

Test Certificate

Client

KOTHALI S.A.
1st klm. Chrissoupolis-Eratinou
Chrissoupolis 64200
GREECE

Order no.:

M 2164 / 2012
Page 1 / 7

Order dated : 12th July 2012
Order : Testing of clay roof tiles in accordance with
DIN EN 1304 by an independent, notified body
Frost resistance in accordance with
DIN EN 539-2:2006, Test method E
(European single test method) and
DIN EN 539-2 Correction 1:2009
Number, type and color of samples : 6 interlocking tiles "HOLLAND"
color natural red
Manufacturer of samples : KOTHALI SA
Country of manufacture : Greece
Date of Manufacture : Not specified
Plant code : See 1.2
Receipt of sample : 25th July 2012
Test time period / date : 8th August - 3th September 2012
Testing authority : Kiwa MPA Bautest GmbH, Munich Lab
Test execution : Mr. Beyer
Sampling : KOTHALI SA
Sampling point : Not specified

Garching, 13 September 2012
be/kr

Department head


Dipl.-Ing. (FH) Maik Kramer



Test center manager


Dipl.-Ing. (FH) Hendrik Zaus

This test certificate contains 7 pages.
The test certificate refers to the submitted sample material. The sample material is used.
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Opinions and interpretations of the testing authority shall be written in *italics* in accordance with DIN EN ISO / IEC 17 025 point 5.10.5.

1 Determination of frost resistance in accordance with DIN EN 539-2:2006
Test method E (European single test method)

1.1 Images (Condition at delivery)





1.2 Sample preliminary treatment

Determination of water absorption $W_{u,R}$

Sample no.	Plant code	Water absorption $W_{u,R}$		
		m_{tr} [g]	m_w [g]	$W_{u,R}$ [%]
1	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3178	3302	3,9
2	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3119	3209	2,3
3	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3117	3240	3,9
4	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3132	3291	5,1
5	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3148	3309	5,1
6	ΚΟΘΑΛΗ ΑΕ ΣΕ ΚΑΒΑΛΑ MADE IN EU	3136	3249	3,6
Average				4,1



1.3 Test results

In accordance with DIN EN 539-2, Point 9.4.2.4 the back sides of the samples were covered with a wet linen cloth after which they were subjected to 150 freeze/thaw cycles at an average ice formation period of 40 minutes.

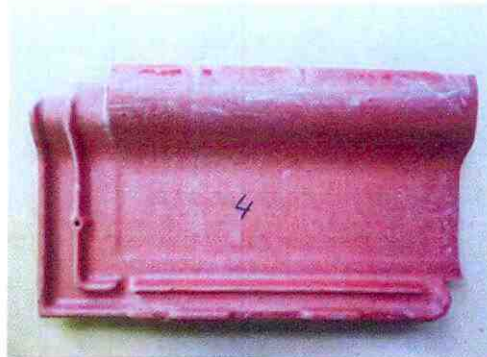
Sample no.	Number of executed freeze/thaw cycles	Nature and extent of changes caused by the effects of the freeze to		
		30 freeze/thaw cycles performance class 1	90 freeze/thaw cycles performance class 2	150 freeze/thaw cycles performance class 3
1	150	no	no	surface damage (scaling - back side acceptable frost damage)
2	150	no	no	surface damage (scaling and breaking off of rib - back side acceptable frost damage)
3	150	no	no	no
4	150	no	no	surface damage (scaling - back side acceptable frost damage)
5	150	no	no	surface damage (scaling - back side acceptable frost damage)
6	150	no	no	surface damage (scaling - back side acceptable frost damage)
Requirement satisfied		yes	yes	yes

The freeze/thaw cycles were performed at our accredited test center in Augsburg.



1.4 Photos (after 150 freeze/thaw cycles)





1.5 Assessment

The tested clay roof tiles are in compliance with the frost resistance according to DIN EN 539-2:2006 performance class 3.

Garching, 13 September 2012

