



## JRC TECHNICAL REPORTS

# Revision of EU Ecolabel Criteria for Converted and Printed Paper Products

Technical Report v.1.0:

Draft criteria proposal for revision of  
EU Ecolabel criteria

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November, 2018

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EUR xxxxx xx

PDF	ISBN xxx-xx-xx-xxxxx-x	ISSN xxxx-xxxx	doi:xx.xxxxx/xxxxxx
Print	ISBN xxx-xx-xx-xxxxx-x	ISSN xxxx-xxxx	doi:xx.xxxxx/xxxxxx

Seville: European Union, 2018

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How to cite this report: Author(s), *Title*, EUR, doi

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## TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
LIST OF FIGURES .....	4
LIST OF TABLES.....	4
ABBREVIATIONS .....	5
ABSTRACT.....	6
1 INTRODUCTION .....	7
2 THE CRITERIA REVISION PROCESS .....	8
3 SUMMARY OF THE PRELIMINARY REPORTS .....	8
3.1 Printed paper products.....	8
3.1.1 Previous considerations.....	9
3.1.2 Existing legislation and standards .....	10
3.1.3 Market analysis .....	11
3.1.4 Technical analysis – Description of printing technologies .....	13
3.1.5 Life Cycle Assessment .....	14
3.2 Converted paper products .....	16
3.2.1 Product group name, scope and definition .....	16
3.2.2 Legal and policy context.....	16
3.2.3 Market analysis .....	16
3.2.4 Life cycle assessment.....	17
3.2.5 Technical analysis.....	20
4 SCOPE REVISION .....	20
4.1 Scope merging.....	21
4.2 New scope definition.....	21
4.2.1 Proposed criteria structure.....	22
4.2.2 Specific scope aspects.....	24
4.2.3 Printed paper products – Specific scope modification proposals .....	27
4.2.4 Converted paper products – Technical specifications of the scope revision proposal.....	28
5 PROPOSED CRITERIA FRAMEWORK AND KEY MODIFICATIONS .....	32
5.1 Criterion 1 - Substrate .....	34
5.2 Criterion 2 - Excluded or limited substances and mixtures .....	40
5.2.1 Criteria on horizontal hazardous substance restrictions –part I.....	40
5.2.2 Proposed criteria on horizontal hazardous substance restrictions – Part I..	43
5.2.3 Criteria on specific hazardous substance restrictions – part II .....	48
5.2.4 Proposed criteria on specific hazardous substance restrictions – Part II ....	50
5.3 Criterion 3 - Recyclability .....	52
5.4 Criterion 4 - Emissions .....	55

5.5 Criterion 5 - Waste .....	62
5.6 Criterion 6 - Energy use .....	70
5.7 Criterion 7 - Training .....	73
5.8 Criterion 8 - Fitness for use .....	75
5.9 Criterion 9 - Information on the product.....	77
5.10 Criterion 10 - Information appearing on the EU Ecolabel .....	78
6 OTHER PROPOSALS FOR DISCUSSION .....	80
ANNEX I.....	81

## LIST OF FIGURES

Figure 1. Overview of the typical EU Ecolabel revision process.....	8
Figure 2. Market share of top 12 countries in printing (2014) .....	12
Figure 3. Evolution of the EU printed paper products production value (2010-2016).....	12
Figure 4. EU market value of printed paper by type of product (2016).....	13
Figure 5. The EU market production, import, export and apparent consumption value for converted paper products in 2016. ....	17
Figure 6. Various life cycle stages of a converted paper product .....	18
Figure 7. Proposals for Commission Decision modification .....	27
Figure 8 Weight of metal content in ring binders and lever arch file .....	30
Figure 9. Flow chart for checking compliance with CLP restrictions .....	46
Figure 10. Generated and cancelled GOs .....	72

## LIST OF TABLES

Table 1. LCA for printed paper products - Key impact parameters identified .....	15
Table 2. Link between the impact hotspots and the revised EU Ecolabel criteria for converted paper products .....	18
Table 3. Comparison of criteria considering different scopes.....	23
Table 4. Material input for envelope manufacturing .....	29
Table 5. Variability of metal content in different filling products .....	30
Table 6. Typical characteristic of filing products .....	31
Table 7. Criteria for converted, printed and merged paper products .....	32
Table 8. Currently Valid EU ecolabel reference values for lamination and board manufacturing.....	38
Table 9. Currently valid reference values for electricity and fuel – converted paper products.....	39
Table 10. Derogations to the CLP hazard restrictions and applicable conditions.....	44
Table 11. BAT 9 - Solvent mass balance of the solvent inputs and outputs of the plant .	58
Table 12. Toluene balance of two gravure printing plants.....	59
Table 13. Nordic Swan point award system for VOC emissions .....	60
Table 14. Classification of printing wastes.....	66
Table 15. Average percentage paper waste generated.....	68
Table 16. Paper waste generated from printing, laminating and cutting .....	68
Table 17. Proposed threshold for paper waste .....	69
Table 18. Average energy consumption per printing technology .....	71

## ABBREVIATIONS

AHWG	Ad-hoc Working Group meeting
AOX	Adsorbable Organic Halogen
BAT	Best Available Technology
BPA	Bisphenol-A
BREF	Best Available Techniques Reference Document
CLP	Classification, Labelling and Packaging
CO <sub>2</sub>	Carbon dioxide
CP	Converted paper products
CTP	Computer to Plate
DIBP	Diisobutyl phthalate.
DIPN	Diisopropyl naphthalene.
EDTA	Ethylenediaminetetraacetic acid
EMAS	Eco Management and Audit Scheme
EN	European Norm
EU	The European Union
EUEB	The European Union Eco-labelling board
EuPIA	The European Ink Industry's Association
FSC	Forest Stewardship Council
GMO	Genetically modified organism
INGEDE	Internationale Forschungsgemeinschaft Deinking-Technik (International Association of the De-inking Industry)
ISCC	(International Sustainability and Carbon Certification),
ITX	Isopropylthioxanthone
IPPC	Integrated Pollution Prevention and Control
ISO	International Standardisation Organisation
LCA	Life Cycle Assessment
NGO	Non-governmental organizations
NO <sub>x</sub>	Nitrogen Oxides
PEFC	Programme for the Endorsement of Forest Certification
PAH	Polycyclic aromatic hydrocarbons.
PBT	Persistent Bioaccumulative Toxic
PP	Printed paper products
PVC	Polyvinyl chloride
PUR	Polyurethane
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RSB	Roundtable on Sustainable Biomaterials
RSPO	Round Table on Sustainable Palm Oil
RTTS	Round Table on Responsible Soy
SETAC	Society of Environmental Toxicology and Chemistry
SO <sub>2</sub>	Sulphur Dioxide
VOC	Volatile Organic Compound
vPvB	Very persistent, very bioaccumulative

## **ABSTRACT**

The Ecolabel criteria for printed and converted paper products are under revision, therefore, the updated product scope and criteria are defined in line with the rationale based on the preliminary reports.

A draft preliminary report (PR) has been published for both product groups in parallel with the technical report (November 2018) ahead of the first AHWG meeting to be held in December 2018. The PRs examine the product groups in the current legal, political market context. Moreover, the technical aspects of each product group are also considered from an LCA perspective to identify the main hotspots.

The technical report (TR) presents the existing scopes, definitions and EU Ecolabel criteria for the two product groups. Any modified criteria are presented after the existing ones highlighting the main changes. Supporting rationale is provided with particular reference to any comments received from stakeholders. Commission statements, criteria included in other ecolabel schemes, and LCA-based impact assessment are also considered. The most significant proposed changes are:

- To merge the product groups converted (CP) and printed paper (PP) under one common Commission Decision;
- To expand the scope accommodating the definition of a revised product group;
- To harmonise requirements referring to paper substrate with the EU Ecolabel for copying and graphic paper, and thus introduce a common ambition level for fibre sourcing criteria and emission requirements;
- To discuss possible thresholds for recyclability and additionally to include de-inkability requirements for converted paper products;
- To introduce a possible restriction on the use of PVC;
- To analyse a possible introduction of additional requirements that address non-paper materials;
- To introduce stricter emission thresholds for releases in water and air;
- To introduce a threshold for energy consumption.

The proposed changes together with the points for discussion aim at providing the discussion platform for the first AHWG meeting. Nevertheless, comments on the proposed changes can be sent prior to the meeting in the hope to outline different perspectives ahead of the meeting.

# 1 INTRODUCTION

The EU Ecolabel promotes the production and consumption of products with a reduced environmental impact along the life cycle and is awarded only to the best (environmental) performing products in the market.

The entire life cycle of the product, from the extraction of raw materials through to production, packaging, distribution, use and disposal is considered. The EU Ecolabel may define criteria that address environmental impacts from any of these lifecycle phases, with the aim being to target those areas of most significant impact preferentially. The criteria development process involves scientists, non-governmental organisations (NGOs), member state representatives, and industry stakeholders. The overall ambition level for criteria should aim to target 10% to 20% of the most environmentally friendly products currently on the market.

Since the life cycle of each product and service is different, the criteria are tailored to address the unique characteristics of each product type. They are revised to reflect upon technical innovation such as alternative materials or production processes, reductions in emissions and market advances. The development and revision processes are carried out in accordance with the EU Ecolabel Regulation (EC) No 66/2010. An important part of the process for developing or revising EU Ecolabel criteria is the involvement of stakeholders through publication of and consultation on draft technical reports and criteria proposals. This is achieved by working group meetings and written consultation processes managed via an online platform.

The overall aim of this project is to update existing criteria for the printed (Commission Decision 2012/481/EU<sup>1</sup>) and converted paper product group (Commission Decision 2014/256/EU<sup>2</sup>). The project performs an evaluation of the existing criteria for the product groups by identifying which are still relevant and those who need revision, addressing existing concerns. It also examines whether any new criteria need to be introduced for areas of concern. The key factors to consider in this respect are:

- New technological development: where progress in existing processes or where new processes become available and economically viable and could mitigate environmental impacts;
- Stricter legal requirements: which may render existing criteria obsolete or of low ambition or which may introduce new restrictions that need to be reflected (e.g. the use of hazardous substances in paper manufacturing or in waste disposal);
- Developments in other ISO 14024 Type I ecolabels: to align where possible and where a clear rationale can be established;
- Published LCA evidence: to help ensure that proposed criteria focus mainly on the environmental hotspots of the paper production.

This technical report aims to provide the background information and rationale for the revision of the criteria, and to suggest changes concerning to the EU Ecolabel criteria for printed and converted paper product groups. The study has been carried by the Joint Research Centre (JRC Seville). The technical support for printed paper products was provided by LEITAT whereas for converted paper products by the Institute of Sustainability in Civil Engineering (Institut für Nachhaltigkeit im Bauwesen - INaB) RWTH

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<sup>1</sup> Commission Decision No 2012/481/EU of the European Parliament and of the Council of 16 August 2012 establishing the ecological criteria for the award of the EU Ecolabel for printed paper, available online at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012D0481>

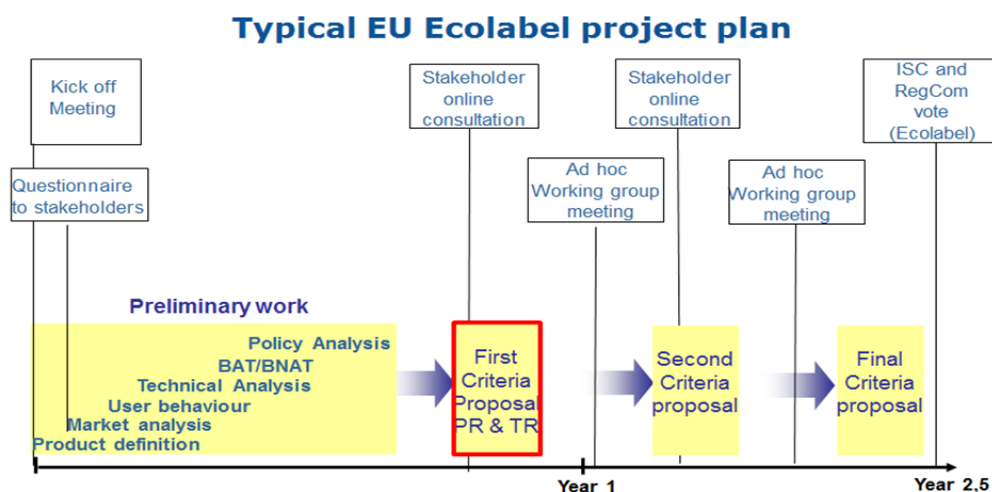
<sup>2</sup> Commission Decision of 2 May 2014 establishing the ecological criteria for the award of the EU Ecolabel for converted paper products (notified under document C(2014) 2774) Text with EEA relevance. <https://publications.europa.eu/en/publication-detail/-/publication/ae7cce99-ea68-11e3-8cd4-01aa75ed71a1>



Aachen. The work is being developed for the European Commission's Directorate General for the Environment.

## 2 THE CRITERIA REVISION PROCESS

The typical standard approach that is taken for the revision of EU Ecolabel criteria is illustrated in Figure 1.



**Figure 1.** Overview of the typical EU Ecolabel revision process

The current stage in the process is highlighted in the red box. Although stakeholders have previously been invited to respond to a preliminary scoping questionnaire, their input to the process became more significant from this stage onwards.

The technical report v.1.0 (TR) presents the existing scopes, definitions and EU Ecolabel criteria for the two product groups. Several iterations are anticipated before the final document will be handed over for voting. These iterations will be reflected in subsequent versions of the technical report. The final criteria proposal will be formed next to the second AHWG meeting and after the inter-service consultation (ISC).

The final criteria attempt to target the top 10% to 20% of the most environmentally friendly products currently in the market.

## 3 SUMMARY OF THE PRELIMINARY REPORTS

This section summarises the main conclusions of the PRs. The full text documents can be found on the BATIS platform and also at the project website:

*Printed paper products:* [http://susproc.jrc.ec.europa.eu/Printed\\_paper\\_products/](http://susproc.jrc.ec.europa.eu/Printed_paper_products/)

*Converted paper products:* [http://susproc.jrc.ec.europa.eu/Converted\\_paper\\_products/](http://susproc.jrc.ec.europa.eu/Converted_paper_products/)

### 3.1 Printed paper products

This preliminary report for printed paper products consists of:

- Introduction: this section describes the goal and content of the document.
- Previous considerations: this section gathers previous decisions and discussions before this revision process, which should be taken into account.

- Market analysis: the analysis comprises the main market data for the printing sector, at global and European level. It includes data on production, trade, geographical distribution, as well as market trends and forecasts.
- Description of printing technologies: this section details the technical aspects of the different printing technologies, the main processes involved, applications and innovations, and the sustainability considerations for each technology.
- Life Cycle Assessment: LCA analyses the potential environmental impacts of printed paper products with a Life Cycle approach (considering their whole life cycle, i.e. from raw materials to end-of-life. It includes a LCA screening based on literature review and LCA exercises of case studies.
- Scope revision: Proposals for the modification of the current scope are presented, together with the different alternatives and Rationale.
- Draft criteria proposal: For each current criterion, a proposal for revision, modification, amendment or suppression/addition of requirements is presented, together with the corresponding technical Rationale. Additional criteria are proposed for those areas not covered currently by EU Ecolabel criteria.

### 3.1.1 Previous considerations

The main outputs from previous documents and statements regarding the product group of printed paper have been taken into account for this revision.

The European Commission Statement from 2009<sup>3</sup> highlighted the following key points for the future revision for the award of the EU Ecolabel to printed paper:

- If the printers and publishers wish to have a broader base on environmental certified paper grades to produce printed paper with the EU Ecolabel.
- The suitability of the assessment and verification of criterion 2a should be reconsidered against chemicals like nanomaterials.
- Criterion 1 should reflect a more horizontal approach concerning the equivalency of schemes to certify the sustainability of substrate fibres in copy and graphic and newsprint paper product groups.

From the previous revision for the establishment of the current criteria of 2012, the following criteria were discussed and they were finally excluded:

- Transport: Requirements on transports were also discussed but the conclusion was that they were not steerable by the most of the printing houses. Therefore, no criteria on transports were proposed.
- Chemicals manufacturing: During the criteria development work, it was also discussed if it is possible to set criteria on the chemicals production as is done for the production of paper. The outcome was, however, that it was beyond the frames of this project to develop such criteria. As regards to the paper production, there are criteria for the graphic paper in EU-flower scheme already. The possibility of developing criteria for the production of the chemicals should be taken into consideration when the criteria for printed paper products are revised.

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<sup>3</sup> Summary of the meeting of the Regulatory Committee established under Article 16 of Regulation (EC) N° 66/2010 of 25 November 2009 of the European Parliament and of the Council on the EU Ecolabel

- Energy: The LCA studies showed that the energy use at printing has some but not a major impact on the environment. The majority of the smaller printing houses has still not actively taken measures in the work with energy savings or renewable energy sources. The requirements on the energy are therefore, drawn up to be flexible. It was judged that it is not possible to set limits to the energy use in printing in this first generation of criteria because the printing houses are far too heterogeneous group as regards the energy use. In the Final draft of Eco-label criteria of 7th October 2005, the purchase of renewable electricity and recovery of energy was among the awarded points.

In addition, other EU Ecolabel paper product groups, such as graphic paper, and their criteria sets have been analysed in order to identify synergies and possible overlaps.

### 3.1.2 Existing legislation and standards

Relevant European environmental policy and legislation has been identified through the environmental regulations database. Specific EU legislation for printed paper products as well as several legislation and standards related to the environment, chemicals, health and safety that directly affect these products are analysed. The following environmental legislation is relevant to the production of printed paper products:

- Directive 2010/75/EU of the European Parliament and the Council of November 2010 on industrial emissions (integrated pollution prevention and control):
  - The IPPC directive aims at reducing, preventing and controlling pollution in an integrated way using "best available technique" requirement (BAT). Printing installations are included in the BREF (Best Available Techniques Reference Document) on surface treatment using solvents.
  - IPPC directive applies only for big plants. Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating, with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year.
- *Council Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installation.*
- *Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance).*
- *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)).*
- *Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a framework for Community action in the field of water policy) for emissions to water.*
- *Directive 2002/61/EC of the European Parliament and of the Council of 19 July 2002 amending for the nineteenth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (azo colourants)) amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations.*
- *Council Directive 75/442/EEC of 15 July 1975 on waste and its amendments.*
- *Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products that will repeal and replace Directive 98/8/EC.*

*The REACH Regulation (EC) 1907/2006* requires that all substances in the EU market are assessed for their impact on human health and on the environment. Appropriate measures to ensure all uses are safe to human health and to the environment must be introduced.

Raw material selection can be influenced by the requirements of specific environmental protection legislation, which applies to printed materials and articles, such as the Packaging Waste Directive, and the Restrictions on Hazardous Substances Directive (RoHS).

Regarding voluntary approaches, a growing number of printed paper products manufacturers are implementing environmental management schemes (e.g. EMAS) in order to improve their environmental performance. Standards, which also have a voluntary nature, are also an important aspect to take into account such as BS EN 643:2014 on standard grades of paper and board for recycling which prohibits any material that represents a hazard for health, safety and environment. Moreover, there are two Technical Committees, the ISO/TC 6 on Paper, board and pulps that develops standards on terminology issues, sampling procedures, test methods, product and quality specifications, and the establishment and maintenance of appropriate calibration systems and the ISO/TC 130 that addresses standardization in the field of printing and graphic technologies.

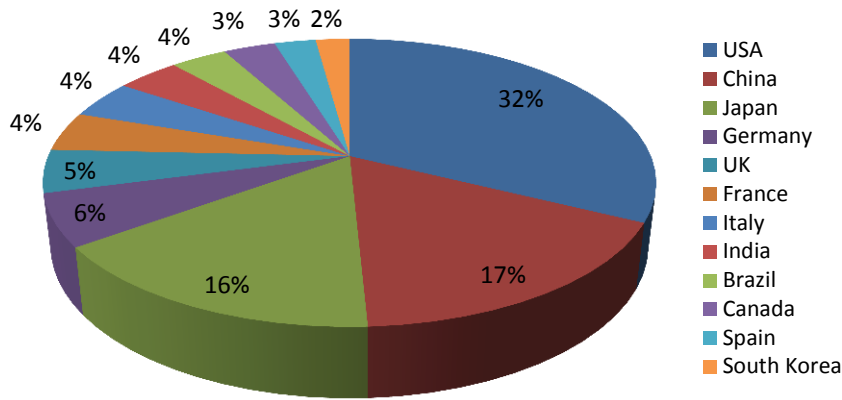
In addition, the main ecological labels in paper products such as Nordic Swan, Blue Angel, NF Environment, Paper by Nature, labels on forest management (FSC and PEFC), etc., have been identified in order to establish a comparison with criteria set in EU Ecolabel and introduce measures to encourage harmonisation with other ecolabel schemes.

### **3.1.3 Market analysis**

The market report outlines the key characteristics of the European printed paper sector. It also provides an overview on the printing industry and printed paper products market at global and European level while showing its current size by volume and value. The European market is analysed considering the different member states, types of printed products, and different printing technologies. Main trade transactions are also analysed at intra and extra EU28 level.

The global printing industry is dimensioned to be \$980 bn by 2018. The sector is driven by growth in packaging and labels, whereas graphic applications are suffering a decrease in production during the last years. Regarding printing technologies, digital is gaining importance over analogue printing.

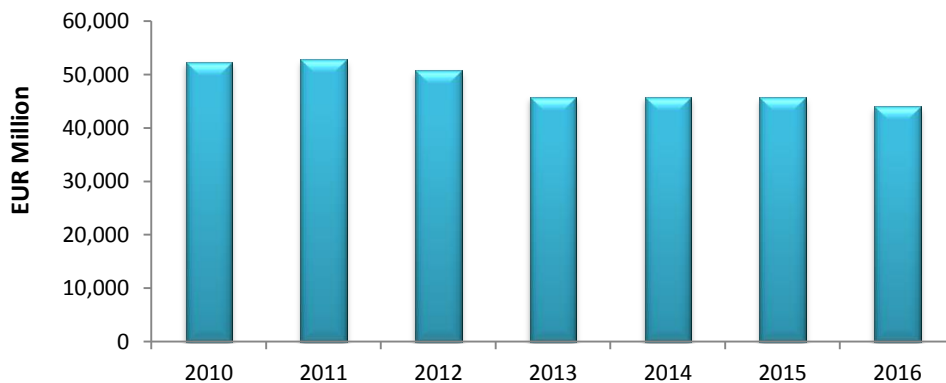
The US is the world's biggest print market (32%) (Figure 2). It is followed by China (17%) while the emerging markets are displacing US and EU in terms of production. European countries represent the third biggest region in terms of printed paper manufacturing, after Asia (37%) and North America (26%).



**Figure 2. Market share of top 12 countries in printing (2014)**

Source: PRIMIR World Wide market for print 2014.

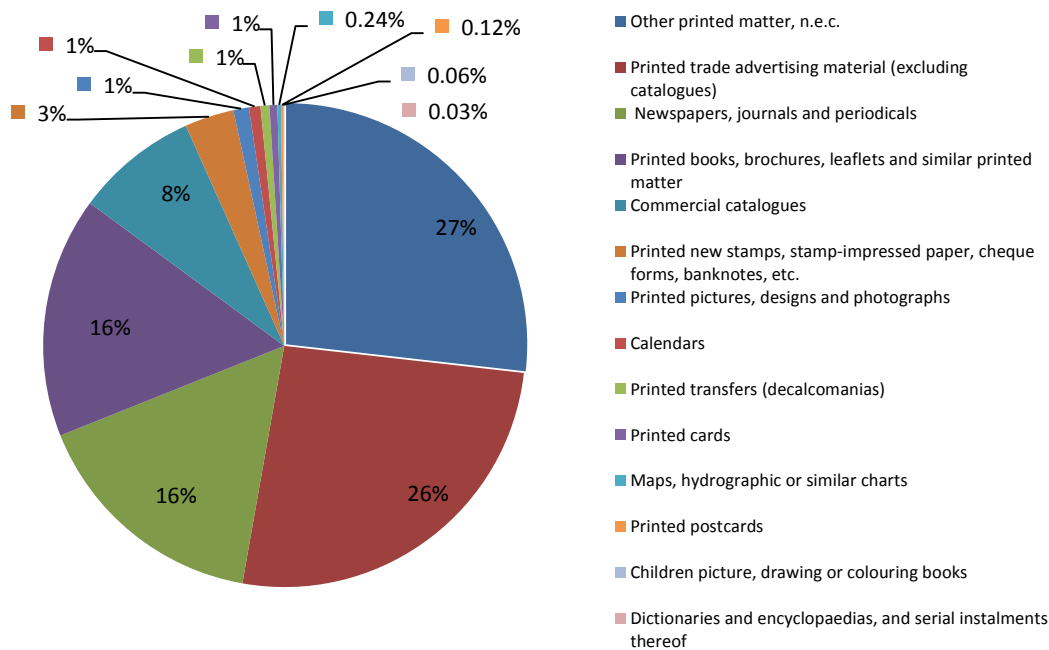
The EU paper printing industry generates an annual turnover of around € 52 bn, where printing activities account for €44 bn (Figure 3). During the last years, the EU printing market has experienced a continuous decrease in terms of production. Germany is leading with production value over € 10,000 m, followed by United Kingdom, Italy and France, which have also important production values exceeding € 4,000 m each.



**Figure 3. Evolution of the EU printed paper products production value (2010-2016)**

Source: Eurostat - PRODCOM

The EU printing industry produces different types of products; those with high market share are printed advertising material (26%), commercial catalogues (8%), books, brochures and leaflets (16%), and newspapers and journals (16%). The 27% are "other printed matter" which includes packaging products (Figure 4).



**Figure 4.** EU market value of printed paper by type of product (2016)

Source: Eurostat - PRODVAL

Main suppliers for the printing industry, besides paper manufacturers, are the chemical industry (€713 bn) as well as inks (€3.1 bn) and printing equipment (€4.42 bn) manufacturers.

Printed paper products are demanded all over the world, and therefore export represents a key activity for European companies. The total printed paper products EU exports, including intra-EU28 and extra-EU28, was €17,984 m (40% of the European production value). The total import transactions in 2017, in the EU member states, were worth €13,430 m (30% of the European production value). These data include intra and extra EU transactions. The aggregated balance of trade for the European Union (EU28) was positive, meaning that exports are higher than imports by € 4,554 m. Most of the imports (77%) and exports (69%) are carried out between EU Member states.

. At European level, a decrease of all paper products except packaging and labels is expected. New technologies and electronic media are gaining position in publications and commercial products. As a consequence, printed material as a communication medium is diminishing. Regarding consumers, although they express concerns about the environmental impacts of the printing industry and printing paper products, many of them still prefer paper-based to digitally printed products due to reading habits and lack of internet access. Nevertheless, the vast majority recognises that paper-based communication needs to be sustainable.

### 3.1.4 Technical analysis – Description of printing technologies

The main aspects regarding printed paper materials and technologies used in the EU are summarized as follows:

- Flexography is a well-established printing technology. It is a high resolution and high productivity process. The use of UV curable inks is increasing. However, pre-press is required and waste and emissions are release to the environment.

- Offset is also a crucial technology, but its importance is decreasing. It is a high resolution and very high productivity process. The use of bio-based components in offset ink formulations is increasing. Pre-press is required.
- Rotogravure is also an important technique. It is a very high resolution and productivity process. The use of more environmentally friendly retention inks is established in the EU. Pre-press is also necessary.
- Inkjet is also a well presented printing technique, particularly for wide format printing, and common for home desktop printers. It has a very high resolution and pre-press is not required. The main environmental advantages are low cost per copy for small editions, use of water-based or solid inks (100%) and low waste and emissions. On the contrary, relatively small editions are required due to low productivity. On the contrary, lower print quality and higher production costs are associated with high print runs.
- The importance of electrography is increasing for office printers and digital print presses at industrial scale. It is associated with low cost per copy for small editions. Pre-press is not required. It is a high resolution printing technology that operates environmentally friendly solid inks (100%) while generating low waste and emissions. On the contrary, relatively small/medium editions are required due to low/medium productivity. Analogous to ink-jet printing technology, a lower print quality and higher production costs are related to high print runs. Moreover, relatively high maintenance costs are associated to electrography.

### **3.1.5 Life Cycle Assessment**

The aim of this section is to analyse the potential environmental impacts related to the printing industry, including the printing house impacts and those associated with printed paper products.

To identify the most important aspects of the examined system, a screening LCA is performed. A critical review of published LCA studies is carried out to draw the main conclusions. This analysis aims at identifying the main environmental areas of concern and lifecycle hotspots and estimating environmental improvements.

Besides the LCA screening, a simplified LCA of two case studies is performed, analysing two standard products a magazine and a book, both produced using offset printing. These LCA have been performed by LEITAT, with primary data from the European LIFE+ project 'Greening Books'. The data are revised and updated for this project.

Most of the papers refer to printed paper products: books, magazines or newspaper while others encompass a comparison between printed and digital products. In those cases, the information about the printed product is analysed.

Most of the journal papers conclude that the main impact of a printed product is sourced to the paper production. On the other hand, printing has also an important environmental contribution due to the electricity consumption and the chemicals used during the process.

Different points were identified as relevant for the improvement of the environmental profile of printed papers:

- Paper production is the main contributor to the environmental impact; the selection and manufacturing of this paper have to be considered. The introduction of recycled fibre in paper production could lead to an environmental impact reduction.
- Next to fibres, water is the most relevant raw material.
- A clear environmental advantage for vegetable inks in comparison with mineral-based inks cannot be stated.

- Energy consumption is always relevant to the overall impact of a process. For this reason, electricity consumption during printing could be a significant impact contributor. Hence, introducing energy efficiency measures in the printing facilities could reduce the environmental impact.
- The manufacturing process (including printing), is also related to VOCs generation.
- Decisions that are taken in the design stage can determine the amount of paper and ink used, as well as the use of other materials, and therefore should not be ignored.
- End-of-life of printed product has significant life-cycle impacts. For instance, the carbon footprint of newspapers could double if newspapers are disposed of to landfills instead recycled or incinerated.
- The Book system is very sensitive to the number of users per book.

A summary of the hotspots identified during the LCA screening are presented in the following Table 1.

**Table 1.** LCA for printed paper products - Key impact parameters identified

<b>RAW MATERIALS</b>	
Substrate	Origin: recycled fibres Certification: type I ecolabels
Inks	Origin: vegetable inks or water-based inks
Adhesives	Recyclability: adhesives accepted in the recycling process Best environmental techniques
Other chemicals	Toxicity Best environmental performance
<b>PRODUCTION</b>	
Emissions	Emissions to air: VOC Emissions to water
Energy and water consumption	Energy sources: renewable sources Energy consumption Best environmental practices: annual energy reduction goal Water consumption
Waste	Inks and toners Washing agents, etc. Unsorted waste control
Design	Eco design strategies
<b>PACKAGING</b>	
Quantity	Eliminate or reduce the packaging of the product Avoid unnecessary packaging
Materials	Use of more sustainable options
<b>USE</b>	
Lifespan	Reuse
<b>END-OF-LIFE</b>	
Consumer	Information regarding recyclability
Waste treatment	Recyclability of the product



The conclusion of the LCA screening is that the analysed literature is sufficient to identify environmental hotspots of printed paper products. This information supports adequately the criteria revision process. Nevertheless, additional scientific literature has been consulted, beyond LCA studies, for examining specific parameters, such as chemicals which are not covered by the LCA studies. Furthermore, although LCA papers analyse the whole life cycle stages, specific data on printing technologies and finishing processes are not assessed in detail. Additional technical studies have been analysed to address these limitations.

## **3.2 Converted paper products**

### **3.2.1 Product group name, scope and definition**

Research was carried out in order to review the scope of the product group. Various definitions of converted paper products and related terms are provided as well for the product group in the related industry and in other ecolabel schemes. The outcome of the analysis is further explored under Chapter 4 that provides the rationale for the proposed scope and definition. It also clarifies the reasoning behind the proposal of merging converted paper and printed paper products under one common **Commission Decision for converted and printed paper products**.

### **3.2.2 Legal and policy context**

The preliminary report focuses on legislation related to the converted paper industry which is of particular relevance to EU Ecolabel criteria, namely:

- The EU Ecolabel Regulation that establishes the legal base for the criteria revision..
- Chemical-related Regulations: i.e. REACH, CLP and the Biocidal Products Regulation. All EU Ecolabel product groups must have restrictions on the use of hazardous chemicals and the approach taken must be in line with these Regulations. It will be important when dealing with chemical suppliers and especially with hazardous substances that can remain in the final product.
- The Industrial Emissions Directive: The recently published BAT report sets out limits for emissions to air and water (COD, S, NO<sub>x</sub>, P, AOX) and specific energy consumption based in the type of process used. These will influence the relevant ambition level of current criteria.
- The Renewable Energy Directive: This will have an important indirect influence on the paper industry as the demand for renewable energy from biomass increases.
- The Air Quality Framework Directive: This sets a wider context for emissions of S, NO<sub>x</sub> and other pollutants from pulp and paper plants.
- The Timber Regulation: places responsibilities on suppliers and importers of wood or wood-based materials in the EU market.

### **3.2.3 Market analysis**

The market analysis is based on information gathered from industry, scientific publications and market research reports. In particular, specific data referring to the European market for converted paper products are sourced from official EU production statistics in PRODCOM for distinct categories covered by the Commission Decision 2014/256/EU. The majority of converted products fall under two main NACE codes 17.12 (manufacture of paper and paperboard) and 17.23 (Manufacture of paper stationery). In order to provide an indication of the market structure of converted paper products as

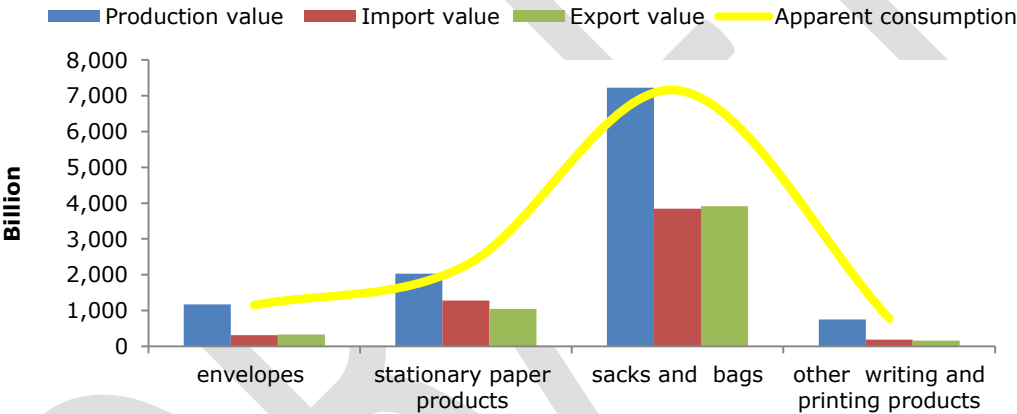
defined in the Commission Decision 2014/256/EU, equivalence of these products with those in the identified NACE codes is assumed.

European converted paper products industry is strongly affected by the emergence and expansion of digital media and paperless communication as in most developed countries with consequent impact on the apparent consumption (Figure 5).

According to EUROSTAT, production volumes of converted paper products were at 3,507 tonnes in 2016. This represents a slight increase on 2015 figures (+1.5%), mainly from the increase of paper carrier bags.

For EU28, import trade values of the considered converted paper products amounted to EUR 1,125 billion while exports were at EUR 625 bn. Imports registered slight changes, in particular imports on carrier bags and on writing material products were increasing by 8% and 2% respectively, in 2017. Similar trends are registered for export trade values with even lesser variations.

Production volumes in future years are estimated for the converted paper products analysed, on the base of historical trends. Paper carrier bags are expected to increase in sold production volumes by about 50% in 2021. For envelopes and other paper stationery products, a 20% to 26% decrease to the sold production in 2016, is expected in 2021.



**Figure 5.** The EU market production, import, export and apparent consumption value for converted paper products in 2016.

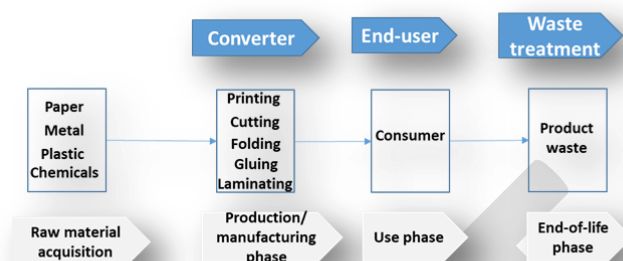
The slow market uptake raises concern over difficulties that manufacturers and related stakeholders might be faced in obtaining the EU Ecolabel and whether the scope definition and criteria are representative enough of common market practices. Hence, a revision of the EU Ecolabel is an excellent opportunity to identify suitable deployment measures to improve the widespread market uptake of the criteria for converted products.

**3.2.4 Life cycle assessment**

To identify relevant environmental impacts of those products along their life cycle a state of the art of the current published studies on the life cycle assessment of the converted paper products covered by the EU Ecolabel has been carried out. Hence, documents and LCA studies whose scope and definition includes, as a minimum, the supply of raw materials and manufacturing of converted paper products were collected and reviewed. When it was possible, LCA studies and LCA related analysis were also carried out based on primary data provided by actors in the related industry. This was the case for those

products whose LCA studies were not publicly available or did not contain sufficient information needed to inform the revision process for example envelopes.

According to the LCA studies analysed, it was possible to identify the environmental hotspot across product life cycle. The figure below illustrates the various life cycle stages of a converted paper product such as paper carrier bags, envelopes, notebooks, folders etc.



**Figure 6.** Various life cycle stages of a converted paper product

The LCA studies reviewed and considered for the different converted paper products indicate that:

- The use of recycled paper in paper carrier bags has a positive effect on both energy and materials related impacts
- Envelopes with windows made up of reduced/recycled plastic have reduced environmental impacts
- Notebooks with spiral binding (plastic or fibre cover) generally have higher impacts
- Among filing stationery products, impacts of lever arch files are the highest followed by those of archive boxes.

In these products, the bulk of impacts (more than 70%) will occur at the upstream raw materials acquisition/production phase. For GWP, the contribution from raw materials acquisition/production, though lesser in the case of other impacts, is still predominant followed by contributions from the manufacturing or converting phase. In the case of paper carrier bags, 33% of GWP comes from the raw material production phase while 21% from the carrier bags manufacturing phase. Further analysis on impacts occurring at the raw materials acquisition phase has shown significant contributions related to the production of pulp and paper used in these products. For all impact categories considered, pulp and paper's production contributes to about 90% of total impacts.

Considering the contribution from non-paper contents of converted paper products, metal components have a higher share of impacts compared to plastics. When comparing two notebooks with the same writing area (one with metal coil binding, and the other without), the former can be attributed 29% to 43 % more impacts than the latter for marine, freshwater and terrestrial eco-toxicity, and 17% for particulate matter formation. Chemicals including ink appear to contribute very little to impacts of the raw material acquisition of converted paper products. In the case of envelopes, inks contribute barely 3% to all impacts except Terrestrial eco-toxicity where the contribution is 19%. Table 2 shows the relation between the impact hotspots and revised EU Ecolabel criteria.

**Table 2.** Link between the impact hotspots and the revised EU Ecolabel criteria for converted paper products

Hotspots	EU Ecolabel criteria	Comments in the related criteria
Abiotic depletion fossil	Criterion 1 – Paper and board substrate	It ensures a reduction in energy use, which is the main source of impacts in the pulping, papermaking and board making processes in particular the use of recycled paper. It limits the emissions to air of CO <sub>2</sub> e emissions arising mainly from the energy consumption in the pulping, papermaking and board making process
	Criterion 7 - Energy	It promotes energy efficiency practices in the converting process ensuring that production sites reduce their energy consumption following a continuous improvement approach
Global warming potential	Criterion 1 – Paper and board substrate	It limits the emissions to air of CO <sub>2</sub> e emissions arising from the pulping, papermaking and board making process. It ensures a reduction in energy use, which is the main source of CO <sub>2</sub> e emissions in the pulping, papermaking and board making processes.
	Criterion 3 – Excluded or limited substances and mixtures	It limits the use of washing agents, varnishes, inks dyes and solvents containing VOC mainly responsible for tropospheric ozone depletion.
Photochemical oxidation	Criterion 5 - Emissions	It limits the emissions of VOC in the converting process responsible for ozone depletion which increases risks of mortality from respiratory diseases.
	Criterion 1 – Paper and board Substrate	It limits the hazardous substances and mixtures that can be included in paper, board and pulp, limiting environmental and health risks for employees and consumers.
Human toxicity	Criterion 3 – Excluded or limited substances	It limits the hazardous substances and mixtures that can be included in the converting process limiting environmental and health risks for employees and consumers.
	Criterion 1 – Paper and board Substrate	It ensures that pulp, paper and board production sites have appropriate waste management systems in place, maximizing the recovery of materials and ensuring safe disposal of hazardous waste
Abiotic depletion elements	Criterion 2 – Resource conservation	It promotes best practices for resource conservation by encouraging the recovery of waste materials.
	Criterion 6 - Waste	It ensures that converted paper production sites have appropriate waste management systems in place, maximizing the recovery of materials and ensuring safe disposal of hazardous waste
	Criterion 4 - Recyclability	It ensures that converted paper products are recyclable at end of life by limiting the use of substances and components that can hinder the recycling process, for example wet strength agents, adhesives, varnishes, lamination and components that are not easily removable.
	Criterion 1 – Paper and board Substrate	It limits emissions of substances to water that have nutrient-enriching effects and lead to high oxygen demand
Eutrophication	Criterion 1 – Paper and board Substrate	It limits emissions of SO <sub>2</sub> to air responsible for health hazards due to acid rain
Acidification	Criterion 1 – Paper and board Substrate	

In the case of Criterion 1, potential savings in energy can be achieved by using recycled paper. LCA study showed that paper carrier bags with 85% recycled content leads to 38.6% less primary energy use compared to 100% virgin paper bags. Also in the case of acidification and Eutrophication potential only 15% virgin fibre contributes to 24% and 48% of impacts respectively.

As regards consumption of raw materials or natural resources, reducing the window plastic content by 2% leads to savings of 9% Abiotic depletion fossil and reduces impacts by 5% for Global warming potential and 3.7 % for Acidification.

### 3.2.5 Technical analysis

A technical analysis was focused on the converting processes applied on paper and board, from the paper making process to produce converted paper articles. The aim of this analysis was to shed light on environmental issues that result from design and production techniques adopted for converted paper products. It enabled to identify improvement potential and best practices related to the LCA results. The outcome of the study will be incorporated into Rationales for the revision proposal for each corresponding criterion.

## 4 SCOPE REVISION

### Current scope (printed paper products)

- 1). The product group 'printed paper' shall comprise any printed paper product that consist of at least 90 % by weight of paper, paperboard or paper-based substrates, except for books, catalogues, booklets or forms that shall consist of at least 80% by weight of paper or paperboard or paper-based substrates. Inserts, covers and any printed paper part of the final printed paper shall be considered to form part of the printed paper product.
- 2). Fixed inserts to the printed paper product (not intended to be removed) shall fulfil the requirements of the Annex to this Decision. Inserts that are not fixed to the printed paper (such as flyers, removable stickers) but sold or provided with it, shall fulfil the requirements of the Annex to this Decision only if the EU Ecolabel is intended to be placed on them.
- 3). The product group 'printed paper' shall not include the following:
  - 3a). Printed tissue papers;
  - 3b). Printed paper products used for packaging and wrapping;
  - 3c). Folders, envelopes, ring binders and stationary paper products.

### Current scope (converted paper products)

- 1). The product group 'converted paper products' shall comprise the following products:
  - 1a). envelopes and paper carrier bags that consist of at least 90 % by weight of paper, paperboard or paper-based substrates
  - 1b). stationery paper products that consist of at least 70 % by weight of paper, paperboard or paper based substrates, except for suspension files and folders with metal fastener subcategories

In the case referred to in point (1b), the plastic component cannot exceed 10% except for ring binders, exercise books, notebooks, diaries, and lever arch files where the plastic weight cannot exceed 13%. Furthermore, the metal weight cannot exceed 30 g per product except for suspension files, folders with metal fasteners and ring binders where it can be up to 50 g and except for lever arch files, where it can up to 120 g.

- 2). The product group 'converted paper product' shall not include the following products

- |      |  |
|------|--|
| 2a). | printed paper products included in the EU Ecolabel as established in Commission Decision 2012/481/EU |
| 2b). | Packaging products (with the exception of paper carrier bags)  |

#### 4.1 Scope merging

The ISO 4046-1 2016 defines "converting" as the set of processes or operations applied after the basic paper or board manufacturing. Therefore, the term "conversion" usually refers to series of operations that aim at transforming raw paper into new finished products, such as books, envelopes, paper tubes, paper towels, paper bags, boxes, containers, and a full range of other paper-based articles of different function and destination. Printing might therefore form an integral part of the conversion process and again printed matter is also converted.

The compatibility of the two product groups is also reflected by the overlap between the currently valid criteria. Hence, some ecolabel schemes, such as Nordic Swan, accommodate converted and printed paper products under one scope.

The EU Ecolabel is a part of the wider portfolio of product policy instruments that contribute to the circular economy targets. The Fitness Check study (evaluation study and stakeholder consultation) shows that the uptake of the schemes could be better and more efficient if applying a more focused approach to maximize impacts on the ground (EC, 2017)<sup>4</sup>. In order to improve the performance of the EU Ecolabel regulation scheme, making it more focused to ensure bigger cumulative impact, a more targeted approach should be developed. It should include bundling of closely related product groups where appropriate. The above mentioned Fitness check conclusions support the idea to merge both Decisions into one (i.e. as currently being done for graphic and tissue paper).

With the objective to ensure coherence between different product groups, and avoid redundancy, this revision tends towards aggregating category similar articles, for which analogous criteria could apply, within the same product group. The scope and definitions of merged product groups should be further explored and discussed with stakeholders.

Furthermore, the magnitude of correlation between the product groups justifies the preparation of one technical report for the two product groups. The latter addresses common areas while distinguish between the product specific issues.

#### 4.2 New scope definition

The division of converted and printed paper products might be misleading for a consumer, especially considering that the same article might be both printed and converted i.e. envelopes.

The analysis revealed that other ecolabel schemes require different thresholds for paper and non-paper content compared to the current criteria of EU Ecolabel for converted paper products. In particular, the products labels and gift wrappings are included in the scope of these ecolabels and the Blue Angel sets a threshold of 5% for non-paper-content in office and school paper finished products.

Merging of the EU Ecolabel criteria for printed paper products and converted paper products, would imply change in the product group name. In order to well reflect the

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<sup>4</sup> REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the review of implementation of Regulation (EC)No 122/2009 of the European Parliament and of the Council on 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS) and the Regulation (EC) No 66/2010 of the parliament and of the Council of 25 November 2009 on the EU Ecolabel. COM(2017) 355 final

intention of the revised product group it is proposed to change the name of the product group into **converted and printed paper products**.

According to the above mentioned issues, the **proposed revised scope and definition** aim to accommodate the currently valid terminology, as follows:

**1. The product group 'converted and printed paper' shall comprise the following products:**

- 1a). Printed and/or converted paper products including printed matter, envelopes, writing products, and paper bags that consist of at least 90 % by weight of paper, paperboard or paper-based substrates;
- 1b). Books, catalogues, pads, booklets or forms that shall consist of at least 80 % by weight of paper or paperboard or paper-based substrates. Inserts, covers and any printed paper parts of the final product shall be considered to form part of the product.
- 1c). Paper wrappings including paper carrier bags and paper gift wrap (parcellings) that consist of 100 % by weight of paper, paperboard or paper-based substrates;
- 1d). Stationery paper products including filing products that consist of at least 70 % by weight of paper, paperboard or paper based substrates, except for suspension files and folders with metal fastener for stationery paper products.
- 1e). For the products referred to in point (b) fixed inserts to the printed paper product (not intended to be removed) shall fulfil the requirements of the Annex to this Decision. Inserts that are not fixed to the printed paper (such as flyers, removable stickers) but sold or provided with it, shall fulfil the requirements of the Annex to this Decision only if the EU Ecolabel is intended to be placed on them.
- 1f). For products referred to in point (d) the plastic component cannot exceed 10 % except for ring binders, exercise books, notebooks, diaries, and lever arch files where the plastic weight cannot exceed 13 %. The metal weight cannot exceed 30 g per product except for suspension files, folders with metal fasteners, ring binders and lever arch files having a filing capacity of up to 225 sheets where it can be up to 50 g and except for lever arch files having a filing capacity of more than 225 sheets, where it can be up to 170 g.

**2. The product group 'converted and printed paper products' shall not include the following products:**

- 2a). Packaging products (with the exception of paper carrier bags and gift wrappings).
- 2b). Printed tissue papers

#### **4.2.1 Proposed criteria structure**

As most products are printed and converted, these two product groups could be merged into one Annex that would include two sections:

- **Part A: requirements related to paper substrate.**
- **Part B: requirements related to printing and conversion processes.**

The objective is to address the differences between conversion and printing processes, and thus allow licensing the product that is i.e. printed but converted. Another possibility is to maintain the product groups in two separated Annexes, one for converted paper products, and another for printed paper products. **Accordingly, the degree of merging is proposed to be further discussed with stakeholders during the first AHWG Meeting.** A scheme representing the current criteria and the ones after merging is depicted in Table 3.

**Table 3.** Comparison of criteria considering different scopes

<b>Criterion</b>	<b>Printed Paper (PP) Decision 2012/481/EU</b>	<b>Converted Paper Products (CPP) Decision 2014/256/EU</b>	<b>Substantial divergences between criteria</b>
<b>Substrate requirements</b>	<b>Criterion 1</b>	<b>Criterion 1</b>	X*
	1 (a) Referred to EU Ecolabel for graphic paper (2011/333/EU)	1 (a) Referred to EU Ecolabel for graphic paper (2011/333/EU), for newsprint paper (2012/448/EU)	X*
	1 (b) Referred to EU Ecolabel for newsprint paper (2012/448/EU)	1 (b) Board Substrate requirements	CPP accommodates the use of board. The main differences consist in a specific requirements for lamination, and board manufacturing. Requirements for board substrate that accommodate lamination and board manufacturing
<b>Fibres: sustainable forest management</b>	(requirement covered by EU Ecolabel for graphic paper, and newsprint paper)	<b>2</b>	X* (different thresholds set for the content of uncertified material)
<b>Excluded or limited substances and mixtures</b>	<b>Criterion 2</b>	<b>Criterion 3</b>	X*
Hazardous substances and mixtures	2 (a)	3 (a)	X*
Substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006	2 (b)	3 (b)	X*
Biocides	2 (c)	3 (c)	X*
Washing agents	2 (d)	3 (d)	X*
Alkylphenoethoxylates — Halogenated solvents — Phthalates	2 (e)	3 (e)	X*
Printing inks, toners, inks, varnishes, foils and laminates	2 (f)	3 (f)	X*
Metal components	-	3 (g)	Applicable only to CPP (stationary paper products)
<b>Recyclability</b>	<b>Criterion 3</b>	<b>Criterion 4</b>	CPP does not include de-inkability requirement
<b>Emissions (from printing/converting)</b>	<b>Criterion 4</b>	<b>Criterion 5</b>	



<b>Criterion</b>	<b>Printed Paper (PP) Decision 2012/481/EU</b>	<b>Converted Paper Products (CPP) Decision 2014/256/EU</b>	<b>Substantial divergences between criteria</b>
<b>process)</b>			
Emissions to water	4 (a)	5 (a)	X*  <i>(In the CPP criterion the recommended test methods are specified for rotogravure printing)</i>
Emissions to air	4 (b)	5 (b)	X*
Emissions from publication rotogravure printing	4 (c)	-	Applicable only to PP
Printing processes to which no legislative measures apply	4 (d)	-	Applicable only to PP
<b>Waste</b>	<b>Criterion 5</b>	<b>Criterion 6</b>	
Waste management	5 (a)	6 (a)	X*
Waste paper	5 (b)	6 (b)	CPP sets the threshold for the specified type of product (envelopes, stationary, and paper bags), and accommodates printing and conversion process.  PP sets the threshold in function of the type of printing technique used.
<b>Energy use</b>	<b>Criterion 6</b>	<b>Criterion 7</b>	X*
<b>Training</b>	<b>Criterion 7</b>	<b>Criterion 8</b>	X*
<b>Fitness for use</b>	<b>Criterion 8</b>	<b>Criterion 9</b>	X*
<b>Information on the product</b>	<b>Criterion 9</b>	<b>Criterion 10</b>	X*
<b>Information appearing on the EU Ecolabel</b>	<b>Criterion 10</b>	<b>Criterion 11</b>	X*

\*X means no substantial differences in the subject matter of the requirement were observed

Key aspects identified, for the further consideration during the merging discussion, are presented in the following sections.

#### **4.2.2 Specific scope aspects**

Conversion processes aim at taking raw paper and creating a finished product such as envelope, notebook, book or magazine, among others. In this line, printing process that in principle falls under the scope of EU Ecolabel for printed paper products could be

incorporated into the revised scope and definition. This is in line with the current criteria that incorporate requirements for a product that is both printed and converted. The exact wording should be further discussed with stakeholders.

**4.2.2.1 Paper substrate**

Under the currently valid criteria for converted paper products paper substrate is separated into two types:

- **'Board substrate'**: means paperboard, cardboard or board, unprinted and not converted, with a basis weight higher than 400 g/m<sup>2</sup>;
- **'Paper substrate'** means paper sheets or reels of not converted, unprinted blank paper and not converted boards up to basis weight of 400 g/m<sup>2</sup>;

This distinction is built on the former scope of EU Ecolabel criteria for copying and graphic paper that encompasses the grammage restrictions (upper limit of 400 g/m<sup>2</sup>). Nevertheless, within the recent revision of EU Ecolabel criteria for graphic paper, the reference to grammage was assumed as being misleading and not related to the industry practice, and consequently was agreed to be withdrawn. Hence, **similar approach is proposed** in order **to harmonise** the current revision **with EU Ecolabel criteria for graphic paper** that are proposed to serve as the key reference for substrate requirements. This is assumed to increase the uptake of the paper-based product groups.

Harmonisation will also simplify the administrative procedure necessary for the criteria verification. On the other side, it might imply merging of currently valid criterion 1 for converted paper products (Part A and B that establish paper substrate requirements, separately for paper and board). The **main difference between Part A and B consist on energy consumption threshold during lamination and board production.** .

This aspect should be further discussed with stakeholders.

Sustainable forest management requirement also refers to paper substrate. It is therefore proposed to be integrated under Criterion 1.

The sustainable forest management criterion, developed during the revision of graphic and tissue paper products, should be taken as the starting point, investigating if this level of sustainable fibre (certified virgin and/or recycled) content can be adopted to the finished products. Life cycle consideration, market availability of certified material and companies marketing strategies for green products should also be considered.

Last but not least, within the revision process, the following substrate-related aspects should be further discussed with stakeholders:

<b>Points for discussion</b>
Should only EU Eco-labelled paper substrates be allowed (as it is now the case for printed paper) or should alternative means of proof apart from an EU Ecolabel certificate for the paper substrate be allowed?
Should the paper substrate used in printed and converted paper need to comply with all or only the main criteria of the revised criteria for graphic paper?
Is an exemption for certain paper components, like back labels for folders needed?
Is specific value for lamination necessary, or it can be accommodated under the EU Ecolabel criteria for graphic paper?

#### **4.2.2.2 Excluded or limited substances and mixtures – metal components**

The requirement is product specific and refers to type of stationary paper products, i.e. suspension files can, in weight, include 25% of metal (bar & eyelets) while lever Arch files can easily include 18% of metal. In filing products, three different kinds of metallic parts can be considered:

- Metal bar for suspension file is made of steel with nickel surface treatment.
- Mechanisms for ring binder and lever arch file are made of steel with nickel surface treatment.
- Flat metal bar for folder consists of steel with tin surface treatment.

#### **4.2.2.3 Recyclability**

Prove of de-inkability is not addressed by the current criterion for converted paper products as it was considered an improvement to strive for in the future. Use of deinkable flexo-inks was assumed not to bring a measurable environmental improvement<sup>5</sup>. Nevertheless, it is accommodated under the criteria for printed paper. The deinking efficiency depends on printing method, printing substrate type, and printing ink chemical composition<sup>6</sup>. Considering the product that is both printed and converted (i.e. envelopes), the need to harmonise the de-inkability requirement between the product groups should be further explored in line with the Commission statements for converted paper products.

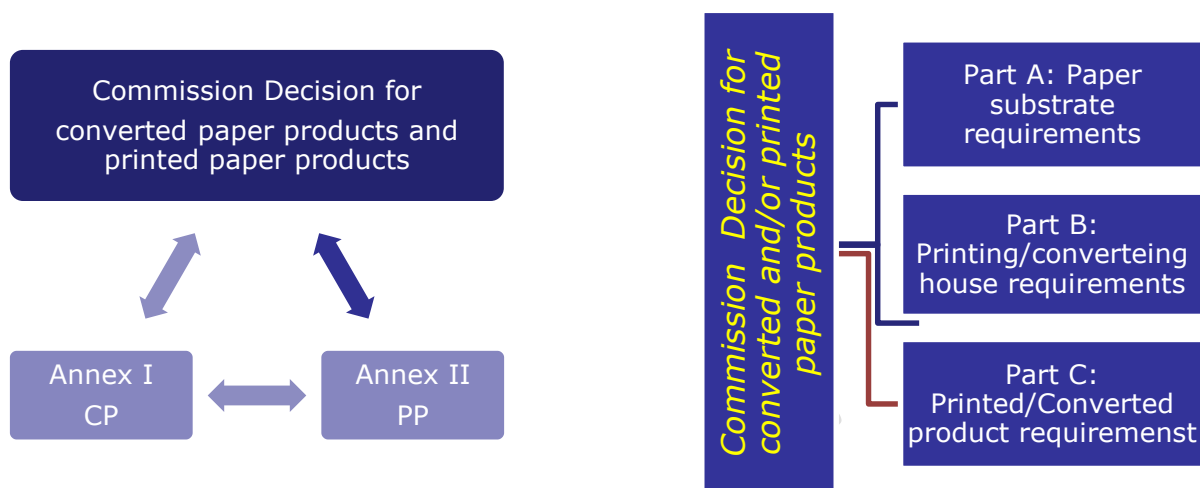
#### **4.2.2.4 Waste**

The quantity of waste paper generated during production stands for of particular divergence between converted and printed paper criteria. In the case of converted paper products, the criterion sets a threshold based on the product type (envelopes, stationery, paper bags etc.), whereas for printed paper products specified printing processes are addressed. The preliminary analysis shows that the total quantity of paper wastage during the conversion process includes paper rejects from the printing and conversion process (i.e. cuttings). Therefore, it is reasonable to revise the criterion while merging the scopes. That in turn would imply the development of product-specific sub-criteria. All in all, the possible option for the stricture of the revised criteria is presented in Figure 7.

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<sup>5</sup> Bureau Veritas. 2013. Converted Paper Products. The EU Ecolabel criteria Background Report.

<sup>6</sup> Carré,B., and Galland,G. (2007). "Overview of deinking technology,"8th CTP/PTS Deinking Training Course, Grenoble ,pp.1-24.



**Figure 7.** Proposals for Commission Decision modification

#### 4.2.3 Printed paper products – Specific scope modification proposals

The printed paper specific proposals for revising the scope are as follows:

- A possible extension to printed products to printing services should be investigated.
- Extension to other printed paper products, inclusion/exclusion of specific products.
- Exclusion or inclusion of specific printing technologies.

##### **PROPOSAL 1 – Analysis of extension to printed products to printing services**

The proposal might allow EU Ecolabel to be awarded to printing companies providing printing services, besides the printed final products.

If the scope is extended so that printing companies could be certified, requirements about the quantity of printing on paper activity (minimum % of the total turnover), suppliers, and pre-printing and post-printing services should be set.

In the questionnaire, stakeholders were asked about the possibility to change the product group of printed paper products from product to service. As result, 17% of the stakeholders agree to change to service, 26% are against this modification while 40% of the stakeholders are not sure about the change. Considering the replies, a clear conclusion on the stakeholders' interest cannot be extracted.

Ahead of the scope merging, an expansion to services will impose additional criteria modifications or development of new criteria which is against to the will of the stakeholders as expressed in the questionnaire replies. Moreover, to certify a company which produces ecolabelled and non-ecolabelled products simultaneously might cause implications in the verification. An additional constraint will rise due to the scope merging as new criteria for conversion and printing services should be created separately. Due to these reasons an extension might cause a drawback to the number of licenses.

All in all, from the perspective of the criteria revision process, **it is not recommended to accommodate printing service under the criteria set.**

### **PROPOSAL 2 - Extension to other printed paper products, inclusion/exclusion of specific products**

The extension of the scope regarding products is suggested by some stakeholders (31% of the questionnaire respondents). However, 34% of them do not see a scope amendment as necessary. Reflecting on this, an extension of the scope by merging the printed and converted paper products is suggested.

### **PROPOSAL 3 - Exclusion or inclusion of specific printing technologies**

The current EU Ecolabel scope does not exclude any specific printing technologies, so in practice all printing techniques can be used for printing eco-labelled products. The exclusion of some of them will be discussed in the first AHWG meeting. The reasons for exclusions could be related to different aspects, such as:

- The market uptake of specific printing technologies.
- Uncertainties of the sustainability behaviour of some emerging technologies and innovations.

As example, the Nordic Swan excludes screen and letterpress printing in the fifth generation of its criteria. Letterpress is an old method which, in practice, has been replaced by flexography. Screen printing is used extensively in connection with materials other than paper. In a similar way, the Blue Angel scope specifies that the product must be produced using one or more of the following printing processes sheet-fed offset, cold-set web offset, heat-set web offset, rotogravure, flexographic or digital printing.

#### **4.2.4 Converted paper products – Technical specifications of the scope revision proposal**

According to ISO 4046-: 2016, conversion process is defined as the manufacturing and finishing processes or operations applied to paper or board. This general understanding is also reflected in the NACE code 17 which splits the manufacture of pulp, paper and paper products into the manufacture of pulp, paper and the manufacture of converted paper products, the latter referring to further-processing of paper.

There is a broad range of products that are classified as converted paper products. The current scope focuses on selected stationary paper products (including envelopes), and paper bags.

In order to aid understanding and reduce confusion among manufacturers of converted paper products, it is proposed to further discuss if the product group name and definition should specify product types that are included (based on functionality and end use that shall be considered), namely: *paper stationery and paper wrapping*.

As a matter of fact, envelopes are classified as stationeries under the NACE classification and understood as such by the related industry. Gift wraps have a similar production process (and hence environmental impacts) as paper carrier bags which are included in the existing scope. The use of the name 'wrappings' stems from the CEPI classification of paper which includes sack kraft, machine glazed paper (MG), other wrapping kraft, sulphite and grease-proof papers. The packaging material is excluded from the scope, therefore a specific provision is needed for paper carrier bags and gift wraps that are proposed to be included in the scope.

The proposed scope does not address labels mainly because there was not sufficient information to assess their environmental impacts. However, it is worth mentioning that labels used in converted paper products are limited to those on the back of lever arch files and ring binders, where they constitute less than 0.2% of weight. Following information received from stakeholders, labels are externally supplied articles and their verification increases administrative burdens of the scheme. It should therefore be further discussed if labels should not be exempted from the fulfilling of criteria requirements.

As regards non-paper content, Blue Angel allows a maximum of 5% non-paper content in printing and writing paper products, mainly stationeries except those for filing purpose. Feedback from industry also identified plastic content in envelopes at barely 4% (Table 4).

**Table 4.** Material input for envelope manufacturing

<b>Material</b>	<b>Weight (kg)</b>	<b>Content (%)</b>	<b>Comments</b>
Paper	0.0052987	93.9%	Actual paper content of envelope
Plastic	0.0001990	3.53%	
Chemicals	0.0001447	2.56%	
Waste paper	0.000912879	14.70%	Percentage of waste paper on total envelope paper input

Source: FEPE (2018)

For writing stationeries i.e. notebooks, the most of the weight is attributed to paper content. It implies that plastic and metal components might be kept as low as possible. In fact, the recently published equivalent Blue Angel criteria document limits these components to 5%. It is therefore subjected to the further discussion if it is possible to lower the threshold for non-paper content from 10 to 5%. This would represent a more stringent requirement and will result in lower environmental impacts of the product group.

A different threshold for non-paper content, mainly metals, is proposed for filing products like suspension files, ring binders and lever arch files because these components are closely related to the functional properties and durability of the products. Ring binder mechanisms are made up of steel and their weight contributes to the resistance of the folder as well as multi-opening process.

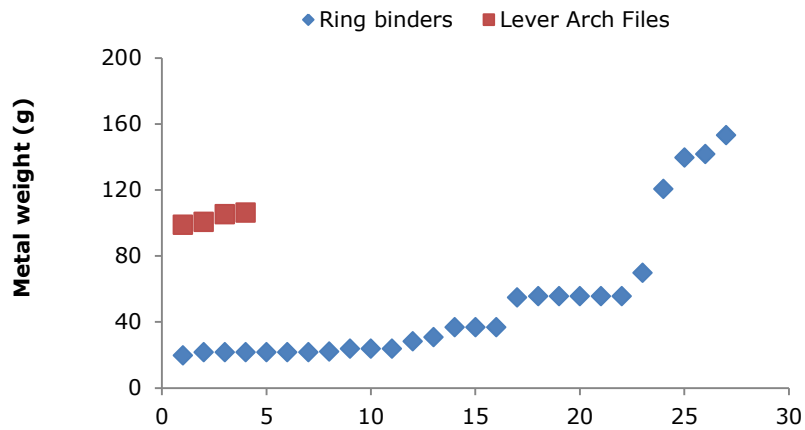
Ring binder mechanisms are usually built up of 3 components, the housing, the carrier rails inside the mechanism and the rings, riveted on the carrier rails. Tests have shown that a reduction of material thickness, thus the weight, causes a significant reduction of a mechanisms lifetime. Reducing the metal weight resulted in a reduction of the opening and closing cycles from an average 50,000 to 3,000-5,000 cycles. Furthermore, a 0.05mm reduction in thickness of the housing material causes a drop of the opening and closing force in some cases of almost 50%. This is also valid for the carrier rails inside the mechanisms.

Tension forces are required to guarantee a proper snap up while opening and an accurate closing force is necessary to hold the paper inserts securely. Due to no additional blocking or spring elements inside the mechanism needed for these tension purposes, the natural resilience of steel is used.

Feedback from industry identified different types of ring binders and lever arch files with differing metal content (see table below).

A closer look at the products reveal that the metal content varies according to type of filing product, size and especially the back size and number of rings. Highest metal content is registered for lever arch files with 80 mm back size and 2 rings. In general,

the metal content in levered arch file is of range 99-107 grams, whereas for ring binders from around 20 to 155 grams (Figure 8).



**Figure 8** Weight of metal content in ring binders and lever arch file  
Source: Hamelin Brands

**Table 5.** Variability of metal content in different filling products

Description	Sizes (paper format)	Nr. of rings	Back size (mm)	Metal content (gr)
<b>Ring binders</b>				
Static use	A6	2	35	31
	A4	2	35	18
	A4	2	40	31
	A4	2	50	13
	A4	4	20	60
	A4	4	25	61
	A4	4	40	66
	A4	4	40	66
	A4+	4	45	61
	24x32	4	40	61
Nomad use	24x32	4	40	71
	24x32	4	40	61
	24x32	2	30	31
	A4	2	50	31
	A4	4	40	61
<b>Lever arch files</b>				
Static use	A4	2	50	94
	A4	2	50	94
	A4	2	80	112
	A4	2	80	138
	A4	2	80	138
	A4	2	50	94

Description	Sizes (paper format)	Nr. of rings	Back size (mm)	Metal content (gr)
	A4	2	50	94
	A4	2	80	112
	A4	2	80	112
	A4	2	80	138

Source: Converted paper products EU Ecolabel Criteria. Draft Background report V3 (2013)

There is also a relation between back size and storage capacity of filing products as reported in Table 6.

**Table 6.** Typical characteristic of filing products

Back size (mm)	Ring diameter or height (mm)	Storage (Nr. A4 sheets)
25	15	100
35	25	165
40	30	225
55	30	400
75	55	500
80	65	750

Source: Hamelin Brands

The figures show that storage capacity increases with increase in back size and ring diameter/height requires higher metal content.

Hence, considering the above mentioned aspects, **it is proposed to adopt a functionality based threshold** for these product types. Proposed threshold for metal content is based on the storage capacity, and be summarised as follows:

- Up to 225 sheets: 50 g
- From 225 to 750 sheets: 170 g.

Therefore, the proposed scope could maintain the 50g threshold of the existing EU Ecolabel associating this, however, with the storage capacity, 225 A4 sheets. This is applied also to lever arch files, which was not the case in the existing EU Ecolabel. Furthermore, the 120g metal content threshold for lever arch files in the exiting EU Ecolabel is proposed to be increased to 170g, being applicable only for products with storage capacity higher than 225 sheets.



## 5 PROPOSED CRITERIA FRAMEWORK AND KEY MODIFICATIONS

Proposed criteria have been designed to cover different life cycle stages, addressing the hot spots and key parameters as identified in the corresponding preliminary reports. In this section, a first proposal for amending, and the associated requirements are presented. This first proposal should be further consulted with stakeholders once the revised scope is defined. For the first AHWG meeting, it is proposed to revise the structure and content of the criteria as indicated below:

1. Harmonisation with other eco-labelled paper based product groups considering substrate requirements.
2. Criterion 1 is proposed to be renamed to specify that it is related to both paper and board substrates
3. Integrate criterion on fibres into Criterion 1.
4. Restriction of substances, such as fragrances.
5. Revision of requirements according to the current state of the art.
6. Revision of requirements and proposal of additional criteria to cover all environmental sustainability hotspots and improvement potential identified in a life cycle approach.
7. Examine possible harmonisation with other Type I Ecolabels covering printed matter and converted paper products (Nordic Swan, Blue Angel etc.).
8. Structure of the revised criteria that includes merging of converted and printed paper products is presented in Table 7. The way in which criteria will be integrated into one product group requires further discussion with stakeholders.
9. Resources conservation and improved product design are two additional criteria.

**Table 7.** Criteria for converted, printed and merged paper products

<b>EU Ecolabel for converted paper products</b>	<b>EU Ecolabel for printed paper products</b>	<b>Proposed EU Ecolabel criteria for printed and converted paper products</b>
<p><b>Criterion 1 – Substrate</b>            Part A – Paper Substrate            Part B – Board Substrate            Criterion B1 – Emissions to water and to air            Criterion B2 – Energy use            Criterion B3 – Excluded or limited substances and mixtures            Criterion B4 – Waste management</p> <p><b>Criterion 2 – Fibres:</b>            sustainable forest management</p>	<p><b>Criterion 1 – Substrate</b></p> <ul style="list-style-type: none"> <li>• Emissions to water and to air</li> <li>• Energy use</li> <li>• Excluded or limited substances and mixtures</li> <li>• Waste management</li> <li>• Fibres: sustainable forest management</li> </ul>	<p><b>Criterion 1 – Substrate</b>            Paper and board requirements that addresses paper and board manufacturing process, and is proposed to be harmonised with EU Ecolabel for copying and graphic paper according to Commission Decision XX/XXX :</p> <ul style="list-style-type: none"> <li>• Emission to water and air</li> <li>• Energy use</li> <li>• Excluded or limited substances</li> <li>• Waste management</li> <li>• Sustainable forest</li> </ul>

		management
<b>Criterion 3</b> – Excluded or limited substances and mixtures (applicable to converting process)	<b>Criterion 2</b> – Excluded or limited substances and mixture (applicable to printing process)	Criterion 2 – Excluded or limited substances and mixture (applicable to printing and converting process)
<b>Criterion 4</b> – Recyclability	<b>Criterion 3</b> – Recyclability	<b>Criterion 3</b> – Recyclability
<b>Criterion 5</b> – Emissions (printing, coating and finishing processes)	<b>Criterion 4</b> – Emission (printing, coating and finishing processes)	<b>Criterion 4</b> – Emission (printing, coating and finishing processes)
<b>Criterion 6</b> – Waste (product specific)	<b>Criterion 5</b> – Waste (applies to the printing, coating and finishing processes of the paper components)	<b>Criterion 5</b> – Waste 5(a) – Conversion process 5(b) – Printing process
<b>Criterion 7</b> – Energy (apply to the printing/converting house)	<b>Criterion 6</b> –Energy (printing house)	<b>Criterion 6.</b> Energy (apply to the printing/converting house)
<b>Criterion 8</b> – Training	<b>Criterion 7</b> – Training	<b>Criterion 7</b> – Training
<b>Criterion 9</b> – Fitness for use	<b>Criterion 8</b> – Fitness for use	<b>Criterion 8</b> – Fitness for use
<b>Criterion 10</b> – Information on the paper carrier bags	<b>Criterion 9</b> –Information on the product	<b>Criterion 9</b> – Information on the product
<b>Criterion 11</b> – Information appearing on the EU Ecolabel	<b>Criterion 10</b> –Information appearing on the EU Ecolabel	<b>Criterion 10</b> – Information appearing on the EU Ecolabel

Further changes in the criteria structure include merging of Part A and Part B of Criterion 1 (converted paper products). These two parts are proposed to be replaced by a single criterion which includes both paper and board substrate requirements. EU Ecolabel criteria for graphic paper do not consider distinction between graphic paper and graphic board, and so the reference to the grammage threshold of 400g/m<sup>2</sup> was withdrawn. It is therefore proposed to streamline the criteria structure by applying requirements of the revised EU Ecolabel for graphic paper to both paper and board substrates. However, the harmonisation of the existing EU Ecolabel with the revised criteria for graphic paper would require further cross-check on the specific board related aspects such as i.e. provision of energy consumption reference values for board and/or lamination.

## 5.1 Criterion 1 - Substrate

### Current criterion (Printed paper product)

- 1a). **The printed paper product shall be printed only on paper bearing the EU Ecolabel as established in Commission Decision 2011/333/EU <sup>(2)</sup>.**
- 1b). **Where newsprint paper is used, the printed paper product shall be printed only on paper bearing the EU Ecolabel as established in Commission Decision 2012/448/EU <sup>(3)</sup>.**

*Assessment and verification:* the applicant shall provide the specifications of the printed paper products concerned, including the trade names, amounts and weight/m<sup>2</sup> of the paper used. The list shall also include the names of the suppliers of the papers used. The applicant shall provide a copy of a valid EU Ecolabel certificate for the paper used.

### Current criterion (Converted paper products)

#### **Criterion 1 – Substrate**

##### **Part A – Paper Substrate**

The substrate used shall be in conformity with the criteria 1, 2, 4 and 5 of the EU Ecolabel as established in Commission Decision 2011/333/EU (2) for Copying and graphic paper or in Commission Decision 2012/448/EU (3) for Newsprint paper and shall demonstrate the conformity to the criterion 2 – Fibres: sustainable forest management of the EU Ecolabel as established in this Commission Decision for converted paper products.

*Assessment and verification:* the applicant shall provide the specifications of the converted paper products concerned, including the trade names, amounts and weight/m<sup>2</sup> of the paper used. The list shall also include the names of the suppliers of the papers used. Conformity with the criteria 1, 2, 4 and 5 of the EU Ecolabel as established in Decision 2011/333/EU or Decision 2012/448/EU shall be proven for each substrate by providing a copy of a valid EU Ecolabel certificate for the paper used. Conformity with criterion 2 on fibres sustainable forest management shall be proven for each substrate by providing a PEFC, FSC or equivalent certificate valid for the substrate used, or through a self-declaration in case the applicant already has a valid EU Ecolabel certificate for the substrate used.

##### **Part B – Board Substrate** (detailed criterion text can be found in ANNEX I)

##### **Criterion B1 – Emissions to water and to air**

##### **Criterion B2 – Energy use**

##### **Criterion B3 – Excluded or limited substances and mixtures**

##### **Criterion B4 – Waste management**

#### **Criterion 2 – Fibres: sustainable forest management**

The fibre raw material may be recycled or virgin fibre. Virgin fibres shall be covered by valid sustainable forest management and chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

However, where certification schemes allow mixing of certified material, recycled materials and uncertified material in a product or product line, the proportion of uncertified virgin material shall not exceed 30 % of the total fibre raw material. Such uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

The certification bodies issuing forest and/or chain of custody certificates shall be accredited/recognised by that certification scheme.

*Assessment and verification:* the applicant shall provide appropriate documentation indicating the

types, quantities and origins of fibres used in the pulp and the board production.

Where virgin fibres are used, the product shall be covered by valid forest management and chain of custody certificates issued by an independent third party certification scheme, such as PEFC, FSC or equivalent. If the product or product line includes uncertified material, proof should be provided that the uncertified material is less than 30 % and is covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

Where recycled fibres are used, the applicant shall provide a declaration stating the average amount of grades of recovered paper used for the product in accordance with the standard EN 643 or an equivalent standard. The applicant shall provide a declaration that no mill broke (own or purchased) was used for the percentage calculation.

### Main proposal for criterion 1: Paper and board substrate

The substrate used shall be in conformity with the criteria 1, 2, 3, 4, and 5 of the EU Ecolabel criterion for graphic paper as established in EU Ecolabel as established in the Commission Decision 2018/XXX/EU.

Graphic paper that has been awarded the EU Ecolabel based on the ecological criteria of Commission Decision 2018/XX/EU are considered to comply with criterion 1.

The next table contains the reference values for calculation of energy consumption. The calculation shall be in conformity with requirements of criterion 2 as established in the Commission Decision 2018/XXX/EU. The reference values can further be discussed with the stakeholders.

Pulp grade	Fuel kWh/ADt Preference		Electricity kWh/ADt Ereference	
	Non-admp	Admp	Non-admp	admp
Chemical pulp	3650	4650	750	750
Thermomechanical pulp (TMP)	0	900	2200	2200
Groundwood pulp (including pressurised groundwood)	0	900	2 000	2000
Chemithermomechanical pulp (CTMP)	0	800	1800	1800
Recycled pulp	350	1350	600	600
Paper grade	kWh/tonne			
Uncoated fine paper, magazine paper (SC), newsprint paper, board manufacturing including lamination	1700		750	
Coated fine paper, coated magazine paper (LWC, MWC)	1700		800	
admp = air dried market pulp				

**Assessment and verification:** the applicant shall provide a declaration of compliance with Criterion 1. It shall include the specifications of the paper products concerned, including the trade names, amounts and weight/m<sup>2</sup> of the paper used. The list shall also include the names of the

### **Main proposal for criterion 1: Paper and board substrate**

*suppliers of the papers used in the product.*

*Conformity with the criteria 1, 2, 3, 4 and 5 of the EU Ecolabel as established in Decision 2018/XXX/EU shall be verified for each substrate used. The applicant should provide a copy of a valid EU Ecolabel certificate. In the case, the substrate used is not covered by the EU Ecolabel, Commission Decision 2018/XXX/EU, equivalent evidence of compliance should be provided.*

### **Additional proposals**

- a). To harmonise the criterion with the EU Ecolabel for graphic paper;
- b). To introduce common requirement for substrate for converted and printed paper products;
- c). For converted paper products, to merge Part A and Part B, of the criterion: Paper and board substrate;
- d). To extend the criterion to other Type I Ecolabels as long as the equivalency of requirements can be proved (29% of stakeholders supporting).

### **Rationale**

Paper and board substrate are the most important resources used for producing printed matter and converted paper products. Paper manufacturing represents the main environmental and resource-related burden in the life cycle of printed and converted paper products, as found in most LCA studies analysed.

The EU Ecolabel for graphic paper has been recently revised including updated thresholds and definitions related to the paper substrate. Thus, the harmonisation with graphic paper requirements benefits from the consensus built and knowledge gained during the revision of EU Ecolabel criteria for graphic paper and leads to the compatibility across the scheme. Consequently, in line with this approach, it is proposed to align criterion 1 for substrate with criterion 1, 2, 3, 4 and 5 as established by Commission Decision 2018/XX/EU for graphic paper, as follows:

1. Emissions to water and air;
2. Energy use;
3. Fibres: conserving resources, sustainable forest management;
4. Restricted hazardous substances and mixtures;
5. Waste management. Conformity with Criterion 3: Fibres: conserving resources, sustainable forest management, of the revised criteria of graphic paper is also required. All requirements of recently revised EU Ecolabel criteria for graphic paper are more ambitious than existing criteria of the EU ecolabel for converted paper products.

For printed matter, currently EU Eco-labelled paper is requested as a paper substrate. Most of the stakeholders agreed on maintaining this requirement. However, 29% of the questionnaire participants proposed to open the criteria to other Type I Ecolabels. Finally, one stakeholder pointed that in some cases is not possible to obtain EU Ecolabel. Since there is not the adequate certified substrate, it is proposed to address different scenarios:

- Scenario 1: The paper substrate used is awarded EU Ecolabel for graphic paper. In this case, the applicant (or substrate manufacturer) should demonstrate the compliance with the criterion providing a valid copy of EU Ecolabel certificate for graphic paper.

- Scenario 2: Paper substrate that is not awarded EU Ecolabel for graphic paper. In this case, the applicant should demonstrate equivalency of compliance with the Criterion 1, 2, 3, 4 and 5 as established by Commission Decision 2018/XXX/EU. "**Equivalency**" that is **proposed to be accepted** is a documentation provided by paper manufacturer that **proves the compliance with the criteria**, or certificate granted by other type I Ecolabels, as long as the specific requirements are at equal or higher level of stringency.

An important argument for not recognising other Type I ecolabel papers is that its equivalency in ambition level for fibre sourcing, energy consumption and emissions. With regards to fibres, there are important differences between the main European Type I ecolabels (Nordic, Blue Swan and EU Ecolabel) in terms of ambition level. The Commission has recently published a study about how to set sustainability criteria for timber and timber-related products and suggests that the conclusions therein can be considered as counting towards evidence of sustainable virgin materials (EFECA, 2018<sup>7</sup>). However, in the absence of a EU Ecolabel for the product, the paper supplier would also need to provide supporting evidence of compliance with the other requirements for specific energy consumption, emissions to water and emissions to air.

The proposed criterion aims at minimizing the main environmental impacts of paper production during its life cycle (*for more details please see the paper project website: [http://susproc.jrc.ec.europa.eu/Paper\\_products/](http://susproc.jrc.ec.europa.eu/Paper_products/)*):

- Deforestation and potential loss of biodiversity from sourcing of raw materials (although this is not well captured by land use indicators, land classification factors or biodiversity indicators using current LCA methodology);
- Emissions to air during pulp and paper production (especially CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>x</sub>);
- Emissions to water during pulp and paper production (especially COD, AOX and P);
- Energy consumption during production (mainly fuel for pulp mills and electricity for paper mills);
- Water consumption during pulp and paper production;
- Energy consumption and eco-toxicity impacts due to the production and use of chemicals across pulp and paper production.

The life-cycle analysis also examines, in more detail, the hotspots identified to determine at which life cycle stage and process, the largest contributions to each impact category occurred. It was found that:

- The dominant life-cycle stage for each impact category is either related to virgin pulp production or the papermaking process;
- The energy use and chemical additives in both pulping and papermaking stages were the sources of most impacts;
- The sourcing of wood (impacts on climate change and land use) and water depletion (for the pulping and papermaking processes) are also identified as important;
- The most significant impacts were related to human toxicity (non-cancerous effects), climate change, acidification, photochemical ozone formation, particulate matter/respiratory inorganics and ionising radiation.

## **Board manufacturing**

<sup>7</sup> EFECA, 2018. Draft proposal: GPP/Ecolabel criteria for timber and timber products.

During the EU Ecolabel revision for graphic paper the grammage upper limit of 400 g/m<sup>2</sup> was assumed as being misleading and not related to industrial practices. This is relevant for some converted paper products for example filing products consisting mainly of paperboard:

- Kraft paperboard/tinted paperboard, containing virgin or recycled fibres, W 160-500 g/m<sup>2</sup>
- Corrugated board/cardboard packaging, containing virgin or recycled fibres, W 200-600 g/m<sup>2</sup>
- White paperboard, W 90-450 g/m<sup>2</sup>

Information from board producers indicates that **there is no specific manufacturing process of pulp destined for board production**, and the key difference lies in the papermaking phase when board can undergo lamination, if requested by client.

Board lamination is usually done inline on the board production machine. Laminating provides a thicker board, a coloured board or a barrier by applying PE or PET, aluminium foil etc. depending on customer needs and production location. This can be on one or both sides/surfaces according to client specifications. In the case of a liner with plastic film, the laminating process basically consists of applying the liner with glue, such as Polyvinyl acetate (PVA), to the surface of the board and then heating to vaporize the added water from the glue till the moisture specification of the board are met. The glue usually has about 10%-15% moisture which has to be dried up using heat energy from steam in drying cylinders. The thickness of the board can be set at the board machine itself as well as adding lamination paper. **The lamination of multiple layers of board together is not done for the type of board used for producing folders or binders.**

As to the criterion on emission to water and air, a more detailed examination reveals that values for paper lamination are derived from adding the value for pulp making to the value for board making. Similar approach is observed for energy consumption criterion (i.e. energy consumption for laminated RCF pulp is expressed by summing up the energy consumption for RCF pulp and for board making). e(Table 8 As the reference values refers to board manufacturing, **the practicality of adding the term "lamination" is not clear and requires further consultation with stakeholders.** The reference values for calculating emissions to air and water, and also electricity and fuel consumption for the paper lamination and board production processes are reported in Table 8, and Table 9. The values are built on Commission Decision 2011/332/EU) on establishing the ecological criteria for the award of the EU Ecolabel for copying and graphic paper. This Decision is shortly going to be amended by the revised criteria for graphic paper.

EU ecolabel for graphic paper does not make a grammage distinction; therefore, adopting requirements for graphic paper will not lead to inconsistencies related to paper and board machine reference values.

On the contrary, referring to paper and board making as a common process is in line with the feedback collected from pulp and paper industry (for further information please see: [http://susproc.jrc.ec.europa.eu/Paper\\_products/documents.html](http://susproc.jrc.ec.europa.eu/Paper_products/documents.html)).

Furthermore, the revised EU Ecolabel criteria for graphic paper are built on the Commission Implementing Decision 2014/687/EU of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council. Thus, the corresponding reference document (BREF) encompasses both pulp and board making process.

**Table 8.** Currently Valid EU ecolabel reference values for lamination and board manufacturing

	kg/adt				kWh/adt	
	COD	S	NOx	P	Fuel	EE
Laminating bleached kraft paper	19	0.9	2.4	0.055	6100	1600
Laminating unbleached kraft paper	11	0.9	2.4	0.055	6100	1600
Laminating recycled paper	3	0.5	1.1	0.02	3100	1600
Board production (non-integrated mill)	1	0.3	0.8	0.01		
Board production (integrated mill)	1	0.3	0.7	0.01		
Board machine					2100	800

Source: Commissions Decision (2014/256/EU).

In the case of fuel and electricity, conducted literature review did not confirm nor provide specific reference values for laminating kraft and recycled paper as required in the existing EU Ecolabel. For board machine, the provided electricity reference value is 800kWh/ADdt<sup>8</sup>. However, the same source reports a fuel reference value of 1860 kWh/ADt as opposed to 2100kWh/ADt required in the existing EU Ecolabel. Following Blum et al (2007)<sup>9</sup> when applying best practice, manufacturing of RCF-based board (with deinking) requires 1000 kWh/t of heat, and 450/t of electricity consumption. The values refer to energy consumption at paper mill<sup>10</sup>.

In line with the revised EU Ecolabel criteria for graphic paper, the threshold for energy consumption at paper mill is as follows:

- Uncoated fine paper, magazine paper (SC), newsprint paper: fuel – 1700 kWh/tonne and electricity 750 kWh/tonne.
- Coated fine paper, coated magazine paper (LWC, MWC): fuel – 1700 kWh/tonne, electricity 800 kWh/tonne

**Table 9.** Currently valid reference values for electricity and fuel – converted paper products.

Pulp grade	Fuel kWh/ADT Reference	Electricity kWh/ADT E reference
Chemical pulp	4000 <sup>a</sup>	800
Mechanical pulp	900 <sup>b</sup>	1900
CTMP	1000	2000
Recycled fibre pulp	1800 <sup>c</sup>	800
Laminating kraft pulp (Bleached or unbleached)	6100	1600
Laminating recycled pulp	3900	1600

<sup>8</sup> Worrell et al. (2008). World Best Practice Energy Intensity Values for Selected Industrial Sectors

<sup>9</sup> Blum, O., Maur, B., Oller, H-J. 2007. Revision of Best Available Technique Reference Document for the Pulp & Paper Industry. Use of energy saving techniques. Umwelt Bundessamt

<sup>10</sup> for further information on EU Ecolabel for graphic paper, please refer to the project website: [http://susproc.jrc.ec.europa.eu/Paper\\_products/](http://susproc.jrc.ec.europa.eu/Paper_products/)



<sup>a</sup>for air dry market pulp containing at least 90% dry matter (admp), this value may be upgraded by 25% for the drying energy.

<sup>b</sup> this value is only applicable for admp

<sup>c</sup> for admp, this value may be upgraded by 25 % for the drying energy

\*value for lamination process is equal to sum of energy for pulp manufacturing and board production.

Source: Commission Decision (2014/256/EU)

Further research and consensus is needed in order to:

1. Harmonise reference value for board manufacturing with the revised EU Ecolabel for graphic paper; or
2. Establish a specific value for board manufacturing, (including lamination). The preliminary proposal should be further discussed with industry stakeholders: 1700 kWh/tonne for fuel, and 750 kWh/tonne for electricity., or/and
3. Withdraw the term lamination referring in general to board manufacturing.

#### Points for discussion

1. Do you think the proposed formulation of the criterion with reference to EU Ecolabel for graphic paper is straightforward?
2. Do you agree with merging requirements for paper and board (Part A and B of EU Ecolabel criteria for converted paper products)?
3. Is there available industry information for board machine to support reduction in energy consumption for board manufacturing?
4. Considering that paper and board making is addressed by a common Commission Implementing Decision, is there any technical justification for setting a specific reference value for lamination?
5. Should criteria related to board making be harmonised with EU Ecolabel for graphic paper?

## 5.2 Criterion 2 - Excluded or limited substances and mixtures

### 5.2.1 Criteria on horizontal hazardous substance restrictions –part I

#### Current criteria (printed and converted paper product)

##### 2a) Hazardous substances and mixtures

Consumables that could end up in the final printed paper product, and that contain substances and/or mixtures 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<sup>11</sup> or Council Directive 67/548/EEC<sup>12</sup> or substances referred to in Article 57 of Regulation (EC) No 1907/2006 of

<sup>11</sup> OJ L 353, 31.12.2008, p. 1.

<sup>12</sup> OJ 196, 16.8.1967, p. 1.

the European Parliament and of the Council<sup>13</sup> shall not be used for printing, coating, and finishing operations of the final printed paper product.

This requirement shall not apply to toluene for use in rotogravure printing processes where a closed or encapsulated installation or recovery system, or any equivalent system, is in place to control and monitor fugitive emissions and where the recovery efficiency is at least 92 %. UV varnishes and UV inks classified H412/R52-53 are also exempted from this requirement.

The non-paper components (up to 20 % in weight, as specified in Article 1) that are part of the final paper product shall not contain the substances referred to above.

List of hazard statements and risk phrases:

<b>Hazard Statement<sup>14</sup></b>	<b>Risk Phrase<sup>15</sup></b>
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

<sup>13</sup> OJ L 396, 30.12.2006, p. 1.

<sup>14</sup> Decision of 7 June 2011 on establishing the ecological criteria for the award of the EU Ecolabel for copying and graphic paper (OJ L 149, 8.6.2011, p. 12).

<sup>15</sup> Decision of 12 July 2012 establishing the ecological criteria for the award of the EU Ecolabel for newsprint paper (OJ L 202, 28.7.2012, p. 26).

EUH031 Contact with acids liberates toxic gas	R31
EUH032 Contact with acids liberates very toxic gas	R32
EUH070 Toxic by eye contact	R39-41

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 and mixtures which may be, or have been, assigned the hazard statements or risk phrase listed above or which meet the criteria for classification in the hazard classes or categories, and concentration limits for substances meeting the criteria of Article 57(a), (b) or (c) of Regulation (EC) No 1907/2006, shall not exceed the generic or specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008. Where specific concentration limits are determined they shall prevail over the generic ones.

Concentration limits for substances meeting criteria set out in Article 57(d), (e) or (f) of Regulation (EC) No 1907/2006 shall not exceed 0.1 % weight by weight.

*Assessment and verification: For substances not already classified in accordance with Regulation (EC) No 1272/2008, the applicant shall prove compliance with these criteria by providing: (i) a declaration that the non-paper components that are part of the final product do not contain the substances referred to in these criteria in concentration above the authorised limits; (ii) a declaration that consumables that could end up in the final printed paper product and used for printing, coating, and finishing operations do not contain the substances referred to in these criteria in concentration above the authorised limits; (iii) a list of all consumables used for the printing, finishing and coating of the printed paper products. This list shall include the quantity, function and suppliers of all the consumables used in the production process.*

*The applicant shall demonstrate compliance with this criterion by providing a declaration on the non-classification of each substance into any of the hazard classes associated to the hazard statements referred to in the above list in accordance with Regulation (EC) No 1272/2008, as far as this can be determined, as a minimum, from the information meeting the requirements listed in Annex VII to Regulation (EC) No 1907/2006. This declaration shall be supported by summarised information on the relevant characteristics associated to the hazard statements referred to in the above list, to the level of detail specified in Sections 10, 11 and 12 of Annex II to Regulation (EC) No 1907/2006 (Requirements for the Compilation of Safety Data Sheets).*

*Information on intrinsic properties of substances may be generated by means other than tests, for instance through the use of alternative methods such as in vitro methods, by quantitative structure activity models or by the use of grouping or read-across in accordance with Annex XI to Regulation (EC) No 1907/2006. The sharing of relevant data is strongly encouraged.*

*The information provided shall relate to the forms or physical states of the substance or mixtures as used in the final product.*

*For substances listed in Annexes IV and V to REACH, exempted from registration obligations under Article 2(7)(a) and (b) of Regulation (EC) No 1907/2006 REACH, a declaration to this effect will suffice to comply with the requirements set out above.*

*The applicant shall provide appropriate documentation on the recovery efficiency of the closed/encapsulated installation/recovery system, or any equivalent system, that has been put in place to deal with the use of toluene in rotogravure printing processes.*

**2b) Substances listed in accordance with Article 59(1) of Regulation (EC) No 1907/2006**

No derogation from the prohibition set out in Article 6(6)(a) of Regulation (EC) No

66/2010 shall be granted concerning substances identified as substances of very high concern and included in the list provided for in Article 59 of Regulation (EC) No 1907/2006, present in mixtures in concentrations higher than 0,1 %. Specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008 shall apply where the concentration is lower than 0,1 %.

*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](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.*

*The applicant shall prove compliance with the criterion providing data on the amount of substances used for the printing of the printed paper products and a declaration stating that the substances referred to in this criterion are not retained in the final product above the concentration limits specified. The concentration shall be specified in the safety data sheets in accordance with Article 31 of Regulation (EC) No 1907/2006.*

### **3g) Metal components (Converted paper only)**

Metals shall not be coated with cadmium, chromium, nickel, zinc, mercury, lead, tin and their compounds. The surface treatment of metal surfaces with nickel or zinc can be accepted for small parts (such as rivet, eyelet, and flat bar mechanisms) where this is necessary due to heavy physical wear. Both nickel plating and zinc galvanisation shall make use of wastewater treatment, ion exchange technology, membrane technology or equal technology in order to recycle the chemical products as much as possible. Emissions from surface treatment shall be recycled and destroyed. The system shall be closed without drainage, with an exception for zinc where the emission can be a maximum of 0.50 mg/l. The chemical products used in the surface treatment must be in compliance with the criteria 3 (c) Biocides and 3 (e) Alkyl phenol ethoxylates – Halogenated solvents – Phthalates. This requirement applies to each separate metal-type component exceeding 10% by weight of the final products in the subcategory of suspension file, folders with metal fastener, ring binder and lever arch file.

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

## **5.2.2 Proposed criteria on horizontal hazardous substance restrictions – Part I**

### **2a) Restrictions on Substances of Very High Concern (SVHC)**

*Note: All process chemicals used in the relevant printing or converting process must be screened. This criterion does not apply to chemicals used for wastewater treatment unless the treated wastewater is recirculated back into the paper production process.*

- 1) The product and, where relevant, its component parts, shall not contain substances that have been identified according to the procedure described in Article 59(1) of Regulation (EC) No 1907/2006 and included in the Candidate List for Substances of Very High Concern in concentrations greater than 0.1 % (weight by weight). No derogation from this requirement shall be granted.

*Assessment and verification: The applicant shall provide a declaration that the product or any component parts do not contain any SVHC in concentrations greater than 0.1 % (weight by weight). The declaration shall be supported by safety data sheets of process chemicals used or appropriate declarations from chemical or material suppliers.*

The list of substances identified as SVHC and included in the candidate list in accordance with Article 59(1) of Regulation (EC) No 1907/2006 can be found here:

[http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](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.

## **2b) Classification, Labelling and Packaging (CLP) restrictions**

*Note: All process chemicals used in the relevant printing or converting process must be screened. This criterion does not apply to chemicals used for wastewater treatment unless the treated wastewater is recirculated back into the paper production process.*

Unless derogated in Table X, the product and, where relevant, its component parts, shall not contain substances or mixtures in concentrations greater than 0.1 % (weight by weight) that are classified with any of the following hazard statements in accordance with Regulation (EC) No 1272/2008:

- Group 1 hazards: Category 1A or 1B carcinogenic, mutagenic and/or toxic for reproduction (CMR): H340, H350, H350i, H360, H360F, H360D, H360FD, H360Fd, H360Df.
- Group 2 hazards: Category 2 CMR: H341, H351, H361, H361f, H361d, H361fd, H362; Category 1 aquatic toxicity: H400, H410; Category 1 and 2 acute toxicity: H300, H310, H330; Category 1 aspiration toxicity: H304; Category 1 specific target organ toxicity (STOT): H370, H372.
- Group 3 hazards: Category 2, 3 and 4 aquatic toxicity: H411, H412, H413; Category 3 acute toxicity: H301, H311, H331; Category 2 STOT: H371, H373.

The use of substances or mixtures that are chemically modified during the production process so that any relevant restricted CLP hazard no longer applies shall be exempted from the above requirement.

**Table 10.** Derogations to the CLP hazard restrictions and applicable conditions.

<b>Substance / mixture type</b>	<b>Applicability</b>	<b>Derogated classification(s)</b>	<b>Derogation conditions</b>
UV curing inks and varnishes	Relevant printing technologies to be confirmed	H412, H413	To be discussed

*Assessment and verification: The applicant shall provide a list of all relevant chemicals used in their production process together with the relevant safety data sheet or chemical supplier declaration. Any chemicals containing substances or mixtures with restricted CLP classifications shall be highlighted. The approximate dosing rate of the chemical, together with the concentration of the restricted substance or mixture in that chemical (as provided in the safety data sheet or supplier declaration) and an assumed retention factor of 100 %, shall be used to estimate the quantity of the restricted substance or mixture remaining in the final product.*

*Justifications for any deviation from retention factor of 100% (e.g. solvent evaporation) or for chemical modification of a restricted hazardous substance or mixture must be provided in writing to the competent body. For any restricted substances or mixtures that exceed 0.1% (weight by weight) of the final printed or converted paper product, or relevant component parts, but are derogated, proof of compliance with the relevant derogation conditions must be provided.*

## **Rationale**

The structure of the horizontal hazardous substance criteria follows the general recommendations of the EU Ecolabel Chemicals Task Force. The wording of the current proposal is based predominantly on the most recently voted product group which is an article (Graphic paper, Tissue paper and Tissue paper products, voted in June 2018) and a very similar wording has been proposed for the Hard Coverings revision.

## **SVHC restrictions**

The 0.1% limit is particularly useful for SVHC declarations since it aligns perfectly with communication requirements that are stipulated in the REACH Regulation (specifically in Articles 7(2) and 33 of REACH).

Article 7(2) requires importers or producers to notify ECHA if an SVHC is present in articles they import or produce in concentrations exceeding 0.1% (w/w) and add up in total to more than 1 tonne of a particular SVHC per actor per year.

Article 33 is even more relevant, since any recipient (i.e. a business to business transaction) or consumer (business to consumer transaction) must, upon request, be informed within 45 days of the presence of any SVHC present in the article(s) they have purchased if the concentration of the SVHC exceeds 0.1% (w/w). The weak point of Article 33 is that this communication requirement is only triggered by a specific request and only if the answer is positive (i.e. that there is an SVHC present >0.1%). There is no obligation to respond if no SVHC is present >0.1% w/w, even if it is simply to confirm that there is no issue.

Since printed or converted paper products may include separable components, it is worth mentioning here that the 0.1% threshold for SVHC and CLP restrictions should apply to the individual component level, not simply the weight of the entire complex article. This is in line with the European Court of Justice ruling on case 106/14 in September 2015 regarding communication requirements on SVHCs. The 0.1% limits should apply to any component that can be considered as an individual article in itself.

## **CLP restrictions**

There is no longer any reference to risk phrases (e.g. R45, R50 etc.) when mentioning the classification of substances and mixtures because these were linked to the Dangerous Substances Directive (67/548/EEC) which was repealed by the CLP Regulation as of June 2015. Instead, reference is exclusively made to hazard statements and classes (e.g. H350, H400 etc.).

The term "*toxic, hazardous to the environment, carcinogenic, mutagenic or toxic for reproduction (CMR)*" from Article 6(6) was translated into specific CLP hazard categories by the EU Ecolabel Chemicals Task Force and resulted in the Group 1, Group 2 and Group 3 hazards as listed in the criterion proposal.

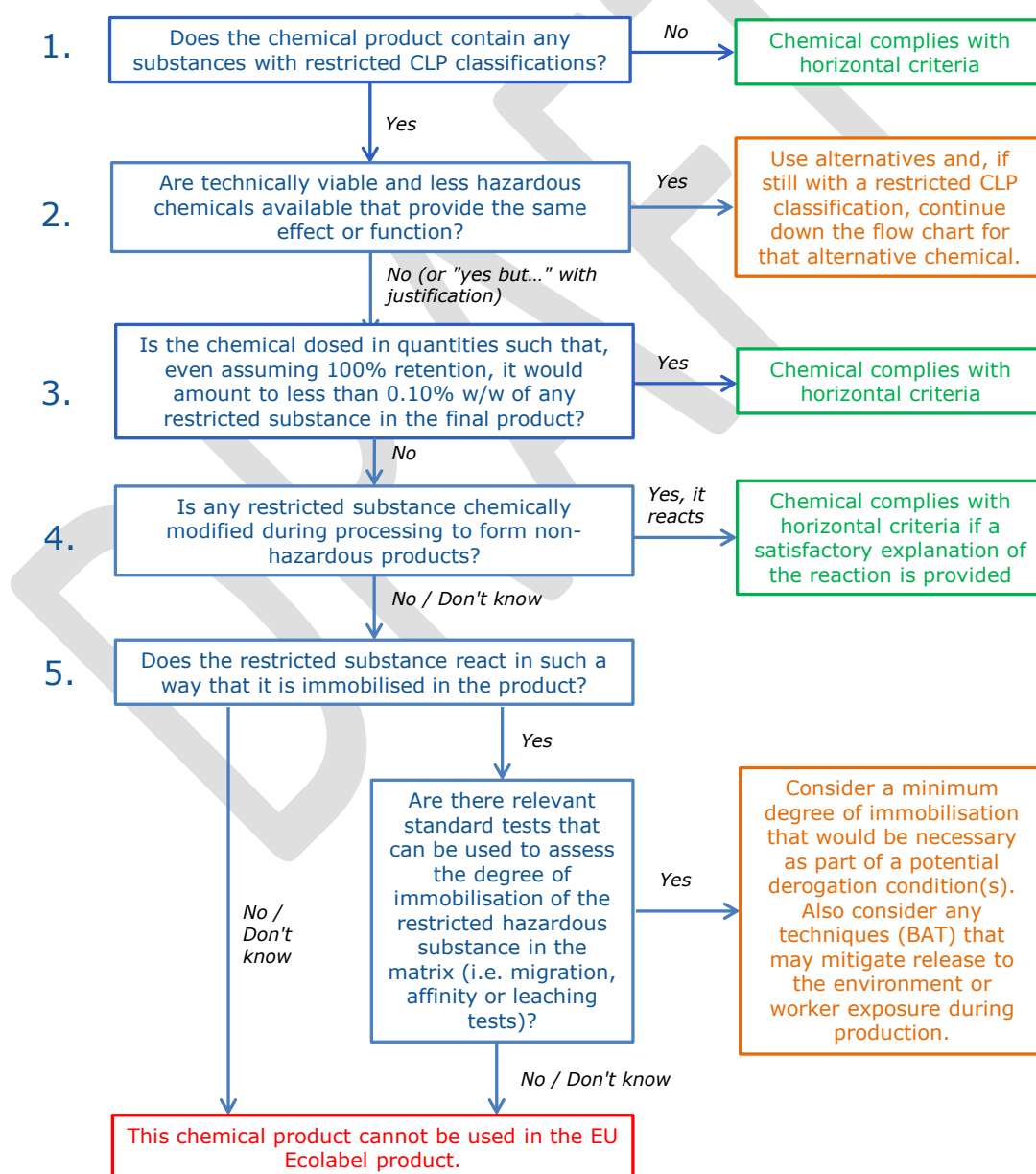
Depending on the nature of the product group and its normal use, the potential to also restrict category 1 skin sensitizers (H317) or category 1, respiratory sensitizers (H334) may be considered. These particular hazards do not seem relevant to printed and converted paper products and so H317 and H334 are not listed in the proposed CLP criterion. They were not listed in the existing criteria either.

The existing criteria for both Printed Paper and Converted Paper make reference to a series of EUH hazards in the horizontal CLP restrictions (specifically: EUH059; EUH029; EUH031; EUH032 and EUH070). These hazards are not specifically addressed by the work of the chemicals task force and seem to be related purely to labelling for the assurance of safe onsite handling of the chemicals. Consequently, it is proposed to no longer include these hazards in the horizontal CLP restrictions.

Unfortunately REACH does not make any provision for communication requirements about non-SVHC substances in articles like converted or printed paper and the CLP Regulation is focussed on labelling of substances and mixtures, not articles. Consequently, in order to demonstrate compliance with the CLP restriction criteria, the EU Ecolabel applicant has to be aware of all of the chemical substances or mixtures that have been used during the processing of the product. The following pieces of information are needed:

- List of chemical substances or mixtures used.
- Safety data sheets or relevant supplier declarations.
- Information about dosing rates and chemistry of any reactions that take place.

Armed with the above information, each chemical product can then be cross-checked against the following flow chart (Figure 9):



**Figure 9.** Flow chart for checking compliance with CLP restrictions

According to the flow chart above, the easiest means to demonstrate compliance is simply not to use chemicals containing hazardous substances in the first place.

When considering whether or not it is technically feasible to substitute the chemical or not, consideration has to be given to the functionality that the chemical imparts (e.g. brightness, gloss, scratch resistance etc.). If less hazardous alternatives do exist, then a case has to be made for why the more hazardous chemical is used. Maybe it is more efficient, maybe its performance is better proven or similar reasons.

If the quantities of the restricted hazardous substance(s) involved are small then applicants should check their dosing rates and calculate if its use can be justified based on the fact that it would account for less than 0.1% of the final product weight.

The last chance for justifying the use of a chemical containing restricted hazardous substances without any specific derogation is to assess whether or not the substance reacts in such a way as to no longer be hazardous. Reactivity should be considered in terms of chemical reaction instead of physical immobilisation. For example, a monomer reacting to form a polymer is a clear example of a relevant chemical reaction but the depositing of a pigment in a coloured matrix is simply immobilisation, and thus not a relevant reaction.

Finally, if a restricted hazardous substance cannot comply with the previous four steps but its use is considered fundamentally important to specific products or desirable product functionalities, then a derogation request should be made by the industry to the JRC.

Any derogation request should explain clearly what substance(s) are involved, their CLP classification(s), why they should be derogated and suggested conditions that could be attached to any such derogation (e.g. worker exposure control, maximum dosing rate, minimum functionality imparted or minimum degree of immobilisation achieved etc.).

## **Derogations**

### **UV inks and varnishes**

The derogation for UV-curing inks and varnishes still needs to be discussed further. The derogation has been introduced to reflect the exemption to criterion 2a) that is stated in Decision 2012/481/EU. However, it is possible that such a derogation is not needed if the restricted substances present in UV inks and varnishes are chemically modified to non-hazardous products or do not remain in the final product in quantities exceeding 0.1% by weight.

### **Toluene**

Derogation for toluene in rotogravure printing was considered as well but discussions with stakeholders revealed that toluene residues in the final product do not exceed 0.1% w/w but are more likely to be present in residual levels around 0.04% w/w immediately after printing and decreasing considerably with time afterwards due to evaporation of toluene traces. So instead of a derogation for the use of toluene in the horizontal criteria (simply not applicable due to the 0.1% rule) it is later proposed to have a specific criterion required relating to toluene recovery and fugitive emissions.

<b>Points for discussion</b>
Any clarifications needed about the proposed wording?
Any derogation requests foreseen?
Discussion about a more precise interpretation of "chemical modification" relating to inks and other chemicals used in this product group would be welcomed.



### 5.2.3 Criteria on specific hazardous substance restrictions – part II

The same *criteria* are generally proposed to be maintained although some minor changes will be required based on updates to legislation or more recently agreed terminology regarding certain types of substance. The changes to the existing criteria are highlighted in the box below.

#### **Proposed revision of current criteria**

##### **2c) Biocides**

Biocidal active substances, either as part of the formulation or as part of any mixture included in the formulation, that are used to preserve the product and that are classified H410 or H411 in accordance with Regulation (EC) No 1272/2008, are permitted only if their bioaccumulation potentials are characterised by log Pow (log octanol/water partition coefficient) < 3.0 or an experimentally determined bioconcentration factor (BCF) ≤ 100.

*Assessment and verification:* the applicant shall provide a declaration of compliance, supported by copies of safety data sheets for all biocidal active substances used during the different production stages, together with an estimation of the concentrations of the biocidal active substance(s) in the final product.

##### **2d) Washing agents**

Washing agents used for cleaning in printing processes and/or sub-processes that contain aromatic hydrocarbon shall only be allowed if they are in compliance with point 2(b) and if one of the following conditions is fulfilled:

- (i) The amount of aromatic hydrocarbons in the washing agent products used does not exceed 0.1% (w/w);
- (ii) The amount of aromatic hydrocarbon-based washing agent used annually does not exceed 5% of the total amount of washing agent used in one calendar year.

This criterion shall not apply to toluene used as washing agent in rotogravure printing.

*Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion, supported by Safety Data Sheet for each washing agent used in the printing house during the calendar year and by declarations from any relevant washing agent suppliers about the aromatic hydrocarbon contents in the washing agents.

##### **2e) Alkyl phenol ethoxylates – Halogenated solvents – Phthalates**

The following substances or preparations shall not be added to inks, dyes, toners, adhesives, or washing agents or other cleaning chemicals used for the printing of the printed paper product:

- Alkyl phenol ethoxylates and their derivatives that may produce alkyl phenols by degradation.
- Halogenated solvents that at the time of application are classified in the hazard or risk categories listed in point 2(b).
- Phthalates that at the time of application are classified with risk phrases H360F, H360D, H361F in accordance with Regulation (EC) No 1272/2008.

*Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion, supported by declarations from any relevant chemical suppliers.

##### **2f) Printing inks, toners, inks, varnishes, foils and laminates**

The following heavy metals or their compounds shall not be used in printing inks, toners, varnishes, foils and laminates (whether as a substance or as part of any preparation used): cadmium, copper (excluding copper-phthalocyanine), lead, nickel, chromium VI, mercury, arsenic, soluble barium, selenium, antimony. Cobalt can only be used up to 0.1% (w/w).

Ingredients may contain traces of those metals up to 0.01% (w/w) deriving from impurities in the raw materials.

*Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion, supported by declarations from any relevant chemical and material suppliers.

### **3g) Metal components (*Converted Paper criteria only*)**

In cases where metal components have been made with stainless steel or have been electroplated with nickel, the release rate of nickel shall not exceed 0.5 µgNi/cm<sup>2</sup>/week according to EN 1811. *Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion, supported by declarations from metal component suppliers and any relevant test reports.

## **Rationale**

The wording of the assessment and verification text is now better harmonised between the sub-criteria.

The modification of the criterion relating to metal parts is based on a consideration of market reality, proportionality and inherent hazards in the final product. The authors are not aware of any current commercial applications for coating metal with cadmium, mercury or lead and so do not understand the added value of banning these metals.

The most relevant potential applications will be electroplating with chromium, zinc and nickel. In each case, the metal is present in the coated article, not the metal compound added to the process. This is an important point to consider since the metal will generally have a different classification to the metal compounds used at the beginning of the process. Another important consideration is the form and availability of the metal in the treated article. In terms of hazards that these coatings present in the article:

- Chromium (CAS No. 7440-47-3) has a joint entry in the [ECHA C&L inventory](#) of not classified, which should take precedence over the many individual entries which indicate a wide range of possible hazards such as H400, H410 and H413.
- Zinc (CAS No. 7440-66-6) has a harmonised classification in the [ECHA C&L inventory](#) of H400 and H410 although it must be emphasised that this is related to zinc powder and not to zinc in the massive form, as it would be present in an electroplated or galvanised article.
- Nickel (CAS No 7440-02-0) has a harmonised classification in the [ECHA C&L inventory](#) of H317, H351 and H372. In particular, according to note 7 of the C&L entry, the H317 classification is linked to alloyed articles when the Nickel release rate exceeds 0,5 µgNi/cm<sup>2</sup>/week according to EN 1811.

Although H317 is not covered by the horizontal CLP restrictions (2b) for this product group, a specific restriction for Nickel could be considered as relevant, since it can be tested on the supplied material. On the other hand, it could be argued that no requirement should be set at all for Nickel if the likelihood of prolonged skin contact is considered as negligible.

A survey carried out by a converted paper manufacturer has shown that all metal mechanisms in suspension files, folders with metal fastener, ring binders and lever arch files present on the marketplace are treated with nickel. However, the survey also

confirmed that there is low probability of having prolonged exposure or skin contact with these metal mechanisms. The surface coating with nickel has a minor effect on the overall weight of a metal mechanism (ca. 0.3%).

The current criterion for metals seems disproportionate in cases where paper converters do not carry out the electroplating or galvanisation operations themselves, which is expected to be the normal case. Compliance would require information from upstream suppliers. The same argument applies to restrictions of biocides, alkyl phenol ethoxylates, halogenated solvents and phthalates. Are these treatments actually carried out by the converter? If not, is it realistic to expect to be able to confirm the non-use of these substances in the supply chain?

#### **Points for discussion**

For 2c: Is it conceivable that printed or converted paper products are "preserved" with intended residual contents of biocidal active substances?

For 2c: Are biocidal products not used mainly for preventing slime growth in process pipes and tanks handling water-based chemicals?

For 2d: Can we make a more specific explanation of what is meant by "sub-processes" in criterion 2d)? In order that all CBs and applicants have a common understanding.

For 2c-2f: General comments about modifications to criteria 2c) to 2f)?

For 2g: Opinions about the changes to the metal criterion (2g)?

For 2g: Do you think nickel should even be restricted at all, given the low probability of prolonged skin contact?

#### **5.2.4 Proposed criteria on specific hazardous substance restrictions – Part II**

There are a number of possible specific restrictions that could be considered, based on approaches taken in other ecolabel criteria (either for EU Ecolabel product groups or other Type I ecolabels for printed or converted paper products).

##### **Potential criterion 2h: Azo-dye restrictions**

Azo dyes, which by reductive cleavage of one or more azo groups may release one or more of the aromatic amines listed in Directive 2002/61/EC or Regulation (EC) No 1907/2006 Annex XVII, Appendix 8, shall not be used in the production of EU Ecolabel printed or converted paper products.

*Assessment and verification: The applicant shall provide a declaration of compliance with this criterion from the supplier(s) of all colourants used in the production process for EU Ecolabel graphic paper. The colourant supplier declaration should be supported by test reports according to the appropriate methods described in Appendix 10 to Annex XVII to Regulation (EC) No 1907/2006 or equivalent methods.*

##### **Rationale**

These dyes are prohibited already in textiles and leather under entry 43 of Annex XVII to REACH if found present in concentrations exceeding 0.003% (equivalent to the limits of detection of the relevant test methods). The same criteria is already present for the paper substrate but, since azo dyes can obviously be introduced during the printing operations on the substrate, this criterion would ensure that.

### **Potential criterion 2i): Toluene**

For rotogravure printing processes, the applicant shall only be permitted to use toluene solvent if a closed loop solvent recovery system is in place and where toluene recovery efficiency is at least 95%.

*Assessment and verification: The applicant shall provide a declaration of compliance with this criterion supported by a description of closed loop solvent recovery system and a mass balance of toluene that demonstrates a recovery of at least 95% during the most recent completed calendar year.*

### **Rationale**

According to the ECHA C&L inventory, toluene (CAS No. 108-88-3) has a harmonized classification of H225, H315, H304, H336, H373 and H361d. The H304 and H361d hazards are considered as Group 2 hazards according to the conclusions of the EU Ecolabel chemicals task force.

Even though [toluene](#) residues do not remain in the final product in high enough quantities to be covered by the horizontal criteria, due to the large quantities of this solvent used in the rotogravure process (some 100 000 t/yr in Europe)<sup>16</sup>, a specific criterion on toluene is considered relevant.

The criteria set out in Decision 2012/481/EU considered that toluene would be covered by the horizontal hazardous substance criteria and so inserted a condition exemption for toluene from those requirements by requesting that at least 92% of the toluene be recovered. The Nordic Ecolabel criteria for printed matter also consider a recovery efficiency of 92% for toluene. A recovery of 95% is proposed to reflect recent modifications to ink compositions, which mean that the ink takes more time to solidify and thus more time is available for toluene to evaporate to the recovery system (EC, 2017).

### **Potential criterion 2j): Fragrances**

Printed or converted paper products shall not be treated with fragrances.

*Assessment and verification: The applicant shall provide a declaration of compliance with this criterion.*

### **Rationale**

Although relevant scented products are on the market (e.g. scratch and sniff printed paper products and perfumed envelopes) these are considered as niche products. Fragrance is not a relevant core function for this product group and so it is proposed to prohibit the use of fragrances. This is in line with the Nordic ecolabel criteria for printed matter.

<b>Points for discussion</b>
Discussion about how exactly to describe the toluene mass balance in a rotogravure printing line is needed together with specific ideas about how to define recovery efficiency.
Any other specific hazardous substance restrictions that should be considered? If so please have some supporting arguments ready.

<sup>16</sup> EC, 2017. BAT Reference Document on surface treatment using organic solvents. Draft 1. Section 13.1: General information about Publication Gravure.

### 5.3 Criterion 3 - Recyclability

#### **Current criterion** (Printed and converted products)

The printed paper product shall be recyclable. The printed paper shall be deinkable and the non-paper components of the printed paper product shall be easily removable to ensure that those components will not hinder the recycling process.

- 3a) Wet strength agents may be used only if the recyclability of the finished product can be proved.
- 3b) Adhesives may be used only if their removability can be proved.
- 3c). Coating varnishes and lamination, including polyethene and/or polyethene/polypropylene, may be used only for covers of books, pads, magazines and catalogues, exercise books.
- 3d). The de-inkability shall be proved (applicable to printed paper product group).

*Assessment and verification: the applicant shall provide the test result of the recyclability for wet strength agents and removability for adhesives. The reference test methods are PTS method PTS-RH 021/97 (for wet strength agents), INGEDE Method 12 (for non-soluble adhesive removability), or equivalent test methods. The de-inkability shall be proven by using the 'Deinking Scorecard'<sup>(10)</sup> of the European Recovered Paper Council or equivalent test methods. Testing must be performed on three types of paper: uncoated, coated and surface-sized paper. If a type of printing ink is only sold for one or two specific types of paper, it is sufficient to test the paper type(s) in question. The applicant shall provide a declaration that coated and laminated printed paper products are in compliance with point 3(c). Where a part of a printed paper product is easily removable (for instance a plastic cover or a reusable exercise book cover), the recyclability test may be made without this component. The easiness of removal of the non-paper components shall be proven via a declaration of the paper collecting company, the recycling company or an equivalent organisation. Test methods shown by a competent and independent third party as giving equivalent results may also be used.*

#### **Main proposal for criterion 3: Recyclability**

The printed and converted paper product shall be recyclable. The printed and converted paper shall be deinkable and the non-paper components of the converted paper product such as plastics and metals shall be easily removable to ensure that those components will not hinder the recycling process.

- 3a). Wet strength agents may be used only if the recyclability of the finished product can be proved.
- 3b). Non-soluble adhesives may be used only if their removability can be proved.
- 3c). Coating varnishes and lamination, including polyethene and/or polyethene/polypropylene, may be used only for covers of books, pads, magazines and catalogues, exercise books, binders, folders, notebooks and diaries, without exceeding 4% by weight of the final products.
- 3d). Printing inks may be used only if their deinkability can be proven.

*Assessment and verification: The applicant shall provide the test result of the recyclability for wet strength agents, removability for adhesives and deinkability of inks used in white paper grades, as applicable. The reference test methods are PTS method PTS-RH 021/97 (for wet strength agents), INGEDE Method 12 (for non-soluble adhesive*

### **Main proposal for criterion 3: Recyclability**

*removability), INGEDE Method 11 (for deinkability), or equivalent standard methods that are accepted by the competent body as providing data of equivalent scientific quality.*

*The applicant shall provide a declaration that coated and laminated paper products are in compliance with point 3(c).*

*For converted paper products, where a part of a product is easily removable (for instance a metal bar in a suspension file or a plastic cover or reusable exercise book cover), the recyclability test may be made without this component. The easiness of removal of the non-paper components shall be proven via a declaration of the paper collecting company, the recycling company or an equivalent organisation. Test methods shown by a competent and independent third party as giving equivalent results may also be used.*

### **Rationale**

In line with the LCA findings, the end-of-life stage of printed matter has notable life-cycle impacts. These are increasing when the assumed waste scenario is landfill or incineration, compared to recycling. To achieve high quality recycled paper following specific issues need to be considered:

### **Deinkability**

To evaluate product recyclability, the standard EN ISO 17025: 2005 (*Conformity assessment General requirements for the competence of testing and calibration laboratories*) (or equivalent) should be considered. Methods for recycling are specified in updated publications from International Association of the Deinking Industry (INGEDE)<sup>17</sup> and the European Recovered Paper Council (ERPC). The key steps of deinking are the detachment of the ink film from the paper, the ink fragmentation into a suitable size range and removal from the pulp slurry.

Nordic Ecolabelling sets a deinkability score of at least 51 points (on a scale of -100 – +100) in accordance with ERPC's points system for all tested paper types. This corresponds to "Good" or "Fair" deinking. In the case of non-soluble adhesives, a threshold score of 51 can be required in line with equivalent ecolabels. This corresponds to "Good" or "Fair" removal of adhesive.

Blue Angel recommends that finished products should be deinkable stating that "The product should comply with the recyclability requirements of the EPRC". The analysis of requirements for converted product deinkability, was also listed as a part of the Commission statement after the criteria acceptance. Hence, stepping up the recyclability criteria by requiring deinkability would increase the range of products in which recycled paper can be used. This is in support of the recycling objectives of paper in the EU as supported by the EPRC.

### **Removability of adhesives**

Removal of adhesives is crucial for paper recycling. It is worth mentioning that, although, part (b) requires proving adhesives removability; it does not set minimum requirements. The indicated method for assessing removability of adhesive is the INGEDE Method 12 (*Assessing the Recyclability of Printed Products - Testing of Fragmentation Behaviour of Adhesive Applications* (2009)). This standard defines removability categories as follows:

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<sup>17</sup> [www.ingede.org](http://www.ingede.org)

- I. Score 71 to 100 points – *Evaluation of removability*: **Good**;
- II. Score 51-70 points - *Evaluation of removability*: **Fair**;
- III. Score 0-50 points - *Evaluation of removability*: **Tolerable**;
- IV. NEGATIVE (failed to meet the threshold) - *Evaluation of removability*: **Insufficient**.

Nordic Ecolabelling requires a result of at least 51 points for the prescribed INGEDE Method 12 (*for non-soluble adhesive removability*), in accordance with the European Paper Recycling Council (ERPC) points system this corresponds to “Good” or “Fair” deinking (Nordic Ecolabel, 2011)<sup>18</sup>.

### **Coating, varnishing and lamination**

Materials used for coating, varnishing and lamination of e.g. notebooks, cover books and filing products have a disturbing effect in the recycling process. They tend to fragment into particles that block the papermaking equipment, creating weak spots in the final paper product or causing that pieces of finished paper stick together. Consequently, their use is required to be as low as technically possible.

Findings from other ecolabels, in particular, NF Environment for notebooks, show that thresholds for the maximum content of laminating and varnishing plastics are required. According to NF Environment **the 4% threshold was defined by paper recycling facilities**<sup>19</sup> (AFNOR, 2011). This threshold further strengthens part (b) of the criterion, related to non-soluble adhesives. In fact, lamination involves adhesives and plastic films which hinder product recyclability.

<b>Points for discussion</b>
<p>Should the requirements on non-soluble adhesives and deinkability be tied to a score on the corresponding ERPC score cards, i.e. harmonised with Nordic Swan?</p> <p>Should a threshold of 4% w/w for coatings, varnishing and lamination be established for specific products?</p> <p>Should deinkability be requested for converted paper products?</p> <p>Should requirement on deinkability reflect EPRC scoring system, accepting the products with a score higher than 51?</p>

<sup>18</sup> Ecolabelling, N. (2011). Printing companies , printed matter , envelo- pes and other converted paper products, (December).

<sup>19</sup> Afnor Certification. (2011). Référentiel de certification de la marque NF Environnement « PRODUITS DE NETTOYAGE », 33(0), 1-59.

## 5.4 Criterion 4 - Emissions

### **Current criterion** (Printed and converted products)

#### **4a). Emissions to water**

- i). Rinsing water containing silver from film processing, as well as from plate production, and photo-chemicals shall not be discharged to a sewage treatment plant.

*Assessment and verification: the applicant shall provide a declaration of compliance with this criterion, together with a description of the management of photo-chemicals and silver containing rinsing water on site. Where the film processing and/or the plate production are outsourced, the sub-contractor shall provide a declaration of compliance with this criterion, together with a description of the management of photo-chemicals and silver containing rinsing water at the subcontractors.*

- ii). The amount of Cr and Cu discharged into a sewage treatment plant must not exceed, respectively, 45 mg per m<sup>2</sup> and 400 mg per m<sup>2</sup> of printing cylinder surface area used in the press.

*Assessment and verification: discharges of Cr and Cu into the sewage shall be checked at rotogravure printing plants after treatment and before their release. A representative sample of Cr and Cu discharges shall be collected each month. At least one annual analytical test shall be carried out by an accredited laboratory to determine the content of Cr and Cu in a representative sub-sample of these samples. Compliance with this criterion shall be assessed by dividing the content of Cr and Cu, as determined by the annual analytical test, by the cylinder surface used in the press during the printing. The cylinder surface used in the press during printing is calculated by multiplying the cylinder surface ( $= 2\pi rL$ , where  $r$  is the radius and  $L$  the length of the cylinder) by the number of printing productions during a year (= number of different printing jobs).*

#### **(4b) Emissions to air**

Volatile Organic Compounds (VOC)

The following criterion must be met:

$$(P_{\text{VOC}} - R_{\text{VOC}})/P_{\text{paper}} < 5 \text{ [kg/tonnes]}$$

Where:

$P_{\text{VOC}}$  =the annual total kilograms of VOC contained in the purchased chemical products used for the annual total production of printed products

$R_{\text{VOC}}$  =the annual total kilograms of VOC destroyed by abatement, recovered from printing processes and sold, or reused

$P_{\text{paper}}$  =the annual total tonnes of paper purchased and used for the production of printed products.

Where a printing house uses different printing technologies, this criterion shall be fulfilled for each one separately.

The  $P_{\text{VOC}}$  term shall be calculated from SDS information related to VOC content or from an equivalent declaration provided by the supplier of chemical products.

The  $R_{\text{VOC}}$  term shall be calculated from the declaration on the content of VOC contained in the chemical products sold or from the internal counting register (or any other equivalent document) reporting the annual amount of VOC recovered and reused on site.

Specific conditions for heat-set printing:

- (i) For heat-set offset printing with an integrated after-burner unit in place for the drying



unit, the following calculation method shall apply:

$P_{\text{VOC}}=90\%$  of the annual total kilograms of VOC contained in damping solutions used for the annual production of printed products + 85% of the annual total kilograms of VOC contained in washing agents used for the annual production of printed products.

(ii) For heat-set offset printing, without an integrated after-burner unit in place for the drying unit, the following calculation method shall apply:

$P_{\text{VOC}}=90\%$  of the annual total kilograms of VOC contained in damping solutions used for the annual production of printed products + 85% of the annual total kilograms of VOC contained in washing agents used for the annual production of printed products + 10% of annual total kilograms of VOC contained in the printing inks used for the annual production of printed products.

For (i) and (ii), proportionately lower percentages than 90% and 85% may be used in this calculation if more than 10% or 15% respectively of annual total kilograms of VOC contained in the damping solutions or washing agents used for the annual production of printed products are shown to be abated in the treatment system for combusting gases from the drying process.

*Assessment and verification: a declaration of the VOC content in alcohols, washing agents, inks, damping solutions or other corresponding chemical products shall be provided by the chemical supplier. The applicant shall provide evidence of the calculation according to the criteria laid down above. The period for the calculations shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least three months of representative running of the plant.*

#### **(4c) Emissions from publication rotogravure printing**

(i) Publication rotogravure printing emissions of VOC to air shall not exceed 50 mg C/Nm<sup>3</sup>.

*Assessment and verification: the applicant shall provide appropriate documentation showing compliance with this criterion.*

(ii) Equipment for reduction of emission to air of Cr<sup>6+</sup> shall be installed.

(iii) Emissions of Cr<sup>6+</sup> to air shall not exceed 15 mg/tonne paper.

*Assessment and verification: the applicant shall provide a description of the system in place, together with a documentation related to the control and the monitoring of Cr<sup>6+</sup> emissions. The documentation shall include the test results related to the reduction of Cr<sup>6+</sup> emissions to the air.*

#### **(4d) Printing processes to which no legislative measures apply**

Volatile solvents from the drying process of heat-set offset and flexography printing shall be managed by means of recovery or combustion or any equivalent system. In all cases where no legislative measures apply, the emissions of VOC to air must not exceed 20 mg C/Nm<sup>3</sup>.

This requirement does not apply to screen printing and digital printing. Moreover it does not apply to heat-set and flexography installations with solvent consumption lower than 15 tonnes per year.

*Assessment and verification: the applicant shall provide a description of the system in place together with documentation and test results related to the control and the monitoring of emissions to air.*

#### **Main proposal for criterion 4: Emissions**

- 4a). The current criterion might maintain its form while following additional issues might be is addressed.
- 4b). To evaluate the possibility to further restrict the current amount of Cr and Cu discharged into a sewage treatment plant.
- 4c). To evaluate the possibility to further restrict the current limits related to VOC emissions:
- Reduce the ratio of kilograms of 'lost VOC' per tonnes of paper used in the production of printed products.
  - Reduce the current limit for the VOC emissions from publication rotogravure printing.
  - Reduce the current limit for the VOC emissions from processes where no legislative measures apply.
  - Modify thresholds or eliminate some of the derogations from the VOC emission limits in processes where no legislative measures apply.
- 4d). To evaluate the possibility to restrict the current limit of Cr<sup>6+</sup> to air from publication rotogravure printing.
- 4e). To introduce the obligation to have local exhaust extraction for all printing units on all printing machines with more than two print/varnish units if the annual VOC consumption for the printing method concerned is more than 9 kg per tonne of product and year.

#### **Rationale**

##### **Emission to water**

Usually, printing facilities are not equipped with a waste water treatment plant and discharge directly to the municipal sewerage system, therefore, treatment of the releases as hazardous waste might be an alternative.

The Nordic Swan criteria for printing companies require a maximum of 25 mg chromium (Cr-tot) and of 90 mg copper (Cu) per tonne of product (not per surface area of cylinder) for gravure printers. This is measured after the sewage treatment plant instead of at the point of discharge as required in the existing EU Ecolabel. Emission of chromium and copper to the drain must be measured after the sewage treatment plant and before the drain. This is probably due to efficient treatment plants in the Nordic region whereas that might not be the case in the other EU28 countries. Hence, it is environmentally safer to set up the thresholds at the exit of the pipe before the sewage treatment plant as the existing criteria correctly do.

##### **Emission to air**

Printing involves use of inks which may contain organic solvents. Different inks necessitate different proportions of organic solvents and therefore the dilution requirements vary. Printing can also require the use of cleaning solvents and organic dampeners (EEA, 2016)<sup>20</sup>. At that point, the main sources of VOC releases are fugitive emissions from printing machines and other equipment, VOC from ink solvents remaining

<sup>20</sup> European Environmental Agency, EMEP/EEA air pollution emission inventory guidebook, Printing, EEA 2016

on the printed products, and VOC in the waste gas (EC, 2009)<sup>21</sup>. The total European unabated VOC emission from heat-set offset printing is estimated at 100 kt per year. Half of the quantity is sourced to the isopropyl alcohol (IPA) while the rest originates from the cleaning agents (EEA, 2016).

The current threshold is based on a mass balance approach where relevant sources of emission are identified and calculated. This approach is in line with BAT for printing process (JRC, 2017). **The need and magnitude of revision of the current equation should be further discussed with stakeholders.** In line with BAT, the following techniques should be considered to perform an adequate annual solvents mass balance as defined in Part 7(2) of Annex VII to Industrial Emission Directive (2010/75/EU) - Table 11.

Table 11. BAT 9 - Solvent mass balance of the solvent inputs and outputs of the plant

Technique	Description
Implementation of solvent tracking system	A solvent tracking system aims to control both used and unused quantities of solvents returned to storage from the application zone.
Full identification, characterisation and quantification of the relevant emission sources	This includes: <ul style="list-style-type: none"> <li>• identification and listing of emissions sources, i.e. WGT system, each fugitive emissions source;</li> <li>• Quantification of each emission source's contribution and the methodology used: measurement, calculation using emission factors, estimation based on operational parameters, etc.</li> <li>• Regular update of emission data</li> </ul>
Monitoring of changes that influence normal operation	Any change that could influence the accuracy of the solvent mass balance is recorded, such as: <ul style="list-style-type: none"> <li>• Malfunctions of the waste gas treatment : date and time period;</li> <li>• Changes that may influence air/gas flow rates, e.g. replacement of fans, drive pulleys, motors; the date and type of change are recorded, e.g. replacement to original specification, refurbished, and upgraded.</li> </ul>

With the view further categorization of emission from different printing processes following information can be summarised on the base of BREF findings (D1) (JRC, 2017):

### **Heat-set web offset printing**

The reported average VOC emission to air in waste gases was 5.5 mg C/Nm<sup>3</sup> (as reported from 22 sources in 2015), varying from 3.3 to 6.5 mg C/Nm<sup>3</sup>. The reported values of total VOC emission expressed as percentage of ink consumption are between 0.08%–

<sup>21</sup> European Commission, 2009. Guidance on VOC Substitution and Reduction for Activities Covered by the VOC Solvents Emissions Directive (Directive 1999/13/EC)

4.89%. The concentration of IPA varies between 8%–15%. On modern presses, during demanding circumstances, reduction of IPA concentration in the dampening solution to 3% w/w can be achieved. In older presses, it should be possible to reduce the IPA concentration to 5% w/w.

### **Flexography and gravure printing – Laminating, varnishing, and packaging printing**

Reported values of total organic solvent consumption show a range from 40 up to 390 g of solvent per kg of printed surface. An average of 1.78 kg VOC per kg purchased ink input is used in the production and auxiliary processes of the plant. The relevant range of reported values for total solvent consumption expressed against the printed surface of printed surface is from 1 up to 30 kg of solvent per 1000 m<sup>2</sup>.

### **Publication gravure**

The European publication rotogravure industry uses annually 30 kt pigments, 50 kt resins and 100 kt toluene and 180,000 tonnes of ink (2006). More than 95 % of the toluene is reused. This is technically feasible since gravure uses a mono-solvent system. Publication printing inks contain 50% toluene. The dilution is made in the printing plant to obtain a toluene concentration of 70%–80%. The solvents are evaporated by heat and air in the drying section. The traces of toluene which remain in the printed product at the moment of leaving the production are lower than 0.04%. The toluene mass balance of two plants is shown in Table 12<sup>22</sup>.

**Table 12.** Toluene balance of two gravure printing plants

	Plant 1 (t/year)	Plant 2 (t/year)
Total toluene consumption (fresh and recovered)	2.571	2.179
Toluene in waste	11	0
Toluene in sold products	10	10
Toluene recovered and reused on site	1.694	1.428
Toluene recovered and sold	599	613
Emissions		
Toluene emissions after treatment	1.1	4
Fugitive toluene emission *	265	133
Total toluene emission	266.1 (10%)**	137 (6%)**

\*Inclusive 10 tonnes of toluene in sold product;

\*\* Consumption (%)

<sup>22</sup> Aminal et al. Evaluatie emissiereductiepotentieel voor VOS-emissies van de grafische sector, deel 1", Aminal. Afdeling Algemeen Milieubeleid, 00.1688., 2002.

BAT set the threshold of total emission, regarding coating of textiles, foils and paper based on mass balance and expressed as percentage of the total solvent input, < 1%-6%. VOC emissions to air in waste gases should be lower than 1-30 mg C/Nm<sup>3</sup>.

For head-set offset printing BAT-associated emission levels (BAT-AELs) to air in waste gases should be lower than 1-15 mg C/Nm<sup>3</sup>, and total VOC emission based on mass balance should be lower than 1%-10% of the total solvent input. For publication gravure printing the VOC emission in waste gases should be lower than 5-35 mg C/Nm<sup>3</sup> whereas the total VOC emission should be lower than 1%-5% of the total solvents input.

The Best Available Techniques (BAT) in Europe for Surface Treatment Using Organic Solvents<sup>23</sup> examines the feasibility to reduce the current 50 mg C/Nm<sup>3</sup> threshold for VOC emissions to air in rotogravure printing to 20 mg C/Nm<sup>3</sup>. This reduction has been shown to be technically feasible although associated with additional steam requirements and consequent economic and environmental costs. The recently revised Nordic Swan criteria for printing companies award points according to VOC emissions (Table 13).

**Table 13.** Nordic Swan point award system for VOC emissions

VOC (kg/tonne paper)	Points
0	20
2	16
5	10
8	4
10	0

A VOC emission of 5 kg/tonne paper is awarded half of points available indicating an average requirement. A more stringent requirement, stepping up the ambitious level of this requirement is 2 kg/tonne. This corresponds to the Blue Angel criteria for the 12 month average of the quantity of volatile solvents purchased in relation to the amount of paper purchased and provided. However, this is directly related to solvents unlike the criteria in the existing EU Ecolabel which focus on VOC content in all chemical products purchased, being more comprehensive.

The respective BREF document (JRC, 2017) is proposed to serve as reference for the further revision of the emission thresholds. Moreover, consultation with stakeholders is deemed to identify the reference for the updated criteria. It should also be discussed whether the equation that sets a threshold for total VOC emission should be harmonised with the BREF approach, being based on percentage of VOC input.

### **Monitoring of air emission**

Emission levels associated with BAT-AELs refer to concentrations expressed as mass of emitted substance per volume of waste gases under the following standards conditions: Temperature 273.15 K, pressure 101.3 kPa, without correction of O<sub>2</sub> and expressed in the unit mg/Nm<sup>3</sup>. Both continuous and periodical monitoring is considered:

- Continues monitoring: Daily average over a period of one day based on valid hourly or half-hourly averages;

<sup>23</sup> BREF for Surface Treatment Using Organic Solvents (D1)

- Periodical monitoring: Average over the sampling period, average value of three consecutive measurements of at least 30 minutes each.

#### **Points for discussion**

Should the current level of Cr and Cu, discharged into a sewage treatment plant, further restricted?

Should the VOC emission thresholds set considering the printing techniques?

Reduction of the ratio kilograms of 'lost VOC' per tonne of paper used in the production of printed products.

Should a reduction of VOC emissions from publication rotogravure printing be introduced?

Level of reduction of VOC emissions from processes where no legislative measures apply.

Modification of thresholds or withdrawal of the derogations regarding VOC emission limits in processes where no legislative measures apply.

Examining the possibility to restrict the current limit of Cr<sup>6+</sup> to air from publication rotogravure printing.

To introduce the obligation to have local exhaust extraction for all printing units on all printing machines with more than two print/varnish units if the annual VOC consumption for the printing method concerned is more than 9 kg per tonne of product and year

## 5.5 Criterion 5 - Waste

### **Current criterion** (Printed paper products)

#### **5a). Waste management**

The facility where the printed paper products are produced shall have in place a system for handling waste, including residual products derived from the production of the printed paper products, as defined by local and national relevant regulatory authorities.

The system shall be documented or explained and shall include information on at least the following procedures:

- (i) handling, collection, separation and use of recyclable materials from the waste stream,
- (ii) recovery of materials for other uses, such as incineration for raising process steam or heating, or agricultural use,
- (iii) handling, collection, separation and disposal of hazardous waste, as defined by the relevant local and national regulatory authorities.

*Assessment and verification:* the applicant shall provide a declaration of compliance with this criterion, together with a description of the procedures adopted for waste management. Where appropriate, the applicant shall provide the corresponding declaration to the local authority every year. Where the waste management is outsourced, the sub-contractor shall provide a declaration of compliance with this criterion as well.

#### **5b). Waste paper**

The amount of waste paper 'X' produced shall be:

Printing method	Maximum Waste paper (%)
Sheet offset	23
Cold-set, newspaper	10
Cold-set, form printing	18
Cold-set rotation (except newspapers and forms)	19
Heat-set rotation	21
Gravure printing	15
Flexography (except corrugated fibreboard)	11
Digital printing	10
Flexography, corrugated fibreboard	17
Screen printing	23

where:

X= Annual tonnes of waste paper produced during the printing (including finishing processes) of the eco-labelled printed paper product, divided by annual tonnes of paper purchased and used for the production of eco-labelled printed paper product.

Where the printing house carries out finishing processes on behalf of another printing house, the amount of waste paper produced in those processes shall not be included in the calculation of 'X'.

Where the finishing processes are outsourced to another company, the amount of waste paper resulting from the outsourced work shall be calculated and declared in the calculation of 'X'.

*Assessment and verification: the applicant shall provide a description of the calculation of the amount of waste paper, together with a declaration from the contractor collecting the waste paper from the printing house. The outsourcing terms and calculations on the amount of paper waste involved in the finishing processes shall be provided. The period for the calculations shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least three months of representative running of the plant.*

**Current criterion** (converted paper products)

**(a) Waste management**

*The facility where the converted paper products are produced shall have in place a system for handling waste, including residual products derived from the production of the converted paper products, as defined by local and national relevant regulatory authorities.*

*The system shall be documented or explained and shall include information on at least the following procedures:*

*(i) handling, collection, separation and use of recyclable materials from the waste stream;*

*(ii) recovery of materials for other uses, such as incineration for raising process steam or heating, or agricultural use;*

*(iii) handling, collection, separation and disposal of hazardous waste, as defined by the relevant local and national regulatory authorities.*

*Assessment and verification: the applicant shall provide a declaration of compliance with this criterion, together with a description of the procedures adopted for waste management. Where appropriate, the applicant shall provide the corresponding declaration to the local authority every year. Where the waste management is outsourced, the sub-contractor shall provide a declaration of compliance with this criterion as well.*

**(b) Waste paper**

*The amount of waste paper 'X' shall not exceed:*

- 20 % for envelopes*
- 20 % for stationery products*
- 10 % for paper bags*

*where, X = annual kilos of waste paper produced during the converting (including finishing processes) of the ecolabelled converted paper product, divided by annual tonnes of paper purchased and used for the production of ecolabelled converted paper product.*

*Where the printing house carries out finishing processes on behalf of another printing house, the amount of waste paper produced in those processes shall not be included in the calculation of 'X'.*

*Where the finishing processes are outsourced to another company, the amount of waste paper resulting from the outsourced work shall be calculated and declared in the calculation of 'X'.*

*Assessment and verification: the applicant shall provide a description of the calculation of*



*the amount of waste paper, together with a declaration from the contractor collecting the waste paper from the printing house. The outsourcing terms and calculations on the amount of paper waste involved in the finishing processes shall be provided. The period for the calculations shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least 3 months of representative running of the plant.*

**Main proposal for criterion 5 Waste management** (converted and printed paper products)

**5a). Waste management system**

The facility where the converted and printed paper products are produced shall have in place a system for handling waste, including residual products derived from the production of the converted paper products, as defined by local and national relevant regulatory authorities.

The system shall be documented or explained and shall include information on at least the following procedures:

- (i) handling, collection, separation and use of recyclable materials from the waste stream;
- (ii) recovery of materials for other uses, such as incineration for raising process steam or heating, or agricultural use;
- (iii) handling, collection, separation and disposal of hazardous waste, as defined by the relevant local and national regulatory authorities.

*Assessment and verification: the applicant shall provide a declaration of compliance with this criterion, together with a description of the procedures adopted for waste management. Where appropriate, the applicant shall provide the corresponding declaration to the local authority every year. Where the waste management is outsourced, the sub-contractor shall provide a declaration of compliance with this criterion as well.*

*Applicants registered with EMAS and/or certified according to ISO 14001 shall be considered as having fulfilled this criterion if:*

- *the inclusion of waste management in the scope of EMAS is documented in the EMAS environmental statement, or*
- *the inclusion of waste management is sufficiently addressed by the ISO 14001 certification*

**5b). Waste paper from printing process**

The amount of waste paper 'X' produced shall be:

Printing method	Maximum waste paper (%)
Sheet offset	??
Cold-set, newspaper	??
Cold-set, form printing	??

**Main proposal for criterion 5 Waste management** (converted and printed paper products)

Cold-set rotation (except newspapers and forms)	??
Heat-set rotation	??
Gravure printing	??
Flexography (except corrugated fibreboard)	??
Digital printing	??
Flexography, corrugated fibreboard	??
Screen printing	??

where:

X= annual tonnes of waste paper produced during the printing (including finishing processes) of the eco-labelled printed paper product, divided by annual tonnes of paper purchased and used for the production of eco-labelled printed paper product.

Where the printing house carries out finishing processes on behalf of another printing house, the amount of waste paper produced in those processes shall not be included in the calculation of 'X'.

Where the finishing processes are outsourced to another company, the amount of waste paper resulting from the outsourced work shall be calculated and declared in the calculation of 'X'.

*Assessment and verification: the applicant shall provide a description of the calculation of the amount of waste paper, together with a declaration from the contractor collecting the waste paper from the printing house. The outsourcing terms and calculations on the amount of paper waste involved in the finishing processes shall be provided. The period for the calculations shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least three months of representative running of the plant.*

**5c). Waste paper form conversion process**

The amount of waste paper 'X' shall not exceed:

- 15 % for envelopes
- 15 % for writing stationery products
- 20 % for filing stationery products printed on one side
- 30 % for filing stationery products printed on both sides
- 10 % for paper bags

where, X = annual kilos of waste paper produced during the converting (including finishing processes) of the eco-labelled converted paper product, divided by annual tonnes of paper purchased and used for the production of eco-labelled converted paper product.

Where the printing house carries out finishing processes on behalf of another printing house, the amount of waste paper produced in those processes shall not be included in the calculation of 'X'.

**Main proposal for criterion 5 Waste management** (converted and printed paper products)

*Where the finishing processes are outsourced to another company, the amount of waste paper resulting from the outsourced work shall be calculated and declared in the calculation of 'X'.*

Assessment and verification: *the applicant shall provide a description of the calculation of the amount of waste paper, together with a declaration from the contractor collecting the waste paper from the printing house. The outsourcing terms and calculations on the amount of paper waste involved in the finishing processes shall be provided. The period for the calculations shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least 3 months of representative running of the plant.*

**Additional proposals**

- 5d). To request a prevention plan for waste production.
- 6e). To set a maximum quantity of total wastes produced by tonne of product. This limit could only refer to unsorted waste fraction or total waste fraction.
- 6f). To revise % of paper waste per technology (Criterion 5 b) and product type (Criterion 5c).
- 6g). To set % of waste for different types of products: ink wastage, washing agents, etc.

**Rationale**

Waste generated during production process can have relevant environmental impacts. According to LCA review, the major part of the impacts for printing process comes from the process residues (between 24 and 88% of contribution depending on the impact category). The waste generated in printing industry can be broadly classified as hazardous waste and non-hazardous waste (see Table 14).

**Table 14.** Classification of printing wastes

<b>Hazardous waste</b>	<b>VOC</b>	<b>Pollutes wastewater</b>	<b>Non-hazardous solid waste</b>
Photographic waste including intensifiers scrap film and photo developer.	Petroleum based inks containing xylene, ketone, and alcohols.	Any liquid hazardous waste dumped in the drains	Waste substrates such as paper, foil, film resulting from rejects and excess quantities.
Waste ink with solvents and different heavy metals.	Fountain and damping solutions such as isopropyl alcohol.	Rinse from photo processing	Water-based inks without heavy metal constituents.
Strong alkaline wastes such as sodium hydroxide	Cleaning solvents including acetone, methanol and toluene		
Strong acid waste such as sulphuric and nitric acid.	Various types of adhesives containing ammonia.		
Cleaning rags which contain solvents			

Source: Rochester Institute of Technology

In heat-set web offset printing, reported values show that the quantity of produced ink waste varies from 2 kg up to 6.5 kg per tonne of used ink. During printing, the dampening solution can become contaminated with paper dust and small amounts of ink. These solutions contain AOX and small amounts of metals. Normally, these waste dampening solutions are delivered to a waste recycling company. Large amounts of used cleaning agents may arise, especially in large printing plants where most of the cleaning is done automatically.

The estimated amount is some 100 kt cleaning agents per year in the European offset printing industry, which is disposed of. Wipes from cleaning the press contain organic solvents, ink and sometimes varnish. Other wastes are: photopolymer and rubber printing plates: the steel, polyester or aluminium sleeves are reused repeatedly: the polyester or rubber materials are glued to these; non-returnable metal containers, primarily aluminium, with traces of other metals; reel cores; glue, adhesive and film wastes. Blankets are also discarded. Waste can also contain filters from filtering the dampening solution and discarded UV lamps from the platemaking process.

Wastewater coming from dampening solutions and cleaning agents has also been identified. The total amount of wastewater is highly dependent on the working methods, and on average 2–3 m<sup>3</sup>/t ink is used and discharged, mainly from interim cleaning and cleaning the machinery after a job. If treated, treatment, the water may be reused and the sludge disposed of as waste.

Waste Framework Directive (2008/98/EC) provides guidance in planning implementation of a comprehensive waste management scheme. A waste management system is a valuable tool that ensures control over the material flow, and drives to waste prevention, and preparing for reuse, recovery, recycling, and safe disposal. One of the limiting factors to implement a comprehensive waste management strategy is the availability of possible routes for waste treatment either internally or externally. Although it is possible to achieve a zero waste to landfill target, this requires access to end markets which should be developed over time and will vary depending on local infrastructure and demand. Therefore no specific waste treatment routes are required under revised criterion proposal. The wording of the criterion was adapted to reflect the main objective which is to ensure the implementation of a long-term waste management strategy.

### **Waste – printing house**

The amount of waste paper from heat-set offset printing is usually higher than from other printing methods. This is due to a significant amount of paper used to reach a proper balance between ink and dampening water. This operation is necessary to ensure (calibrate) the printout's quality. The reported proportion of waste paper is about 15% of the input quantity.

Waterless offset is claimed to produce less waste, given that there is no calibration of ink and dampening water. Lower paper losses associated with waterless offset printing provides an economic advantage, however, only in the case of short runs.

During gravure printing, the ink percentage is estimated less than 0.1 % of the ink input. Waste ink is treated off site as hazardous waste. Leftover coloured ink is normally mixed with black ink and thus reused. Waste ink can also be distilled to recover the toluene. The distillation sludge, which is about 20 % of the original weight of the waste ink, is disposed of. However, because of the small amounts of toluene recovered, distillation is not often applied because of the relatively expensive equipment needed. Wastewater generation at a publication gravure installation has also been identified. Wastewater from the plating department is evaporated and the sludge is treated as hazardous waste.

In Nordic Ecolabel, printing companies are awarded points for the quantity of mixed waste up to 20 kg/tonnes of product, as a measure of the effectiveness of sorting waste at source. The Nordic Ecolabel also rewards printing companies for implementing technologies that could minimise waste.

## **Waste – Paper conversion process**

The quantity of waste paper generated depends on a number of aspects, including type of product, printing method and quantity of product. The table below illustrates the different percentage of waste paper for the type of converted paper products and the printing method applied. However, there are high variations from these averages when considering the single products, different in size and production runs.

**Table 15.** Average percentage paper waste generated

<b>Product/printing method</b>	<b>Industry feedback</b>	<b>Nordic Swan<sup>24</sup></b>	<b>Blue Angel<sup>25</sup></b>
Envelope Offset	3.5%	4%	
Envelope flexography	15%	15%	
Flexographic printing (except envelopes)		11%	11%
Gravure printing		12%	15%
Coldset, forms		18%	18%
Heatset rotation		21%	20%
Sheet fed offset (except envelopes)		23%	20%

In the case of stationery products resulting from the gravure printing, higher waste paper percentages are registered for small sizes and filing products that require printing on both sides (Table 16). The influence of the product size can increase waste paper production by more than 40 percentage points as can be seen in the case of the folder Colorlife (14% to 63% excluding cutting)

**Table 16.** Paper waste generated from printing, laminating and cutting

<b>Filing Products</b>	<b>Printed sides</b>	<b>2016 (% waste)</b>	<b>2017 (% waste excl. cutting)</b>
License folders	1	17%	
Binder outside cover A4	1	15%	18%
Binder inside cover	1	8%	
Insert sheets	1	14%	
Box Colorlife	2	25%	36%
Folder Colorlife	2	12%	14%
Box Nomadbox students	2	26%	
Folder Quickfile students	2	29%	
Folder PowerFile students	2	22%	
Folder Colorlife 17x22 (small format)	2		63%
<i>Average</i>		16%	20%

*Source: Hamelin Brands*

<sup>24</sup> Ecolabelling, N. (2011). Printing companies , printed matter , envelopes and other converted paper products, (December). Revised 2017

<sup>25</sup> Blue Angel.(2015). Basic Criteria for Award of the Environmental Label. Printed matter

The setting up of the machine also influences the amount of waste paper. There is usually a fixed amount of sheets that are wasted during machine set up. This implies that products with a high production volume per machine run will have low waste percentages in contrast to small production volumes. The production volumes depend on the client order and this is usually low for specialized or niche products. It is therefore proposed to set thresholds according to different types of paper stationery products as follows (Table 17).

**Table 17.** Proposed threshold for paper waste

<b>Stationery product (excl. envelopes)</b>	<b>Percentage paper waste</b>
Writing and printing	15%
Filing product (printed on 1 side)	20%
Filing product (printing on both sides)	30%

<b>Points for discussion</b>
Should the thresholds of waste generation per printing technology be revised? Should specific threshold of waste per type of input be introduced e.g. ink wastage, washing agents etc.?

## 5.6 Criterion 6 - Energy use

### **Current criterion**

- 6). The printing (printing/converting) house shall establish a register of all energy consuming devices (including machinery, lightning, air conditioning and cooling) and a programme consisting of measures for improvement of energy efficiency.

*Assessment and verification: the applicant shall provide the register of energy consuming devices together with the improvement programme.*

### **Main proposal for criterion 6: Energy**

- 6). The printing/converting house shall establish a register of all energy consuming devices (including machinery, lighting, air conditioning, cooling) and a programme consisting of measures for improvement of energy efficiency.

*Assessment and verification: the applicant shall provide the register of energy consuming devices together with the improvement programme.*

### **Additional proposals**

- 6b). A quantitative energy limit by process /technology. The limit can be set at:
- For sheet offset printing, limit value 4,000 kWh/tonne of product
  - For digital printing, limit value 5,000 kWh/tonne of product
  - For the rest of printing technologies, limit value of 3,500 kWh/tonne of printed product (NORDIC).
- 6c). A request for performing a CO<sub>2</sub> review of the product (NORDIC).
- 6d). Printing devices: The printing machines must have an ecolabel such as Energy Star or must be labelled on a scale of A+ to A+++ (the most efficient classes) according to Directive 2010/30/EU.

### **Rationale**

The key energy form used in manufacturing is electricity from grid. From the LCA perspective, impacts from grid electricity are the highest after those from paper production, i.e. In the case of envelopes electricity contributes up to 20% impacts especially for global warming, ozone depletion, acidification and eutrophication. For this reason, electricity consumed during printing/conversion operations could be considered when analysing the environmental performance of a product. Energy costs represent a significant contribution to total production costs, so there is an inherent incentive for the sector to improve energy efficiency.

### **Energy consumption threshold**

Energy consumption encompasses all the printing electricity, gas, and fuel consumption. It is calculated as kWh per tonne of product.

Nordic Swan has set a threshold of 3,500 kWh/tonne of product. The calculation of energy consumption per tonne of product is obtained by the division of the total annual energy consumed, including administration and normal building operation (from the electricity meter) per annual production. The Nordic Print Portal undertakes to distribute

the energy consumption on each printing method in relation to the market average (**Error! Not a valid bookmark self-reference.**) for each method and makes all the calculations. The calculation is based on the assumption that the distribution of energy consumed at the individual printing company is the same as the distribution of the average market values. The data are compiled by Nordic Ecolabelling from 68 printers using different technologies.

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**Error! Not a valid bookmark self-reference.**) for each method and makes all the calculations. The calculation is based on the assumption that the distribution of energy consumed at the individual printing company is the same as the distribution of the average market values. The data are compiled by Nordic Ecolabelling from 68 printers using different technologies.

**Table 18.** Average energy consumption per printing technology

<b>Printing method</b>	<b>Average energy consumption (kWh/tonne of product)</b>
Sheet fed offset (except packaging and offset printing of envelopes)	1253
Cold-set, news print	365
Cold-set, forms	997
Cold-set rotation (except news print and form printing)	825
Heat-set rotation	965
Rotogravure printing	864
Flexographic printing (except envelope production)	486
Digital printing	2799
Offset printing, envelopes	436
Envelope production with flexography	552
Offset, packaging	1564

*Source:* Nordic Ecolabel

Digital printers are characterised by a higher than other printing methods energy consumption, followed by sheet-fed offset printing. The coldest is a technique with the lowest energy consumption. The proposed threshold value of 3,500 kWh/tonne of product could affect mainly digital printers with high-energy consumption. Based on the data compiled from licensed printers and pilot printers in the autumn of 2010 by Nordic Swan, between 85 and 90% of printing houses would accomplish the requirement. Reported values for specific energy consumption associated to gravure printing vary between 0.4 MWh and 0.75 MWh per tonne of substrate or from 10 MWh up to 30 MWh/million m<sup>2</sup> of substrate (all coated slides). The toluene recovery system (local extraction, steam generation, cooling water pumping) represents a significant share (in some cases close to half) of the total energy consumption of the installation.

In addition to the general energy saving measurements, such as energy-saving lighting and optimisation of pressure level, other the key energy-saving measurements could include heat exchanging in the ventilation systems including the toluene recovery plant, air conditioning adjustments, reduced air ventilation at idle operation or maintenance, thermal insulation of tanks and vats with heated liquids (toluene recovery plant adsorbers, hot water tank), toluene recovery plant with variable frequency drives, heat recovery from the toluene recovery plant, and air extraction and energy recovery from drying processes.

According to the Nordic Ecolabel, a reasonable energy consumption calculated as purchased energy in the form of electricity, district heating/cooling and fuel for a printing



method must not exceed 3,500 kWh per tonne of product and year. However, several exceptions can be considered. For instance, a limit value of 4,000 kWh per tonne of product/year is applied for sheet offset printing, and a limit value of 5,000 kWh per tonne of product/year is applied for digital printing applications.

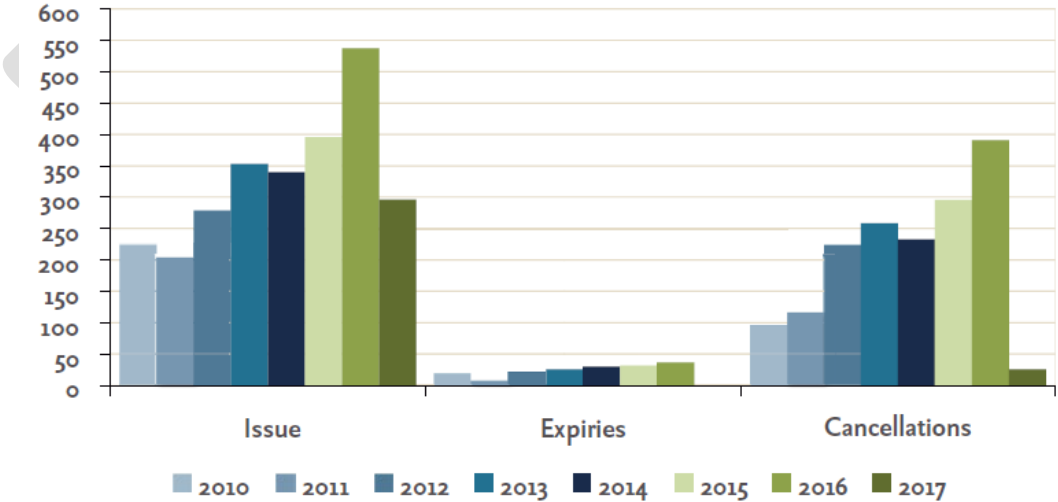
**Increase of the renewable energy input**

In the 2020 climate & energy package, the EU introduced goals for the year 2020 in a number of different sectors. In the energy sector the European 20-20-20 targets include 20% of the energy, on the basis of consumption, coming from renewables. In addition, the 2030 climate & energy framework sets a binding target at EU level to boost the share of [renewables](#) to at least 27% of EU energy consumption by 2030.

The RES Directive ([2009/28/EC](#)) promotes a substantial increase in the proportion of electricity generated from renewable energy sources across the European Union. Individual Member States have all been required to take appropriate steps to encourage greater consumption of electricity from renewables, in order that the overall EU target 2020 can be met.

Under the quota obligations support scheme for RES the government requires electricity distributors to obtain a fixed proportion of their electricity from renewable non-fossil sources. If they do not produce enough renewable electricity themselves, they must obtain tradable certificates from RES producers. This creates demand for certificates. Therefore, Member States are required to give producers the opportunity to obtain electronic guarantees of origin (GOs) for electricity generated from renewable sources. A GO is issued on request by producers of electricity from eligible renewable energy sources, as defined by the RES Directive. The system is purely voluntary, and individual producers can decide whether or not they wish to make such a request.

Statistics from the Association of Issuance Bodies (3rd quarter of 2017) show an increase of GOs generated and cancelled in the past years (Figure 10). The increase in cancellation implies that more of these certificates are being used.



**Figure 10.** Generated and cancelled GOs  
*Source: Association of Issuance Bodies (2017)*

Issue = GOs created in a month for electricity produced in an earlier month

Cancel = GOs which have been made non-transferrable by the holder of the account in which they reside (or its agent)

Expire=GOs which relate to electricity produced more than a year ago, and which have consequently been cancelled.

The number of cancellations in 2017 has already exceeded the previous years' record levels, considering that most cancellations occur at the closing of the financial year. Issuing tends to be 20% understated over the past quarter, due to delays in capturing metering data, so the number of issued GOs will doubtless top last years.

The possibility of setting requirements on the consumption of electricity from renewable sources could be explored in line with the 20% EU target for energy consumption from renewable sources. According to the Commission communication entitled 'Renewable Energy Roadmap – Renewable energies in the 21st century: building a more sustainable future', the 20% target is equivalent to 34% electricity consumption from renewable sources. Hence a threshold for renewable electricity use in the converting process of converted paper products could be set in the range 20%-30% of total electricity consumption. However, this represents a huge effort, if not unrealistic for producers located in some countries. It is therefore proposed to set a 10% threshold for renewable electricity, which corresponds to the minimum national overall target for the share of energy from renewable sources in gross final consumption of energy in 2020, included in the RES

Compliance to this requirement can be verified through the purchase and obtainment of renewable energy certificates generated by a quota based renewable energy support scheme, prior to verification of their reliable registration and cancellation tracking system.

#### Points for discussion

Should an energy consumption threshold per tonne of EU eco-labelled product be introduced?  
Should requirements for energy from renewable sources be introduced?

## 5.7 Criterion 7 - Training

### **Current criterion** (*printed and converted paper products*)

7). All members of staff participating in day-to-day operation shall be given the knowledge necessary to ensure that the Ecolabel requirements are fulfilled and continuously improved.

*Assessment and verification: the applicant shall provide a declaration of compliance with this criterion, together with details of the training programme, its content, and an indication of which staff have received what training and when. The applicant shall provide to the Competent Body also a sample of training material.*

### **Proposal** (printed and converted paper)

No modifications are proposed for this criterion.

## **Rationale**

The knowledge of processes and requirements of EU Ecolabel by all printing houses employees is a key aspect in order to guarantee that the requirements from EU Ecolabel are accomplished in the different manufacturing steps. Most of stakeholders agree on keeping this criterion (40%-63%).

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## 5.8 Criterion 8 - Fitness for use

### **Current criterion** (*printed and converted paper products*)

8). The product shall be suitable for its purpose.

*Assessment and verification: the applicant shall provide appropriate documentation in compliance with this criterion. National or commercial standards, where relevant, may be used by the applicant to prove the fitness for use of the printed paper products.*

### **Proposal for criterion 8: Fitness for use**

8). The product should be suitable for its purpose.

*Assessment and verification: The applicant shall provide appropriate documentation demonstrating compliance with the scope of the criteria. The product shall fulfil the requirements for permanence in accordance with applicable standards. The producers shall guarantee the fitness for use of their products providing appropriate documentation demonstrating the paper quality, in accordance with the standard EN ISO/IEC 17050-1:2004, which provides general criteria for suppliers' declaration of conformity with normative documents.*

*In addition, national or commercial standards, where relevant, may be used by the applicant to prove the fitness for use of the converted paper products.*

*For paper carrier bags, the reference test method is EN 13590:2003.*

*For print substrates and printing parameters the applicant shall demonstrate the compliance with ISO 12647*

### **Rationale**

Compliance with EN conformity requirements should be required for all products, though national standards and tests existing at national levels.

Specific EN test standard is available for paper carrier bags but were not identified for the other converted paper products under study.

If compliance with a reference standard of quality for printed paper such as ISO12647 or a standard based on ISO 12647 is required, the requirement for quality and fitness for use would be more objective and checking of compliance will be easier to be done by Competent Bodies.

In Nordic Ecolabel, the practicing company can obtain points by having a certified quality system for print quality in accordance with ISO12647 or a standard based on ISO 12647.

The ISO 12647 specifications includes standard process control for various printing methods and processes. ISO 12647-2 for instance covers the offset printing process. Standardizing production means that a number of production parameters need to be clearly defined, along with a specific tolerance on each. In the case of ISO 12647 these definitions include:

- the colour and transparency of printing inks
- definitions of paper types
- solid tones, which are described with CIELAB values
- tone value increases (TVI), per paper type and colour

The ISO 12647 standard is split up in different parts, which each have a different number. Their names also include the year when the standard was established or last modified. Because the standard covers various printing methods, a printer only needs to implement a part of the full specifications.

- ISO 12647-1:2005 describes the parameters and measurements methods. Essentially 12647-1 provides the basis for the subsequent print related settings.
- ISO 12647-2:2004 defines the process control settings for offset lithography.
- ISO 12647-3:2005 defines the process control settings for newspaper printing, more specifically cold-set offset lithography on newsprint.
- ISO 12647-4:2005 defines the process control settings for publication gravure printing, which is used for high volume magazines, catalogues, etc.
- ISO 12647-5:2001 defines the process control settings for screen printing.
- ISO 12647-6:2006 defines the process control settings for flexographic printing.
- ISO 12647-7 is still being work on. It will cover off-press proofing processes.

<b>Points for discussion</b>
To include quality standard ISO 12647 as reference in the assessment and verification.

## 5.9 Criterion 9 - Information on the product

### **Current criterion**

9a). The criterion refers to printed paper and paper bags.

9b). The following information shall appear on the printed product or paper bag:  
'Please collect used paper for recycling'.

*Assessment and verification*: The applicant shall provide a declaration of compliance with this criterion, supported by an image of the product bearing the information required.

### **Proposal for criterion 8: Fitness for use**

No modifications are proposed for this criterion.

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## 5.10 Criterion 10 - Information appearing on the EU Ecolabel

### **Current criterion** (*printed paper products*)

10). The optional label with text box shall contain the following text:

This printed product is recyclable

It is printed using paper with low environmental impact

Emissions of chemicals to air and water of paper production and printing process have been limited.

The guidelines for the use of the optional label with the 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/pdf/logo%20guidelines.pdf>

*Assessment and verification: the applicant shall provide a sample of the printed paper product showing the label, together with a declaration of compliance with this criterion.*

### **Current criterion** (*Converted paper products*)

10). The optional label with text box shall contain the following text:

This product is recyclable.

Emissions of chemicals to air and water of paper production, printing and converting processes have been limited.

In order to avoid the risk of providing confusing messages to consumers between an EU eco-labelled bag and its non EU eco-labelled contents, paper carrier bags shall be designed to be open and to be filled either at the point of purchase or afterwards so that consumers understand that the EU Ecolabel is only valid for the paper carrier bag, and not for the goods added. The EU Ecolabel logo displayed on the bag shall bear the following text 'EU eco-labelled paper carrier bag'.

The guidelines for the use of the optional label with the 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/pdf/logo%20guidelines.pdf>

*Assessment and verification: the applicant shall provide a sample of the converted paper product showing the label, together with a declaration of compliance with this criterion.*

### **Proposed criterion** (*printed and converted paper products*)

**10). The optional label with text box shall contain the following text:**

This product is recyclable

It is printed using paper with low environmental impact

Emissions of chemicals to air and water of paper production and printing process have been limited

For paper carrier bags, in order to avoid the risk of providing confusing messages to consumers between an EU eco-labelled bag and its non EU eco-labelled contents, paper carrier bags shall be designed to be open and to be filled either at the point of purchase or afterwards so that consumers understand that the EU Ecolabel is only valid for the paper carrier bag, and not for the goods added. The EU Ecolabel logo displayed on the bag shall bear the following text 'EU Eco-labelled paper carrier bag'.

The guidelines for the use of the optional label with the 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/pdf/logo%20guidelines.pdf>

**Assessment and verification:** *the applicant shall provide a declaration of compliance with this criterion, supported by an image of the product showing the label.*

**Points for discussion**

No particular point of discussion as the merging does not add any additional requirements

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## **6 OTHER PROPOSALS FOR DISCUSSION**

Other aspects have been identified as being potentially covered by the revised criteria, although their improvement potential and applicability could be limited. These aspects are listed below for further discussion:

### ***Resource conservation***

Material resource conservation intends to adopt lean production and recycling opportunities in supporting the conservation of natural resources as well as the use of renewable materials. It addresses issues that are critical for the non-paper contents and which can reasonably be improved by specific requirements included in the revised criteria.

### ***Improved Eco-Design strategy***

To design the product with an eco-design approach, in order to ensure the minimum consumption of materials and chemical products. It is estimated that over 80% of the overall environmental impacts are determined during the product's design phase.

Design decisions such as the format (number of pages, dimensions of the product, colours, image quality or resolution, etc.) can have considerable influence on the environmental impact of the final product.

### ***Water consumption during printing operations***

Water consumption is not a critical point from a sustainability point of view. LCA. Nevertheless, some technologies promote an efficient use of water and recirculation of water. Regarding other Type I Ecolabels, Nordic Ecolabel give points according to levels of water consumption (<2000 l/tonne product).

### ***Transport processes***

Transport processes for materials and for the final product is one life stage with minor contribution to the global impact of the final product. Nevertheless, in the past revision it was discussed if this aspect should be covered by EU Ecolabel; it was concluded to postpone the discussion for the next process revision.

### ***To limit print run, printing on demand***

Over-printing and large print-runs generate avoidable environmental impacts (resource consumption and waste) and over-costs since unnecessary items are printed. There are increasing practices in the market on printing on demand, linked to the growth of digital printing that allows adjusting the number of printed products to the real demand.

## ANNEX I

### **Board Substrate (EU Ecolabel criteria for converted paper products 2014/256/EU)**

#### **Criterion B1 – Emissions to water and to air**

(a COD, Sulphur, NOx, Phosphorous)

For each of these parameters, the emissions to air and/or water from the pulp, the laminating papers and the board production shall be expressed in terms of points (PCOD, PS, PNOx, PP) as detailed below.

None of the individual points PCOD, PS, PNOx, PP shall exceed 1.5.

The total number of points ( $P_{total} = PCOD + PS + PNOx + PP$ ) shall not exceed 4,0.

The calculation of P COD shall be made as follows (the calculations of PS, PNOx, PP shall be made in exactly the same manner).

For each pulp 'i', or each laminating paper, 'i' used, the related measured COD emissions ( $COD_{pulp, i}$  or  $COD_{paper, i}$  expressed in kg/air dried tonne – ADT), shall be weighted according to the proportion of each pulp or laminating paper used (pulp 'i', or paper 'i', with respect to air dried tonne of pulp, or paper), and summed together. The weighted COD emission for the pulps, or laminating papers, is then added to the measured COD emission from the board production to give a total COD emission,  $COD_{total}$ .

The weighted COD reference value for the pulp production or laminating paper production shall be calculated in the same manner, as the sum of the weighted reference values for each pulp or laminating paper used and added to the reference value for the board production to give a total COD reference value  $COD_{ref, total}$ . The reference values for each pulp or laminating paper type used and for the board production are given in the Table 1.

Finally, the total COD emission shall be divided by the total COD reference value as follows:

Reference values for emissions from different pulp types and from board production

Pulp grade/Board	Emissions (kg/ADT) (4)			
	COD reference	S reference	NOx reference	P reference
Bleached chemical pulp (other than sulphite)	18	0,6	1,6	0,045 (4)
Bleached chemical pulp (sulphite)	25,0	0,6	1,6	0,045
Unbleached chemical pulp	10,0	0,6	1,6	0,04
CTMP	15,0	0,2	0,3	0,01
TMP/groundwood pulp	3,0	0,2	0,3	0,01
Recycled fibres pulp	2,0	0,2	0,3	0,01
Laminating bleached kraft paper	19	0,9	2,4	0,055
Laminating unbleached kraft paper	11	0,9	2,4	0,055
Laminating recycled paper	3	0,5	1,1	0,02
Board production (non-integrated mills where all pulps used are purchased market pulps)	1	0,3	0,8	0,01
Board production (integrated mills)	1	0,3	0,7	0,01

In case of a co-generation of heat and electricity at the same plant the emissions of S and NO<sub>x</sub> resulting from electricity generation can be subtracted from the total amount. The following equation can be used to calculate the proportion of the emissions resulting from electricity generation:

$$2 \times (MWh(\text{electricity})) / [2 \times MWh(\text{electricity}) + MWh(\text{heat})]$$

The electricity in this calculation is the electricity produced at the co-generation plant. The heat in this calculation is the net heat delivered from the power plant to the pulp/laminating paper/board production.

**Assessment and verification:** *the applicant shall provide detailed calculations showing compliance with this criterion, together with related supporting documentation which shall include test reports using the following test methods: COD: ISO 6060; NO<sub>x</sub>: ISO 11564; S(oxid.): EPA No 8; S(red.): EPA No 16A; S content in oil: ISO 8754; S content in coal: ISO 351; P: EN ISO 6878, APAT IRSA CNR 4110 or Dr Lange LCK 349.*

*The supporting documentation shall include an indication of the measurement frequency and the calculation of the points for COD, S and NO<sub>x</sub>. It shall include all emissions of S and NO<sub>x</sub> which occur during the production of pulp, laminating paper and board, including steam generated outside the production site, except those emissions related to the production of electricity. Measurements shall include recovery boilers, lime kilns, steam boilers and destructor furnaces for strong smelling gases. Diffuse emissions shall be taken into account. Reported emission values for S to air shall include both oxidised and reduced S emissions (dimethyl sulphide, methyl mercaptan, hydrogen sulphide and the like). The S emissions related to the heat energy generation from oil, coal and other external fuels with known S content may be calculated instead of measured, and shall be taken into account.*

*Measurements of emissions to water shall be taken on unfiltered and unsettled samples either after treatment at the plant or after treatment by a public treatment plant. The period for the measurements shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the measurements shall be based on at least 45 subsequent days of stable running of the plant. The measurement shall be representative of the respective campaign.*

*In case of integrated mills, due to the difficulties in getting separate emission figures for pulp, laminating paper and board, if only a combined figure for pulp, laminating paper and board production is available, the emission values for pulp(s) shall be set to zero and the figure for the board mill shall include pulp, laminating paper and board production.*

#### (b) AOX

The weighted average value of AOX released from the productions of the pulps used in the substrate shall not exceed 0,170 kg/ADT board.

AOX emissions from each individual pulp used in the board shall not exceed 0,250 kg/ADT pulp.

Assessment and verification: the applicant shall provide test reports using the following test method: AOX ISO 9562 accompanied by detailed calculations showing compliance with this criterion, together with related supporting documentation.

The supporting documentation shall include an indication of the measurement

frequency. AOX shall only be measured in processes where chlorine compounds are used for the bleaching of the pulp. AOX need not be measured in the effluent from non-integrated board production or in the effluents from pulp production without bleaching or where the bleaching is performed with chlorine-free substances.

Measurements shall be taken on unfiltered and unsettled samples either after treatment at the plant or after treatment by a public treatment plant. The period for the measurements shall be based on the production during 12 months. In case of a new or a re-built production plant, the measurements shall be based on at least 45 subsequent days of stable running of the plant. The measurement shall be representative of the respective campaign.

(c)CO2

The emissions of carbon dioxide from non-renewable sources shall not exceed 1 000 kg per tonne of board produced, including emissions from the production of electricity (whether on-site or off-site). For non-integrated mills (where all pulps used are purchased market pulps) the emissions shall not exceed 1 100 kg per tonne. The emissions shall be calculated as the sum of the emissions from the pulp and board production.

*Assessment and verification: the applicant shall provide detailed calculations showing compliance with this criterion, together with related supporting documentation.*

*The applicant shall provide data on the air emissions of carbon dioxide. This shall include all sources of non-renewable fuels during the production of pulp and board, including the emissions from the production of electricity (whether on-site or off-site).*

*The following emission factors shall be used in the calculation of the CO2 emissions from fuels:*

Fuel	CO2 fossil emission	Unit
Coal	95	g CO2 fossil/MJ
Crude oil	73	g CO2 fossil/MJ
Fuel oil 1	74	g CO2 fossil/MJ
Fuel oil 2-5	77	g CO2 fossil/MJ
LPG	69	g CO2 fossil/MJ
Natural gas	56	g CO2 fossil/MJ
Grid electricity	400	g CO2 fossil/kWh

*The period for the calculations or mass balances shall be based on the production during 12 months. In case of a new or a rebuilt production plant, the calculations shall be based on at least 45 subsequent days of stable running of the plant. The calculations shall be representative of the respective campaign.*

*For grid electricity, the value quoted in the table above (the European average) shall be used unless the applicant presents documentation establishing the average value for their suppliers of electricity (contracting supplier or national average), in which case the applicant may use this value instead of the value quoted in the table.*

*The amount of energy from renewable sources (5) purchased and used for the production processes shall not be considered in the calculation of the CO2 emissions: appropriate documentation that this kind of energy are actually used at the mill or are externally purchased shall be provided by the applicant.*

## Criterion B2 – Energy use

### (a) Electricity

The electricity consumption related to the pulp, laminating paper and the board production shall be expressed in terms of points (PE) as detailed below.

The number of points, PE, shall be less than or equal to 1,5.

The calculation of PE shall be made as follows.

Calculation for pulp or laminating paper production: For each pulp, laminating paper  $i$  used, the related electricity consumption ( $E_{pulp}$  or laminated paper,  $i$  expressed in kWh/ADT) shall be calculated as follows:

$E_{pulp}$  or  
laminating paper,  $i$   
Eboard  
=Internally produced electricity + purchased electricity – sold electricity  
Calculation for board production: Similarly, the electricity consumption related to the board production (Eboard) shall be calculated as follows:  
=Internally produced electricity + purchased electricity – sold electricity

Finally, the points for pulp, laminating paper and board production shall be combined to give the overall number of points (PE) as follows:

In case of integrated mills, due to the difficulties in getting separate electricity figures for pulp, laminating paper and board, where only a combined figure for pulp, laminating paper and board production is available, the electricity values for pulp(s) shall be set to zero and the figure for the board mill shall include pulp, laminating paper and board production.

### (b) Fuel (heat)

The fuel consumption related to the pulp, laminating paper and the board production shall be expressed in terms of points (PF) as detailed below.

The number of points, PF, shall be less than or equal to 1,5.

The calculation of PF shall be made as follows.

Calculation for pulp or laminating paper production: For each pulp, laminating paper  $i$  used, the related fuel consumption ( $F_{pulp}$  or laminated paper,  $i$  expressed in kWh/ADT) shall be calculated as follows:

$F_{pulp}$  or laminating  
paper,  $i$   
=Internally produced fuel + purchased fuel – sold fuel – 1,25 ×  
internally produced electricity

#### *Note:*

$F_{pulp}$  or laminating paper,  $i$  (and its contribution to PF, pulp or laminating paper) need not be calculated for mechanical pulp unless it is market air dried mechanical pulp containing at least 90 % dry matter.

The amount of fuel used to produce the sold heat shall be added to the term 'sold fuel' in the equation above.

Calculation for board production: Similarly the fuel consumption related to the board production ( $F_{board}$ , expressed in kWh/ADT), shall be calculated as follows:

$F_{board}$ =Internally produced fuel + purchased fuel – sold fuel – 1,25 × internally produced electricity

Finally, the points for pulp and board production shall be combined to give the overall number of points (PF) as follows:

<b>Pulp grade</b>	<b>Fuel kWh/ADT Reference</b>	<b>Electricity kWh/ADT E reference</b>
Chemical pulp	4000 <sup>a</sup>	800
Mechanical pulp	900 <sup>b</sup>	1900
CTMP	1000	2000
Recycled fibre pulp	1800 <sup>c</sup>	800
Laminating kraft pulp (Bleached or unbleached)	6100	1600
Laminating recycled pulp	3900	1600
Board production	2100	800

<sup>a</sup>for air dry market pulp containing at least 90% dry matter (admp), this value may be upgraded by 25% for the drying energy.

<sup>b</sup> this value is only applicable for admp

<sup>c</sup> for admp, this value may be upgraded by 25 % for the drying energy

\*value for lamination process is equal to sum of energy for pulp manufacturing and board production.

**Assessment and verification:** (for both (a) and (b)): the applicant shall provide detailed calculations showing compliance with this criterion, together with all related supporting documentation. Reported details shall therefore include the total electricity and fuel consumption.

The applicant shall calculate all energy inputs, divided into heat/fuels and electricity used during the production of pulp and board, including the energy used in the de-inking of waste papers for the production of recycled board. Energy used in the transport of raw materials, as well as conversion and packaging, is not included in the energy consumption calculations.

Total heat energy includes all purchased fuels. It also includes heat energy recovered by incinerating liquors and wastes from on-site processes (e.g. wood waste, sawdust, liquors, waste paper, paper broke), as well as heat recovered from the internal generation of electricity — however, the applicant need only count 80 % of the heat energy from such sources when calculating the total heat energy.

Electric energy means net imported electricity coming from the grid and internal generation of electricity measured as electric power. Electricity used for wastewater treatment need not be included.

Where steam is generated using electricity as the heat source, the heat value of the steam shall be calculated, then divided by 0,8 and added to the total fuel consumption.

In case of integrated mills, due to the difficulties in getting separate fuel (heat) figures for pulp, laminating paper and board, if only a combined figure for pulp, laminating paper and board production is available, the fuel (heat) values for pulp(s) shall be set to zero and the figure for the board mill shall include pulp, laminating paper and board production.

### **Criterion B3 – Excluded or limited substances and mixtures**

**Assessment and verification:** the applicant shall supply a list of the chemical products used in the pulp and board production, together with appropriate documentation (such as SDSs). This list shall include the quantity, function and suppliers of all the substances used in the production process.

(a) Hazardous substances and mixtures

In accordance with Article 6(6) of Regulation (EC) No 66/2010 of the European Parliament and of the Council (6) the board shall not contain substances referred to in Article 57 of Regulation (EC) No 1907/2006 nor substances or mixtures meeting the criteria for classification with the hazard classes or categories specified below.

List of hazard statements and risk phrases:

Hazard Statement (7)	Risk Phrase (8)
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
No commercial dye formulation, colorants, surface-finishing agents, auxiliaries and coating materials shall be used on either	R43

pulp or board that has been assigned or may be assigned at the time of application the hazard statement H317: May cause allergic skin reaction.	
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The use of 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 or mixtures which may be or have been assigned the hazard statements or risk phrase listed above, meeting the criteria for classification in the hazard classes or categories, and for substances meeting the criteria of Article 57(a), (b) or (c) of Regulation (EC) No 1907/2006, shall not exceed the generic or specific concentration limits determined in accordance with the Article 10 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council [\(9\)](#). Where specific concentration limits are determined they shall prevail over the generic ones.

Concentration limits for substances meeting criteria of Article 57(d), (e) or (f) of Regulation (EC) No 1907/2006 shall not exceed 0,10 % weight by weight.

Assessment and verification: the applicant shall prove compliance with the criterion providing data on the amount (kg/ADT board produced) of substances used in the process and that the substances referred to in this criterion are not retained in the final product above concentration limits specified. The concentration for substances and mixtures shall be specified in the Safety Data Sheets in accordance with Article 31 of Regulation (EC) No 1907/2006.

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

No derogation from the prohibition set out in Article 6(6) of Regulation (EC) No 66/2010 shall be granted concerning substances identified as substances of very high concern and included in the list provided for Article 59 of Regulation (EC) No 1907/2006, present in mixtures, in an article or in any homogenous part of a complex article in concentrations higher than 0.10 %. Specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008 shall apply in case it is lower than 0,10 %.

**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](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. The applicant shall prove compliance with the criterion providing data on the amount (kg/ADT board produced) of substances used in the process and that the substances referred to in this criterion are not retained in the final product above concentration limits specified. The concentration shall be specified in the safety data sheets in accordance with Article 31 of Regulation (EC) No 1907/2006.*

(c) Chlorine

Chlorine gas shall not be used as a bleaching agent. This requirement does not apply to chlorine gas related to the production and use of chlorine dioxide.

**Assessment and verification:** *the applicant shall provide a declaration from the*



*pulp producer(s) that chlorine gas has not been used as a bleaching agent. Note: while this requirement also applies to the bleaching of recycled fibres, it is accepted that the fibres in their previous life-cycle may have been bleached with chlorine gas.*

(d) APEOs

Alkylphenol ethoxylates or other alkylphenol derivatives shall not be added to cleaning chemicals, de-inking chemicals, foam inhibitors, dispersants or coatings. Alkylphenol derivatives are defined as substances that upon degradation produce alkyl phenols.

**Assessment and verification:** *the applicant shall provide a declaration(s) from their chemical supplier(s) that alkylphenol ethoxylates or other alkylphenol derivatives have not been added to these products.*

(e) Residual monomers

The total quantity of residual monomers (excluding acrylamide) that may be or have been assigned any of the following risk phrases (or combinations thereof) and are present in coatings, retention aids, strengtheners, water repellents or chemicals used in internal and external water treatment shall not exceed 100 ppm (calculated on the basis of their solid content):

Hazard Statement <a href="#">(10)</a>	Risk Phrase <a href="#">(11)</a>
H340 May cause genetic defects	R46
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
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

Acrylamide shall not be present in coatings, retention aids, strengtheners, water repellents or chemicals used in internal and external water treatment in concentrations higher than 700 ppm (calculated on the basis of their solid content).

The competent body may exempt the applicant from these requirements in relation to chemicals used in external water treatment.

**Assessment and verification:** *the applicant shall provide from their chemical supplier(s) a declaration of compliance with this criterion, together with appropriate documentation (such as Safety Data Sheets).*

(f) Surfactants in de-inking

All surfactants used in de-inking shall be ultimately biodegradable.

**Assessment and verification:** *the applicant shall provide from their chemical supplier(s) a declaration of compliance with this criterion together with the relevant safety data sheets or test reports for each surfactant which shall indicate the test method, threshold and conclusion stated, using one of the following test method and pass levels: OECD 302 A-C (or equivalent ISO standards), with a percentage degradation (including adsorption) within 28 days of at least 70 % for 302 A and B, and of at least 60 % for 302 C.*

#### (g) Biocides

The active components in biocides or biostatic agents used to counter slime-forming organisms in circulation water systems containing fibres shall not be potentially bio-accumulative. Biocides' bioaccumulation potentials are characterised by log Pow (log octanol/water partition coefficient) < 3,0 or an experimentally determined bioconcentration factor (BCF) ≤ 100.

**Assessment and verification:** *the applicant shall provide from their chemical supplier(s) a declaration of compliance with this criterion together with the relevant material safety data sheet or test report which shall indicate the test method, threshold and conclusion stated, using the following test methods: OECD 107, 117 or 305 A-E.*

#### (h) Azo dyes

Azo dyes that may cleave to any of the following aromatic amines shall not be used, in accordance with Annex XVII to Regulation (EC) No 1907/2006:

1. 4-aminobiphenyl	(92-67-1)
2. benzidine	(92-87-5)
3. 4-chloro-o-toluidine	(95-69-2)
4. 2-naphthylamine	(91-59-8)
5. o-aminoazotoluene	(97-56-3)
6. 2-amino-4-nitrotoluene	(99-55-8)
7. p-chloroaniline	(106-47-8)
8. 2,4-diaminoanisole	(615-05-4)
9. 4,4'-diaminodiphenylmethane	(101-77-9)
10. 3,3'-dichlorobenzidine	(91-94-1)
11. 3,3'-dimethoxybenzidine	(119-90-4)
12. 3,3'-dimethylbenzidine	(119-93-7)
13. 3,3'-dimethyl-4,4'-diaminodiphenylmethane	(838-88-0)
14. p-cresidine	(120-71-8)
15. 4,4'-methylene-bis-(2-chloroaniline)	(101-14-4)
16. 4,4'-oxydianiline	(101-80-4)
17. 4,4'-thiodianiline	(139-65-1)
18. o-toluidine	(95-53-4)
19. 2,4-diaminotoluene	(95-80-7)
20. 2,4,5-trimethylaniline	(137-17-7)
21. 4-aminoazobenzene	(60-09-3)
22. o-anisidine	(90-04-0)

**Assessment and verification:** *the applicant shall provide from their chemical supplier(s) a declaration of compliance with this criterion.*

(i) Metal complex dye stuffs or pigments

Dyes or pigments based on lead, copper, chromium, nickel or aluminium shall not be used. Copper phthalocyanine dyes or pigments may, however, be used.

**Assessment and verification:** *the applicant shall provide from their chemical supplier(s) a declaration of compliance.*

(j) Ionic impurities in dye stuffs

The levels of ionic impurities in the dye stuffs used shall not exceed the following: Ag 100 ppm; As 50 ppm; Ba 100 ppm; Cd 20 ppm; Co 500 ppm; Cr 100 ppm; Cu 250 ppm; Fe 2 500 ppm; Hg 4 ppm; Mn 1 000 ppm; Ni 200 ppm; Pb 100 ppm; Se 20 ppm; Sb 50 ppm; Sn 250 ppm; Zn 1 500 ppm.

**Assessment and verification:** *the applicant shall provide a declaration of compliance.*

#### **Criterion B4 – Waste management**

All pulp and board production sites shall have a system for handling waste (as defined by the relevant regulatory authorities of the pulp and board production sites in question) and residual products arising from the production of the eco-labelled product. The system shall be documented or explained in the application and include information on at least the following points:

- procedures for separating and using recyclable materials from the waste stream,
- procedures for recovering materials for other uses, such as incineration for raising process steam or heating, or agricultural use,
- procedures for handling hazardous waste (as defined by the relevant regulatory authorities of the pulp and board production sites in question).

**Assessment and verification:** *the applicant shall provide a detailed description of the procedures adopted for the waste management of each of the sites concerned and a declaration of compliance with the criterion.*

#### **Criterion 2 – Fibres: sustainable forest management**

The fibre raw material may be recycled or virgin fibre.

Virgin fibres shall be covered by valid sustainable forest management and chain of custody certificates issued by an independent third party certification scheme such as FSC, PEFC or equivalent.

However, where certification schemes allow mixing of certified material, recycled materials and uncertified material in a product or product line, the proportion of uncertified virgin material shall not exceed 30 % of the total fibre raw material. Such uncertified material shall be covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.

The certification bodies issuing forest and/or chain of custody certificates shall be accredited /recognised by that certification scheme.

**Assessment and verification:** *the applicant shall provide appropriate documentation indicating the types, quantities and origins of fibres used in the pulp and the board production.*

*Where virgin fibres are used, the product shall be covered by valid forest management and chain of custody certificates issued by an independent third party certification scheme, such as PEFC, FSC or equivalent. If the product or product line includes uncertified material, proof should be provided that the uncertified material is less than 30 % and is covered by a verification system which ensures that it is legally sourced and meets any other requirement of the certification scheme with respect to uncertified material.*

*Where recycled fibres are used, the applicant shall provide a declaration stating the average amount of grades of recovered paper used for the product in accordance with the standard EN 643 or an equivalent standard. The applicant shall provide a declaration that no mill broke (own or purchased) was used for the percentage calculation.*

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