INSTITUTE OF ARCHITECTURE AND
CONSTRUCTION OF KAUNAS
UNIVERSITY OF TECHNOLOGY

BUILDING PHYSICS LABORATORY

CALCULATION REPORT No. 234 SF/23

Date: 05 of December 2023

Determination of installed thermal resistance into a roof and into a wall of ATI MIX FIBRE DE BOIS INTERIEUR according to EN ISO 6946:2017

(test name)

Test method: Determination of installed thermal resistance into a roof and into a wall according to EN ISO 6946:2017 and EN 16863:2023

(number of normative document or test method, description of test procedure, test uncertainty)

Product name: **ATI MIX FIBRE DE BOIS INTERIEUR**

(identification of the specimen)

Customer: SAS ATI FRANCE, 146 Avenue du Bicentenaire – FR-01120 Dagneux, France

(name and address of enterprise)

Manufacturer: SAS ATI FRANCE, 146 Avenue du Bicentenaire – FR-01120 Dagneux, France

Calculation results:

Roof slope angle, α	Calculation method reference no.	Calculation result, R, $(m^2 \cdot K)/W$
Flat roof (α = 0°)	EN ISO 6946:2017	**6.13**
Pitched roof (α = 30°)		**6.18**
Pitched roof (α = 45°)		**6.21**
Wall (α = 90°)		**6.33**
R value for others pitched sloop (different α value) can be determined by linear interpolation between two calculated R values		

Calculation made by: Building Physics Laboratory, Institute of Architecture and Construction of Kaunas University of Technology

(Name of the organization)

Products used in calculation: Ventilated air layer (external surface resistance R_{se}).
Wood fiber panel "Pavaflex" 80 mm, λ_{ref} = 0.038 W(m·K); R = 2.10 $(m^2 \cdot K)/W$ *; ε = 0.90.
Multilayer reflective insulation product **ATI PRO PREMIUM** (test report no. 106 SF/23 U). Emissivity of ATI PRO PREMIUM upper surface ε = 0.10**; lower surface ε = 0.10**.
Unventilated air layer 20 mm.
* CERTIFICAT ACERMI N° 17/006/1259 *Licence n° 17/006/1259*
** Declared by the manufacturer

Additional information: Application, 2023-11-08

Annex: *Annex 1. Calculation results*

(the numbers of the annexes should be pointed out)

Head of Laboratory: K. Banionis
(approves the test results) (n., surname) (signature)

Calculated by J. Ramanauskas
(calculation made by) (n., surname) (signature)

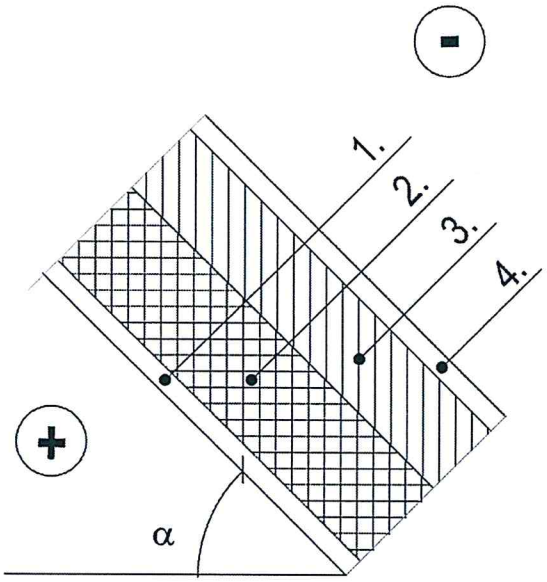
S.P.

Lietuvos Respublika DOKUMENTAI Architektūros ir statybos institutas Kauno technologijos universitetas

Annex 1: Calculation results

Table 1: Products R- values

Product	Thermal resistance R, (m²·K)/W
PAVAFLEX 80 (CERTIFICAT ACERMI N° 17/006/1259 *Licence n° 17/006/1259*)	**R = 2.10**
ATI PRO PREMIUM (test report no. 106 SF/23 U)	**$R_{core90/90}$ = 3.52**
"Rcore90/90" is the declared R core value following EN 16012 + A1. *"Rcore90/90" is calculated on 4 results of 4 samples came from 4 different fabrication dates following EN 16012 + A1 (and using the fractile 90/90 calculation rules* $S_{R-prod} = \sqrt{\frac{\Sigma(R_i - R_{average})^2}{n-1}}$;).	



Temperature regime of air cavities: θ_{mn} = 10 °C; ΔT = 5 K	
1.	**Unventilated Air cavity #1, 20 mm**
2.	**ATI PRO PREMIUM**
3.	**PAVAFLEX, 80 mm**
4.	**Ventilated Air cavity #2, 20 mm**

Figure 1. Roof construction design

Table 2: Roof construction calculation results for slope α = 0° (EN ISO 6946)

ATI MIX FIBRE DE BOIS INTERIEUR installed on roof			
Angle: α = 0°	**Layer**	**R value**	**Unit**
Ascendant Heat Flux (Winter period)	Unventilated Air cavity # 1	0.4066	m²·K/W
	ATI PRO PREMIUM	3.52	m²·K/W
	PAVAFLEX 80	2.10	m²·K/W
	Ventilated Air cavity # 2 (the thermal resistance of external surface R_{se})	0.1038	m²·K/W
	R_{Total}	**6.13**	**m²·K/W**

Table 3: Roof construction calculation results for slope α = 30° (EN ISO 6946)

ATI MIX FIBRE DE BOIS INTERIEUR installed on roof			
Angle: α = 30°	**Layer**	**R value**	**Unit**
Ascendant Heat Flux (Winter period)	Unventilated Air cavity # 1	0.4493	m²·K/W
	ATI PRO PREMIUM	3.52	m²·K/W
	PAVAFLEX 80	2.10	m²·K/W
	Ventilated Air cavity # 2 (the thermal resistance of external surface R_{se})	0.1132	m²·K/W
	R_{Total}	**6.18**	**m²·K/W**

Table 2: Roof construction calculation results for slope α = 45° (EN ISO 6946)

ATI MIX FIBRE DE BOIS INTERIEUR installed on roof			
Angle: α = 45°	**Layer**	**R value**	**Unit**
Ascendant Heat Flux (Winter period)	Unventilated Air cavity # 1	0.4741	m²·K/W
	ATI PRO PREMIUM	3.52	m²·K/W
	PAVAFLEX 80	2.10	m²·K/W
	Ventilated Air cavity # 2 (the thermal resistance of external surface R_{se})	0.1186	m²·K/W
	R_{Total}	**6.21**	**m²·K/W**

Table 3: Wall construction calculation results for slope α = 90° (EN ISO 6946)

ATI MIX FIBRE DE BOIS INTERIEUR installed on wall			
Angle: α = 90°	**Layer**	**R value**	**Unit**
Ascendant Heat Flux (Winter period)	Unventilated Air cavity # 1	0.5684	m²·K/W
	ATI PRO PREMIUM	3.52	m²·K/W
	PAVAFLEX 80	2.10	m²·K/W
	Ventilated Air cavity # 2 (the thermal resistance of external surface R_{se})	0.1402	m²·K/W
	R_{Total}	**6.33**	**m²·K/W**

Requirements for calculation validity:

- Calculations of R values are valid for a pitched roof (α is generally from 0° to 90°).
- Calculations of R values are valid when ATI PRO PREMIUM is installed in agreement with the installation guidelines described into the manufacturer brochure.