

**About Swan-labelled
Tissue paper**

Background for ecolabelling

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Nordic Ecolabelling

Background to Swan-labelled Tissue paper

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1 Summary

The criteria for ecolabelled tissue paper have been revised. This document sets out the background to the requirements in the Supplementary module for Tissue paper and describes discussions that have been conducted within the working group during the revision work. Many of the requirements laid down for tissue paper that can be ecolabelled are contained in the Basic and Chemical modules. The background to these requirements can be read in the Background document for the Basic module. Such requirements include, for example, requirements governing certified fibres, energy, emissions of COD, P, S, NO_x and CO₂ and also governing a number of production chemicals.

The revision work has focussed on the following areas: function, transport and printing process.

The work resulted in the following new requirements for tissue paper:

- Auxiliary chemicals used on the Yankee cylinder must not contain epichlorohydrin.
- Requirements relating to additions of cosmetic or body care preparations.
- Requirements relating to the function of paper towels and toilet paper
- Requirements to the effect that the packaging must be optimised from the transport point of view (an information requirement)

It was considered that this product group on its own was too difficult to control so that it ought to be justified to impose direct requirements on transport/the carrier in this product group.

2 History

Criteria for tissue paper were laid down for the first time on 10/02/1992. The product group was then called paper towels and toilet paper. Originally, only paper towels and toilet paper were included in the product group. During the revision conducted in 1996, this group was, however, expanded to include other types of tissue paper such as handkerchiefs, napkins and paper cloths. Only recycled fibre-based products were allowed in the first criteria, which was changed in 1996. The criteria were revised in 2000 and extended in 2005. They are valid until 30 June 2007.

3 Motives for Swan-labelling Tissue paper

The manufacture of tissue paper is complex and involves a number of aspects that may have a significant impact on the environment, e.g. as a result of forestry and emissions from pulp and paper manufacture. It may therefore be virtually impossible or very time-consuming for individual purchasers and consumers to assess and compare the environmental impact of various products. As tissue paper is a typical consumer product, the ecolabel is an easy way of communicating enterprises' environmental work to consumers.

With this in mind, the licence holder is allowed to use the Swan brand in its marketing. The Swan label is very well known and credible within the Nordic region.

The Swan label encompasses not only environmental requirements but also quality requirements as the environment and quality usually go hand in hand. This means that a Swan licence can be viewed as a quality stamp. Tissue paper also has a large market among professional users.

4 About the development of criteria/the revision

Development of the environmental criteria for various kinds of paper products to cover the entire production chain from forestry to waste has led to very extensive criteria documents with many different requirements. In the past, a criteria document existed for each product group, such as printing paper, coffee filters or envelopes, which was revised at various times and by various working groups. The result was therefore often that the requirements governing the same chemicals or paper pulp were formulated differently, even if the environmental impact was the same. Many subcontractors have therefore found it difficult to understand why their products were covered by different requirements or why the documentation of compliance with requirements differed according to whether the paper was used for, say, printing paper or envelopes.

To remedy this, a new structure was formulated within the paper sector for all criteria documents, the 'Module criteria', which were laid down in the autumn of 2003. These applied in the first phase to the criteria documents for coffee filters, greaseproof paper and paper envelopes. The new structure was then to be introduced in all paper product groups as they are revised.

The thinking behind the module criteria is that all the requirements that apply jointly to the various paper product groups for, say, pulps and chemicals are set out in a joint criteria module in a 'basic module'. As it may be appropriate also to have different product-specific requirements, these are set out in 'supplementary modules', which are specific to the product group in question. The requirements in the supplementary modules may be either less or more stringent or be product-specific.

The module criteria were circulated for comment towards the end of 2003 and were received positively by the bodies to which they were circulated. The criteria for tissue

paper have therefore also been restructured so that the general requirements in the basic module and the chemical module apply where this is relevant and so that the product-specific requirements are set out in a supplementary module for tissue paper.

The assessment of the criteria (2003) revealed 3 areas that ought to be put in focus during the development of a supplementary module in the audit of the tissue paper criteria: function, transport and printing process.

The supplementary module for tissue paper has been drawn up by a working group at Nordic Ecolabelling. The following individuals were included in the group:

Ulla Sahlberg, SIS Ecolabelling, Sweden, Project manager

Birgitte Holm Christensen, Ecolabelling Secretariat, Denmark

Jaakko Suursalmi, SFS Ecolabelling, Finland

Lise Sunsbj, Ecolabelling Foundation in Norway

Facts and data for the requirements have been obtained via personal contacts with manufacturers and other players within the sector. A 2-day seminar has also been organised on the subjects of function, transport and printing. Invited representatives were manufacturers, the business community, representatives from the transport section and consumer representatives from the Nordic countries.

External anchoring takes place with the general circulation of a report for comment in autumn 2005.

5 What can be Swan-labelled?

Cellulose-based tissue paper made from new and/or recycled fibres can be Swan-labelled. The product group comprises, for example, toilet paper, paper towels, handkerchiefs, napkins and paper cloths. Wet-wipes, nonwovens and products laminated with non-cellulose-based material do not form part of the product group.

The product group definition has not been changed. Wet-wipes can now be ecolabelled if they meet the ecolabelling requirements for cosmetics. Paper products laminated with non-cellulose-based material and nonwoven products form part of the hygiene products product group. Classification between different product groups has been carried out with a view to applications, partly as wet-wipes are usually marketed in a manner that defines them as cosmetics and the criteria document for hygiene products contains composite products and nonwovens and requirements for them.

6 Substantiation of requirements

This background report sets out the background to the requirements laid down in the supplementary module for Tissue paper. The requirements contained in the Basic module or the chemical modules are substantiated in the background document for the Basic module.

The relevance of imposing requirements in a number of different areas was investigated during the revision work. In many cases, however, it has been decided not to impose requirements as this might be felt to be irrelevant or uncontrollable.

6.1 Areas in which requirements are laid down

Description of the product K1 and basic requirements for pulp and paper manufacture, K2 and K3

The ecolabelling licence is granted to a paper product and it is therefore important that the applicant describes the product in as much detail as possible. In order for it to be assessable whether the product meets the ecolabelling requirements, detailed information is needed on the manufacturing processes and the constituent raw materials of pulp and chemicals.

The Basic and Chemical module contains requirements relating to pulp and paper manufacture and production chemicals used therein that are to be met by the tissue paper. The supplementary module sets out additional requirements that are not present either in Basic or Chemical modules or that are product-specific as it has been adapted to tissue paper manufacture.

K4 Emissions into air and water

Pulp and paper production gives rise to emissions into both air and water. From the life cycle point of view, emissions into water and emissions from energy production are the paper manufacturing factors with the greatest adverse environmental impact. It is therefore important that these be limited in ecolabelled products.

Many of the tissue paper manufacturers asked indicated the emissions requirements as being the most important in the ecolabelling context. The assessment of the criteria showed that there was scope for making the emission requirements more stringent. The requirement concerning emissions from pulp and paper mills were therefore revised and substantially tightened up in connection with the formulation of the requirements in the Basic module.

The requirement concerning emissions is formulated as a matrix system in which the actual emissions of COD, P, S and NO_x are compared with a reference emission for the parameter in question. The ratio between the actual and the reference emission constitutes an emission point. The sum of the emission points for the four emission

parameters must not exceed 4. Pulp production and paper production have separate reference values. The reference values for emissions from tissue paper production are not contained in the Basic module as these are product-specific and have therefore been incorporated in the supplementary module for tissue paper – these are set out in Table 1. The previous version of the criteria document for tissue paper contained a joint reference value for pulp and paper manufacture. However, these were separated when the Basic module was formulated.

The new reference values for emissions from the paper machine for tissue paper manufacturing have been formulated by using the range for the BAT values for emissions in BREF (IPPC report, July 2000) to arrive at a value for the parameters in question. The values laid down were formulated by studying current official statistics, for example in environmental reports, and from experience of ecolabelling of emissions from existing tissue paper machinery. The tightening-up of the emissions levels is in accordance with Ecolabelling's desire for constant environmental improvements.

Table 1

| Paper type | Reference value for emissions | | | |
|--------------|-------------------------------|------------------|------------------|---|
| | COD _{ref} | P _{ref} | S _{ref} | NO _{x,ref} |
| Tissue paper | 2.0 | 0.01 | 0.3 | 0.29g/kWh* (the reference value for fuel consumption for tissue paper manufacturing)* |

The Basic module and Table 2 quote reference values for various pulp types and the background to these is contained in the background document for the Basic module.

The BAT values for tissue paper manufacture from new fibres are shown in Table 2. Equivalent values for recycled fibre-based paper machines alone do not exist (the existing BAT values in BREF also encompass emissions from the deblackening of the fibres.) The proposed COD reference value is slightly higher than the BAT value for new fibre-based paper machines as recycled fibres may be assumed to result in higher emissions from a paper machine than the new fibres and the Ecolabelling would not keep out recycled fibre-based products by imposing excessively stringent requirements.

Table 2

| Paper type | BAT values for emissions and energy | | | |
|-------------------------------|-------------------------------------|------------------|---------------------|-------------------------|
| | COD _{ref} | P _{ref} | Process heat, kWh/t | Electricity used, kWh/t |
| Tissue paper, new fibre-based | 0.4-1.5 | 0.003-0.015 | 1528-2084 | 500-2000 |

The BREF does not quote values for emissions from energy production, but refers to process energy use and emissions from various fuels. The BREF also states that

energy reporting within Europe is deficient, which is why the BAT values for energy consumption should be viewed as examples of the levels of BAT energy consumption.

The reference values for the emissions requirements for S and NO_x have therefore been based on a good fuel mix and statistics compiled by Ecolabelling – see the background document for the Basic module.

Table 3 Reference values for emissions from various pulp types and paper manufacturing

| Pulp type (pulp, _i) or paper | Reference value for emissions (kg/tonne 90% pulp) | | | |
|---|--|------------------|------------------|---|
| | COD _{ref} | P _{ref} | S _{ref} | NO _{xref} |
| Bleached chemical pulp (sulphate and other chemical pulp without sulphite pulp) | 18.0 | 0.03 | 0.6 | 0.29g/kWh* (the sum of the reference values for fuel consumption) |
| Bleached chemical pulp (sulphite pulp) | 25.0 | 0.03 | 0.6 | |
| Unbleached chemical pulp | 10.0 | 0.02 | 0.6 | |
| CTMP pulp | 15.0 | 0.01 | 0.2 | |
| TMP/Mechanical pulp | 3.0 | 0.01 | 0.2 | |
| Recycled fibre pulp | 3.0 | 0.01 | 0.2 | |
| Paper machine, uncoated | 2.0 | 0.01 | 0.3 | |
| Paper machine, coated | 2.5 | 0.01 | 0.3 | |
| Paper machine, special paper | 3.8 | 0.02 | 0.5 | |

K5 Emissions of AOX

The use of chemicals containing chlorine, for example for bleaching pulp, gives rise to chlorinated organic compounds that may persist in the environment for a long time. One measure of the amount of organic substances containing chlorine is the level of AOX (Adsorbable Organic Halogens) in the waste water.

In the version (v.3) of the tissue paper criterion that currently applies, the requirement limit for AOX is 0.05 kg/tonne paper product. It is proposed that this requirement should remain unchanged. On the other hand, the requirement for the individual pulp has been harmonised with the requirements of the basic module.

Emissions of AOX from each pulp used must, according to the basic module, not exceed 0.4 kg/tonne, which is therefore now proposed to apply in the new tissue paper criterion (v.4). The requirement in the current tissue paper criterion (v.3) is 0.3 kg/tonne. This proposed lightening of the requirement for the individual pulps has been carried out to harmonise with the requirement level of the basic module and to give tissue paper manufacturers greater flexibility to choose between the pulps. The intention of the module system is for the basic module to be the standard for all paper-based product groups as far as possible. By having the same AOX requirements for pulps that are used in tissue paper and other ecolabelled paper products, it is made easier for pulp manufacturers to adhere to the ecolabelling criteria. In the case of the

end product of tissue paper, however, the same stringent AOX limit therefore applies from now on as under the previous tissue paper criterion.

Product safety and quality

K6 Chloro-organic substances in wet strength agents and in other auxiliary chemicals on the Yankee cylinder

The requirements for chloro-organic substances in wet strength agents have been tightened up from 1.0% to 0.1%. A fresh ban on auxiliary chemicals used on the Yankee cylinder containing epichlorohydrin 1,3-dichloro-2-propanol (DCP) or 3-monochloropropanediol (CPD) has been introduced.

Wet strength agents are needed for the function of the product in kitchen towels, napkins and flannels. In toilet paper, on the other hand, a good dissolving capacity in the toilet is important, which is why wet strength agents are not added to it.

The wet strength agents used in tissue paper are what are known as polyamide epichlorohydrin resins, which give the paper a long-lasting wet strength. Complete development of the wet strength (polymerisation) of the paper takes about a week. A small amount of residual monomers (ECP) may then be left in the paper. In addition, epichlorohydrin undergoes reactions in which 1,3-dichloro-2-propanol (DCP) and 3-monochloropropanediol (CPD) are formed. Both these are classified as potentially carcinogenic. In addition, chemicals of this kind result in emissions of AOX.

The trend for lower levels of DCP and CPD for wet strength agents has been driven by more stringent requirements for chemical purity in packaging paper, primarily for food packaging and requirements concerning substances that are harmful to health in paper in contact with food.

Within Nordic ecolabelling, requirements have previously been imposed on the content of EPC, DCP and CPD in wet strength agents used in tissue paper. The requirement limit was then set in accordance with 'second generation' wet strength agents, i.e. the sum of EPC, DCP and CPD in the dry matter in the wet strength agent must not exceed 1.0%. This requirement is now being tightened up to 0.1%. The trend for wet strength agents with low levels of chloro-organic compounds has moved on and there are now a number of products on markets that comply with this limit.

Within the chemical module, requirements for 0.01% chloro-organic substances in wet strength agents are laid down. The background to this was BfR's (BgVV)'s requirement for levels of DCP and CPD in paper in contact with food such as greaseproof paper and coffee filters, and these values were laid down in connection with the revision of the criteria for greaseproof paper and coffee filters.

The supplementary module for envelopes contains a ban on paper that is strong when wet, and wet strength agents are not used in standard printing paper. The new requirement in the supplementary module is based on responses to reports circulated for comment from tissue paper manufacturers in connection with the report circulated for comment for the Chemical module.

As tissue paper enters the human body via the skin and also lens products, requirements have also been imposed on the epichlorohydrin content of auxiliary

chemicals in order to reduce the risk of the content of carcinogenic substances in ecolabelled tissue paper.

DCP and CPD are also present in other production chemicals in wet strength agents during tissue paper manufacturing. On Yankee cylinders, various auxiliary chemicals are used, such as release chemicals, which may themselves also contain DCP and CPD. In certain cases, significant quantities are involved. It has therefore frequently emerged that changing wet strength agents merely to reduce the substances hazardous to health in the tissue paper does not suffice. As there are alternatives to such products, Nordic Ecolabelling wants to prohibit auxiliary chemicals containing epichlorohydrin.

K7 Requirements for perfume, K8 Additives in toilet paper and K9 Additives of Cosmetics or body care preparations

Tissues represent a growing category¹ and more and more tissues are treated with various kinds of lotion and other products, which are intended to have a cosmetic or health-bringing function.

The criteria for tissue paper, version 3, do not contain any requirements covering such products, apart from a ban on perfumes and other scents added to produce an odour.

Tissues treated with large quantities of grease emulsions and active components such as Aloe Vera will be intermediate between a tissue paper and a cosmetic product corresponding to wet-wipes. Wet-wipes are covered by the EU Cosmetics Directive, 76/768/EEC and can be marked with the Swan label by meeting Nordic Ecolabelling's criteria for cosmetics² (The term 'cosmetics and hygiene products' (CoH) should be understood to mean substances or preparations intended to be applied to the external parts of the *human body* or to teeth and mucous membranes in the oral cavity. The exclusive or main aim must be to clean or perfume, modify appearance, correct body odour, protect skin, mucous membranes and teeth or keep them in good condition).

Tissues will continue to be covered by the product group definition of tissue paper, but requirements are laid down for the preparation added to produce a cosmetic or health-bringing effect. The requirement will vary with the amount of preparation added. If less than 10 kg preparation/tonne paper is added, none of the constituent substances in the preparation will be classified as carcinogenic (Carc), mutagenic (Mut), reproduction-toxic (Rep) or sensitising with R42 and/or R43. If the preparation is incorporated at the rate of more than 10 kg/tonne paper or if the product is marketed as a cosmetic product (see the definition in the Cosmetics Directive), the requirements of the Nordic Ecolabelling criteria document for Cosmetics are met. The background to the requirements in the criteria document for Cosmetics are described in a background document, which can be obtained from one of the secretariats.

¹ Dagligvarehandelen, no. 7-2005

² <http://www.svanen.nu/kriterier/kriterie.asp?pgn=090>

The limit of 10 kg preparation/tonne paper has been set on the basis of a small range of products in question. If more than this is added, the product will no longer be regarded as a tissue paper.

The requirement will also cover other types of tissue paper with the exception of toilet paper. Preparations added to produce a cosmetic or health-bringing effect must not be added to toilet paper as these products end up in the aquatic environment.

K10 Content of harmful substances and bleeding

The requirement is unchanged from the previous version of the criteria document. “The Guidelines for tissue paper kitchen towels and napkins” (2004) contain extensive requirements governing kitchen towels and napkins in contact with food. If it can be shown that the manufacturer follows these “guidelines”, this requirement is met.

Product function

The importance of the function of the product has been discussed in previous revisions of the criteria. At the time of the previous revision, however, the development of requirements concerning effective function did not fit within the framework of the revision project. The work has continued and requirements have been formulated concerning the function of kitchen towels, napkins and toilet paper.

Good quality, i.e. the functional characteristics, is important as the effective function of a tissue paper may be considered to save resources. For example, a good absorption capacity may lead to fewer kitchen towels being needed to dry liquid. Conversely, effective function may on another occasion mean a greater burden on the environment in the form of chemicals consumption, emissions or energy consumption. In October 2004, Nordic Ecolabelling arranged a seminar (see Chapter 4) at which scope for imposing requirements on product function and which characteristics are most relevant were discussed. A summary of the discussion is contained in the report from the seminar, which is appended to this document. This resulted in requirements being laid down concerning the minimum absorption capacity of kitchen towels and paper towels and concerning a sufficient ratio between strength in the longitudinal direction and above the perforation in kitchen towel rolls.

K11. Requirement concerning the absorption capacity of kitchen towels and paper towels.

This requirement is new.

Paper that absorbs too much or too little performs poorly and may result in increased consumption. The same applies to the suction *rate*. In relation to hand drying, certain manufacturers have conducted detailed studies of the consumption pattern. They have investigated how many seconds it takes to dry one’s hands and how many grams of water need to have been dried. They have also investigated what the consumer does if

the paper cannot absorb the correct amount of water within the time that the consumer is willing to spend on drying. If the paper absorbs too quickly, it feels wet too quickly and another piece is therefore taken. If the paper absorbs too slowly, another piece is taken because the drying process takes longer than the consumer's patience will allow. If the paper cannot absorb enough water, the consumer is forced to use another piece. If it absorbs too well, unused drying capacity is thrown in the rubbish bin.

Paper towels are needed most when one is away from home. This means that it is often professional buyers who purchase paper gloves. It is thought that manufacturers and professional buyers focus beforehand on the drying rate and that it is therefore unnecessary for the Swan label to impose requirements in this regard.

Hand drying is a well-defined function for drying paper. The situation is different as regards kitchen rolls. These products are used for very different tasks. In some cases, it is important that the paper can absorb a large amount, while in others it must absorb rapidly or merely have a sufficient area to take what is being dried.

Many manufacturers have previously focussed on the paper having an adequate absorption capacity. The Swan is primarily an ecolabel, but, as mentioned, is also intended to ensure satisfactory quality. The Swan requirements concerning absorption capacity are laid down so that paper with a markedly poor absorption capacity cannot be granted the Swan label, regardless of whether the paper meets the environmental requirements. The requirement is intended to ensure that consumers are not dissatisfied with paper bearing the Swan label.

K12 Requirement concerning strength in relation to perforation for kitchen rolls and toilet paper

This requirement is new.

Many people are familiar with the situation in which one wants to tear off a piece of kitchen roll or toilet paper, but the piece tears into several bits, which means that one has to try again. This results in unnecessary consumption. The Swan label can influence this by imposing requirements requiring perforated paper to be easy to tear off. This requirement can be formulated as how strong the perforation is allowed to be relative to the strength of the paper. The perforation is determined in a dry condition and the strength of the paper as the tensile strength in the longitudinal direction. A Danish consumer study has investigated this strength relationship for a number of kitchen rolls and toilet paper. The Swan labelling requirements are based on this knowledge and laid down so that poorly perforated paper cannot be granted the Swan label, regardless of whether the paper meets the environmental requirements.

K13 Requirement concerning the function of toilet paper:

This requirement is new.

With regard to toilet paper, it is important that the paper is not strong when wet, but readily dissolves in the toilet bowl so that it does not block up the waste pipe.

Requirements have therefore been laid down stipulating that the toilet paper must not be strong when wet.

Plugs caused by paper and fibre products occur in sewerage systems. There are reports that plugs have occurred in waste pipes and even in the toilet bowl. The plugs were blamed on the toilet paper as this seemed the natural thing to do. However, studies (*Helsinki city*) have shown that plugs are nearly always caused by something other than toilet paper, i.e. hand-drying paper, wet-wipes, textiles and toilet paper containers. If an incipient plug has arisen, the effect has often been intensified by other contributory effects; there are examples of certain viscous liquid soaps having contributed to the formation of plugs. Paper that is strong when wet is not readily rid of fibres without favourable conditions, namely high shear forces and a favourable pH. The conditions in the household waste pipe are not sufficient to remove fibres from paper that is strong when wet.

The mechanism in plugs, which usually occur in the bends of the waste pipe, involves a relatively small plug build-up occurring, after which fibres that normally float begin to build up. When flow-through then decreases, this is perceived as a plug, although the pipe has not always lost its flow capacity.

The Swan label is not geared to whether foreign fibres are rinsed down into the waste water system. The Swan label is, however, geared to the crucial characteristics of toilet paper, namely strength when wet. By imposing requirements on the strength of toilet paper when wet, the potential of the toilet paper for plug formation is minimised. No adverse effects can follow from this requirement, as toilet paper is not deliberately rendered strong when wet.

The requirement concerning routines which ensure that the paper is not strong when wet is aimed at production lines that consecutively carry runs of different paper types, both strong when wet and not strong when wet. This requirement is intended to ensure that the remaining strength when wet effect is as good as eliminated when manufacture of the Swan-labelled toilet paper begins.

The requirement for a tensile strength of 10 N/m usually means that the strength when wet is less than 5%, which may be considered lower than the limit for paper that is not strong when wet.

K14 Requirement concerning packaging material

This requirement has not changed as compared with the previous version of the criteria. Nordic Ecolabelling still considers it important to limit chlorine-based plastics in packaging and to promote packs whose materials can be recycled.

K15 Requirement concerning optimisation of transport packs

Requirements concerning transport were discussed during the revision. It was considered, however, that the controllability of this product group was too weak to be able to lay down requirements for the transport itself, see section 6.2.

Optimisation of packs from the transport point of view can, however, be done, and is already being done by a number of tissue paper manufacturers. Requirements have

therefore been laid down stipulating that manufacturers of ecolabelled tissue paper must use optimised transport packs, for example place multipacks on the pallet to increase the level of filling of pallets in the vehicle.

6.2 Other areas that have been discussed during the revision

Transport

Scope for introducing requirements concerning the adoption of parameters relating to the transport of tissue paper other than the optimisation of packs from the transport point of view has been investigated during the revision. Transport is considered to be a major environmental threat and is of particular interest for products made from tissue paper, due to the fact that tissue paper products take up a lot of space relative to their weight when transported. There are, however, a number of problems that complicate scope for laying down requirements for transport. The following issues have therefore been investigated in greater detail during the revision:

Relevance: What proportion of total environmental pollution from tissue paper production is caused by transport?

Transport generally results in considerable environmental pollution. Of total EU carbon dioxide emissions, 20% come from road transport, and forecasts indicate that emissions from transport may increase by 50% between 1990 and 2010. Transport is responsible for between 5 and 10% of the environmental impact of tissue paper on the parameters of oxygen consumption in water, acid rain and the greenhouse effect, according to results from an LCA shown at the seminar held in connection with the revision. Most of this environmental impact is from transport from the mill and then to the consumer, while the environmental impact from raw material transport is substantially less. Environmental pollution from the transportation of tissue paper is thus significant, but still represents a fraction of total environmental pollution.

Potential: What scope exists for reducing environmental pollution from transport?

People engaged in purchasing transport operations can make various environmental demands of transport companies. Standard environmental requirements are an environmental policy, environmental audits and training. For example, an Ecodriving course for drivers results on average, in the short term, in 10-15% less fuel consumption and thus lower emissions. Customers will also often know about the emission levels of the transport operations and make environmental calculations. Emission calculations can currently be performed on a single consignment or an individual product group, and it can then be calculated what emissions are produced by the consignment in question on a stretch of road. This can help the transport buyer to choose the environmentally best option.

The transport sector, for its part, is engaged in reducing environmental pollution, including through the adoption of new technology, alternative modes of transport and alternative fuels, where possible on account of the infrastructure. As fuel costs are high, it is in the enterprise's interests to increase the effectiveness of the transport. Transport is, however, very inexpensive and often accounts for a small element of the final price of the product.

EU standards governing new vehicles mean that the vehicle park automatically improves over the years. A common aim of the environmental work of transport enterprises is to rejuvenate the vehicle park. Older and environmentally poorer vehicles are, however, rarely scrapped, but are instead driven in countries outside the Nordic region, where environmental work is not so developed. Although rejuvenation of the vehicle park thus improves the environmental performance of the transport company in question, it does not reduce overall environmental pollution caused by transport – the problems have merely been displaced to other countries. Introducing a requirement for the haulier to have an environmentally sound fleet of vehicles is therefore of doubtful benefit as environmental problems with old vehicles would remain in other respects.

Logistics and capacity utilisation are extremely important for increasing the effectiveness of transport. Capacity utilisation may often be highly dependent on the type of goods, e.g. for vehicles engaged in transporting timber, the capacity utilisation rate is never more than 50%. A low level of capacity utilisation may depend on customer requirements, e.g. shop opening times and traffic problems in large towns can lead to considerable practical difficulties in increasing capacity utilisation. A more feasible route may be to optimise the capacity utilisation of pallets used for transportation.

It is theoretically possible to increase the effectiveness of transport by optimising the way in which the tissue paper rolls are packed in the transport vehicle. By compressing the products or optimising their placement on the pallets, the amount of paper sent per pallet can be increased. As an example, a lorry can hold three times more of a compressed “heavy” toilet paper than one that is “full of air”. This results in lower levels of emissions per tonne of paper, even allowing for the fact that a lorry consumes more fuel if it weighs more.

Controllability: What scope do tissue paper manufacturers have for reducing the environmental pollution caused by transport?

In practice, the tissue paper manufacturer has two different ways of influencing environmental pollution caused by transport: imposing requirements on hauliers and, secondly, increasing the weight per unit volume of tissue paper. Unfortunately, neither option is very controllable.

Option 1: Imposing requirements covering the haulier

The tissue paper manufacturer’s scope for imposing requirements on transport and transport companies is limited. A precondition for such requirements to work is that the tissue paper manufacturer should have a means of controlling his transport, i.e. that they act as buyers for the transport. Controllability is greater for raw material transport than for transport of the finished product to the consumer, owing to the fact that the manufacturer is more frequently the purchaser of his raw material transport.

Environmental pollution from raw material transport is relatively limited and practical problems hamper the environmental optimisation of transport operations. For instance, it is very difficult to increase capacity utilisation for timber transport as the

vehicles are always empty when driven from the mill. Imposing requirements on vehicles leads to small net environmental gains owing to the fact that the old vehicles are hardly taken off the road, even if they no longer have to operate just for that customer. Access to alternative (renewable) fuels is limited in most Nordic countries, limiting opportunities for imposing ecolabelling requirements on this. One possibility might be to require what is known as Ecodriving training for transport ordered and controlled by the tissue paper manufacturer. Fuel-saving driving is, however, something that hauliers themselves are currently increasingly adopting, owing to the high fuel costs.

Imposing requirements on hauliers from the production site to the market is hampered not only by the problems mentioned above but also by the fact that the tissue paper manufacturer decreasingly arranges for such transport. One trend within the Nordic consumer non-durables sector is for the sector to assume increasing responsibility for logistics, and goods are increasingly sourced direct from the manufacturer. The reason for this is that the consumer non-durables sector is in this way trying to reduce its logistics and transport costs. Manufacturers are increasingly producing goods to customer order, with both parties thus avoiding storage problems. This results in a flow from the mill direct to the shop, often so that the transport pallet functions as a means of exposure for the product in the shops. This flow is increasingly controlled by the sector.

Option 2: Imposing requirements on the weight per unit volume of the products

One way of reducing the environmental pollution caused by transport is to increase the quantity of products transported to the market by lorry. This could be done by requiring the products to have a high weight per unit volume. The problem is, however, that a low weight per unit volume typically results in the fluffy products that have a better absorption capacity and which many consumers prefer to use. Requirements concerning the product's high weight per unit volume would therefore run counter to the need for the products to function effectively.

It can be concluded that, despite the environmental work going on within the transport sector, it is currently difficult to impose environmental requirements that can be geared to the tissue paper manufacturer. The soft tissue manufacturer has less and less scope for controlling the transport of the products to the shops, while the consumer non-durables sector has greater scope for co-ordinating its own transport.

Option 3: Imposing requirements on how the products are packed, see requirement K15.

Functional units of tissue paper

Nordic Ecolabelling wants to promote measures that save resources, which, in terms of tissue paper, means important usage functions being achieved with less pulp or a smaller sheet area.

During the revision, the term "functional unit" has therefore been investigated. In particular, kitchen paper has been studied.

Parameters appraised are: water absorption, energy use and raw materials use.

These parameters have been calculated for various types of paper, per sheet of paper, paper area and weight per unit area. Test data have come from a Danish study in the journal *Tænk & Test*, issue 43 (April 2004), in which various kitchen towels were tested.

The results show that it is not possible to produce an equation explaining the parameters.

The most important factor in explaining water absorption is the proportion of recycled fibres in the paper. Of course, a higher weight per unit area also helps; in practice, more layers in the refined product gives better absorption characteristics. The kitchen roll is a product that is given many of its final properties at the refining stage, i.e. imprinting and joining of the sheets is very important.

Bulky and compressible paper structures, with greater water absorption, can be achieved if the wet pressing of the tissue paper machine is replaced by wire-borne hot-air drying, but the drawback is greater energy use and greater chemicals consumption. Water absorption can be measured in various ways, from "total absorption" (unlimited volume of water present) to absorption capacity with a limited volume of liquid. If water absorption is measured as capillary absorption, the raw paper product again emerges as the most important explanatory factor, while a bulky and compressible structure assumes less importance.

Consequently, it is not proposed that energy requirements be made less stringent for certain tissue paper types, even if they have higher total absorption. For the same reasons, nor is it proposed that the functional unit be changed from tonnes of paper to square metres of paper or to sheets of paper.

Nordic Ecolabelling wants to put a premium on tissue paper with an adequate function and therefore intends to introduce minimum limits for tissue paper properties, such as minimum guarantee values. If studies are produced in future showing that the environmental benefits of certain paper types are not appearing because calculation is based on per tonne of paper, the question of functional units may be taken up again.

Printing

The printing processor and any environmental impact arising from parameters other than printing inks were also discussed during the revision. However, it was considered that, as tissue paper is for the most part printed with water-based flexography, it was sufficient to limit the inks used in colouring and printing. The environmental impact of the other parameters from the life-cycle perspective was deemed to be limited, and so no requirements were imposed on the printing process. Requirements limiting the use of printing inks and colouring agents for colouring tissue paper are contained in the Chemical module.

7 Changes from previous version

The most important changes from the previous version of the criteria are, besides the changes to the environmental requirements, the change in the structure of the criteria document. This means that there is now a basic module and a chemical module covering a large proportion of the requirements relating to forestry, emissions, energy and chemicals in pulp and paper production. The product-specific requirements are contained in a supplementary module for tissue paper.

The most important changes with regard to the environmental requirements are:

- The requirement concerning the proportion of certified fibres has been tightened up from 15% to 20%.
- The reference values for emissions have been made more stringent, while pulp and paper making have been given separate reference values.
- In the requirement for energy use, the total maximum score has been tightened up from 1.5 to 1.25.
- Alkylphenolethoxylates must not be actively added to certain production chemicals.
- In the case of the requirement for wet strength agents, the authorised quantity of low-molecular chloro-organic compounds has been reduced from 1.0% to 0.1%.

New requirements proposed in the report circulated for comment concerning criteria are:

- Dedicated reference values for emissions from tissue paper machinery.
- Auxiliary chemicals used on the Yankee cylinder must not contain epichlorohydrin.
- Requirement concerning additions of cosmetics or body care preparations.
- Requirement concerning the function of kitchen towels and toilet paper
- Requirement that the packaging must be optimised from the transport point of view (an information requirement)

8 Market overview

The licensing situation, June 2005

There are currently a total of 37 tissue paper licences, breaking down as follows: 26 in Sweden, 7 in Finland, 3 in Denmark and 1 in Norway. The licence holder is usually the manufacturer. However, there are also chains of stores and business concerns that import and sell trade marks of their own under their own licences.

Sector profile

The paper industry is traditionally one of the most environmentally polluting sectors in the Nordic region. When environmental issues were increasingly highlighted in the 1970s and 1980s, the paper industry also came into the spotlight, partly as a result of chlorine emissions, acid rain and overfertilisation. Nordic Ecolabelling was established in the late 1980s, and part of the paper industry then chose to show its increased environmental commitment by ecolabelling many of its products.

During the 1980s and 1990s, environmental legislation developed strongly and the paper industry invested heavily in environmental protection. At the same time, a number of voluntary environmental schemes were introduced such as environmental management systems, forestry certification systems, environmental reporting and environmental product declarations.

Many of the tissue paper mills then invested in environmental management systems such as ISO 14001 and EMAS. As of 28 October 1998, there were only 3 tissue paper licences. The change came in 1999, after which virtually all Nordic tissue manufacturers have one or more ecolabelling licences. That this arose then can in large part be attributed to the fact that the large consumer non-durables chains started to require in their environmental policy that the products they sold should be ecolabelled as far as possible. At the same time, competition failed to appear from the competing Good Environmental Choice label in Sweden. A possible explanation for this is that its paper criteria had been revised in 1998 and the requirements, particularly for forestry, were so stringent that paper products made from new fibres experienced problems in meeting them.

The Nordic tissue paper market is dominated by a few large concerns. However, production often takes place in many smaller mills located close to consumers. There are 12 production sites (not including conversion facilities) in the Nordic region, with 8 of these being in Sweden, 2 in Norway and 2 in Finland. In Denmark, only conversion of tissue paper takes place.

Assuming that enterprises with licences apply ecolabelling to all their production in Sweden, it can be estimated that around 80% of toilet paper and kitchen towels is ecolabelled.

Ecolabelled napkins on the Swedish market are produced by a number of smaller tissue paper converters and manufacturers.

The consultancy AC Nielsen has conducted a survey of the share of ecolabelled consumer non-durables in Finland, Norway, Denmark and Iceland. The study is based on daily sales data collated over five years. Over this period, statistics were collected

in relation to the number of Swan-labelled products in the range, their sales value and the sales trend for consumer non-durables. The study covered product groups for which ecolabelling criteria exist. The result showed that demand for Swan-labelled goods grew steadily until 2002. In Finland, about half of tissue paper is for the professional market.

9 New criteria

It should be assessed at the next revision whether the module system works for this product group. It should also be investigated whether the requirements should be tightened up at the next revision. New requirements introduced during this revision should be followed up.

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