

# for the proof of fire behaviour according to DIN 4102-1

<b>Reference</b>	FLT 3802623 (Translation of the German Prüfzeugnis - no guarantee for translation of technical terms)
<b>Client</b>	DATA PLOT GmbH Gutenbergstrasse 15 D – 24558 Henstedt-Ulzburg
<b>Test order</b>	2022-08-22 <b>Arrived</b> 2022-09-02
<b>Description of samples</b>	Self-adhesive plastic films to be used on metallic substrates, named "EMBLEM Monomeric Vinyl Glossy 100 C P" and "EMBLEM Monomeric Vinyl Matt 100 C P". (for details see page 2)
<b>Delivered</b>	2022-09-07
<b>Content of request</b>	Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1
<b>Assessment</b>	The examined materials meets the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1 if the compound is used suspended freely or with distance if >40 mm to the same or other plain materials. (for details see page 5)
<b>Validity of certificate</b>	2027-10-31
<b>Sampling</b>	The samples have been sent to the laboratory by the manufacturer.

Remark: If the above-mentioned building material is not used as product according to MBO § 2, there is no need for a general building supervisory test certificate.

This test certificate is not regarded as the sole proof if the tested building material is used as building product within the meaning of state building prescriptions (MBO § 17).

This test certificate does not replace an eventually necessary proof of applicability concerning building supervisory or building laws in the meaning of state building prescriptions.

This has to be verified by:

- "allgemeine bauaufsichtliche Zulassung" (general building inspectorate approval) or by
- "allgemeines bauaufsichtliches Prüfzeugnis (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall (exceptional approval).

This test certificate can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

This test certificate comprises 5 pages and 3 enclosures.

**Approved testing, inspection and certification body**

This test certificate must not be published and copied preceding agreement of the test laboratory and if agreed, only during validity and unchanged concerning appearance and contents. Agreement of the test laboratory has to be given in any case if norms in which the tests are based or other technical standards have changed.



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TEST CERTIFICATE



## 1 Description of the test material

### 1.1 Description (according to the manufacturer)

The materials delivered are self-adhesive plastic films consisting of a white soft-PVC film of a thickness of 100 µm, an polyacrylate adhesive on one side and a siliconized paper covering the adhesive surface. The self-adhesive films are intended to be used indoor, applied on metallic surfaces and were named "EMBLEM Monomeric Vinyl Glossy 100 C P" and "EMBLEM Monomeric Vinyl Matt 100 C P" by the client.

### 1.2 Description of the delivered samples

For the tests, 2 sample rolls (approx. 10 m length and 1.05 m width) of one-sided self-adhesive plastic films with a protective paper on the self-adhesive surface, were sent to the testing laboratory. The samples were marked with the trade names and the manufacturer's batch and were described with the following names and properties:

Trade name *)	Colour / Surface	Adhesive colour	Matchcode *)
EMBLEM Monomeric Vinyl Glossy 100 C P	white / glossy	transparent	MOVIGL100CP
EMBLEM Monomeric Vinyl Matt 100 C P	white / matt		MOVIMA100CP

\*) according to the client

Material characteristics: see Table 1; photos: see enclosures.

Further details are not known to the laboratory, information about the manufacturer and retain samples have been deposited.

## 2 Preparation of samples

For the small burner test ("Brennkastenprüfung") samples for edge flame exposure (dimensions 190 mm x 90 mm) and samples for surface flame exposure (dimensions 230 mm x 90 mm) have been cut in longitudinal and transverse direction of the films and applied on one side onto uncoated aluminium sheets of a thickness of 1,0 mm. For the tests in the fire shaft ("Brandschacht") 4 specimens were prepared. The samples (dimensions 1000 mm x 190 mm) of test specimens A and C were cut in longitudinal, the samples for the test specimens B and D in transverse orientation of the films and applied on one side onto uncoated aluminium sheets of a thickness of 1,0 mm (specimen assignment: see page 4). Afterwards all samples kept in a climate chamber acc. DIN 50014-23/50-2 until they reached constant weight.

## 3 Test procedure

The tests in the fire shaft ("Brandschacht") have been performed acc. DIN 4102-1 and -16 (building materials class B1). The small burner ("Brennkasten") tests have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).

There was no additional substrate arranged behind the material compound.

Test period: October 2022

## 4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2 (small burner test)
- section 4.2.2 Test results class B1 (fire shaft)

### 4.1 Material characteristics

Table 1

Tradename / Layer "EMBLEM Monomeric ..."	Manufacturer's data		Measured values (m.v.)	
	Thickness [mm]	Weight per unit area [g/m <sup>2</sup> ]	Thickness [mm]	Weight per unit area [g/m <sup>2</sup> ]
Vinyl Glossy 100 C P	0.12	./.	0.1	152
Vinyl Matt 100 C P	0.12	./.	0.1	152
PVC-film	0.1	./.	./.	./.
Adhesive	./.	20	./.	./.
Paper liner	./.	120	0.12	122

m.v. mean value

./. not received/not measured

\*) with adhesive layer, without paper liner





## 4.2 Results of the fire behaviour

### 4.2.1 Test results class B2 (Brennkasten)

According DIN 4102-1 all building materials class B1 must also meet the requirements of materials class B2 (low flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements class B2; the material does not show burning particles / droplets. (Results: see enclosure 3)

### 4.2.2 Test results class B1 (Brandschacht)

Table 3

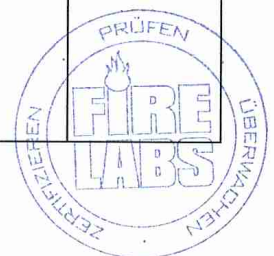
Test results "Brandschachtprüfung" (part 1)						
line no.		Test results				requirements
		A	B	C	D	
1	<u>Number of specimen arrangement</u> acc. DIN 4102 –15 Table 1	7	7	7	7	
2	<u>Maximal flame height</u> above bottom edge ..... cm	60	50	60	60	*)
3	Time <sup>1)</sup> ..... min	2	2	2	2	
4	Burning / melting through Time <sup>1)</sup> ..... min	./.	./.	./.	./.	
5	<u>Back side of the specimens:</u> Flames / glowing Time <sup>1)</sup> ..... min:s	./.	./.	./.	./.	
6	Discolouring Time <sup>1)</sup> ..... min:s	./.	./.	./.	./.	
7	<u>Falling of burning droplets</u> Begin <sup>1)</sup> ..... min:s	No	No	No	No	
8	Extend: Sporadic falling of burning droplets					
9	Continuous falling of burning droplets					
10	<u>Falling of burning parts</u> Begin <sup>1)</sup> ..... min	No	No	No	No	
11	Extend: Sporadic falling of burning parts					
12	Continuous falling of burning parts					
13	Afterflame time at the bottom of thesieve (max.) ..... min:s	./.	./.	./.	./.	
14	<u>Impairment of the burner flames by dropping or falling Material</u> Time <sup>1)</sup> ..... min:s	No	No	No	No	
15	<u>Premature end of test</u> Final occurrence of burning at the specimen <sup>1)</sup> ..... min	No	No	No	No	
16	Time of eventually end of test <sup>1)</sup> ..... min:s	./.	./.	./.	./.	

<sup>1)</sup> Indication of time: from the beginning of testing procedure

- Not tested

./. Not occurred

\*) No cause for complaint



Test results "Brandschachtprüfung" (part 2)						
line no.		Test results				requirements
		A	B	C	D	
17	<u>Afterflame after end of test</u> Time ..... min:s	No	No	No	No	
18	Number of specimen					
19	Front side of specimen					
20	Back side of specimen					
21	Flame length ..... cm					
22	<u>Afterglow after end of test</u> Time ..... min:s	No	No	No	No	
23	Number of specimen					
24	<u>Place of appearance:</u> Lower half of specimen					
25	Upper half of specimen					
26	Front side of specimen					
27	Back side of specimen					
28	<u>Smoke density</u> ≤ 400 % min	26.1	22.8	21.3	28.0	
29	≥ 400 % min (very strong smoke density)	./.	./.	./.	./.	
30	Diagram fig. no.	1	3	5	7	
31	<u>Residual length</u> Individual value ..... cm	49 44 46 44	42 48 47 46	46 45 48 49	43 44 46 47	> 0
32	Average value ..... cm	<b>45</b>	<b>45</b>	<b>47</b>	<b>45</b>	≥ 15
33	Photo of the test specimen fig. no.	2	4	6	8	
34	<u>Flue gas temperature</u> Maximum of average value ...°C	120	118	121	120	≤ 200
35	Time <sup>1)</sup> ..... min:s	9:58	10:00	9:42	9:58	
36	Diagram fig. no.	1	3	5	7	
37	<u>Remarks:</u> line 32: There were no additional tests proceeded because of the residual length of ≥ 45 cm (DIN 4102-16: 2015-09, 5.2 b)). (diagrams and photos see appendices 1, 2)					

- 1) indication of time: from the beginning of testing procedure
- not tested
- ./. not occurred
- \*) no cause for complaint



Specimen	Test-No.	Trade name	Orientation of self-adhesive film	Substrate
A	789422-001	EMBLEM Monomeric Vinyl	longitudinal	Aluminium
B	789422-002	Glossy 100 C P	transversal	
C	789422-003	EMBLEM Monomeric Vinyl	longitudinal	
D	789422-004	Matt 100 C P	transversal	

## 5 Assessment

Section 4.2 lists the test results of the composite which is described in section 1 and compares the results with the requirements for not easily flammable building materials acc. DIN 4102-1. According to the test results the self-adhesive plastic film, fulfil the requirements of building materials class B1 according to DIN 4102-1, if used on one side onto metal surfaces:

- with a density  $\geq 2025 \text{ kg/m}^3$ , a melting point  $\geq 500 \text{ °C}$  and a thickness  $\geq 0,8 \text{ mm}$
  - with a density  $\geq 5890 \text{ kg/m}^3$ , a melting point  $\geq 1000 \text{ °C}$  and a thickness  $\geq 0,6 \text{ mm}$
- and if the composite is mounted in a distance of  $> 40 \text{ mm}$  to the same or other plain materials.

The requirements of building materials class B2 are also fulfilled. No falling of burning parts or droplets occurred during these tests.

The verification for outdoor usage (ageing behaviour by outdoor weathering) has not been proved.

## 6 Special remarks

This certificate is only valid for the material as described under paragraph 1 and 4.1. In combination with other materials or additional coatings or surfaces etc. the burning behaviour may differ.

This test certificate is not regarded as the sole proof if the tested building material is used as building product within the meaning of state building prescriptions (MBO § 17).

This test certificate is no substitute for a General Building Inspectorate Certificate and is granted without prejudice to the rights of third parties, or particular private proprietary rights.

This test certificate can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

The explanations given in DIN 4102-1 app. D, especially concerning an external production control have to be considered.

This test certificate is valid until 2027-10-31, provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 21<sup>st</sup> of August 2023


Head of the test laboratory  
(Dipl.-Ing. Uwe Kühnast)

*This translation was issued the 21<sup>st</sup> of August 2023, in a case of doubt the German version is valid solely.*

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Test specimen A

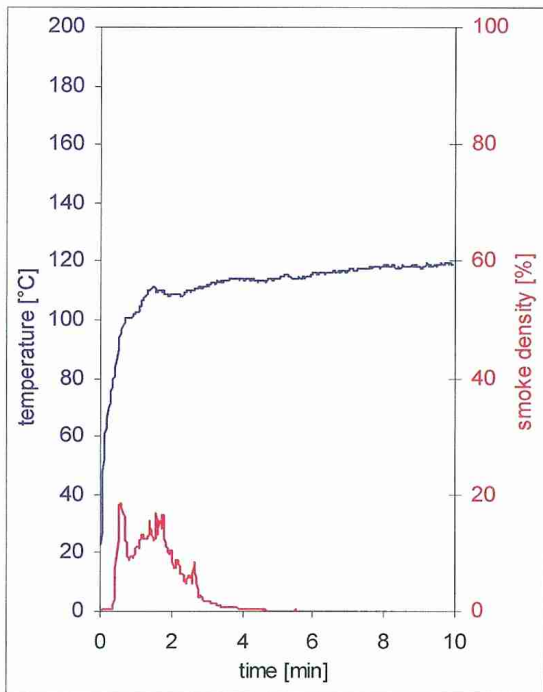


fig. 1  
Graphs of the flue gas temperature and the smoke density

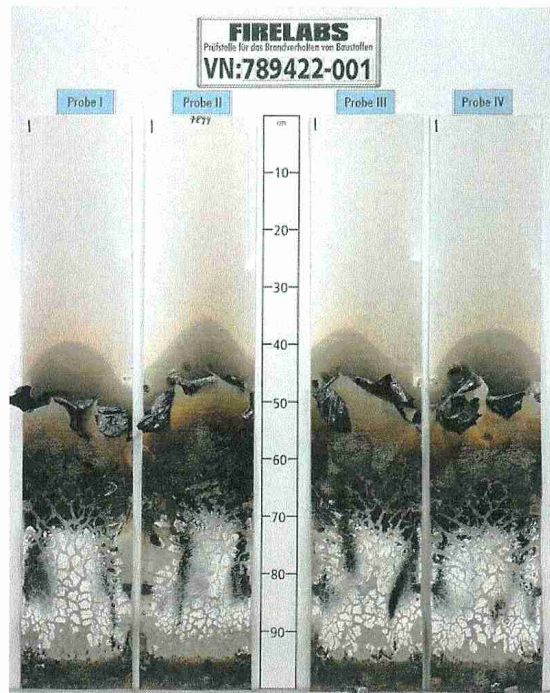


fig. 2  
Photo of the test specimen after the test

Test specimen B

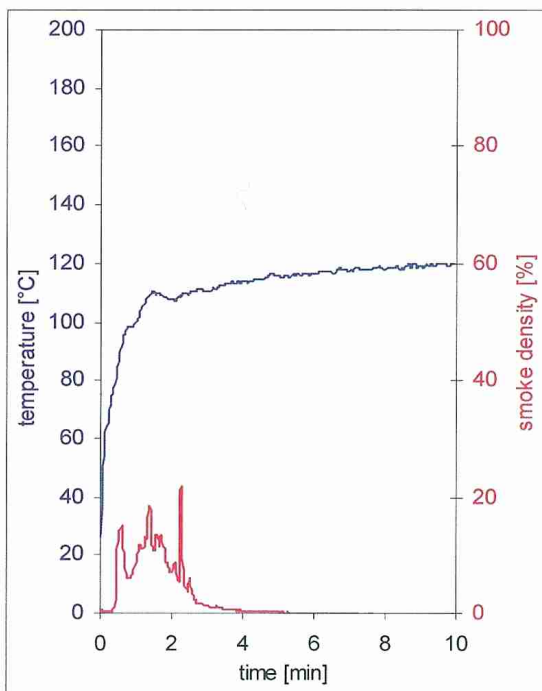


fig. 3  
Graphs of the flue gas temperature and the smoke density

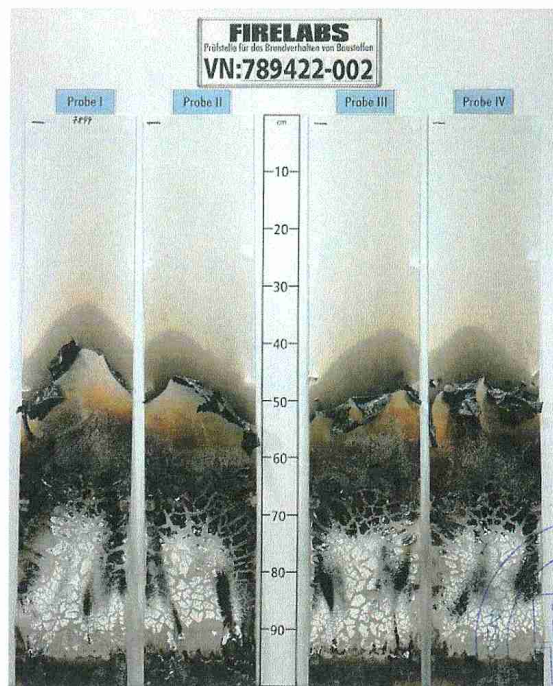


fig. 4  
Photo of the test specimen after the test



Test specimen C

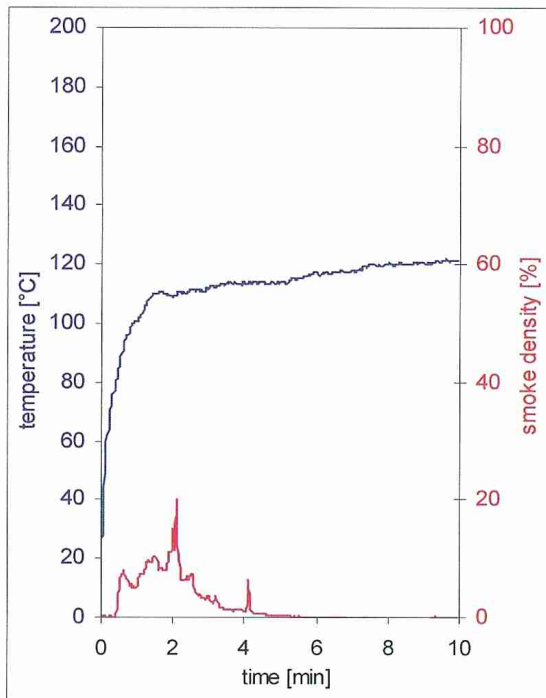


fig. 5  
Graphs of the flue gas temperature and the smoke density

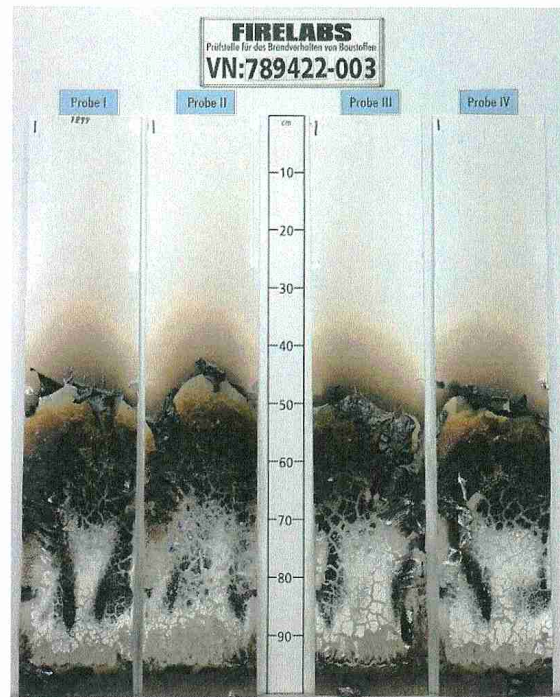


fig. 6  
Photo of the test specimen after the test

Test specimen D

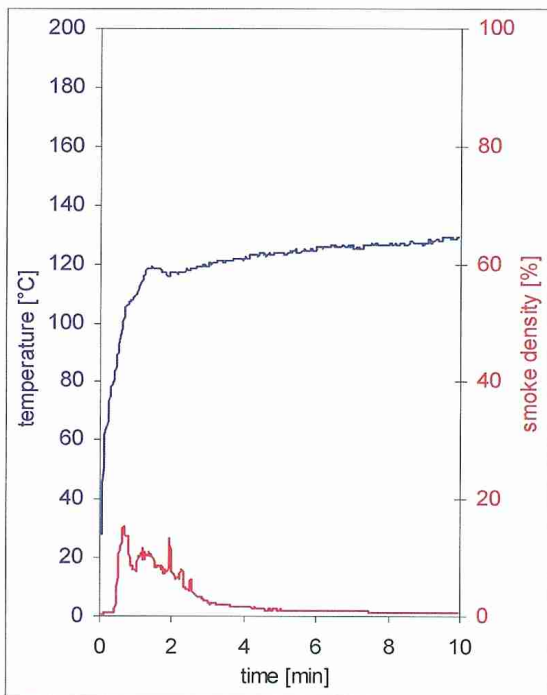


fig. 7  
Graphs of the flue gas temperature and the smoke density

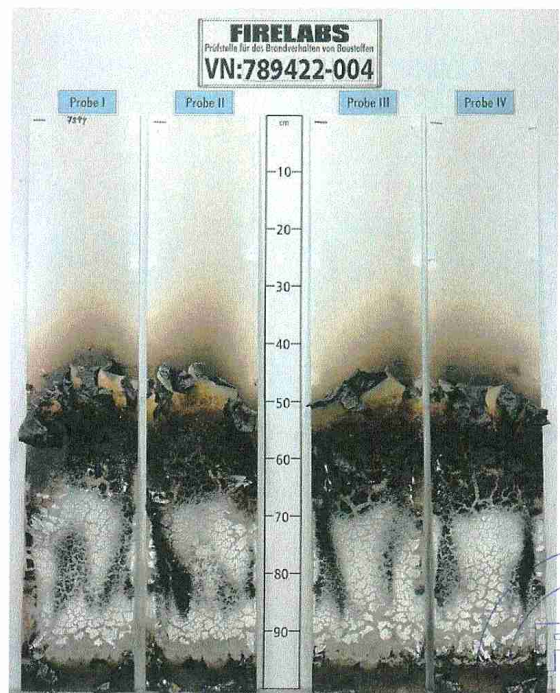


fig. 8  
Photo of the test specimen after the test



Test results class B2 (Brennkasten)

Table 2.1: "EMBLEM Monomeric Vinyl Glossy 100 C P" (complete set of samples)

	longitudinal						transversal						dim.	requirements
	1	2	3	4	5	6	1	2	3	4	5	6		
Sample-No.	1	2	3	4	5	6	1	2	3	4	5	6	-	-
Ignition of the sample	1	1	1	./.	./.	./.	1	1	./.	1	./.	./.	s	-
Maximum flame height	1	1	1	./.	./.	./.	1	1	./.	1	./.	./.	cm	-
Time of the maximum	15	15	15	./.	./.	./.	15	15	./.	15	./.	./.	-	-
Flame tip has reached the 150 mm mark	16	16	16	./.	./.	./.	16	16	./.	16	./.	./.	s	≥ 20
Flame has extinguished	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
Ignition of filter paper	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	1)
Smoke density (visual)	very low						very low						-	./.
Afterburning time	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	./.	s	-
View of the samples after the test: - burnt height: max. 3 mm, about 1 cm discoloured and soot above														

Table 2.2 : "EMBLEM Monomeric Vinyl Matt 100 C P"

	longitudinal						transversal						dim.	requirements
	1	2	-	-	-	6	1	2	-	-	-	6		
Sample-No.	1	2	-	-	-	6	1	2	-	-	-	6	-	-
Ignition of the sample	./.	1	-	-	-	./.	1	./.	-	-	-	./.	s	-
Maximum flame height	./.	1	-	-	-	./.	1	./.	-	-	-	./.	cm	-
Time of the maximum	./.	15	-	-	-	./.	15	./.	-	-	-	./.	-	-
Flame tip has reached the 150 mm mark	./.	16	-	-	-	./.	./.	./.	-	-	-	./.	s	≥ 20
Flame has extinguished	./.	./.	-	-	-	./.	16	./.	-	-	-	./.	s	-
Ignition of filter paper	./.	./.	-	-	-	./.	./.	./.	-	-	-	./.	s	1)
Smoke density (visual)	very low						very low						-	./.
Afterburning time	./.	./.	-	-	-	./.	./.	./.	-	-	-	./.	s	-
View of the samples after the test: - burnt height: max. 3 mm, about 1 cm discoloured and soot above														

Samples 1-5: edge flame exposure

Samples 6: surface flame exposure

1) No ignition within 20 seconds

./ Not occurred

dim. Dimension

Indication of time: from the beginning of testing procedure

Indication of measurements: from reference line of the flame

