

**FINAL REPORT OF THE FORUM REACH ENFORCEMENT PROJECT ON ANNEX XVII
RESTRICTIONS CONCERNING POLY-CYCLIC AROMATIC HYDROCARBONS (PAHS) IN
EXTENDER OILS IN TYRES**

2013

Helsinki, Finland

Contents

1. Executive Summary	5
2. Introduction	6
3. Compliance assessment	7
<i>3.1 Compliance Assessment Overview</i>	7
<i>3.2 Extender Oils and Analysis</i>	7
<i>3.3 Tyres and Tyre Analysis</i>	7
<i>3.4 Compliance Assessment for different Actors in the Supply Chain</i>	9
3.4.1 Tyre/rubber Manufacturer Compliance Assessment	9
3.4.2 Tyre Importer Compliance Assessment	9
3.4.2 Tyre Distributor/Retailer Compliance Assessment	9
4. Communications & Industry Engagement	10
5. Issues & Challenges	11
6. Outcomes & Conclusion	13

1. Executive Summary

The joint European enforcement project began in December 2009, to assess compliance with REACH¹ restrictions concerning polycyclic-aromatic hydrocarbons (PAHs) in extender oils and tyres. The manufacture and placing on the market of extender oils and tyres containing PAHs is restricted under Paragraph 50 Annex XVII of EC Regulation 1907/2006. Eight PAHs are classed as carcinogenic and these are included in the restriction.

The project aimed to assess compliance with the restriction, raise awareness about the restriction, take relevant enforcement action for non-compliance and ultimately reduce the amount of PAH from tyre use entering the environment. Twelve MS actively participated in the project.

The structure of the tyre industry is variable and therefore different methods of assessing compliance were utilised. Table 1 provides an overview of the methods of compliance assessment and the findings.

Table 1: Compliance Assessment Overview

Compliance assessment activity	Number undertaken	Non-compliances found
Extender oil analysis (IP346) (oils analysed)	10	3
Tyre analysis (ISO 21461) (tyres analysed)	94	4
Tyre/rubber manufacturer (companies assessed)	25	0
Tyre importers (companies assessed)	116	0
Tyre distributors/retailers (companies assessed)	31	0

Three extender oils were found to be non-compliant. Four tyres were found to be non-compliant, all were summer car tyres manufactured in China. This represents 4.3% of tyres tested.

The project has made considerable progress towards checking the compliance of tyres currently available in Europe, and has highlighted a limited number of non-compliances which are investigated further.

Communications were used by a number of MS to raise awareness about the restriction. A number of external press articles about the project and the restriction were published in media outlets. The communications surrounding this project have been very successful at raising the tyre industry's awareness about the restriction. They have also sent out a clear message that enforcement authorities are actively assessing compliance with the restriction. By raising awareness about the restriction enforcement authorities encourage manufacturers, importers and distributors/retailers to take steps to reduce or eliminate PAHs from their tyres which will benefit the environment in the long term.

¹ REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals)

2. Introduction

The joint European enforcement project began in December 2009 to assess compliance with REACH restrictions concerning polycyclic-aromatic hydrocarbons (PAHs) in extender oils and tyres. Eight PAHs are classed as carcinogenic and these are restricted. The manufacture and placing on the market of extender oils and tyres containing PAHs is restricted under Paragraph 50 Annex XVII of EC Regulation 1907/2006 REACH. The full restriction can be viewed in Appendix 1.

The campaign aimed to:

- assess compliance of tyres available in Europe;
- raise awareness about the restriction
- provide guidance for companies supplying tyres to Europe;
- identify non-compliances and follow this up with appropriate enforcement action;
- reduce the amount of PAH from tyre use entering the environment.

The project was adopted by ECHA as the first joint European enforcement project concerning a REACH restriction. The following MS actively participated in the project:

Belgium

France

Cyprus

Germany

Czech Republic

Ireland

Denmark

Netherlands

Estonia

Portugal

Finland

UK

3. Compliance assessment

The structure of the tyre industry differs between the European countries; some MS have a number of tyre manufacturers whilst others have none. Different MS have thus assessed compliance in different ways. The following methods were utilised to assess industry compliance:

- Information notices/requests - for extender oils manufacturers, rubber producers, tyre manufacturers, tyre importers, tyre retailers
- Audits/inspections – for extender oils manufacturers, rubber producers, tyre manufacturers, tyre importers, tyre retailers
- Analysis – for extender oils and tyres

Each of these compliance activities are discussed in further detail in the following sections.

3.1 Compliance Assessment Overview

Within the joint European enforcement project assessment of the tyre market can be broken down into different areas of compliance assessment. Table 2 summarises these different areas and the number of products/companies assessed.

Table 2: Compliance Assessment Overview

Compliance assessment activity	Number undertaken	Non-compliances found
Extender oil analysis (IP346) (oils analysed)	10	3
Tyre analysis (ISO 21461) tyres analysed)	94	4
Tyre/rubber manufacturer (companies assessed)	25	0
Tyre importers (companies assessed)	116	0
Tyre distributors/retailers (companies assessed)	31	0

3.2 Extender Oils and Analysis

Extender oil analysis was conducted in one MS. Tyre manufacturers were audited to assess compliance with the restriction. As part of the audit, samples of extender oils were taken and analysed using IP346. The aim of the audits and extender oil analysis was to establish compliance of the Member State's tyre manufacturing industry. If the extender oils were shown to be compliant with IP346 then it could be assumed that the manufactured tyres comply with the restriction.

The analysis showed that three of the ten oils analysed contained polycyclic aromatic (PCA) extract above 3% and therefore did not comply with the restriction. However, there are concerns over the suitability of IP346 as a method for determining PAHs in some types of extender oils (particularly those that contain asphaltenes).

Other methods of compliance assessment (audit of paperwork and procedures, tyre analysis etc) were used in this MS to establish compliance at each of these manufacturers.

3.3 Tyres and Tyre Analysis

Four MS carried out tyre analysis using ISO 21461. Four tyres were found to be non-compliant with the restriction (4.3% of tyres tested).

In total, analysis involved 94 tyres, covering 59 brands, manufactured in 53 factories in 20 countries. Table 3 summarises the manufacturing origin of tyres tested.

Table 3: Overview of Tyres Analysed by Origin

Country of Manufacture	Number Tyres Analysed	Number Tyre Factories	Number Non-compliant Tyres
China	47	21	4
Czech Republic	1	1	0
Finland	1	1	0
France	2	2	0
Germany	4	3	0
Indonesia	2	2	0
Italy	1	1	0
Japan	2	2	0
Korea	5	3	0
Netherlands	1	1	0
Poland	1	1	0
Portugal	1	1	0
Romania	5	2	0
Russia	3	2	0
Slovakia	3	1	0
Slovenia	4	1	0
Taiwan	3	2	0
Thailand	3	2	0
Turkey	4	3	0
UK	1	1	0
Total	94	53	4

The tyres were selected using amongst others the following criteria:

- Manufacturer within the jurisdiction of the enforcement authority
- Tyres produced after 1/1/10
- Tyres with a high market share (i.e. used for the most popular cars)
- Tyre size is one of the most popular car tyre sizes
- Tyres are fast-selling / have a high volume and are readily available in many brands
- Intelligence suggesting tyres with a high PAH content
- Tyres manufactured by companies who have not provided any information about the type of oils used in their tyres

3.4 Compliance Assessment for Different Actors in the Supply Chain

3.4.1 Tyre/rubber Manufacturer Compliance Assessment

Seven MS carried out compliance assessment of tyre manufacturers through 17 audit/inspection and 13 information notices/requests. Three non-compliant extender oils were identified during these audits and no other non-compliances were noted (see section 3.2)

3.4.2 Tyre Importer Compliance Assessment

Nine MS carried out compliance assessment of tyre importers through at least 32 audits/inspections and at least 84 information notices/requests. No non-compliances were noted.

In some MS customs authorities played a significant role in establishing the identity of key importers. In one MS the majority of the companies contacted were unable to demonstrate effective systems of management for checking or ensuring compliance and also in one MS very few of the companies were able to fully demonstrate compliance.

3.4.3 Tyre Distributor/Retailer Compliance Assessment

Five MS carried out compliance assessment of tyre distributors/retailers through 39 audits/inspections or more than 7 information notices/requests. The four non-compliances were found at tyre distributors/retailers (see section 3.3 for further details) and further legal action was taken. No further non-compliances were noted.

4. Communications & Industry Engagement

Communications were used in the joint European enforcement project by a number of participants and aimed to:

- raise awareness about the restriction;
- provide information to businesses about how to assess compliance;
- help to prevent the future manufacture, import, purchase and sale of extender oils and tyres containing PAHs.

A number of approaches were used to communicate which included letters, guidance, publication of information on websites, journal articles, trade shows, engagement of trade associations and flyers.

The project has received a great deal of interest from the press and media which has helped to raise awareness about the restriction.

5. Issues & Challenges

Over the last decade or so, more and more legislation has entered into force that affects the tyre industry, especially in Europe. Tyres manufactured for the European market are required to comply with a number of EU regulations and directives concerning for example noise limits, wet grip performance, rolling resistance, run flat tests, high speed tests or physical dimensions. REACH obligations and restrictions have added further to the regulatory burden of the tyre industry. Allocation of resources to ensure compliance with the restriction competes with other legislation which companies may view as more of a priority.

Gathering the right information to establish compliance has been a challenge for enforcement authorities. The only definitive way to know if a tyre is compliant is to analyse it. However, this is expensive and time consuming so other methods were utilised by the European enforcement authorities to assess compliance:

- audits and inspections;
- written declarations from suppliers stating compliance and actions they have taken to ensure this;
- information about the extender oil used in the tyres – name, manufacturer, analysis reports;
- assessment of procedures implemented by the company to ensure compliance.

As information was gathered from the target companies it became evident that many companies did not understand fully how the REACH restriction affected them. Many companies provided declarations stating that they were 'REACH compliant' with no further information to back this up. Many of these declarations referred to compliance with REACH registration and substances of very high concern (SVHCs) rather than the restriction and were not relevant or useful for assessing compliance with the restriction.

Many companies failed to provide sufficient information of the appropriate quality to demonstrate compliance. These companies therefore could not be confident that they were complying with the law. Companies need to have a better understanding of what steps they should be taking to be confident their tyres are compliant.

Many companies provided written declarations from tyre manufacturers stating tyres complied with the restriction. Many believed it was adequate to rely solely on a declaration without supplementary evidence to back this up and with no effort being made to determine the validity or relevance of the declaration.

Other companies provided test reports which either they or their suppliers had commissioned to establish PAH concentrations in tyre samples and extender oils. The restriction states that extender oils must be analysed using IP346 and tyres using ISO21461. The majority of analysis that companies provided as evidence of compliance had not been conducted to the test methods required by the restriction.

Companies have been consistently advised of the need to use the correct test methods at an accredited laboratory to ensure the analysis is accurate, reliable and a true indication of the level of PAHs present within a tyre or extender oil. However, as the project progressed and more information was gathered, advice concerning IP346 was revised. Concerns have been raised from several sources about the suitability of IP346 for analysing extender oils, particularly those that contain asphaltenes. There is mixed information about the impact upon detected PCA levels in asphaltene containing oils when following the IP346 method. It is possible that a low PCA extract may be observed due to the asphaltene preventing the PAHs from

being extracted fully. This has the potential to show a non-compliant oil as compliant. However, an analysis conducted by one of the Member States showed the reverse to be true; oils that are shown to be compliant by other analytical methods are shown to exceed the PCA extract limit stated in the restriction when tested by IP346.

Companies below tyre manufacturers in the supply chain have limited control over the extender oils used in the tyres that they purchase. As a further check on compliance it is advisable that analysis of finished tyres should be undertaken periodically using ISO21461. However, for tyre importers that deal with a wide range of tyre brands and sizes, this is a huge burden, in terms of cost and time.

The European Commission have advised that a new CEN method for the analysis of extender oils is currently in draft form: "prEN 16143 Petroleum Products - Determination of content of Benzo(a)pyrene (BaP) and selected polycyclic aromatic hydrocarbons (PAH) in extender oils - Procedure using double LC cleaning and GC/MS analysis." It is anticipated that the restriction will be amended at some point to incorporate the new CEN method although no timescales have been provided for this.

6. Outcomes & Conclusion

The project has made considerable progress towards checking the compliance of tyres currently available in Europe, and has highlighted a limited number of non-compliances.

The communications surrounding this project have been very successful at raising the tyre industry's awareness about the restriction, and most importantly that enforcement authorities are actively assessing compliance with the restriction.

Due to the enforcement actions and project communications, it can be assumed that many companies will have assessed their compliance and taken action where appropriate without any direct involvement from enforcement authorities. By raising awareness about the restriction this joint European enforcement project will encourage manufacturers, importers and distributors/retailers to take necessary steps to reduce or eliminate PAHs from their tyres which will benefit the environment in the long term.

Appendix 1: REACH Annex XVII, Restriction 50

50. Polycyclic-aromatic hydrocarbons (PAH)	1. From 1 January 2010, extender oils shall not be placed on the market, or used for the production of tyres or parts of tyres if they contain:
(a) Benzo[a]pyrene (BaP) CAS No 50-32-8	more than 1 mg/kg (0,0001 % by weight) BaP, or,
b) Benzo[e]pyrene (BeP) CAS No 192-97-2	more than 10 mg/kg (0,001 % by weight) of the sum of all listed PAHs.
(c) Benzo[a]anthracene (BaA) CAS No 56-55-3	These limits shall be regarded as kept, if the polycyclic aromatics (PCA) extract is less than 3 % by weight as measured by the Institute of Petroleum standard IP346: 1998 (Determination of PCA in unused lubricating base oils and asphaltene free petroleum fractions — Dimethyl sulphoxide extraction refractive index method), provided that compliance with the limit values of BaP and of the listed PAHs, as well as the correlation of the measured values with the PCA extract, is controlled by the manufacturer or importer every six months or after each major operational change, whichever is earlier.
(d) Chrysen (CHR) CAS No 218-01-9	
(e) Benzo[b]fluoranthene (BbFA) CAS No 205-99-2	
(f) Benzo[j]fluoranthene (BjFA) CAS No 205-82-3	
(g) Benzo[k]fluoranthene (BkFA) CAS No 207-08-9	2. Furthermore, tyres and treads for retreading manufactured after 1 January 2010 shall not be placed on the market if they contain extender oils exceeding the limits indicated in paragraph 1. These limits shall be regarded as kept, if the vulcanised rubber compounds do not exceed the limit of 0,35 % Bay protons as measured and calculated by ISO 21461 (Rubber vulcanised — Determination of aromaticity of oil in vulcanised rubber compounds).
(h) Dibenzo[a,h]anthracene (DBAhA) CAS No 53-70-3	3. By way of derogation, paragraph 2 shall not apply to retreaded tyres if their tread does not contain extender oils exceeding the limits referred to in paragraph 1. 4. For the purpose of this entry "tyres" shall mean tyres for vehicles covered by: — Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers (****), — Directive 2003/37/EC of the European Parliament and of the Council of 26 May 2003 on type-approval of agricultural or forestry tractors, their trailers and interchangeable towed machinery, together with their systems, components and separate technical units (*****), and — Directive 2002/24/EC of the European Parliament and of the Council of 18 March 2002 relating to the type-approval of two or three-wheel motor vehicles and repealing Council Directive 92/61/EEC (*****). <hr/> <p>(****) OJ L 263, 9.10.2007, p. 1. (*****) OJ L 171, 9.7.2003, p. 1. (*****) OJ</p>

L 124, 9.5.2002, p. 1.
EN 26.6.2009 Official Journal of the European
Union L 164/