

BLUE ANGEL

The Environmental Label



Coffee Machines for Household Use

DE-UZ 136

Basic Award Criteria

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The Environmental Label is supported by the following four institutions:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is the owner of the label. It regularly provides information on the decisions taken by the Environmental Label Jury.



The German Environmental Agency with its specialist department for "Ecodesign, Eco-Labeling and Environmentally friendly Procurement" acts as office of the Environmental Label Jury and develops the technical criteria of the Basic Criteria for Award of the Blue Angel.



The Environmental Label Jury is the independent, decision-making body for the Blue Angel and includes representatives from environmental and consumer associations, trade unions, industry, the trade, crafts, local authorities, academia, the media, churches, young people and the German federal states.



The RAL gGmbH is the awarding body for the Environmental Label. It organises the process for developing the relevant award criteria in independent expert hearings – which involve all relevant interest groups.

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This document is a translation of a German original. In case of dispute, the original document should be taken as authoritative.

1 Introduction

1.1 Preface

In cooperation with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, the German Environmental Agency and considering the results of the expert hearings conducted by RAL gGmbH, the Environmental Label Jury has set up these Basic Criteria for the Award of the Environmental Label. RAL gGmbH has been tasked with awarding the Environmental Label.

Upon application to RAL gGmbH and on the basis of a Contract on the Use of the Environmental Label to be concluded with RAL gGmbH, the permission to use the Environmental Label may be granted to all products, provided that they comply with the requirements as specified hereinafter.

The product must comply with all the legal requirements in the country in which it is to be marketed. The applicant shall declare that the product meets this requirement.

1.2 Background

The Basic Award Criteria for Coffee Machines for Household Use focuses on the following types of coffee machines: automatic portioned coffee machines (fully automatic, portafilter and pod coffee machines) and filter coffee machines.

Automatic capsule coffee machines, which also come under the category of portioned coffee machines, are excluded from these Basic Award Criteria. In comparison to the impact on the environment resulting from the use of a fully automatic, pod or filter coffee machine, automatic capsule coffee machines cause significantly higher greenhouse gas emissions. Over a third of these emissions are caused by the coffee capsules.¹

Only a small proportion of the power consumption of coffee machines is accounted for by the actual coffee making process. The largest proportion is consumed while keeping the coffee warm and in standby mode. For example, in the case of the average use of a filter coffee machine with a glass pot and a warming plate in a private household, up to 50 percent of the power consumption is caused by keeping the coffee warm². Espresso machines can also consume up to 50 percent of their electricity by keeping the water hot to ensure they are immediately ready to make coffee at the push of a button.

Coffee machines that have been awarded the environmental label possess an automatic switch-off function and exhibit a low power consumption in standby mode. This enables their power consumption to be reduced by 30 to 50 percent depending on the type of machine³.

¹ Results of a comparison of the environmental impact of different types of coffee making systems by the Öko-Instituts e.V.

² Depending on the length of time the coffee is kept warm (30 to 60 minutes); measurements by the Öko-Instituts e.V. and Initiative HAUSGERÄTE+: "Coffee in the Thermos Flask" (Kaffee in die Thermoskanne); <http://www.hausgeraete-plus.de/kochen-backen-braten/energieeffizient-kochen.php>

³ European Commission (DG ENER): Preparatory Studies for Ecodesign Requirements of EuPs (III), Lot 25, Non-Tertiary Coffee Machines. Task 4: Technical analysis of existing products – Final version, July 2011

1.3 Objective of the environmental label

Climate protection, the minimisation of standby losses, a reduction in power consumption and the avoidance of pollutants and waste are key objectives of environmental protection.

The Blue Angel ecolabel for coffee machines for household use may be awarded to products featuring the following environmental properties:

- Low power consumption
- Durability and recycling-friendly design
- Use of environmentally-friendly materials
- Reduction of waste

Therefore the information field states the following advantages for environment and health:



1.4 Compliance with legal regulations

The observance of relevant existing laws and legal requirements is a prerequisite for those products awarded with the environmental label. In particular, the following legal requirements are observed:

- Ordinance to limit the use of hazardous substances in electrical and electronic equipment (Material Ordinance for Electrical and Electronic Equipment - ElektroStoffV)⁴ to implement the EU directives⁵ into German law is observed.
- The substance requirements defined by the EU Chemicals Regulation REACH (1907/2006/EC)⁶ and Regulation EC No. 1272/2008⁷ (or Directive 67/548/EEC) are observed.
- Observance of the requirements of the European Union for the safety of equipment (EU Directive - "CE" compliance marking).

⁴ Law for the sale, return and environmental disposal of electrical and electronic equipment, BGBl, 2005, Part I, no. 17 (23 May 2005)

⁵ Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment and its revisions: Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment; Directive 2002/95/EG on the restriction of the use of certain hazardous substances in electrical and electronic equipment, OJ: L 37, 13 February 2003 or its revisions: Directive 2011/65/EC of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

⁶ Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

⁷ Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No. 1907/2006

- The Standby Directive⁸ (801/2013) amending Regulation (EC) No. 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment.
- The observance of the requirements for materials in contact with foodstuffs in accordance with the regulations in the LFGB⁹.

1.5 Definitions

Definitions of the different types of coffee machines that come under the scope of these Basic Award Criteria:

- **Fully automatic coffee machines:** prepare portions of coffee or espresso (sometimes also automatically prepare cappuccino or latte macchiato) under high pressure (> 8 bar). They function fully automatically at the push of a button and possess a complete coffee making system consisting of a grinder, tamping container, membranes and pumps. These machines remove, grind, press and brew a portion of coffee beans from a container.
- **Portafilter coffee machines (semi-automatic):** prepare portions of coffee or espresso by feeding hot water through the finely ground coffee at high pressure (approx. 15 bar) The pressure is generated either manually (hand lever machines) or via an electric pump. Only a few portafilter coffee machines possess their own integrated grinder. The finely ground coffee needs to be added by hand in a removable portafilter, which is fixed into the machine using a bayonet coupling. In some portafilter coffee machines, it is possible to also insert pods into the filter instead of finely ground coffee.
- **Portioned coffee machines:** prepare coffee or espresso after a pre-manufactured portioned filter bag (pod) or a plastic or aluminium capsule containing finely ground coffee is inserted into the machine, through which the water is then automatically pressed at the push of a button. A distinction is made between machines made for pods, so-called "pod coffee machines"¹⁰ and those made for capsules, so-called "capsule coffee machines"¹¹.
- **Filter coffee machines:** hot water is dripped onto a filter paper containing ground coffee and then filtered. The preparation of the coffee is carried out semi-automatically like with portafilter coffee machines.

Definitions of the operating modes in accordance with Directive (EC) no. 1275/2008:

- **"Off mode"** describes a state in which the equipment is connected to the mains power source and is not providing any function. The following conditions are also considered to be off mode:
 - ♦ Conditions providing only an indication of off-mode condition;
 - ♦ Conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council.

⁸ COMMISSION REGULATION (EU) No. 801/2013 of 22 August 2013 amending Regulation (EC) No. 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No. 642/2009 with regard to ecodesign requirements for televisions

⁹ German Food and Feed Code (Lebensmittel - Bedarfsgegenstände-und Futtermittelgesetzbuch (LFGB))

¹⁰ These are machines in which water that has been heated up to over 90° C is pressed at a pressure of around 1 bar through a pod (round filter bag filled with ground coffee). The quality of the coffee produced by these machines tends to be similar to filter coffee.

¹¹ These machines are excluded from the scope of these Basic Award Criteria (see below).

- **"Standby"**¹² describes a state in which the equipment is connected to the mains power source, depends on energy input from the mains power source to work as intended and provides only the following functions, which may persist for an indefinite time:
 - ♦ Reactivation function, or reactivation function and only an indication of enabled reactivation function
and/or
 - ♦ Information or status display
- **"Information or status display"** describes a continuous function providing information or indicating the status of the equipment on a display, including clocks.
- **"Reactivation function"** describes a function facilitating the activation of other modes, including active mode, by remote switch, including remote control, internal sensor, timer to a condition providing additional functions, including the main function.

Other definitions:

- **"Automatic switch-off function (auto-off)"**: Function that automatically switches the warming mode (see footnote no. 12) of the machine into standby or off mode after a certain length of time.

2 Scope

These Basic Award Criteria apply to coffee machines for use in private households (see 1.5):

- Fully automatic coffee machines
- Portafilter coffee machines (semi-automatic)
- Pod coffee machines
- Filter coffee machines

The following are excluded from the scope of these Basic Award Criteria: electric mocha pots that function according to the principle of a kettle¹³, automatic capsule coffee machines (see definition under 1.5) and professional machines for use in the commercial sector (see definition according to DIN EN 60335-1¹⁴). Machines with warming plates for cups in which the cups are kept warm with an additional electrical heating system are also excluded.

¹² In the product group "coffee machines", there is an additional function that is not defined in the Directive (EC) no. 1275/2008: **"Warming mode"**: This describes a state in which the equipment is ready to prepare a coffee without any further delay at the push of a button. This state is also often called "ready-to-use" mode. The power consumption is not constant, meaning that it is high during the heating interval, e.g. 1000 W, and then lower again afterwards. There are machines with two ready-to-use values because the warming plate for the coffee cups can sometimes be switched on or off in the programme menu. In the case of machines without a ready-to-use mode (e.g. with a percolator), the power consumption corresponds to that in standby mode.

¹³ This deals with traditional mocha pots (often also known as "espresso pots") made out of aluminium or stainless steel. A mocha pot consists of a lower section that is filled with fresh water and an upper section in which the fresh coffee is located after the brewing process. This unit is placed onto a base, similar to a kettle, via which electricity is drawn to heat the water (thanks to the resulting pressure the boiling water rises up from the lower section through a pipe into the middle section containing the ground coffee and is then forced into the upper section of the pot.

¹⁴ (DIN EN 60335-1 Household and similar electrical appliances - Safety - Part 1: General requirements: 2012-10).

3 Requirements

3.1 Power consumption

The following criteria must be observed in order to guarantee low power consumption:

The following is valid for fully automatic, portafilter and pod coffee machines:

- The machine shall possess an auto-off function ("automatic switch-off", "energy-saving mode" or similar) that automatically switches it after a set period of time from ready-to-use warming mode into standby mode or off mode.
- The factory setting for the delay time until the automatic switch-off function is triggered shall be for:
 - ♦ Fully automatic and portafilter coffee machines: max. 30 mins
 - ♦ Pod coffee machines: max. 15 mins
- The programmable delay time that can be set by the user until the automatic switch-off function is triggered shall be for:
 - ♦ Fully automatic and portafilter coffee machines: max. 120 mins
 - ♦ Pod coffee machines: max. 30 mins
- It must not be possible for the user or any other function to deactivate the switch-off function.
- The power consumption in standby (or sleep) mode after the automatic switch-off function has been triggered shall not exceed 0.3 W.
- The machine shall have a mains power switch that is accessible for the consumer; the power consumption in off mode shall not exceed 0.0 W.
- The absolute energy requirement for a 100 minute coffee period shall be ≤ 50 Wh in accordance with the EN 60661 standard.

The power consumption in standby mode, the adjustable delay times for the automatic switch-off function and the absolute energy requirement for a 100 minute coffee period in accordance with EN 60661 shall be noted in the product documentation.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit a test report that verifies compliance with the above-mentioned times and power consumption values. The absolute energy requirement for a 100 minute coffee period is to be determined in accordance with the latest draft version or valid version of the EN 60661 standard at the time of the application. The test must be carried out by a testing laboratory accredited according to DIN EN ISO/IEC 17025 (Annex 2). Test reports completed by the applicant are recognised as being of an equivalent standard when the testing laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory). The applicant shall also submit the corresponding pages of the product documentation (Annex 3).

The following is valid for filter coffee machines:

- The machine shall exhibit a maximum power consumption of 0.3 W after a successful brewing process (as soon as no more water is located in the supply container) and a subsequent delay time lasting a maximum of 1 minute.

- The machine shall possess a mains power switch that is accessible to the consumer. The power consumption in off mode shall be 0.0 W.
- The power consumption in standby mode shall not exceed 0.3 W.
- In the case of machines with a timer function: The power consumption shall not exceed 0.5 W while the timer function is active (time preset)¹⁵.

The power consumption in the different operating modes shall be noted in the product documentation.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit a test report that verifies compliance with the above-mentioned power consumption values. The test must be carried out by a testing laboratory accredited according to DIN EN ISO/IEC 17025 (Annex 2). Test reports completed by the applicant are recognised as being of an equivalent standard when the testing laboratory used for the measurements is accredited by an independent body as an SMT laboratory (supervised manufacturer testing laboratory). The applicant shall also submit the corresponding pages of the product documentation (Annex 3).

3.2 Plastics used in the housing, housing parts, water container and collection container

The plastics may not contain as constituent parts any substances classified as:

- a) carcinogenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008¹⁶
- b) mutagenic in categories 1 or 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008
- c) reprotoxic in categories 1 and 2 according to Table 3.2 of Annex VI to EC Regulation 1272/2008
- d) particularly alarming for other reasons according to the criteria of Annex XIII to the REACH Regulation, insofar as they are included in the List (so-called "list of candidates"¹⁷) set up in accordance with REACH, Article 59, Paragraph 1.

¹⁵ This falls under the "reactivation function" in accordance with Directive (EC) no. 1275/2008.

¹⁶ Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, as well as amending Regulation (EC) No 1907/2006, Annex VI on harmonized classification and labelling of hazardous substances, Part 3: Harmonized classification and labelling, Tables, Table 3.2, – List of harmonized classification and labelling of dangerous substances from Annex I to Directive 67/548/EEC. In short: GHS Regulation http://www.reach-info.de/ghs_verordnung.htm, each as amended..

The GHS Regulation (Global Harmonization System) that came into force on 20 January 2009, replaces the old Directives 67/548/EEC and 1999/45/EC. According to the said regulation, substances are classified, labelled and packed until 1 December 2010 according to Directive 67/548/EEC (Dangerous Substances Directive) while mixtures are classified, labelled and packed until 1 June 2015 according to Directive 1999/45/EC (Dangerous Preparations Directive). Notwithstanding this, the classification, labelling and packaging of substances and preparations may be performed according to the provisions of the GHS Regulation already before 1 December 2010 or 1 June 2015, respectively. In such cases, the provisions of the Dangerous Substances Directive or Dangerous Preparations Directive shall not be applicable.

¹⁷ Link to the list of candidates of Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH): <http://echa.europa.eu/web/quest/candidate-list-table>

Halogenated polymers shall not be permitted. Neither may halogenated organic compounds be added as flame retardants. In addition, the use of flame-retardant materials that are rated as acutely toxic to aquatic organisms with long-term effects according to Tables 3.1 or 3.2 of Annex VI of EC regulation 1272/2008 and classified with the hazard statement code H410 or with the risk phrase R50/53 is prohibited.

The following shall be exempt from this rule:

- fluoroorganic additives (e.g. anti-dripping agents) used to improve the physical properties of plastics, provided that they do not exceed a proportion of 0.5 percent by mass.
- plastic parts with a mass of less than 25 grams

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit a written declaration from the plastics manufacturer or guarantee the provision of these documents to RAL gGmbH. The declaration in Annex P-M confirms that the excluded substances have not been added to the plastics and provides a chemical description of the flame-retardant materials used including the CAS number and its rating. The applicant shall state which plastics are used in the housing for parts with a mass ≥ 25 grams and provide a list of the plastics used in the housing according to Annex P-L25.

3.3 Metal parts in contact with water and milk

In the preparation of coffee and milk (foam), no nickel or lead may be released that results in a concentration of more than 10 micrograms of lead per litre of water and 50 micrograms of nickel per litre of test water. This is also valid for the preparation of coffee and milk immediately after decalcification or cleaning with recommended decalcifying and cleaning agents in accordance with the operating instructions.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1 and submit a test report that verifies compliance with the above-mentioned values for the released materials. The test must be carried out by a testing laboratory accredited according to DIN EN ISO/IEC 17025. The preparation and removal of the sample (test water) shall be carried out in accordance with the regulations in DIN 10531.¹⁸ In order to test compliance with the values for the released materials, one sample shall be tested after commissioning the machine. Another sample is to be taken and tested after decalcification or cleaning in accordance with the manufacturer's instructions.

The water used for the tests must also be examined and any concentrations of nickel and lead that may already exist in the test water shall be taken into account

3.4 Durability

The following is valid for fully automatic and portafilter coffee machines:

¹⁸ DIN 10531 standard: Food hygiene - Production and dispense of hot beverages from hot beverage appliances - Hygiene requirements, migration test

- The applicant undertakes to make sure that the provision of spare parts for the repair of the machines is guaranteed during ongoing production and for at least 10 years following the termination of production.

The following is valid for all other coffee machines:

- The applicant undertakes to make sure that the provision of spare parts for the repair of the machines is guaranteed during ongoing production and for at least 5 years following the termination of production.

Spare parts are those parts which, typically, may break down within the scope of the ordinary use of a product. Whereas those parts which normally exceed the life of the product are not to be considered as spare parts.

The product documentation must contain information on the stated requirements.

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and submit the corresponding pages of the product documentation (Annex 3).

3.5 Fitness for use

The following is valid for all coffee machines:

- The machine shall possess a calcification indicator. The manufacturer shall describe the decalcification process in the consumer information.

In the case of insulated jugs that are used with the machine, the following is valid:

- The insulation effect of the jug has to be measured according to Appendix A: Measurement guidelines and has to be submitted to RAL gGmbH. The temperature difference within 60 minutes must be less than 8 K.

Compliance verification

The applicant shall declare the existence of a calcification indicator in Annex 1 to the Contract and submit the corresponding pages of the product documentation (Annex 3).

If the coffee machine is operated together with an insulated jug, the applicant shall declare compliance with the requirements for the insulated jug and state the calculated temperature difference in Kelvin (ΔT_A) in Annex 1 to the Contract. In order to determine the temperature difference, the measurement guidelines in Appendix A shall be used. The test report must be submitted to verify compliance (Annex 5).

3.6 Recyclable design

The equipment shall be designed and constructed in such a way that it is possible to easily and quickly dismantle it for the purposes of separating recyclable components and materials. This means:

- having suitable connections that can be removed using standard tools and these connecting joints shall be easily accessible
- plastics should consist of only one polymer or plastic parts whose mass is greater than 25 grams shall be labelled in accordance with the ISO 11469 standard to enable the separation of different plastic materials

- instructions for dismantling the appliance shall be available for those handling old appliances – with the aim of recycling as many resources as possible

Compliance verification

The applicant shall declare compliance with the requirements in Annex 1 and provide the relevant dismantling instructions for those handling old appliances (Annex 6).

3.7 Consumer information

The documentation included with the machines shall include both the technical specifications and also environmentally-relevant consumer information.

The following information must be included in the documentation:

- a) In the case of fully automatic, portafilter and pod coffee machines, the power consumption in the different operating modes and the absolute energy requirement for a 100 minute coffee period shall be stated in accordance with the EN 60661 standard.
- b) Description of the cleaning and decalcification processes.
- c) Description of the energy-saving functions e.g. functionality and setting of the automatic switch-off function.
- d) Information on the environmentally-friendly disposal of coffee packagings (e.g. coffee grounds + filter as biowaste, outer packaging using the dual system).
- e) Information on the specialist disposal of the machines.

Furthermore, the above-mentioned information shall be published on a freely accessible website that must be linked via the manufacturer's website. The address of this website must be stated in the consumer information.

Compliance verification

The applicant shall declare compliance with the requirement in Annex 1, state the link to the website where the information is available and submit the corresponding pages of the product documentation as Annex 3.

4 Applicants and Parties Involved

Manufacturers or distributors of final products according to Paragraph 2 shall be eligible for application.

Parties involved in the award process are:

- RAL gGmbH to award the Blue Angel Environmental Label,
- the federal state being home to the applicant's production site,
- Umweltbundesamt (German Environmental Agency) which after the signing of the contract receives all data and documents submitted in applications for the Blue Angel in order to be able to further develop the Basic Award Criteria.

5 Use of the Environmental Label

The use of the Environmental Label by the applicant is governed by a contract on the use of the Environmental Label concluded with RAL gGmbH.

Within the scope of such contract, the applicant undertakes to comply with the requirements under Paragraph 3 while using the Environmental Label.

Contracts on the Use of the Environmental Label are concluded to fix the terms for the certification of products under Paragraph 2. Such contracts shall run until December 31, 2022. They shall be extended by periods of one year each, unless terminated in writing by March 31, 2022 or March 31 of the respective year of extension.

After the expiry of the contract, the Environmental Label may neither be used for labelling nor for advertising purposes. This regulation shall not affect products being still in the market.

The applicant (manufacturer) shall be entitled to apply to RAL gGmbH for an extension of the right to use the ecolabel on the product entitled to the label if it is to be marketed under another brand/trade name and/or other marketing organisations.

The Contract on the Use of the Environmental Label shall specify:

- Applicant (manufacturer/distributor)
- Brand/trade name, product description
- Distributor (label user), i.e. the above-mentioned marketing organisations.

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Appendix A Measurement guidelines for determining the fitness for use of an insulated jug

Measurement conditions

The temperature of the machine shall correspond to the ambient temperature and be $23\text{ °C} \pm 3\text{ °C}$.

The series of tests shall be carried out a minimum of three times and the average values taken.

Completing the measurements

- a) Filling of the insulated jug with hot water ($\geq 95\text{ °C}$) for preheating.
- b) Emptying of the jug after 5 ± 1 minutes and immediate refilling with $80 \pm 1\text{ °C}$ hot water up to 50 % of the filling level.
- c) The time measurement will start immediately after the filling has been completed.
- d) The start temperature of the water in $^{\circ}\text{C}$ (T_1) shall be measured in the centre, half way up the filling scale.
- e) The insulated jug shall then be closed in accordance with the operating instructions.
- f) After the water has been held in the insulated jug for 60 minutes, the jug is then opened.
- g) The end temperature (T_2) of the water after it has been held in the insulated jug for 60 minutes is then immediately measured in $^{\circ}\text{C}$ half way up the filling scale.

The measurements to be taken

- Start temperature in $^{\circ}\text{C}$ (T_1)
- End temperature of the coffee after it has been held in the insulated jug for 60 minutes in $^{\circ}\text{C}$ (T_2)

Temperature difference

The following formula is used to determine the difference in temperature in K:

$$\Delta T_A = T_1 - T_2$$

Key for the calculation formula:

ΔT_A Difference in temperature in K

T_1 Start temperature in $^{\circ}\text{C}$

T_2 End temperature of the coffee after it has been held in the insulated jug for 60 minutes in $^{\circ}\text{C}$