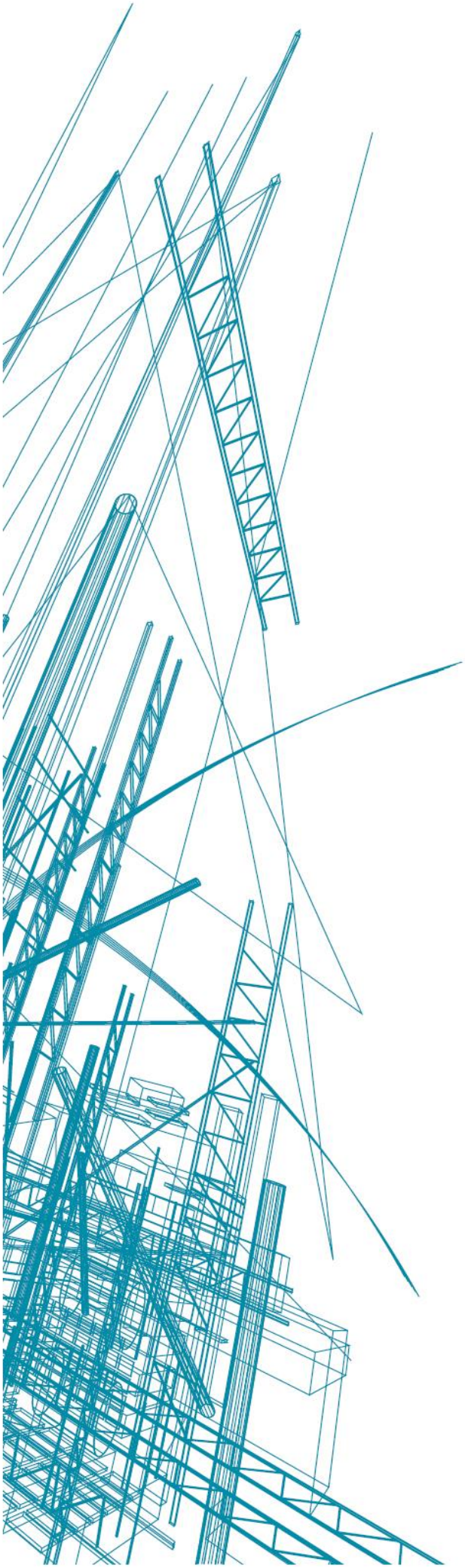


CONSTRUCTECH

Research and development for the construction industry

Test report

Test of resistance to wind uplift according to the Guideline for European technical approval of systems of partially bonded roof waterproofing membranes.
EOTA guideline TR 005 (edition 2004)

Project number:	20160914-121-1
Report date:	2016-09-24
Roof system:	TECHNOROOF PROF G+ UNIFLEX Express +TECHNOELAST EKP
Membrane type:	UNIFLEX Express +TECHNOELAST EKP
Bonding type:	Multi-layer bonded system with Stone wool insulation bonded in hot bitumen to vapor control layer. Roof cover torched to TECHNONICOLStone Wool insulation, TECHNONICOL TECHNOROOF PROF G 100 mm
Client:	LLC TECHNONICOL - Construction Systems Gilyarovskogo str. 47 page 5 129110 Moscow Russian Federation
Contact:	Konstantin Kozetov

Chief of controlling and testing Fredrik Rundgren

1. Introduction

Constructech Sweden AB has, on request of the client, carried out windload testing of the Roof system TECHNOROOF PROF G+ UNIFLEX Express +TECHNOELAST EKP.
The purpose of the testing was to determine the windload capacity of the partially bonded roof system and define a characteristic load according to the standard EOTA TR 005.

The installation and welding has been carried out by the client in cooperation with Constructech's test engineer. The installation has been carried out according to the general installation guide for the membrane system.

2. Investigation – Wind load tester

The wind uplift has been carried out according to the Guideline for European technical approval of systems of of partially bonded roof waterproofing membranes. EOTA guideline TR 005 (edition 2004).

Wind load tester size: 4,90 m x 2,65 m
Pitch 0±2°
The wind load tester fulfills the requirements according to the standard.
The pressure load cells have been calibrated in line with Constructech's quality management routines. Last calibration performed 20160616.

Wind load tester 4,90 m x 2,65 m

3. Test model

Test model dimensions: 4,90 m x 2,65 m

Substructure: Concrete with vapor control layer

Thermal insulation: TECHNONICOL
TECHNOROOF PROF G 100 mm
Bonding method: Fully bonded in hot bitumen to vapor control layer
Bonding pattern: 1,6 – 1,7 kg/m2

Roof system:

Membrane:	UNIFLEX Express +TECHNOELAST EKP
Membrane width (M_w):	1,0m
Overlap width (O_w):	100mm
Bonding pattern:	Fully torched
Bonding method:	
	0,00

Temperature:

Temperature during test was between +22°C and +24°C.

A photo report of the buildup and the failure mode is given in annex A.
A drawing of the test model is given in annex C.

4. Results

At the failure cycle of $W_{max\ 100\%}$(theoretical load) the test was stopped. According to EN-16002:2010 the approved test result is $W_{max\ 100\%}$ (theoretical load) for the fulfilled cycle prior the failed cycle, which results in:

W_{test} =	6500 N/m^2 N

Failure mode

Below you will find a short description of the failure mode:

The tissue facing of the insulation boards was peeled off during cycle 16, 7000N/m2. The membrane was separated from the insulation. All insulation was still fully bonded to the vapor control layer.
Approved value is 6500 N/m^2

The design value is calculated according to the formula in annex C and the results for this test are as follows:

W_{test}	6500 N/m^2
ΔW_{char}	6500 N/m^2

A graph of the loads in load cycle, W_{test} , is given in annex B
Note: ΔW_{char} is the characteristic value and not the design value.
$W_{adm} = W_{char}/\gamma_m$ is the design value.
γ_m= Material correction factor (determined on national level)

Remark

The indicated test data are valid under test conditions only. A successful application under other than the reported test conditions are not proven with this test report.
It shall be emphasized that this investigation is only an indication at a given moment of the properties of the investigated material and does not provide information on the scope of the variations over course of time.

Strängnäs 2016-09-24

Constructech Sweden AB

Fredrik Rundgren

Constructech Sweden AB

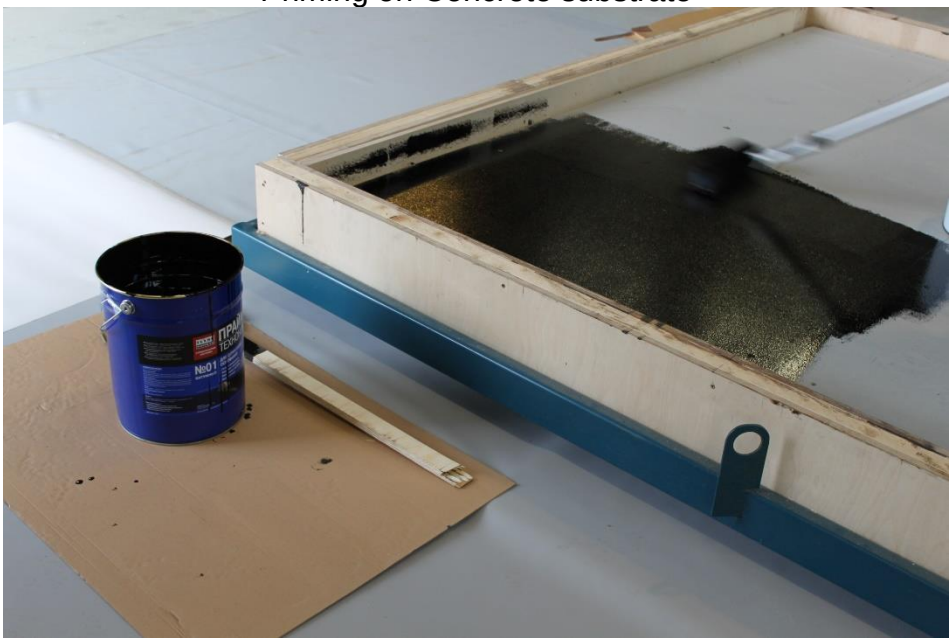
Sofie Rundgren

Annex A

Pictures from test sample

Primer

Priming on Concrete substrate

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Линия
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Лин. разм., м
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Гарантийный срок хранения -
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ООО "ТехноНИКОЛЬ Воскресенск"
140204, Московская обл.
г.Воскресенск, Промплощадка,5б
тел. +7 (49644) 48993
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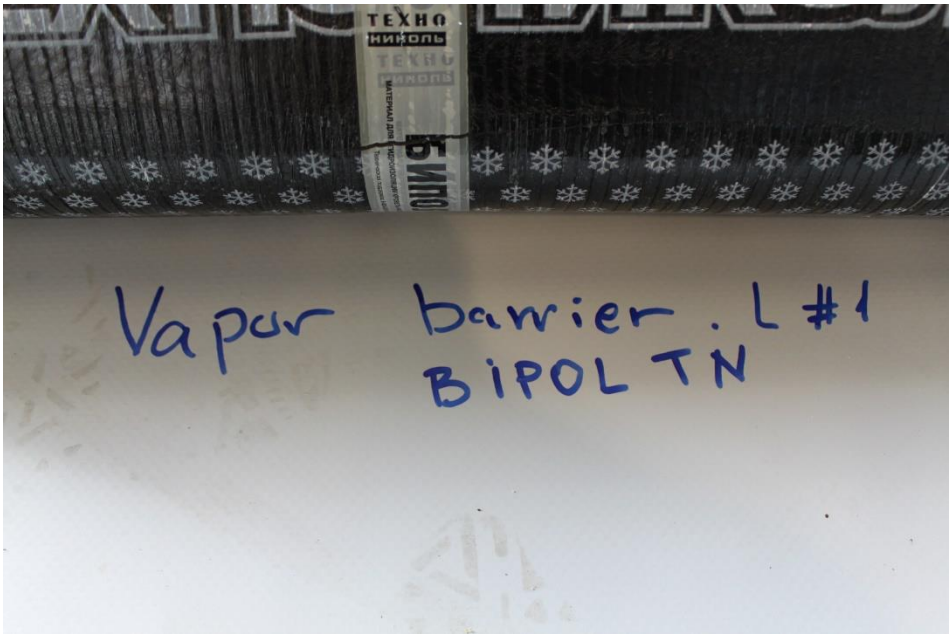
ТЕХНО
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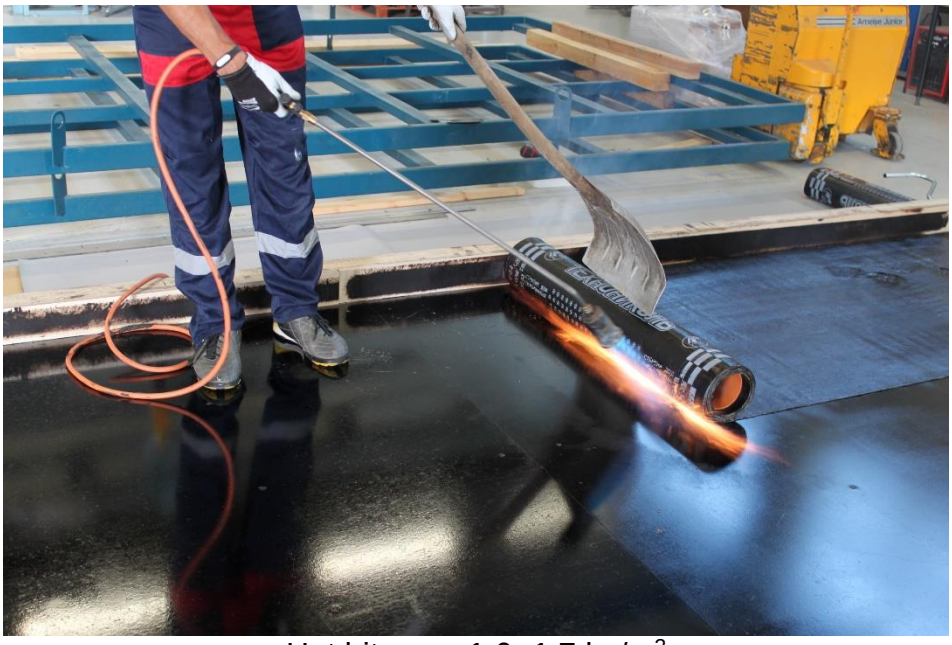
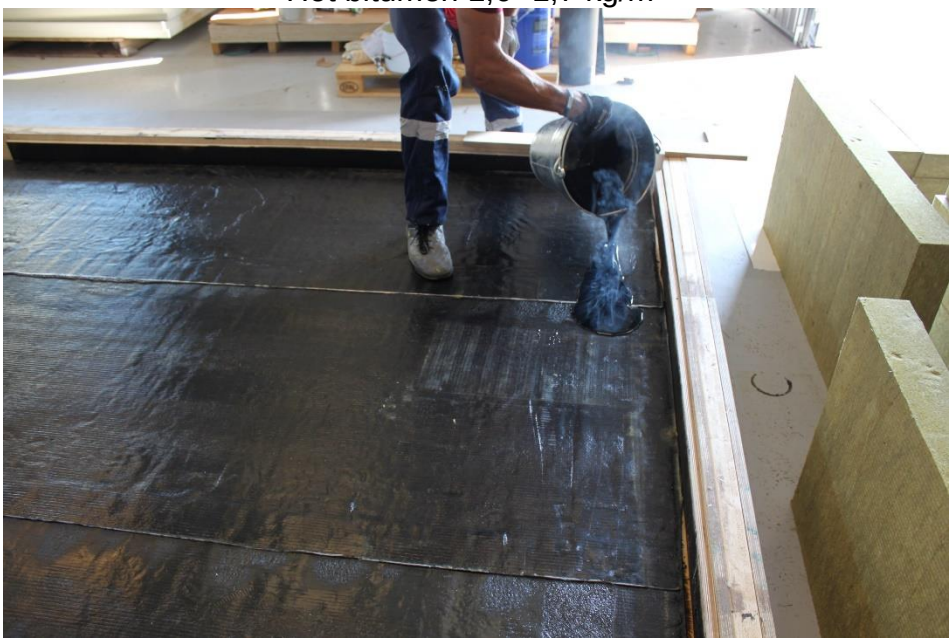
Vapor barrier. L #1
BIPOL TN



Hot bitumen 1,6 -1,7 kg/m^2




ТЕХНОРУФ ПРОФ с
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ТУ 5762-017-74182181-2015
Плиты минераловатные теплоизоляционные ТЕХНО
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100
мм
1200 x 600
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М2
2,16
М3
0,216
Внутренний код товара
549302
Номер смены: 1 / 4
Номер партии: 72 236
Дата изготовления:
16.08.16
λ= 0,039 Вт/м*К
ООО "Завод ТЕХНО"
390047, г. Рязань, Восточный Проезд, 21, стр.58
E-mail: info@tn.ru; www.teplo.tn.ru
техническая поддержка: 8-800-200-05-65


Base
Uniflex Exspress


Унифлекс Экспресс ЭМП
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Смена
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ТЕХНОНИКОЛЬ
ТЕХНОЭЛАСТ
Сар TechnoElast EKP


Техноэласт К ЭКП
ТЕХНОНИКОЛЬ
сланец серый
Дата
Партия
Кол. рул., м
05.08.16
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Основа: Э (Полиэфир)
Гарантийный срок хранения -
ООО "ТехноНИКОЛЬ Воскресенск"
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4 620008 306223


ТЕХНОНИКОЛЬ

Pictures from test sample
Description of failure

Annex B

Failure in load cycle 16, 7000 N/m^2
Approved cycle 15, 6500 N/m^2