TESTING LABORATORY

"ITEM - Consult" Ltd. Sofia 1220, 8 Istoria Slavianobulgarska Blvd

№ CPR 21 - NB 1837

TEST REPORT

From testing of the type of product
№ CPR 128/19.04.2018

1. Object of testing:

Residential space heating appliance fired by wood logs
Manufacturer: "IFYIL TERMO Iklimlendirme San. Ve Tic. Ltd. Sti"
Year of manufacture: 2018
Type: Residential space heating appliance fired by wood logs with hot water production and cooker ZIGANA/ Star;
Purpose: Heating of closed spaces and cooking.

2. Applicant:

Фирма/ *Company*: "IFYIL TERMO Iklimlendirme San. Ve Tic. Ltd. Sti"
Адрес/ Address: Kavak OSB 3, Cad. №11, Kavak/Samsun, TURKEY
e-mail: info@ ifyil.com.tr
tel.: +90 362 266 9443

3. Test method:

Testing of biofuel cooking stove, working with wood logs according to EN 12815:2006

3.1. Characteristics for testing and checking

1. Specification of the materials used in the appliance construction
2. Nominal heating output (efficiency)
3. Control of the air for combustion
4. Availability of ashtray
5. Cleaning of heating surfaces
6. Installation instructions
7. Operating instructions
8. Marking

3.2 Documents submitted

1. Construction documentation
2. Materials used
3. Certificates, licenses
4. Operation instruction
5. Safety instruction
6. Marking of the appliance

4. Periods:

Date of receipt: CPR-116/13.04.2018
Date of testing: 13.04.2018 – 19.04.2018

5. Tested sample: 1 pc. Residential space heating appliance fired by wood logs with hot water production and cooker ZIGANA/ Star;

6. Place of testing: ITEM Consult Ltd – Testing laboratory
Sofia 1220, Blvd. Istoria Slavianobulgarska № 8

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7. Description:

Stove with water jacket /cooker hydro stove/ burning woods, designed for heating and cooking. The stove has combustion chamber and circulating pump. The fuel delivery, ignition and burning process are controlled manually. The stove has a baking oven.

8. Technical characteristics, declared by the manufacturer:

Nominal heating output:	23.0 кW
Heat for heating the water:	18.0 кW
Heat given up in the space:	5.0 кW
Max working pressure:	2 bar
Max working temperature:	80 ^{0}C
Dimentions /H/L/W:	1162x732x921 mm
Weight:	287 kg

9. Fuel used:

Hard beech. Test report for the fuel №12797/24.03.2016
Fir thimber. Test report for the fuel №7524/09.03.2018

- Net calorific value of the fuel (NCV) 16.74 MJ/kg
- Moisture (total) 7.83%

10. Test conditions:

1. Test stand - developed by the requirements of A.4 in EN 12815:2006
2. Environment – according to the requirements of the standard
3. Distance from the walls of the stand to the unit - pointed by the manufactuirer
A. Left and right to stand – 500 mm
B. Back to stand – 300 mm
4. Operation modes, pointed by the manufacturer
A. Nominal: 23.0 kW
5. Values calculation: using formulas pointed in A.6.2 of EN 12815:2006
6. Measuring equipment used: pointed in p.13

The Mathematical calculation are made using standard excel tables, and results are checked manually by calculating by a calculator.

11. Testing at nominal power

11.1 Parameters of the environment

EN 12815:2006	Indicator	Measurement unit	Measured value	Requirement of the standard	Conformity
A.1.1	Ambient room temperature	^{0}C	19.65	to be measured	Conforms
A.1.2	Cross-draught	m/s	0.022	≤0.500	Conforms

11.2. Temperature safety testing

EN 12815:2006	Indicator	Measurement	Measured value	Requirement of the	Conformity

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		unit		standard	
1	2	3	4	5	6
p.5.2	Temperature of standing close combustible materials				
	Max temperature of the left wall of the trihedron	° C	33.6	$\leq(t_{ок} + 65K)$	Conforms
	Max temperature of the back wall of the trihedron	° C	37.9	$\leq(t_{ок} + 65K)$	Conforms
	Max temperature below the appliance	° C	21.1	$\leq(t_{ок} + 65K)$	Conforms
p.5.3	Max temperature of the handles				
	Oven handle	° C	44.2	$\leq(t_{ок} + 60K)$	Conforms

11.3 Measured temperature and draught of the flue gasses

EN 12815:2006	Indicator	Measurement unit	Measured value	Requirement of the standard	Conformity
1	2	3	4	5	6
p.6.1	Flue gases draught	Pa	11.5	12.00±2.00	Conforms
p.6.2	Temperature of the flue gases	° C	298.63	to be measured	Conforms

11.4 Measured emissions of the combustion

EN 12815:2006	Indicator	Measurement unit	Measured value	Requirement of the standard	Conformity
1	2	3	4	5	6
p.6.3	CO emissions (class 1) (at 13% O_2), (1181.61 ppm)	%	0.12	≤0.30	Conforms

11.5 Measured heating output/ Efficiency and intervals for refueling

EN 12815:2006	Indicator	Measurement unit	Measured value	Requirement of the standard	Conformity
1	2	3	4	5	6

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p.6.4	Efficiency (class 1)	%	84.93	≥75.00	Conforms
p.6.5	Refueling intervals	h	1.025	≥1.00	Conforms
p.6.6	Nominal heating output	kW	23.19	≥23.00	Conforms
p.6.6.1	Номинална мощност отдадена във водния кръг/ Nominal water heating output	kW	18.18	≥18.00	Conforms
p.6.6.2	Номинална мощност отдадена в околното пространство/ Nominal heat output in the space	kW	5.01	≥5.00	Conforms

12. Checked characteristics

EN 12815:2006	Indicator	Test/examination Result	Norm according to the Standard
1	2	3	4
	Requirements for materials, design and construction of the appliance		
p.4.1	Manufacturing documentation	available	required
p.4.2	General construction	available	required
т.4.3	Boilers constructed of steel	Not applicable	
p.4.3.1	Parts subject to water pressure	Not applicable	
p.4.3.2	Nominal minimum wall thickness	Not applicable	
p.4.4	Boilers constructed of cast iron	Not applicable	
p.4.5	Boiler shell tappings	Not applicable	
p.4.6	Draining of boiler shell	Not applicable	
p.4.7	Boiler waterways	Not applicable	
p.4.7.1	Venting of the water sections	Not applicable	
p.4.7.2	Boilers used with direct water systems	Not applicable	
p.4.7.3	Boilers used with indirect water systems	Not applicable	
p.4.7.4	Water tightness	Not applicable	
p.4.8	Ashpan and ash removal	available	required
p.4.9	Firedoors and charging doors	available	required

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p.4.10	Oven door	Not requested by the Applicant	
p.4.11	Flue spigot or socket	available	required
p.4.12	Internal flue gas diverter	available	required
p.4.13	Control of flue gas	available	required
p.4.14	Combustion air supply		
p.4.14.1	Primary air inlet control	available	required
p.4.14.2	Secondary air inlet control	available	required
p.4.15	Flueways	available	required
p.4.16	Front firebars and/or deepening plate	available	required
p.4.17	Hotplate and top plate	Not requested by the Applicant	
p.4.18	Main/additional ovens	Not requested by the Applicant	
p.4.19	Bottomgrate	available	required
p.4.20	Ashpit and ashpit cover/door	available	required
p.4.21	Provision for cleaning the boiler heating surfaces and the flue connector	available	required
p.4.22	Oven temperature indicators	Not applicable	
p.5	**Safety of the appliance**		
p.5.1	Temperature in intergral fuel storage container	Not applicable	
p.5.4	Natural draught safety test	Not applicable	
p.5.5	Strenght and leaktightness of boiler shells	Not applicable	
p.5.6	Thermal discharge control	Not applicable	
p.6	**Requirements to the technical characteristics**		
p.6.7	Oven heating	Not requested by the Applicant	
p.6.8	Slow combustion and recovery	Not requested by the Applicant	
p.6.9	Boiling test	Not requested by the Applicant	
p.6.10	Appliances with alternative bottomgrate positions	Not applicable	
p.7	**Appliance instructions**		
p.7.1	General conditions	available	required
p.7.2	Installation instructions	available	required

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p.7.3	User operating instructions	available	required
p.8	**Marking of the appliance**	available	required

13. Measurement equipment

№	Name, type, manufacturer	Measured indicator	Measuring range	Expanded uncertaintyU(P)	Id. №
1	2	3	4	5	6
1.	Electronic scala, type B600P	fuel consumption	0,4 ÷ 600 kg	0,07 kg	1311035
2.	Digital manometer, type Testo 512 , TESTOAG – Germany	differential pressure	0 ÷ 2 hPa	0,040 hPa	AC 463196/ 311
3.	Digital thermometer, type TESTO 350 XL to gas analyzer with a probe № 0607451/509	Temperature of the flue gases	0 ÷ 300 ^{0}C	0 ^{0}C – 0,06^{0}C 150 ^{0}C – 0,07^{0}C 300 ^{0}C – 0,12 ^{0}C	01129680/5 09
4.	Measuring device for air speed Testo 405 V1	Air flow	0 ÷ 10 m/s	0,20 m/s-0,04m/s 0,47 m/s-0,05m/s 4,69 m/s-0,09 m/s	41510622
5.	Thermoelectric converter-type K thermocouple for temperature measurement	Surface temperature	0 ^{0}C ÷ 400 ^{0}C	0 ^{0}C – 0,07 ^{0}C 70 ^{0}C – 0,06 ^{0}C 150 ^{0}C – 0,07 ^{0}C	37486/2014
6.	Thermoelectric converter-type K thermocouple for temperature measurement	Surface temperature	- 50 ^{0}C÷200 ^{0}C	0 ^{0}C – 0,06 ^{0}C 70 ^{0}C – 0,06 C 150 ^{0}C – 0,07 ^{0}C	1312018
7.	Steel measuring tape class II	distance appliances	0 ÷ 3000 mm	0,6 mm	P - 01
8.	Contact thermometer Testo 922	Surface temperature	0 ÷ 196 ^{0}C	0,49^{0}C	922
9.	Hygrometer Type DampFinder (082.010 A) LaserLiner - Germany	biofuel moisture	6 – 44 %	Accuracy: ± 1% (6 %÷ 30%) ± 2%(30 %÷44%)	082.010 A
10.	Electronic scale Model DE 60K1DL, KERN - Germany	Biofuel weight	0-60 kg	0.004 kg	WD1400539 52

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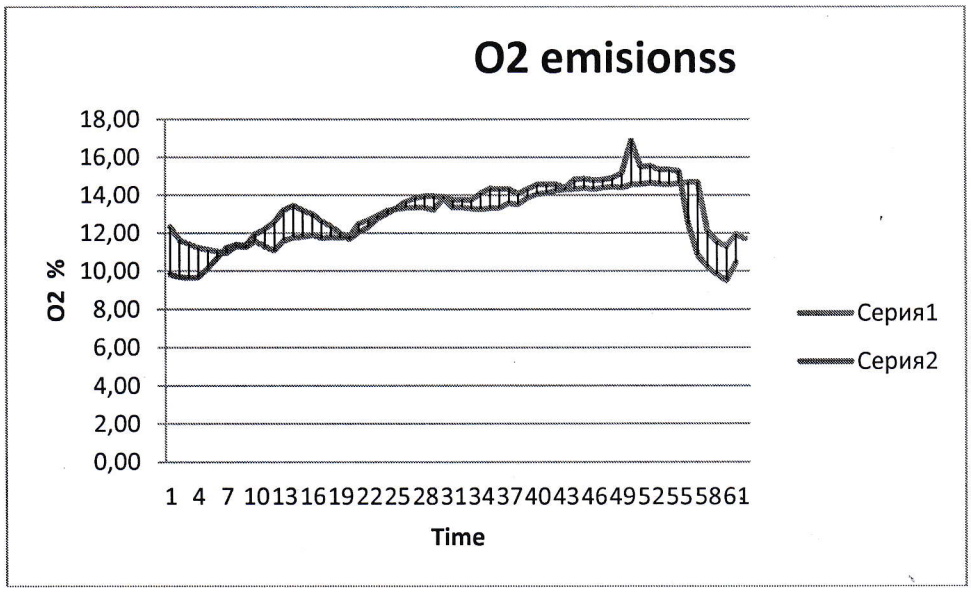
11.	Electronic stopwatch, model 696, Hong Kong	Fuel consumption	Deviation for 24 h 0,56 s	0,01 s / 24 h	22710
12.	Infrared Thermometer Testo 830-T2 TestoAG	Surface temperature	- 30 ÷ 400 ^{0}C	0,0 ^{0}C – 0,47 ^{0} C 148 ^{0}C – 0,44 ^{0}C	30713805/ 107
13.	Gas analyzer "TESTO" 350-XL "TESTO" AG Germany	Flue gases emission	O_2-0vol% O_2-12,0vol % O_2 –20.94vol%	0,02 vol% 0,34 vol % 0,48 vol %	01129680
		Flue gases emission	CO – 50ppm CO 250,0 ppm CO 840 Ppm	1,8 ppm 8,0 ppm 23,0 ppm	
		Flue gases emission	CO- 4002 ppm CO-10000ppm	47,0 ppm 185,0 ppm	

14 Graphic presentation of the results

14.1 O_2 emissions at 13 % O_2



14.2 CO emissions at 13 % O_2

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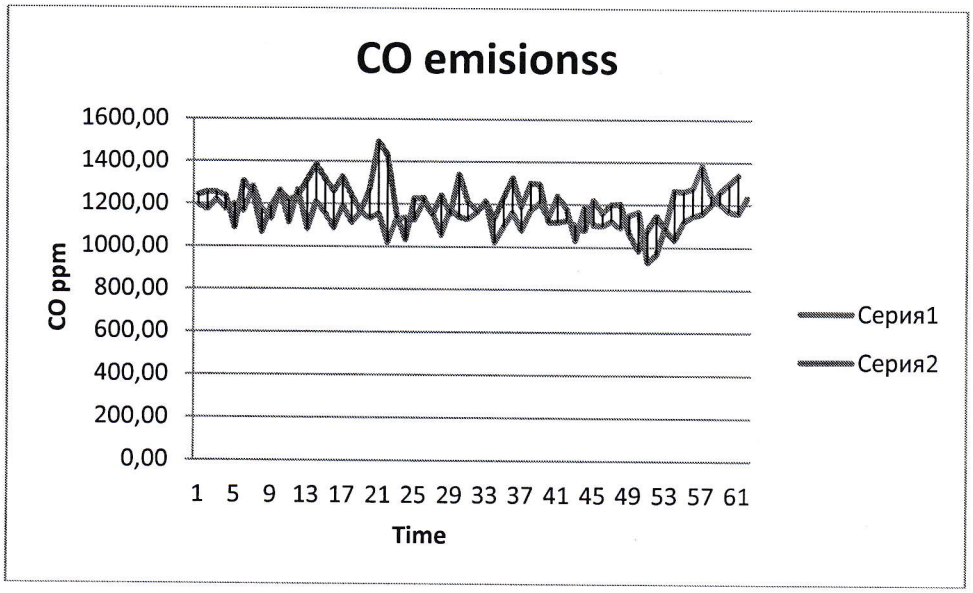
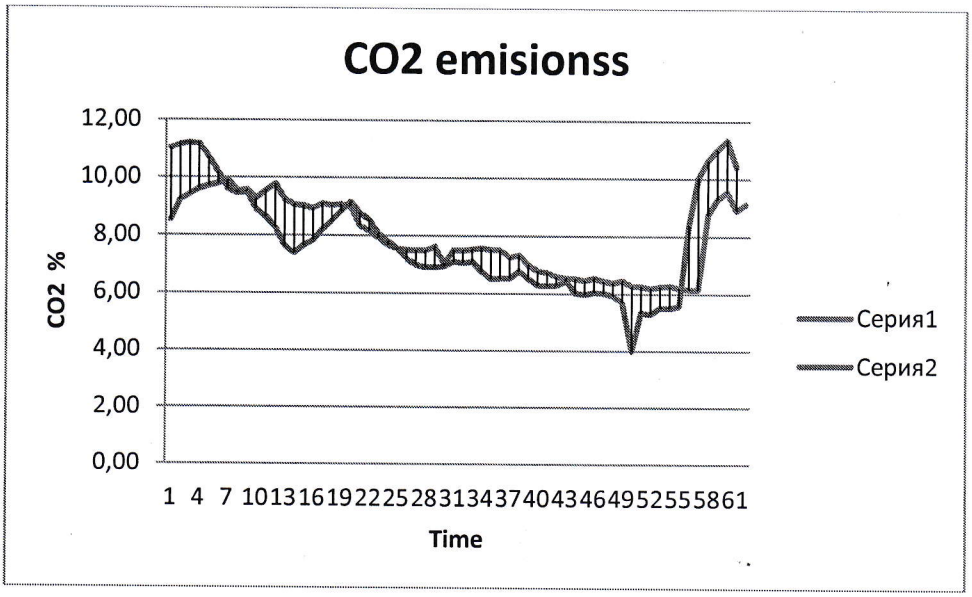


14.3 CO_2 emissions at 13 % O_2



14.4 Flue gas temperature

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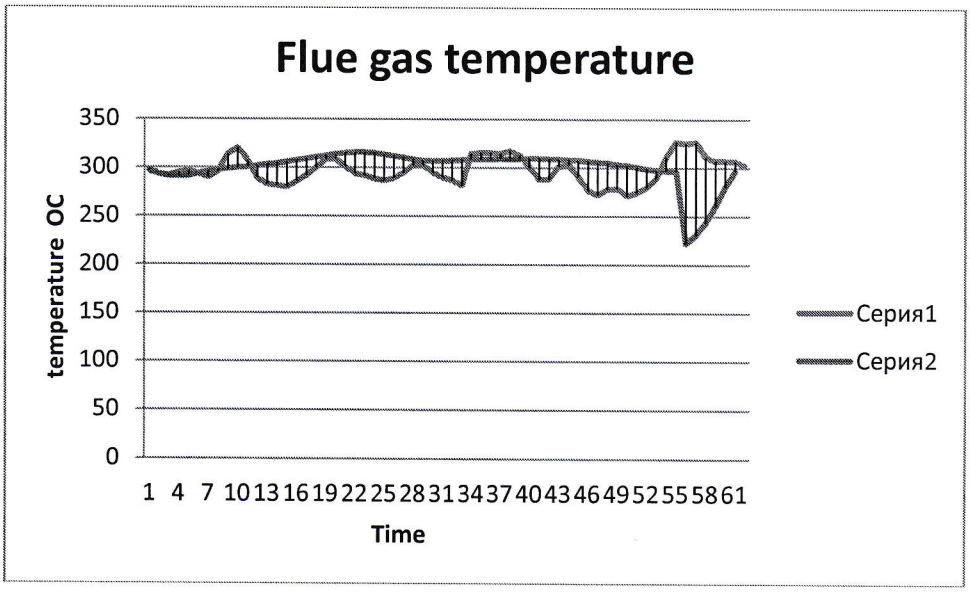

CONCLUSION:

Residential space heating appliance fired by wood logs with hot water production and cooker ZIGANA/ Star, MEET THE REQUIREMENTS OF EN 12815:2006 according to parameters that have been tested/checked.

Remarks: 1. The test results relate only to the sample under test.
2. Extracts from the test report cannot be reproduced without written consent of the testing laboratory.

Date: 19.04.2018

TESTED BY:..... Dipl.eng.N.Evtimov

VERIFIED BY:..... Dipl.eng. Z.Zdravkov

THE HEAD OF THE LABORATORY:.....

Dipl.eng. Zdravko Zdravkov

ИТЕМ Консулт ЕООД София Изпитвателна лаборатория