

**Nordic Ecolabelling of  
Stoves**

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**Nordic Ecolabelling**

In November 1989, the Nordic Council of Ministers adopted a measure to implement an official voluntary ecolabelling scheme, the Swan. The organizations/companies listed below administer the Nordic Ecolabelling scheme on assignment from their national governments.

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Quotations may be made provided that Nordic Ecolabelling is stated as the source.

# Nordic Ecolabelling of stoves

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## **What is a Nordic Ecolabelled stove?**

A stove is located in the room that is to be heated and may also distribute heat as a supplementary function via a water or ventilation system. It is fired on solid biofuel, that is wood, wood pellets or, in some cases, an alternative biofuel. Stoves include heaters such as wood stoves, slow heat release appliances such as tiled stoves and stone-clad stoves, inset stoves and sauna stoves.

The fuel can be fed by hand or mechanically. Wood is generally fed by hand while pellets are fed mechanically. A stove contains the fire. Air is supplied through special ducts and the air flow can often be regulated.

As a rule, a stove does not provide the majority of a building's heating requirement; rather it usually supplements another heat source. In energy efficient houses, however, a stove may cover all heating needs.

The flue gas emissions produced by the stove are tested. If the stove is fired on pellets, noise is also tested. The supplier must provide clear user information as to how to operate and maintain the stove for optimum performance.

A Nordic Ecolabelled stove offers high efficiency and has low emissions of particles, carbon monoxide (CO), organic gaseous carbon (OGC) and nitrous oxides (NO<sub>x</sub>). The manufacturer must also ensure that the instruction manual contains comprehensive information and recommends that the stove is installed by a qualified fitter.

The requirements in the Nordic Ecolabel criteria on flue gas emissions are more stringent than the Norwegian, Swedish, Danish and Finnish national regulations. Norwegian and Danish regulations only require particle tests and Swedish regulations only hydrocarbon tests. There are no emission requirements in Finland.

## **Why choose the Nordic Ecolabel?**

- The manufacturer and/or reseller may use the Swan trademark. The Nordic Ecolabel, the Swan, is well known and commands high consumer confidence throughout the Nordic region.
- The Nordic Ecolabel is a cost-effective and simple way to communicate that a stove is among the best on the market from an environmental viewpoint and that it has been tested by a third-party laboratory.
- Nordic Ecolabelling enables manufacturers to reach a growing number of professional and private consumers who wish to reduce their impact on the environment by using stove that produce the lowest emission levels and general environmental impact.
- Environmental issues are complex and it is difficult to compare the various parameters. For a long time, municipalities and other users have sought an aid that provides credible evaluations. The Swan leads the way.

## What can carry the Nordic Ecolabel?

Stoves that are fired on solid biofuels such as wood and pellets, are eligible for the Nordic Ecolabelled. For example, woods stoves, slow heat release appliances (e.g. tiled stoves and stone-clad stoves), inset stoves and sauna stoves can be awarded the Nordic Ecolabel. Nordic Ecolabelled stoves for solid biofuel are fuelled by hand, with the exception of pellet stoves which may also be mechanically fed.

The stove may be a slow heat release appliance or standard appliance. A slow heat release stove normally stores the thermal energy in a solid material. There are also slow heat release stoves that store the heat in a water reservoir. These differ from water-jacketed stoves since they cannot be fired without water in the reservoir.

Stoves that have a water jacket are not defined as slow heat release appliances. They can be used both water filled and empty of water.

Solar collectors delivered with a stove must be type approved to EN 12975.

Open fireplaces, where the fire burns in an open space, are not included in the product group.

Stoves and fireplaces for liquid biofuels are not part of the product group.

The definitions of stove types, with some exceptions, follow the standards specified under Definitions.




## How to apply

A manufacturer or reseller may apply for a licence using the designated application form. If a reseller applies for a licence, the manufacturer must also sign the application.

All requirements must be fulfilled. The requirements are marked in this document with the letter R and consecutive numbers. Icons indicate for each requirement how the applicant shall demonstrate that the requirement is fulfilled.

### Icons in the text

The text describes how the applicant shall demonstrate fulfilment of each requirement. There are also icons in the text to make this clearer. These icons are:

-  Enclose documentation.
-  Information must be provided in the instruction manual (R15-R16).
-  Requirement checked on site

### **Application**

The application shall be sent to Nordic Ecolabelling in the country in which the stove is manufactured or sold. See page 2 for addresses. The documents required for application are an application form and documentation demonstrating fulfilment of the requirements (specified under each requirement).

Further information and assistance can be obtained during application. Visit the Web site of the national ecolabelling body for more information.

### **Sales in other Nordic countries**

Registering a licence in another Nordic country allows the Nordic Ecolabel to be used on a larger market. The following must be submitted to Nordic Ecolabelling:

- Application form marked with the intended country of sale.
- The applicable sections of the installation manual and operating and maintenance instruction translated into the national language(s) (R15 and R16).
- Take-back system for packaging (R27).

Registration is free of charge but an annual fee shall be paid in accordance with the national regulations.

### **On-site inspection**

During the application process, Nordic Ecolabelling normally performs an on-site inspection at the manufacturing plant to ensure adherence to the requirements. For this inspection, the licensee must be able to present data used for calculations, original copies of submitted certificates, test records, purchase statistics, and similar documents that support the application. This inspection also covers the relevant sections of the quality assurance process or documented procedures.

### **Costs**

An application fee is charged to companies applying for a licence. There is an additional annual fee based on the revenues produced by the Nordic Ecolabelled stove.

### **Enquiries**

Please contact Nordic Ecolabelling if you have any queries or require further information. See page 2 for addresses.

# 1. Manufacture

## 1.1 Product requirements

### R1 Description of the manufacturing process

The following documents shall be submitted:

- A description of the manufacturing process for the stove specifying the various phases of manufacture, name of suppliers, production site, surface treatments and cleaning processes.
- Copy of authorization for manufacturing and information regarding licensed emissions from the past year.

*Manufacturing does not include the primary production of steel, glass or plastic parts.*

- A description of the production process for the stove including a list of suppliers. Copy of licence.

### R2 Material requirements

Applicants shall submit a complete list of parts in the stove that specifies the constituent materials of each part. The list shall include small parts such as screws, bolts, rivets, plugs, washers, hinges and suchlike. *The description of materials approved by the test laboratory in connection with testing (see Section 1.1 of Appendix 1) may be used.*

The materials and design shall comply with the pertinent requirements of the applicable standard: EN 13240 (wood stoves), EN 14785 (pellet stoves), EN 13229 (inset stoves), EN 15250 (slow heat release appliances) or prEN 15821 (sauna stoves). The requirements cover parameters such as thickness, strength and permitted surface temperature (safety).

The stove, including internal components, shall have a minimum guaranteed service life of 3 years under normal usage.

- Description of the parts of the stove. Declaration from the manufacturer that the material and design requirements are fulfilled. Appendix 3.2 may be used.

### R3 Classification of chemical products

Applicants shall submit a list of chemical used during the manufacture and surface treatment of the stove.

Chemical products (such as adhesives, sealants, cleaning agents, paints and lacquers) that are used during the manufacture and surface treatment (including metal coating) of the stove, must not be classified according to the following table. An exemption is made for products classified as CARC 3/R40 that contain furfuryl alcohol (CAS 98-00-0) and are used for moulding sand during casting.

*Manufacturing does not include the primary production of steel, glass or plastic parts. Cast iron production is considered to occur if the manufacturer stores cast iron stoves. Cast iron parts for other stoves are not subject to the requirements.*

*The surface treatment of small parts is exempt from this requirement (small parts are defined under R2). The surface treatment of small parts must however fulfil R6.*

**Table 1:** Classification of chemical products

<b>Classification</b>	<b>EU classification until 1 December 2010</b>	<b>EU classification from 1 December 2010</b>
Dangerous for the environment	N with R50, R50/53, R51/53 or R59	Aquatic 1 with H400 Chronic 1/2/3/4 with H410, H411, H412, H413
Very toxic	Tx (T+ in Norway) with R26, R27, R28, R39	Acute Tox. 1/2 with H330, H310, H300, STOT SE 1 with H370
Toxic	T with R23, R24, R25, R39 or R48	Acute Tox. 2/3 with H331, H301 STOT SE 1 with H370 STOT RE 1 with H372
Sensitising	Xn with R42, Xi with R43	Resp. sens. 1 with H334 or Skin sens 1 with H317
Carcinogenic	Xn with R40 or T with R45, R49	Carc 1A/1B/2 with H350, H350i and/or H351
Mutagenic	T with R46 or Xn with R68	Mut 1B/2 with H340 and/or H341
Toxic for reproduction	T with R60 and/or R61. Or Xn with R62 and/or R63	Repr 1A/1B/2 with H360F, H360D, H361f, H361d, H360FD, H361fd, H360Fd, H360Df Lact with H362

*\*Classification in accordance with Council Directive 67/548/EEC and Council Directive 1999/45/EEC (until 1 December 2010 and during the transition period 2010-2015) or Regulation 1272/2008/EEC (as of 1 December 2010). The requirement also applies to combinations of risk phrases, such as T+ R26/R27/R28.*

*Note that the producer of the chemical product is responsible for classification.*



List of chemicals used during the manufacture and surface treatment of the stove.

The material safety data sheet shall comply with applicable legislation in the country of application, e.g. Annex II of REACH (Council Regulation 1907/2006/EC) for all chemical products.

#### **R4 Chemical substances**

The following substances must not be actively added to chemical products (such as adhesives, sealants, cleaning agents, paints and lacquers) that are used during the manufacture and surface treatment (including metal coating) of the stove:

- Lead (Pb), mercury (Hg), hexavalent chrome (Cr<sup>VI</sup>), cadmium (Cd) and their compounds
- Halogenated organic compounds
- Alkylphenols, alkylphenolethoxylates or other alkylphenol derivatives<sup>1</sup>
- Phthalates

*Manufacturing does not include the primary production of steel, glass or plastic parts. Cast iron production is considered to occur if the manufacturer stores cast iron stoves. The requirement does not apply to cast iron parts intended for other stoves.*

<sup>1</sup> *Alkylphenol derivatives are defined as compounds that liberate alkylphenols upon degradation.*

*The surface treatment of small parts is exempt from this requirement (small parts are defined under R2). The surface treatment of small parts must however fulfil R6.*

*Substances that are not actively added by a chemical producer or their suppliers and that are not found in concentrations exceeding 100 ppm are exempt from the requirement.*

*The manufacturer of a chemical product is responsible for its constituent components.*

- Declaration from the chemical manufacturer (or supplier) as to fulfilment of the requirement. MSDN for the product, see Appendix 3.1.

#### **R5 Surface treatments containing organic solvents**

The application and curing of surface treatments containing organic solvents shall be enclosed. The emission of organic solvents (VOC) during surface treatment must not exceed 20% of the applied solvent.

*This requirement is equivalent to the requirements of Council Directive 1999/13/EC on volatile organic compounds for manufacturing facilities that use more than 5 tons of organic solvents a year (surface treatment). For Nordic Ecolabelled stoves, the requirement applies irrespective of the quantity of organic solvent used. Volatile organic compounds (VOC) are defined as organic compounds that at 293.15 K have a vapour pressure of 0.01 kPa or greater.*

- Description of the emission of organic solvents (VOC) during surface treatment (see Appendix 3.2).

#### **R6 Metal coating of small parts**

Lead, mercury, cadmium, chrome and nickel additives must not be used during the metal coating of small parts.

Small parts (screws, bolts, rivets, plugs, washers, fittings and hinges) must not be coated with chrome, nickel or compounds of these unless this is justified due to high chemical or mechanical wear or another specific technical requirement. Parts in thermometers are classified as small parts. Chrome plating must be based on trivalent chrome.

If performed, chrome and nickel plating must be performed using purification, ion exchange, membrane technique or similar process to maximise the reuse of the chemical products. The emissions from surface treatment must be recycled and destroyed. The system must be closed and without a drain.

Any parts surface treated with the abovementioned metals must be reusable/recyclable.

- Declaration from the manufacturer that the requirement on metal coatings is fulfilled. Specification of need for metal coating and of the purification process. Appendix 3.2 may be used.

**R7 Packaging**

It must be possible to recycle or reuse the packaging material. The manufacturer shall provide a description of the packaging and how this is dealt with in the countries in which the Nordic Ecolabelled stove will be sold.

Chlorinated plastics and timber that is treated with wood preservatives/biocides must not be used in packaging.

- Description of the packaging and its disposal (as provided in the installation manual, see R15).

**R8 Waste**

The manufacturer shall sort waste at source into the fractions that arise during production, such as wood, glass, plastic and metal. A waste management plan specifying waste fractions, how the waste is managed (for example recycling, landfill or incineration) and waste recipient. If the waste is environmentally hazardous this must be clearly marked at the site.

- Waste management plan for the stove manufacturer's operations.

## 1.2 Peripheral equipment

**R9 Solar collector**

If the heating system includes a solar collector, this must be type approved according to EN 12 975.

- Declaration from the manufacturer of the solar collector, see Appendix 4.

**R10 Fuel pellet hopper**

The manufacturer of a Nordic Ecolabelled pellet stove shall inform the customer of how storage facilities for the recommended fuel should be designed to ensure that the quality of the fuel is not impacted when the fuel pellets are emptied into and stored in the customer's storage hopper.

-  Information must be provided in the instruction manual.

## 2. Operation of the Nordic Ecolabelled stove

**R11 Air emissions**

The stove must not exceed the emission limit values for organic gaseous carbon (OGC), carbon monoxide (CO), nitrous oxides (NO<sub>x</sub>) and particles specified in Table 2.

**Table 2.** Emission limits for Nordic Ecolabelled stove tested at 13% O<sub>2</sub>. The requirement applies at nominal heat output unless specified otherwise.

	<b>OGC</b>	<b>CO</b>	<b>NO<sub>x</sub></b>	<b>Particles</b>
	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>
<b>Hand fed slow heat release appliance</b>	<b>120</b>	<b>1500</b>	<b>200</b>	<b>50</b>
	mg/m <sup>3</sup>	mg/m <sup>3</sup>	mg/m <sup>3</sup>	<i>g/kg fuel</i>
<b>Hand fed stove or inset stove</b>	<b>120</b>	<b>1 500</b>	<b>200</b>	<i>Average of three partial heat outputs + nominal heat output: 4.0 for each individual test: 8.0</i>
<b>Mechanically fed pellet stove</b>	<i>Average of two partial heat outputs + nominal heat output 40</i>	<b>800</b>	<b>200</b>	<i>Average of two partial heat outputs + nominal heat outputs: 3.5 for each individual test: 7.0</i>
<b>Hand fed sauna stove</b>	<b>150</b>	<b>2 000</b>	<b>200</b>	<i>Average of three partial heat outputs + nominal heat output: 8.0 for each individual test: 15.0 If the appliance is only fired at nominal heat output: 120 mg/m<sup>3</sup></i>

The following conditions apply to testing. The test methods are described in Appendix 1.

**Hand fed slow heat release appliance.** Test at nominal heat output in accordance with:

- CEN/TS 15883:2009 for OGC and NO<sub>x</sub> emissions
- EN 15250 for CO emissions
- Applicable sections of VDI 2006 as per technical specification TC295 WG5 N 51 for particle emissions.

**Hand fed wood stove or inset stove.** Test at nominal heat output for CO, OGC and NO<sub>x</sub> emissions, and at nominal heat output and three different partial heat outputs for particulate in accordance with:

- CEN/TS 15883:2009 for OGC and NO<sub>x</sub> emissions
- EN 13240 (wood stoves) or EN 13229 (inset stoves) for CO.
- NS 3058 and NS 3059 with class 1 and 2 partial heat outputs for particle tests.

**Mechanically fed pellet stove.** Test at nominal heat output for CO and NO<sub>x</sub> emissions, and at nominal heat output and two different partial heat outputs for particulate in accordance with:

- CEN/TS 15883:2009 for OGC and NO<sub>x</sub> emissions
- EN 14785 for CO emissions
- NS 3058 and NS 3059 with class 1 and 2 partial heat outputs for particle tests.

**Hand fed sauna stove.** Test at nominal heat output for CO, OGC and NO<sub>x</sub> emissions, and at nominal heat output and three different partial heat outputs for particulate in accordance with:

- CEN/TS 15883:2009 for OGC and NO<sub>x</sub> emissions
- prEN 15821 for CO emissions
- If the stove is designed for partial heat outputs (in accordance with the manufacturer's instructions) particle emissions shall be tested according to NS 3058 and NS 3059 with class 1 and 2 partial heat outputs. If the stove is designed only for a nominal heat output (in accordance with the manufacturer's instructions) particle emissions shall be tested according to applicable sections of VDI 2066 and according to technical specification TC295 WG5 N 51.

*Requirements on laboratories, the testing of stoves and the measurement of emissions are described in detail in Appendix 1.*

☒ Full test report.

## **R12 Efficiency**

The efficiency of the appliance ( $\eta_k$ ) when tested at nominal heat output in accordance with the pertinent EN standard, shall be at least:

- 80% for hand fed slow heat release appliances, as per EN 15250.
- 78% for hand fed stoves (EN 13240) and inset stoves (EN 13229).
- 85% for mechanically fed pellet stoves as per EN 14785.
- 60% for hand fed sauna stoves as per prEN 15821.

*Requirements on laboratories, the testing of stoves and the measurement of efficiency are described in detail in Appendix 1.*

☒ Full test report.

## **R13 Noise**

The noise level from mechanically fed stoves must not exceed 55 d(B)A during normal use measured according to ISO 3743.

*Requirements on laboratories are described in Appendix 1.*

☒ Full test report.

## **R14 Declaration on the testing of emissions and efficiency**

A laboratory shall certify that the stove is tested in accordance with the specifications in Appendix 1, Section 1.3 for R11-R13.

***The laboratory shall be accredited to perform the tests specified. See Appendix 1, Section 1.2 Test laboratories.***

☒ Declaration demonstrating the fulfilment of the requirement.

### 3. Customer information

#### R15 Installation manual

The stove shall be supplied with an installation manual. The installation manual shall be easy to understand and written in the national language of the country in which the stove is installed. The manual shall include the following information and recommendations:

- Installation shall be performed as specified by a qualified fitter.
- Technical data for the stove (such as material types, dimensions, weight, heat output).
- Necessary volume of air for combustion.
- Distance from combustible materials.
- Space required for operation, maintenance and chimney sweeping.
- Type of gas flue to which the stove can be connected with regard to flue gas temperature and the dimension and location of the gas flue.
- Guidelines for the design of a storage vessel for pellets, if such fuel is used.
- Ventilation and installation of sauna stoves in a sauna, with regard to the size of the sauna.
- How to dispose of packaging.

☒ Copy of the installation manual that is supplied with the stove.

#### R16 Operating and maintenance instructions

Operating and maintenance instructions shall be supplied with each supplied stove.

The instructions shall be easy to understand and written in the national language of the country in which the stove is sold. The instructions shall contain the following information:

- Technical data for the stove (such as material types, dimensions, weight, heat output, heating area and distance from walls).
- How different fuels (types, grades) influence emissions.
- Suitable fuels for the stove and information that fossil fuels should not be used.
- That Nordic Ecolabelled pellets should be used in pellet stoves.
- Recommendations for the handling and storage of wood, pellets and other possible solid biofuels.
- How to light a fire.
- Directions on laying the fire and maximum wood length.
- Adjustment of air inlet.
- How a low air supply can result in poor combustion, high emissions and low efficiency.
- Instructions on cleaning, inspection and maintenance.
- Instructions describing the recommended maintenance.

☒ Copy of the operation and maintenance instructions that are supplied with the stove.

## 4. Information to resellers and fitters

### R17 Qualification requirements

If the stove has a water jacket and a supplementary solar **collector, the reseller must** recommend a qualified fitter.

Example of the written information supplied to resellers and fitters.

### R18 Design and sizing of the heating system

If the stove has a water jacket and the heating system has a supplementary solar collector, the system must be correctly designed and sized.

Example of the written information supplied to resellers and fitters.

### R19 Other information

The manufacturer shall inform resellers that:

- The stove should be installed by a qualified fitter.
- That the user must have access to the installation manual and operating and care instructions.

Example of the written information supplied to resellers and fitters.

## 5. Quality and regulatory requirements

To ensure that Nordic Ecolabelling requirements are fulfilled, the following procedures must be implemented. If the manufacturer's environmental management system is certified to ISO 14 001 or EMAS, where the following procedures (R24-R26) are applied, it is sufficient for the accredited certification body to certify that the requirements are implemented.

### R20 Laws and regulations (regulatory requirements)

The licensee must ensure that applicable laws and regulations in force are observed at facilities at which the Nordic Ecolabelled stove is manufactured. For example, regulations and provisions regarding health and safety, the working environment, environmental legislation (including REACH) and plant-specific conditions and concessions, must be followed.

Declaration from the licensee that the requirement is met, and details of the regulatory authority. See Appendix 2.

### R21 Licence administrators

The company shall appoint an individual responsible for ensuring the fulfilment of Swan requirements, and a contact person for communications with Nordic Ecolabelling.

Organisational structure showing the above areas of responsibility.

**R22 Documentation**

The licensee must keep the following documents during the licence period. The licensee must be able to present these documents during the application process and follow-up inspections:

- Copy of the entire application.
- Facts/basic data (including test reports, documents from suppliers and suchlike).
- Results from inspections of the production of the ecolabelled product.
- Returns and complaints.

☺ Checked on site.

**R23 Stove quality**

The licensee must ensure that the quality of manufacturing of the Nordic Ecolabelled stove is maintained throughout the validity period of the licence.

Nordic Ecolabelling maintains the right to request documentation of the annual quality inspection of manufacturing if the laboratory has performed such a test.

Requirements regarding the quality of materials are found under R2.

- ☒ Procedures for collating and, where necessary, dealing with claims and complaints regarding the quality of the Nordic Ecolabelled stove. Documentation regarding quality control during manufacture if requested by Nordic Ecolabelling.

**R24 Planned changes**

Planned changes to areas controlled by Nordic Ecolabel requirements must be reported in writing to Nordic Ecolabelling and the licensee (if other than the product manufacturer).

- ☒ Procedures detailing how planned changes are handled.

**R25 Unplanned nonconformities**

Unplanned nonconformities in manufacturing related to areas controlled by Nordic Ecolabel requirements must be reported in writing to Nordic Ecolabelling and the licensee (if other than the product manufacturer).

- ☒ Procedures detailing how unplanned nonconformities are handled.

**R26 Traceability**

The licensee/manufacturing must have a traceability system for the production of the Nordic Ecolabelled stove.

- ☒ Description of/procedures for the fulfilment of the requirement.

**R27 Take-back system**

Applicable national regulations, legislation and/or agreements within the sector regarding the recycling systems for products and packaging shall be met in the Nordic countries in which the Nordic Ecolabelled stove is marketed.

- ☒ Statement from the applicant regarding adherence to existing recycling/take-back agreements.

## Marketing

The Nordic Ecolabel, the Swan, is a very well-known and well-reputed trademark in the Nordic region. A Nordic Ecolabelled stove may be marketed using the Swan label so long as the associated licence is valid.

The label must be positioned so that there is no doubt as to what the label refers and so that it is clear that the stove is ecolabelled.

More information on marketing can be found in "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version.

## Design of the Nordic Ecolabel

Design of the Nordic Ecolabel:



Licence number (xxx - xxx)

Each licence has a unique, six-digit licence number that must be displayed along with the label.

More information on the design of the label can be found in "Regulations for Nordic Ecolabelling" of 12 December 2001 or later version.

## Follow-up inspections

Nordic Ecolabelling may decide to check whether the stove fulfils ecolabel requirements during the licence period. This may involve a site visit, random sampling or similar test.

The licence may be revoked if it is evident that the stove does not meet the requirements.

## How long is a licence valid?

Nordic Ecolabelling adopted version 3.0 of the criteria on xx xxx 2010. These criteria are valid through 31 xxx xxxx.

An ecolabel licence is valid providing the criteria are fulfilled and until the criteria expire. The validity period of the criteria may be extended or adjusted, in which case the licence is automatically extended and the licensee informed.

Revised criteria shall be published at least one year prior to the expiry of the present criteria. The licensee is then offered the opportunity to renew their licence.

## New criteria

Prior to the next revision of this criteria document, the following items shall be evaluated:

- Material and chemical requirements.
- The manufacturing process and raw materials including energy consumption during production.
- Test methods and variations of test at different laboratories.
- Requirement levels regarding efficiency and emissions.
- Relationship to EuP and RES directives.
- Impact of particle size on health.

## Definitions

**Stoves are defined according to the following standards:**

### Hand fuelled stoves:

Slow heat release appliance: defined in EN 15 250, section 6.6 “Thermal storage capacity”, as follows: “The time period from the appliance achieving the maximum surface temperature and falling to 50% of that maximum value based upon differential surface temperatures against ambient temperatures shall be not less than 4 hours”.

There are also slow heat release appliances that store the heat in a water reservoir. These differ from water-jacketed stoves since they cannot be fired without water in the reservoir.

- Wood stove: EN 13240.
- Inset stove: EN 13229.
- Sauna stove: prEN 15821

### Mechanically fuelled stoves:

Pellet stove: EN 14785.

# Appendix 1 Testing

## 1.1 Testing

The stove must be tested to determine the flue gas emissions regarding carbon monoxide, hydrocarbons expressed as organic gaseous carbon (OGC), nitrous oxides (NO<sub>x</sub>), particles and efficiency. Testing is based on the European standards. But testing shall also be performed at the heat outputs specified by the Norwegian standard (NS).

Mechanically fed stoves must also be tested for noise.

The test laboratory shall produce a comprehensive test report that contains information on the following.

1. Selected test method.
2. Results from all tests.
3. A clear definition of the stoves.
4. Confirmation that the test has been performed in accordance with the method specified, except where stated otherwise.
5. Specification of the test fuel.
6. That the laboratory fulfils the specified requirements and can demonstrate that testing is performed in an impartial, competent manner.

Sample products shall be chosen at random from the factory's warehouse or from the open market.

Nordic Ecolabelling maintains the right to request additional documents regarding the fulfilment of requirements and test reports.

## 1.2 Test laboratory

Flue gas tests shall be performed by an accredited laboratory that fulfils the general requirements of SS EN ISO/IEC 17 025 or which has official GLP status. An alternative laboratory may perform testing if the laboratory has applied for accreditation according to an applicable EN method but has not yet been granted approval. The laboratory must be able to show that it is independent and qualified.

If the country of origin lacks an accredited laboratory, the laboratory may be chosen following approval from Nordic Ecolabelling.

Noise can be tested by the manufacturer of the appliance if the manufacturer has been assessed by a notified body in accordance with Directive 2002/14/EC relating to noise emission.

## 1.3 Test methods

### Testing of hand fed stoves

*Slow heat release appliances shall be tested at nominal heat output only. CO and efficiency tests shall comply with EN 15 250 and OGC and NOx test shall comply with CEN/TS 15883, with the following modifications. Particle tests shall comply with applicable sections of VDI 2066 and technical specification TC295 WG5 N 51.*

*Wood stoves: CO and efficiency tests shall comply with EN 13 240 and OGC and NOx test shall comply with CEN/TS 15883, with the following modifications. Particle emissions from wood stoves shall be tested at nominal heat output and three partial heat outputs according to NS3058 and NS3059.*

*Sauna stoves: CO and efficiency tests shall comply with EN 15 821 and OGC and NOx test shall comply with CEN/TS 15883, with the following modifications. Particle emissions from sauna stoves shall be tested at nominal heat output and, if the manufacturer claims that the stove is designed for firing at partial heat outputs, at three partial heat outputs according to NS3058 and NS3059. If the stove is designed only for a nominal heat output particle emissions shall be tested according to applicable sections of VDI 2066 and technical specification TC295 WG5 N 51.*

*Inset stove: CO and efficiency tests shall comply with EN 13 229 and OGC and NOx test shall comply with CEN/TS 15883, with the following modifications. Particle emissions from inset stoves shall be tested at nominal heat output and three partial heat outputs.*

The partial heat output of hand fed stoves shall be tested according to NS 3058 and NS 3059 with class 1 and 2 partial heat outputs for particle tests.

### Test assembly

*Nominal heat output tests shall be performed with the stove connected to an extraction system according to the instructions in the standard in question. The rest of the extraction system shall be designed as a dilution tunnel as described in NS 3058-2, Section 4.2.*

*Testing at partial heat output shall be conducted with the stove connected to a chimney as described in NS 3058-1, Section 3.1, and the rest of the extraction system shall act as a dilution tunnel as described in NS 3058-2, Section 4.2.*

*Stoves with water tanks must also be connected to a water system that can ensure the flow temperature is maintained at  $80 \pm 5^{\circ}\text{C}$ .*

### Fuel

*Hand fed stoves shall at nominal output be fired on the fuel specified in each standard.*

*At partial heat output the test fuel and fill quantity must comply with NS 3058-1, Section 4.3.*

## **Procedure**

*During particle testing, pre-firing (stove ageing) in accordance with NS 3058-1, Section 6.1 may be excluded, if the partial heat output tests are not part of a complete type approval in accordance with Norwegian NS 3058 and NS 3059.*

*Nominal output tests of hand fed stoves shall comply with EN standards. The measurement of the total hydrocarbon content (THC) shall comply with CEN/TS 15883.*

*Partial heat output tests of hand fed stoves shall comply with EN 3058-2, Section 6.2 and 6.3. Testing shall be conducted at normal pressure with outputs equivalent to class 1 and 2 partial heat outputs.*

## **Measurements**

*The following measurements must be taken during testing at nominal heat output:*

- *CO, CO<sub>2</sub> or O<sub>2</sub> and flue gas temperature measured in accordance with the specific EN standard.*
- *Room temperature measured according to the specific EN standard.*
- *Total hydrocarbon content (THC) measured according to CEN/TS 15883, as a basis for determining OGC and NO<sub>x</sub>.*
- *Particles measured in accordance with NS 3058-2. The ignition phase is not included in the measurements.*
- *Flue gas pressure and temperature measured according to the specific standard.*
- *Particle emissions from slow heat release appliances shall be measured according to VDI 2066 and TC295 WG5 N 51 if it is not possible to use a dilution tunnel.*
- *Efficiency measured according to the specific EN standard.*

*For partial heat output the following shall be measured:*

- *Flue gas temperature in accordance with NS 3058-1, Section 4.1.2.*
- *Particle emissions in accordance with NS 3058-2. The ignition phase is not included in the measurements.*
- *Flue gas pressure measured in accordance with NS 3058-1, Section 3.8.*

## **Calculations**

*OGC and NO<sub>x</sub> calculations shall follow CEN/TS 15883 and be based on an average total hydrocarbon content (THC) measured at nominal heat output.*

*Particle emissions shall be calculated according to NS 3059, Section 4. The emission level shall be calculated for each individual heat output range and as a weighted mean value of all tests.*

*Particle emissions from slow heat release appliances shall be calculated according to VDI 2066 and TC295 WG5 N 51 if testing is performed in chimney.*

## **Testing of mechanically fed stoves**

*Pellet stoves: CO and efficiency tests shall comply with EN 14 785 and OGC and NOx test shall comply with CEN/TS 15883, with the following modifications. Partial heat output tests are performed without thermostatic control. Particle emissions from pellet stoves shall be tested at nominal heat output and at partial heat output according to NS 3058 and NS 3059 with class 1 and 2 partial heat outputs. OGC shall be tested at nominal heat output and at two partial heat outputs.*

*Stoves shall also be tested for noise according to ISO 3743.*

### **Test assembly**

*Nominal heat output tests shall be performed with the stove connected to an extraction system according to the instructions in the standard. The rest of the extraction system shall be designed as a dilution tunnel as described in NS 3058-2, Section 4.2.*

*Testing at partial heat output shall be conducted with the stove connected to a chimney as described in NS 3058-1, Section 3.1, and the rest of the extraction system shall act as a dilution tunnel as described in NS 3058-2, Section 4.2.*

*Mechanically fed stoves with built-in smoke extraction or other mechanical installations in the air and/or smoke ducts may be connected to a chimney according to the manufacturer's instructions.*

*Stoves with water tanks must also be connected to a water system that can ensure the flow temperature is maintained at  $80 \pm 5^{\circ}\text{C}$ .*

*Noise emissions shall be measured during combustion at a power output of 3-5 kW. Testing shall comply with ISO 3743.*

### **Fuel**

*Pellets complying with the specifications of EN 14 785 shall be used for testing. The specifications allow a variable grade of pure wood raw material. If testing uses a fuel of a lesser grade but that nonetheless fulfils the standard, this shall be specified. In this case, the customer must be encouraged to purchase fuel of such a grade.*

*In exceptional cases, following approval from Nordic Ecolabelling, fuel grades other than pure wood raw material may be used, such as straw pellets or other biomaterial. This must be stated clearly. In this case, the customer must be encouraged to purchase fuel of such a grade. Peat is not considered to be a biofuel.*

### **Procedure**

Partial heat output testing shall be conducted over 2 x 4 hours (4 hours for each output level). Testing shall be performed at  $\leq 2$  kW and 3-5 kW. Testing shall take place at normal pressure, unless otherwise stated by the manufacturer or if the stove is designed to operate with a smoke extractor or other mechanical installations in the air and/or smoke ducts. In both tests, measurement begins after half an hour once the stove output has stabilised.

### **Measurements**

*The following measurements must be taken during testing at nominal heat output:*

- *CO, CO<sub>2</sub> or O<sub>2</sub> and flue gas temperature measured in accordance with EN 14 785.*
- *Room temperature measured according to EN 14 785.*
- *Total hydrocarbon content (THC) measured according to CEN/TS 15883 to determine OGC and NO<sub>x</sub>.*
- *Particles measured in accordance with NS 3058-2. The ignition phase is not included in the measurements.*
- *Flue gas pressure measured according to EN 14 785.*
- *Efficiency measured according to the specific EN 14 785.*
- *Noise.*

*For partial heat output the following shall be measured:*

- *Flue gas temperature in accordance with NS 3058-1, Section 4.1.2.*
- *Particle emissions in accordance with NS 3058-2. The ignition phase is not included in the measurements.*
- *Total hydrocarbon content (THC) measured according to CEN/TS 15883 to determine OGC.*
- *Flue gas pressure measured in accordance with NS 3058-1, Section 3.8.*

Noise emissions shall be measured during combustion at a power output of 3-5 kW. Testing shall comply with ISO 3743.

### **Calculations**

*OGC calculations shall be made in accordance with CEN/TS 15883 based on the mean values of measured THC at nominal heat output and two partial heat outputs.*

*Particle emissions shall be calculated according to NS 3059, Section 4. The emission level shall be calculated for each individual heat output range and as a weighted mean value of all tests.*

### **Alternative test methods**

*Nordic Ecolabelling may approve products for licensing based on test results from testing methods other than those mentioned above if the test method in question is assessed as equivalent by an independent, competent body.*

## Appendix 2 Declaration of fulfilment of manufacturing regulations

Product name:
Manufacturer:

We hereby declare that applicable laws and regulations in force are observed at facilities at which the Nordic Ecolabelled stove is manufactured. For example, regulations and provisions regarding health and safety, the working environment, environmental legislation (including REACH) and plant-specific conditions and concessions, must be followed.

Details of local regulatory authorities:

.....

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Date Licensee (Company name)

---

Administered by (signature) Phone

---

Name (block capitals) E-mail

# Appendix 3.1 Declaration regarding chemical products

## 3.1 Production of chemicals

Name of chemical product:

### Chemical substances (R4)

We hereby declare that:

The following chemical substances are not actively added to chemical products (such as adhesives, sealants, cleaning agents, paints and lacquers) that are used during the manufacture and surface treatment (including metal coating) of the stove:

- Lead (Pb), mercury (Hg), hexavalent chrome (Cr<sup>VI</sup>), cadmium (Cd) and their compounds
- Halogenated organic compounds
- Alkylphenols, alkylphenoxyethoxylates or other alkylphenol derivatives<sup>1</sup>
- Phthalates

<sup>1</sup> Alkylphenol derivatives are defined as compounds that liberate alkylphenols upon degradation.

The surface treatment of small parts is exempt from this requirement, see R6 in Appendix 3.2.

Substances that are not actively added by a chemical producer or their suppliers and that are not found in concentrations exceeding 100 ppm are exempt from the requirement.

---

Date

Manufacturer/supplier  
(company name)

---

Administered by (signature)

Phone

---

Name (block capitals)

E-mail

## Appendix 3.2 Declaration on material requirements (R2), surface treatments containing organic solvents (R5), and the metal coating of small parts (R6)

### 3.2 Manufacture of the stove

Product name:
Manufacturer:
Weight of material/part:

#### Material requirements (R2)

We hereby declare that:

- The materials and design comply with the requirements of EN 13240 (wood stoves), EN 14785 (pellet stoves), EN 13229 (inset stoves), EN 15250 (slow heat release appliances) or prEN 15821 (sauna stoves).

We declare that:

- Materials (including internal components) have a minimum guaranteed service life of 3 years under normal usage.

#### Surface treatment – organic solvents (R5)

We hereby declare that:

- The application and curing of surface treatments containing organic solvents is enclosed. The emission of organic solvents (VOC) during surface treatment does not exceed 20% of the applied solvent.

Submit a copy of a report regarding the emission of organic solvents (VOC) during surface treatment.

#### Metal coating of small parts (R6)

We hereby declare that:

- Lead, mercury, cadmium, chrome and nickel additives must not be used during the metal coating of small parts (screws, bolts, rivets, plugs, washers, fittings and hinges).

Metal coating of small parts

- Small parts may be coated with chrome, nickel or compounds of these if this is justified due to high chemical or mechanical wear or another specific technical requirement. If small components are chrome or nickel coated, please document the background to this. Any parts surface treated with the abovementioned metals must be reusable/recyclable.

Chrome plating must be based on trivalent chrome.

If performed, chrome and nickel plating must be performed using purification, ion exchange, membrane technique or similar process to maximise the reuse of the chemical

products. The emissions from surface treatment must be recycled and destroyed. The system must be closed and without a drain.

Submit a report that justifies the possible need for metal coating, specifies the cleaning method and confirm that parts coated with chrome or nickel can be recycled. The declaration shall be based on sufficient documentation from suppliers.

Stove manufacturer

Signature

Date	Company name
Administered by	Phone
Name (block capitals)	E-mail

## Appendix 4 Declaration on supplementary solar collector

We hereby certify that the supplementary solar collector intended for use with the Nordic Ecolabelled stove is type approved to EN 12975.

Product name (solar collector):

Product name (stove):

_____	_____
Date	Manufacturer (Solar collector):
_____	_____
Administered by	Phone
_____	_____
Name (block capitals)	E-mail