data exists. QSARs shall be accepted to fill data gap in only one of the three trophic levels rather having to perform the test.
- Exemptions from testing on aquatic toxicity studies have been included in this revised second proposal (these were already included in the existing criteria in force and list situations when the aquatic toxicity text is not needed).

3.3 CRITERION 3: Biodegradability and bioaccumulative potential

Second proposal for criterion 3: Biodegradability and bioaccumulative potential

Requirements for the biodegradability of organic compounds and bioaccumulative potential shall be fulfilled by each substance present above 0,10 % weight by weight in the final product.

The lubricant shall not contain substances that are both: non-biodegradable and potentially bioaccumulative. However, the lubricant may contain one or more substances with a certain degree of degradability and potential or actual bioaccumulation up to a cumulative mass concentration as indicated in Table 4:

Table 4. Cumulative mass percentage (%w/w) of substances present in the product

	ALL	PLL	TLL
Readily aerobically biodegradable	> 90	> 75	> 95
Inherently aerobically biodegradable	≤ 10	≤ 25	≤ 5
Non-biodegradable and non-bioaccumulative	≤ 5	≤ 20	≤ 5
Non-biodegradable and bioaccumulative	≤ 0,1	≤ 0,1	≤ 0,1

Assessment and verification: The applicant shall provide a declaration of compliance with this criterion supported by a high quality test reports or literature data (testing according to acceptable protocols and GLP) including the references on the biodegradability and when required on the (potential) bioaccumulation of each constituent substance.

Biodegradation

Readily biodegradable shall be measured in accordance with the following tests:

- Regulation (EC) No 440/2008 (Part C.4, C.5 and C.6 of the Annex), OECD 301, OECD 310, or equivalent methods.

Inherently biodegradable shall be measured in accordance with the following tests:

- Regulation (EC) No 440/2008 (Part C.9 of the Annex), OECD 302 C or equivalent methods
- Tests based on oxygen depletion or carbon dioxide generation: Regulation (EC) No 440/2008 (Part C.4 of the Annex), OECD 306, OECD 310, or equivalent methods.

The biodegradation test does not need to be conducted when the classification of the substance, base fluid or additive is already stated on the Lubricant Substance Classification list or a valid letter of compliance from a competent body can be submitted.

The applicant may also use read-across data to estimate the biodegradability of a substance. 'Read-across' for the assessment of the biodegradability of a substance shall be acceptable if the reference substance differs by only one functional group or fragment from the substance applied in the product. If the reference substance is readily or inherently biodegradable and the functional group has a positive effect on the aerobic biodegradation then the applied substance may also be regarded as readily or inherently biodegradable. Functional groups or fragments with a positive effect on the biodegradation are: aliphatic and aromatic alcohol [-OH], aliphatic and aromatic acid [-C(=O)-OH], aldehyde [-CHO], Ester [-C(=O)-O-C], amide [-C(=O)–N or -C(=S)–N]. Adequate and reliable documentation of the study on the

reference substance should be provided. In case of a comparison with a fragment, not included here above, adequate and reliable documentation of the studies should be provided on the positive effect of the functional group on the biodegradation of structurally similar substances.

Bioaccumulation

The (potential) bioaccumulation does not need to be established when the substance:

- has a MM > 800 g/mol, or
- has a molecular diameter > 1,5 nm (> 15 Å), or
- has an octanol-water partition coefficient, log K_{ow}, value of <3 and >10, or
- has a measured BCF of ≤ 100 L/kg, or
- is a polymer and its molecular weight fraction below 1.000 g/mol is less than 1 %.

Since most substances used in lubricants are quite hydrophobic the BCF- value should be based on the lipid weight content and care must be shown to ensure a sufficient exposure time. The bioconcentration factor (BCF) shall be assessed according to Part C.13 of the Annex to Regulation (EC) No 440/2008 or equivalent test methods.

The log octanol/water partition coefficient (log Kow) shall be assessed according to Part A.8 of the Annex to Regulation (EC) No 440/2008 or OECD 123 or equivalent test methods. In case of an organic substance other than a surfactant where no experimental value is available, a calculation method can be used. The following calculation methods are allowed: CLOGP, LOGKOW, (KOWWIN) and SPARC. Estimated log Kow values by any of these calculation methods < 3 or > 10 indicates that the substance is not expected to bioaccumulate.

Log Kow values are applicable to organic chemicals only. To assess the bioaccumulation potential of non-organic compounds, surfactants, and some organo-metallic compounds, BCF measurements shall be carried out.

Rationale of the proposed criterion text

For the first revised proposal, an analysis of other Eco-labels and certification systems were performed in order to understand how the issue of biodegradability and bioaccumulation is addressed in respective schemes. In general, values for other schemes (e.g. Blue Angel, NF Environment, Korean Ecolabel and the Swedish Standard) are more restrictive than EU Ecolabel.

In addition, information about the threshold values of currently awarded lubricants were collected in order to evaluate the level of ambition of the current thresholds.

Against this background, in relation to **biodegradability**, it was suggested in the first proposal to have more stringent values for readily aerobically biodegradation in the existing categories 1 and 2.

The inherent aerobically biodegradability was proposed to be modified for the lubricant products greases and 2-stroke oils; according the current threshold values of the EU Ecolabel products certified. In addition it was proposed to replace *Ultimately* with *Readily* according to the last version of CLP. The table comparing the thresholds values for the different schemes and the results of the assessment of the values of current EU Ecolabel product can be found in the TR1.0[3].

With regard to **bioaccumulation**, Blue Angel limit values are similar to the values defined in the EU Ecolabel. Data received from stakeholders and CBs for the current EU Ecolabel products revealed that the share of bioaccumulative components is usually zero.

In the first proposal, the limit value was kept the same in order to allow for applying other lubricant products.

The requirements to establish bioaccumulation of a substance were suggested to be modified according to the last version of CLP Regulation. In the AHWG1, the following values were presented: log K_{ow} value of < 4 or >7 and BCF of ≤ 500 L/kg.

- **Outcomes from and after the 1st AHWG meeting**

This criterion has generated an important discussion in the 1st AHWG meeting. Different issues were discussed, highlighting two modifications made in the first proposal:

- The nomenclature change of *ultimately* for *readily* biodegradation.
- The new threshold proposal for the octanol-water partition coefficient (log K_{ow} ≥4) published in the TR1.0.

During and after the 1st AHWG meeting some concern was expressed by industry whether the term "readily biodegradable" implies an obligatory consideration of the 10-day window in the pass level. Stakeholders argued that lubricants are designed to comply with the 28-day ready biodegradation requirement, and the elimination of the 10-day window exemption will influence product formulation.

Regarding the second issue, the main concern of the stakeholders has been the elimination of the upper limit as justification for not establishing the bioaccumulation potential of a substance in the first draft of the technical report. They commented that most of the current certified lubricants are not able to fulfil the criterion if the upper limit is removed in the revision and proposed maintaining the current thresholds given for the bioconcentration factor and log octanol-water partition coefficient: BCF≤100 or log K_{ow} <3 or >7.

Other comments made during the 1st AHWG meeting and received from the stakeholders and competent bodies were about the **threshold values** suggested in the first proposal. Specific comments were received about products not compliant with the proposed thresholds or about substances not able to comply with the biodegradability limit (e.g. thickeners). See comments received about this issue in the separated annex published along with this report.

- **Further research and main changes in second proposal**

Text clarification

According to Annex VII to REACH Regulation related to the information on the ecotoxicological properties of substances , there is no need to conduct the study on "Ready biodegradability" if the substance is inorganic. To clarify this issue, the specification of "Requirements for the biodegradability of organic compounds" has been included in the second revised proposal.

Nomenclature change of ultimately for readily biodegradation

Regarding the issue of nomenclature change, EEB/BEUC provided a clarification document (posted in BATIS forum[27]) about the different relevant terminology definitions on biodegradability. There exists different terms on ready, rapid, ultimate or inherent biodegradability depending on the regulatory scheme. CLP Regulation refers to substances that are considered as rapidly degradable in the environment while referring to the same pass levels under OECD or REACH for readily biodegradable.

In OECD Guideline a substance readily biodegradable is defined as *an arbitrary classification of chemicals which have passed certain specified screening tests for ultimate biodegradability; these tests are so stringent that it is assumed that such compounds will rapidly and completely biodegrade in aquatic environments under aerobic conditions*. The REACH guidance refers to "ready biodegradability tests" as stringent screening tests, measuring ultimate biodegradation by non-specific parameters like Dissolved Organic Carbon (DOC), Biochemical Oxygen Demand (BOD) and CO_2 production. A positive result in a test for ready biodegradability can be considered as indicative of rapid and ultimate degradation in most environments including biological sewage treatment plants. The last one also includes in the definition the 10-day windows test, explaining that 10-day window does not apply if the test substance represents a mixture of homologous compounds e.g. technical surfactants.

The main concern of stakeholders is to comply with 10-days windows test. In order to be consistent with other EU Ecolabel product groups and with CLP, the terminology proposed in the 1st draft, of readily biodegradable is suggested to be maintained.

The definition of readily degradable includes that for substances identified as UVCB (*Unknown or Variable composition, complex reaction products or biological materials)* or as a complex, multi- constituent substance with structurally similar constituents an exemption from the 10-day window can be applied.

Thresholds revision

Finally, in this second proposal, the threshold values have been modified to correspond well to the revised scope proposal. The unification of the previous categories 1 and 5 under ALL, and categories 2 and 4 under PLL has created the need for a new definition of the threshold values. In the first proposal the threshold values were defined as following:

[27] http://eippcb.jrc.ec.europa.eu/batis/

Table 3.8: Threshold values of cumulative mass percentage (%w/w) of substances present in the product for the existing criteria in force and proposed in the first draft revision

	Category 1 (ALL)		Category 2 (PLL)		Category 3 (TLL)		Category 4 (PLL)		Category 5 (ALL)	
	existing	1st proposal	existing	1st proposal	existing	1st proposal	existing	1st proposal	existing	1st proposal
Readily aerobically biodegradable	> 90	**> 95**	> 75	**> 80**	> 90	**> 95**	> 75	> 75	> 90	> 90
Inherently aerobically biodegradable	≤ 5	≤ 5	≤25	**≤ 15**	≤ 5	≤ 5	≤ 20	**≤ 15**	≤ 5	≤ 5
Non-biodegradable and non-bioaccumulative	≤ 5	≤ 5		**≤ 15**	≤ 5	≤ 5	≤ 10	≤ 10	≤ 5	≤ 5
Non-biodegradable and bioaccumulative	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1	≤ 0,1

Different considerations have been used to define revised threshold values. First of all, following the approach TLL, PLL and ALL, the threshold values have to be defined gradually according the higher risk to spill out. In addition, it has been ensured that according to information provided by competent bodies corresponding to the 40% of licences, all assessed products would comply with second revised thresholds, as it can be seen in the tables below. Moreover, inherent aerobic biodegradation has been adjusted in order to sum up to 100% when it is combined with readily biodegradability. This modification benefits the totally biodegradable lubricants.

The threshold value of readily biodegradation for category 1 (ALL in the second revised proposal) has been reverted to 90% (which is existing value in force for categories 1 and 5) keeping in mind that TLL should have a higher threshold value (95%) since the probability to release in the environmental is higher. Adjusting this limit allows the unification of the categories 1 and 5, as they overlap.

Threshold values for readily biodegradability of PLL (previous categories 2 and 4) have been also adjusted. Some comments received outlined the difficulty to comply with the proposed limits for category 2. Taking into account these comments the threshold value of readily biodegradability has been reverted to existing value in force (75%). In addition, this facilitates the merging with the category 4 under the PLL group.

Summing up, with the unification of categories, thresholds proposed in the first revision have maintained or reverted to existing values, in line with the feedback received by stakeholders. Compared to existing criteria in force, main relevant change corresponds to an increase of 5% of the value for readily biodegradability threshold for total loss lubricants.

Table 3.9: Biodegradability and bioaccumulation potential descriptive statistics and current limits – Lubricants TLL (previous Category 3)

NUMBER OF ECOLABELLED PRODUCTS RECEIVED	Biodegradability and bioaccumulation potential	(cumulative mass percentages (% weight by weight) of substances present in the lubricant)						
		TLL (previous category 3)						
		RANGE	AVERAGE	50th PERCENTILE	75th PERCENTILE	CURRENT LIMIT	PROPOSED LIMIT	Number of products under the proposed limit
38	**Ultimately aerobically biodegradable**	90,40 - 100	97	97,24	95,64	>90	**> 95**	5
	Inherently aerobically biodegradable	0 - 7	1,64	1,10	2	≤5	≤ 5	1
	Non-biodegradable and non-bioaccumulative	0 - 5	2,28	1,95	3,40	≤5	≤ 5	0
	Non-biodegradable and bioaccumulative	-	0	0	0	≤0,1	≤ 0,1	0

Table 3.10: Biodegradability and bioaccumulation potential descriptive statistics and current limits – Lubricants PLL

NUMBER OF ECOLABELLED PRODUCTS RECEIVED	Biodegradability and bioaccumulation potential	(cumulative mass percentages (% weight by weight) of substances present in the lubricant)						
		PLL (previous categories 2 and 4)						
		RANGE	AVERAGE	50th PERCENTILE	75th PERCENTILE	CURRENT LIMIT	PROPOSED LIMIT	N° of products under the proposed limit
CAT 2: 25	**Ultimately aerobically biodegradable**	74,48 – 98,4	89,40	89,72	85,56	>75	**> 75**	0
	Inherently aerobically biodegradable	0 – 14,99	6,00	3,9	10,35	≤25	**≤ 25**	0
	Non-biodegradable and non-bioaccumulative	0,5 – 16,75	6,19	5,48	7,8	≤25	**≤ 20**	0
	Non-biodegradable and bioaccumulative	-	0	0	0	≤0,1	≤ 0,1	0
CAT 4: 1	**Ultimately aerobically biodegradable**	-	76	-	-	>75	>75	0
	Inherently aerobically biodegradable	-	14	-	-	≤20	≤25	0
	Non-biodegradable and non-bioaccumulative	-	10	-	-	≤10	≤20	0
	Non-biodegradable and bioaccumulative	-	-	-	-	≤0,1	≤0,1	0

Table 3.11: Biodegradability and bioaccumulation potential descriptive statistics and current limits – ALL

NUMBER OF ECOLABELLED PRODUCTS	Biodegradability and bioaccumulation potential	(cumulative mass percentages (% weight by weight) of substances present in the lubricant)
		ALL (previous categories 1 and 5)

RECEIVED		RANGE	AVERAGE	50th PERCENTILE	75th PERCENTILE	CURRENT LIMIT	PROPOSED LIMIT	Nº of products under the proposed limit
CAT 1: 68	**Ultimately aerobically biodegradable**	90,95 – 99,42	97,80	98,25	97,89	>90	**> 90**	0
	Inherently aerobically biodegradable	0 – 5	0,62	0	0,60	≤5	≤ 10	0
	Non-biodegradable and non-bioaccumulative	0,36 – 5	1,61	1,38	1,80	≤5	**≤ 5**	0
	Non-biodegradable and bioaccumulative	0 – 1	0,03	0	0	≤0,1	≤ 0,1	1 *(not currently compliant)*
CAT 5: 18	**Ultimately aerobically biodegradable**	91 – 98,67	96,50	97,24	94,55	>90	> 90	0
	Inherently aerobically biodegradable	0 – 0,319	0,12	0	0,30	≤5	≤ 10	0
	Non-biodegradable and non-bioaccumulative	0,87 – 4,98	2,69	1,99	4,98	≤5	≤ 5	0
	Non-biodegradable and bioaccumulative	0	0	0	0	≤0,1	≤ 0,1	0

Bioconcentration factor (BCF) and log octanol/water partition coefficient (log Kow) values

During the stakeholders consultation process it has been discussed and agreed to keep the current formulation of the criterion with the strict values of the BCF and the lower limit of log K_{ow} and not to align them with the less strict threshold given in CLP Regulation.

With regard the upper limit, the value included in the current decision (log K_{ow} >7) cannot be justified according CLP regulation, for this reason further research was carried out in order to identify the possibilities to include those substances with a high value of octanol-water partition coefficient.
There is no evidence to justify that a substance is not bioaccumulable for values of log K_{ow} >7.

The European Chemical Agency (ECHA) guidance document[28] indicates that the log BCF increases linearly with log K_{ow} values <5 and a decreasing linear relationship is observed for higher values of log K_{ow} (>6). Moreover, the experimental determination of log K_{ow} for very hydrophobic chemicals is normally uncertain.

Dimitrov et al. (2002)[29] supports a cut-off for the log K_{ow} of 10, which used within a Weight-of-Evidence scheme supports the observation that a substance may not be bioaccumulative and/or very bioaccumulative. Therefore, a calculated log K_{ow} of 10 or above is taken as an indicator for showing reduced bioconcentration. *Subsequently, the TC NES (Technical Committee for New and Existing Substances of ECHA) subgroup addressing persistent, bioaccumulative and toxic (PBT) and very persistent/very bioaccumulative (vP/vB) chemicals (ECHA PBT working group) considered this recommendation and agreed to use it as part of the strategy of determining whether a chemical should be placed on a screening PBT/vPvB list and/or should be tested to determine whether it is B/vB.*

Against this background a cut-off for the log K_{ow} of 10 is proposed and the existing cut-down value of 3 is re-introduced. The cut-down value from the first proposal has been modified since EU Ecolabel aims to go further than the legislation requirements. **The impact of the second proposal (log K_{ow} <3 or >10 instead of the existing log K_{ow} <3 or >7) in the LuSC list will be further investigated with regards to criterion 3 in order to identify its technical viability**.

<u>Rationale of proposed assessment and verification</u>

OECD 301B (CO_2 Evolution) and ISO 14593 (Water quality - Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium - Method by analysis of inorganic carbon in sealed vessels) are the most commonly requested methods in the U.S. and Europe for testing the biodegradation of lubricants[30]. The OECD 301 test is the most extensively used for other Ecolabels to evaluate the biodegradability of the substances: Korean Ecolabel, Japan Ecolabel, Nordic Swan and Blue Angel.

Other tests used to define the biodegradability are: ISO 14593, 9439 and 9408 (or equivalent) for Nordic Swan, ISO 10708, 9439 and 9408 for Swedish Standard. Blue Angel also relates to other OECD tests: OECD 306, 310 and 302C to verify the ultimate biodegradability and inherent biodegradability.

[28] Guidance on Information Requirements and Chemical Safety Assessment Chapter R.11: PBT/vPvB Assessment. More information available online at: https://www.echa.europa.eu/documents/10162/13632/information_requirements_r11_en.pdf/a8cce23f-a65a-46d2-ac68-92bee1f9e54f

[29] Dimitrov SD, Dimitrova NC, Walker JD, Veith GD and Mekenyan OG (2002) Predicting bioconcentration factors of highly hydrophobic chemicals: effects of molecular size. Pure and Applied Chemistry 74:1823-30.

[30] http://www.situbiosciences.com/lubricant-biodegradation-and-toxicity-testing/

In the Regulation (EC) No 440/2008[31], OECD 107 test and the method OECD 305 are referred to for testing the bioaccumulation potential. The Blue Angel also mentions the same test methods to verify the bioaccumulation potential.

Against this background, the first proposal consisted in asking for test reports or literature data about the biodegradability and bioaccumulation potential (if required).

- **Outcomes from and after the 1st AHWG meeting**

There were very few comments referring to the verification and tests used to assess the biodegradability and bioaccumulation potential.

- **Further research and main changes in the second proposal**

In general most of the wording of current text in force has been reintroduced. An extension of the description of the assessment and verification has been done, in order to include the main methods used to calculate the biodegradability of a substance. Moreover, a clarification about when a report of read-across data can be submitted has been included.

About the bioaccumulation, the explanation currently included in the existing text in force has been reintroduced in order to extend and clarify the information.

In addition, definitions have been transferred to the definitions section in order to simplify the text

[31] COUNCIL REGULATION (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

3.4 CRITERION 4: Raw materials

Second proposal for criterion 4: Raw materials
The lubricant product shall have a minimum content of: a) carbon derived from renewable raw materials; or b) synthetic esters, poly-alphaolefins (PAOs) or poly-alkylene glycols (PAGs); or c) a combination of a) and b), at percentage ≥60% (m/m) for lubricants under ALL group, ≥65% (m/m) for lubricants under PLL group, ≥70% (m/m) for lubricants under TLL group. **Assessment and verification** The applicant shall indicate on the application form the type (s), source(s) and origin of the material(s) of the main components. The applicant shall provide the competent body with a declaration of compliance with this criterion supported by the test results in case of renewable origin raw materials and data sheets of the product, from the supplier or applicant, as appropriate. ASTM D6866 test method or equivalent (e.g. ISO 16620-2) shall be used to determine the renewable carbon content.

Rationale of the proposed criterion text

With regard to the renewable content, the existing criteria in force (Criterion 5: Renewable raw material) only requires a minimum percentage of renewable content in order to enforce renewable ingredients.

Nevertheless, as mentioned in the chapter 1.2.2 other options are currently available on the market such as re-refined and synthetic base oils that potentially could have lower environmental impacts than mineral oils; although it would depend not only type but also on the application of the lubricant. With modern re-refining technologies, CO_2 emissions from the re-refined oils can be reduced by more than 50% compared to the conventional production of base oil[32]. However the inclusion of this base oil wouldn't meet the requirements on toxicity and biodegradability criteria. A draft broader criterion considering other alternative to pure mineral lubricants (i.e. synthetic or re-refined origin) was proposed for discussion for the AHWG meeting.

In addition, for the first proposal, a revision of the thresholds was carried out based on the analysis of values of the current EU Ecolabel products and other Ecolabel schemes. More restrictive thresholds were proposed in the first proposal, when compared with the currently valid ones,. The results of the consultation of competent bodies and industry stakeholders with regard existing renewability thresholds are available in the 1st draft of the technical report.

- **Outcomes from and after the 1st AHWG meeting**

[32] GEIR Fishing Vessel registered in Norway: position (GEIR: Groupement Européen de l'Industrie de la Régénération)

In order to allow the inclusion of re-refined oils as an alternative for the categories with less probability to reach the environment, stakeholders were asked to provide their views on the following options:

- Re-refined oils are not allowed for category 3 (in this revision named TLL)
- Re-refined oils are only allowed in category 4 (engine oils)

The inclusion of re-refined oils was not welcome. Most of the stakeholders did not agree to include this base oil, others only considered the inclusion for the engine oil products. Only two stakeholders agreed with the inclusion of re-refined oils, on the condition that derogations for criteria 1 and 3 were included.

Another important issue discussed was the threshold values. Different stakeholders stated that it would be problematic to comply with the new threshold values, mainly for greases category.

Moreover, a few stakeholders commented that there is a lack of LCA information of re-refined oils, and pointed out the need to better define synthetic.

In addition, during the first meeting, the existing criteria on renewable raw material is seen by several stakeholders as controversial as there is no absolute evidence which supports bio-based as a superior environmental option. It was mentioned that Blue Angel dropped the criterion on renewability from the criteria set for lubricants in the last revision (2014) because of this reason. According to several stakeholders, the use of renewable raw materials could be beneficial to address two current problems: fossil resources depletion and climate change. Despite the potential environmental advantages of using these renewable oils in comparison with mineral or synthetic oils (non-vegetable derived), some impacts from vegetable oils used should be considered, especially those related to the agriculture stage. In addition, there are other issues relevant for biofuels that might be relevant for bio-based lubricants as well e.g. indirect land use change (ILUC). It was not easy to have a clear picture of bio-based lubricants as a superior environmental choice. Therefore some stakeholders asked to delete this criterion.

- **Further research and main changes in the second proposal**

Several stakeholders pointed out the need of a clear definition for synthetic base oil, or synthetic in general.

The word synthetic is used as a synonym for human-made, opposite to nature made. In other words, it is something that has been prepared artificially, in contrast to naturally. Furthermore, in a chemical way, synthetic is the result of a chemical synthesis. Likewise, in lubricants, the use of the term synthetic is associated with the use of a substance made artificially, synthetic base oil, as opposite to the mineral oil, which comes from crude oil / petroleum, made by nature.

Synthetic base oil is a base fluid consisting of chemical compounds that are artificially made. They can be made from mineral oil, through chemical modification (for instance hydro cracking, hydrogenation with a catalyst) or made from a vegetable oil, through chemical modification (for instance trans-esterification). The result is a synthetic base oil that can be partly bio-based (if it has been produced by modifying a vegetable oil), or non bio-based (if it comes from a chemical modification of a mineral oil) with better properties than the original oil (mineral or bio-based oil).

In the lubricants world, specifically in the MWF, it is also common to use the term 'synthetic metalworking fluid' with a complete different meaning. A **synthetic metalworking fluid** (MWF) is a type of MWF that is a true water solution. A synthetic MWF is made with water and water-soluble products, in contrast to the majority of MWF that are either emulsions or neat oils. The use of the term synthetic in this case has little to do with being made artificially or

naturally; it is due to historical reasons within the metalworking fluids product group. Historically, MWF have been grouped under three categories:

a) **Neat oil** that is a product containing only oil;
b) **MWF emulsions**, usually containing 5 to 8% oil in an Oil-in-Water O/W emulsion; occasionally there are producers that consider two types of MWF emulsions, depending on the amount on oil in the emulsion (soluble oil MWF and semi-synthetic MWF);
c) **Synthetic MWF**, which contain water and water soluble additives.

Considering that the use of synthetic term could be confusing, it will only be used accompanied by references to specific oils.

In order to complete the technical analysis included in the preliminary report, Chapter 1.2.2 on key environmental aspects have been extended with additional sources of evidence. Further environmental assessment revealed that there seems to be several alternatives to conventional mineral lubricants, in addition to bio-based lubricants, that present good biodegradability potential, low toxicity and are not bioaccumulative, and that therefore could be suitable alternatives for lubricants included in the scope of this EU Ecolabel (loss lubricants). Synthetic base oils could be developed from a renewable or mineral source. The renewable synthetic oils are included in the existing scope, since they can comply with the existing criterion on carbon content from renewable origin (criterion 5). However there are other synthetic base oils from non-renewable sources: including poly-alphaolefins (PAOs), poly-alkylene glycols (PAGs) and synthetic non-renewable esters. Some of these synthetic oils from non-renewable sources have good biodegradability potential, solubility, resist oxidation and have good temperature viscosity characteristics. However, they are not able to comply with the existing EU Ecolabel criterion 5 that focus on the renewable raw ingredients.

The Environmental Acceptable Lubricants (EAL) includes the vegetables oils, synthetic esters (from renewable and non-renewable sources), PAGs and PAOs as the most common biodegradable base oils. Moreover, they are classified as low aquatic toxicity.

Table 3.12: Environmental characteristics by base oil[33, 34]

Lubricant base oil	Base oil source	Biodegradation	Toxicity	Bioaccumulation
Mineral oil	Petroleum	Persistent/ Inherently	High	Yes
PAG and PAO	Petroleum- synthesized hydrocarbon	Readily	Low	No
Synthetic esters	Petrochemical or biochemical alcohols (in different percentages)	Readily	Low	No
Vegetable oils	Naturally occurring vegetable oils (e.g rapeseed, sunflower, palm and coconut)	Readily	Low	No

Against this background, in order to enlarge the scope of the EU Ecolabel, in the second proposal continues to be proposed the inclusion of other synthetic lubricants (those partially derived from renewable content are already covered by existing criterion 5). Lubricants presenting good biodegradability, low toxicity and that do not bioaccumulate (most relevant environmental aspects for loss lubricants) compare to conventional mineral lubricants are proposed to be included. **Therefore, in the second proposal for this criterion, besides the renewable carbon content, PAGs, PAOs and non-renewable ester base oils are suggested to be considered in line with the Environmental Acceptable Lubricants (EAL).**

In addition, the thresholds values for the renewable carbon content have been adjusted and unified. The existing threshold value for category 3 in EU Ecolabel in force continues to be suggested for TLL lubricants (≥70%). For the ALL group, that covers mainly existing categories 1 and 5 remains to be the value initially proposed for the first proposal (≥60%). Finally, 65% has been proposed for PLL (existing categories 2 and 4), this value is stricter that values originally proposed for the first meeting. Nevertheless, current EU Ecolabel products under category 2 have an average renewability of 75,98% (75th percentile of 71,64%) and current EU Ecolabelled products under category 4 have and average renewability of 67,29% (75th percentile of 67,29%), so according to data available most of products could comply with proposed thresholds, especially taken into account that the scope of alternatives for the criterion is broader with the inclusion of synthetics substances.

The inclusion of re-refined is beneficial in case of substituting mineral base oil, however for loss lubricants applications for which toxicity and biodegradability are core aspects, the inclusion of derogations in aquatic toxicity and biodegradability needed for re-refined oils is not considered appropriate. Some stakeholders commented that the inclusion of these base oils is only reasonable for 4-stroke oils. Since the 4-stroke lubricants have been removed in the 2nd revision, the re-refined oils have been excluded.

[33] Madanhire, I. & Mbohwa, C. (2016). Mitigating Environmental Impact of Petroleum Lubricants. Springer International Publishing.
[34] Dietrich, H. Unconventional metalworking fluids. Industrial Lubrication and Tribology; 2003; 55, 1; ABI/INFORM Collection.+pg. 5

Rationale of proposed assessment and verification

With regards to the assessments and verification, for the existing criterion in force, only a declaration of compliance is requested. However there are several test methods to measure biomass content:

- The USDA Bio-Preferred program employs the ASTM D6866 for testing the bio-based content of a product[35]. This standard is a test method that provides accurate bio-based/biogenic carbon content results[36]. Some similar methods being developed following the methodology of carbon-14 analysis include:
- ISO 13833: Stationary source emissions - Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide - Radiocarbon sampling and determination[37].
- EN 15440: Solid recovered fuels - Methods for the determination of biomass content[38].

For the first assessment and verification proposal it was suggested to request test reports to support the declaration and stakeholders were consulted in order to know the availability, cost and use of methods above.

- **Outcomes from and after the 1st AHWG meeting**

Stakeholders attempted to define the best option for assessing the renewable content of lubricants. Different opinions were received about the test methods included in the 1st draft: ASTM D6866 is welcome for some stakeholders, in contrast to other stakeholder that propose alternatives to the ASTM D 6866. Moreover, other test methods are proposed referring to the renewable content of a product:

- EN 16640:2017 Bio-based products - Determination of the bio-based carbon content of products using the radiocarbon method.
- EN 16785-1:2015 Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis.
- Draft EN 16785-2 Bio-based products - Bio-based content - Part 2: Determination of the bio-based content using the material balance method.
- DIN 51637 Liquid petroleum products - Determination of the bio-based hydrocarbon content in diesel fuels and middle distillates using liquid scintillation method.

- **Further research and main changes in the second proposal**

A summary of the most used test methods in eco-labelling programs and bio-based product initiatives globally is presented in the following table:

[35] https://www.biopreferred.gov/BioPreferred/faces/Welcome.xhtml
[36] http://www.astm.org/Standards/D6866.htm
[37] http://www.aenor.es/aenor/normas/normas/fichanorma.asp?tipo=N&codigo=N0051753#.WAiD3fmLSUl
[38] http://www.aenor.es/aenor/normas/normas/fichanorma.asp?tipo=N&codigo=N0049098#.WAiD7PmLSUl

Table 3.13: Test methods used in different eco-labelling programs

Eco-labelling program	Logo	Testing method
OK Bio-based - Vinçotte (Belgium)		ASTM D6866
DIN- Geprüft Bio-based - DIN CERTCO (Germany)		ASTM D6866
EcoLogo- UL Environment (Canada)		ASTM D6866
BiomassPla- Japan BioPlastics Association		ASTM D6866
BioPreferred Program- U.S Department of Agriculture		ASTM D6866
Sustainable Biomaterials Collaborative		ASTM D6866

The most extensively used test is the ASTM D6866. Therefore it is suggested that the verification of the renewable content shall be done according this methodology, or others equivalents test methods. ISO 16620-2 is an example of equivalent standard[39].

Additionally, with the goal of identifying the best option of verifying the synthetic oil presence in the lubricant, a question box has been included:

Questions to stakeholders
In order to complement the self-declaration, what method or document do you think is the best option to verify the use of non-renewable base oils (esters, PAGs and PAOs) (e.g. bill of the product)?

[39] ASTM D6866: Standard Test Methods for Determining the Bio-based Bio-based Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis. https://www.astm.org/Standards/D6866.htm

3.5 CRITERION 5: Origin and traceability of renewable raw materials

Second proposal for criterion 5: Origin and traceability of renewable raw materials
The renewable raw materials used in the lubricant shall be produced in a way that at least satisfies the mandatory sustainability requirements for the production of biofuels and bioliquids from bio-based renewable materials (including biomass) as documented in the European Union Renewable Energy Directive 2009/28/EC[43] and, or equivalent standards. For this purpose, the renewable raw material sourced shall be certified as sustainable via recognized international third party voluntary schemes with a membership base that includes NGOs, industry and government, and offers credible certification of products from various economic sectors extending beyond the biofuel sector to the food, feed, energy and bio-based products sector. **Assessment and verification** The applicant shall demonstrate through the provision of a valid certificate issued by a body or organisation accredited to offer third-party certification services against a relevant and internationally recognized standard and or certification scheme that the renewable raw material(s) used in the manufacturing of the product are sustainable. This includes valid certification against ISCC Plus, RSPO (for segregated and mass balance models), or similar schemes, which are based on the specific multi-stakeholder sustainability criteria, that confirms the purchase of the claimed renewable raw material(s) content and substantiate traceability.

Rationale of the proposed criterion text

Renewable raw materials used in the production of lubricants are basically vegetable oils, animal oils and greases. Lubricants containing any of these renewable raw materials (up to a certain stipulated minimum content) are known as bio-based lubricants. Top growth areas for the biolubricant market are forecasted to be industrial gear, hydraulic, and process oils in North America. In Europe the three top growth areas forecasted are: hydraulic fluids, automotive, and process oils. From the 658.1kT of bio-based lubricants produced globally in 2015, 580.8 kT where produced from vegetable origin.

A wide range of types of vegetable oils are used as lubricants and additives for industrial applications. Vegetable oils used in lubricants are mainly derived from rapeseed, sunflower, palm and coconut. Although some other forms of vegetable oils could also be applied, they are not available in required commercial quantities. In Europe, rapeseed and sunflower oils are the major vegetable oils used for industrial purposes, including lubricant production, while soybean and corn are mostly utilized in the United States[40]. Palm oil is less favourable because it tends to solidify at low temperatures. However palm oil does possess good properties for lubricants, such as good oxidative stability, good adherence to metal and lower price. For this reason the plant based vegetable oil has also penetrated the lubricant industry.

[40] Cuevas, P. (2010). Comparative life cycle assessment of biolubricants and mineral based lubricants (Doctoral dissertation, University of Pittsburgh).

Vegetable oils have environmental advantages over mineral or non-bio-based synthetic oils in terms of biodegradability and toxicity. However, these advantages could be offset by the reported negative impacts associated with their cultivation, especially those related to the agriculture stage. Palm and soybean oils are seen as more controversial, because of the issue of deforestation and land use change (direct and indirect) involving loss of natural habitats, associated with their plantations in Southeast Asia and Amazon rainforest.

To address the socio-economic issues and negative environmental impacts related to the cultivation of these oil producing plants, and also satisfy relevant regulatory requirements (e.g. the European Union Renewable Energy Directive (RED) 2009/28/EC), some voluntary sustainability certification schemes have been developed. These include: ISCC (International Sustainability and Carbon Certification), RSPO (Round Table on Sustainable Palm Oil), RSB (Roundtable on Sustainable Biomaterials) bioproduct standard, as well as several others.

Although a few of the above schemes were originally intended to address the sustainability requirements of biomass based biofuels under the RED, because there are no binding sustainability criteria in place for solid biomass in Europe, they have been extended to provide voluntary and acceptable certification of biomass or biomass-based products for other economic sectors (food, feed, bioplastics, biolubricants, etc) in order to guarantee the sustainability requirements from the cultivation phase to the production of the final product. The ISCC Plus (an add-on of ISCC scheme) is a good example of this.

Other Ecolabels have explored the possibility of setting criteria regarding the origin of vegetable oils. These explorations are ongoing and include:

- The revision of the Japanese Ecolabel from 2004 which concluded that an inclusion of restriction for plant species is not realistic since most plant (vegetable) based oils are imported; and that it is not possible to identify a gene-recombinant product.
- A revision of the Blue Angel for Biodegradable Lubricants and Hydraulic Fluids (RAL-UZ 178) in the year 2014 which stated that issues related to the renewable origin of renewable substances will be analysed in future revisions in order to set corresponding new criterion "renewable raw materials".

Other product groups from EU Ecolabel (namely Rinse-off cosmetics and Detergents and cleaning product groups) include certain criteria regarding the sustainability of vegetable oils, but limited them to palm oil and palm kernel oil and their derivatives only[41].

In order to generate discussion and to explore further the available certification schemes, it was suggested in the first technical report to include a new criterion (Criterion 5: Origin and traceability of vegetable raw materials) promoting the sustainable production of vegetable based raw materials to ensure that they originate from well managed sources.

It was suggested in the first proposal to provide supply-chain-evidence that the vegetable renewable raw materials originate from certified and well managed sources and that certified products were not mixed with products from uncertified sources at any point in the supply chain, as a mean of ensuring traceability.

Nevertheless, some difficulties to define a proper verification through a third party certification scheme arose in the first proposal. Although there are certification schemes which focus only on one type of vegetable oil (e.g. RSPO for palm oil and palm kernel oil, and their derivatives), and

[41] http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014D0893&from=EN; http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012D0721

others which have been developed to certify a range of different renewable biomass feedstocks (e,g, ISCC EU and ISCC Plus, as well as some others), there is a lack of information on the extent to which the available schemes are being currently used within lubricant sector.

- **Outcomes from and after the 1st AHWG meeting**

Most of comments received argued that the incorporation of this criterion for this revision was not feasible, since only few well-established third-party certification schemes for renewable oils are available and not all of them are recognised across EU. In addition it seems that these schemes are not commonly used for bio-lubricants by producers. However some stakeholders suggested to conduct additional research on all the available initiatives. To see all the comments received at the first consultation, see the published annex accompanying this technical report.

- **Further research and main changes in the second proposal**

Some standards, directives, legislations, and third party voluntary sustainability certification schemes have been further investigated in order to explore their potential consideration for the revised criteria, according to comments received from stakeholders.

Several policies and standards regarding bio-based products exist at the European level[42] in the framework of the European policy aimed at promoting sustainable bio-based products which can make the economy more sustainable and lower its dependence on fossil fuels. The bio-based product market was identified as a lead market by the European Commission's Lead Market Initiative. The Lead Market Initiative aims to support the up-take of a series of specific sectors by using policy instruments such as regulation, public procurements, standardization and other supporting activities, in order to lower barriers to bring these new products into the market.

Within this framework, the European Committee for Standardisation (CEN) is currently developing standards under the following Mandates in the area of bio-based products, including:

- M/430 on bio-polymers and bio-lubricants
- M/491 on bio-solvents and bio-surfactants
- M/492 for the development of horizontal standards for bio-based products
- M/547 on algae and algae-based products or intermediates

The **CEN Technical Committee 'Bio-based products' (CEN/TC 411)** develops standards that cover horizontal aspects of bio-based products. The standards that are being developed in the framework of EC Mandate 492 are mainly focused on bio-based products other than food and feed or biomass for energy applications. European Standards and other standardization deliverables have been or are being developed in relation to the following horizontal aspects of bio-based products:

- Common terminology (EN 16575)
- Methods for determining bio-based content (CEN/TR 16721, CEN/TS 16640, EN 16785)
- Sustainability aspects (EN 16751)
- Life Cycle Assessment (EN 16760)
- Declaration tools

[42] http://ec.europa.eu/growth/sectors/biotechnology/bio-based-products_es

- **EN 16751:2016. Bio-based products - Sustainability criteria**

This standard sets horizontal sustainability criteria applicable to the bio-based part of all bio-based products; excluding food, feed and energy, covering all three pillars of sustainability; environmental, social and economic aspects. If the product is partly bio-based, this European standard can only be used for the bio-based part since it does not address non-bio-based (fossil, mineral) parts of a product. This European standard can be used for two applications, either to provide sustainability information about the biomass production only or to provide sustainability information in the supply chain for the bio-based part of the bio-based product.

This standard sets a framework to provide information on the management of sustainability aspects. It cannot be used to make claims that operations or products are sustainable since it does not establish thresholds or limits. However, it can be used for business-to-business (B2B) communication or for developing product specific standards and certification schemes.

- **The European Union Renewable Energy Directive (RED) 2009/28/EC**

The **RED**[43] outlines sustainability criteria for all bio-fuels produced or consumed in the EU to ensure that they are produced in a sustainable and environmentally friendly manner. Companies can show they comply with the sustainability criteria through national systems or so-called voluntary schemes recognised by the European Commission. The EU has defined a set of sustainability criteria to ensure that the use of bio-fuels (in transport) and bio-liquids (for electricity and heating) is carried out in a way that guarantees real carbon savings and protects biodiversity.

In the European Union, under the RED, only biofuels and bioliquids produced from verifiably certified sustainable biomass can receive state support and may be counted towards national renewable energy targets. For this purpose a set of EU's sustainability criteria was defined in ***Article 17: Sustainability criteria for biofuels and bioliquids.*** Main points referred to:

- Greenhouse gas emissions saving from the use of biofuels and bioliquids.
- Biofuels and bioliquids shall not be made from raw material obtained from land with high biodiversity value.
- Biofuels and bioliquids shall not be made from raw material obtained from land with high carbon stock, namely wetlands, continuously forested areas, land with mature trees.
- Agricultural raw materials cultivated accordance with the requirements and standards establishing common rules for direct support schemes for farmers.
- Issues related to the impact on social sustainability in the Community and in third countries of increased demand for biofuel; the availability of foodstuffs at affordable prices; respect of land-use rights and Conventions of the International Labour Organisation.

Compliance with the criteria can be demonstrated through participation in one of recognised voluntary schemes[44], some of which are:

- ISCC (International Sustainability and Carbon Certification)
- Bonsucro EU

[43] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
[44] For more information see the following webpage: https://ec.europa.eu/energy/node/74

- RTRS EU RED (Round Table on Responsible Soy EU RED)
- RSB EU RED (Roundtable of Sustainable Biofuels EU RED)
- 2BSvs (Biomass Biofuels voluntary scheme)
- RBSA (Abengoa RED Bioenergy Sustainability Assurance)
- Greenergy (Greenergy Brazilian Bioethanol verification programme)
- Ensus voluntary scheme under RED for Ensus bioethanol production
- Red Tractor (Red Tractor Farm Assurance Combinable Crops & Sugar Beet Scheme)
- SQC (Scottish Quality Farm Assured Combinable Crops (SQC) scheme)
- Red Cert
- NTA 8080
- RSPO RED (Roundtable on Sustainable Palm Oil RED)
- BioGrace GHG calculation tool
- HVO Renewable Diesel Scheme for Verification of Compliance with the RED sustainability criteria for biofuels
- Gafta Trade Assurance Scheme
- KZR INIG System
- Trade Assurance Scheme for Combinable Crops
- Universal Feed Assurance Scheme
- The Approved Austrian National Scheme - Austrian Agricultural Certification Scheme

Detailed information on a few of these schemes is provided in the Appendix 2.

Table 3.14 shows a summary of a review through the schemes documentation and related literature to identify reference schemes that fulfilled most of the requirements detailed in the mentioned directive and regulation and could be potentially used for this criterion. It is pertinent to note that not all the voluntary sustainability schemes available have been reviewed. For simplicity and considering the broader implications of the EU Ecolabel criteria, only schemes with a global coverage have been considered. The schemes examined fulfilled the same similar basic criteria detailed in the EU RED, with some being exceptional due to the additional stringent criteria required via their add-on modules (e.g. ISCC Plus an add-on to ISCC, RSPO Next an add-on to RSPO).

The potential of these schemes (low, medium, high) to be used for verifying that the bio-based materials being used in the manufacture of biolubricants has been defined according to the scope of the certification and the degree of maturity of each scheme, and the market availability of biolubricants containing certified renewable raw materials. Several sources[45,46,47,48] revealed that there are bio-based lubricant producers who utilize a mixture of certified sustainable renewable materials from different schemes in their biolubricant production process.

[45] http://www.agrobiobase.com/en/database/bioproducts/maintenance/berylane-biolife
[46] http://www.chemanager-online.com/en/topics/chemicals-distribution/peter-greven-extends-lubricant-portfolio-rspo-certified-products
[47] http://www.emeryoleo.com/OleoBasics.php
[48] http://www.emeryoleo.com/content/Emery_BL_brochure.pdf

Table 3.14: Summary of the different available schemes for bio-based products

General considerations and criteria scope	ISCC	RSPO	RSB	RTRS
Voluntary	Yes	Yes	Yes	Yes
Global in geographical scope, comprehensive coverage of criteria and not only EU RED, multi-stakeholder scheme	Yes	Yes	Yes	Yes
EU Recognized	Yes (but only for EU RED)	Yes (but only RSPO RED Scheme[49] for EU RED)	Yes (but only for EU RED)	Yes (but only for EU RED)
Applicable renewable feedstock[50]	All types of feedstock	Only Palm Oil, Palm Kernel Oil and their derivatives	All types of feedstock	Only Soy
Market uptake for certification of feedstocks for non-biofuel sector[51]	High	High	High	Medium
Biolubricants in market with certified bio-based content	Yes (Certification schemes applied is a combination of RSPO and the ISCC Plus addon of the ISCC Scheme)	Yes (Certification schemes applied is RSPO Scheme)	Yes	Yes
Certifications available	ISCC Plus / ISCC EU (Biofuel)	RSPO / RSPO NEXT	Production / chain custody standard	Production / chain custody standard
Ecological (EU RED 2009 (Art.17))	Yes	Yes	Yes	Yes
Reduction of environmental impacts EU RED 2009 (Art.17, focus on GHG reduction)	Yes	Yes	Yes	Yes
Energy (EU RED 2009 (Art.17)	Yes	Yes	Yes	Yes
High Carbon stocks & biodiversity (EU RED 2009 (Art.17))	Yes	Yes	Yes	Yes
Land use change (EU RED 2009 (Art.17))	Yes	Yes	Yes	Yes
Traceability (EU RED 2009 (Art.18), EU RED 2016 (Art. 25))	Yes	Yes	Yes	Yes

[49] http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/voluntary-schemes
[50] http://english.rvo.nl/sites/default/files/2013/12/Report%20certification%20schemes%20-%20Partners%20for%20Innovation%20-%20NL%20Agency%20DEF.pdf
[51] https://www.iisd.org/pdf/2014/ssi_2014_chapter_6.pdf

Accreditation (EU RED 2009& EU RED 2016)[52]	No	Yes	Yes	No
Social and labour (EU RED 2009 (Art.17))	Yes	Yes	Yes	Yes
Water (EU RED 2009 (Art.17, 18))	Yes	Yes	Yes	Yes

[52] http://ec.europa.eu/energy/sites/ener/files/documents/1_en_annexe_proposition_part1_v9.pdf

Against the background, for the second draft TR2.0 it is suggested to tentatively maintain the initially proposed criterion on "Origin and traceability of vegetable raw materials". However, several modifications have been introduced:

- The requirements have been further specified based on the sustainability requirements for the production of biofuels and bioliquids through the use of certified renewable raw materials including biomass as documented in the European Union Renewable Energy Directive and the criteria included in the different available schemes used to fulfil RED Directive.
- References to valid available certifications schemes that could be used for the assessment and verification of the proposed criterion have been included in the text. In addition, other equivalent schemes which fulfil criteria to be complied with are suggested to be equally accepted.
- Finally, considering that the available schemes could be used for broad range of renewable raw material, and only for vegetable raw material, it is suggested to broaden the scope of the criterion to all types of renewable raw materials.

However to ensure the feasibility of the proposed criterion, stakeholders are asked to provide data on their practices with regard the use of certified renewable raw material.

Questions to stakeholders
To what extent do producers and suppliers of bio-based lubricants use third party sustainability schemes to certify renewable raw materials for their products?

3.6 Exhaust emissions (CRITERION 6 in first proposal)

Engine design changes do require meeting the latest emission regulations, having a great impact on the engine oil degradation process. New regulations with stricter emission limits, especially particulate matter (PM) and nitrogen oxides (NOx) are being introduced not only in Europe with the "Euro" standards, but also in Australia, USA, and Japan.

In contrast to the 4-stroke engines, in 2-stroke engines there is no a dedicated lubrication system, the lubricant is mixed with fuel. Each time a new charge of air-fuel mixture is loaded into the combusting chamber, a part of it leaks out through the exhaust port. The combustion of lubricating oil and the exhaust of un-burnt fuel makes them more polluting than 4-stroke engines with similar power ratings.

The thermal efficiency and fuel economy of two-stroke engines is poor, and total hydrocarbon (THC) and particulate matter (PM) emissions are very high. The high PM emissions, associated with respiratory problems, result mainly from the mixture of oil and fuel employed in the two-stroke engines. Lubricating oil is less combustible than gasoline; some of the oil that is mixed with fuel is unburned or partially burned, therefore lubricating oil exits the engine with exhaust. Un-burnt hydrocarbon emissions result from the elements of the air-fuel mixture that fail to burn in the engine due to leakage through the exhaust port, weak compressing causing partial combustion and misfiring.

It has been suggested that lubricating oil contributes up to 95% of the total exhaust particulate mass. Improving the fuel and lubricating oil formulation could result in a reduction in the emission of gaseous and particulate pollutants.

Against this background, for the first proposal it was suggested to include a criterion for two-stroke engine oils products requiring a minimum criterion on exhaust smoke and exhaust blocking aligned to the Korea Eco-label. M342 and M343 standards from the JASO (Japanese Automotive Standards Organization) where proposed to verify the exhaust smoke and exhaust blocking, respectively

- **Outcomes from and after the 1st AHWG meeting**

At the first consultation, stakeholders expressed that any fluid lubricant displayed on the market has to pass special emission and performance tests as a condition of access to the EU market (regulated by Euro Emission Standards). They include a measurement of emissions, so this criterion is also considered in the technical performance. Consequently, it was claimed that this criterion duplicates the test and add additional costs to get the EU Ecolabel.

Moreover, various stakeholders suggested that the JASO test is not reliable at all, because it is mainly based on the engine design and test results do not correlate with the performance from field tests.

- **Proposal**

Considering that this test is already included in the technical standard ISO 13738:2011 Lubricants, industrial oils and related products (class L) — Family E (Internal combustion engine oils) — Specifications for two-stroke-cycle gasoline engine oils (categories EGB, EGC and EGD) and that this technical standard is already covered in criterion 7 (criterion 8 in text in force): *Minimum technical performance* , **it is suggested not to have a separated criterion on exhaust emissions.**

3.7 CRITERION 6: Packaging requirements

Second proposal for criterion: Packaging requirements

In the case of lubricants designed to be sold to private end consumers

a) Design: a dispenser closure system avoiding spillage shall be made available to the users as part of the packaging.

b) Recycled content: plastic packaging shall be made on a minimum of 25% of recycled material.

In the case of lubricants designed to be sold in bulks (B2B)

a) The take-back system needs to be provided

b) Recycled content: plastic packaging shall be made on a minimum of 25% of recycled material.

Assessment and verification

The applicant shall provide a declaration including the commercial use of the lubricant specifying that the product is marketed for private end consumer and a description of the dispenser closure, along with photos or technical drawings of the dispenser closure system.

The applicant or packaging supplier, as appropriate, shall provide a declaration of compliance specifying the material composition of the packaging and the shares of recycled and virgin material

Rationale of proposed criterion text

The relative impact generated for the packaging is minor compared to the lubricant manufacturing and other stages. However, waste generated due to packaging is an increasing concern and considering the extension of the lubricant market, the impact generated due to the waste disposal of packaging could be important.

Packaging materials

According to the LCA, it is considered that the environmental impact generated by the packaging would be low in comparison with the rest of life stages. Nevertheless, some materials and substances used in the packaging could be considered important due to its potential environmental impact and inherent toxicity of certain substances contained in it.

Other regional Ecolabels include criteria about the packaging materials:

- The withdrawn Nordic Swan included the following criterion about the product packaging: Product packaging, including caps and labels, must not contain halogenated plastics.
- Eco mark Japan: Packaging shall not contain resins made of halogens and halogenids as constituents.

Design:

Two regional eco-labels include information about the design of the packaging: Nordic Swan and NF-Environment include a criterion on design to prevent the retention of the lubricant and also for the right dosing of lubricants.

Recycled content and recyclability:

The use of recycled content and criteria on recyclability are relevant in terms of circularity.

In line with other eco-labels, in the first proposal published for the 1st AHWG the following issues were proposed:

- A dispenser closure shall be available for a proper dosage and avoid spillages.
- Plastic used shall be recyclable
- Recycled material shall be used (it was proposed and asked to the stakeholders)
    - **Outcomes from and after the 1st AHWG meeting**

One comment was received about the design proposal, arguing that the consideration could increase risk of spilling and that could result in additional costs for the producers.

With regard to the recycled content and recyclability, in the first draft of the report, stakeholders were asked about current practices of recycled content and recyclability of the packaging. Few answers have been received, with opposing views.

Some stakeholders have commented that the products are mainly sold in metal drums and pails, and other that the criterion is only relevant for 4-stroke oils. On the other hand, the inclusion of a minimum recycled content in the package and the consideration of the recyclability was supported by other groups of stakeholders. However, they commented that it might be problematic to recycle grease contaminated plastics.

- **Further research and main changes in the second proposal**

According to stakeholders the approximately 95% of the EU Ecolabel lubricants are B2B products. Therefore the relevance of the criterion seems to be low. However there might be B2C products on the market that potentially could apply for the EU Ecolabel. In addition, information about the different types of packaging used in this sector could not be obtained.

Against this background, it is suggested to tentatively keep criterion on packaging, waiting for extra data about current practices and more information on the share of B2C products potentially within the scope of the EU Ecolabel.

In relation to B2B products normally are delivered as:

- Small packs, suitable for small volumes of lubricant (up to 10 L) and or infrequent use.
- Pails, can be made from plastic or steel, usually in the range 5-25 kg. These are best for handling, small volume use and limited space / staking is required.
- Drums, where large volumes of lubricant supply are required. The 55 gallon drum is the most frequently used in the industry. These are best for constant consumption. A full drum can usually weight 204 kg.
- Bulk, for high-volume requirements and operations suited to piped supplies of lubricants. A bulk-storage vessel installed on site offers the most efficient and convenient solution.

With regard the criterion text, in the second revised proposal minor changes are suggested:

- The recyclability requirement has been deleted since a lubricant package is once contaminated with the product, is classified as a dangerous package.
- The recycled content requirement is suggested to be kept and an initial minimum of 25% is suggested. The recycled content is welcome for different stakeholders;

however the current market share of recycled packaging used in lubricant industry is unknown. A question box about this issue has been included.

- Considering that a proportion of B2B products are also delivered in plastic packaging/containers it is suggested to include also a requirement on a minimum recycled content. In addition, in order to promote the circularity of B2B products it is suggested to discuss the possibility to set a criterion to require applicant to provide take back systems for such products.

Questions to stakeholders

- Stakeholders are asked to provide information on the availability of B2C products for the different lubricant categories included in the scope of the EU Ecolabel?
- Competent Bodies are asked if they could provide data on the share of licences that correspond to products marketed as B2C?
- Is recycled content of plastic used currently in lubricant packaging? In case that it is, which percentage of recycled content does the packaging have for B2C and B2B products?
- Do the B2B lubricant producers provide take back system service?

Rationale of proposed assessment and verification

Information about the assessment and verification possibilities for the recycled content of the packaging was asked in the first draft of the technical report. However, no answers have been received with this regard.

Minor changes have been introduced in the assessment and verification section for the second proposal to align the text to other EU Ecolabel product groups containing recycle plastics use requirement (e.g. footwear).

3.8 CRITERION 7: Minimum technical performance

Second proposal for criterion 7: Minimum technical performance

The quality of the lubricant product must be equal to or better than the quality of a reference lubricant, or within the tolerances, as specified in Table 5.

Table 5. Minimum technical performance for lubricant products

Lubricant family	Minimum technical performance
Chainsaw oils	Based on RAL-UZ 178
Wire rope lubricants, stern tube lubricants and other total loss lubricants	At least one relevant OEM approval
Concrete release agents	At least one relevant OEM approval
Gear lubricants	Enclosed gear oils: DIN 51517 section (I, II or III) Open gears: At least one relevant OEM approval
2-stroke oils	2-stroke marine: NMMA TC-W3 2-stroke terrestrial: ISO 13738:2011 (EGD)
Hydraulic systems	ISO 15380 (Tables 2 to 5) Fire resistant hydraulic fluids: ISO 12922 or Factory Mutual Approval
Metalworking fluids	At least one relevant OEM approval
Temporary protection against corrosion	ISO/TS 12928:1999
Greases	Greases for temporary protection against corrosion: ISO/TS 12928:1999 Greases for closed gear: DIN 51826 All other greases: "Fit for purpose"

Note: Multipurpose greases that include any of the above specified applications among their potential uses shall be tested according to the corresponding specific test of the relevant specified application.

***Assessment and verification*:** the applicant shall provide a declaration of compliance with this criterion supported by testing results, where appropriate. The testing laboratories confirming compliance with the requirements could be manufacturer's own laboratory which has a quality assurance system encompassing sampling and analysis and has been certified according to ISO 9001 or ISO 9002 or independent third party testing laboratories.

For hydraulic systems, it shall be indicated on the product information sheet which elastomers have been tested.

Rationale of the proposed criterion text

In the first proposal it was suggested to incorporate a technical performance criterion for the new categories suggested to be included in the scope, as 4-stroke engine oils or metalworking

fluids. Moreover, some categories that are currently considered in the EU Ecolabel were revised in order to establish a minimum technical performance that brings additional protection to the EU Ecolabel as a quality seal.

First proposal considered:

a) Total loss systems

The main functions of wire rope lubricants are not only to reduce friction as the individual wires move over each other, but also to provide corrosion protection and lubrication in the core, inside wires, and on the outer surface. A revised minimum technical performance was suggested based on common analysis.

For chainsaw oils the existing EU Ecolabel technical performance in force is based on RAL UZ 48 (Swedish Standards). There are, however, other eco-labels, as NF Environment brand, that are based on other standards as AFNOR 375-0 (certification scheme criteria 7 to 12). In addition, ISO/TC 23/SC 17 has recently defined a new test procedure to evaluate the chainsaw oil lubrication ability, ISO/TS 19858:2015. Therefore, for the first proposal it was suggested to keep RAL UZ 48 and to include AFNOR NF 375 standard for chainsaw lubricants.

For other total loss lubricants, as railway lubricants, a minimum stability requirement (MSR), was proposed, which guarantees no aspect changes for a short storage time, although for several types technical performance criteria are desired.

b) Concrete release agents

With regard to concrete release agents, after completing a deep review, no technical standards were found that covers a minimum technical performance. Other eco-label programs are also lacking a specific technical performance requirement. As a result, for the first proposal, it was decided to propose a minimum stability requirement (MSR), which takes technical standards into account.

c) Gear lubricants

Existing EU Ecolabel requirement in force for gear lubricants, as well as other eco-label like the Swedish Standard, take the recognized DIN 51517 specification as a basis to define a minimum technical performance. In addition, the standard ISO 12925 has also been taken into consideration as an alternative standard. As a result, for the first proposal it was suggested to keep the existing minimum technical performance criterion (DIN 51517 (I, II or III)).

d) Internal combustion engine oils

Internal combustion engine oils were classified in: two-stroke and four-stroke engine oils. The existing EU Ecolabel technical performance for 2-stroke engine oils was not been modified for the first proposal. For four-stroke engine oils, a minimum technical performance was established. Similarly to the approach taken for two-stroke oils, a distinction was made between marine and terrestrial applications, based on NMMA FC-W "Four-Stroke Cycle, Water-Cooled Gasoline Engine Lubricant" for marine applications, and on the engine tests as laid down in ACEA 2016 European Oil Sequences 2016 for terrestrial applications.

e) Hydraulic systems

Existing EU Ecolabel in force as well as Swedish Standard for hydraulic fluids are both based on the ISO 15380 standard. In the first proposal, the minimum technical performance was maintained. Nevertheless, only for fire-resistant hydraulic fluids it was suggested to meet some additional requirements and pass several fire resistance tests. As a result, a new minimum

technical performance was proposed only for fire-resistant hydraulic fluids; at least shall be performed the criteria of ISO 12922, Table 1 to 3.

f) Metalworking fluids

No other eco-labels include technical performance criteria for MWF. Considering the variety of products and applications for this new category with diverse performance requirements, a minimum stability requirement was proposed, which guarantees no aspect changes for a short storage time, although for several types technical performance criteria are desired.

g) Temporary protection against corrosion

No other eco-labels include technical performance criteria for this new family group, it was proposed for the first proposal to, at least, the lasting of the corrosion protection complies with what defined in ISO/TS 12928:1999 "Lubricants, industrial oil and related products (class L) – Family R (Products for temporary against corrosion) – Guidelines for establishing specifications", (Table 1 to 3). This standard is a guideline that establishes specifications for temporary corrosion protection products for a given application.

h) Stern tube oil lubricants

In the first proposal, stern tube oil lubricants were suggested to comply with the limits of ISO 8068:2006.

i) Greases

Existing requirement in force specify 'fit for purpose' as a minimum technical performance. Under the ISO 6743-9 the greases are divided in a group of five letters depending on: the minimum and maximum operating temperatures; the ability of the grease to provide satisfactory lubrication in water prone conditions; the ability to provide the proper level of protection against rust; the ability of the grease to lubricate in high load conditions. In accordance with this standard, ISO/DIS 12924 specifies the requirements of greases taking into account this 5-letter designation.

Other eco-labels schemes (Swedish Standard SS 15 54 70, Japan Ecolabel IS K 2220) do in fact establish several requirements for greases, different from "Fit for purpose". On the one hand, the Swedish Standard, similar to ISO/DIS 12924, classifies greases according to their properties: the lower and upper operating temperature; gel strength (oil separation); corrosion preventive abilities of lubricating greases; and lubrication ability under extremely high loads. On the other hand, some characteristics requirements that grease should fulfil according to the Japan Ecolabel are the dropping point, the penetration, the oil separation and the water wash-out, just to name several of the most common ones.

Such a wide range of applications for greases, ranging from lubrication in industrial, automotive or marine use, makes very difficult, if possible at all, to establish a clear technical requirement for greases. Quite often a grease does not need to fulfil a specific technical standard in order to properly perform its functional requirements.

Against this background, for the first proposal it was suggested to ask for temporary protection against corrosion grease to fulfil the specifications of performance duration of ISO/TS 12928:1999; and for gear greases to fulfil the requirements of DIN 51517. On the other hand, stern tube greases stern tube greases minimum technical performance was maintained as fit for purpose (under 'other greases').

- **Outcomes from and after the 1st AHWG meeting:**

During the first consultation, stakeholders said that minimum stability requirements (MSR) defined in some categories (other total loss lubricants or metalworking fluids) was not well defined and should therefore be called "fit for purpose". However, they expressed the importance of having good performance products on the market. Consequently, some stakeholders considered establishing "user tests" or OEM approval.

Concerning the requirement for total loss systems, it was said that the KWF-Test got revised together with the RAL-UZ 48 basic award criteria document, which is now called RAL-UZ 178 and that a new KWF-Test from June 2016 describing test for chainsaw oils should be assessed thoroughly. Moreover, for wire ropes it was stated that there are no existing standards and its requirements depend on how the manufacturer built the wire rope and its alloy. Manufacturers have their own test procedures and therefore the stakeholder suggested to change the requirement to "fit for purpose".

In addition, various stakeholders suggested that in the case of stern tube lubricants the minimum technical performance should be "fit for purpose" instead of ISO 8068:2006. Another stakeholder suggested removing fire test for hydraulic fluids, since in Europe fire resistant hydraulic fluids should meet the 7th Luxembourg Report.

For greases, a stakeholder noted that in this category there were overlapping problems, and it was difficult to know to which class they are assigned. For multipurpose greases, with a wide range of applications and consequently respective requirements, it was a not easy to know which minimum requirement had to be met. Another stakeholder suggested to modify gear greases minimum technical requirements, and proposed DIN 51826 for closed gear boxes greases and DIN 51825 for greases in roller bearings, plain bearings and sliding surfaces. For other gear applications, such as open gear greases, the stakeholder suggested a "fit for purpose" criterion.

All the comments received at the first consultation can be found on the separated Annex of comments published along with this report.

- **Further research and main changes in the second proposal**

Against this background and to guarantee the good performance of the EU Ecolabelled lubricants placed on the market, it is important to define a minimum performance requirement. However, minimum stability requirements (MSR) suggested for some lubricant types in the first proposal, does not have a technical performance standard associated with the product families, and could be ambiguous. Therefore, minimum stability requirements have been replaced for "at least one relevant **OEM approval**".

Therefore, it is suggested in this second proposal that for TLL lubricants OEM approval is required. The technical requirements for other total loss systems not specified (e.g. wire ropes) and the other TLL family have also been replaced by an OEM approval, since there are no specific technical standard for wire ropes and other specific subcategories or applications that could be classified as TLL. Considering the updated information with regard the KWF-Test and RAL-UZ 48 basic award criteria document, which since June 2016 is called RAL-UZ 178, chainsaw lubricant requirements have been updated accordingly.

In the first proposal, **stern tube oil** lubricants were proposed to be linked to Familiy T and, thus had to fulfil the limits of ISO 8068:2006 "Lubricants, industrial oil and related products (class L) – Family T (Turbines) – Specification for lubricating oils for turbines". However, the wide range of applications including circulating oil, hydraulic oil, gear oil, among others, makes ISO 8068:2006 not necessarily appropriate for stern tubes lubricants. Therefore, for the new proposal it is suggested at least one relevant OEM approval.

For **concrete release agents** and **metalworking fluids**, the minimum stability requirements have been replaced for "at least one relevant OEM approval".

From the outcomes from the 1st AHWG meeting for Lubricants, **4-stroke engine oil**s have been removed from this revision.

A clear cut minimum technical performance for fire resistant **hydraulic fluids** has been developed. Only fire-resistant hydraulic fluids (not the rest of HF) are suggested to meet some additional requirements and pass several fire resistance tests. As many end-users require the factory Mutual Approval and to prevent an extra effort, it is suggested that the applicant can provide a declaration of compliance with the Factory Mutual Approval Standard 6930 or perform the criteria of ISO 12922, Table 1 to 3. Following ISO 12922, there are different limit values according to categories for:

- ISO 14395 - Wick test: Mean flame persistence
- ISO 20832 - Hot Manifold test: Ignition temperature
- ISO 15029-1 or ISO 15029-2 - Spray ignition: Excluded from the minimum technical performance

Finally, greases minimum technical performance is replaced by "at least one relevant OEM approval". Gear greases have been distinguished in open gears and close gear, adding only an additional requirement for closed gear boxes, DIN 51826.

For multipurpose grease, the minimum technical requirements are aligned with its applications. For example, if the grease is suitable for wire and corrosion, it shall perform ISO/TS 12928:1999. Another example, if a multipurpose grease is suitable for bearings and gears, it shall perform according to DIN 51826 and DIN 51825. If it does not perform appropriately, this could mean that is not suitable for the application. A note to reflect these potential situations have been included.

Rationale of proposed assessment and verification

A minor modification in the assessment and verification section has been included to reflect that the technical criteria for hydraulic fluids based in the standard ISO 15380 includes an elastomer compatibility test, where at least two elastomers types shall met the specifications. Therefore, as is specified in the existing text in force, it should be indicated on the product information sheet which elastomers have been tested.

In addition, in order to give flexibility and minimise the costs of the testing it is suggested to allow the following verification options:

a) manufacturer's own laboratory which has a quality assurance system encompassing sampling and analysis and has been certified according to ISO 9001 or ISO 9002 or
b) independent third party testing laboratories

3.9 CRITERION 8: Consumer information regarding use and disposal

Second proposal for criterion 8: Consumer information
In the case of lubricants designed to be sold to private end consumers, the following information shall be present in the label of the package: "Lubricating oil may contain substances harmful to health and environment, therefore be mindful and avoid any spillage to the environment. Product residue must be managed by an authorized waste manager". ***Assessment and verification*:** the applicant shall provide a sample of the product packaging or its artwork where the above information appears.

Rationale of proposed criterion text

The European List of Waste (Commission Decision 2000/532/EC[53]) classifies wastes and provides a common terminology to improve the efficiency of waste management activities. Lubricating oils are included in the category 13: Oil wastes and wastes of liquid fuels.

Waste oils can have high negative environmental impact if they are not collected correctly but released to the environment. The uncontrolled disposal could affect soils, aquatic life and renders water unfit for consumption.

A criterion to ensure the proper disposal of waste lubricant is important to decrease the overall environmental impact, especially in aquatic ecosystems.

Disposal of waste lubricant is a criterion considered in different eco-labels. Most of them consider the inclusion of a description with the information about the waste disposal. Some references are:

- Nordic Swan: Lubricating oils must be delivered to an approved site or collector of toxic waste.
- NF-Environment: All lubricating oils can present a risk to the environment and health and therefore should not be discharged into sewers, water or soil.
- Swedish Standard (SS) specifies that the waste lubricant must not discharge into drains, water courses or onto the ground; and that the applicant should provide recommendations for safe handling of lubricant. The SS introduce a new specification concerning the emergency plan in case of spillage.

The industry should put in place mechanisms to make available appropriate disposal and separation facilities. In case of the private consumers, the disposal of the lubricant cannot be controlled and regulated; nevertheless the use of lubricant presents higher risk due to the lack of knowledge of the consumer. For this reason, the applicants shall inform product end users on how to properly dispose of used lubricant.

Against this background a new criterion was proposed in the first technical report: *criterion 9 (New): Consumer information regarding use and disposal.* The criterion alerted about the

[53] Commission Decision 2000/532/EC: European List of Waste

lubricant risk in case of ending up in the environment. Similar to the new proposal, the sentence was referring to the product itself: *Lubricating oil may be harmful to health and environment*.

- **Outcomes from and after the 1st AHWG meeting**

There were few comments related to this criterion. Stakeholders did not disagree with the new criteria proposal; however the sentence proposed has been questioned. It was for instance said that the formulation could be confusing because of the requirements of the EU Ecolabel: include information about the health and environmental risk is contradictory with the Criterion 1, 2 and 3 of the EU Ecolabel.

Changes and formulations have been proposed for different stakeholders. They are explained more extensively in the separated annex published along with this technical report.

On the other hand, it was questioned the relevance of this criterion considering the number of products certified B2C.

- **Further research and main changes in the second proposal**

Research has been done in order to identify other relevant statements used in other EU Ecolabels and other national Ecolabels. Relevant statements are given below:

- **Blue Angel** includes a criterion for lubricants designed to be sold to private end consumers including the following information:
  - "Store out of reach of children"
  - "Do not allow unused quantities of the product to reach the sewerage system, watercourses or soil"
  - "Product residue is to be disposed of in municipal collection points for harmful substances"
  - "Only return empty containers for recycling"

Some stakeholders considered inclusion of pictograms to define concrete recommendations instead of a warning-sentence. This has not been however used in other product groups.

In the lubricant industry the same product could be sold in different formats, for instance a product with the same name could be sold using 5 liters bottles, or 1000 liters containers. One licence may include a broad range of products with different viscosity grades or different market availability. If it is considered that a certified product could be sold in a private end consumer format, the criterion must be maintained as it is important that the consumer is informed about the use and disposal requirements of a lubricant. However in order to explore how relevant are B2C products among the EU Ecolabel scope and therefore to assess the relevance of this criterion a question box has been included in order to ask about the packaging characteristics of the products awarded (Question box of *CRITERION 6: Packaging requirements*).

Additionally, following stakeholder recommendations, the initial proposal has been reformulated.

Rationale of proposed assessment and verification

The first proposal requested a sample of the packaging as a mean of proof for this criterion. Minor wording changes have been introduced in the rationale in this second proposal and the possibility to provide an artwork of the packaging was also included.

3.10 CRITERION 9: Information appearing on the EU Ecolabel

Second proposal for criterion 9: Information appearing on the EU Ecolabel
Optional label with text box shall contain the following text: - "Limited amount of hazardous substances", - "Limited impact on the aquatic environment", - "Verified performance/As effective as the average product on the market" The guidelines for the use of the optional label with text box can be found in the 'Guidelines for the use of the EU Ecolabel logo' on the website: http://ec.europa.eu/environment/Ecolabel/promo/logos_en.htm ***Assessment and verification:*** the applicant shall provide a sample of the label, together with a declaration of compliance with this Criterion.

Rationale of proposed criterion text

According to Article 8 (3b) of the EU Ecolabel Regulation 66/2010, for each product group, three key environmental characteristics of the EU Ecolabel product may be displayed in the optional label with text box. The guidelines for the use of the optional label with text box can be found in the "Guidelines for the use of the EU Ecolabel logo" on the website[54].

Information about the EU Ecolabel on the product is needed in order to inform the consumer and make easy the environmental friendly decision. For this reason, a requirement about the logo and the certification number shall be included.

A first proposal was done partially modifying the information that appears on the existing EU Ecolabel criterion. Main change corresponded to the deletion of the claim *contains a large fraction of bio-based material* that would not be always the case regarding the proposal made for the first AHWG to introduce other base oils in criterion 4. In addition, for the first proposal it was suggested to introduce the claims:

- *Restricted amount of hazardous substances;*
- *Tested for lubricating performance*

Also instructions on the use of logo and license number were included with the recently voted detergents product group. The text was aligned to the most recently revised EU Ecolabel criteria of product categories such as the detergent product group.

- **Outcomes from and after the 1st AHWG meeting**

At the first consultation, stakeholders expressed different views. Some stakeholders commented that the sentences "Limited impact on the aquatic environment" and "Restricted amount of hazardous substances" could be confusing due to the EU Ecolabel aim and support the maintenance of previous sentences of the Criterion. On the other hand, other stakeholders agree with the changes proposed in the current revision.

[54] http://ec.europa.eu/environment/ecolabel/documents/logo_guidelines.pdf

Other relevant issue discussed during the stakeholder consultation was the sentence "tested for lubricating performance", since it is not suitable for all the families included in the revision. The stakeholders suggested modifying the sentence according to the last version of the Criterion 8.

A minority of stakeholders also commented that information has to be focused on aquatic toxicity and biodegradation of lubricants, and it was proposed statements on resource efficiency.

- **Further research and main changes in the second proposal**

As the main objective of EU Ecolabel is to award the products or services with the best environmental profile, the sentences included in this criterion have to refer to the requirements defined for the lubricant product group.

Minor modifications have been introduced in the second revised proposal:

- The sentence about the hazardous substances is maintained with a modification in the wording, Use of *limited* instead of *restricted* is proposed to be used as suggested by stakeholders: "Limited amount of hazardous substances".
- The sentence about the influence on the aquatic environment of the product, initially introduced in line with the EU Ecolabel of rinse-off cosmetic products, is suggested to be kept.
- Finally, the sentence included in the first proposal "Tested for lubricating performance" has been modified considering that not all products covered under the scope are tested. However, taking into account that the existing requirement *fit for purpose* has been changed to *OEM approval*, it is suggested to include the sentence which confirms that the performance has been verified or a sentence stating that the lubricant is as effective as the average product on the market.

4 IMPACT OF CHANGES TO CRITERIA

This section consists of a summary of the main general changes proposed for the revised criteria and potential implications for current license holders and possible applicants. This section will be further developed at an advanced stage of the revision when a more definitive proposal is available.

In relation to the **scope** there are two main aspects proposed:

- Enlargement of the scope to cover a higher market share and categorization in three categories: Total loss, Partial loss, and Accidental loss (ALL, PLL, and TLL), according to the environmental release. This lead to the unification of the previous categories 1 and 5 by ALL – Accidental Loss Lubricant, and categories 2 and 4 under PLL – Partial Loss Lubricant has been. The previous category 3 has been assigned to TLL – Total Loss Lubricant.

- In addition, in order to better define the covered categories, a definition for each category has been included in the complementary definitions section. In the case where a ISO (ISO 6743 "Lubricants, industrial oils and related products") family has been developed for a specific category, a reference to it has been included in the definition text

These two aspects will have direct implications on possible applicants due to a wider and clearer scope. There would be a broader spectrum of lubricants that would be able to apply for the EU Ecolabel and in addition it would be clearer which different type of lubricants are covered in the scope.

In relation to the **criteria,** there is a general raise of ambition level proposed mainly based on data received from competent bodies and information from other labelling schemes.

Regarding the criteria dealing with excluded or limited **hazardous substances, aquatic toxicity, bioaccumulation and biodegradability of products (criterion 1, 2 and 3),** the requirements have been updated considering updates on legislation, new evidence and data from current EU Ecolabel licences. One of the main changes corresponds to criterion 1. It is proposed to set an overall restriction to hazard classifications at substance level as made in other product groups. However a flexible approach similar to Blue Angel scheme has been proposed. In addition, where possible, the ambition level has been raised in accordance to the thresholds values of the assessed EU Ecolabel licenses. Data on 143 Ecolabelled products from 11 different countries was obtained. According to the data received (40% of the existing licenses) the majority of the assessed licenses would be able to comply with the revised thresholds.

These changes reflect the evolution of the market and the industry, evolving to more sustainable and less hazardous products.

For **raw materials criteria (revised criterion 4),** the focus have been broad from vegetable oils/substances to raw materials from renewable origin, synthetic esters and PAO or PAG base oils. These options have been found to be more sustainable than conventional mineral lubricants especially for applications for which lubricants are released during its use. In recent years, last technology developments have increased the quality of synthetic oils for several applications. With this change proposed, manufacturers have more alternatives to accomplish with the new and more restrictive thresholds proposed. This scope of including substances from renewable sources and synthetics are in line with other standards such as EAL.

Regarding raw materials of renewable origin, a criterion (**criterion 5)** has been proposed in order to ensure that these substances are produced and sourced in an environmentally sustainable manner, and they can be traced to their point of origin through all the custody chain. The most relevant and accepted third-party certifications have been taken as reference.

Two new criteria have been formulated for the **use phase and end-of-life,** since in LCA studies was found that these two life stages can have important impacts associated since lubricants can reach the environment compartments. Criteria have been proposed for **packaging (criterion 6) and consumer information regarding use and disposal (criterion 8)**, covering design for proper dosage, recycled content and end of life of the lubricant.

Regarding the use phase, **minimum technical performance (criterion 7)** has been revised according to updated standards and tests, covering all existing and new categories included within the scope. ISO 6743 "Lubricants, industrial oils and related products" has been used to define further the revised criteria. Requirements for exhaust emissions for 2-stroke engine oils are included in this criterion.

Finally, **criterion 9** (information appearing on the EU Ecolabel) has been updated in line with the proposed criteria, with minor changes.

5 APPENDIX 1. ADDITIONAL EVIDENCE ON HAZARDOUS SUBSTANCES USED IN THE LUBRICANTS AND THE POTENTIAL DEROGATION NEED FROM ARTICLE 6 (6) OF THE EU ECOLABEL REGULATION

In order to establish a strict interpretation, it was suggested in the first proposal to restrict the EU Ecolabel hazards at substance level as per regulation. Therefore the text was aligned to the recently voted detergents product group. It was proposed to eliminate the general derogation to the lowest classification limit that would trigger the classification of the final product and to grant derogations only to specific substances or group of substances following a thorough analysis. This is the approach followed in the recently voted products. Stakeholders were asked to provide information on the derogation needs according to the first revised proposal.

Since no derogation request was received in the first consultation, stakeholders and CBs have been further consulted. In order to evaluate the impact of the revised requirements on the number of the current EU Ecolabel products and on the LuSC list, and the possible derogations needs. The consultation to stakeholders and further research has been focused on:

1. Compilation of information about the hazard profile of all intentionally added substances above 0,010% present in the current EU Ecolabel lubricants.
2. Compilation of the Safety Data Sheets (SDS) of the commercial brands of ingredients included in part 2 of the LuSC list.

In the first case, an "excel survey" targeting Competent Bodies called "***Hazard profile assessment of substances***" was created in order to assess all substances above 0,01% and/or brands from the LuSC-list or valid letter of compliance (LoC). The survey is very similar to Table 3.2.1 of the existing application and therefore relatively easy to fulfil.

According to data from the EU Ecolabel Helpdesk Team 97 licenses have been awarded with the EU Ecolabel, corresponding to 363 products available on the market. As can be seen in the below table, the major share of licenses evaluated by the CBs belongs to Germany, United Kingdom, The Netherlands and France (altogether they correspond to the 90% of current licenses).

Table 5.1: EU Ecolabel licenses and products in the lubricants product group

COMPETENT BODIES	LICENSES	PRODUCTS	% LICENSES	
GERMANY	**48**	**160**	**49%**	**90%**
UNITED KINGDOM	**17**	**52**	**18%**	
THE NETHERLANDS	**12**	**47**	**12%**	
FRANCE	**10**	**69**	**10%**	
AUSTRIA	3	4	3%	10%
CZECH REPUBLIC	2	9	2%	
POLAND	2	3	2%	
BELGIUM	1	12	1%	
FINLAND	1	4	1%	
SPAIN	1	3	1%	
TOTAL	**97**	**363**	**100%**	

Consequently, the compilation of information about the hazard profile of current EU Ecolabel lubricants has been mainly focused on competent bodies with major share of licenses. To date, four answers provided by competent bodies were received which represents approximately the **73% of all licenses**. An overview of the hazard profile of all substances above 0,01% present in the lubricants assessed is shown according to the table below based on the results of the "excel survey".

Table 5.2: Overview of hazard statements found for substances present in the lubricants at or above the concentration of 0,010% w/w

Health Hazard Statement	Environmental Hazard Statement
H319	H411
H311/H331/H301	H412
H315	H413
H317	H400
H373	H410
H304	
EUH066	
H372	
H314	
EUH066	
H302	
H318	

It should be note that the hazard statements H302 and H318, although not currently included in the list of EU Ecolabel restricted hazard statements, have also been added to this list as they are included in the Blue Angel approach. Unfortunately, **little feedback was received regarding**

the type of substances (corrosion inhibitor, wear inhibitors, thickeners...) **corresponding to these hazard statements.**

A second excel sheet was created in order to assess the commercial brands included in part 2 of the **LuSC list** (compilation of the SDSs). The objective was to understand the hazards present in the **LuSC list** and explore the possible derogations needed. Unfortunately, no SDS has been provided from stakeholders. Due to the difficulty to obtain these SDSs (for instance some of these products do not legally require a SDS if the substances and/or mixtures are classified as not hazardous or, in some cases the latest version is not available online due to confidentially issues), it has not been possible to evaluate the impact of the first proposal in the LuSC list. In addition, it has been noticed that the SDS will be not sufficient to verify the non presence of some type of hazardous substances above 100 ppm in a final product because of 1) there is no legal obligation to declare them below the cut off limits of the CLP which are often less stringent to the EU Ecolabel and 2) the 100 ppm cut off of refers to the final product and not to the mixture. In conclusion, it is understood that the LuSC list stand alone is not sufficient to confirm the compliance of a mixture/substance with the all requirements regarding substances in this EU Ecolabel.

In relation to **biocides**, according to the preliminary report, lubricants preservatives are covered under Product type 6, defined as preservatives for products during storage and Product type 13, working or cutting fluid preservatives. It is worth to note that although all organic-based functional fluids (lubricants) are usually subject to potential microbiological deterioration, only those products that are water-based are usually candidates for biocides use. Therefore, biocides are typically used in **water-based metalworking fluids, hydraulic fluids and concrete release agents**.

The following table gathers the approved active substances that can be used for product type 6 and 13 according to the BPR[55] and their harmonized classification according to Annex VI of Regulation (EU) No1272/2008, if available. In cases where no harmonized classification is available, the classification has been based on the joint submissions classifications notified to the ECHA C&L inventory.

However the concentrations of the preservatives in lubricant products are unknown. A question box has been included in criterion 1 in order to know the need of including derogations.

[55] The Biocidal Product Regulation (BPR, Regulation (EU) 528/2012) concerns the placing on the market and use of biocidal products.

Table 5.3: List of approved active substances that can be used for PT6 and PT13

LIST OF APPROVED SUBSTANCES TO BE USED FOR PRODUCT TYPE 6: PRESERVATIVES FOR PRODUCTS DURING STORAGE						
Active substance	**EC number**	**CAS number**	**Classification**[56]		**Specific Conc. Limits, M-factors**[57]	**Scope of restriction and/or derogation**
			Hazard Class and category code(s)	**Hazard Statement**		
2-bromo-2-(bromomethyl)pentanedinitrile (DBDCB)	252-681-0	35691-65-7	Acute Tox. 4 (oral) Acute Tox. 2 (inhalation) Skin sens. 1 Eye Dam. 1 Aquatic Chronic 2	H302 H330 H317 H318 H411	-	H330: Fatal if inhaled H301: Toxic if swallowed H302: Harmful if swallowed H311: Toxic in contact with skin H312: Harmful in contact with skin. H314: Causes severe skin burns and eye damage H315: Causes skin irritation H317: May cause an allergic skin reaction H318: Causes serious eye damage H319: Causes serious eye irritation H331: Toxic if inhaled H332: Harmful if inhaled H334: May cause allergy or asthma symptoms or breathing difficulties if H335: May cause respiratory irritation H341: Suspected of causing genetic defects H350: May cause cancer H351: Suspected of causing cancer H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long-lasting effects H411: Toxic to aquatic organisms with long lasting effects
3-iodo-2-propynylbutylcarbamate (IPBC)	259-627-5	55406-53-6	Acute Tox 3 Eye Dam. 1 Acute Tox 4 Skin Sens. 1 STOT SE3 Aquatic Acute 1 Aquatic Chronic 1	H331 H318 H302 H317 H335 H400 H410	M-factor 10 (acute), 1 (chronic)	
Biphenyl-2-ol	201-993-5	90-43-7	Eye Irrit.2 Skin Irrit.2 STOT SE3 Aquatic Acute 1	H319 H315 H335 H400	-	
Glutaral (Glutaraldehyde) [58]	203-856-5	111-30-8	Acute Tox. 3 Acute Tox. 3 Skin Corr. 1B Resp. Sens. 1 Skin Sens. 1 Aquatic Acute 1	H331 H301 H314 H334 H317 H400	C ≥ 10 % Skin Corr. 1B; H314 0,5 % ≤ C < 10 % Skin Irrit. 2; H315 2 % ≤ C < 10 % Eye Dam. ; H318 0,5 % ≤ C < 2 % Eye Irrit. 2; H319 C ≥ 0,5 % STOT SE; H335 C ≥ 0,5 % Skin Sens. 1; H317	
Hydrogen peroxide	231-765-0	7722-84-1	Ox. Liq. 1 Acute Tox. 4 Acute Tox. 4 Skin Corr. 1A	H271 H332 H314	Ox. Liq.1; H271: C ≥ 70 % Ox. Liq. 2; H272: 50 % ≤ C < 70 % Skin Corr. 1A; H314: C ≥ 70 % Skin Corr. 1B; H314: 50 % ≤ C <70 %	

[56] Harmonised classification according to Annex VI of Regulation (EU) No1272/2008,

[57] Multiplying factors (M-factors) for substances classified as hazardous to the aquatic environment, acute category 1 or chronic category 1, should be assigned to a substance by a manufacturer, importer or downstream user.

[58] Note: Annex VI of Regulation 1272/2008 lists glutaraldehyde as the pure (100%) substance

					Skin Irrit. 2; H315: 35 % ≤ C <50 % Eye Dam. 1; H318: 8 % ≤ C <50 % Eye Irrit. 2; H319: 5 % ≤ C < 8 % STOT SE 3; H335: C ≥ 35 %	
Mixture of 5-chloro-2-methyl-2H- isothiazol-3-one (EINECS 247-500-7) and 2-methyl-2H-isothiazol-3-one (EINECS 220-239-6) (Mixture of CMIT/MIT) [59]		55965-84-9	Acute Tox. 3 Acute Tox. 3 Acute Tox. 3 Skin Corr. 1B Skin Sens. 1 Aquatic Acute 1 Aquatic chronic	H331 H311 H301 H314 H317 H400 H410	Skin Corr. 1B; H314: Causes severe skin burns and eye damage C ≥ 0.6% Eye Irrit. 2; H319: Causes serious eye irritation Skin Irrit. 2; H315: Causes skin irritation 0.06% ≤ C < 0.6% Skin Sens.1/H317: May cause an allergic skin reaction C ≥ 0.0015%	
N,N′-methylenebismorpholine (MBM)[60]	227-062-3	5625-90-1	Skin Corr. 1 Skin Sens. 1 Carc. 1B Muta 2	H314 H317 H350 H341	-	
N-(trichloromethylthio)phthalimide (Folpet)	205-088-6	133-07-3	Acute Tox. 4 Eye Irrit. 2 Skin Sens 1 Carc. 2 Aquatic Acute 1	H332 H319 H317 H351 H400	M factor 10.	
Peracetic acid	201-186-8	79-21-0	Flam. Liq. 3 Org. Perox. D Acute Tox. 4 Acute Tox. 4 Acute Tox. 4 Skin Corr. 1A Aquatic Acute 1	H226 H242 H332 H312 H302 H314 H400	STOT SE 3; H335: C ≥ 1 %	
LIST OF APPROVED SUBSTANCES TO BE USED FOR PRODUCT TYPE 13: WORKING OR CUTTING FLUID PRESERVATIVES						
Active substance	**EC number**	**CAS number**	**Classification**[61] **Hazard Class and category code(s)**	**Hazard Class and category code(s)**	**Classification**	**Scope of restriction and/or derogation**

[59] Active substance (C(M)IT/MIT 100%)

[60] For the active substance there is no harmonised classification available in Annex VI of Reg. (EU) No 1272/2008. For the hydrolysis products Morpholine and Formaldehyde there are harmonised classifications available in Annex VI of Reg. (EU) No 1272/2008 and in the 6. ATP to Reg. (EU) No 1272/2008, respectively. Classification is to be decided by RAC (**Committee for Risk Assessment)** and COM. This proposal has been submitted by RMS (Rapporteur Member State). This classification has been based on the joint submission classification notified to the ECHA C&L inventory.

[61] Harmonised classification

2-methyl-2H-isothiazol-3-one (MIT)	220-239-6	2682-20-4	Acute Tox. 3 (oral) Acute Tox. 3 (dermal) Acute Tox. 2 (inhalation) Skin corr . l B Skin sens. lA STOT Single 3 Aquatic Acute 1 Aquatic Chronic 1	H301 H311 H330 H314 H317 H335 H410	SCL ≥ 0.06 % M=10 (Aquatic acute 1) M=1 (Aquatic chronic 1)	H301: Toxic if swallowed. H302: Harmful if swallowed H311: Toxic in contact with skin. H314: Causes severe skin burns and eye damage. H315: Causes skin irritation H317: May cause an allergic skin reaction H318: Causes serious eye damage H319: Causes serious eye irritation H330; Fatal if inhaled H331: Toxic if inhaled H335: May cause respiratory irritation H341: Suspected of causing genetic defects H350: May cause cancer H372: Causes damage to organs through prolonged or repeated exposure H400: Very toxic to aquatic life H410: Very toxic to aquatic life with long lasting effects
3-iodo-2-propynylbutylcarbamate (IPBC)	259-627-5	55406-53-6	Acute Tox 3 Eye Dam. 1 Acute Tox 4 Skin Sens. 1 STOT RE 1 Aquatic Acute 1 Aquatic Chronic 1	H331 H318 H302 H317 H372 H400 H410	M-factor 10 for acute and 1 for chronic	
Biphenyl-2-ol	201-993-5	90-43-7	Eye Irrit.2 Skin Irrit.2 STOT SE 3 Aquatic Acute 1	H319 H315 H335 H400	-	
Mixture of 5-chloro-2-methyl-2H- isothiazol-3-one (EINECS 247-500-7) and 2-methyl-2H-isothiazol-3-one (EINECS 220-239-6) (Mixture of CMIT/MIT)		55965-84-9	Acute Tox. 3 Acute Tox. 3 Acute Tox. 3 Skin Corr. 1B Skin Sens. 1 Aquatic Acute 1 Aquatic chronic	H331 H311 H301 H314 H317 H400 H410	Skin Corr. 1B; H314 C ≥ 0.6% Eye Irrit. 2; H319 Skin Irrit. 2; H315 0.06% ≤ C < 0.6% Skin Sens.1/H317 C ≥ 0.0015%	
N,N′-methylenebismorpholine (MBM)	227-062-3	5625-90-1	Skin Corr. 1 Skin Sens. 1 Carc. 1B Muta 2	H314 H317 H350 H341	-	

Source: European Commission website

In red color is marked common biocidal active substances for PT6 and PT13.

6 APPENDIX 2. BRIEF OVERVIEW OF SELECTED INTERNATIONALLY RECOGNIZED CERTIFICATION SCHEMES FOR SUSTAINABLE RAW MATERIALS

ISCC (International Sustainable Carbon Certification)

The ISCC[62] (International Sustainable Carbon Certification) is a globally leading certification system covering the entire supply chain and is applicable to a wide variety of bio-based feedstock and renewable materials. Independent third party certification ensures compliance with high ecological and social sustainability requirements, greenhouse gas emissions savings and traceability throughout the supply chain. ISCC can be applied in various markets including the bio-energy sector, the food and feed market and the chemical market. All elements along the supply chain from agriculture or the point of origin up to the end user of the final product are covered. ISCC ensures through its systems requirement that:

- Greenhouse gas emissions are reduced
- Biomass is not produced on land with high biodiversity and high carbon stock
- Good agricultural practices and the protection of soil, water and air is applied
- Human, labour and land rights are respected

High requirements for traceability ensure that the physical flow of biomass can be traced throughout the whole supply chain. Furthermore, ISCC provides methodologies to calculate mass balances and verify greenhouse gas emissions along the supply chain.
Some vegetable oils and bio-lubricants certified have been identified, although disclosed ISCC statistics by sectors and final application are not available. The current raw materials certified to ISCC globally are: Rapeseed , Soybeans, Palm, Sugarcane, Sugarbeet, Wheat, Corn, Sunflower. The scheme has also been applied to certified Used Cooking Oil, and Other waste/residue materials.

Depending on the target market to be supplied with sustainable material, a specific variant of the certification system has to be applied:

- ISCC PLUS: Food, Feed, Bio-based products, Energy, Biofuels outside EU
- ISCC EU: Biofuels in EU
- ISCC Non-GMO: Food, Feed, completely independent from the general ISCC certification on environmental, social and economic sustainability on farm level

Round Table on Sustainable Palm Oil (RSPO)

The Round Table on Sustainable Palm Oil (RSPO) is an extended voluntary and third-party certification scheme which focuses exclusively on the certification of palm oil and palm kernel oil (and their derivatives) that fulfil the economic, social and ecological criteria of sustainability. Its general criteria are:

- **Economic criteria**: continuous efficiency improvements; documentation on the improvement of production conditions and continuous increases in yield which lead to work and employment;
- **Ecological criteria**: rainforest or other areas of high conservation value may not be destroyed to make way for new plantations;

[62] http://www.iscc-system.org/en/iscc-system/iscc-plus/

- **Social criteria**: working conditions must be consistent with industry standards and minimum wages must be paid. The RSPO also addresses health and safety at work.

RSPO NEXT is a voluntary initiative which engages RSPO member companies that not only met the current requirements and guidance of the RSPO Principles and Criteria but exceed them (through voluntary policies and actions undertaken). The scheme has been designed to allow credible third party verification of these additional practices. Elements of RSPO NEXT encompass: no deforestation, no fire, no planting on peat, reduction of GHGs, respect for human rights and transparency. They are also applicable at an organization level, which includes investments, joint ventures and in the supply base.

Within each above-mentioned category there are indicators that are audited by an accredited RSPO Certification Body (CB). RSPO NEXT applies not only to RSPO certified operations but also to suppliers of raw material, regardless of the supply delivery path. Organizations signing up for the RSPO NEXT are expected to put into effect the core RSPO Principles and Criteria across all spheres of their operations subject to the uptake from supply chain members. The RSPO provides information on certified growers, distributors and traders. However, the sectors corresponding to the different certified products are not specified. Nevertheless, some examples of certified products for lubricants have been found.[63]

Roundtable on Sustainable Biomaterials (RSB) standard

The RSB standard recognizes biomass and biofuel producers and processors who adhere to stringent social responsibility and environmental stewardship criteria, reaching well above minimum levels of compliance established in the Directive 2009/28/EC[64].
RSB certification applies to the production, processing, conversion, trade and use of biomass and biofuels, and can be sought by feedstock and biofuel producers and processors, as well as biofuel blenders. It is applicable globally and to all types of biomass and its derivatives. It can be applied to legal organizations or natural persons producing, converting, processing, blending, trading, using or otherwise handling biomass or biomaterials (or both).
Its original name (Roundtable on Sustainable Biofuels) was changed in 2013 to Roundtable on Sustainable Biomaterials, in line with the expansion of its scope to a wide range of biomass-derived products other than biofuels.
A multi-stakeholder governance system, it aims to improve the production and processing of biomass and biomaterials, and to ensure:

- compliance with all applicable laws and international conventions.
- that production and processing are undertaken following a proper environmental and social impact assessment.
- that free prior and informed consent of local communities, especially regarding land and water rights is carried out.
- achievement of significant GHG savings compared to the fossil-based products used for similar purposes (e.g. gasoline, plastics, coal, etc.).
- upholdment and respect of workers' rights and human rights.
- contribution to the economic development of rural and under privileged areas, especially in developing countries.
- local food security.

[63] http://www.rspo.org/certification
[64] https://www.isealalliance.org/online-community/resources/roundtable-on-sustainable-biomaterials-rsb-standard-setting-code-public-systems-rep

- conservation of areas with high biodiversity value or areas providing important ecosystem services
- conservation of water resources and preservation of its quality, as well as the quality of soil and air
- moderate and controlled use of hazardous technologies such as chemical inputs, genetically modified material and waste.

Some other voluntary third-party certifications renewable products specific schemes exists, e.g.:

- The Round Table on Responsible Soy (RTRS) focused on soya beans
- BOSUCRO – focused on sugar cane products. This is a global multi-stakeholder non-profit initiative dedicated to reducing the environmental and social impacts of sugar cane production and actively supported by the Brazilian Sugarcane Industry Association
- The Malaysia Sustainable Palm Oil (MSPO) certification and the mandatory Indonesian Sustainable Palm Oil (ISPO) certification, which are producer countries certification schemes for palm oil and palm kernel oil (and their derivatives). .

7 ANNEX I. SUBSTITUTION INFORMATION AND DEROGATION REQUEST FORM

Stakeholders should fulfil to communicate the derogation from of substances that cannot be replaced and are not able to comply with article 6 (6) of the EU Ecolabel Regulation.

1. Common information requirements

To be treated as confidential?	☐Yes ☐No

Contact name	
Organisation	
Email	
Telephone No.	
Supplementary documents attached	

1a. Chemical substance name(s)	
1b. CAS, EC or Annex VI numbers	
1c. Current EU regulatory status	
1d. CLP Classifications from the EU Ecolabel hazard listing	
1e. Proportional contribution to final product classification (for mixture ingredients)	
1f. Existing scientific evidence and risk assessments relating to the substance	
1g. Functional need and significance to the final product	
1h. Typical concentration in the final product and specific components or articles	

2. Additional information required for <u>derogation requests</u>

2a. The relevance of the hazard classification(s) along the life cycle of the product (e.g. manufacturing, use, disposal)	
2b. Market availability of alternatives and the potential for substitution	

3. Additional information required about <u>substitutes</u>

3a. Comparative evaluation of environmental performance	
3b. The relevance of the hazard	

substitution along the life cycle of the product (e.g. manufacturing, use, disposal)	
3c. Compliance with product performance and functional requirements	
3d. Market diffusion and technical maturity	

8 ANNEX II. EXISTING CRITERIA

Criterion 1 – Excluded or limited substances and mixtures

(a) Hazardous substances and mixtures

According to the Article 6(6) of Regulation (EC) No 66/2010 on the EU Ecolabel, the product or any part of it shall not contain substances (in any forms, including nanoforms) meeting the criteria for classification with the hazard statements or risk phrases specified below in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council (1) or Council Directive 67/548/EEC (2) nor shall it contain substances referred to in Article 57 of Regulation (EC) No 1907/2006 of the European Parliament and of the Council (3). The risk phrases below generally refer to substances. Nanoforms intentionally added to the product shall prove compliance with this criterion for any concentration.

List of hazard statements and risk phrases:

Hazard Statement (4)	Risk Phrase (5)
H300 Fatal if swallowed	R28
H301 Toxic if swallowed	R25
H304 May be fatal if swallowed and enters airways	R65
H310 Fatal in contact with skin	R27
H311 Toxic in contact with skin	R24
H330 Fatal if inhaled	R26
H331 Toxic if inhaled	R23
H340 May cause genetic defects	R46
H341 Suspected of causing genetic defects	R68
H350 May cause cancer	R45
H350i May cause cancer by inhalation	R49
H351 Suspected of causing cancer	R40
H360F May damage fertility	R60
H360D May damage the unborn child	R61
H360FD May damage fertility. May damage the unborn child	R60; R61; R60-61
H360Fd May damage fertility. Suspected of damaging the unborn child	R60-R63
H360Df May damage the unborn child. Suspected of damaging fertility	R61-R62
H361f Suspected of damaging fertility	R62
H361d Suspected of damaging the unborn child	R63
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child	R62-63
H362 May cause harm to breast fed children	R64
H370 Causes damage to organs	R39/23; R39/24; R39/25; R39/26; R39/27; R39/28
H371 May cause damage to organs	R68/20; R68/21; R68/22
H372 Causes damage to organs through prolonged or repeated exposure	R48/25; R48/24; R48/23
H373 May cause damage to organs through prolonged or repeated exposure	R48/20; R48/21; R48/22
H400 Very toxic to aquatic life	R50
H410 Very toxic to aquatic life with long-lasting effects	R50-53
H411 Toxic to aquatic life with long-lasting effects	R51-53
H412 Harmful to aquatic life with long-lasting effects	R52-53
H413 May cause long-lasting harmful effects to aquatic life	R53
EUH059 Hazardous to the ozone layer	R59
EUH029 Contact with water liberates toxic gas	R29
EUH031 Contact with acids liberates toxic gas	R31

EUH032 Contact with acids liberates very toxic gas	R32
EUH070 Toxic by eye contact	R39-41

This criterion shall also apply to the following hazard statements and risk phrases:

Hazard Statement (6)	Risk Phrase (7)
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled	R42
H317: May cause allergic skin reaction	R43
H314 Causes severe skin burns and eye damage	R34; R35
H319 Causes serious eye irritation	R36
H315 Causes skin irritation	R38
EUH066 Repeated exposure may cause skin dryness or cracking	R66
H336 May cause drowsiness and dizziness	R67

Substances or mixtures which change their properties upon processing (e.g. become no longer bioavailable, undergo chemical modification) so that the identified hazard no longer applies are exempted from the above requirement.

Concentration limits for substances meeting criteria of Article 57(a), (b) or (c) of Regulation (EC) No 1907/2006 shall not exceed 0,010 % (w/w). If specific concentration limits are referred to for substances meeting criteria of Article 57(a), (b) or (c) they should remain below one tenth (1/10) of the lowest specific concentration value indicated unless this value falls below 0,010 % (w/w).

Derogations from Criterion 1(a) are listed in Table 1.

Assessment and verification of criterion: the applicant shall provide the exact formulation of the product to the competent body. The applicant shall demonstrate compliance with this criterion for substances in the product on the basis of information consisting as a minimum of that specified in Annex VII to the Regulation (EC) No 1907/2006. Such information shall be specific to the particular form of the substance, including nanoforms, used in the product. For that purpose, the applicant shall provide a declaration of compliance with this criterion, together with a list of ingredients and related Safety Data Sheets in accordance with Annex II to Regulation (EC) No 1907/2006 for the product as well as for all substances listed in the formulation(s). Concentration limits shall be specified in the Safety Data Sheets in accordance with Article 31 of Regulation (EC) No 1907/2006.

Sufficient data shall be available to allow for the evaluation of the environmental hazards (indicated by the hazard statements H400 – H413 or R-phrases: R 50, R 50/53, R 51/53, R 52, R 52/53, R 53), of the product in accordance with Regulation (EC) No 1272/2008 or Directive 67/548/EEC and Directive 1999/45/EC of the European Parliament and of the Council (8).

The evaluation of a product for hazards to the environment shall be performed by the conventional method as indicated in Annex III to Directive 1999/45/EC or by the summation method in Section 4.1.3.5.2 of Regulation (EC) No 1272/2008. However, as defined by Part C of Annex III to Directive 1999/45/EC or by Section 4.1.3.3 of Regulation (EC) No 1272/2008, the results of testing the preparation (either the product preparation or the additive package) as such can be used to modify the classification concerning the aquatic toxicity that would have been obtained using the conventional or summation method.

(b) Substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006

No derogation from the exclusion in Article 6(6) of Regulation (EC) No 66/2010 may be given concerning substances identified as substances of very high concern and included in the list foreseen in Article 59 of Regulation (EC) No 1907/2006, when present in mixtures, in concentrations higher than 0,010 % (w/w).

Assessment and verification: the list of substances identified as substances of very high concern and included in the candidate list in accordance with Article 59 of Regulation (EC) No 1907/2006 can be found here:

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

Reference to the list shall be made on the date of application.

Concentration limits shall be specified in the Safety Data Sheets according to Annex II, paragraph 3.2.1(c) of Commission Regulation (EU) No 453/2010 (9).

Criterion 2 – Exclusion of specific substances

The following stated substances are not allowed in quantities exceeding 0,010 % (w/w) of the final product:

—substances appearing in the Union List of priority substances in the field of water policy in Annex X to Directive 2000/60/EC of the European Parliament and of the Council (10) as amended by laid in Decision No 2455/2001/EC of the European Parliament and of the Council (11) and the OSPAR List of Chemicals for Priority Action (http://www.ospar.org/content/content.asp?menu=00950304450000_000000_000000),

— organic halogen compounds and nitrite compounds,

—metals or metallic compounds with the exception of sodium, potassium, magnesium and calcium. In the case of thickeners, also lithium and/or aluminium compounds may be used up to concentrations limited by the other criteria included in the Annex to this Decision.

Assessment and verification: conformance with these requirements shall be stated in writing and signed by the applicant.

Criterion 3 – Additional aquatic toxicity requirements

The applicant shall demonstrate compliance by meeting the requirements of either criterion 3.1 or criterion 3.2.

Criterion 3.1. – Requirements for the lubricant and its main components

Acute aquatic toxicity data of the main components and the mixture shall be provided.

Acute aquatic toxicity data for each main component shall be stated on each of the following two trophic levels: algae and daphnia (12). The critical concentration for the acute aquatic toxicity for each main component shall be at least 100 mg/L.

Acute aquatic toxicity data for the applied lubricant shall be stated on each of the following three trophic levels: algae, daphnia and fish. The critical concentration for the acute aquatic toxicity for a lubricant in Category 1 and 5 shall be at least 100 mg/L and for a lubricant in Category 2, 3 and 4 at least 1 000 mg/L.

Table 2 summarises the requirements for the different lubricant categories according to criterion 3.1.

Assessment and verification: either marine or freshwater toxicity data are accepted. The tests are carried out according to and using relevant test species mentioned in the following guidelines: ISO/DIS 10253 or OECD 201 or Part C.3 of the Annex to Council Regulation (EC) No 440/2008 (13) for algae, ISO TC 147/SC5/WG2 or OECD 202 or Part C.2 of the Annex to Regulation (EC) No 440/2008 for daphnia and OECD 203 or Part C.1 of the Annex to Regulation (EC) No 440/2008 for fish. Equivalent test methods as agreed with a competent body are also permitted. Only (72hr)ErC50 for algae, (48hr)EC50 for daphnia and (96hr)LC50 for fish are accepted.

Criterion 3.2. – Requirements for each stated substance present above 0,10 % (w/w)

Chronic toxicity test results in the form of No Observed Effect Concentration (NOEC) data shall be stated on each of the following two aquatic trophic levels: daphnia and fish.

In case chronic toxicity test results are missing, acute aquatic toxicity tests results shall be provided for each of the following two trophic levels; algae and daphnia. One or more substances exhibiting a certain

degree of aquatic toxicity are allowed in each of the five lubricant categories for a cumulative mass concentration as indicated in Table 1.

Assessment and verification: No Observed Effect Concentration (NOEC) data on the two trophic levels, daphnia and fish, are established by the following test methods: Part C.20 and Part C.14 of the Annex to Regulation (EC) No 440/2008 for daphnia and fish respectively, or equivalent test methods as agreed with a competent body.

Either marine or freshwater acute toxicity data are accepted on algae and daphnia. The tests in marine water are carried out according to and using relevant test species mentioned in the following guidelines: ISO/DIS 10253 or OECD 201 or Part C.3 of the Annex to Regulation (EC) No 440/2008 for algae, ISO TC 147/SC5/WG2 or OECD 202 or Part C.2 of the Annex to Regulation (EC) No 440/2008 for daphnia and OECD 203 or Part C.1 of the Annex to Regulation (EC) No 440/2008 for fish. Equivalent test methods as agreed with a competent body are also permitted. Only (72hr)ErC50 for algae and (48hr)EC50 for daphnia are accepted.

Assessment and verification for Criteria 3.1 and 3.2: high quality test reports or literature data (testing according to acceptable protocols and GLP) including the references shall be submitted to the competent body demonstrating compliance with the requirements set out for the aquatic toxicity in Table 1.

In the case of slightly soluble substances or preparations (< 10 mg/L) the method of the water-accommodated fraction (WAF) can be used in the aquatic toxicity determination. The established loading level, sometimes referred to as LL50 and related to the lethal loading, may be used directly in the classification criteria. The preparation of a water-accommodated fraction shall follow the recommendations set out according to one of the following guidelines: ECETOC Technical Report No 20 (1986), Annex III to OECD 1992 301 or the ISO Guidance document ISO 10634, or ASTM D6081-98 (Standard practice for Aquatic Toxicity Testing for Lubricants: Sample Preparation and Results Interpretation or equivalent methods). In addition, demonstration of the absence of toxicity for a substance at its limit of water solubility shall be deemed to have met the requirements of this criterion.

An aquatic toxicity study does not need to be conducted when:

—the classification of the substance, base fluid or additive is already stated on the Lubricant Substance Classification list, or

— a valid letter of compliance from a competent body can be submitted, or

—the substance is unlikely to cross biological membranes MM > 800 g/mol or molecular diameter > 1,5 nm (> 15 Å), or

—the substance is a polymer and its molecular weight fraction below 1 000 g/mol is less than 1 %, or

— the substance is highly insoluble in water (water solubility < 10 µg/l),

as such substances are not regarded as toxic for algae and daphnia in the aquatic system.

The water solubility of substances shall be determined where appropriate according to OECD 105 or equivalent test methods.

The molecular weight fraction below 1 000 g/mol of a polymer shall be determined according to Part A.19 of the Annex to Regulation (EC) No 440/2008 or equivalent test methods.

Criterion 4 – Biodegradability and bioaccumulative potential

Requirements for the biodegradability and bioaccumulative potential shall be fulfilled for each stated substance present above 0,10 % (w/w).

The lubricant shall not contain substances that are both: non-biodegradable and (potentially) bioaccumulative.

However, the lubricant may contain one or more substances with a certain degree of degradability and potential or actual bioaccumulation up to a cumulative mass concentration as indicated in Table 1.

Assessment and verification: conformity shall be demonstrated by providing the following information:

High quality test reports or literature data (testing according to acceptable protocols and GLP) including the references on the biodegradability and when required on the (potential) bioaccumulation of each constituent substance.

4.1. Biodegradation

A substance is considered ultimately biodegradable (aerobic) if:

1.In a 28-day biodegradation study according Part C.4 of the Annex to Regulation (EC) No 440/2008, OECD 306, OECD 310 the following levels of biodegradation are achieved:

— in the ultimately biodegradable tests based upon dissolved organic carbon ≥ 70 %,

—in the ultimately biodegradable tests based upon oxygen depletion or carbon dioxide generation ≥ 60 % of the theoretical maxima.

In these ultimately biodegradable tests the 10-day window principle will not necessarily apply. If the substance reaches the biodegradation pass level within 28 days but not within the 10-day time-window, a slower degradation rate is assumed.

2.The BOD5/ThOD or BOD5/COD ratio ≥ 0,5. The BOD5/(ThOD or COD) ratio can only be used if no data based on Part C.4 of the Annex to Regulation (EC) No 440/2008, OECD 306 or OECD 310 or any other equivalent test methods are available. The BOD5 shall be assessed according to Part C.5 of the Annex to Regulation (EC) No 440/2008 or equivalent methods while the COD shall be assessed according to Part C.6 of the Annex to Regulation (EC) No 440/2008 or equivalent methods.

A substance is considered inherently biodegradable if it shows:

—a biodegradation > 70 % in the Part C.9 of the Annex to Regulation (EC) No 440/2008 or OECD 302 C test for inherent biodegradation or equivalent methods, or

—a biodegradation > 20 % but < 60 % after 28 days in Part C.4 of the Annex to Regulation (EC) No 440/2008, OECD 306, OECD 310 tests based on oxygen depletion or carbon dioxide generation or equivalent methods.

The biodegradation test does not need to be conducted when:

—the classification of the substance, base fluid or additive is already stated on the Lubricant Substance Classification list or a valid letter of compliance from a competent body can be submitted,

—a substance is non-biodegradable if it fails the criteria for ultimate and inherent biodegradability.

The applicant may also use read-across data to estimate the biodegradability of a substance. 'Read-across' for the assessment of the biodegradability of a substance shall be acceptable if the reference substance differs by only one functional group or fragment from the substance applied in the product. If the reference substance is readily or inherently biodegradable and the functional group has a positive effect on the aerobic biodegradation then the applied substance may also be regarded as readily or inherently biodegradable. Functional groups or fragments with a positive effect on the biodegradation are: aliphatic and aromatic alcohol [-OH], aliphatic and aromatic acid [-C(=O)-OH], aldehyde [-CHO], Ester [-C(=O)-O-C], amide [-C(=O)–N or -C(=S)–N]. Adequate and reliable documentation of the study on the reference substance should be provided. In case of a comparison with a fragment, not included here above, adequate and reliable documentation of the studies should be provided on the positive effect of the functional group on the biodegradation of structurally similar substances.

4.2. Bioaccumulation

The (potential) bioaccumulation does not need to be established when the substance:

— has a MM > 800 g/mol, or

— has a molecular diameter > 1,5 nm (> 15 Å), or

— has an octanol-water partition coefficient, log Kow, value of < 3 or > 7, or

— has a measured BCF of ≤ 100 L/kg, or

— is a polymer and its molecular weight fraction below 1 000 g/mol is less than 1 %.

Since most substances used in lubricants are quite hydrophobic the BCF-value should be based on the lipid weight content and care must be shown to ensure a sufficient exposure time.

The bioconcentration factor (BCF) shall be assessed according to Part C.13 of the Annex to Regulation (EC) No 440/2008 or equivalent test methods.

The log octanol/water partition coefficient (log Kow) shall be assessed according to Part A.8 of the Annex to Regulation (EC) No 440/2008 or OECD 123 or equivalent test methods. In case of an organic substance other than a surfactant where no experimental value is available, a calculation method can be used. The following calculation methods are allowed: CLOGP, LOGKOW, (KOWWIN) and SPARC. Estimated log Kow values by any of these calculation methods < 3 or > 7 indicates that the substance is not expected to bioaccumulate.

Log Kow values are applicable to organic chemicals only. To assess the bioaccumulation potential of non-organic compounds, surfactants, and some organo-metallic compounds, BCF measurements shall be carried out.

Criterion 5 – Renewable raw materials

The formulated product shall have a carbon content derived from renewable raw materials that shall be:

— ≥ 50 % (m/m) for Category 1,

— ≥ 45 % (m/m) for Category 2,

— ≥ 70 % (m/m) for Category 3,

— ≥ 50 % (m/m) for Category 4,

— ≥ 50 % (m/m) for Category 5.

Carbon content derived from renewable raw material means the mass percentage of component A × [number of C-atoms in component A, which are derived from (vegetable) oils or (animal) fats divided by the total number of C-atoms in component A] plus mass percentage of component B × [number of C-atoms in component B, which are derived from (vegetable) oils or (animal) fats divided by the total number of C-atoms in component B] plus the mass percentage of component C × [number of C-atoms in component C, which are derived from (vegetable) oils or (animal) fats divided by the total number of C-atoms in component C], and so on.

The applicant shall indicate on the application form the type (s), source(s) and origin of the renewable material(s) of the main components.

Assessment and verification: the applicant shall provide the competent body with a declaration of compliance with this criterion.

Criterion 6 – Minimum technical performance

(a)For Hydraulic fluids: at least the technical performance criteria as laid down in the current ISO 15380, Tables 2 to 5. The supplier shall list on his product information sheet which 2 elastomers have been tested.

(b)For Industrial and marine gear oils: at least the technical performance requirements as in the DIN 51517. The supplier shall list on his product information sheet which Section (I, II or III) was selected.

(c)For chainsaw oils: at least the technical performance criteria as laid down in the RAL UZ 48 of the Blue Angel.

(d)For two-stroke oils for marine applications: at least the technical performance criteria laid down in 'NMMA Certification for Two-Stroke Cycle Gasoline Engine Lubricants' of NMMA TC-W3.

(e)For two-stroke oils for terrestrial applications: at least meet the EGD level of technical performance criteria laid down in ISO 13738:2000.

(f) For all other lubricants: fit for purpose.

Assessment and verification: the applicant shall provide the competent body with a declaration of compliance with this criterion, together with related documentation.

Criterion 7 – Information appearing on the eco-label

Optional label with text box shall contain the following text:

‘— Reduced harm for water and soil during use

— Contain a large fraction of biobased material’.

The guidelines for the use of the optional label with text box can be found in the ‘Guidelines for the use of the EU Ecolabel logo’ on the website: http://ec.europa.eu/environment/ecolabel/promo/logos_en.htm

Assessment and verification: the applicant shall provide the competent body with a sample of the product packaging showing the label, together with a declaration of compliance with this criterion.

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Title: **Revision of the European Ecolabel and Green Public Procurement (GPP) Criteria for Wooden Floor coverings: Working Document for the 1st AHWG meeting.**

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