**Strojírenský zkušební ústav, s.p.**
**Hudcova 424/56b, Medlánky, 621 00 Brno, Česká republika**
Testing Laboratory 1045.1 accredited by the CAI pursuant to ČSN EN ISO/IEC 17025:2018



L 1045.1

# INITIAL TYPE TEST REPORT
# 30-17685/T

| | |
|---|---|
| **Product:** | Cooker for wood |
| **Type designation:** | ROCCO |
| **Customer:** | TIM SISTEM d.o.o.<br>ul. Prva industrijska br. 9<br>22330 Nova Pazova<br>SERBIA |
| **Manufacturer:** | TIM SISTEM d.o.o.<br>ul. Prva industrijska br. 9<br>22330 Nova Pazova<br>SERBIA |
| **Report issue date:** | 2025-03-27 |
| **Distribution list:** | 1 copy to the Customer<br>1 copy to the Engineering Test Institute |

## I. Description of product tested

Tested product - type designation **ROCCO** is designed for combustion of solid fuel (wood) in periodic batches and is intended for cooking in households and heating of the space where it is installed. The appliance may be connected to a chimney from the top. The appliance is equipped with a grate. Combustion air is regulated by means of a star-shaped air inlet in the front door of the ash-pan. By turning the handle of the air inlet, air inlet can be continuously regulated, thereby affecting the rate of fuel combustion (performance of the appliance). The plate above the combustion chamber is designed for cooking. This appliance is intended for intermittent operation.

A detailed description is given in the operating and installation instructions.

**Basic technical specifications of product:**

| Type | Main dimensions (mm) | | | Nominal heat output (kW) | Fuel consumption (kg/h) Wood | Diameter of flue gas connector (mm) | Operating draught (Pa) |
|---|---|---|---|---|---|---|---|
| | Height | Width | Depth | | | | |
| ROCCO | 893.5 | 900 | 701 | 9.9 | 2.7 | 119 | 12 |

## II. Sample tested

| SZU reg. no. | Product name | Date of submission |
|---|---|---|
| Prototype 1 | ROCCO | 2023-05-24 |

The visual inspection, tests and verification were carried out by Ing. Radek Machara at the test station of Engineering Test Institute in Brno in 05/2023.

The tests were performed using measuring and testing equipment with valid calibration.

The product has been selected in accordance with ČSN EN 16510-1 ed. 2:2024, supporting the choice of appliance tested enabling it to represent the family of appliances covered by the type test report with reference to the characteristics detailed in Table G.1

## III. Measuring and test equipment:

| No. | Name | Inventory number: |
|---|---|---|
| 1. | Barometer | 022435/P2 |
| 2. | Thermometer – ambient | 022435/T2 |
| 3. | Hygrometer | 022435/T2 |
| 4. | Draught gauge | 118510 |
| 5. | Scale | 022333 |
| 6. | THERM 2285.2 | 021763 |
| 7. | Analytical scale Sartorius | 021458 |
| 8. | Calliper | ME 543 |
| 9. | Combustion product analyser | 022317 |
| 10. | Elemental analyser | 022305 |
| 11. | Gravimat | 022380 |

*Note:* X ... Verified with the use of calibration standards prior to measurement
+ ... ± 5 % of measured values

Measurement uncertainty:

| Parameter measured | Uncertainty of measurement |
|---|---|
| Gas analysis | |
| CO | ≤ 6 % of the limit values in Table 8 |
| CO2 | ≤ 2 % |
| O2 | ≤ 2 % |
| Temperature | |
| Flue gas | ≤ 5 K |
| Ambient room | ≤ 1.5 K |
| Water | ≤ 0.5 K |
| Surface | ≤ 2 K |
| Touchable Area | ≤ 2 K |
| Water flow | ≤ 0.005 $m^3/h$ |
| Static pressure | ≤ 2 Pa |
| Mass | |
| - fuel consumption | ± 20 g |
| - residue | ± 5 g |
| - fuel load ≤ 7.5 kg | ± 5 g |
| > 7.5 kg | ± 10 g |

*Note:* The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient k=2, corresponding to the coverage certainty of 95% as regards standard classification.
If a statement of conformity is provided, the decision rule pursuant to ILAC-G8:09/2019, Art. 4.2.1 - binary statement for the simple acceptance rule shall apply.

## IV. Methods, results of tests and verifications

| No. | Test objective | Requirement | Method of test | Test evaluation/ verification * |
|---|---|---|---|---|
| 1. | Mechanical resistance and stability | - | - | 0 |
| 2. | Safety in case of fire | ČSN EN 16510-2-3:2025, Art. 4.1<br>ČSN EN 16510-1 ed.2:2024, Art. 5.6, 6.2.2 | ČSN EN 16510-1 ed.2:2024, Art. A.2.2, A.4.10 | + |
| 3. | Hygiene, health and the environment | ČSN EN 16510-2-3:2025, Art. 4.2, 4.3, 4.4, 4.5 | ČSN EN 16510-1 ed.2:2024, Art. A.4, A.4.1, A.4.2, A.4.3, A.4.4, A.4.6, A.4.7, A.4.8 | + |
| 4. | Safety and accessibility in use | ČSN EN 16510-2-3:2025, Art. 4.6.2, 4.6.4, 4.6.6, 4.6 .8<br>ČSN EN 16510-1 ed.2:2024, Art. 5.5, 6.2.1 | ČSN EN 16510-1 ed.2:2024, Art. A.4.7, A.4.10.4 | + |
| 5. | Energy economy and heat retention | ČSN EN 16510-2-3:2025, Art. 4.7.1, 4.7.3, 4.7.7, 4.7.8 | ČSN EN 16510-1 ed.2:2024, Art. A.4.7, A.6.2.1 | + |

***) Evaluation / statement of conformity:**

+ ..... Requirement fulfilled
- ..... Requirement not fulfilled
0 ..... Not applicable
x ..... Not evaluated

| | |
|---|---|
| **Test objective:** | **Hygiene, health and the environment**<br>**Safety and accessibility in use**<br>**Energy economy and heat retention** |
| **Exact name of the test procedure:** | 1.4*, 1.5* - Tests of tightness, pressure resistance, thermal technical parameters, combustion efficiency, safety functions |
| **Test method:** | ČSN EN 16510-1 ed. 2:2024, Art. A.4, A.4.1, A.4.2, A.4.3, A.4.4, A.4.6, A.4.7, A.4.10.4, A.6.2.1 |
| **Sample tested:** | **ROCCO** |
| **Measuring equipment used:** | see Chapter III |
| **Date of test:** | 2023-05-24 |
| **Ambient conditions:** | 27 °C (Temperature) / 36.4 % (Relative humidity) / 98.8 kPa (Barometric pressure) |

| **Variables measured and calculated: Nominal heat output** | **Unit** | **Tests n.** | | | | **Limit according to:** |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **Average** | **ČSN EN 16510-2-3:2025** |
| Fuel used: beech wood | mm | 250 | | | | |
| Combustion air setting – primary/secondary | % | 10/80 | | | | |
| Fuel consumption | kg/hour | 2.8 | 2.7 | 2.6 | 2.7 | |
| Achieved input | kW | 12.1 | 11.8 | 11.3 | 11.7 | |
| Ambient temperature in the room and combustion air temperature | °C | 27 | 27 | 28 | 27 | |
| Chimney draught | Pa | 12 | 12 | 12 | 12 | |
| Combustion product average temperature | °C | 166 | 165 | 171 | 167 | |
| Flue gas outlet temperature | °C | 200 | | | | |
| $CO_2$ | % | 7.83 | 8.68 | 9.39 | 8.63 | |
| CO – measured | % | 0.0829 | 0.114 | 0.1357 | 0.1100 | |
| CO – at $O_2$ = 13% | % | 0.0841 | 0.1010 | 0.1134 | 0.0995 | |
| CO – at $O_2$ = 13% | mg/Nm³ | 1051 | 1263 | 1418 | 1244 | ≤ 1500 |
| CO – at $O_2$ = 0% | mg/MJ | 679 | 824 | 928 | 810 | |
| $NO_x$ – measured | ppm | 53 | 54 | 51 | 53 | |
| $NO_x$ – at $O_2$ =13 % | mg/Nm³ | 111 | 100 | 88 | 100 | ≤ 200 |
| $NO_x$ – at $O_2$ = 0% | mg/MJ | 72 | 65 | 58 | 65 | |
| OGC– measured | ppm | 31 | 44 | 68 | 47 | |
| OGC– at $O_2$ = 13 % | mg/Nm³ | 55 | 71 | 101 | 76 | ≤ 120 |
| OGC– at $O_2$ = 0% | mg/MJ | 36 | 46 | 66 | 49 | |
| Chimney loss | % | 15.7 | 14.2 | 13.7 | 14.5 | |
| Loss of gas underburning | % | 0.7 | 0.8 | 0.9 | 0.8 | |
| Loss of solid underburning | % | 0.5 | 0.5 | 0.5 | 0.5 | |
| Efficiency | % | 83.1 | 84.5 | 84.9 | 84.2 | |
| Total heat capacity achieved | kW | 10.0 | 10.0 | 9.6 | 9.9 | |
| Water heat output | kW | - | - | - | - | |
| Uncertainty of total heat output | kW | 0.3 | 0.3 | 0.3 | 0.3 | |
| Nominal capacity | kW | 9.9 | | | | |
| Mass flow rate of dry combustion products | g/s | 10.4 | 9.2 | 8.1 | 9.2 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| $CO_2$ | % | 8.38 | 9.46 | 10.36 | 9.40 | |
| Dust– measured | mg/Nm³ | 25 | 30 | 35 | 30 | |
| Dust– at $O_2$ = 13 % | mg/Nm³ | 24 | 25 | 27 | 25 | ≤ 40 |
| Dust– at $O_2$ = 0% | mg/MJ | 16 | 17 | 18 | 17 | |

| **Energy efficiency** | | | **Limit according to: ČSN EN 16510-2-3:2025** |
|---|---|---|---|
| At nominal heat output ($el_{max}$) | kW | - | |
| At minimum heat output (elmin) | kW | - | |
| In standby mode ($el_{sb}$) | kW | - | |
| Permanent pilot flame power requirement ($P_{pilot}$) | kW | - | |
| correction factor F2 | % | 0 | |
| correction factor F3 | % | 0 | |
| correction factor F4 | % | 0 | |
| correction factor F5 | % | 0 | |
| Seasonal space heating energy efficiency ηs | % | 74.2 | ≥ 65 |
| Energy Efficiency Index (EEI) | - | 112 | |
| Energy Efficiency Class | - | A+ | |

### *Fuel analysis*

| **Type of fuel** | **Wood** | | | |
|---|---|---|---|---|
| **Analytical indicator** | **Symbol** | **Unit** | **Value** | **Uncertain** |
| Caloric value | $H_u$ | [MJ.kg$^{-1}$] | 17.18 | 0.14 |
| All water in original condition | W | [% by weight] | 11.7 | 0.10 |
| Ash | A | [% by weight] | 0.54 | 0.02 |
| Carbon | C | [% by weight] | 43.85 | 0.04 |
| Hydrogen | H | [% by weight] | 5.4 | 0.25 |

*Note:* Sample in the original condition

### *Temperature rise of the operating components*

| **Measured point** | **Material** | **Temperature rise (K)** | |
|---|---|---|---|
| | | Measured | Limit |
| Door handle | plastic | 54 | 60 |
| Ash door | | 23 | |
| Oven handle | | 39 | |
| Primary air handle | metal | 110.0 | 35 |
| Secondary air handle | | 112.0 | |
| Box under oven handle | | 48.0 | |
| Regulator heating of oven | | 118.0 | |
| Top of box under oven | | 203.0 | |

*Note*: *) A suitable glove is regarded as a tool.

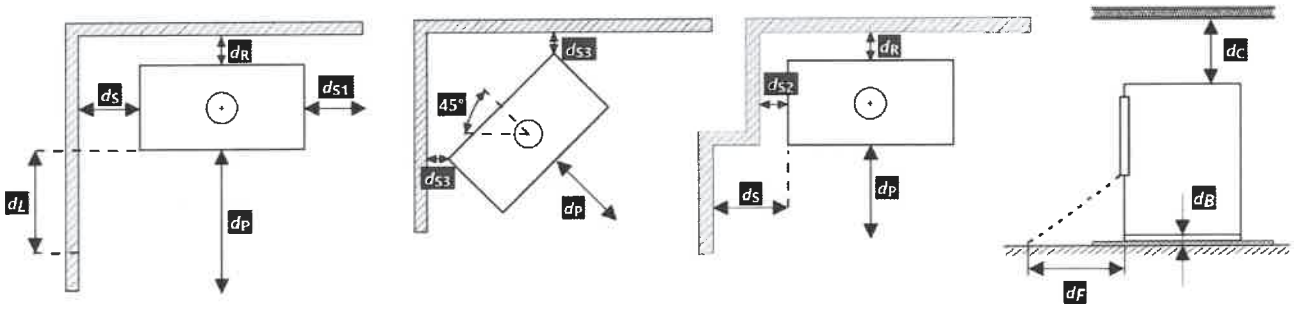
| | |
|---|---|
| **Test objective:** | **Safety in case of fire** |
| **Exact name of the test procedure:** | 1.4*, 1.5* - Tests of tightness, pressure resistance, thermal technical parameters, combustion efficiency, safety functions |
| **Test method:** | ČSN EN 16510-1 ed. 2:2024, Art. A.2.2, A.4.10 |
| **Sample tested:** | **ROCCO** |
| **Measuring equipment used:** | see Chapter III |
| **Date of test:** | 2023-06-06 |

| | | | |
|---|---|---|---|
| **Ambient conditions:** | 28 °C | 47 % | 98.9 kPa |
| | Temperature | Relative humidity | Barometric pressure |

| | |
|---|---|
| Flue draught (Pa) | 15 Pa |
| Timber wood size | 5 × 5 cm |
| Timber wood moisture | 12.4 % |
| Quantity of fuel (150% of the mass of the fuel for the nominal heat output test) | 4.1 kg |
| Maximum reached flue gas temperature | 267 °C |

| **Protection of combustible materials** | **Minimum distances to combustible materials, in mm** | | **Maximum temperature rise, in K** |
|---|---|---|---|
| | bottom ($d_B$) | 0 | - |
| | floor in front ($d_F$) *) | 1500 | - |
| | ceiling ($d_C$) | >750 | - |
| | rear ($d_R$) | 350 | 61 |
| | side ($d_S$) | 350 | 49 |
| | side radiation area ($d_L$) *) | 1500 | - |
| | adjacent combustible materials (e.g. furniture) ($d_P$) | 600 | 44 |
| | material type and thickness of protective insulation material (s), (if any) | - | - |

*Note*: The tables show the highest values measured.
Limit is 65 K above room temperature at the hottest point of any adjacent walls.
After the overload tests, there was no permanent deformation or damage to the appliance.
*) in case limit 65 K is not superseded due to radiation on the floor in front and/or on the side walls, $d_F$ and/or $d_L$ can be declared 0 mm




Tested by: Josef Duchan Date: 2023-09-07 Signed:

Reviewed and approved by: Ing. Radek Machara Date: 2025-03-26 Signed:

## V. A list of referenced documents

- Order of 2025-02-28 (Order reg. no. B-84465, received on 2025-03-03)
- Contract B-84465/30
- Test report 30-16723/T of 2023-09-06
- Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC
- ČSN EN 16510-1 ed. 2:2024 - Residential solid fuel burning appliances - Part 1: General requirements and test methods
- ČSN EN 16510-2-3:2025 - Residential solid fuel burning appliances - Part 2-3: Cookers
- Technical documentation (drawings, manual)

Test Report compiled by: Eliška Puki

Test Report approved by: Milan Holomek
Combustion Equipment Manager

– End of Test Report –