

# Ecolabeling and recycling of lubes packaging for greener environment

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## Introduction

Lubricant packaging is usually used to maintain the properties of product over a specified period of time and for safe storage of lubricants during transport, handling and storage [1]. The EU Packaging Directive 94/62/EC which covers packaging and packaging waste has been introduced in 1994. With introduction of this directive, it has been ensured that packaging and packaging waste were made from healthy, environmentally friendly and uniform nature.

The fundamentals considering this directive are that unnecessary packaging must be prevented, recycling of unavoidable packaging waste must be maximised, and that waste disposal costs should be reduced.

Also, this way, the standard was defined, which binds all manufacturers and retailers to meet the following requirements for the packaging that they place on the market [1]. The lowest possible weight and volume of material should be used whilst still maintaining standards of safety, hygiene and consumer acceptance.

Similarly, packaging manufacturers should maximise the reduction of the use of hazardous and noxious substances and components in the packaging material.

Finally, the manufacture of packaging should utilise as many reusable and recyclable materials as possible.

Diverse types of packaging [2] in which lubricants can be stored include lubricant oil bottles, drums, pails and flexible containers. Lubricant packaging [2] is further

divided based on materials used for production of packaging into metals and plastics. Packaging made of metal<sup>1</sup> can be divided into steel, tin and aluminium metal packaging. Packaging made of plastics [2] shall be divided into polyethylene, polyvinyl chloride, polyethylene terephthalate, polypropylene and others.

## Main Directive and Regulations

Under Directive 94/62/EC there are the following requirements specific to the recoverable nature of packaging:

- Packaging recoverable in the form of material recycling.
- Packaging recoverable in the form of energy recovery.
- Packaging recoverable in the form of composting
- Biodegradable packaging.

According to Directive 94/62/EC, biodegradable packaging waste must be of such nature that most of the finished compost decomposes into carbon dioxide, biomass and water during its physical, chemical, thermal or biological decomposition.

The most important certification organisation in Europe<sup>3</sup> are DIN CERTCO and Vincotte both relating to bioplastics. Materials made of renewable resources are certificated<sup>3</sup> based on ASTM D6866 standard by both certification bodies. Certificates [3] for biodegradable products are also issued by the Biodegradable Products Institute (BPI) in United States, BioPlastic Association of Japan as well as by other widely used certification organisations. List of the main certification organisations for bioplastics are shown in Table 1.

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ORGANIZATION	BIOBASED CONTENT	CERTIF. LABEL
DIN CERTCO: Additional requirements: waste solids ≥ 90 % (more)	20 – 50 %	
	50 – 85 %	
	> 85 %	
Vegopole	20 – 40 %	
	40 – 60 %	
	60 – 80 %	
	> 80 %	
U.S. Department of Agriculture	Product is 57% Packaging is 32%	

Table 1: 40+ certification organisations for bioplastics

### Innovation lube oil packaging concept

Castrol has launched its sustainable strategy called PATH360 in 2021. This strategy sets out aims for 2030 to save waste, reduce carbon, improve lives and to help in reaching net-zero by 2050 or sooner [4]. The PATH360 framework is shown below in figure 1.



Figure 1: Castrol's PATH360 Framework

With the introduction of the PATH360 strategy Castrol has managed in 2021 to reduce its plastic footprint and help its customers to save energy, waste or water which is shown in Figure 2 [4].



Figure 2: Castrol in action in 2021

Also, in accordance with PATH360 strategy, Castrol announced in 2021, that it would start working on its innovation in lubricant packaging with Pulpex in order to design paper bottles (Fig. 3) for use with Castrol's lubricants products [4].



Figure 3: Castrol's paper lubricant packaging prototype

During 2021, Valvoline has also introduced innovative packaging called FlexFill (Figure 4) [5]. This has been made for packaging of synthetic gear oil with the aim to make changing synthetic gear oil easier while also providing a more flexible, less wasteful automotive do it yourself experience [5].



Figure 4: FlexFill

### Labelling of lubricants

The majority of the products that are put on the market of EU have been defined by following labelling:

- EU labelling.
- National rules labelling.
- Mandatory labelling.
- Voluntary labelling.
- Environmental, energy, food and cosmetic labelling.

As a general rule, official language must be used on the labels [6] but multi-language labelling is also allowed through the EU Regulation (EC) No 1272/2008 [7] or CLP regulation stands for mandatory labelling in EU.

Any package containing substances or mixtures classified as hazardous must be clearly labelled with the information listed in Article 17 of the CLP Regulation [7].

The CLP regulation also provides conditions for the application, format, readability and location of labels. Packaging that contains hazardous substances and mixtures shall:

- Prevent any loss of the contents.
- Be made of resistant materials if they encounter contents.
- Be strong, solid and have sealable fastening.

CLP regulation also covers additional packaging requirements that may apply, such as child-resistant fastenings and tactile warnings [7].

The EU Ecolabel system represents a voluntary

labelling system that promotes and identifies "green products". Based on EC No. 66/2010 [8] of the European Parliament and of the Council of 25 November 2009 the EU Ecolabel can be used on products and services as well as their associated promotional material, exclusively during the validity period of the EU Ecolabel awarded licence.

Current criteria for awarding an EU Ecolabel licence to lubricants is defined by COMMISSION DECISION (EU) 2018/1702 of 8 November 2018. The product group 'lubricants' shall comprise any lubricant falling within one of the following sub-groups [8]:

- The Total Loss Lubricants (TLL).
- The Partial Loss Lubricants (PLL).
- The Accidental Loss Lubricants (ALL).

Lubricants that are awarded with EU Ecolabel licence can include the EU Ecolabel logo and licence number. The basic information on how the EU Ecolabel Logo should be used is shown in Figure 5 [9].

There are diverse types of formats that can be applied to correctly reproduce the EU Ecolabel licence number (see Figure 6) [9].

<p><b>Style:</b></p> <ul style="list-style-type: none"> <li>- The logo's style shall not be modified.</li> <li>- Other pictures or logos are not allowed to be part of the EU Ecolabel logo.</li> <li>- Text written over the EU Ecolabel logo is prohibited.</li> </ul>	<p><b>Location on packaging/marketing material:</b></p> <ul style="list-style-type: none"> <li>- Both the EU Ecolabel logo and the licence number text box shall appear on the product or service's packaging/marketing material.</li> </ul>	<p><b>Size:</b></p> <ul style="list-style-type: none"> <li>- The logo should be visible and legible.</li> <li>- The logo should be no smaller than 10,6 x 10,6 mm.</li> </ul> <div data-bbox="1107 1375 1181 1447">  </div> <p>Minimum real size</p>
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Figure 5: EU Ecolabel Logo

**Correct: ✓**  
**Example 1**  
 Licence number directly above or below logo (most common)



**Correct: ✓**  
**Example 2**  
 Licence number and logo on the same side of packaging, spread apart



**Correct: ✓**  
**Example 3**  
 Licence number on the opposite side of packaging



Figure 6: EU Ecolabel licence number

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The next target, which should be achieved by the end of 2030, is that at least 70% by weight of all packaging should be recycled [13].

In Directive 94/62/EC it can be found that:

*"Producer responsibility schemes provide for the financing or financing and organisation of the return and/or collection of used packaging and/or packaging waste and its channelling to the most appropriate waste management option, as well as for reuse or recycling of the collected packaging and packaging waste."*

Until the end of 2024, EU countries should ensure that producer responsibility schemes are established for all packaging [13]. Established product schemes will need to satisfy the smallest requirements as defined by the Waste Framework Directive 2008/98/EC.

## Conclusion

Producing packaging for lubricants uses a lot of metal and plastics which ends up as waste. Companies that produce packaging tend to lower the amount of packaging waste by using recycled material. Besides this, lubricant companies should also work on developing innovative packaging, in order to help decrease excess wastage in the packaging process. Good examples of this are Valvoline FlexFill packaging and ongoing cooperation between Castrol and Pulpex on development of paper bottles packaging for lubricants.

At the moment many lubricants made from mineral oil cannot be replaced by biodegradable ones. Innovative products that are coming from companies such as Nowi LLC [14] and other similar industry players bring completely new set of biodegradable lubricants [15] which will be able to replace mineral ones. At the end it can be said that lubricant packaging and lubricants market is on good path to introduce new kinds of biodegradable packaging and biodegradable lubricants which would lead lubricant market to satisfy strict targets set in European Green Deal.

## References

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