About Nordic Ecolabelled

Vehicle wash installations

Consultation version – 22 March 2013

Background to Nordic Ecolabelling

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Nordic Ecolabelled vehicle wash installations –
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074/Consultation version, 22 March 2013

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1 Summary

The purpose of this document is to present the background to the criteria for vehicle wash installations.

The document explains why Nordic Ecolabelling has chosen to ecolabel vehicle wash installations and gives the background to the individual requirements as they relate to the environmental goals in Nordic Ecolabelling's environmental philosophy. The criteria for Nordic Ecolabelling of vehicle wash installations focus on:

- The design of the vehicle wash installation, whether it is the appropriate size for the purpose
- Emissions and water consumption
- Chemicals
- Environmental management

2 About the criteria

Products eligible for ecolabelling

Experience from the Nordic Ecolabelling of vehicle wash installations shows that the supplier of washing and water treatment units for a vehicle wash installation is often a total supplier of washing and water treatment units and associated chemicals, as well as servicing. This means that such total suppliers know which chemicals are best suited to the installations, conduct water analyses, measure water consumption and know what procedures are necessary during everyday operation to keep the wash installation working properly.

Many vehicle wash installations prefer to maintain a contract with such a total supplier. Against this background, a desire has been expressed for such total suppliers to be able to obtain their own 'basic licence', which can then be used by vehicle wash installations that wish to Nordic Ecolabel their operation.

Nordic Ecolabelling does not want a supplier solely of washing units or chemicals or water treatment units to be able to receive either a regular licence or a basic licence. It is important to ensure that the holder of the basic licence has overall responsibility for deliveries, matching chemicals and units.

As a consequence of this, the product group parameters have been amended.

Wash installations for passenger cars, buses and trucks can be Nordic Ecolabelled.*

The wash installations must be automated and/or manual pre-programmed installations.

Installations that are intended for use in other services, such as reconditioning and repairs, are not covered by the criteria. Wash installations for trams and trains are also not covered by the criteria.

The licensee of the Nordic Ecolabelled vehicle wash installation is the owner of the wash installation (such as a petrol station). Total suppliers of washing units, chemicals and water treatment units may obtain a ***basic licence*** *as defined below.*

- *Vehicle wash installations that apply for Nordic Ecolabelling must meet all the requirements in the criteria document.*
- *Where vehicle wash installations use washing equipment, washing chemicals, water treatment chemicals and water treatment units from a supplier with a* ***basic licence*** *(see explanation below), it must state on the licence which basic licence holder is being used. Vehicle wash installations that apply for a licence to cover washing equipment, washing chemicals, water treatment chemicals and water treatment units from a supplier with a basic licence must meet all the requirements in the criteria document, but are not required to submit documentation for each requirement where the supplier (basic licence holder) has already*
- *submitted such documentation. This applies to the following requirements:*
    - *Initial sampling*
    - *Water treatment chemicals*
    - *Chemical requirements R1–R14*

** Passenger car means a vehicle designed for the transportation of no more than 9 people including the driver. The term truck denotes a heavy truck larger than 3.5 tonnes, with or without trailer. The term bus denotes a vehicle that is registered for more than 9 persons.*

Basic licence

A total supplier of washing units, chemicals and water treatment units may obtain a basic licence for their washing technology. If the supplier uses an external chemicals supplier, it must be stated on the licence which chemicals supplier the basic licence holder has a contract with, and which chemicals are tailored to the treatment technology and wash installation, and thus covered by the basic licence. When applying for a basic licence, the applicant must refer to a physical installation where the initial sampling has been conducted. The installation where the initial sampling took place must also be shown on the licence.

A basic licence may only be marketed with the Nordic Ecolabel logo to potential purchasers of wash installations, and not users of wash installations.

A basic licence holder must meet all the requirements in the criteria document, with the following exceptions:

- *O10 Automatic door closure*
- *All point score requirements, but must still report how many points are achieved in terms of water consumption (O7) and chemicals (O8).*
- *O11 Emptying system for toilets*
- *O13 Special vehicles*

The licence holder always retains responsibility for ensuring that the vehicle wash installation is operated in agreement with the Nordic Ecolabelling criteria. Licences are issued to each individual production location. If a chain/group has several production locations, a licence will be awarded to each production location, on condition that each location meets the requirements.

Justification for Nordic Ecolabelling

Vehicle wash installations affect the environment through considerable consumption of water and chemicals, and through emissions of contaminated wash water. Wash water from vehicle wash installations contains metals and organic substances that have a negative impact on the water recipients, processes and sludge quality. Water consumption is particularly large in installations that do not re-circulate water.

Emissions of metals, oil and organic substances per washed vehicle vary a great deal from installation to installation. Much of the contamination derives from the dirt that is washed off the vehicles. Emissions of metals and organic substances can be significantly limited by choosing specifically adapted cleaning chemicals and tailoring the treatment technology to the washing method. This naturally assumes that the business has good procedures in place for the operation and maintenance of the vehicle wash installation.

The requirements for a Nordic Ecolabelled vehicle wash installation stimulate the development of resource-efficient and effective vehicle wash installations without environmentally hazardous emissions to air, soil or water.

Criteria version and validity

The first version of the criteria document for Nordic Ecolabelling of vehicle wash installations was adopted by the Nordic Ecolabelling Board (NMN) in October 2000. The criteria have since been revised on one occasion.

Version 1, adopted on 6 October 2000

The environmental requirements in the first version focused on the physical design of the installation, as well as water consumption, choice of chemicals, emission controls, waste management and procedures for operation and maintenance.

Version 2, adopted on 14 June 2007

In the second version, the focus was on making the criteria document more user-friendly for licence holders. Point score requirements were introduced and new requirements (point score requirements) were set for energy and emissions of DEHP, VOC and COD. Emission requirements for the metals Pb, Ni, Cr, Cd and Cu were tightened, and point score requirements were introduced for water consumption and chemicals, in addition to the obligatory requirements.

Version 3, scheduled for adoption in October 2013

The revised version 3 is expected to be adopted by the Nordic Ecolabelling Board (NMN) in December 2013.

The Nordic market

In the Nordic region, vehicle wash installations are generally linked to other businesses such as filling stations and car dealerships, but also occur as separate commercial ventures. Wash installations for passenger cars include both automated and manual installations (self-service installations). Passenger car wash installations are primarily run by the oil companies' filling stations, but many installations can also be found at shopping centres, for example. There are several central wash installations for large vehicles (trucks, semi-trailers, etc).

Distribution of wash installations in the Nordic region

Type of installation	Denmark	Finland	Norway	Sweden
Automated installation for passenger cars	1320	900	835	1100
Automated installation for trucks			100	300
No. of washed vehicles (passenger cars) per year (in millions)	13	10	14	16

There are currently around 67 Nordic Ecolabelled vehicle wash installations in the Nordic region. All the Nordic Ecolabelled installations are for passenger cars, and the majority are located in Sweden and Denmark. Finland has two Nordic Ecolabelled installations and Norway has none. The wide variation in uptake in the different Nordic countries is due in part to the differing attitudes of authorities and consumers. In Norway there is little interest in investing in water treatment units for the re-circulation of water, when this is not required by the authorities. At the same time, water is not seen as a scarce resource in the same way that it is in Denmark. There has long been a focus by the Swedish authorities on re-circulating water in vehicle wash installations, and this is reflected in the attitude towards investing in water treatment units.

Several municipalities (including in Sweden and Norway) have introduced tighter emission rules than those set by the national authorities. Some municipalities in Sweden advise consumers not to wash their car at home. Nevertheless, 7 out of 10 Swedes do wash their car at home.

Nordic Ecolabel licences

As of 12 December 2012, there are 35 licences for vehicle wash installations issued under version 2 of the criteria, with the licences covering a total of 67 washing units. This is an increase of 41 washing units since 2006. The licences relate exclusively to washing units for passenger cars. The distribution of the licences is as follows: Denmark (18 licences, 50 washing units), Sweden (15 licences, 15 washing units) and Finland (2 licences, 2 washing units).

Other labels

There are no other ecolabelling systems for vehicle wash installations in the Nordic region. Some follow ISO 14001.

3 About the revision

Purpose of the criteria revision

The main objective of the revision is to present a proposal for revised criteria for vehicle wash installations, version 3.0, in June 2013.

The evaluation of the criteria document for the Nordic Ecolabelling of vehicle wash installations, version 2, which was put before NMN in June 2012, highlighted a number of points that should be examined in the next revision of the criteria. These points included:

- Clear declaration of product group parameters
- Include chemical requirements in the criteria document
- Clarify requirements that have been interpreted differently
- State whether the licence must be linked to the production site or the owner
- Make certain requirements more precise
- Review procedures for taking samples
- Tighten certain requirements and adjust the points weighting
- Amend the requirements concerning manual vehicle wash installations

About this revision

The project team comprised Anne Kristine Feltman (project manager) and Pehr Hård (project adviser). Lena Axelsson was area coordinator for the project.

Under the current schedule, the proposed new criteria will be sent out for consultation during the period March–May 2013 and will be presented to the Nordic Ecolabelling Board (NMN) in December 2013.

4 Background to the requirements

Vehicle washing affects the environment primarily through consumption of water and chemicals, and through emissions of contaminated wash water. Wash water from vehicle wash installations contains metals and organic substances that have a negative impact on the water recipients and disrupt processes and sludge quality in municipal water treatment plants. Large quantities of water are used when a vehicle is being washed, particularly in installations that do not re-circulate water.

Emissions of metals and organic substances per wash vary a great deal from installation to installation. Much of the contamination derives from the dirt that is washed off the vehicle. Measures to reduce emissions of heavy metals and oil include choosing the right cleaning chemicals and adapting the water treatment technology to the washing method. It is also important to have the right operational and maintenance procedures in place. Parts of the industry have been quite resistant to installing water treatment and re-

circulation units. This is particularly true in Norway. In Finland, Sweden and Denmark, there is broader acceptance of the use of water treatment units to reduce emissions and water consumption.

The requirements for a Nordic Ecolabelled vehicle wash installation stimulate the development of resource-efficient and effective vehicle wash installations without environmentally hazardous emissions to air, soil or water. In the Nordic Ecolabelling of vehicle wash installations, the key focus areas have been:

Focus area	Requirement
Physical design of the installation	Oil separator and water treatment technology adapted to the washing method and washing volume. Overview of installation's water and drainage system, location of equipment and machinery, sludge and oil separator, sampling point, water meter and connection points
Water consumption	Absolute requirement for water consumption per vehicle wash, which requires that water is re-circulated. Manual wash installations must not use re-circulated water
Chemicals handling	Requirements concerning type of chemicals
Emission controls	Emissions from the vehicle wash installation
Waste handling	Waste from oil and sludge separators
Operation and maintenance	Automatic door closure In-house checks and initial sampling Annual reporting Procedures and instructions Training Storage of chemicals

In order to assess which requirements should be set for Nordic Ecolabelled vehicle wash installations, a simplified LCA, known as a MECO analysis, was conducted in conjunction with the evaluation of the criteria for vehicle wash installations in 2012. The MECO analysis examined the environmental impact of vehicle wash installations over five 'phases':

1) Materials/ingredient production (mainly manufacture of chemical ingredients, materials for the actual wash installation and any packaging materials)
2) Manufacture (manufacture of the actual wash installation, including the water treatment unit, ingredients for car care products and water treatment chemicals)
3) Use phase (the actual vehicle wash installation and its operation)
4) Waste/disposal (used chemicals and packaging, sludge disposal, waste water)
5) Transport (across the entire life cycle)

Within each of these five phases, the assessment focused on Material use/consumption, Energy use, Chemical use and finally Other considerations. The MECO analysis is a good tool for avoiding setting requirements that simply shift environmental problems from one phase to another.

The MECO matrix helps us to assess the issue of relevance, in terms of whether there is a health and/or environmental impact associated with materials, energy and chemicals in the different life cycle phases of a vehicle wash installation. The next stage is to assess the potential for reducing health and/or environmental effects in the wash installation's life

cycle, before the final judgement is made on whether ecolabelling offers the steerability required to realise the potential for environmental improvement.

In order to set relevant requirements that promote real environmental gains, all three parameters (RPS) must be assessed to establish the existence of Relevance, Potential and Steerability. In exceptional circumstances, it may be enough to have Relevance and Potential or Steerability, if we believe that licence applicants/manufacturers seeking the Nordic Ecolabel may create/contribute towards the required parameter that is lacking in an RPS through increased demand and competition.

The MECO analysis during the evaluation showed that in the case of vehicle wash installations, the environmental impact is particularly significant in the use phase and waste phase, but it also indicated an applicable RPS. The table below shows the parameters that contribute an environmental impact across the whole life cycle of the vehicle wash installation. The areas that were also judged to have a high RPS are marked in green in the table below.

Assessment of life cycle and environmental impact for vehicle wash installations

	Material phase	Production phase	Use phase	Waste phase	Transport
Material	Steel, other metals, cement, sand, crude oil for plastic.	Materials for building the installation, machinery and water treatment unit.	Car wash, transporter, conveyor, brushes.	Adapted water treatment equipment. Sludge disposal. Waste handling.	
Energy	Energy to produce metals, cement and other raw materials.	Construction energy. Energy to produce washing and water treatment chemicals.	Fans, brush machine, pumps, heating of enclosed wash installation and water. Power management.	Energy for pumps and water treatment unit.	
Chemicals	For mining and extraction of raw materials.	Production of units and chemical building materials.	Water consumption. Washing chemicals and water treatment chemicals.	Chemical residues in waste water and sludge. Water treatment chemicals. Nordic Ecolabelled chemicals.	
Other		Installation's design and construction.	Installations with re-circulated water, toilet emptying systems, special vehicles, chemical requirements, environmental management.	Dimensioning of water treatment equipment, emissions from the washing, waste management.	Special vehicles

It is clear that the areas where the RPS is high match in well with the areas where Nordic Ecolabelling sets requirements for Nordic Ecolabelled vehicle wash installations.

MECO analysis in relation to the requirements for Nordic Ecolabelled vehicle wash installations

	Material phase	Production phase	Use phase	Waste phase	Transport
Material				O1	
Energy			O10, P2, P3		
Chemicals			O7, O8, O9	O8, O10	
Other		O1 + O2	Environmental management requirements O3, O4, O12, O8, O13	O1, O2, O6, O11	O13

Both the material phase and the production phase have an environmental impact in terms of extracting raw materials and the energy required to extract and produce materials for the wash installations and the chemicals used during operation. However, the steerability is judged to be so low that setting requirements for these phases is currently not a priority. Energy consumption during the use phase is a relevant parameter in the life cycle of a vehicle wash installation, and is an area in which Nordic Ecolabelling wishes to consider setting more detailed requirements in future revisions. At the moment, the only requirement is for automatic door closure. In addition, points are given for energy reporting and power management.

The criteria document for the Nordic Ecolabelling of vehicle wash installations focuses on the environmental impact of washing vehicles.

Design of the vehicle wash installation

Technical solutions

To achieve a good wash result with only a small environmental impact, it is important that the choice of chemicals, dosing and application time are tailored to each other, but also to factors such as dirt and temperature.

High-pressure washers without brushes normally require a rather larger dose of washing chemicals and more water than machines that wash using brushes. The correct chemical dosage requires that the nozzles on the washing unit are reliable for use with the cleaning chemicals, for example.

The water treatment technology must be dimensioned according to the washing method and the washing frequency at the particular site. Written instructions must be in place on how operating conditions are optimised in different circumstances.

Much of the contamination from vehicle wash installations derives from the dirt that is washed off the vehicle. Measures to reduce emissions of heavy metals and oil include choosing the right cleaning chemicals and adapting the water treatment technology to the washing method.

There are various types of technology for treating waste water from vehicle wash installations. All the equipment manages to cleanse the water of impurities to a certain degree. Automated wash installations, which use relatively large quantities of water, must be fitted with a water treatment solution that re-circulates the water in order for the emissions to comply with the requirements set by Nordic Ecolabelling.

The most commonly used water treatment solutions are:

- **Gravimetric oil and sludge separators**

  The separation of oil and particles is based on the fact that the oil rises to the surface of the water and the particles drop down to form a sediment. The technology relies on the waste water spending a certain amount of time in the sludge and oil separator so that separation can take place. This system is not able to separate oil in emulsions.

  The cleansing effect can be boosted using lamellae (which increase the sedimentation surface) or **coalescing filters**. In the latter case, the waste water passes through a filter where small emulsified oil droplets are captured and form larger droplets that rise to the surface and are skimmed off. If the oil droplets are extremely small (as is the case in a high-pressure wash, for example) or strongly emulsified, the oil will pass through the filter and the filter will have no effect.

  Another method of achieving sedimentation is to pass the water through a **hydrocyclone**. This forces the water into a rotating motion and particles heavier than water are separated out by catching on the walls of the cyclone and dropping down to the bottom, where they are removed.

- **Chemical flocculation**

  To make gravimetric separation more effective, the water is treated with chemical flocculants. This technique is used to split emulsions (microscopic oil droplets floating in water with the help of surfactants), suspensions (particles > 0.1 nm) and dispersions (particles > 0.01 nm).

  Dirt particles are usually electrically charged and therefore repel each other. A flocculant neutralises these charges and the particles form flocs that sink to the bottom (**sedimentation**) or float up to the surface (**flotation**) depending on the type of flocculants used.

  The flocculation process is pH-dependent, with flocculants normally working best within a pH range of 6–8, and sedimenting agents at a pH of 7–9.5. In installations where the pH of the waste water varies or lies outside the ideal intervals, pH regulating chemicals must therefore be added to the waste water.

  To improve flotation, small bubbles of air are blown into the water (**microflotation**) to encourage the flocs to stick to the bubbles and rise to the surface. The flotation method generates less sludge, but at the same time is more sensitive (narrower pH range) than the sedimentation method. It is also possible to create electrically charged gas bubbles using electrodes (**electroflotation**). This method can be used to remove wax and drying agents (cations) from the water.

  Filtration normally uses a sand filter or a membrane. With a sand filter, the waste water is filtered through fine sand, which traps the dirt particles. The filter is cleaned through regular washing.

Membrane filtration is usually referred to according to the size of the pores in the filter:

- Microfiltration (approx. 1–0.1 μm)
- Ultrafiltration (approx. 0.3–0.02 μm)
- Nanofiltration (approx. 0.05–0.005 μm)
- Reverse osmosis (approx. 0.007–0.001 μm)

- **Biological treatment**

  This technique is based on microbiological (bacterial) digestion of organic matter, for example surfactants and oil residues. The bacteria require good access to oxygen for the best effect. If the oxygen is lacking, anaerobic bacteria begin to grow instead. Anaerobic bacteria break down organic matter and at the same time form metabolites that can be both toxic and malodorous, for example hydrogen sulphide H_2S. This is usually combated by continually circulating the water.

  One benefit of biological water treatment is that it does not require any chemical additives and does not generate any major quantities of waste. The disadvantage is that the bacteria need a certain amount of time to adapt to the type of waste water that is to be treated. The bacteria are also highly sensitive to disruption, for example from toxic substances.

- **Antibacterial treatment**

  In water that is re-circulated, organic matter will be broken down by microorganisms over time. Under anaerobic conditions, an unpleasant odour may develop. To eliminate such odours, the water is treated in various ways, for example using ozone (O_3). Ozone is formed with the help of electricity and air, and has an antibacterial effect, while also introducing oxygen into the water. Ozone is added in gaseous form in a quantity of around 2–6 g/h.

  The water can also be treated with hydrogen peroxide (H_2O_2), sodium hypochlorite (NaClO) or UV radiation. UV radiation has a limited effect, since the water contains particles that shield the microorganisms from the UV rays. Sodium hypochlorite in combination with organic matter in the water can cause unwanted organochlorides.

Basic licence

Experience from Sweden and Denmark shows that the supplier of washing and water treatment units for a vehicle wash installation is often a total supplier of washing and water treatment units and associated chemicals, as well as servicing. This means that such total suppliers know which chemicals are best suited to the installations, conduct water analyses, measure water consumption and know what procedures are necessary during everyday operation to keep the wash installation working properly.

Many vehicle wash installations prefer to maintain a contract with such a total supplier.

Experience suggests that for the benefit of the vehicle wash installations, the total suppliers and Nordic Ecolabelling, there is a need for a system of "basic licences" to make the application process easier for all parties. At the same time there needs to be a clarification of exactly who has to fulfil which requirement.

O1 Vehicle wash installation and water treatment equipment/system

Both automated and manual pre-programmed vehicle wash installations may be Nordic Ecolabelled. There are many different solutions for treating emissions from vehicle wash installations, such as chemical flocculation, biological treatment and antibacterial treatment.

Nordic Ecolabelling does not intend to dictate the type of water treatment equipment a vehicle wash installation must use to meet emission requirements in the criteria, but does consider a system for sludge and oil separation with sand filter to be a minimum requirement for the operation of a wash installation. It is up to the owner of the vehicle wash installation to decide which water treatment solution to use over and above a sludge and oil separator with sand filter.

It is important for both Nordic Ecolabelling and the vehicle wash installation to have an overview of the installation and its operation. Nordic Ecolabelling therefore requires a description of the installation that is to be Nordic Ecolabelled.

To achieve a good wash result with only a small environmental impact, it is important that the choice of chemicals, dosing and application time are tailored to each other, but also to factors such as dirt and temperature. High-pressure washers without brushes normally require a rather larger dose of washing chemicals and more water than machines that wash using brushes.

The water treatment technology must be dimensioned according to the washing method and the washing frequency at the particular site, in order to treat the waste water to a satisfactory level in terms of oil and heavy metal content.

Proposed requirement:

There is to be a brief description of the vehicle wash installation, which includes:

- *type of wash installation (manual and/or automated installation, dimensioned for cars or buses)*
- *washing method*
- *type of treatment unit (treatment technique)*
- *no. of vehicles that installation is designed for per day*

  For buses and trucks, water consumption and emissions are calculated in relation to the vehicle's length in metres. See O6.
- *no. of vehicles washed per day*

The waste water from the vehicle wash installation, (also in the case of overflow) is to be cleansed by a water treatment solution tailored to the washing method and washing volume. A sludge and oil separator with sand filter is to be included in the water treatment solution.

✉ *Declaration from the suppliers of the water treatment solution and the chemicals that the vehicle wash installation and the water treatment solution are tailored to the washing method and washing volume, see Appendix 1.*

O2 Technical description of the installation

Nordic Ecolabelling wishes to have a good overview of the vehicle wash installation and the water treatment system to ensure that the installation functions well. It is also important that the company has a good overview of the installation, the water and waste water system, and the location of the water meter and sampling points.

Oil separators and water treatment equipment must not be used to treat surface water (i.e. rainwater and meltwater from nearby roofs and ground). The water treatment equipment is to be designed for the maximum water flows used for washing the vehicles. A water treatment unit will therefore be unable to cope with the addition of rainwater and melting snow from the surrounding area. The channelling of water from these sources can also cause contaminants to be flushed into the drainage system.

Sites with some other activity (such as a workshop) may channel their waste water to the water treatment unit if the supplier of the treatment system and the authorities approve this.

Sampling point

In order to check that emissions do not exceed permitted levels, it must be easy to take representative samples from the waste water. If taking samples is difficult, there is a major risk that the checks will be lacking/insufficient.

The sampling points must be located such that the samples are taken from the waste water that is channelled away from the vehicle wash installation, i.e. after the water treatment system.

Water meter

A water meter is to be located so that it measures all fresh water consumption in the vehicle wash installation. Water used for cleaning the installation must also be measured. If there is more than one vehicle washing unit in the same installation, each unit must have a separate water meter and a separate vehicle counter.

For the water supply, any re-circulation of water and the waste water from the installation, it is to be made clear where the water supply comes in, where it is re-circulated and where it is channelled away from the installation.

Proposed requirement:

The oil separator and water treatment solution tailored to the vehicle wash installation must not be used to treat surface water. The water treatment system may be used to treat waste water from a part of the site that has a use other than the washing of vehicles, provided this is approved by the supplier of the water treatment system. Toilets must not be connected to the water treatment system due to the risk of spreading infections.

A sketch of the vehicle wash installation is to be provided, showing the location of:

- *the wash installation's water and drainage systems*
- *washing machines*
- *water treatment equipment*
- *sludge and oil separator, overflow*

- *sampling point, which must be easily accessible*
- *water meter connected to the vehicle wash installation*

✉ *Sketch of the vehicle wash installation showing the above points and description of the drainage system, in accordance with the requirement. If the water treatment system will be used to treat waste water from elsewhere on the site, a declaration must be made by the supplier to the effect that the treatment solution is designed to treat waste water from parts of the site with a use other than the washing of vehicles.*

O3 Installations with re-circulated water

Vehicle wash installations that re-circulate water are more vulnerable to the occurrence of anaerobic conditions in the system and thus the growth of algae and bacteria. To avoid this, the installation must be designed to prevent such conditions from occurring. One measure, for example, may be to pump air into the water during the water treatment process.

Proposed requirement:

Vehicle wash installations with re-circulated water must be designed to keep anaerobic conditions in the water to a minimum. This may be done, for example, by pumping air into the water.

✉ *A description/statement of the measures taken to avoid anaerobic conditions in systems with re-circulated water.*

O4 Manual wash installations

In order to reduce any health risks, re-circulated water may not be used in manual wash installations. Water from manual wash installations may contain high concentrations of chemicals and microorganisms.

At a manual wash installation, customers wash their own cars and decide on how much of a wash to give their car. Customers can choose which wash programmes they want to use (degreasing, hot wax and/or wax polish, for example). Nordic Ecolabelling would like to see the quantity of water and chemicals used regulated, and therefore sets the requirement that the use of cleaning and care chemicals and water consumption must be time-controlled or dosage-controlled.

Proposed requirement:

Re-circulated water must not be used in manual wash installations.

In wash installations where customers wash their own cars manually, the choice and use of cleaning and care chemicals is to be controlled automatically and water consumption is to be time-controlled.

✉ *Declaration of how chemical choice, dosing and water consumption are controlled in manual wash installations. Declaration from the supplier that re-circulated water is not used for manual vehicle washing. Appendix 1 can be used.*

Water consumption and emissions

O5 Initial sampling

An initial sampling is conducted to verify that the installation has technology in place that will function successfully at all times. This check must show that the installation meets the Nordic Ecolabel's emission requirements over time.

The sampling is to be conducted during the period 1 November – 30 April. Where new vehicle wash installations and installations that have been refurbished are awarded a licence outside the sampling period, an initial sampling must be conducted in the course of the next sampling period (1 November – 30 April). Vehicle wash installations that are due for reassessment must also conduct a new initial sampling when renewing their licence.

Vehicle wash installations that make use of a basic licence are exempted from the requirement regarding the initial sampling, since this will already have been conducted by the basic licence holder.

Sampling is to be conducted once at least 10% of the annual number of vehicles have been washed and after the sludge and oil separator has been pumped out. The results from this check will form the basis for a Nordic Ecolabel licence application. The above criteria mean that once the sludge and oil separator has been emptied, at least 10% of the annual number of washed vehicles must have been washed before the sampling takes place. For example, if a vehicle wash installation washes 5,000 vehicles a year, at least 10% (500 vehicles) must have been washed since the most recent emptying and before the sampling is conducted.

This is to ensure that emission measurements are taken from the water treatment unit after it has been in operation for a while. The resulting emission values will thus prove whether the water treatment unit is working properly.

Emissions

In the case of a new application (and also reassessment of licences), the water sampling is to be conducted using the automatic flow proportional method over a period of 1 working week (5 days).

Licence applicants who use technology from a supplier with a basic licence do not need to conduct the 5-day sampling, since it has already been documented that the technology works to a satisfactory degree.

Water consumption

Water consumption is to be measured for 5 days during the period 1 November – 30 April.

Licence applicants who use technology from a supplier with a basic licence do not need to conduct the 5-day measurement, since the water consumption has already been documented.

Proposed requirement:

When applying for the Nordic Ecolabel, sampling is to be conducted at the installation to show that the emission requirements in O6 and the water consumption requirements in O7 are fulfilled.

The sampling is to be conducted during the period 1 November – 30 April, and once at least 10% of the annual number of vehicles have been washed after the sludge and oil separator has been pumped out. The results from this check will form the basis for a Nordic Ecolabel licence application.

In the case of a new application (and also reassessment of licences), the water sampling is to be conducted using the automatic flow proportional method over a period of 1 working week (5 days) to show that the emission requirements in O6 are fulfilled.

For new vehicle wash installations that are awarded a licence outside the sampling period, an initial sampling must be conducted in the course of the next sampling period (1 November – 30 April).

Licence applicants who use technology for which the total supplier already has a Nordic Ecolabel licence (basic licence) do not need to conduct the 5-day sampling, since it has already been documented that the technology works to a satisfactory degree. An annual self-assessment is also to be conducted to calculate emissions under the terms of the requirements for self-assessment in O14.

Water consumption is to be measured for 5 days during the period 1 November – 30 April.

Licence applicants who use technology for which the total supplier already has a Nordic Ecolabel licence (basic licence) do not need to conduct the 5-day measurement to document water consumption. An annual self-assessment is also to be conducted to calculate water consumption under the terms of requirement O7.

✉ *Description of compliance with the requirement, see Appendix 2.*

O6 Emissions from the vehicle wash installation

The most common contaminants from vehicle wash installations are lead, chromium, nickel, cadmium and zinc, in addition to mineral oil. Climate and use of road salting also affect a vehicle's dirt levels. Norway, Finland and Sweden also use seasonal winter tyres, which cause increased wear on the roads and asphalt deposits on the vehicles.

Flecks of asphalt are often difficult to remove, and therefore micro-emulsions are considered necessary in the washing process. Winter tyres are not used to the same degree in Denmark, which means that water-based degreasing agents are used almost exclusively for washing vehicles.

The Swedish Transport Administration analysed the slush that builds up along salted roads and found that the slush contained asphalt residues (46%), sand and grit (40%), rubber residues (7%) and salt (2%). Asphalt comprises the petroleum derivative bitumen, which itself contains low levels of metals (for example <20 ppm zinc, <35 ppm chromium, 15-100 ppm nickel) and polycyclic aromatic hydrocarbons (<100 ppm PAH). Tyre rubber may also contain zinc and PAH.

Waste water from vehicle wash installations contains substances that may disrupt the water treatment process in municipal treatment plants and lower the sludge quality. Some substances may also have a negative impact on the ecosystems of the water recipient. The most undesirable substances are the metals cadmium (Cd), zinc (Zn), lead (Pb), nickel (Ni) and copper (Cu), as well as organic substances such as unsaturated aliphatic hydrocarbons (oil).

These contaminants may come from the dirt washed off the vehicle, which comprises particles from tyre wear, material from other vehicles and the roads, plus residues of fuel

and exhaust gases. Added to this is the material in the wash installation itself, with galvanised materials and brass parts for example capable of releasing metals (zinc). It is important that a Nordic Ecolabelled vehicle wash installation's water treatment unit captures as many of these undesirable substances as possible before the waste water is sent on to the municipal treatment plant.

Sampling is to take place at a point after the waste water has passed through the water treatment equipment but before the connection to the municipal waste water network/ water recipient, where the collected waste water from the wash installation passes. Water turbulence is important at the sampling point, to avoid samples from layered water.

Sampling must be conducted between 1 November and 30 April, and when at least 10% of the annual number of vehicles have been washed after the sludge and oil separator has been emptied.

Experience from Nordic Ecolabelled vehicle wash installations indicates that the requirement levels for emissions are set at the correct level, but that there is scope to tighten some of the requirement levels. Tighter emission requirements have therefore been proposed for ∑ Pb, Ni, Cr (from 7 mg/car to 5 mg/car) and cadmium (Cd) (from 0.1 mg/car to 0.05 mg/car). Miljösamverkan Skåne, an environmental partnership in southern Sweden, has developed advisory material[1] for the vehicle industry, including vehicle wash installations. The material includes guidelines and limits for emissions for vehicle wash installations. The emission requirements for ∑ Pb, Ni and Cr are the same as in the requirements for Nordic Ecolabelling vehicle wash installations. The Nordic Ecolabel has stricter emission requirements for cadmium (Cd) and oil, and has added emission requirements for copper (Cu).

Proposed requirement:

Emissions to the drainage system from automated and manual wash installations must not exceed the values specified in the tables below.

The emissions must be calculated as monthly average values. For information on water sampling, see Appendix 6 "Explanations, analysis and control".

	Emission requirements for passenger car washes		Emission requirements for bus and truck washes	
	Finland, Iceland, Norway and Sweden	Denmark and Skåne	Finland, Iceland, Norway and Sweden	Denmark and Skåne
Σ Pb, Ni, Cr	5 mg/car	5 mg/car	15 mg/vu	15 mg/vu
Cd	0.05 mg/car	0.025 mg/car	0.15 mg/vu	0.075 mg/vu
Zn	50 mg/car	50 mg/car	150 mg/vu	150 mg/vu
Cu	10 mg/car	10 mg/car	30 mg/vu	30 mg/vu
Oil	1.5 g/car	0.75 g/car	4.5 g/vu	2.25 g/vu

One vehicle unit (vu) is a vehicle, truck or bus, with a length of 12 metres.

- *0.5 vu is a van or minibus, for instance, with a length of about 6 metres.*
- *1.5 vu is, for instance, an articulated bus or a semi-trailer rig with a length of about 18 metres.*

[1] Handledningsmaterial från Miljösamverkan Skåne, Fordonsbranchen – åkerier, bilverkstäder och fordonstvättar (2013)

- *2 vu is a truck plus trailer with a length of about 24 metres.*

✉ *Test results. The water analysis shall be carried out by a competent laboratory according to test methods specified in Appendix 6. The sampling must take place at a point after the water treatment equipment but before the connection to the municipal waste water network.*

P1 Emissions of phthalates

Phthalates are used chiefly as plasticisers in plastic, and can be found in many products that we use on a daily basis. The phthalates can be found in plastic, primarily PVC (for example construction materials, flooring and roofing, cables).[2]

Many phthalate compounds have undesirable effects on health and the environment[3]. Some phthalates are inscribed on the EU's priority list of substances that should be investigated more closely for endocrine disruptive effects. Di-2-ethylhexyl phthalate (DEHP), dibutyl phthalate (DBP) and butyl benzyl phthalate (BBP) are classified as toxic and specifically toxic to reproduction. They may damage fertility and the unborn child. Diisobutyl phthalate (DIBP) is on the EU's Candidate List of Substances of Very High Concern[4]. Di-2-ethylhexyl phthalate (DEHP) has also been recorded in waste water from vehicle wash installations, and is suspected to derive from soft PVC materials on the underside of the vehicles. Denmark in particular has been monitoring di-2-ethylhexyl phthalate emissions from vehicle wash installations.

In version 2 of the criteria, measuring DEHP was introduced as a point score requirement in the hope that we would gain more knowledge about DEHP levels in waste water. It would also be useful to have more knowledge about the phthalates DBP, BBP and DIBP in waste water. Nordic Ecolabelling has extremely limited data in this area. If there is to be any meaning in setting absolute requirements for phthalate measurement, measurements should be taken before and after the water treatment unit, in order to see the effect of the treatment. If the water treatment methods are not effective enough in capturing phthalates, demanding such measurements will have little effect.

Proposed requirement:

Vehicle wash installations that take measurements of di-2-ethylhexyl phthalate (DEHP), dibutyl phthalate (DBP), butyl benzyl phthalate (BBP) and diisobutyl phthalate (DIBP) are awarded 1 point. Water samples must be taken both before and after the water treatment unit in order to measure the phthalate content before and after treatment.

✉ *Test results using the GC-MS method (Gas Chromatography-Mass Spectrometry) with detection limit ≤ 0.5 micrograms/litre.*

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[2] www.erdetfarlig.no

[3] http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/ftalater/

[4] http://echa.europa.eu/web/guest/candidate-list-table?p_p_id=substancetypelist_WAR_substanceportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=4&_substancetypelist_WAR_substanceportlet_keywords=&_substancetypelist_WAR_substanceportlet_advancedSearch=false&_substancetypelist_WAR_substanceportlet_andOperator=true&_substancetypelist_WAR_substanceportlet_orderByCol=inclusiondatecl&_substancetypelist_WAR_substanceportlet_orderByType=desc&_substancetypelist_WAR_substanceportlet_delta=75

VOC and COD

In version 2 of the criteria for vehicle wash installations, points were awarded for measuring VOC and COD. Few wash installations carried out these measurements and there is little basis for setting an absolute requirement regarding VOC. VOC levels are also controlled through choice of chemicals.

Emissions of organic substances from vehicle wash installations, in the form of BOD and COD, are affected by the washing chemicals chosen and how these are diluted in the solution used, as well as the water treatment technology.

Raised levels of organic matter lead, amongst other things, to increased oxygen consumption during degradation in municipal water treatment plants or in the water recipient. Alkaline degreasers generally cause a lower environmental impact than solvent-based degreasers. Research conducted by the Swedish Petroleum & Biofuel Institute (SPBI) in 2002/2003 shows a generally low reduction in BOD_7 and COD_{Cr} from commonly used water treatment techniques. The degradability of the organic substances in the waste water from vehicle wash installations, expressed as BOD_7/COD_{Cr}, has improved in step with the development of environmentally aware washing chemicals.

The project team has therefore chosen to remove the point score requirement for COD and VOC measurements, as this area is being indirectly steered by the choice of chemicals.

O7 Water consumption

There is a great deal of variation in water consumption across the Nordic countries. In Denmark, water is considered a scarce resource, which means there is a strong commitment to reducing water consumption. In Sweden and Finland, there is less of a focus on reducing water consumption, while in Norway there is very little focus on this issue. These differing attitudes are also reflected in the water treatment technology used in the vehicle wash installations. In Norway, there is little willingness in the industry to invest in water treatment solutions where the water is re-circulated, since the investment costs are considerable compared with the cost of higher water consumption. In Norway, the water treatment solution is generally only a sludge and oil separator. In the rest of the Nordic region, particularly Denmark and Sweden, it is common to have water treatment solutions where the water is treated and re-circulated.

Different washing methods involve very different water consumption. High-pressure washing uses as much as 300 litres of water to wash one car. If the installation does not re-circulate water, this represents considerable consumption of fresh water. If the installation does re-circulate the water, fresh water consumption comes in at around 60-80 litres.

Type of installation	Water consumption per washed car (litres)*
- High-pressure wash with no water re-circulation	230-280
- High-pressure wash with water re-circulation	60-80
- Brush wash with no water re-circulation	150-250
- Brush wash with water re-circulation	80-100
- Attended car wash with no water re-circulation	200-300
- Attended car wash with water re-circulation	60-100
- Self-service car wash	50-75
- Req. for Nordic Ecolabel (cars)	90 (70 in Denmark)

** Fresh water consumption per washed car*

Normal water consumption when washing passenger cars requires up to 500 litres of water per washed car. This consumption can be significantly reduced by installing water treatment solutions where the water can be re-circulated. The requirement for no more than 90 litres of water per washed car (70 litres in Denmark) was based on an assessment by the Swedish Environmental Protection Agency, which would like to see a re-circulation level of 80%. This could give a maximum amount of water sent to the drainage system per washed car of around 50 litres. This limit was considered too stringent in relation to normal water consumption. In order to take account of market opinion and of the water used to dilute concentrated products, the level was set at 90 litres per washed car. The Swedish Environmental Protection Agency no longer requires 80% of the water in vehicle wash installations to be re-circulated, but wishes to see technical advances in which re-circulation reliably leads to reduced emissions.

At wash installations for buses and trucks, it is generally the case that fresh water is only used for brush washes and re-circulated water for high-pressure washers. This tends to give a consumption figure of 150-250 litres per 12 metres (1 vehicle unit).

If fresh water is also used for high-pressure washers, water consumption rises to around 1100 litres per wash.

Treatment of waste water is a key factor in controlling emissions of metals and oil from vehicle wash installations.

For the automated wash installations, the requirement concerning water consumption per washed vehicle means that the water must be re-circulated in order to maintain the water level in the washing machine that is needed to get the vehicle clean.

Water used to fill up the system after emptying can be excluded from the calculation of water consumed per vehicle, on condition that no water escapes during filling and that the installation can prove when the system has been emptied (for example via a receipt or similar document).

Continual measurement of emissions is not practically viable. Water consumption per car represents a goal that emission values will not exceed the set limits and that licensees cannot dilute their way out of emission problems through higher water consumption.

Climatic differences in the Nordic region lead to different vehicle washing processes. In Finland, Norway and the majority of Sweden, the vehicles are dirtier during the winter (due to the use of winter tyres) and the climate requires the use of salt on the roads, which then accumulates in the water systems of the wash installations. Higher chemical consumption and greater quantities of salt require larger water treatment units and

slightly greater water consumption to keep the re-circulated water at a satisfactory level of quality (applies both to biological and chemical water treatment units).[5]

The requirement concerning water consumption is therefore different for Denmark and the southern Swedish region of Skåne than for the rest of the Nordic region.

Experience from the Nordic Ecolabelled vehicle wash installations is that water consumption varies relatively widely across installations with similar conditions in terms of chemicals and equipment. Water consumption at the Swedish installations is very close to today's requirements. There is greater variation in Denmark, but the installations generally lie well within the limit. Experience from the Nordic Ecolabelled installations also shows that their procedures for operation and maintenance, and the analysis laboratories' procedures for sampling, also affect the emission values.

Requirements have been set for sampling points and sampling periods.

Water consumption is calculated as the number of litres of fresh water consumed per washed vehicle, calculated as an annual average. The figure for fresh water consumption is shown on water meters connected to the wash installation.

The water consumption in manual vehicle wash installations may, for example, be controlled by having water consumption pre-programmed. To reduce the risk of health hazards, re-circulated water is not to be used in installations for manual washing. Re-circulated water may contain high concentrations of chemicals and microorganisms.

During the initial sampling, the water consumption is measured over a period of 7 days. Water consumption per vehicle is calculated by dividing water consumption over the period of a week (7 days) by the number of vehicles that were washed during that same period.

Proposed requirement:

Water consumption is calculated as the number of litres of fresh water consumed per washed vehicle, calculated as an annual average, and must not exceed the values in the tables below.

Water consumption is to be measured and logged on a monthly basis.

For information on calculating water consumption, see Appendix 6 "Explanations, analysis and control".

Table O7 Water consumption

	Passenger cars		Trucks, buses	
	Automated	Manual	Automated	Manual
Finland, Iceland, Norway and Sweden (except Skåne)	90	70	270	210
Denmark and Skåne	70	50	210	150

✉ *Documentation showing the calculation of water consumption, see Appendix 6.*

Chemicals

[5] Ulf Nielsen, DHI, "Input til justering/endringer af kriterier" ULN/2004-10-27 (NMN document December 2004)

08 Overview of chemicals

Chemicals are used to clean the vehicle and to treat the water. Chemicals used in conjunction with washing vehicles include:

- Solvent-based degreasers
- Water-based degreasers (alkaline and non-alkaline)
- Micro-emulsions
- Car shampoo and wash & wax shampoo
- Wax
- Rinsing and drying agents
- Water treatment chemicals

A more detailed description of these can be found in the Nordic Ecolabelling criteria for car and boat care products, version 5.

Even if chemicals used at a Nordic Ecolabelled vehicle wash installation are not discharged directly into the drainage system, due to the water treatment system that all Nordic Ecolabelled vehicle wash installations are required to have, Nordic Ecolabelling considers it important not to use chemical substances that can have long-term damaging effects. There are several reasons for this.

- Water from the vehicle wash installation will also eventually be channelled into the municipal drainage system and the water recipient, even if this will be in smaller quantities than before.
- The vehicle wash installations are generally not entirely sealed. The contaminants that are separated in the water treatment units must generally be handled by a dedicated facility as specialist/hazardous waste.

There is therefore a requirement that Nordic Ecolabelled cleaning chemicals are to be used in a Nordic Ecolabelled vehicle wash installation. These products are checked and verified by Nordic Ecolabelling, which makes choosing products easier for the businesses.

An alternative is for Nordic Ecolabelling to require that certain criteria for ecolabelling car care products must be fulfilled. This means that Nordic Ecolabelling will still have to check and verify the content of the products. It will be more difficult for the business owners to know whether or not a product has been checked. The chemicals supplier can always claim that a product meets the criteria for ecolabelling, even if it has not been checked by Nordic Ecolabelling. The requirement for Nordic Ecolabelled products combats misleading product information about products that do not carry the Nordic Ecolabel.

The choice of chemicals is usually determined by the kind of installation the customer has and thus which chemicals are tailored to the installation, and what agreements the supplier has with chemicals suppliers. The vehicle wash installation owner (licensee) generally does not decide which chemicals are to be used, as this is governed by agreements entered into between the equipment supplier and the chemicals supplier.

Automated wash installations almost always use a series of chemicals that are tailored to each other. This means that it is not possible to simply replace chemicals in a series with other products. Entire series are often Nordic Ecolabelled. Suppliers also have series where none of the products are Nordic Ecolabelled.

Nordic Ecolabelling wishes to encourage chemicals manufacturers to Nordic Ecolabel their products and at the same time get the vehicle wash installations to require Nordic Ecolabelled products from the chemicals suppliers and equipment suppliers. When it comes to basic licence holders, Nordic Ecolabelling would like as large a proportion of the chemicals as possible to be Nordic Ecolabelled. In the first phase, Nordic Ecolabelling will require that 20% of the chemicals are Nordic Ecolabelled. The cleaning chemicals play a crucial role in ensuring that the vehicles are cleaned properly. However, they must not cause emissions of hazardous substances or risk jeopardising the operation of the installation's water treatment unit or the municipal water treatment plant.

In order to ensure correct operation, it is important for the vehicle wash installation and for Nordic Ecolabelling to have an overview of the chemicals used in the operation of the installation.

Chemical products used for cleaning vehicles and wash installations must either be Nordic Ecolabelled or meet chemical requirements R1–R14.

Proposed requirement:

20% of the chemicals used in the vehicle wash installation must be Nordic Ecolabelled.

An overview of the chemicals used in operating the vehicle wash installation is to include information such as the manufacturer/supplier, function (degreasing, wax, etc), quantity and whether the product is Nordic Ecolabelled. The licence number is to be stated for all ecolabelled products.

The proportion of Nordic Ecolabelled products (%) is also to be calculated (as active substance, which means content without water). Points are awarded depending on the percentage of Nordic Ecolabelled products used in the operation. See section 1.6 for more about points scoring.

For chemicals that are not Nordic Ecolabelled, at least 95% by volume of the total quantity of chemicals used on an annual basis (both Nordic Ecolabelled and non-Nordic Ecolabelled products) must meet requirements R1–R14. Documentation for R1–R14 must be obtained from the chemicals supplier and sent to Nordic Ecolabelling.

- ✉ *Overview of chemicals, see Appendix 3, and calculation of percentage of Nordic Ecolabelled products.*
- ✉ *For chemical products that are not Nordic Ecolabelled, the supplier must submit a declaration to Nordic Ecolabelling, see Appendix 4.*

O9 Water treatment products – all vehicle wash installations

Experience from Nordic Ecolabelled vehicle wash installations shows that methods for combating microorganisms, which can cause problems such as unpleasant odours, include treatment using ozone (O_3), hydrogen peroxide (H_2O_2), sodium hypochlorite or UV radiation. Sodium hypochlorite in combination with organic matter in the water can cause unwanted organochlorides. Sodium hydroxide is used for pH regulation.

Sodium hypochlorite (which is an antibacterial agent) is considered inappropriate due to the risk of forming organochlorine metabolites. Chemical products for water treatment must therefore not contain organochlorine substances or reactive chlorine compounds that may form organochlorine metabolites.

Proposed requirement:

Chemical products used for water treatment (e.g. chemical separation, pH regulation, combating microorganisms) must not contain organochlorine substances or reactive chlorine compounds that may form organochlorine metabolites.

✉ *Declaration from the supplier of the water treatment chemicals that the products or methods do not contain organochlorine substances or reactive chlorine compounds that may form organochlorine metabolites.*

O10 Fragrance in chemicals in manual installations

Nordic Ecolabelling would like to see tighter requirements for chemical fragrances used in manual installations than for such chemicals in automated installations. The exceptions that have been made for fragrances apply to professional products for automated installations, primarily because exposure to fragrances and other chemicals that are hazardous to health is greater for the consumer in manual installations. Fragrances are often added to car care products to conceal malodorous surfactants in automated installations that re-circulate their water. Manual installations are required not to use re-circulated water, so the problem of odour is therefore not the same.

See also the section on fragrance for more background information.

Proposed requirement:

Chemicals used in manual installations must not contain fragrance.

✉ *Duly completed declaration from the manufacturer, see Appendix 8.*

R1 Formulation – non-ecolabelled chemicals

For the chemicals that are not Nordic Ecolabelled under the criteria for car and boat care products, version 5, the requirements regarding classification, degradability, prohibited substances and so on must be fulfilled. The chemicals manufacturer must submit sufficient documentation to enable Nordic Ecolabelling to assess whether the products meet enough of the requirements to be used in a Nordic Ecolabelled vehicle wash installation.

A complete formulation specifying the content of ingredients/products, in contrast to a mixing recipe, where only products that are to be mixed are declared, must be sent to Nordic Ecolabelling. It is necessary to require a complete formulation in order to document the requirements concerning both product and constituent substances.

Proposed requirement:

At least 95% by volume of the total amount of chemicals, based on annual consumption, is to be documented with a complete formulation. There must be a safety data sheet for the product and all its constituent substances.

The formulation shall include the trade name, chemical name, quantity and CAS number for each constituent substance. The water content of the ingredients and the function of each ingredient are also to be stated.

✉ *Complete formulation in line with the requirement and safety data sheet/product data sheet for the product and each constituent substance, in accordance with Directive 2001/58/EC.*

R2 Classification of the product

The goal of Nordic Ecolabelling is for the environmental and health effects of car care products to be as little as possible. For more detailed background on the requirements set for the chemicals used in a vehicle wash installation, see the background document for the Nordic Ecolabelling of car and boat care products, version 5.

The classification applies under the EU's Dangerous Substances Directive 67/548/EEC as amended and/or the CLP Regulation (EC) No 1272/2008 as amended. During the transition period, up until 1 June 2015, classification under the EU's Dangerous Substances Directive or the CLP Regulation may be used. After the transition period, only classification under the CLP Regulation will apply.

Proposed requirement:

Products that are to be used in Nordic Ecolabelled vehicle wash installations must not have a classification, as stated in the table below, under the EU's Dangerous Substances Directive 67/548/EEC as amended and/or the CLP Regulation (EC) No 1272/2008 as amended.

Classification	***67/548/EEC***	***CLP Regulation***
Toxic to the environment	*N with R50, R50/53, R51/53, R59*	*Acute 1: H400* *Chronic 1, 2: H410, H411* *Ozone: EUH 059*
	R52/53, R52, R53	*Chronic 3, 4: H412, H413*
Very toxic	*Tx (T+ in Norway) with R26, R27, R28 and/or R39*	*Acute 1, 2: H330, H310, H300* *STOT SE 1: H370*
Toxic	*T with R23, R24, R25, R39 and/or R48*	*Acute 2, 3: H301, H311, H330, H331* *STOT SE 1: H370* *STOT RE 1: H372*
Harmful to health	*Xn with R20, R21, R68, R48*	*Acute toxicity 4: H332, H312* *STOT SE 2: H371* *STOT RE 2: H373*
Allergenic	*Xn with R42 or Xi with R43*	*Resp. Sens. 1: H334* *Skin Sens. 1: H317*
Corrosive	*C with R35*	*Skin corr. 1A: H314*
Explosive	*E with R2 and R3*	*No direct translation possible.*
Extremely flammable	*Fx with R12*	*H224 or H242*
Highly flammable	*F with R11, R15 and R17*	*No direct translation possible.*

✉ *Label and data sheet for the product.*

R3 Super-concentrates

Super-concentrates reduce the loads being transported since water is not being carried unnecessarily. However, super-concentrates may also be hazard classified due to their concentrated form. In order to deal with this, we have chosen to set the requirement that super-concentrates in concentrated form must not be classified as toxic to the environment. At the same time, super-concentrates in useable form (at the maximum recommended dosage) must meet the classification requirements for other products.

For further information on super-concentrates, see the background document for Nordic Ecolabelling of car and boat care products, version 5.

Nordic Ecolabelling has chosen to define super-concentrates as products that contain <10% water by volume.

Proposed requirement:

Super-concentrates in concentrated form must not be classified as toxic to the environment.

Super-concentrates must otherwise meet all other requirements for classification as set out in the table above, in useable form (at maximum recommended dosage).

Super-concentrates are defined as products that contain <10% water by volume.

The packaging for super-concentrates must be designed in such a way that there is no risk that the user will come into contact with the product. For super-concentrates a technical instruction and user manual must be available describing how to avoid contact with the product.

✉ *Declaration on classification of the product in useable form (at maximum recommended dosage) showing that the requirement is met.*

✉ *Declaration from the manufacturer regarding packaging design, as well as a technical description and user manual describing how the user can avoid contact with the product.*

R4 CMR substances

Nordic ecolabelling wishes, as far as possible, to limit the use of substances that are carcinogenic, mutagenic and toxic to reproduction (CMR) and therefore prohibits these substances.

The intention of the requirement is to exclude from products the worst of the substances that are hazardous to health. The requirement prohibits substances such as formaldehyde and NTA (Carc3, R40). NTA has been classified as carcinogenic (cat3) since March 2008 and is thus subject to this requirement. NTA present in the product as an impurity in complex makers is exempt from the requirement. The concentration of NTA must, however, not exceed 0.010% in the product.

For further information on the requirement concerning CMR substances in car care products, see the background document for Nordic Ecolabelling of car and boat care products, version 5.

Proposed requirement:

None of the constituent substances must be classified as carcinogenic, mutagenic or toxic to reproduction (CMR) with the following risk/hazard phrases:

R40/H351	*R60/H60F*
R64/H362	*R45/H350*
R61/H360D	*R68/H341*
R46/H340	*R62/H361f*
R49/H350i	*R63/H361d*

Combinations of the R-phrases and the combinations H360FD, H361fd, H360Fd.

The requirement also applies for substances that may give off substances with the above classifications.

✉ *Declaration from the manufacturer or ingredient supplier of the car care product, see Appendix 8.*

R5 Nanomaterials/particles

Nanotechnology, which also includes nanoparticles, is being used to an increasing extent in many product areas, including those for which Nordic Ecolabelling has criteria. The greatest cause for concern is the use of nanoparticles, which can be released and affect health and the environment. There is a worry among public bodies, environmental organisations and others about the lack of knowledge regarding the potential damaging effects on health and the environment.

Proposed requirement:

Nanomaterials/nanoparticles/nanofibres (such as nanometals, nanominerals, pure nanocarbon compounds and/or nanofluoride compounds) must not be actively added to chemical products.

Nanoparticles are defined here as microscopic particles, where at least one of the dimensions is less than 100 nm. Nanometals include nanosilver, nanogold and nanocopper, titanium dioxide, zinc oxide and silicon oxide.

✉ *Declaration from the manufacturer of the car care product, see Appendix 8.*

R6 Organic substances, degradability

Substances with poor degradability can cause environmental problems, and in cases where the substances are also acutely toxic, these environmental problems can become extremely serious. Degradability is therefore a very important characteristic of organic substances and a key environmental parameter describing how long a substance remains in the environment after discharge.

Proposed requirement:

All organic substances and their degradation products shall be readily aerobically degradable in accordance with OECD Guidelines No. 301 A–F or other equivalent methods (surfactants are exempted from the requirement for the 10-day window) and anaerobically degradable in accordance with ISO 11734 or other similar method.

The following compounds are exempted from the degradability requirement:

- *non-chlorinated polymers*
- *non-chlorinated natural and synthetic waxes*
- *preservatives*
- *iminodisuccinate*
- *fragrances (see separate requirements in R8, R9 and R10)*
- *dyes in products for professional use (see separate requirements in R13)*
- *denaturing agents in ethanol*

✉ *Degradability for all organic substances in the car or boat care product shall be documented in accordance with the DID list. If the substance is not on the DID list, other documentation in accordance with the section on degradability (Appendix 6) shall be submitted.*

R7 Substances that must not be present in the products

There are many substances with properties that are hazardous to health and the environment, making them undesirable in Nordic Ecolabelled products. Some are known as substances of very high concern (SVHC) and are included on the Candidate List drawn up by the European Chemicals Agency (ECHA).

For more information on the background to why certain substances must not be present in the products used in Nordic Ecolabelled vehicle wash installations, see the background document for car and boat care products, version 5.

Proposed requirement:

The following substances must not be present in the products:

- *halogenated and/or aromatic solvents*
- *organic chlorine compounds and reactive chlorine*
- *substances categorised in REACH Article 57, XIV as Substances of Very High Concern (SVHC) and included on the Candidate List:*

(http://echa.europa.eu/web/guest/candidate-list-table)

- *substances meeting the PBT (persistent, bioaccumulative and toxic substances) criteria and vPvB substances (very persistent and very bioaccumulative) according to the criteria in Annex XIII of REACH*
- *substances considered as a potential endocrine disrupting chemical (EDC), category I or II, according to the European Union's reports on endocrine disruptors*

(http://ec.europa.eu/environment/endocrine/documents/final_report_2007.pdf) (Annex L, page 238 onwards)

- *linear alkylbenzene sulphonates (LAS)*
- *alkylphenol ethoxylates (APEO) or alkylphenol derivatives (APD)*
- *quaternary ammonium compounds, which are not readily degradable*
- *benzalkonium chloride*
- *siloxanes D4, D5 and HMDS*
- *EDTA, DTPA*
- *poly and perfluorinated alkylated substances (PFAS)*

✉ *Duly completed declaration, see Appendix 8.*

Fragrance

Nordic Ecolabelling has always focused on fragrance in Nordic Ecolabelled products and has noted an active debate surrounding allergenic fragrances, particularly in Denmark.

Allergies are a growing problem, and people with allergies can have allergic reactions when using car and boat care products containing substances that we know are allergenic. Requirements concerning allergenic fragrances in car care products exclude the worst allergenic substances from such products.

Fragrance has no functional effect in the products and is often classified as toxic to the environment (N with R51/53/H411 Toxic to aquatic life with long lasting effects). It is desirable to add fragrance to certain products to conceal bad odours from other constituent substances. There is less exposure to chemicals in automated vehicle wash installations than when washing a car manually. Nordic Ecolabelling has therefore allowed a limited type of fragrances in products for automated vehicle wash installations.

Carcinogenic musk compounds must also not be used. Musk compounds are only partly degradable in water treatment units and may therefore enter the environment via the drainage system and waste sludge from the treatment unit. The compounds are stable in the environment and may also bioaccumulate in the food chain.

Most fragrances are classified as allergenic (Xi with R43/H317 May cause an allergic skin reaction), and some are also harmful to health (Xn with R42/H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled).

The EU's Scientific Committee on Consumer Safety (SCCS) published a report in June 2012 on allergenic fragrances in cosmetic products. The report shows that the list of 26 fragrances cannot be seen as sufficient to cover fragrances with scientifically documented allergenic effects. SCCS recommends that a total of 127 fragrances, including the 26 fragrances that are already restricted in the Detergent Regulation, should be declared by name on cosmetics. In the future, Nordic Ecolabelling wishes to exclude all of these 127 fragrances in Nordic Ecolabelled car and boat care products, but in this version only the 26 fragrances from the Detergent regulation will be restricted.

The proposed fragrance requirements are summed up in the requirements R8, R9 and R10.

R8 Fragrances – IFRA

The use of fragrances must follow IFRA's guidelines.

The guidelines of IFRA (International Fragrance Association) can be found at www.ifraorg.org/guidelines.asp

✉ *Declaration from the manufacturer of the car care product and from the fragrance manufacturer that the use of fragrances follows IFRA's guidelines, see Appendix 8 and Appendix 9.*

R9 Musk compounds

Musk compounds and polycyclic musk compounds are not permitted in car or boat care products. This includes the following substances:

Compound	CAS number
Musk xylene	81-15-2
Musk ambrette	83-66-9
Musk moskene	116-66-5
Musk tibetine	145-39-1
Musk ketone	81-14-1
HHCB	114109-62-5, 114109-63-6, 1222-05-5, 78448-48-3 and 78448-49-4
AHTN	1506-02-1 and 21145-77-7

✉ *Declaration by the manfacturer of the car care product and by the fragrance manfacturer that the substances listed in the requirement are not present in the product, see Appendix 9.*

R10 Allergenic fragrance substances

The following allergenic fragrance substances are not permitted in car care products.

Allergenic fragrance substances	CAS-number
Amyl cinnamal	122-40-7
Benzyl alkohol	100-51-6
Cinnamyl alkohol	104-54-1
Citral	5392-40-5
Eugenol	97-53-0
Hydroxycitronellal	107-75-5
Isoeugenol	97-54-1
Amylcinnamyl alkohol	101-85-9
Benzyl salicylat	118-58-1
Cinnamal	104-55-2
Coumarin	91-64-5
Geraniol	106-24-1
Hydroksyisoheksyl 3-sykloheksen karboksaldehyd	31906-04-4
Anisyl alkohol	105-13-5
Benzyl cinnamat	103-41-3
Farnesol	4602-84-0
Butylfenyl metylpropional	80-54-6
Linalool	78-70-6
Benzyl benzoat	120-51-4
Citronellol	106-22-9
Hexyl cinnamal	101-86-0
d-Limonene	5989-27-5
alfa isometyl ionone	127-51-5
metylheptinkarbonat (metyl 2-octynoat)	111-12-6
egemos ekstrakt	90028-68-5
tremos ekstrakt	90028-67-4

✉ *Declaration by the manfacturer of the car care product and by the fragrance manfacturer that none of the allergenic fragrances are present in the product.*

R11 Preservatives

Preservatives are toxic as part of their function (they kill bacteria) and can also have other negative health and environmental effects. Nevertheless, the use of preservatives is often necessary to ensure a certain useful life before a product becomes out of date. Preservatives in Nordic Ecolabelled products must not be bioaccumulative, to prevent concentrations building up and entering the food chain.

Proposed requirement:

Preservatives included in products or in constituent substances must not be potentially bioaccumulative. Preservatives are not considered bioaccumulative if the following criteria are met:

Classification	OECD 107 or 117	OECD 305
Not bioaccumulative	$\log K_{OW} < 4.0$	BCF < 500

If there is data on both BCF and $\log K_{OW}$, the value for the highest BCF measured shall be used.

✉ *Documentation for BCF or $\log K_{OW}$.*

R12 Volatile organic compounds (VOC)

Volatile organic compounds are generally undesirable since they tend to be harmful to health on use. For some washing operations there are so few alternative substances that it has been found necessary to permit a small amount of volatile organic compounds. The permitted quantity of VOC is calculated based on the Photochemical Ozone Creation Potential (POCP).

Proposed requirement:

The product may only contain a limited amount of volatile organic compounds (VOC) which could contribute to the formation of photochemical ozone, measured as POCP (Photochemical Ozone Creation Potential).

Products that have a VOC content of < 6.0% do not need to undergo the POCP calculation, since the requirement will be fulfilled even in a worst-case scenario.

The maximum content of VOC in the product is 60 g ethylene equivalents/kg product.

$$\frac{\sum (m_1 \cdot POCP_1 + m_2 \cdot POCP_2 + \ldots)}{m_{produkt}} \leq 60 \text{ g } C_2H_2 \text{ ekvivalenter/kg}$$

m_i – mass in grams of VOCi in the product

POCPi – VOCi substance's factor in Table 1 of Appendix 7 in the criteria for car and boat care products, version 5. The POCP value for each constituent substance/ingredient must be entered in the formula.

$m_{product}$ is the mass of the product in kg

VOC: organic substances with vapour pressure > 0.010 kPa at 20°C or boiling point < 250°C at 101.3 kPa (1 atm).

POCP: Photochemical Ozone Creation Potential (photochemical ozone is a main constituent of smog).

In the case of solvents not included on the list in Appendix 10, POCP values from tests may provide the basis for calculating the permitted VOC content, alternatively the worst case for the VOC group may be used.

In the case of super-concentrates, the POCP calculation must be performed using the useable form (at maximum recommended dosage).

✉ *Product formulation and declaration of fulfilment, including calculation of VOC content.*

R13 Dyes in professional products

Dyes can have negative effects on health and the environment, and may only be added to professional products if the dye is approved for use in foodstuffs and pigments in the dye are not based on the metals: lead, cadmium, mercury, hexavalent chromium, aluminium or copper.

Lead[6]

Lead is a toxic heavy metal with both acute and chronic health and environmental effects.

Lead is acutely toxic to aquatic organisms and mammals, and also has chronic toxic effects on many other organisms, even in small concentrations.

Lead compounds can damage the unborn child and have the potential to reduce fertility. There has also been a great deal of research into children's exposure to lead in low concentrations, amid suspicions that lead exposure can affect the intellectual development of children.

Lead bioaccumulates in fish and mammals. The absorption of lead often takes place slowly and during long-term chronic exposure. The secretion of lead from organisms takes a long time.

People are exposed to lead primarily through polluted air and food. Lead can also be found in products such as the casing on electric cables, boat keels, blasting abrasives, paints and varnishes. In addition, lead may be found in other types of imported products. The danger of emissions of lead into the environment will usually be greatest when it comes to disposal of the products.

Cadmium[6]

Cadmium and cadmium compounds are acutely and chronically toxic to people and animals. Most cadmium compounds are also carcinogenic.

Cadmium is classified as very toxic by inhalation and carcinogenic. It also presents a possible risk of impaired fertility and damage to the unborn child.

Most cadmium compounds are very acutely toxic to aquatic organisms, particularly in fresh water, and acutely toxic to mammals. Cadmium also has chronic toxic effects on many organisms, even in very small concentrations.

Cadmium is bioaccumulative in fish and mammals, and has a long biological half-life in mammals.

Chromium[6]

Chromium is a metallic element found in several forms in nature. The hexavalent form is considered the most problematic for health and the environment. It is prohibited to use timber impregnated with chromium for most uses. However, chromium leaks from impregnated timber that is already in use, and will do so for a long time to come. Almost 70% of chromium emissions derive from CCA-impregnated timber.

Chromium compounds are not readily degradable and can bioaccumulate in organisms. The health and environmental effects depend on which chromium compound we are exposed to. The hexavalent form is considered more problematic for health and the environment than the trivalent form.

Mercury[6]

Mercury occurs as inorganic and organic chemical compounds, and is one of the most dangerous environmental toxins. Mercury is a threat to the environment and to human health.

The organic mercury compounds are particularly toxic. Mercury compounds are very toxic to aquatic organisms and to mammals. Mercury can have chronic toxic effects, even in small quantities. Mercury can also cause kidney damage, damage to the unborn child and contact allergies.

Mercury bioaccumulates in fish and mammals, and it takes a long time for mercury to be secreted from organisms.

Dyes do not contribute to the performance of a cleaning chemical, but can help facilitate dosing of the products. Correct dosing of the products is important in achieving environmental improvements.

Proposed requirement:

Pigments in dyes must not contain lead, cadmium, mercury, hexavalent chromium, aluminium or copper.

All dyes present in the product as an ingredient or in a raw material must be approved for use in foodstuffs in any Nordic country. Alternatively, the dye must not be bioaccumulative. Dyes are not considered bioaccumulative if the following criteria are met:

Classification	OECD 107 or 117	OECD 305
Not bioaccumulative	$\log K_{OW} < 4.0$	BCF < 500

If there is data on both BCF and $\log K_{OW}$, the value for the highest BCF measured shall be used.

✉ *Declaration that the requirement is fulfilled.*

✉ *Specification of E-number (number assigned on approval of foodstuff), alternatively $\text{Log}K_{OW}$ or BCF.*

R14 PVC in packaging

For some products, packaging is a significant element, both in terms of volume and weight. Packaging components may comprise substances that have a negative impact on

[6] http://www.miljostatus.no

health or the environment, such as PVC and other halogenated plastics prohibited for use in packaging for ecolabelled products.

This is because undesirable environmental effects occur when disposing of these types of plastics, and because they contain substances that have a damaging effect on health.

The requirement states that PVC and halogenated plastics must not be present in primary packaging. Caps, lids, pumps and labels are not subject to separate requirements.

Proposed requirement:

PVC and other halogenated plastics shall not be part of the primary packaging or packaging components (including caps/lids/pumps and labels).

✉ *Declaration from the manufacturer. Declaration of the type of packaging used.*

Energy

Nordic Ecolabelling wishes to focus on the energy consumption of the vehicle wash installation and measures that can reduce that consumption. Nordic Ecolabelling would also like the consumer and the licensee to be more aware of the installation's energy consumption and opportunities to reduce it.

Nordic Ecolabelling has its own energy guidelines, which express the desire to set energy requirements, where relevant, according to the principles of:

- Limiting overall energy consumption
- Setting requirements concerning energy source

If it is not possible to set requirements for energy efficiency, the focus may instead be placed on requirements concerning the energy source. Nordic Ecolabelling considers energy consumption to be a relevant parameter in large parts of the life cycle of vehicle wash installations, but at the same time judges the steerability, i.e. Nordic Ecolabelling's scope to set requirements, to be low.

A report by IVL Svenska Miljöinstitutet AB from 2004[7] states that energy consumption is lower at installations with a water treatment unit and 80% percent re-circulation than at installations without water treatment, if one considers the treatment of fresh water and waste water that has to take place (0.1-1 kWh/washed car).

For entirely closed installations that use evaporation technology to remove the salts from the system, the energy consumption is around 5 kWh/washed car. If the heat from such an induction unit is used to heat up the premises or prepare hot wax, net consumption will be around 4 kWh/washed car. An installation that uses 400-500 l/washed car without re-circulation has greater electricity consumption than facilities where 80% of the water is re-circulated, if one takes account of the production of fresh water and the treatment of the waste water, and the energy that requires.

[7] IVL Svenska Miljöinstituet AB, Rapport B 1554 Utvärdering av miljöanpassade fordonstvättar ur ett bredare perspektiv (January 2004)

By way of comparison, showering for 5 minutes consumes 2 kWh (60 l water consumption)[8]. The available data thus suggests that energy consumption in the use phase, i.e. at the water treatment unit, is not terribly great.

O11 Automatic door closure

In order to achieve satisfactory performance in the vehicle wash installations during the winter, a certain temperature must be maintained in the enclosed facility. To avoid unnecessary heating of the premises, particularly during the winter, vehicle wash installations with doors must have a system of automatic door closure for periods where heating is required for satisfactory operation. This means that during warmer periods, for example in the summer, the doors to the vehicle wash installation do not need to be controlled automatically.

Experience from licensing shows that requirements for energy management in the form of door closure and automatic lighting control are seen as positive. The measures are clear and signal the intentions of the Nordic Ecolabel. The requirement is of little use for manual wash installations without doors.

The evaluation report from 2012 pointed out that less of a weighting for energy management measures should be considered alongside the introduction of requirements regarding procedures for purchasing new equipment (equipment, for example, that has automatic light control and door closure).

Proposed requirement:

Enclosed vehicle wash installations with doors must have a system of automatic door closure for periods where heating is required to ensure satisfactory operation. This will be checked during an on-site inspection.

P2 Energy reporting

Nordic Ecolabelling has little data on the energy consumption of brush machines, fans, pumps and other machinery, but believes this to be an area worth investigating. Version 2 of the criteria for vehicle wash installations has a point score requirement for giving information about energy consumption per vehicle washed (measured or calculated over a representative period for the installation). None of the Nordic Ecolabelled installations have, however, provided information on energy consumption.

Data is required per functional unit (washed car) in order to assess the energy consumption of the vehicle wash installation and the environmental impact of that consumption in each of the different phases in the life cycle.

In the proposed new criteria for vehicle wash installations, a point is given if energy consumption is documented in the form of consumption and type of energy source.

Proposed requirement:

2 points are awarded for reporting calculated annual values for energy consumption by energy type (electricity, district heating, oil, etc).

✉ *Energy report with calculations.*

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[8] Aqua Consult: Förstudie Bilvårdsanläggningar

P3 Energy management – applies to all vehicle wash installations

There are various standards for energy management, including the Danish DS 2403:2001 Energy Management and the Norwegian standard NS-EN ISO 50001 Energy Management Systems.

The evaluation report for the Nordic Ecolabelling of vehicle wash installations, version 2, from June 2012, states that requirements for energy management should refer to standards of which DS 2403 and equivalent standards are only one example. None of the Danish Nordic Ecolabelled vehicle wash installations follow the standard DS 2403:2001. Experience from Nordic Ecolabelled vehicle wash installations shows that measures such as automatic light control and door closure are seen by the employees at the installations as positive and tangible measures.

Proposed requirement:

Automatic light control in the wash installation earns 1 point.

☺ This will be checked during an on-site inspection.

Procedures

O12 Sludge emptying

To reduce the risk of tanks and containers in water treatment units with re-circulated water being contaminated with bacteria or heavy metals from sludge tanker trucks when emptying sludge, the company that owns the sludge tanker truck must guarantee that the truck is not contaminated with heavy metals or bacteria.

Requirements concerning waste management must ensure that the waste (in this case sludge and other contaminants separated from the water treatment equipment) is processed in an environmentally appropriate way. This means that the facilities that will be processing the waste must also be officially licensed to do so. If the final processing of the waste is not correct/satisfactory, this undermines the purpose of water treatment at the vehicle wash installation, since the environmental problem and environmental impact are simply shifted from the wash installation to the waste processing facility.

Proposed requirement:

Tanks and containers in water treatment units with re-circulated water must be filled with clean water. When emptying the sludge, it must be guaranteed that the sludge tanker truck is not contaminated with heavy metals or bacteria.

Waste from oil and sludge separators and other contaminants from the water treatment unit must be processed by a facility that is approved by the authorities to handle this type of waste.

✉ *Declaration, see Appendix 5, that the sludge tanker truck is not contaminated with heavy metals or bacteria before the sludge is emptied, or see Appendix 5 – Emptying systems for toilets.*

O13 Emptying system for toilets in buses

To reduce the risk of the re-circulated water being contaminated with bacteria from toilets in buses or motorhomes, there must be an emptying system in place that ensures toilet emptying without cross contamination.

Proposed requirement:

The requirement applies to vehicle wash installations for buses and trucks.

If the wash installation is intended to wash buses with toilets, there must be an emptying system in place that ensures the toilet waste is not emptied in a way that can contaminate the re-circulated water.

If there are no facilities for emptying toilets, the customer must be informed that their toilet cannot be emptied at the installation due to the dangers of spreading infections.

✉ *Description of the emptying system for toilets and description of how customers are informed if there is no emptying system available.*

O14 Special vehicles (applies to vehicle wash installations for buses and trucks)

Regulation (EC) No 852/2004 on the hygiene of foodstuffs aims to provide a higher level of protection for human life and health. Under the regulation, vehicles used for transporting food must be kept clean and in good condition, such that food is protected from contamination.

Since re-circulated water from vehicle wash installations is more prone to anaerobic conditions and thus blooms of algae and bacteria, only fresh water is to be used to wash vehicles that require special hygiene levels.

Proposed requirement:

When vehicles requiring special hygiene are washed, such as vehicles covered by EC 852/2004, only fresh water may be used, i.e. no re-circulated water. However, the total emission values per vehicle must be met. If the plant washes both vehicles that demand extra hygiene and vehicles that may be washed with re-circulated water, the plant shall be equipped with a so-called double system. Double system means that the plant can temporarily be switched over to using fresh water only.

✉ *Description of the emptying system for toilets and description of how customers are informed if there is no emptying system available.*

O15 Self-assessment

A water consumption reading is to be taken each month and reported annually.

It is not possible to have continuous sampling of outgoing water to check that the installation meets the Nordic Ecolabelling requirements for water emissions. The checks that are carried out therefore have to assume that the equipment is working properly.

Even if there is a water meter and monitoring system, one cannot entirely trust the technology, particularly if it is not maintained. A programme must therefore be drawn up for each installation showing what is to be controlled and how often, to ensure good operating conditions. All self-assessment is to be recorded and collated annually so that it can be reported to the ecolabelling body.

Proposed requirement:

Self-assessment and record-keeping shall be performed in accordance with a self-assessment programme comprising the following:

- *The figures for fresh water consumption and number of vehicles are to be recorded each month.*
- *The annual average of fresh water consumption is to be calculated as number of litres per washed vehicle.*
- *Emission samples are to be taken once a year during the period 1 November – 30 April.*
- *Emission values to be calculated per washed vehicle for ∑ Pb, Ni, Cr plus Cd, Zn, Cu and oil.*
- *Complaints of a serious nature are to be recorded.*

✉ *This information is to be compiled in an annual report and submitted to Nordic Ecolabelling by 31 March each year. Appendix 2 can be used for the self-assessments.*

P4 Waste

To encourage vehicle wash installations to reduce plastic packaging and ensure recycling, a point is given for sorting the packaging that cleaning and water treatment chemicals are delivered in and sending the sorted waste to a recycling plant for re-use or material recovery.

Proposed requirement:

1 point may be given to vehicle wash installations that sort the packaging that cleaning and water treatment chemicals are delivered in and send it to a recycling plant for re-use or material recovery.

✉ *Invoice or copy of agreement stating that waste fractions are sent for re-use or material recovery.*

Points summary

In the previous version of the criteria for Nordic Ecolabelled vehicle wash installations, point score requirements were introduced in addition to the obligatory requirements. Point score requirements were introduced to make the criteria more flexible and to reward installations with lower emissions. There was also a desire to encourage vehicle wash installations to report their energy consumption and implement energy efficiency measures. Experience has shown that almost none of the Nordic Ecolabelled vehicle wash installations have reported data on energy consumption or conducted measurements of DEHP, VOC or COD. The points system has also proven to be incorrectly weighted in relation to what actually contributes to major environmental gains. In other words, the points system has not had the intended effect.

Nevertheless, in this version Nordic Ecolabelling has chosen to continue with the points system, since the flexibility it provides hopefully steers vehicle wash installations towards a focus on lower consumption of water, energy management and greater use of Nordic Ecolabelled products. The points system has been adjusted and the weighting amended compared with the previous version.

Automated wash installations must achieve at least **5** points to be Nordic Ecolabelled.

Manual wash installations must achieve at least **4** points to be Nordic Ecolabelled.

For newly built installations and refurbished installations that receive a licence outside the sampling period 1 November – 30 April, it must be documented in the next sampling period that the installation qualifies for a sufficient number of points.

Basic licence holders, who cannot achieve points on the requirements P1, P2, P3 and P4, must still report how many points are achieved in terms of water consumption (O7) and chemicals (O8).

Requirement	Result achieved	Possible points		Points achieved
DEHP measurement **(P1)**	Before treatment: After treatment:		1 p	
Water consumption **(O7)**	_____ litres/washed vehicle	Passenger car wash:		
		F, I, N and S:	65 litres: **1 p** 45 litres: **2 p**	
		DK and Skåne:	50 litres: **1 p** 35 litres: **2 p**	
		Manual installations:	60 litres: **1 p** (Nordic) 40 litres: **1 p** (Denmark + Skåne)	
		Wash installations for buses and trucks		
		F, I, N and S:	200 litres: **1 p** 135 litres: **2 p**	
		DK and Skåne:	155 litres: **1 p** 105 litres: **2 p**	
		Manual installations:	190 litres: **1 p** (Nordic) 130 litres: **1 p** (Denmark + Skåne)	
Chemicals **(O8)**		Obligatory req.: 20% Nordic Ecolabelled products. > 75% ecolabelled products: **3 p** 45-74% ecolabelled products: **2 p** < 20-44% ecolabelled products: **1 p**		
Energy reporting **(P2)**		Calculated annual values for energy consumption by energy type (electricity, district heating, oil, etc): **2 p**		
Automatic light control **(P3)**		Automatic light control: **1 p**		
Waste **(P4)**		Sorting of packaging that cleaning and water treatment chemicals are delivered in and sending to a recycling plant for re-use or material recovery: **1 p**		
Total no. of points:				points

Environmental management

To ensure reasonable quality and an appropriate working environment beyond what is demanded in the requirements regarding chemicals, Nordic Ecolabelling normally also sets a number of general requirements in its criteria for products and services.

It is necessary for Nordic Ecolabelling to know, at all times, who the licensee's contact person is for the Nordic Ecolabel. The applicant shall therefore appoint an individual

responsible for ensuring the fulfilment of the Nordic Ecolabel requirements, and a contact person for communications with Nordic Ecolabelling.

Changes to the ecolabelled production process may have repercussions for the Nordic Ecolabel licence. A written report of all changes that may relate to the requirements set for the ecolabelled service must therefore be submitted to Nordic Ecolabelling. This will enable Nordic Ecolabelling to provide information on what needs to be done to ensure that the change does not impact on the licence.

In the event of unforeseen non-conformities, Nordic Ecolabelling can assess the consequences of the non-conformity and provide advice on what action the licensee should take.

M1 Environmental policy

The company must draw up an environmental policy that sets out the company's level of ambition and the environmental goals that the company is committed to achieving. The environmental policy must be signed by the CEO/MD.

M2 Organisation and responsibility

It is important to have an overview of the organisation, along with its various areas of responsibility and functions, to ensure that Nordic Ecolabelling's operational requirements and procedures are followed.

There may be several people involved in operating a vehicle wash installation. In addition to the employees at a wash installation, there may be suppliers of washing machines, cleaning chemicals, water treatment equipment and water treatment chemicals. It is therefore important to have a clear division of responsibility. Consequently, a Nordic Ecolabelled vehicle wash installation must have someone in overall charge of operations at the installation, someone who coordinates with suppliers and someone who is responsible for employee training.

An organisational chart shall be provided, showing areas of responsibility and functions. includingresponsibility for the Nordic Ecolabel, marketing and training.

Proposed requirement:

An organisational chart shall be provided, showing areas of responsibility and functions. The information shall also include a contact person for the Nordic Ecolabel, and the people responsible for purchasing, marketing, operating the wash installation and staff training.

✉ *Description of compliance with the requirement and a copy of environmental management procedures.*

M3 Procedures and instructions

Many washing machines and water treatment units are so technically advanced that they require operation and maintenance of both the washing function and water treatment to be conducted in line with the supplier's instructions. Experience shows that this is a critical point for both the washing results and the quantity of emissions from the vehicle wash installations.

In addition to the often technical operational and maintenance instructions that come with washing and water treatment equipment for vehicle wash installations, there must be

instructions in place that are tailored to the staff who are responsible for day-to-day operations. The instructions must be easy to understand and cover both the washing machine and the water treatment equipment.

The instructions shall/should state which actions/measures the staff are responsible for and which actions require the services of the relevant supplier. The instructions shall also specify how often the system should be emptied and what indicates the need for emptying.

In addition, the instructions shall contain an action plan for accidents and the name and phone number of the person in charge of quality and operations, as well as service personnel from all suppliers of washing and water treatment equipment and chemicals.

Proposed requirement:

Each vehicle wash installation shall have documented procedures and instructions that ensure that the Nordic Ecolabelling criteria are fulfilled regarding:

- *daily checks on the washing and water treatment units, including checking that the water treatment equipment is functional and operates when the wash installation is in use*
- *implementation of self-assessments*
- *operation and maintenance of the wash installation*
- *reporting unforeseen non-conformities and planned changes (for example change of chemicals) to Nordic Ecolabelling*

The wash installation must also have procedures to ensure satisfactory protection against the transmission of Legionella, E. coli and other pathogens.

The procedures shall contain the following text:

- *In the event of a stoppage lasting longer than 30 days, water samples shall be taken and submitted for analysis. The installation cannot be put back into operation until the analysis results show the level of harmful bacteria is below a safe level.*

Measures such as sterilisation or disinfection should also be considered if the device or parts of the device have been significantly changed or opened for maintenance purposes in a way that might have allowed or might potentially allow infection to occur.

✉ *Declaration of compliance with the requirement.*

M4 Training

All employees who are involved in the everyday business must have the necessary knowledge to ensure that the Nordic Ecolabelling requirements are fulfilled.

✉ *Description of staff training and skills.*

M5 Storage and handling of chemicals

Chemicals must be stored in a way that contains chemical discharges and allows chemical spills to be channelled via the water treatment unit. In the event of major unexpected spills, it must be possible to collect the chemicals, for example in the water treatment system's tanks or on an adjacent floor. Floor drains in chemical storage rooms must be connected to the water treatment system for the wash installation.

Proposed requirement:

Chemicals are to be stored in a way that contains discharges.

Floor drains in chemical storage rooms must be connected to the water treatment system.

Drains that are plumbed or equipped with valves, for example, to limit the effects of chemical spills do not need to be connected to the water treatment system, but must be constructed in such a way that chemical spills are contained. This may take the form of a bund wall/barrier that keeps the chemicals in place.

The packaging for chemical products must be designed such that the user does not risk coming into contact with the product during dosing to make dosing easier.

✉ *A description of the way in which chemicals are stored and the way in which the drain in the floor of the chemical room is constructed.*

✉ *Declaration of the packaging design.*

M6 Safety data sheets

Up-to-date safety data sheets must be available for all the chemical products used at the installation.

Proposed requirement:

Safety data sheets for the chemical products used for cleaning and water treatment must be readily available at the installation.

✉ *Declaration of where the safety data sheets are kept.*

M7 Information on use of customers' own products/degreasers

The customers must be informed that use of their own degreasers is not permitted. The water treatment system is tailored to a particular type of chemicals, so the use of other product types will disrupt the treatment process.

It is difficult to control which cleaning products the customer uses.

Proposed requirement:

The customers must be informed that use of their own products/degreasers is not permitted. This regards both manual and automatic wash installations.

M8 Quality

After being washed in the installation the vehicle shall be as clean as if it had been washed in some other commercial wash installation that uses equivalent methods of washing.

The definition of a "clean car" is not easy since it is often a case of subjective judgements. The washing chemicals (Nordic Ecolabelled) have already proven that they have satisfactory performance but, when washing vehicles in the wash installation, the whole picture must be considered.

In the absence of reliable and standardised testing methods for performance, the business must itself report and explain how the wash installation is just as good as other installations.

Proposed requirement:

After being washed in the installation the vehicle shall be as clean as if it had been washed in some other commercial wash installation that uses equivalent methods of washing.

M9 Laws and regulations

The business must comply with environmental laws and regulations in the country in question. This means, for example, that the discharge of water to the drainage system must comply with the environmental authority's instructions. Procedures must be in place to interpret which requirements the environmental legislation demands and to monitor the installation's compliance with the requirements.

M10 Purchasing

Procedures shall be in place to set environmental requirements when purchasing goods and services.

In the case of everyday purchases, concrete purchasing procedures must be established regarding what is to be chosen in the first instance, along with a list of the products that must not be purchased. In the event of deviations from the procedures, the issue is to be dealt with by the head of purchasing.

For goods and services that are purchased less often, there are to be overarching principles regarding what can be chosen, and what cannot. The head of purchasing is to choose these goods and services based on environmental considerations.

The vehicle wash installation's purchasing procedures must include procedures for purchasing new equipment that ensure more energy-efficient solutions.

M11 Technical servicing

Documented procedures or service agreements that ensure regular checks and servicing.

Servicing records are to be retained and kept readily available.

📖 *Copy of procedures in the environmental management system or alternatively a service agreement showing how checks are carried out.*

M12 Documentation from the applicant

A copy of the application is to be accompanied by the supporting fact sheets and calculation data (including test reports, documents from supplier and so on) required as part of the application.

☺ On-site inspection

M13 Legislation

The licensee must ensure compliance with the applicable legislation on health and safety, environmental legislation and installation-specific terms/permits at all the production sites where the Nordic Ecolabelled service is provided.

Failure to comply with this requirement may result in Nordic Ecolabelling revoking the licence.

M14 Annual follow-up

Each year, the environmental requirements shall be followed up with regard to the self-assessments in O14. The results of the self-assessments are to be signed off by the person responsible for the Nordic Ecolabel licence and then submitted to Nordic Ecolabelling.

M15 Marketing

Marketing of Nordic Ecolabelled vehicle wash installations must comply with the "Regulations for the Nordic Ecolabelling of Products" from June 2011 or later versions.

A basic licence holder may only market the Nordic Ecolabel to potential purchasers of wash installations, and not users of wash installations.

✉ *Duly completed Appendix 7.*

5 Changes compared to previous version

Comparison of requirements for vehicle wash installations in criteria version 2 and draft version 3.

Req. version 3	Req. version 2	Same	Changed	New req.	Draft for consultation
O1	O1 + O2		X		Requirements merged and clarification. New appendix drawn up.
O2	O3		X		Clarification of what should be included in the technical description of the installation.
O3	O4	X			Text amended.
O4	O6	X			Text amended.
O5	M3		X		Requirement for initial sampling has been moved forward in the document. Better explanation of the requirement and the conditions.
O6	O7 + P1		X		Text amended and merger of obligatory requirement and point score requirement for emissions. Points for lower emissions summed up in section 1.6. Tightening of requirements concerning ∑ Pb, Ni and Cr, and Cd.
P1	P1		X		Requirement amended to require measurements before and after treatment to achieve points. Requirement tightened by requiring measurement of DEHP, DBP, BBP and DIBP.

O7	O8 + P2		X		Text amended and merger of obligatory requirement and point score requirement for water consumption. Water consumption for manual installations now has its own limit values.
O8	O11+O12 + declaration in Appendix 3b		X		Chemicals requirements and general information moved from appendix into criteria document. Introduction of new appendix tailored to the specific chemicals requirements. Proposed obligatory requirement of 20% Nordic Ecolabelled chemicals for basic licence holders.
O9				X	The use of chemicals with added fragrance is not permitted in manual installations.
O10	O13	X			
R1	Appendix 3a	X			
R2	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R3	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R4				X	The requirement concerning CMR substances is taken from the most recent version of the criteria for car and boat care products (version 5).
R5				X	The requirement concerning nanomaterials/particles is taken from the most recent version of the criteria for car and boat care products (version 5).
R6	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R7	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R8	Appendix 3a	X			Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R9	Appendix 3a	X			Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R10	Appendix 3a	X			Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5). The list of 26 fragrances has been expanded into a list of 127 fragrances.
R11	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R12	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).
R13	Appendix 3a		X		Requirement updated in line with the most recent version of the criteria for car and boat care products (version 5).

R14				X	The requirement concerning PVC packaging is taken from the most recent version of the criteria for car and boat care products (version 5).
O10	P3		X		Automatic door closure changed from a point score requirement to a compulsory requirement.
P2	P3		X		Text amended.
P3	P3	X			Requirement unchanged but now a separate point score requirement.
O11	O5 + M12		X		Requirement for handling waste from sludge and oil separator has been merged with requirement for sludge emptying and sludge tanker trucks. Text amended.
O12	O9	X			
O13	O10	X			Special vehicles
O14	M4 + M15		X		Requirements merged and text amended.
P4				X	New requirement for sorting packaging at source.
M1				X	Environmental policy – from template.
M2	M1		X		Organisation and responsibility – from template. Clarification.
M3	M5+M7+ M8+M14		X		Merger and rewording.
M4	M6	X			Training – from template, but adapted to criteria.
M5	M9		X		Requirement written more clearly.
M6	M10	X			Safety data sheets
M7	M11	X			Information to customers.
M8	M15		X		Quality requirement simplified.
M9	M16		X		Legislation – from template.
M10					Purchasing
M11				X	Technical servicing – from template.
M13				X	Documentation from the applicant – from template.
M14				X	Laws and regulations – from template.
M15				X	Annual follow-up – from template.
M16	M16	X			Marketing

6 References[1]

Ulf Ramsay, Constant Clean

Handledningsmaterial från Miljösamverkan Skåne, Fordonsbranchen – åkerier, bilverkstäder och fordonstvättar (2013)

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http://www.miljostatus.no/Tema/Kjemikalier/Noen-farlige-kjemikalier/ftalater/

Ulf Nielsen, DHI, "Input til justering/endringer af kriterier" ULN/2004-10-27 (NMN document December 2004)

IVL Svenska Miljöinstituet AB, Rapport B 1554 Utvärdering av miljöanpassade fordonstvättar ur ett bredare perspektiv (January 2004)

Aqua Consult: Förstudie Bilvårdsanläggningar

7 New criteria

In a future revision, the following points should be considered:

- Requirements regarding the wash installation's water treatment efficiency. Gather data to establish what percentage of organic matter a water treatment unit has the capacity to remove (calculated as reduced COD concentration in waste water in relation to input water).
- Reviewing the possibility of setting requirements for the vehicle wash installations' total energy consumption.
- Tightening up the requirements concerning emissions from the installations. Lower limits for the existing substances and more substances on the list.
- Tightening up the requirements concerning volatile organic compounds in car care products.

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