TEST REPORT n.1880-CPR-096-25

TEST REPORT

EN 16510-2-6:2022
Residential solid fuel burning appliances – Part 2.6: Mechanically by wood pellets fed roomheaters, inset appliances and cookers

EN 16510-1:2022
Residential solid fuel burning appliances – Part 1: General requirements and test methods

Manufacturer:	THERMOROSSI S.P.A. VIA GRUMOLO, 4 36011 ARSIERO (VI) ITALY
Type designation: Serial number	INSERTLINE IDRA MAXI EVO6 not present
Appliance family:	--
Type of appliance:	Mechanically by wood pellets fed roomheater with boiler
Receipt date:	December 9, 2025
Start test date:	December 10, 2025
End test date:	December 12, 2025
Issue date:	February 12, 2026

Head of Test Laboratory
Dr.ssa Claudia Marcuzzi

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LIST OF THE ESSENTIAL CHARACTERISTICS DECLARED BY THE MANUFACTURER

Essential characteristic		declared	confirmation
Mechanical resistance and stability			
Load bearing capacity	kg	0	yes
Safety in case of fire			
Minimum distance to combustible materials:			
Bottom d_B	mm	0	--
Floor in front d_F	mm	200	--
Ceiling d_C	mm	750	--
Rear d_R	mm	50	--
Side d_S	mm	100	--
Side radiation d_L	mm	400	--
Front d_P	mm	800	--
Material type and thickness of protective insulation material (s)	mm	NPD	--
Hygiene, health and the environment			
At nominal heat output:			
CO CO_{nom}	mg/m^3	47	yes
NOx NOx_{nom}	mg/m^3	96	yes
OGC OGC_{nom}	mg/m^3	2	yes
PM PM_{nom}	mg/m^3	7	yes
At part load heat output:			
CO CO_{part}	mg/m^3	203	yes
NOx NOx_{part}	mg/m^3	137	yes
OGC OGC_{part}	mg/m^3	8	yes
PM PM_{part}	mg/m^3	11	yes
Safety and accessibility in use			
Data for installation to a chimney at nominal heat output:			
Flue gas outlet temperature T_{snom}	°C	156	yes
Minimum flue draught p_{nom}	Pa	12	yes
Flue gas mass flow $Ø_{f,g,nom}$	g/s	14,7	yes
Data for installation to a chimney at part load heat output:			
Flue gas outlet temperature T_{spart}	°C	88	yes
Minimum flue draught p_{part}	Pa	12	yes
Flue gas mass flow $Ø_{f,g,part}$	g/s	10,7	yes
Data for installation to a chimney regarding fire safety on safety test heat output:			
Fire safety of installation to a chimney	--	T200 G	yes
Energy economy and heat retention			
Appliance's thermal output and energy efficiency at nominal heat output			
Space heat output P_{SHnom}	kW	3,2	yes
Water heat output P_{Wnom}	kW	20,4	yes
Efficiency η_{nom}	%	93	yes
Appliance's thermal output and energy efficiency at part load heat output			
Space heat output P_{Spart}	kW	0,8	yes
Water heat output P_{Wpart}	kW	5,9	yes
Efficiency η_{part}	%	92	yes
Space heating efficiency			
Seasonal space heating efficiency η_s	%	82	yes
Energy efficiency:	EEI	124	yes
	Class	A+	yes
Electric power consumption at nominal heat output el_{max}	kW	0,113	yes
Electric power consumption at part load heat output el_{min}	kW	0,100	yes
Standby mode power consumption el_{SB}	kW	0,003	yes
Sustainable use of natural resources			
Environmental sustainability	--	NPD	yes

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TASK

ACTECO SRL was instructed to assess the performance of the appliance on the basis of testing in accordance with EN 16510-2-6:2022, clause 6.2 “Assessment of performance”
Document NB-CPR/SG03-23/016r1 was applied as guidance in the application of the standard series EN 16510.
The practical tests were performed in the laboratory in Cordenons (PN), via Amman, 41.

Assessment according to par. 5.8 “Electrical safety and functional safety of electrical components” is not carried out.
Assessment according to par. 8 “Environmental sustainability” was not performed. No performance related to this clause was provided.
Safety tests for the assessments of the safety distances to combustible materials, temperature rise in the hopper and the risk assessment according to Annex K were not requested.
The load bearing capacity of the appliance was not verified since it was declared by the manufacturer that no load was permitted.

SAMPLING OF THE APPLIANCE

Sampling is not under the scope of the Notified Body and AVCP system 3; the appliance was sampled by the manufacturer and was received by the testing laboratory on November 9, 2025.
The tested appliance represents a prototype.
The tests were carried out on the appliance as received.

DESCRIPTIVE FEATURES OF THE APPLIANCE

(not in the scope of accreditation and not under AVCP system 3)
INSTERTLINE IDRA MAXI EVO6 is a pellet mechanically fed inset appliance with radiation and forced convection air, fitted with a boiler.
The appliance is equipped with a glass pane swing door with vertical hinges for the firebox.
The firebox is lined with cast iron panels.
The appliance is equipped with a convection air fan, an ignition resistance for the automatic ignition and a fan assisted exhaust flue gas discharge.
The feeding system is equipped with a pellet loading auger gearmotor.
Combustion is controlled by an electronic control unit, and air is conveyed through a heat exchanger to heat the room.
The appliance is not intended for open operation.
The flue gas outlet has a diameter of 80 mm. and is placed in the rear right back the appliance; the outlet is vertical.

The appliance is equipped with:
- removable retort;
- an ashpan;
- a boiler.

The appliance is not equipped with:
- catalyst;
- a fuel storage compartment other than the pellet hopper;
- a damper / fan cut-off device.

The appliance is not intended for open operation.

Designation of the appliance (according to Table 1 – Types of appliances):
- Type BE;
- room sealed: NO;
- leakage declaration: NO;
- combustion air supply connection: YES;
- door closure: no specific requirement;
  - tightness requirement: appliance intended to be supplied with combustion air via a combustion air duct - no specific requirements for tightness.

ELECTRICAL COMPONENTS		
description	**supplier**	**type/model**
Safety water temperature limiter	IMIT	STB FIX 100°C TYPE LS1 7045 15 (2,5) A/250v
Safety pressure switch	HUBA	TYPE 605 99908 0,2/30V 22/10Pa
Flue gas blower	EBM PAPST	R2E180-CG82-34 230V 50Hz 72W 0,32A
Fuel motor	MERKLE - KORFF INDUSTRIES INC	GFIB/F SNCM B3720U NB-NF 230V 50 Hz 18 W 3 rpm
Burner cleaning system motor	MERKLE - KORFF INDUSTRIES INC	GFIB/F SNCM S4415U NB NF 230V 50Hz 1 rpm
Ignition resistance	ROTFIL	UTXSO21221 12,5x308 W350 V240
Control board	THERMOROSSI	IDROLINE

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CE 26
EN 16510-1:2022
EN 16510-2-6:2022

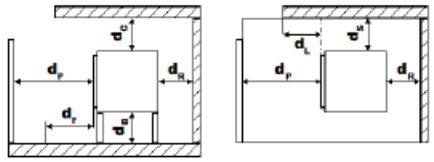
MODELLO - MODEL - MODELL - MODÈLE - MODELO
INSERTLINE IDRA MAXI EVO6

MATRICOLA N° / SERIAL NUMBER / SERIEN – NR. / NUMÉRO DE SÉRIE / MATRÍCULA N°: **17522753600000010**

TIPO DI COMBUSTIBILE: (I) - PELLET
TYPE OF FUEL: (I) - WOOD PELLETS
BRENNSTOFF: (I) - HOLZPELLET
TYPE DE COMBUSTIBLE: (I) - PELLET
TIPO DE COMBUSTIBLE: (I) - PELLETS

Leggere e seguire le istruzioni di funzionamento
Read and follow the operating instructions
De Bedienanleitung lesen und befolgen
Lire et suivre les instructions d'utilisation
Leer y seguir las instrucciones de funcionamiento

	ALLA POTENZA NOMINALE AT NOMINAL HEAT OUTPUT NENNWÄRMELEISTUNG À LA PUISSANCE NOMINALE A LA POTENCIA NOMINAL	A POTENZA PARZIALE PART LOAD HEAT OUTPUT TEILLAST-WÄRMELEISTUNG À LA PUISSANCE PARTIELLE A LA POTENCIA PARCIAL	
Pnom - POTENZA NOMINALE (kW) Pnom - NOMINAL HEAT OUTPUT (kW) Pnom - NENNWÄRMELEISTUNG (kW) Pnom - PUISSANCE NOMINALE (kW) Pnom - POTENCIA NOMINAL (kW)	23,7	Ppart - POTENZA NOMINALE (kW) Ppart - NOMINAL HEAT OUTPUT (kW) Ppart - NENNWÄRMELEISTUNG (kW) Ppart - PUISSANCE NOMINALE (kW) Ppart - POTENCIA NOMINAL (kW)	6,7
PSHnom - POTENZA ALL'AMBIENTE (kW) PSHnom - SPACE HEAT OUTPUT (kW) PSHnom - RAUMWÄRMELEISTUNG (kW) PSHnom - PUISSANCE À L'AMBIANT(kW) PSHnom - POTENCIA AL AMBIENTE (kW)	3,2	PSHpart - POTENZA ALL'AMBIENTE (kW) PSHpart - SPACE HEAT OUTPUT (kW) PSHpart - RAUMWÄRMELEISTUNG (kW) PSHpart - PUISSANCE À L'AMBIANT(kW) PSHpart - POTENCIA AL AMBIENTE (kW)	0,8
PWnom - POTENZA ALL'ACQUA (kW) PWnom - WATER OUTPUT (kW) PWnom - WASSERLEISTUNG (kW) PWnom - PUISSANCE À L'EAU (kW) PWnom - POTENCIA AL AGUA (kW)	20,4	PWpart - POTENZA ALL'ACQUA (kW) PWpart - WATER OUTPUT (kW) PWpart - WASSERLEISTUNG (kW) PWpart - PUISSANCE À L'EAU (kW) PWpart - POTENCIA AL AGUA (kW)	5,9
ηnom - RENDIMENTO (%) ηnom - EFFICIENCY (%) ηnom - WIRKUNGSGRAD (%) ηnom - RENDEMENT (%) ηnom - RENDIMIENTO (%)	93	ηpart - RENDIMENTO (%) ηpart - EFFICIENCY (%) ηpart - WIRKUNGSGRAD (%) ηpart - RENDEMENT (%) ηpart - RENDIMIENTO (%)	92
COnom (13% O_2) - CO (13% O_2) mg/m³	47	COpart (13% O_2) - CO (13% O_2) mg/m³	203
NOxnom (13% O_2) - NOx (13% O_2) mg/m³	96	NOxpart (13% O_2) - NOx (13% O_2) mg/m³	137
OGCnom (13% O_2) - OGC (13% O_2) mg/m³	2	OGCpart (13% O_2) - OGC (13% O_2) mg/m³	8
PMnom (13% O_2) - PM (13% O_2) mg/m³	7	PMpart (13% O_2) - PM (13% O_2) mg/m³	11
pnom - TIRAGGIO MINIMO (Pa) pnom - MINIMUM DRAUGHT (Pa) pnom - MINIMALER ZUGBEDARF (Pa) pnom - TIRAGE MINIMUM (Pa) pnom - TIRO MÍNIMO (Pa)	12	ppart - TIRAGGIO MINIMO (Pa) ppart - MINIMUM DRAUGHT (Pa) ppart - MINIMALER ZUGBEDARF (Pa) ppart - TIRAGE MINIMUM (Pa) ppart - TIRO MÍNIMO (Pa)	12



DISTANZA MINIMA DA MATERIALI INFIAMMABILI
MINIMUN GAP FROM FLAMMABLE MATERIALS
MINDESTABSTAND ZU BRENNBAREN MATERIALIEN
DISTANCE MINIMALE DEPUIS TOUT MATÉRIAU INFLAMMABLE
DISTANCIA MÍNIMA DE MATERIALES INFLAMABLES

d_P=	1250	mm	d_F=	1500	mm
d_C=	750	mm	d_L=	1500	mm
d_R=	200	mm	d_S=	220	mm
d_B=	100	mm			

p_W - PRESSIONE MASSIMA DELL'ACQUA kPa (bar) p_W - MAXIMUN WATER PRESSURE kPa (bar) p_W - MAXIMALER BETRIEBSDRUCK WASSER kPa (bar) p_W - PRESSION D'EAU MAXIMALE kPa (bar) p_W - PRESIÓN MÁXIMA DE AGUA kPa (bar)	2,5	TEMPERATURA MASSIMA DI ESERCIZIO H_2O (°C) MAXIMUN WORKING TEMPERATURE H_2O (°C) MAXIMALE BETRIEBSTEMPERATUR H_2O (°C) TEMPÉRATURE DE SERVICE MAXIMALE H_2O (°C) TEMPERATURA DE MÁXIMO EJERCICIO H_2O (°C)	80
E,f - COLLEGAMENTO ELETTRICO (V - Hz) E,f - ELECTRIC CONNECTION (V - Hz) E,f - STROMANSCHLUSS (V - Hz) E,f - BRANCHEMENT ÉLECTRIQUE (V - Hz) E,f - CONEXIÓN ELÉCTRICA (V - HZ)	230 - 50	Wmax - MASSIMO ASSORBIMENTO (W) Wmax - MAXIMUM ABSORPTION (W) Wmax - HÖCHSTE STROMAUFNAHME (W) Wmax - ABSORPTION MAXIMALE (W) Wmax - ABSORCIÓN MÁXIMA (W)	370
Apparecchio per riscaldamento domestico a pellet Domestic heating appliance fuelled by wood pellets Holzpellet heizgerät für den haushalt Appareil de chauffage domestique à pellet Equipo de calefacción domestica de pellets	TYPE BE		

ARRANGEMENT AND PREMISES FOR TEST

The appliance was installed on a platform scale according to the manufacturer's instructions as delivered (mounted on a base with front panel).
The flue gas outlet of the appliance was connected to the measuring section as described in Fig. A.3.
Tests at nominal output were carried out according to par. A.4.7 with wood pellet.
The end of test cycle was based on the requirements of EN 16510-2-6:

- par. A.4.7.3 - two separate 3 h tests for the nominal heat output test;
- par. A.4.8.1 - one 6 h test for the part load heat output test.

The manufacturer supplied the pellet to be used as fuel for the testing, together with a Test report of its specifications issued by an accredited laboratory.

NOMINAL AND PART LOAD HEAT OUTPUT TEST RESULTS

			nominal load			part load
Test n°			1	2	average	1
Test date			10/12/25	11/12/25	--	12/12/25
Start time			11:17	10:02	--	09:20
End time			14:17	13:02	--	15:20
Combustion:						
fuel load		*kg*	15,48	15,54	15,51	8,96
test period		*min*	180	180	180	360
fuel load	M_h	*kg/h*	5,16	5,18	5,17	1,49
average flue draught		*Pa*	12,4	12,1	12,2	12,2
Ventilation circuit:						
average ambient room temperature	T_a	*°C*	21,7	21,5	21,6	20,6
Flue gas:						
carbon dioxide	CO_2	*%*	12,1	12,3	12,2	4,5
oxygen	O_2	*%*	8,5	8,2	8,4	16,2
average flue gas temperature	T_{fg}	*°C*	129	130	130	73
maximum flue gas temperature		*°C*	131	132	132	76
flue gas outlet temperature	T_s	*°C*	155	156	156	88
flue gas mass flow	$\Phi_{f,g}$	*g/s*	14,8	14,6	14,7	10,7
efficiency	η	*%*	93,2	93,2	93,2	91,8
space heat output	P_{SH}	*kW*	3,2	3,3	3,2	0,8
water heat output	P_W	*kW*	20,4	20,4	20,4	5,9
total heat output (1)	P	*kW*	23,6	23,7	23,7	6,7
CO (at 13% O_2)		*mg/m³*	34	59	47	203
CO		*mg/MJ*	23	39	31	135
NOx (as NO_2 at 13% O_2) (measured)		*mg/m³*	105	102	103	137
NOx (as NO_2 at 13% O_2) (recalculated) (§)		*mg/m³*	97	94	96	--
NOx (as NO_2)		*mg/MJ*	65	62	64	91
OGC (as C at 13% O_2)		*mg/m³*	1	2	2	8
OGC (as C)		*mg/MJ*	1	2	1	5
Particulate matter (PM) (at 13% O_2)		*mg/m³*	6	7	7	11
Particulate matter (PM)		*mg/MJ*	4	5	4	7

(1) each separate test result differs from the mean value by <10% therefore the condition for selection of the tests is fulfilled

(§) calculation based on N content of the fuel according to formula (D.4)

			nominal load			part load
Test n°			1	2	average	1
Test date			10/12/25	11/12/25	--	12/12/25
Start time			11:17	10:02	--	09:20
End time			14:17	13:02	--	15:20
Boiler curcuit						
average boiler water output temperature		°C	73,8	73,8	73,8	59,9
average boiler water input temperature		°C	50,0	50,0	50,0	53,0
average boiler water temperature rise	ΔT_w	°C	23,8	23,8	23,8	6,9
water flow rate	Φ_w	kg/h	724	725	725	734
water heat output	P_W	kW	20,4	20,4	20,4	5,9

Electrical power consumption:			--
at nominal heat output	el_{max}	kW	0,113
at part load heat output	el_{min}	kW	0,100
while in standby mode	el_{SB}	kW	0,003

ENERGY ECONOMY AND HEAT RETENTION

Appliance's thermal output and energy efficiency at nominal heat output:		
space heat output at nominal heat output	kW	3,2
water heat output at nominal heat output	kW	20,4
efficiency at nominal heat output	%	93
Appliance's thermal output and energy efficiency at part heat output:		
space heat output at part heat output	kW	0,8
water heat output at part heat output	kW	5,9
efficiency at part heat output	%	92
Space heating efficiency:		
seasonal space heating efficiency at appliance's nominal heat output η_s	%	82
Energy efficiency index EEI	-	124
Energy efficiency class	-	A+
Auxiliary electricity consumption at nominal heat output el_{max}	kW	0,113
Auxiliary electricity consumption at minimum heat output el_{min}	kW	0,100
Auxiliary electricity consumption in standby mode el_{SB}	kW	0,003
Correction factors:		
Correction factor F(2)	%	0,0
Correction factor F(3)	%	0,0
Correction factor F(4)	%	1,1

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STATEMENTS OF THE TEST RESULTS

NOMINAL LOAD HEAT OUTPUT TEST

Parameter		result	specified values		Reg. (EU) 2015/1185	
				conformity	requirement	conformity
efficiency	%	93,2	93	pass	--	--
seasonal efficiency	%	82	82	pass	79	pass
nominal heat output	*kW*	23,7	23,6	pass	--	--
carbon monoxide [at 13% O_2]	*mg/m³*	47	47	pass	300	pass
NOx (as NO_2 at 13% O_2)	*mg/m³*	96	96	pass	200	pass
OGC (as C at 13% O_2)	*mg/m³*	2	2	pass	60	pass
PM emission (at 13% O_2)	*mg/m³*	7	7	pass	20	pass

PART LOAD HEAT OUTPUT TEST

Parameter		result	specified values		Reg. (EU) 2015/1185	
				conformity	requirement	conformity
efficiency	%	91,8	92	pass	--	--
heat output	*kW*	6,7	6,7	pass	--	--
carbon monoxide [at 13% O_2]	*mg/m³*	203	203	pass	300	pass
NOx (as NO_2 at 13% O_2)	*mg/m³*	137	137	pass	200	pass
OGC (as C at 13% O_2)	*mg/m³*	8	8	pass	60	pass
PM emission (at 13% O_2)	*mg/m³*	11	11	pass	20	pass

The specified values declared by the manufacturer are rounded as required by EN 16510-1, Table 22 – Parameters to be given on the appliances' technical datasheet and data plate.

REQUIREMENTS OF LOCAL REGULATIONS

		declared values at nominal heat output	Ecodesign Regulation (EU) 2015/1185	Italian Decree n°186/2017 5 STARS	French Flamme Verte
			limits		
efficiency	%	93	--	88	
seasonal efficiency	%	82	79	--	79
carbon monoxide (at 13% O_2)	mg/m^3	47	300	250	300
NOx (as NO_2 at 13% O_2)	mg/m^3	96	200	100	200
OGC (as C at 13% O_2)	mg/m^3	2	60	10	60
PM emission (at 13% O_2)	mg/m^3	7	20	15	20
PM + OGC	mg/m^3	9	--	--	70
conformity			pass	pass	pass

MEASURING DEVICES

The requirements of the measuring instruments are fulfilled.
Before each measurement series, analysers were checked for leakage and a preliminary zero and span check and adjustment (if needed) was performed with zero gas and calibration gas.
After each measurement series, analysers were zero and span checked to verify drift.
Deviations between checks after the measurement series and the preliminary adjustments were <2%, therefore no corrections to the measured values were necessary.

Tests conducted on test rig 4					
Parameter measured	Traceabiliy	test rig 1	test rig 2	test rig 3	test rig 4
O_2 analyzer, MRU, paramagnetic	internal calibration	260	323	261	207
CO, CO_2, NOx analyzer, MRU, IR	internal calibration	260	323	261	207
zero gas (O_2, CO, CO_2, NOx)	Air liquid	Alphagaz 1 nitrogen			
span gas (O_2)	--	ambient air			
span gas (low CO, CO_2, NOx)	ACCREDIA	certified Sapio calibration gas			
span gas (high CO, CO_2, NOx)	ACCREDIA	certified Sapio calibration gas			
OGC analyzer, Ratfisch, FID	internal calibration	202	--	--	--
OGC analyzer, Environment, FID	internal calibration	--	325	267	311
zero gas	--	ambient air			
span gas (low propane)	ACCREDIA	certified Sapio calibration gas			
span gas (high propane)	ACCREDIA	certified Sapio calibration gas			
static pressure, MRU, flue draught	internal calibration	260	307	261	207
ambient room temperature, National Instruments, thermocouples K	internal calibration	262	262	284	292
flue gas temperature, MRU, thermocouples K	internal calibration	260	325	261	207
surface temperature, National Instruments, thermocouples K	internal calibration	262	262	284	292
thermometer, Delta Ohm, thermocouple K	ACCREDIA	281			
deprimometer, Sfera Technology	ACCREDIA	297			
water flow temperature, Microplan, PT100	internal calibration	175			
water flow temperature, Microplan, PT100	internal calibration	203			
thermometer, Delta Ohm, PT100	ACCREDIA	301			
water flow, Siemens, magnetic	internal calibration	175			
water flow, Siemens, magnetic	internal calibration	203			
flow meter	ACCREDIA	211			

Parameter measured	Traceabiliy	test rig 1	test rig 2	test rig 3	test rig 4
dust measuring equipment, PME sampling probe and heated filter holder, Sfera Technology	internal calibration	307	307	308	309
dust measuring equipment, sampler, Sfera Tecnology	internal calibration	--	268	--	268
dust measuring equipment, sampler, Mega System	internal calibration	223	--	199	--
scale, Mettler Toledo, 205 g/0.01 mg	internal calibration	004			
scale, Komina, 10 kg/0.5 g	internal calibration	007			
scale, SBP, 1500 kg/20 g	internal calibration	272	272	305	306
certified masses, Mettler Toledo	ACCREDIA	014, 015, 016, 017, 018, 019, 020, 021, 022, 023, 024, 025, 026, 027			

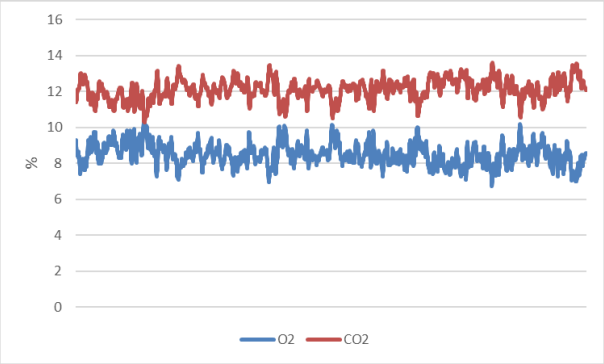
All data were continuously recorded with data logger at intervals of 5 seconds. All raw data is stored for 10 years.

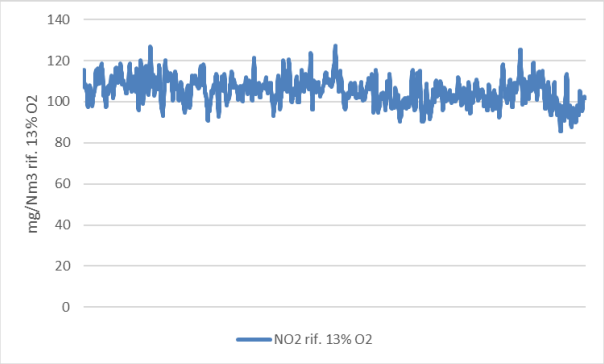
FUEL DATA

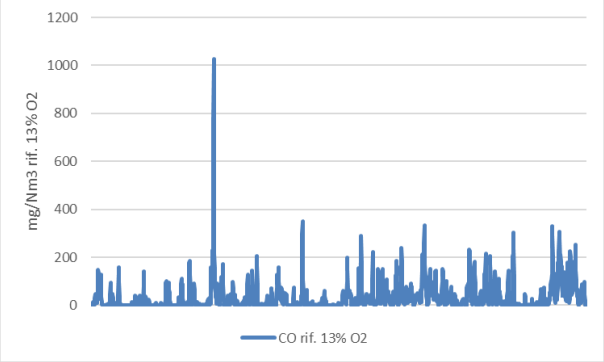
	nominal heat output test
Fuel	wood pellet (supplied by the manufacturer)
Moisture content [%on fired basis]	5,6
Lower calorific value [KJ/Kg on fired basis]	17680
Carbon content [% on fired basis]	46,5
Hydrogen [% on fired basis]	6,0
Nitrogen [% on dry basis]	0,09
size / arrangement: length [mm]	 12 – 30

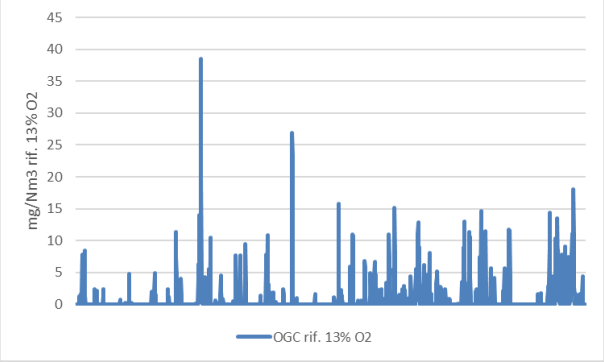
GRAPHS OF THE EMISSIONS

nominal load heat output test n°1









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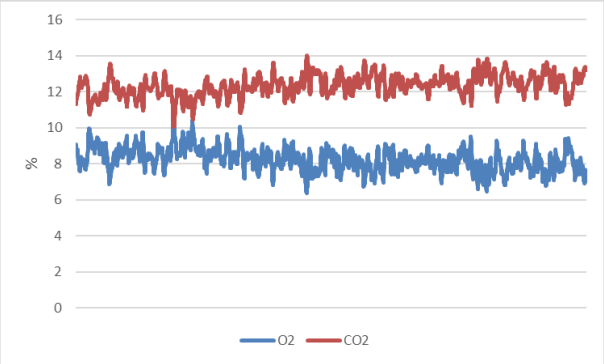
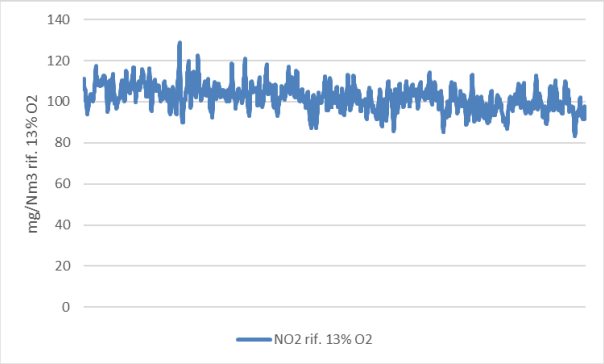
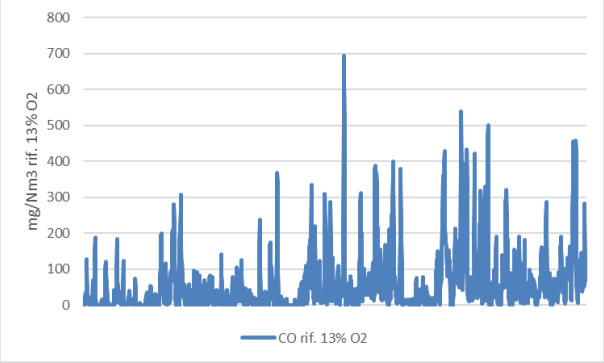
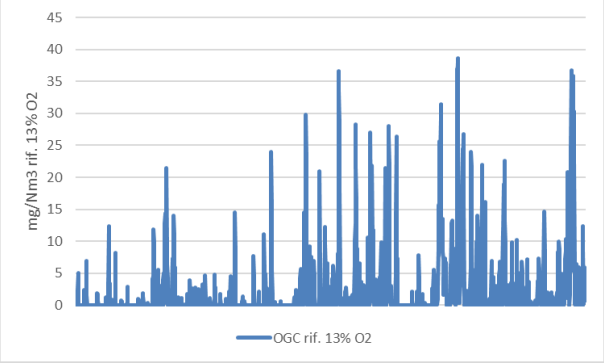
nominal load heat output test n°2



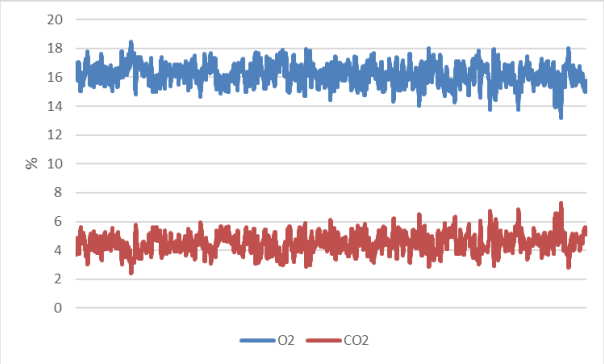


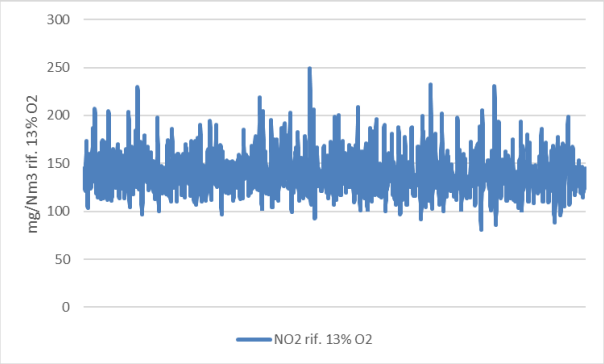


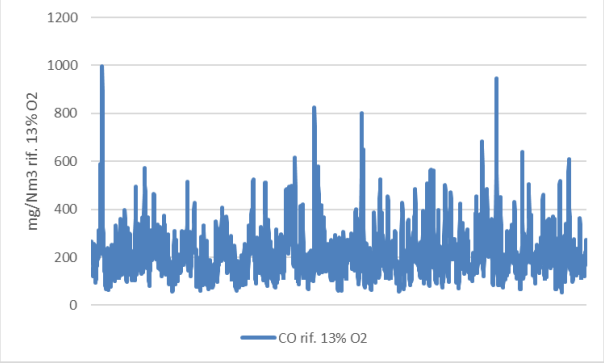


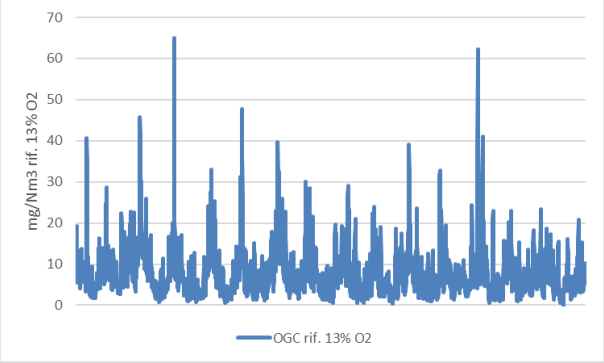
TEST REPORT n.1880-CPR-096-25

part load heat output test



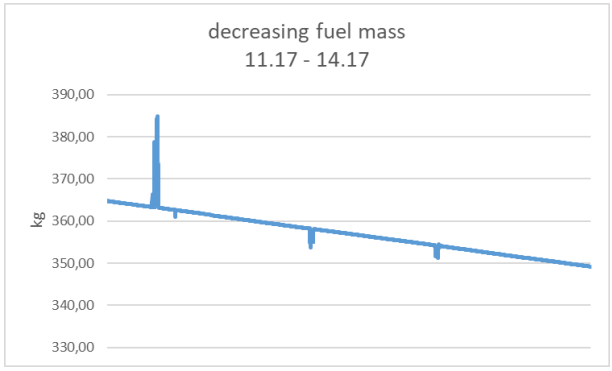




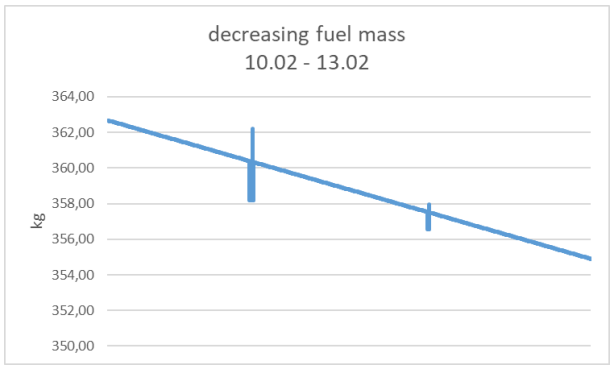


GRAPHS OF THE DECREASING FUEL MASS AT NOMINAL LOAD HEAT OUTPUT

test n°1



test n°2



GRAPH OF THE DECREASING FUEL MASS AT PART LOAD HEAT OUTPUT

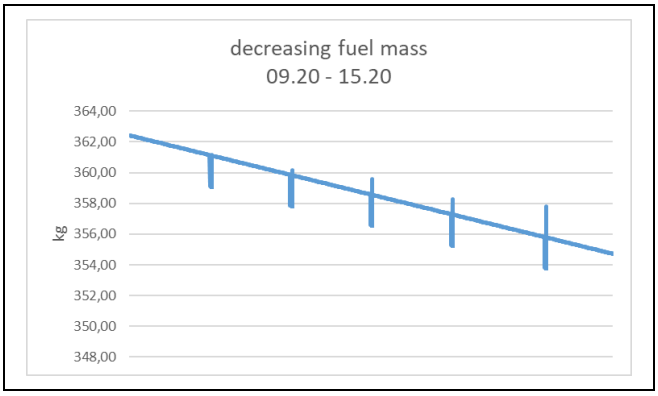


fig.1 – premises of the test

fig.2 - retort