Strojírenský zkušební ústav, s.p.
(Engineering Test Institute, Public Enterprise)
Hudcova 424/56b, 621 00 Brno, Czech Republic

TEST REPORT
31-9433-T

Product:	Hot-water boiler for wood with manual fuel supply
Type designation:	ORLAN SUPER 96 kW
Versions:	–

Customer:	EKO-VIMAR ORLAŇSKI Sp. Z o.o. ul. Warszawska 20, 48-385 Otmuchów Poland
Manufacturer:	EKO-VIMAR ORLAŇSKI Sp. Z o.o. ul. Warszawska 20, 48-385 Otmuchów Poland
Manufacturing plant:	1) EKO-VIMAR ORLAŇSKI Sp. Z o.o. ul. Warszawska 20, 48-385 Otmuchów Poland 2) CRANP - KOVO, spol. s r.o. Míru 371, 790 70 Javorník Czech Republic
Employee responsible:	Ing. Stanislav Buchta
Report issue date:	2014-08-11
Distribution list:	1x copy to SZÚ, s.p. (Engineering Test Institute) 1x copy to Customer

The tests were performed based on Order B-47555 of 2013-09-04 (received on 2013-09-14) and Contract B-47555/31. The implementation date in Contract B-47555/31 was changed by a letter Ref. No. 0210-Sk/493 of 2014-08-04.

I. Product description, intended use and application

ORLAN SUPER 96 kW hot-water boiler is a gasification boiler with manual fuel supply (Wood - A). It is intended for heating of houses and suitable production premises.

The boiler body is a weldment of 4-6 mm thick steel walls. Loading chamber is in the upper part of the boiler. Combustion chamber lined with ceramics is underneath. The loading and the combustion chamber are separated by a partition fitted with a ceramic nozzle and integrated openings for supply of secondary combustion air. Flue gases leave the combustion chamber and pass through a tubular exchanger and into a flue gas outlet. Primary and secondary air is forced into the boiler by three fans fitted in the front wall. Volume of air can be adjusted by combining the settings of electronic controller (30 ÷ 100) % with the adjustment of mechanical air chokes. The boiler casing is made of varnished steel sheets, lined with mineral wool.
G2" heating water inlet and outlet and G3/4" connections for filling and draining of the boiler are in the rear part of the boiler. Horizontal-axis flue gas outlet is at the back of the boiler. Control panel with electronic controller (EKOSTER 2) and safety functions incl. indication of boiler water temperature are in the top part. The boiler is equipped with a cooling loop for dissipation of excess heat in case of a heating system failure.

Detailed description of individual assemblies is in the enclosed technical documentation to Tasks 31-9433 and 32-0119.

II. Sample tested

Visual inspection, tests and evaluations were carried out on the sample indicated in this table:

Table 1

Type designation	Nominal output	Water capacity	Max. operating temperature	Max. operating pressure	Weight
	[kW]	[l]	[°C]	[bar]	[kg]
ORLAN SUPER 96 kW	95	340	95	3.0	1360

Table 2

Type designation	EKV number	Place of testing
ORLAN SUPER 96 kW	0211.14.15701.000	SZU in Brno

The visual inspection, tests and evaluation of the product and of the technical documentation were performed by Ing. Marek Skřivan, Test Engineer, at SZU in Brno Test Station, in the period from 04/2014 to 08/2014.

The tests were performed with the use of validly calibrated measuring and test equipment.

III. Measuring and test equipment

Table 3

No.	Description	Inventory number	Calibration valid until	Accuracy
1.	Combustion products analyser, Horiba, type 680 P	92-0004	Calibration prior to every measurement	See CRM 103000237769 See CRM 103000237770
2.	Scale	02-2290	02/2015	See Calibration Sheet 6051-KL-H-0168-13
3.	Water meter, NW 20	02-1575	03/2015	See Calibration Sheet AKL-P/006/2009
4.	Data collection system	02-2241	12/2016	See Calibration Sheet 130129
5.	Hygrometer, thermometer	11-6258	11/2015	See Calibration Sheet 8346F/12
6.	Barometer	11-2541	12/2014	See Calibration Sheet 6013-KL-K001
7.	Draught gauge	11-7275	02/2015	See Calibration Sheet 1165F/13
8.	Stop watch	99-0760	11/2017	See Calibration Sheet 2955E-12
9.	IKA calorimeter, type C 5000	02-2236	Calibration prior to every measurement	± 0.12 MJ/kg
10.	Elemental analyser, Perkin Elmer, type 2400 CHNS	02-2107	Calibration prior to every measurement	± 0.2 % rel.
11.	Gravimat, SHC 501	02-2328	04/2015	See Calibration Sheet 120080-120084
12.	Laboratory scale	02-1458	06/2015	See Calibration Sheet 6051-KL-H0403-13
13.	Scale, Ohaus MB 45	02-2274	06/2015	See Calibration Sheet 6051-KL-H0400-13
14.	Manometer	11-1985	02/2015	See Calibration Sheet 090162
15.	Prandtl tube, 0.3 m	ME 484	11/2015	See Calibration Sheet 5012-KL-RS090-09
16.	Psychro-meter, H 4220	92-0005	12/2014	See Calibration Sheet 090176
17.	Electrometer	03524781	03/2022	See Calibration Sheet 002/12/E

Note: × ... Verified with calibration standards prior to measurement
+ ... ± 5 % from measured values

IV. Test results and evaluation

Table 4

No.	Name and specification	Technical standard/ regulation applied	Source materials	Evaluation	
				Test	Evaluation
1. **	General requirements	ČSN EN 303-5:2013 Art. 4.1	Pages 5 ÷ 6		+
2. **	Construction requirements	ČSN EN 303-5:2013 Art. 4.2, 4.2.1, 4.2.1.1, 4.2.1.2, 4.2.2, 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4, 4.2.4, 4.2.4.1, 4.2.4.2, 4.2.4.3, 4.2.4.4, 4.2.4.5, 4.2.4.6, 4.2.4.7, 4.2.4.8, 4.2.4.9, 4.2.4.11, 4.2.4.12	Pages 7 ÷ 11		+
3. **	Safety requirements	ČSN EN 303-5:2013 Art. 4.3, 4.3.1, 4.3.2, 4.3.5, 4.3.6, 4.3.7, 4.3.8, 4.3.8.1, 4.3.8.2, 4.3.8.3, 4.3.8.4, 4.3.9, 4.3.9.1, 4.3.9.2, 4.3.9.3	Pages 12 ÷ 16		+
4. **	Performance requirements	ČSN EN 303-5:2013 Art. 4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5, 4.4.6, 4.4.7	Pages 17 ÷ 18		+
5. **	Marking	ČSN EN 303-5:2013 Art. 7, 7.1, 7.2, 7.3	Page 19		+
6. **	Technical documentation, supplied with boiler	ČSN EN 303-5:2013 Art. 8, 8.1, 8.2, 8.3, 5.16.1	Pages 20 ÷ 22		+
7.	Strength and tightness of pressurized components (1001.1*)	ČSN EN 303-5:2013 Art. 5.4, 5.4.1, 5.4.2	Page 23	+	
8.	Surface temperature test (1003*)	ČSN EN 303-5:2013 Art. 5.12, 4.3.6	Pages 24 ÷ 25	+	
9.	Test of heat output, input and efficiency (1004.1*) Test of flue gas temperature (1004.2*)	ČSN EN 303-5:2013 Art. 4.4.2, 4.4.3, 5.7, 5.8, 5.10	Pages 26 ÷ 28	+	
10.	Combustion efficiency test - emissions (1005.1*)	ČSN EN 303-5:2013 Art. 4.4.7, 5.7.3, 5.7.4, 5.9, 5.10.4	Pages 29 ÷ 30	+	
11.	Test of heat output, input and efficiency (1004.1*) Combustion efficiency test - emissions (1005.1*)	ČSN EN 303-5:2013 Annex C, Deviation from Austria, C.2.2, C.2.3	Pages 31 ÷ 32	+	
		ČSN EN 303-5:2013 Annex C, Deviation from Croatia, C.3	-	0	
		ČSN EN 303-5:2013 Annex C, Deviation from Denmark, C.4.1, C.4.2	Pages 33 ÷ 34	+	
		ČSN EN 303-5:2013 Annex C, Deviation from Germany, C.5.1, C.5.2	Pages 35 ÷ 36	+	
		ČSN EN 303-5:2013 Annex C, Deviation from Switzerland, C.6	Pages 37 ÷ 38	+	
		ČSN EN 303-5:2013 Annex C, Deviation for Italy, C.8	-	0	
12.	Function test of control, regulation and safety elements (1006.1*) Combustion efficiency test - emissions (1005.1*)	ČSN EN 303-5:2013 Art. 5.13, 5.14, 5.16.3 ČSN EN 303-5:2013 Art. 5.9, 5.10.4	Pages 39 ÷ 40	+	
13.	Function test on the device for dissipating excess heat	ČSN EN 303-5:2013, Art. 4.1, 5.15	Pages 41 ÷ 42	+	

Note: No.:
(**) Not a test

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

Requirement evaluated: **General requirements**

Requirement specification: ČSN EN 303-5:2013 Art. 4.1

Sample evaluated: ORLAN SUPER 96 kW

Evaluation results: see the Table below

Requirement	Requirement specification	Evaluation	Note
General requirements			
Boilers shall be fire-resistant and safe to operate. They shall be made of non-combustible materials according to EN 13501-1 and shall be resistant to deformation. They shall be made such that:		+	
a) they can withstand stresses arising during normal operation;			
b) the heat carrier (water) does not become heated to a dangerous extent (≤ 110 °C);		+	
c) gases do not leak from the boiler or the stoking device or from an integrated hopper in dangerous quantities into the place of installation or into the fuel line;		+	
NOTE: Safety requirements regarding harmful gas concentrations of course need to be considered. Both these elements however strongly depend on the place of installation and the fuel storage discharge system and therefore fall outside of the scope of this standard. This requirement is deemed to be fulfilled if the requirements of the leakage of the boiler and of the emissions are met and there is no visible smoke emerging from the boiler into the test room at normal operation during type test;			
d) flames do not flare out and embers do not fall out when the boiler is operated correctly;	ČSN EN 303-5:2013 Art. 4.1	+	
e) dangerous accumulations of combustible gases (> 5 % CO) in the combustion chamber and in the flues are prevented.		+	
For the evaluation of the hazardous situation, the CO concentration in the flue gas measuring section should not exceed the critical values for a time period greater than 1 min.		+	
Combustible materials shall be allowed for the following:			
f) internal components of controls and safety equipment;		+	
g) operating handles;		+	
h) electrical equipment;		+	
i) components of accessory (e.g. burner cover);		+	
j) additional or supplemental optical outer covers (e.g. an additional decorative cover).		+	
Component parts of covers, operating controls, safety devices and electrical accessories shall fulfil the requirements of resistance against heat and fire in either EN 60335-1 or EN 60730-1.		+	
Component parts of covers, operating controls, safety devices and electrical accessories shall be arranged in such a way that their surface temperatures, under steady state conditions, do not exceed those specified either by the manufacturer or in the component part standard		+	

Requirement	Requirement specification	Evaluation	Note
The materials for the parts subject to pressure shall be in accordance with generally accepted technical requirements. They shall be suitable for the purpose and intended use. Documented proof of mechanical and physical properties of materials used and their chemical composition shall be obtained from the supplier.		+	
The design of the boiler shall be such that it can be handled safely. It shall be designed and packaged so that it can be stored safely and without damage.		+	
Where the weight, size or shape of the boiler or its components prevents them from being moved by hand, they shall be fitted with means to lift them easily.		+	
Constructional parts accessible during use and maintenance shall be free from sharp edges and corners that might cause damage or personal injury during use or maintenance.		+	
Motors and fans shall be mounted in such a way as to minimize noise and vibration.		+	

Note:

+... Compliant
-... Non-compliant
0... Not applicable
x... Not assessed

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:

Person responsible for evaluation:
Ing. Stanislav Buchta Date: 08/2014 Signed:

Requirement evaluated:	**Construction requirements**
Requirement specification:	ČSN EN 303-5:2013 Art. 4.2, 4.2.1, 4.2.1.1, 4.2.1.2, 4.2.2, 4.2.2.1, 4.2.2.2, 4.2.2.3, 4.2.2.4, 4.2.4, 4.2.4.1, 4.2.4.2, 4.2.4.3, 4.2.4.4, 4.2.4.5, 4.2.4.6,4.2.4.7, 4.2.4.8, 4.2.4.9, 4.2.4.11, 4.2.4.12
Sample evaluated:	ORLAN SUPER 96 kW
Evaluation results:	see the Table below

Requirement	Requirement specification	Evaluation	Note
Construction requirements	ČSN EN 303-5:2013 Art. 4.2		
Production documentation	ČSN EN 303-5:2013 Art. 4.2.1		
Drawings The drawings and/or the relevant documentation shall include at least the following information: a) the specification of the material; b) the welding process, the seam type (generally the symbol for the seam type is sufficient) and the welding fillers; c) the maximum allowable operating temperature, in °C; d) the maximum allowable operating pressure, in bar; e) the type test pressure, in bar; f) the nominal heat output or the heat output range for every boiler size, in kW, in accordance with the fuel(s) recommended for use in the boiler	ČSN EN 303-5:2013 Art. 4.2.1.1	+ + + + + +	
Manufacturing controls A Quality Manual shall be compiled on the inspections and tests necessary during the manufacturing process. The manual shall 1) describe the inspection system; 2) specify the person responsible for quality assurance; 3) specify the necessary inspections and tests as well as the pertinent limit values and 4) lay down the requisite measuring and testing equipment and their inspection.	ČSN EN 303-5:2013 Art. 4.2.1.2	+ + + + +	
Heating boilers made of steel and non-ferrous materials	ČSN EN 303-5:2013 Art. 4.2.2		
Execution of welding work Boiler manufacturers who carry out welding work shall meet the requirements of EN 287-1 and EN ISO 9606-2 as follows: – only welders who are qualified in the welding of the materials to be processed shall be used; – equipment shall be available to allow defect-free welding to be carried out; – supervision of the welding shall be carried out by staff qualified in welding (at least one supervisor shall be qualified).	ČSN EN 303-5:2013 Art. 4.2.2.1	+ + + +	Enclosed technical documentation

Requirement	Requirement specification	Evaluation	Note
Welding seams and welding fillers The materials shall be suitable for welding. *NOTE 1 The materials in Table 1 are suitable for welding and do not require additional heat treatment after welding.*	ČSN EN 303-5:2013 Art. 4.2.2.2	+	Enclosed technical documentation (welding procedures)
The welded seams shall not show any cracks or lack of fusion and shall be defect free over the whole cross-section for butt welds. One-sided fillet welds, and half Y-welds which have been welded through, shall be kept substantially free from bending stresses. Smoke tubes, inserted stays and similar components need not be counter welded.		+	
Double fillet welds are only permissible when sufficiently cooled. Projections into the flue gas side in areas of high thermal stresses shall be avoided.		+	
Corner welds, edge welds and similar welded connections, which shall only be subject to high bending stresses during production and operation, are to be avoided.		+	
When welding longitudinal stay bars or stay tubes, the shearing cross section of the fillet weld shall be 1,2 times the required stay bar or stay tube cross sectional area.		+	
The permissible types of weld and appropriate material thicknesses are given in Table 2 and these parameters shall be met.		+	
Welding fillers shall be suitable for the material being used.		+	
NOTE 2: The terms given in Table 2 are in accordance with EN 22553; the reference numbers of welding processes are in accordance with ISO 857-1, ISO 857-2 and EN ISO 4063.		+	
Parts of steel subject to pressure The steels listed in Table 1 shall be used.	ČSN EN 303-5:2013 Art. 4.2.2.3	+	Enclosed technical documentation (welding procedures)
Materials and wall thicknesses other than those specified shall only be used on the production of appropriate evidence, with regard to (at least) their equivalent corrosion resistance, heat resistance and strength to non-alloy steel at the material thicknesses specified in Table 1 for the particular application/usage.		+	
The specification of the materials shall be documented by a works certificate in accordance with EN 10204. These certificates shall be obtained by the boiler manufacturer. This does not apply to components, e.g. sockets up to DN 50, screws and nuts.		+	

Requirement	Requirement specification	Evaluation	Note
Minimum wall thicknesses The minimum wall thicknesses listed in Table 3 have been specified in order to take into account the following: a) the maximum allowable operating pressure, b) the nominal heat output; and c) the material properties For boilers which consist of a combination of individual geometrically identical parts (sections), the requirements of the minimum wall thickness for the complete range of the nominal heat output of the boiler shall be in accordance with the individual boiler sections as specified in Table 3.The wall thickness tolerance for carbon steels shall be as specified in EN 10029. The minimum wall thicknesses according to Table 3 apply to pressure-loaded sheets, tubes (except immersion coils and safety heat-exchangers) and forgings. Smaller wall thicknesses shall be permitted upon the production of evidence demonstrating equivalence with regard to corrosion, heat resistance and strength.	ČSN EN 303-5:2013 Art. 4.2.2.4	+ + + + + + +	Enclosed technical documentation (semi-finished products
Design requirements	ČSN EN 303-5:2013 Art. 4.2.4		
Venting of the water sections The boiler and its components shall be designed in such a way that their respective water sections can be fully vented. The boiler shall be designed in a way that under normal operation in accordance with the manufacturer's instructions no undue boiling occurs. *NOTE Boiling can be detected by boiling noise.*	ČSN EN 303-5:2013 Art. 4.2.4.1	+	
Cleaning of heating surfaces The heating surfaces shall be accessible from the flue gas side for inspection and cleaning with chemical agents and brushes. A sufficient number and appropriate arrangement of cleaning openings shall be provided. If special tools (for example special brushes) are required for cleaning and maintenance of the boiler, these shall be supplied.	ČSN EN 303-5:2013 Art. 4.2.4.2	+	
Inspection of the flame The facility shall be provided which allows inspection of the flame or fire bed. If this facility is a door, then hazard-free inspection shall be possible. *NOTE The facility of an inspection window is recommended.*	ČSN EN 303-5:2013 Art. 4.2.4.3	+	
Water tightness Holes for screws and similar components which are used for the attachment of removable parts shall not enter into spaces through which water flows. This does not apply to pockets for measuring or control and safety equipment.	ČSN EN 303-5:2013 Art. 4.2.4.4	+	

Requirement	Requirement specification	Evaluation	Note
Replacement parts Replacement and spare parts (e.g. inserts, shaped firebricks, turbulators etc.) shall be designed, made or marked in such a way that their installation shall be correct in accordance with the manufacturer's instructions.	ČSN EN 303-5:2013 Art. 4.2.4.5	+	
Boiler shell tappings Boiler shell tappings shall comply with EN 10226-1, ISO 7-2, EN ISO 228-1, EN ISO 228-2; flange connections shall comply with ISO 7005-1, ISO 7005-2 and ISO 7005-3. The arrangement of the tappings shall be such that they are easily accessible and the function of each respective connection can be adequately fulfilled. There shall be sufficient space around the connection to allow the installation of the connecting pipes (flanges, bolts) with the necessary tools. Threaded pipe connections above 2 inches (**DN 50**) are not recommended. Threaded pipe connections with nominal diameters above 3 inches (**DN 80**) shall not be permitted. This information shall be supplied with the boiler. If connections are fitted with flanges, the mating flanges and seals shall also be supplied except where standardised flanges and seals are available. The minimum size for flow outlet shall be **DN 20**. The boiler shall have at least one connection for filling and emptying. This connection may be common. The size of the connection shall be as a minimum: - **G 1/2 for nominal heat outputs up to 70 kW;** - **G 3/4 for nominal heat outputs above 70 kW.** It is possible to provide these connections outside the boiler if satisfactory filling and emptying of the boiler can be assured.	ČSN EN 303-5:2013 Art. 4.2.4.6	+	
Immersion pockets for control and indicating equipment, and safety temperature limiter Every boiler shall be equipped with at least one immersion pocket which is used for temperature control, a safety temperature limiter and a thermometer. If a threaded pipe connection is required, the minimum nominal diameter shall be G 1/2. Alternative arrangements are allowed, provided that the control devices are supplied with the boiler, and that they cannot be substituted by other components. The immersion pockets shall be designed so that an unintended change of position of the temperature sensor is avoided. The position of the immersion pocket shall be chosen in such a way that the highest temperature of the boiler water is recorded with sufficient accuracy. Where additional connections for safety devices such as a pressure detector, manometer, low water cut-out device or a safety valve are provided, then their size (especially the size of the safety valve), shall be determined according to the output of the boiler. *NOTE For further information on safety valves, see EN 12828.*	ČSN EN 303-5:2013 Art. 4.2.4.7	+	

Requirement	Requirement specification	Evaluation	Note
Thermal insulation All boilers shall be fitted with thermal insulation. The thermal insulation shall withstand normal thermal and mechanical stresses. It shall be made of non-combustible material and shall not give off fumes during normal running.	ČSN EN 303-5:2013 Art. 4.2.4.8	+	
Water side resistance of the boiler The water side resistances are to be determined for those flows which correspond to the nominal heat output with two temperature differences of 10 K and 20 K between the flow and return connections of the boiler. The results are to be stated in mbar for each boiler size and shall correspond to the values indicated by the manufacturer.	ČSN EN 303-5:2013 Art. 4.2.4.9	+	
Fuel chamber The fuel chamber shall be designed in such a way that the fuel moves freely and the duration of the combustion period is assured.	ČSN EN 303-5:2013 Art. 4.2.4.11	+	
Ash chamber The capacity of the ash chamber shall be adequate for a combustion period of at least 12 h using the stipulated fuel at nominal heat output. It shall be designed to ensure the unobstructed flow of combustion air under the grate. If the system is designed with devices for automatic ash and clinker removal, the above requirement shall be considered as met.	ČSN EN 303-5:2013 Art. 4.2.4.12	+	

Note:

+	Compliant
0	Not applicable
x	Not assessed
-	Non-compliant

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:

Person responsible for evaluation: Ing. Stanislav Buchta Date: 08/2014 Signed:

Requirement evaluated:	**Safety requirements**
Requirement specification:	ČSN EN 303-5:2013 Art. 4.3, 4.3.1, 4.3.2, 4.3.5, 4.3.6, 4.3.7, 4.3.8, 4.3.8.1, 4.3.8.2, 4.3.8.3, 4.3.8.4, 4.3.9, 4.3.9.1, 4.3.9.2, 4.3.9.3
Sample evaluated:	ORLAN SUPER 96 kW
Evaluation results:	see the Table below

Requirement	Requirement specification	Evaluation	Note
General Potential hazards caused by the boiler, including the operation of the firing system and any stoking device, shall be avoided by either constructional means or by, the use of safety devices. Safety shall be maintained in the event of possible failures in the safety device itself. The manufacturer shall undertake a risk assessment covering all potential hazards of the boiler and the measures how to avoid or control them in a safety concept. Control functions within the safety concept shall be classified and realized accordingly. The risk assessment shall be performed according to EN ISO 12100 with particular emphasis on the type of the boiler and the fuel fired. Control functions are classified as follows. **Class A:** Control functions which are not intended to be relied upon for the safety of the application. **Class B:** Control functions which are intended to prevent an unsafe state of the appliance. Failure of the control function will not lead directly to a hazardous situation. For devices used in a class B control function, a single fault assessment of the device including use of software class B according to EN 60730-1 is required. **Class C:** Control functions which are intended to prevent special hazards such as explosion or whose failure could directly cause a hazard in the appliance. For devices used in a class C control function, a second fault assessment of the device including use of software class C according to EN 60730-1 is required. In case of safety routines realised in a programmable logic control the software shall meet the requirements of the appropriate software class B or C (including fault assessment according to EN 60730-2-5 in connection with EN 60730-1). This risk assessment shall cover at least the following: – elements given in 4.3.4 to 4.3.9; – boiler functions, including start-up, purge, ignition, flame supervision, flue gas flow, control of heat demand and combustion control. In the risk assessment, one of the above mentioned classifications of the control function shall be allocated to any identified hazard. The actuation of any control function class B or class C shall at	ČSN EN 303-5:2013 Art. 4.3.1	+	Class B 31-9433/E 31-9433/ EMC

Requirement	Requirement specification	Evaluation	Note
least result in cutting off the fuel feed			
Manual stoking Boilers with manual stoking shall be designed in such a way that, when the boiler is operated in accordance with the boiler manufacturer's operating instructions, the operator does not run the risk of a hazardous operation mode. Such a mode might result in an injury when opening the fuel chamber door or the combustion chamber (e.g. by ignition of gases).	ČSN EN 303-5:2013 Art. 4.3.2	+	
Safety against lack of air supply or insufficient combustion If the air supply includes fan assistance or adjustable devices to control the cross section of the air inlet, the tests according to 5.16.3 shall be performed. Neither a combination of a failure of the fan and the malposition of the adjustable devices nor the malposition of adjustable devices with separate actuators at the same time shall be taken into account. The CO concentration in the boiler shall not exceed 5 % volume.	ČSN EN 303-5:2013 Art. 4.3.5	+	Less than 5 % of CO
Surface temperature The surface temperature on the outside of the boiler (including the bottom and doors but not including the flue gas outlet and maintenance openings of natural draft boilers) shall not exceed the room temperature by more than 60 K when tested in accordance with 5.12. The requirement for the bottom is not applicable for instances when the manufacturer declares that the boiler is to be installed on a non-combustible base. When tested in accordance with 5.12, the surface temperature of operating levers and all parts which will be touched by hand during operation of the boiler shall not exceed the room temperature by more than the following values: – 35 K for metals and similar materials; – 45 K for porcelain and similar materials; – 60 K for plastics and similar materials.	ČSN EN 303-5:2013 Art. 4.3.6	+ + + +	
Leakage of the combustion system For boilers designed to operate with a positive pressure in the combustion chamber when tested in accordance with 5.6 at a test-pressure of 1.2 times the gas side resistance at nominal heat output, the leakage rate based on mass flow shall not exceed 2 % of the flue gas mass flow at the nominal heat output. The gas side resistance shall be determined with the fuel chamber filled to maximum capacity (as specified by the manufacturer). *NOTE: For boilers designed to operate with negative pressure, the leakage rate measured according to 5.6 characterises the boiler.*	ČSN EN 303-5:2013 Art. 4.3.7	+	

Requirement	Requirement specification	Evaluation	Note
Temperature control and limiting devices	ČSN EN 303-5:2013 Art. 4.3.8		
General The control and safety devices described in the sections below as well as the appropriate installation options shall be provided for each boiler, depending on the type of firing system and the type of protection provided for the installations in which the boiler is to be fitted. The equipment required in each case shall be supplied by the boiler manufacturer along with the boiler. If equipment is not supplied, precise specifications shall be given in the installation instructions, in particular the limit values and time constants for the safety temperature limiter.	ČSN EN 303-5:2013 Art. 4.3.8.1	+	
Temperature control and limiting devices for open vented systems When used in physically protected heating installations (the temperature is limited by installation pressure) the following equipment shall be provided, according to the requirements of EN 14597: – a temperature controller; – a safety temperature limiter (manual reset). The safety temperature limiter is not necessary in cases where the firing system is neither rapidly nor partly dis-connectable. In these cases (e.g. for boilers without automatic force draft), the excess heat is dissipated in the form of steam through the open vented connection with the atmosphere.	ČSN EN 303-5:2013 Art. 4.3.8.2	0	
Temperature control and limiting devices for closed vented system When used in thermostatically protected heating installations, the firing system shall be either rapidly or partly dis-connectable; and/or the heat or residual heat output not absorbed by the heating system shall be dissipated reliably using a safety heat exchanger or equivalent devices. Accordingly, a distinction is to be made between the following equipment variants, according to the requirements of EN 12828: a) The firing system is rapidly dis-connectable; the necessary equipment shall consist of: - a temperature controller; - a safety temperature limiter (manual reset). b) The firing system is partly dis-connectable; the necessary equipment shall consist of: - a temperature controller; - a safety temperature limiter (manual reset); - a thermal discharge safety device in accordance with 4.3.8.4 for dissipating the maximum heat output possible in the event of a malfunction; c) The heating system is not dis-connectable and the nominal heat output is < 100 kW; the necessary equipment shall consist of: - a temperature controller; - a thermal discharge safety device in accordance with 4.3.8.4 for dissipating the maximum heat output possible in the event of a malfunction. If the requirements are not fulfilled, the boiler shall be installed in an open vented system according to EN 12828.	ČSN EN 303-5:2013 Art. 4.3.8.3	0 + 0 0	
Devices for dissipating excess heat The safety heat exchanger or other devices for dissipating excess		+	

Requirement	Requirement specification	Evaluation	Note
heat shall ensure that a maximum boiler water temperature of 110 °C is not exceeded in accordance with 5.14.	ČSN EN 303-5:2013 Art. 4.3.8.4		
For this purpose, a thermal discharge safety device shall be used such as an STW type Th according to EN 14597, in combination with a heat exchanger integrated in the boiler. Admissible heat exchangers include storage or circulatory water heaters, provided they are designed and sized in such a way that the heat can be transferred without any additional auxiliaries and outside energy. Fixed integrated circulatory water heaters cannot be used as operating water heaters but only as safety heat exchangers. Additionally, the following conditions shall be met:		+	
– the thermal safety discharge device and the heat exchanger shall be adapted to the design and thermal properties of the boiler and be capable of reliably dissipating the maximum heat output possible in the event of malfunction or, in the case of partly dis-connectable heating systems, the residual heat output; – if a storage water heater is used as the heat exchanger, it shall be designed so that it meets the aforementioned condition at its maximum operating temperature; – in the case of safety heat exchangers used exclusively to dissipate heat in the event of malfunctions, the thermal safety discharge device shall be fitted ahead of the heat exchanger in the cooling water inlet. Other solutions are not excluded provided they comply with the protection objectives and safety standards described above. In principle however, all devices for dissipating excess heat are only admissible for		+ 0 0	
– boilers without a dis-connectable firing system with rated heat outputs of maximum 100 kW, – boilers with a partly dis-connectable firing system with residual heat outputs of up to 100 kW.		+ +	
Heating boiler accessories	ČSN EN 303-5:2013 Art. 4.3.9		
General If the boiler is factory equipped with additional fittings which need to be serviced to ensure their correct operation and the safety of the boiler, the design shall ensure ease of access without requiring extensive dismantling work.	ČSN EN 303-5:2013 Art. 4.3.9.1	0	
Electrical safety The electrical safety of the boiler and the interfaces (e.g. connectors) between control devices shall comply with EN 60335-2-102. The electrical safety of control devices shall comply either with EN 60335-2-102, with EN 60730-1 or its relevant part 2 or with the electrical requirements of the standards listed in Annex ZBB of EN 60335-2-102:2006. For abnormal operation as fault condition according to 19.11.2 f) of EN 60335-2-102:2006 (failure of integrated circuits), only output signals which cause only one malfunction in one actuator shall be considered as relevant. Combinations of output signals which cause malfunction in more than one actuator are not considered relevant in the sense of abnormal operation because it is unlikely that any hazardous situation can occur. The documentation of the electrical connections for the individual components shall be provided by means of an electrical wiring and connection diagram.	ČSN EN 303-5:2013 Art. 4.3.9.2	+	Class B 31-9433/E

Requirement	Requirement specification	Evaluation	Note
Electromagnetic compatibility The EMC requirements shall be fulfilled in accordance with EN 61000-6-2 and EN 61000-6-3. For this testing, it is permissible to use an adapted version of the boiler software for simulating boiler operation.	ČSN EN 303-5:2013 Art. 4.3.9.3	+	31-9433/ EMC

Note: +... Compliant
-... Non-compliant
0... Not applicable
x... Not evaluated

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:

Person responsible for evaluation:
Ing. Stanislav Buchta Date: 08/2014 Signed:

Requirement evaluated:	**Performance requirements**
Requirement specification:	ČSN EN 303-5:2013 Art. 4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5, 4.4.6, 4.4.7
Sample evaluated:	ORLAN SUPER 96 kW
Evaluation results:	see the Table below

Requirement	Requirement specification	Evaluation	Note
General The following performance requirements shall be assessed in tests using the appropriate test fuel(s) specified in Table 7. These shall be selected to represent the recommended fuel(s) which it is claimed the boiler can burn. *NOTE The nominal heat output and the heat output range might vary depending on the fuel.* The requirements for the boiler efficiency and the emission limits are divided into 3 classes. To meet the class requirements, all the efficiency and emission limits of that class shall be fulfilled.	ČSN EN 303-5:2013 Art. 4.4.1	+	
Boiler efficiency The boiler efficiency, when tested in accordance with 5.7, 5.8 and 5.10, shall not be less than the formula shown in Figure 1 for the nominal heat output. For boilers above 100 kW, the requirement for class 4 is given at 84 % and class 5 is given at 89 %. For boilers above 300 kW, the requirement of class 3 is given at 82 %.	ČSN EN 303-5:2013 Art. 4.4.2	+	
Flue gas temperature For boilers which operate with a flue gas temperature below 160 K and above room temperature at nominal heat output, the boiler manufacturer shall make recommendations regarding the flue installation in order to ensure sufficient draught and to prevent the chimney sooting up and condensation.	ČSN EN 303-5:2013 Art. 4.4.3	+	Less than 160 K
Draught The manufacturer shall specify the minimum draught at the flue gas outlet of the boiler needed for correct operation of the boiler. Where the manufacturer gives no detailed values, the figures according to Table B.2 of EN 13384-1:2002+A2:2008 shall apply.	ČSN EN 303-5:2013 Art. 4.4.4	+	
Combustion period The combustion period for hand-stoked boilers at nominal heat output shall be stated by the manufacturer and shall be at least: – 2 hours for biogenic and other solid fuels ; – 4 hours for fossil fuels.	ČSN EN 303-5:2013 Art. 4.4.5	+ 0	
Minimum heat output For manually stoked boilers where the manufacturer specifies that the boiler shall be connected to an accumulator tank, the minimum continuous heat output can be greater than 30 % of nominal heat output, provided that the manufacturer specifies in the technical documentation how the amount of heat generated is to be dissipated.	ČSN EN 303-5:2013 Art. 4.4.6	0	

Requirement	Requirement specification	Evaluation	Note
Manually stoked boilers do not require testing at minimum heat output if the manufacturer claims that they shall always be connected to accumulator tank.			
The following applies as a reference for the minimum accumulator tank volume: $V_{Sp} = 15\, T_B \times Q_N \left(1 - 0{,}3 \frac{Q_H}{Q_{min}}\right)$ where V_{Sp} is the accumulator tank volume, in litres; Q_N is the nominal heat output, in kilowatts; T_B is the burning period, in hours; Q_H is the heating load of the premises, in kilowatts; Q_{min} is the minimum heat output, in kilowatts. For heating boilers using several allowable fuels, the tank size shall be based on the fuel which requires the largest accumulator tank. The minimum volume of the accumulator tank shall be 300 l.		0	
Emission limits Combustion shall be of low-emission. This requirement shall be satisfied if the emission values shown in Table 6 are not exceeded when operating at nominal heat output or, in the case of boilers with heat output range, when operating at nominal heat output and minimum heat output, in accordance with 5.7, 5.9 and 5.10.	ČSN EN 303-5:2013 Art. 4.4.7	+	

Note:
+... Compliant
-... Non-compliant
0... Not applicable
x... Not evaluated

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:
Person responsible for evaluation:
Ing. Stanislav Buchta Date: 08/2014 Signed:

Requirement evaluated: **Marking**

Requirement specification: ČSN EN 303-5:2013 Art. 7, 7.1, 7.2, 7.3

Sample evaluated: ORLAN SUPER 96 kW

Evaluation results: see the Table below

Requirement	Requirement specification	Evaluation	Note
Marking	ČSN EN 303-5:2013 Art. 7		
General Each heating boiler shall have a data plate. The boiler data plate shall be written in the language of the country of destination and be affixed in an accessible spot.	ČSN EN 303-5:2013 Art. 7.1	+	
Information on the boiler plate The boiler plate shall contain at least the following information: a) name and company domicile of the manufacturer and, where available, the manufacturer's symbol; b) trade designation, type under which the boiler is marketed; c) production number and year of construction (coding is permissible at the manufacturer's discretion); d) nominal heat output and heat output range in kilowatts for each type of fuel; e) boiler class regarding each fuel type that was tested; f) maximum allowable operating pressure, in bar; g) maximum allowable operating temperature, in degrees Celsius; h) water content, in litres; i) electrical connection (V, Hz, A) and wattage, in watts; j) the fuel class according to Clause 1 and for fuels of class E the tested fuel.	ČSN EN 303-5:2013 Art. 7.2	+ + + + + + + + + +	
Boiler plate requirements The material and labelling used for the plate shall be durable. The labelling shall be abrasion-proof. Under normal operating conditions, the plate shall not discolour so as to make its information difficult to read. Self-adhesive plates should not become detached as a result of moisture and temperature.	ČSN EN 303-5:2013 Art.7.3	+	

Note:
+... Compliant
-... Non-compliant
0... Not applicable
x... Not evaluated

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:

Person responsible for evaluation: Ing. Stanislav Buchta Date: 08/2014 Signed:

Requirement evaluated: **Technical documentation, supplied with boiler**

Requirement specification: ČSN EN 303-5:2013 Art. 8, 8.1, 8.2, 8.3, 5.16.1

Sample evaluated: ORLAN SUPER 96 kW

Evaluation results: see the Table below

Requirement	Requirement specification	Evaluation	Note
Technical documentation, supplied with boiler	ČSN EN 303-5:2013 Art. 8		
General For each boiler, the documents listed below shall be made available in the language of the boiler's country of destination; the documents specified under 8.2 and 8.3 shall be enclosed with every boiler.	ČSN EN 303-5:2013 Art. 8.1	+	
Technical information and installation instructions These documents shall contain at least the following indications:	ČSN EN 303-5:2013 Art. 8.2		
a) necessary draught, in millibars;		+	
b) water content, in litres;		+	
c) exhaust gas temperature at nominal heat output and minimum heat output, in degrees Celsius;		+	
d) exhaust mass flow at nominal heat output and at minimum heat output, in kilograms per second;		+	
e) flue pipe diameter, in millimetres;		+	
f) water-side resistance, in millibars;		+	
g) nominal heat output and heat output range, in kilowatts;		+	
h) boiler class;		+	
i) combustion period in hours at Q_N ;		+	
j) setting range for the temperature controller, in degrees Celsius;		+	
k) minimal return temperature at boiler return tapping, in degrees Celsius;		+	
l) fuel type and water content as well as fuel size and detail information according to Table 7 for fuels type E resp. e;		+	
m) filling chamber capacity in litres and filling opening dimensions, in millimetres;		+	
n) necessary accumulator storage, in litres if $Q_{min} > 0{,}3\ Q_N$;		+	
o) auxiliary power requirement at Q_N and Q_{min}, in watts;		+	
p) stand by power, in watts;		+	
q) cold water temperature and pressure for safety heat exchanger, in bars;		+	
r) electrical connections including appliance and main-switch-off;		+	
s) whether the heating appliance is running with or without using a fan;		+	
t) whether the heating appliance is working under over pressure or under pressure at flue gas outlet;		+	
u) whether the heating appliance is working under condensing or non-condensing conditions;		+	
v) information about the boiler's emission of airborne noise, the method to measure the airborne noise level and the possibilities of means of reducing the noise emission of the boiler.		+	
NOTE Noise measurements should be made according to EN 15036-1.			

Requirement	Requirement specification	Evaluation	Note
Furthermore, the installation instructions shall contain information concerning			
w) the on-site assembly of the boiler (if necessary) and the required water pressure test as per 5.4.2 or 5.5.2.2;		+	
x) the installation;		+	
y) the commissioning, with information on the boiler output to be set in the output range;		+	
z) instructions on the location and fitting of the sensors for the control, display and safety equipment.		+	
In addition, the technical information and installation instructions shall contain general references to the standards and regulations to be observed on the safety equipment of the installation			
- take care of installed ventilations systems in the same heating room;		+	
- take care there is sufficient amount of clean (i.e. uncontaminated) combustion air;		+	
- measuring points should be self-locking and thigh;		+	
- emission control after first installation;		+	
- verbal instruction by a competent person before first using;		+	
- take care of the correct storage of the used fuels;		+	
- regularly checks if the heating appliance is in good condition;			
- take care of the correct dimensioning of the system;		+	
- take care of the correct dimensioning of the chimney including the connecting flue pipe;		+	
- take care of the necessary distances to combustible materials, if required;		+	
- require a shielding construction, if necessary;		+	
- take care of the necessary minimum distance to walls and ceilings (related to cleaning).		x	
		+	
Operating instructions			
The operating instructions shall contain references to:			
- the operation of the boiler, stoking and opening doors without risk;		+	
- cleaning and cleaning intervals, including the equipment required for the cleaning operations;		+	
- measures to be taken in the event of malfunction;		+	
- the reasons for recommending a regular, competent maintenance service and the necessary maintenance intervals;	ČSN EN 303-5:2013 Art. 8.3	+	
- the type of fuel and water content and the fuel size (with the direction of the layers in the case of wood logs);		+	
- the maximum filling height for fuel in the filling chamber;			
- the nominal combustion period for fuel types at nominal heat output		+	
Other documents (brochures, etc.) shall not contain any information that is in contradiction with that of the operating instructions		+	
Check of the safety and risk assessment	ČSN EN 303-5:2013 Art. 5.16		
General A risk analysis shall be performed by the manufacturer according to EN ISO 12100. "Force majeure risks" shall not be taken into consideration. Completeness, correctness and plausibility of the risk analysis of the manufacturer shall be verified by a third party.	ČSN EN 303-5:2013 Art. 5.16.1	+	

The verification does not generally require testing. If tests are performed, the following conditions shall be applied. a) Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler, a steady state condition shall be reached and the outlet pressure at the flue gas section shall be according to the nominal heat output setting. b) For manual stoked boilers, the boiler shall be refuelled after reaching steady state with a full batch before starting the test The verification of the risk analysis can be done on the basis of one or more of the following: – implementation of accepted solutions according to this standard; – implementation of safety functions with verification of the shut-off function; – check of the characteristics of the boiler at normal operation and in the case of failures; – relevant references to other standards or associated test results. The risk analysis shall at least provide risk assessments for the following tasks and take into account possible failures in the components of the fuel supply, the air supply, the combustion and combustion control, the flue gas exit, the heat dissipation, fire prevention and the risk of injuries of persons. The following risks shall be evaluated in detail: c) fuel feed operation continuously at maximum speed, fuel overload; d) feed rate too low; e) loss of air supply; f) loss of power; g) unstable combustion chamber pressure; h) unclosed doors and openings within the boiler or the stoking device; i) open integral fuel hopper; j) empty integral fuel hopper; k) ignition failure during start up; l) check of the strategy for safety against back burning; m) safety check regarding effect of emptiness or a blockage of the stoking device; n) voltage variation; o) leakage of combustion products (e.g. flue gas fan failure, power loss, pressurized combustion chamber); p) lockout and restart; q) electric safety (documents and certificates have to be provided); r) risk of injuries of persons. *NOTE Additional tests are recommended.*	ČSN EN 303-5:2013 Art. 5.16.1	+	

Note:
+... Documentation includes the required data
-... Documentation does not include the required data
0... Not required
x... Not evaluated

Evaluation compiled by: Ing. Marek Skřivan Date: 08/2014 Signed:

Person responsible for evaluation:
Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number: **1001.1*** Test title: **Strength and tightness of pressurized components**

Test method: ČSN EN 303-5:2013 Art. 5.4, 5.4.1, 5.4.2

Sample tested: ORLAN SUPER 96 kW

Measuring equipment used: Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Pressure test for boilers of sheet or sheet metal of non-ferrous metal	ČSN EN 303-5:2013 Art. 5.4		
Tests to be carried out before production The type test pressure is 2 × *PS* using hydraulic pressure where *PS* is the maximum permissible operating pressure. The test period shall be at least 10 min and if it is to apply to a range of boilers, the test shall be carried out on at least 3 boiler sizes (smallest, medium, and largest size). No leakage or noticeable permanent deformation shall occur during the test. A record shall be made of the test, including the following details: - exact description of the boiler tested by stating the drawing number; - test pressure in bar and duration of the test; - test result; - place and date of the test, including the names of persons carrying out the test. The test report shall be signed by, as a minimum, the works tester responsible and one witness.	ČSN EN 303-5:2013 Art. 5.4.1	+ + + + + +	Enclosed technical documentation
Test during production Each boiler shall be tested during the production and the test pressure shall be at least 1.43 × *PS*.	ČSN EN 303-5:2013 Art. 5.4.2	+	

Test evaluation: No leakages or visible permanent deformations appeared during the test.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number: **1003*** Test title: **Surface temperature test**

Test method: ČSN EN 303-5:2013 Art. 5.12, 4.3.6

Sample tested: ORLAN SUPER 96 kW

Measuring equipment used: Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Surface temperature The mean surface temperature shall be measured at nominal heat output. In order to do this, a minimum of 5 points on each boiler surface shall be measured. Under the same conditions, the critical temperatures (e.g. boiler doors, operating levers) shall be measured).	ČSN EN 303-5:2013 Art. 5.12	+	
The surface temperature on the outside of the boiler (including the bottom and doors but not including the flue gas outlet and maintenance openings of natural draft boilers) shall not exceed the room temperature by more than 60 K when tested in accordance with 5.12. The requirement for the bottom is not applicable for instances when the manufacturer declares that the boiler is to be installed on a non-combustible base. When tested in accordance with 5.12, the surface temperature of operating levers and all parts which will be touched by hand during operation of the boiler shall not exceed the room temperature by more than the following values: – 35 K for metals and similar materials; – 45 K for porcelain and similar materials; – 60 K for plastics and similar materials.	ČSN EN 303-5:2013 Art. 4.3.6	+ + + +	

Measurement results: ORLAN SUPER 96 kW

Average temperatures of boiler walls, doors and covers [^{0}C]	
	ORLAN SUPER 96 kW (Wood – A)
Front wall	46
Rear wall	32
Right wall	32
Left wall	30
Top wall	32
Bottom wall	49
Temperatures of control elements [^{0}C]:	
El. control panel (plastic)	29
Stoking door handle (plastic)	40
Ash chamber door handle (plastic)	50
Bypass device handle (plastic)	26
Exchanger cleaning handle (plastic)	25

Measurement uncertainty: 2 °C for temperatures within the range (0 ÷ 250) °C

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. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02.

Test evaluation: Specified temperature rise values have not been exceeded.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1004.1***	Test title:	**Test of heat output, input and efficiency**
	1004.2*		**Test of flue gas temperature**

Test method: ČSN EN 303-5:2013 Art. 4.4.2, 4.4.3, 5.7, 5.8, 5.10

Sample tested: ORLAN SUPER 96 kW

Measuring equipment used: Chapter III - Measuring and test equipment

Test results:

Average measured and calculated values (solid fuels):

Test no.:		I.	II.
Boiler type:		ORLAN SUPER 96 kW	
Date of testing:		2014-06-06	
Output tested:		Nominal	Nominal
Fuel type:		Wood - A	
Combustion period (manual stoking)		> 2 hours	> 2 hours
Nominal heat output (declared by manufacturer)	[kW]	95	95
Flue gas temperature	[°C]	124.4	123.6
Fuel mass added	[kg/h]	22.05	22.04
Inlet water temperature	[°C]	60.2	59.1
Outlet water temperature	[°C]	80.2	78.5
Cooling water temperature	[°C]	13.6	13.8
Cooling water flow rate	[m^3/h]	1.1360	1.1680
Draught after boiler	[Pa]	20.0	20.0
Ambient temperature	[°C]	22.8	24.2
Relative air humidity	[%]	37.6	34.6
Barometric pressure	[kPa]	98.50	98.50

Analysis of combustion products:

Test (combustion period):		I.	II.
Oxygen, O_2	[%]	5.00	5.31
Carbon dioxide, CO_2	[%]	15.60	15.05
Carbon monoxide, CO	[ppm]	399	794
Higher hydrocarbons, THC/OGC	[ppm]	11	38
Nitrogen oxides, NO_x	[ppm]	168	152

Auxiliary combustion values (solid fuels):

Test (combustion period):		I.	II.
Stoichiometric oxygen volume	[m^3/kg]	0.820	0.820
Stoichiometric air volume	[m^3/kg]	3.905	3.905
Stoichiometric volume of dry combustion products	[m^3/kg]	3.857	3.857
Maximum volume of CO_2	[%]	19.98	19.98
Stoichiometric air multiple	[-]	1.31	1.33
Volume of dry combustion products, actual	[m^3/kg]	4.928	5.094
Volume of H_2O in combustion air	[m^3/kg]	0.053	0.056
Content of H_2O in combustion products	[m^3/kg]	0.833	0.836

Calculated values - thermal overview

Test (combustion period):		I.	II.
Loss through sensible heat of combustion products (chimney)	[%]	5.3	5.3
Loss through gas underburning	[%]	0.2	0.3
Loss through mechanical underburning	[%]	0.5	0.5
Loss through heat transfer into environment	[%]	1.2	1.2
Total loss	[%]	7.1	7.3
Efficiency – indirect method	[%]	92.9	92.7
Fuel mass added - actual	[kg/h]	22.374	22.364
Heat input	[kW]	95.5	95.4
Heat output	**[kW]**	**87.9**	**87.7**
Uncertainty of determining heat output	[kW]	3.7	3.7
Efficiency – direct method	**[%]**	**92.1**	**91.9**
Output / Nominal output	[%]	92.5	92.3

The boiler efficiency when burning **wood - A** meets the requirements for **Class 5** as per ČSN EN 303-5:2013.

Test evaluation:

The measured heat output is within the 8 % tolerance;
Boiler Class 5;
At nominal output, the flue gas temperature is less than 160 K above ambient temperature;
Combustion period is 2 hours at nominal output when burning wood - A;

Electricity consumption:

Maximum electrical input	210 W
Electrical input at nominal heat output	132 W
Electrical input for STAND BY mode	2 W

Fuel analysis:

Type of fuel	Wood - A			
Analytical indicator	Symbol	Unit	Value	Uncertainty
Higher heating value	Q_s	[MJ/kg]	16.90	0.14
Lower heating value	Q_j	[MJ/kg]	15.36	0.14
Total water, in original condition	W^r_t	[% of mass]	14.74	0.02
Ash	A	[% of mass]	1.22	0.03
Carbon	C	[% of mass]	41.87	0.25
Hydrogen	H	[% of mass]	5.38	0.10
Nitrogen	N	[% of mass]	0.17	0.10
Sulphur	S	[% of mass]	0.029	0.002
Chlorine	Cl	[% of mass]	0.015	0.002
Oxygen, calculation for 100%	O	[% of mass]	36.58	
Conversion factor f_{emis} for emissions in [mg/m^3] to [mg/MJ]	f_{emis}	[-]	0.25257	

Note: Sample in original condition

Measurement uncertainty: see table Measurement results

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. The uncertainties do not reflect the impact of sample taking and lack of homogeneity. The standard uncertainty was determined in accordance with Document EA 4/02.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number: **1005.1*** Test title: **Combustion efficiency test - emissions**

Test method: ČSN EN 303-5:2013 Art. 4.4.7, 5.7.3, 5.7.4, 5.9, 5.10.4

Sample tested: ORLAN SUPER 96 kW

Measuring equipment used: Chapter III - Measuring and test equipment

Requirement	Requirement specification	Test evaluation	Note
Emission limits Combustion shall be of low-emission. This requirement shall be satisfied if the emission values shown in Table 6 are not exceeded when operating at nominal heat output or, in the case of boilers with heat output range, when operating at nominal heat output and minimum heat output, in accordance with 5.7, 5.9 and 5.10.	ČSN EN 303-5:2013 Art. 4.4.7	+	

Table 6

Fuel supply	Fuel	Nominal heat output	Emission limits								
			CO			OGC/THC			Dust		
			mg/m³ at 10 % O_2								
		kW	Class 3	Class 4	Class 5	Class 3	Class 4	Class 5	Class 3	Class 4	Class 5
Manual	**Biogenic**	≤ 50	5000	1200	**700**	150	50	**30**	150	75	**60**
		> 50 ≤ 150	2500			100					
		> 150 ≤ 500	1200			100					
	Fossil	≤ 50	5000			150			125		
		> 50 ≤ 150	2500			100					
		> 150 ≤ 500	1200			100					
Automatic	Biogenic	≤ 50	3000	1000	500	100	30	20	150	60	40
		> 50 ≤ 150	2500			80					
		> 150 ≤ 500	1200			80					
	Fossil	≤ 50	3000			100			125		
		> 50 ≤ 150	2500			80					
		> 150 ≤ 500	1200			80					

NOTE 1 The dust values in this Table are based on the experience of the gravimetric filter method. The method used needs to be referred to in the test report. The particulate matter emission measured according to this European Standard does not include condensable organic compounds which may form additional particulate matter when the flue gas is mixed with ambient air. The values are therefore not directly comparable with values measured by dilution tunnel methods. Neither can they be directly translated into ambient air particulate concentrations.

NOTE 2 Additional test methods and emission limits which apply in some countries are given in the A-Deviations in Annex C.

[a] Referred to dry exit flue gas, 0 °C, 1013 mbar.

[b] Boilers of class 3 for type E-fuels according to 1.2.1 or e-fuels according to 1.2.3 in this Table and marked with the classification E-fuels and e-fuels do not need to fulfil the requirements for the dust emissions. The actual value shall be stated in the technical documentation and shall not exceed 200 mg/m3 at 10 % O2.

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Average values									
	Measured values						Converted values O_2=10%			
	O_2 [%]	CO_2 [%]	CO [ppm]	OGC/THC [ppm]	NO_x [ppm]	Dust [mg/m^3]	CO [mg/m^3]	OGC/THC [mg/m^3]	NO_x [mg/m^3]	Dust [mg/m^3]
Average values	5.16	15.32	597	24	160	29	520	28	227	20

Test evaluation:

ORLAN SUPER 96 kW hot-water boiler for wood (Wood - A) with manual fuel supply meets at nominal output the emission requirements for **Class 5** as per ČSN EN 303-5:2013 Table 6.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1004.1*** **1005.1***	Test title:	**Test of heat output, input and efficiency** **Combustion efficiency test - emissions**

Test method:	ČSN EN 303-5:2013 Annex C, Deviation from Austria, C.2.2, C.2.3
Sample tested:	ORLAN SUPER 96 kW
Measuring equipment used:	Chapter III - Measuring and test equipment

Test results:

Requirement		**Requirement specification**	**Test evaluation**
Boiler efficiency for nominal heat output		ČSN EN 303-5:2013 Annex C, Deviation from Austria, C.2.2	Wood - A
Boiler	**Minimum efficiency**		
Central heating boilers for solid fuels	75 %		+
a) manually loaded			
up to 10 kW	79 %		
>10 to 200 kW	**(71.3 + 7.7 log Pn) %**		+
>200 kW	89		
b) automatically loaded			
up to 10 kW	80 %		
>10 to 200 kW	(72.3 + 7.7 log Pn) %		
>200 kW	90 %		
NOTE P_n *is the nominal heat output (*Q_N *in this standard).*			

Requirement							**Requirement specification**	**Test evaluation**
Emission limits							ČSN EN 303-5:2013 Annex C, Deviation from Austria, C.2.3	Wood - A
Small burners used for solid fuels manually loaded								
	Emission limits mg/MJ							
	Wood		**Other standardised biogenous fuels**		**Fossil fuels**			
Parameter	Room heaters	Central heaters	Nominal heat output< 50 kW	Nominal heat output> 50 kW	Nominal heat output< 50 kW	Nominal heat output> 50 kW		
CO	1100	**500**	1100	500	1100	500		+
NO_x	150	**150**	300	300	100	100		
OGC/THC	80/50[a]	**50**	50	30	80	30		
Dust	60/35[a]	**50**	60/35[a]	60/35[a]	50/35[a]	50/35[a]		

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Minimum efficiency required	Measured efficiency
Nominal	86.5	92.0

Test evaluation:
The measured efficiency for ORLAN SUPER 96 kW (Wood - A) is **higher** than required.

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Average values								
	Measured values					Converted values O_2=0%			
	O_2 [%]	CO [ppm]	NO_x [ppm]	OGC/THC [ppm]	Dust [mg/m^3]	CO [mg/MJ]	NO_x [mg/MJ]	OGC/THC [mg/MJ]	Dust [mg/MJ]
Average values	5.16	597	160	24	29	249	109	13	10

Test evaluation:

The measured emission values for ORLAN SUPER 96 kW (Wood - A) **do not exceed** the specified values.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1004.1***	Test title:	**Test of heat output, input and efficiency**
	1005.1*		**Combustion efficiency test - emissions**

Test method:	ČSN EN 303-5:2013 Annex C, Deviation from Denmark, C.4.1, C.4.2
Sample tested:	ORLAN SUPER 96 kW
Measuring equipment used:	Chapter III - Measuring and test equipment

Test results:

Requirement		Requirement specification	Test evaluation
Boiler efficiency		ČSN EN 303-5:2013 Annex C, Deviation from Denmark, C.4.1	Wood - A
According to the Danish Construction Code BR08, Clause 8.5.1.4, Sub-clause 7, boilers for coal, coke, bio fuel or biomass shall have an efficiency equivalent to Class 3 as per EN 303-5.			
Minimum efficiency	**(67 + 6 log Qn) %**		+
For boilers above 300 kW, the requirement corresponding to 300 kW shall be applied.			

Requirement						Requirement specification	Test evaluation
Emission limits							Wood - A
According to the Danish EPA Statutory Order No. 1432 of 11/12/2007, only Class 3 (or higher) is acceptable for Denmark.						ČSN EN 303-5:2013 Annex C, Deviation from Denmark, C.4.2	+
Fuel supply	**Fuel**	**Nominal heat output**	**Emission limits** [a]				
			CO	**OGC/ THC**	**Dust**		
			mg/m³ at 10% O_2				
		kW	**Class**				
			3				
Manual	**Biogenic**	≤ 50	5000	150	**150**		
		> 50 to 150	**2500**	**100**			
		> 150 to 300	1200				
	Fossil	≤ 50	5000	150	125		
		> 50 to 150	2500	100			
		> 150 to 300	1200				
Automatic	Biogenic	≤ 50	3000	80	150		
		> 50 to 150	2500				
		> 150 to 300	1200		125		
	Fossil	≤ 50	3000	100			
		> 50 to 150	2500	80			
		> 150 to 300	1200				

[a] Referring to dry exit flue gas, 0 °, 1 013 mbar.

Measurement results: ORLAN SUPER 96 kW

Boiler output	Minimum efficiency required	Measured efficiency
Nominal	78.9	92.0

Test evaluation:
The measured efficiency for ORLAN SUPER 96 kW (Wood - A) is **higher** than required.

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Average emission values						
	Measured values				Converted values O_2=10%		
	O_2 [%]	CO [ppm]	OGC/THC [ppm]	Dust [mg/m^3]	CO [mg/m^3]	OGC/THC [mg/m^3]	Dust [mg/m^3]
Average values	5.16	597	24	29	520	28	20

Test evaluation:

The measured efficiency for ORLAN SUPER 96 kW (Wood - A) **do not exceed** the specified values.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1004.1***	Test title:	**Test of heat output, input and efficiency**
	1005.1*		**Combustion efficiency test - emissions**

Test method:	ČSN EN 303-5:2013 Annex C, Deviation from Germany, C.5.1, C.5.2
Sample tested:	ORLAN SUPER 96 kW
Measuring equipment used:	Chapter III - Measuring and test equipment

Test results:

Requirement					**Requirement specification**	**Test evaluation**
Emission limits						
Table 7 – Emission limitsThe emission limits are regulated in Chapter 2, paragraphs 4, 5 and Annex 2 of the German Immission Control Ordinance *"Erste Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über kleine und mittlere Feuerungsanlagen - 1. BImSchV)"*.Boilers operated with solid fuels shall only be installed, possess the quality and be put into operation if they fulfil the following specifications of the 1. *BImSchV*.					ČSN EN 303-5:2013 Annex C, Deviation from Germany, C.5.1, C.5.2	Wood - A
	Fuel acc. to § 3 (1)	**Heat output range kW**	**Dust g/m³**	**CO g/m³**		
Stage 1: Appliances, which will be installed after 22.3.2010	Numbers 1 to 3a	≥ 4 ≤ 500	0.09	1.0		
		> 500	0.09	0.5		
	Numbers 4 to 5	**≥ 4 ≤ 500**	**0.10**	**1.0**		+
		> 500	0.10	0.5		
	Number 5a	≥ 4 ≤ 500	0.06	0.5		
		> 500	0.06	0.5		
	Numbers 6 to 7	≥ 30 ≤ 100	0.10	0.8		
		> 100 ≤ 500	0.10	0.5		
		> 500	0.10	0.3		
Stage 2: Appliances, which will be installed after 31.12.2014	**Numbers 1 to 5a**	**≥ 4**	**0.02**	**0.4**		+
	Numbers 6 to 7	≥ 30 ≤ 500	0.02	0.4		
		> 500	0.02	0.3		
	Numbers 8 to 13	≥ 4 < 100	0.02	0.4		
NOTE Differing from sentence 1 for firing systems (appliances) which will exclusively be fired by fuels according §3 Article 1 Number 4 in the form of split logs, the limits according to Stage 2 apply for firing systems (appliances) if they are installed after 31.12.2016.						

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Average emission values				
	Measured values			Converted values O_2=13%	
	O_2 [%]	CO [ppm]	Dust [mg/m^3]	CO [g/m^3]	Dust [g/m^3]
Average values	5.16	597	29	0.378	0.015

Test evaluation:

The measured emission values for ORLAN SUPER 96 kW (Wood - A) **do not exceed** the specified values.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1004.1***	Test title:	**Test of heat output, input and efficiency**
	1005.1*		**Combustion efficiency test - emissions**

Test method:	ČSN EN 303-5:2013 Annex C C.6 Deviation from Switzerland
Sample tested:	ORLAN SUPER 96 kW
Measuring equipment used:	Chapter III - Measuring and test equipment

Test results:

<table>
<tr><th>Requirement</th><th>Requirement specification</th><th>Test evaluation</th></tr>
<tr><td colspan="2">Emission limits</td><td></td></tr>
<tr><td colspan="2">Article 4.4.7, Table 7
The emission limits are regulated in Annex 4 of the Swiss Ordinance on Air Pollution Control ([OAPC] SR 814.318.142.1) of 1985-12-16 (as at 2010-07-15).
Boilers operated with woody biomass shall only be put on the market if they fulfil the following specifications of the OAPC:
– declarations of conformity (Figure 20 OAPC);
– Figures 1, 212, 23 Annex 4 OAPC;
– Figures 31, 32 Annex 5 OAPC.
Emissions for boilers operated with coal or woody fuels shall not exceed the following limits:</td><td rowspan="5">ČSN EN 303-5:2013 C.6 Deviation from Switzerland</td><td>Wood - A</td></tr>
<tr><td>Type of installation</td><td>Particular requirements (emission limits)[a] for carbon monoxide (CO) and particulate matter (dust)
CO (mg/m^3) | Dust (mg/m^3)</td><td></td></tr>
<tr><td>Boilers for log wood and boilers for coal, manual stoking</td><td>800 | 50</td><td>+</td></tr>
<tr><td>Boilers for chipped wood and boilers for coal, automatic stoking</td><td>400 | 60</td><td></td></tr>
<tr><td>Boilers for wood pellets, automatic stoking</td><td>300 | 40</td><td></td></tr>
<tr><td colspan="3">[a] Referred to oxygen basis:
– for boilers for natural state wood 13 % volume;
– for boilers for coal 7 % volume.</td></tr>
<tr><td colspan="2">The sulphur content of coal, coal briquettes and coke shall not exceed 3 %. Boilers operated with non-woody biomass shall comply with the following specifications of the OAPC:
– Figures 741, 742, 743 Annex 2 OAPC;
– Figures 81, 82 Annex 3 OAPC.
According to Figure 743, Annex 2 OPAC, non-woody biomass, such as biogenic waste and products from agriculture, may only be burnt in boilers with a heat input of at least 70 kW. Such units need an approval and shall meet stronger emission limits according to Figure 742, Annex 2 OAPC</td><td>0</td></tr>
</table>

Measurement results: ORLAN SUPER 96 kW – Wood - A

Boiler output	Average emission values				
	Measured values			Converted values O_2=13%	
	O_2 [%]	CO [ppm]	Dust [mg/m^3]	CO [mg/m^3]	Dust [mg/m^3]
Average values	5.16	597	29	378	15

Test evaluation:

The measured emission values for ORLAN SUPER 96 kW (Wood - A) **do not exceed** the specified values.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number:	**1006.1*** **1005.1***	Test title: **Function test of control, regulation and safety elements Combustion efficiency test - emissions**

Test method:	ČSN EN 303-5:2013 Art. 5.13, 5.14, 5.16.1, 5.16.2, 5.16.3 ČSN EN 303-5:2013 Art. 5.9, 5.10.4
Sample tested:	ORLAN SUPER 96 kW
Measuring equipment used:	Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Function check of the temperature controller and safety temperature limiter at the boiler The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test °C. Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler. A steady state condition shall be reached and the outlet pressure at the flue gas section shall be according to the nominal heat output setting. For manual stoked boilers, the boiler shall be refuelled after reaching steady state with a full batch before starting the test. The dissipated output shall be reduced to (40 ± 5) % of the nominal heat output of the boiler, circulating pump running in continuous operation; temperature controller adjusted to maximum set value. When the temperature controller is operating normally, the measured flow temperature shall not exceed 100 °C; the safety temperature cut out or limiter or the device for dissipating excess heat shall not trigger. Repeat the test with the temperature controller out of function. This time, check if the safety temperature limiter/detector switches off the firing system at the highest value specified by the boiler manufacturers and if all hazardous operation states are avoided (see 4.1).	ČSN EN 303-5:2013 Art. 5.13	+	
Function test for the rapidly dis-connectable firing system – Sudden absence of heat dissipation The water-side flow rate shall comply with that specified for the nominal output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler, a steady state condition is reached and the outlet pressure at the flue spigot is according to the nominal heat output. The heat consumption is set to 0; water circulation in the boiler is permitted; temperature controller is adjusted to manufacture recommended maximum set value. Check if the safety temperature limiter or the temperature controller switches off the firing system and all hazardous operation states are avoided.	ČSN EN 303-5:2013 Art. 5.14	0	

- Loss of the electrical power supply The water-side flow rate shall comply with that specified for the nominal heat output test. The flow temperature of 75 °C shall not be exceeded at the start of the test. Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the rated heat output. The electrical power supply including the circulation is cut off, check that no hazardous operation conditions occur. For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered.			
Loss of combustion air supply The safety of the heating boiler shall be checked at maximum heat input under the following conditions: – failure of combustion air fan; – failure to close off the adjustable combustion air supply. In each case, only one failure shall be simulated. The CO concentrations in the boiler shall not exceed 5 % volume. The measurement of CO concentration shall be carried out in the flue gas measuring section. **Test of combustion air supply loss**	ČSN EN 303-5:2013 Art. 5.16.3	+	

Note:
+... Compliant
-... Non-compliant
0... Not applicable
x... Not evaluated

Test results:

Temperature controller		
Temperature	**[°C]**	**Note:**
Pre-set	90 °C	Temperature limit set on the temperature controller
Shutdown	91 °C	Fan switched off
Restoration of operation	82 °C	Fan switched on

Temperature limiter STB		
Temperature	**[°C]**	**Note:**
Pre-set	97 °C	Temperature limit set on the temperature limiter
Shutdown	99 °C	Fan switched off
Restoration of operation	The boiler irreversibly switched off. In order to restore operation, a manual intervention required, after the temperature drops under the limiter switching temperature.	

Test evaluation: Proper functioning of safety elements has been verified.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

Accredited test number: **1006.2*** Test title: **Function test on the device for dissipating excess heat**

Test method: ČSN EN 303-5:2013, Art. 4.1, 5.15

Sample tested: ORLAN SUPER 96 kW

Measuring equipment used: Chapter III - Measuring and test equipment

Test results:

Requirement	Requirement specification	Test evaluation	Note
Function test on the device for dissipating excess heat (partly or non dis-connectable firing system) Adjust the firing so that it corresponds to the nominal heat output Q_N of the boiler, a steady state condition is reached and the outlet pressure at the flue gas section is according to the nominal heat output. Put the temperature controller out of function. Maintain the function of the safety temperature limiter. The heat consumption is set to 0; water circulation in the boiler is permitted. Check if the safety temperature limiter switches off the firing system and the device for dissipating excess heat works properly and all hazardous operation states are avoided. The cold water shall be kept at a temperature of (10 ± 5) °C and a pressure of maximum 2 bar. (Deviations are permissible if they are specified in the installation instructions.) For the evaluation of the temperatures and the CO-concentrations, only mean values at a maximum average time of one minute shall be considered..	ČSN EN 303-5:2012 Art. 5.15	+	
The heat carrier (water) does not become heated to a dangerous extent (≤ 110 °C);	ČSN EN 303-5:2012 Art. 4.1	+	

Note:
+ Compliant
- Non/compliant
0 Not applicable
x Not evaluated

Measurement results:

Measured and calculated values:	Unit	Value	Limit	Note
Highest temperature of heating water in boiler	°C	105.4	110	
Cooling water temperature at safety valve inlet	°C	14.4		
Water temperature at cooling loop outlet	°C	43.2		
Water flow through safety valve	kg/h	1628		
Cooling (dissipated) output	kW	54.4		
Uncertainty of determining the cooling output	kW	1.0		
Safety valve opening temperature	°C	97.0		
Fan switching-off temperature	°C	99.0		
Cooling water inlet pressure	bar	1.9		

Test evaluation: During safety test of the device for dissipating excess heat, the water temperature at the outlet from the boiler has not exceeded 110 °C.

Tested by: Ing. Marek Skřivan Date: 08/2014 Signed:

Reviewed by: Ing. Stanislav Buchta Date: 08/2014 Signed:

The test methods in this Report were applied without any deviations, additions or exceptions.

V. List of referenced documents

- Order B-47555 of 2013-09-04 (received on 2013-09-04)
- Contract B-47555/31
- Change of implementation date - Contract B-47555/31, letter Ref. No. 0210-Sk/493 of 2014-08-04
- ČSN EN 303-5:2013 – Heating boilers – Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW – Terminology, requirements, testing and marking
- Instructions for assembly, installation and operation of the boiler
- A set of the required drawing documentation to Tasks 31-9433 and 32-0119

Persons accountable for correctness of above-specified data:

Ing. Stanislav Buchta
Head of Boilers and Industrial Heat Equipment Department

Milan Holomek
Head of Heat and Environment-Friendly Equipment Test Station