



Építésügyi Minőségellenőrző Innovációs Nonprofit Kft.

ÉMI Építésügyi Minőségellenőrző Innovációs Nonprofit Kft.
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An accredited Tester Laboratory registered at Nr. NAT-1-1110/2010 by NAT

No.: M-398/2011

Date: 31. August 2011.

Test report

Product description: FuranFlex®-XP glass fibre reinforced resin lining
for wood fuelled chimney applications

Field of application: EN 1443 T450 N1 D V2 G0

Manufacturer: Kompozitor Műanyagipari Fejlesztő Kft.
2220 Vecsés, Széchenyi utca 60.

Customer: Kompozitor Műanyagipari Fejlesztő Kft.
2220 Vecsés, Széchenyi utca 60.

Date: 31. August 2011.

The test results refer to the tested samples.
Without the written consent of the Building Services and Energetics Laboratory, this Test Report
may only be copied in its full extent.

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1. Data

Designation of the product: FuranFlex®-XP glass fibre reinforced resin lining for wood fuelled chimney applications

Other identification data: EN 1443 T450 N1 D V2 G0 (Description in Annex 1)

Manufacturer name and address:

Kompozitor Műanyagipari Fejlesztő Kft. 2220 Vecsés, Széchenyi utca 60.

Date of the order: 21. Jun 2011. and No.: M-398/2011

2. The test conditions, subject of the tests

2.1. The devices used for the tests

Hot gas generator

The device has been developed by ÉMI Kht.

Serial No./year: 01/2006

Heat power: max. 100 kW

Hot gas volume: max 200 Nm³/h

Burners	Burner 1.	Burner 2.
Types	EMB-1-SIK-GA-CH ₄ -L2	EMB-2-SIK-GA-CH ₄ -L2
Manufacturer	ESA-Pyronics	ESA-Pyronics
Power	3-30 kW	10-80 kW
Ignition	direct spark	
Flame guard	ionization	



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Air volume measures

Measurement by means of circle orifice plate, calculated from pressure loss
The pressure sensors: 2 pcs. DIPTRON 3 precision micro manometer
Manufacturer: Wallace & Tiernan GmbH
No.: NAT-2-0133/2007
Markings: N07562 and N07563
Date of last calibration: 16.07.2011. ; valid until: 16.07.2012.

Data acquisition

Device made by National Instruments, connected to PC, proprietary evaluation program.

Thermocouples

NiCr-Ni, K-type

Leakage Testing

Leakage Tester
Manufacturer: Wöhler
Type: DP 23
Serial No.: 42/2003
Date of last calibration: 01. 01.2011. ; valid until: 01. 01.2012.

2.2. Place of tests

Építészeti Minőségellenőrző Innovációs Nonprofit Kft.
Building Services and Energetics Laboratory
1113 Budapest, Diószegi út 37.

2.3. Related standards

Considering the test temperatures (550 °C and 1000 °C):

- MSZ EN 1859:2009 Chimneys. Metal chimneys. Test methods
- MSZ EN 1856-2:2009 Chimneys. Requirements for metal chimneys. Part 2: Metal flue linings and connecting flue pipes

2.4. The ordered tests

	Requirements	Test
Leakage	MSZ EN 1856-2:2009 6.3	MSZ EN 1859:2009 4.4.
Heat test	MSZ EN 1856-2:2009 6.4.1.1.	MSZ EN 1856-2:2009 A.7

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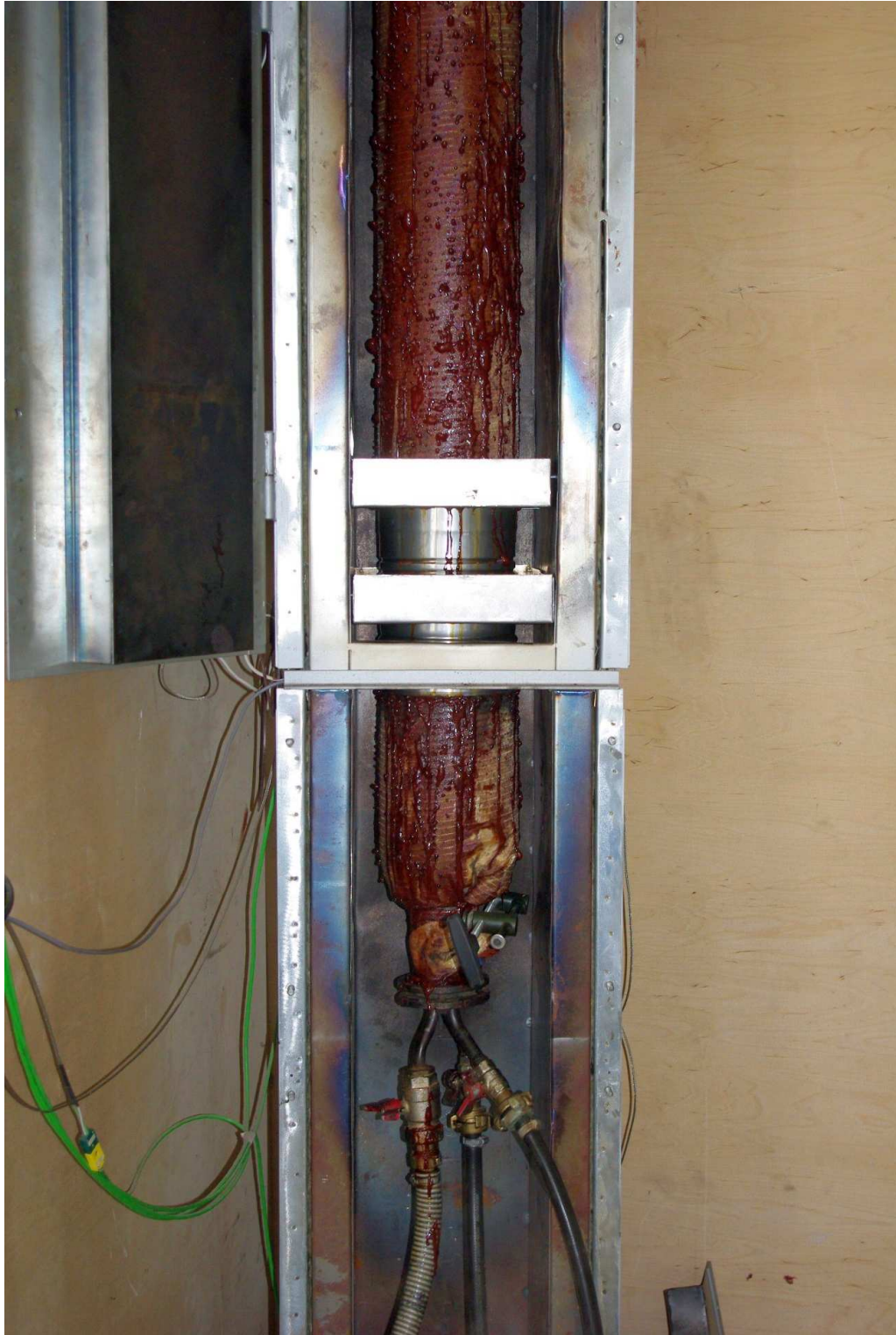
3. Sampling

The tested lining has been manufactured, transported and installed to the test shaft in the ÉMI Nonprofit Kft. Building Services and Energetics Laboratory by the Customer.



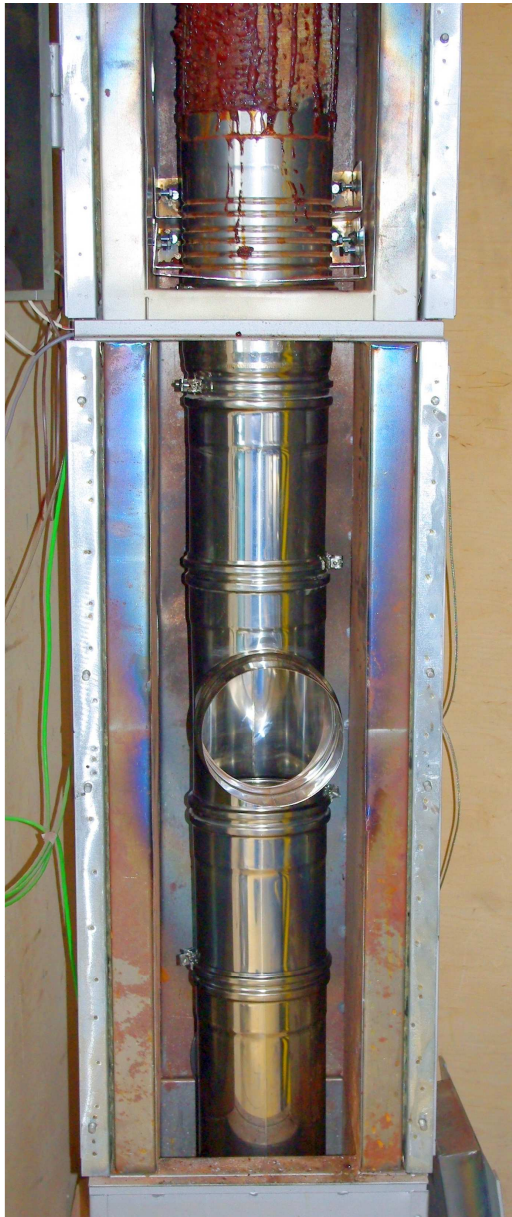
The lining before blowing and hardening process

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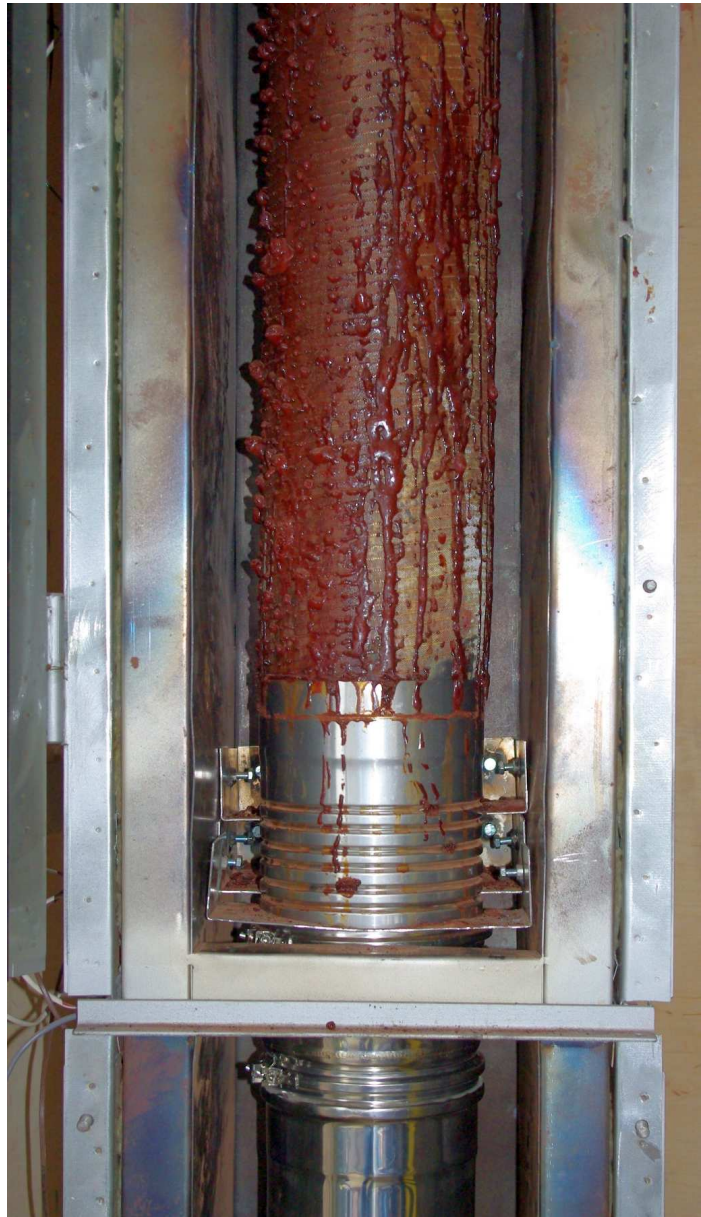


FuranFlex lining during installation

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The metal inlet



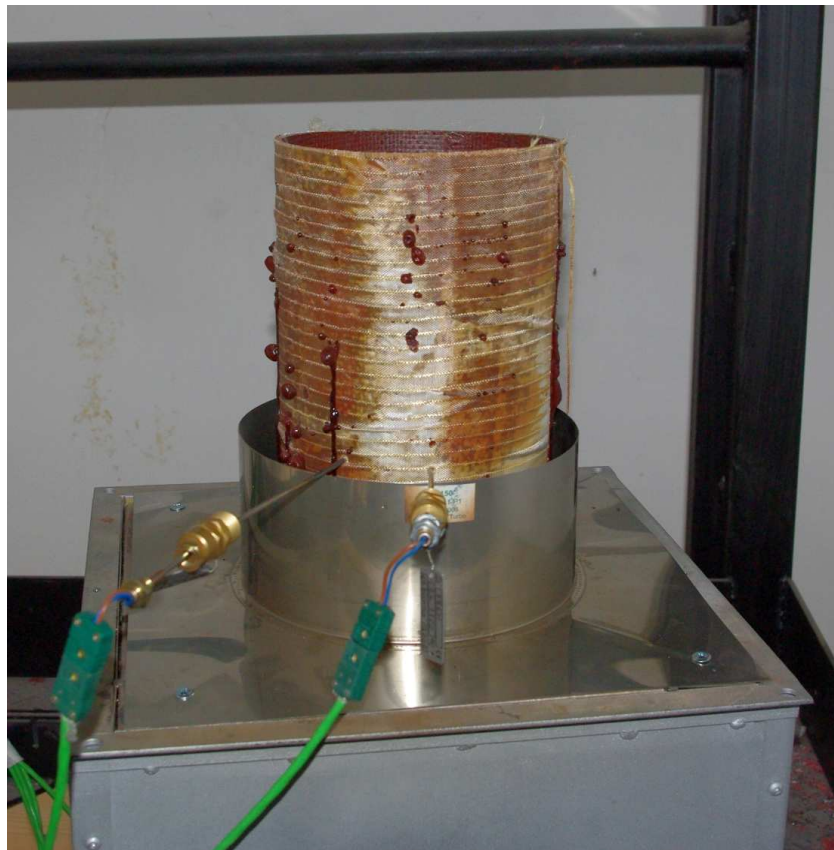
the hardened FuranFlex lining

before the test

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The inner surface of FuranFlex lining before the test (end section)



Position of the thermocouples for measuring the smoke gas temperature from the lining

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4. Test results

4.1. Leakage test

Object of the test: Kompozitor Műanyagipari Fejlesztő Kft. manufactured 5,5 m long Ø150 mm size lining installed to the test shaft.

The test was performed according to MSZ EN 1859:2009 4.4.

The leakage test was done at 40 Pa testing pressure, N1 pressure class, 5,5 m long test sample.

	Diameter [mm]	measured [$\frac{l}{sm^2}$]	limit [$\frac{l}{sm^2}$]	evaluation
Leakage	150	0,043	2	passed

4.2. Heat test

Object of the test: Kompozitor Műanyagipari Fejlesztő Kft. manufactured 5,5 m long Ø150 mm size lining installed to the test shaft.

The test was performed according to MSZ EN 1859:2009 4.5. and MSZ EN 1859:2009 4.5.3.2.

Test 1. with 550 °C hot gas

The detailed data of the test is in annex 2.

Data of the test:

Date of test	10. August 2011.
Average room temperature	23,93 °C
Duration of the heating up	10 min
Duration of the heating	30 min
Hot gas average temperature	552,28 °C
Volume of the hot gas	237,34 m ³ /h

The measured results:

The highest temperature of the shaft surface	56,85 °C
Position of the highest shaft surface temperature	A500

After the heat test, pressure tests were done on the chimney. The leakage test was done at 40 Pa testing pressure, N1 pressure class, on the 5,5 m long test sample.

	measured [$\frac{l}{sm^2}$]	limit [$\frac{l}{sm^2}$]	evaluation
Leakage	0,029	2	passed

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Test 2. 1000 °C heat test, soot fire resistance

The detailed data of the test is in annex 3.

Data of the test:

Date of test	12. August 2011.
Average room temperature	26,25 °C
Duration of the heating up	10 min
Duration of the heating	30 min
Hot gas average temperature	1010,95 °C
Volume of the hot gas	389,63 m ³ /h

The measured results:

The highest temperature of the shaft surface	102,24 °C
Position of the highest shaft surface temperature	A1400

Leakage test

After the heat test, pressure tests were done on the chimney. The leakage test was done at 40 Pa testing pressure, N1 pressure class, on the 5,5 m long test sample.

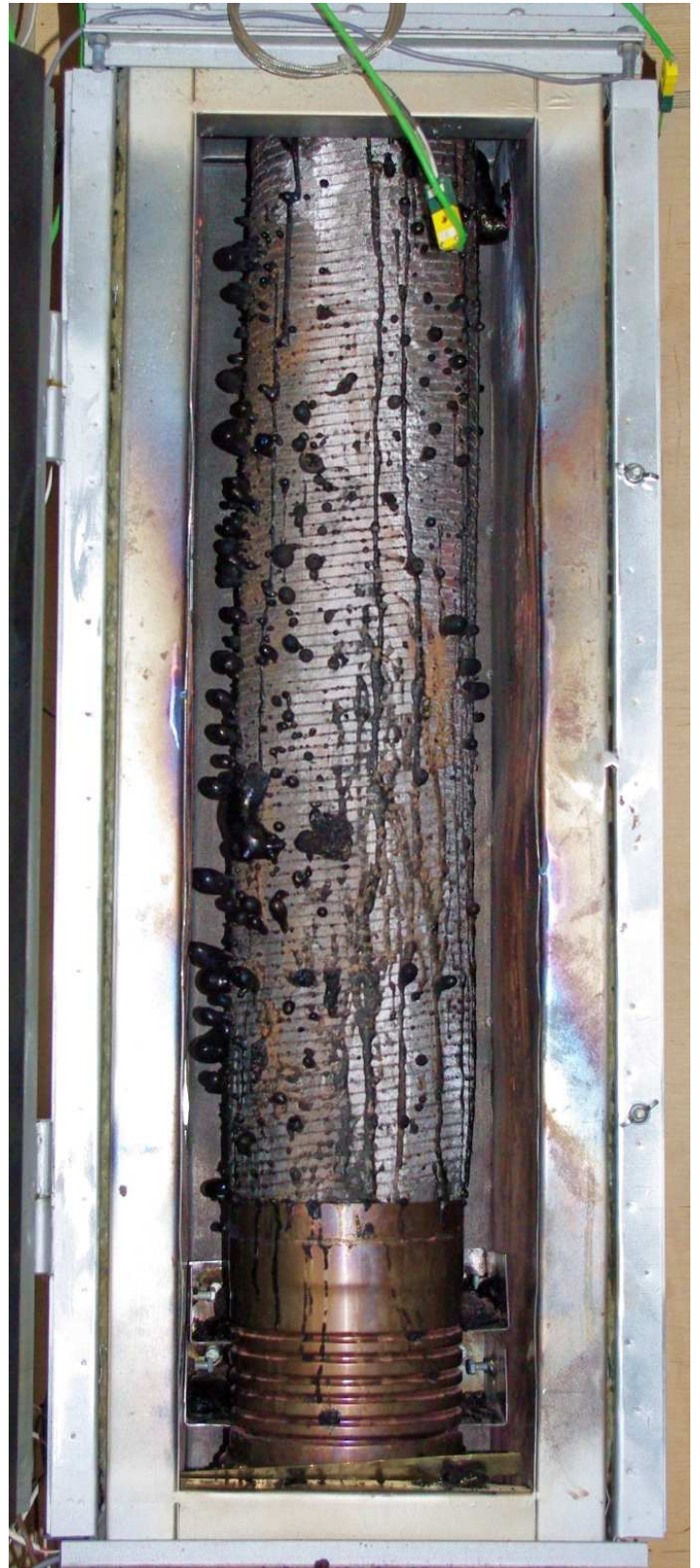
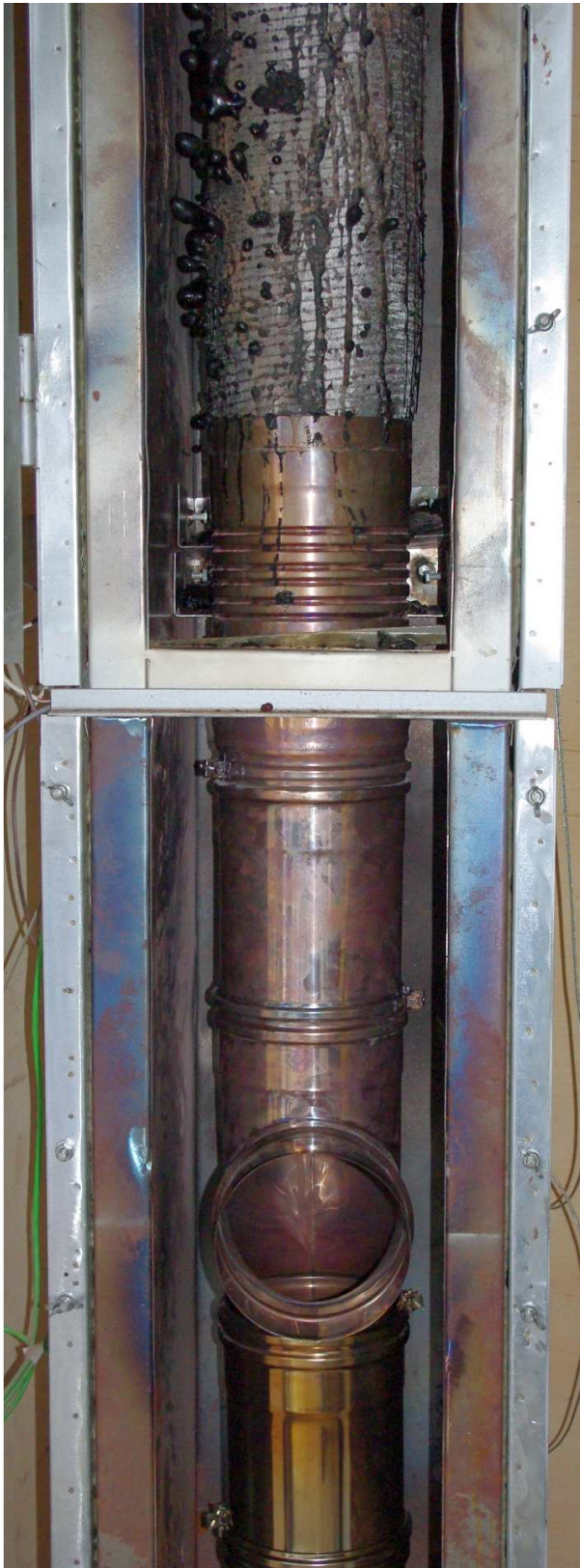
	measured [$\frac{l}{sm^2}$]	limit [$\frac{l}{sm^2}$]	evaluation
Leakage	0,405	2	passed



The inner surface of FuranFlex lining after 1000 °C heat test
upper 1 m section

lower 1 m section

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The FuranFlex lining after 1000 °C heat test

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5. Summary of test results

Leakage [$\frac{l}{sm^2}$]	measured	limit	limit %	evaluation
– after installation, before heat test	0,043	2	2 %	passed
– after 550 °C heat test	0,029	2	1 %	passed
– after 1000 °C heat test	0,405	2	20 %	passed

Tests performed and the test report drawn by:

Oskó József
Test engineer

Professionally checked by:

Checked by:

Haszmann Iván
Head of Building Services Laboratory

Sólyomi Péter
Head of Division

Approved by:

dr. Kovács Károly
Head of Central Laboratory