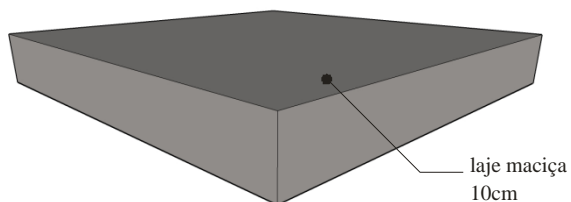


**b) Coberturas:**

Descrição:

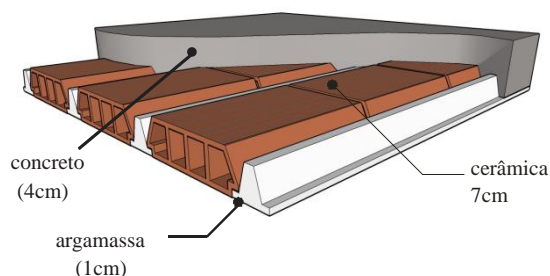
1

Laje maciça (10,0cm)  
Sem telhamento

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
3,73	220

Descrição:

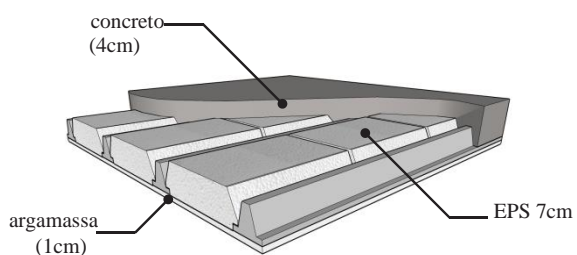
2

Laje pré-moldada 12cm (concreto  
4cm + lajota cerâmica 7cm +  
argamassa 1cm)  
Sem telhamento

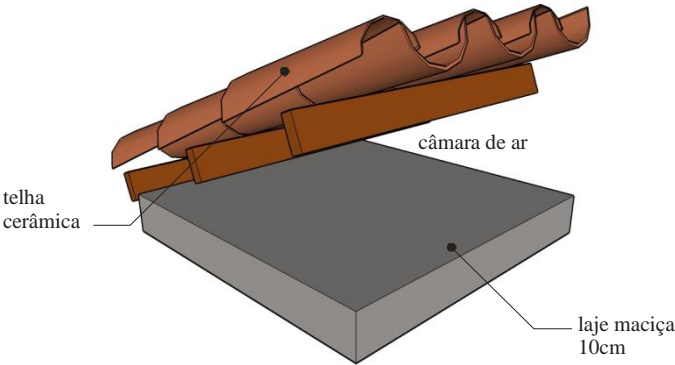
U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
2,95	167

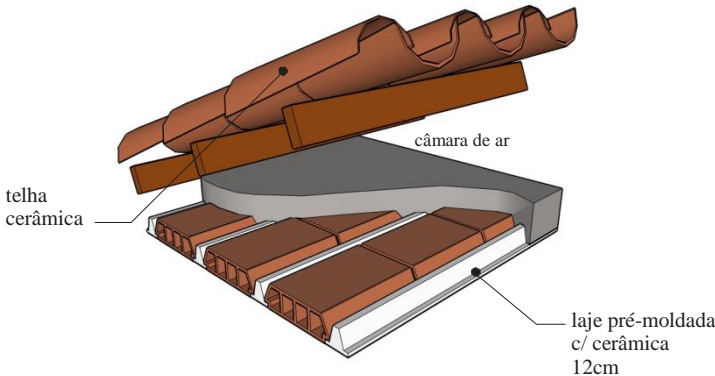
Descrição:

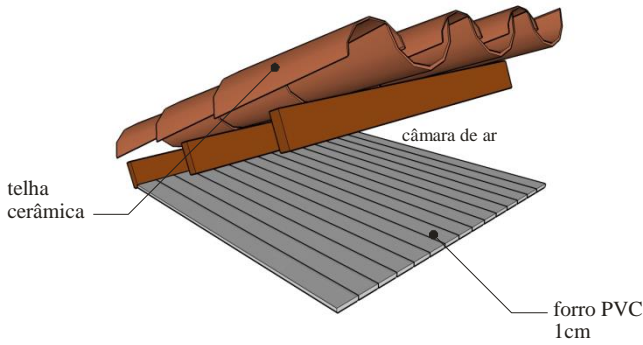
3

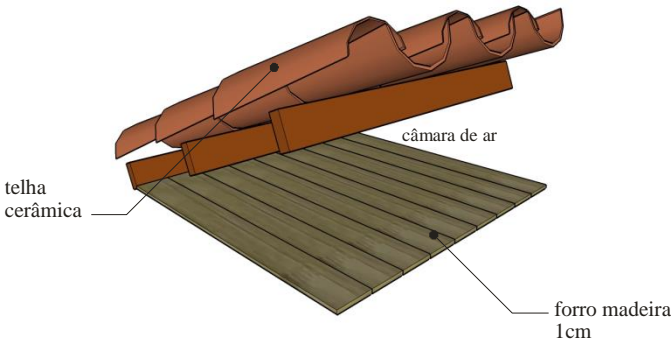
Laje pré-moldada 12cm (concreto  
4cm + EPS 7cm + argamassa 1cm)  
Sem telhamento

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
2,29	132

 <p>Diagram showing a cross-section of a roof assembly. From top to bottom: a brown ceramic tile, a wooden batten, a grey air chamber labeled 'câmara de ar', and a thick grey concrete slab labeled 'laje maciça 10cm'. The label 'telha cerâmica' points to the tile.</p>	<p>Descrição: <span style="float: right; border: 1px solid black; padding: 2px;">4</span></p> <p>Laje maciça (10,0cm) Câmara de ar (&gt; 5,0 cm) Telha cerâmica</p>			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2,05</td> <td style="text-align: center;">238</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	2,05
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]			
2,05	238			

 <p>Diagram showing a cross-section of a roof assembly. From top to bottom: a brown ceramic tile, a wooden batten, a grey air chamber labeled 'câmara de ar', and a precast concrete slab with a ceramic tile on top labeled 'laje pré-moldada c/ cerâmica 12cm'. The label 'telha cerâmica' points to the tile.</p>	<p>Descrição: <span style="float: right; border: 1px solid black; padding: 2px;">5</span></p> <p>Laje pré-moldada 12cm (concreto 4cm + lajota cerâmica 7cm + argamassa 1cm) Câmara de ar (&gt; 5,0 cm) Telha cerâmica</p>			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1,79</td> <td style="text-align: center;">185</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	1,79
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]			
1,79	185			

 <p>Diagram showing a cross-section of a roof assembly. From top to bottom: a brown ceramic tile, a wooden batten, a grey air chamber labeled 'câmara de ar', and a grey PVC sheet labeled 'forro PVC 1cm'. The label 'telha cerâmica' points to the tile.</p>	<p>Descrição: <span style="float: right; border: 1px solid black; padding: 2px;">6</span></p> <p>Forro PVC (1,0cm) Câmara de ar (&gt; 5,0 cm) Telha cerâmica</p>			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1,75</td> <td style="text-align: center;">21</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	1,75
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]			
1,75	21			

 <p>Diagram showing a cross-section of a roof assembly. From top to bottom: a brown ceramic tile, a wooden batten, a grey air chamber labeled 'câmara de ar', and a green wood sheet labeled 'forro madeira 1cm'. The label 'telha cerâmica' points to the tile.</p>	<p>Descrição: <span style="float: right; border: 1px solid black; padding: 2px;">7</span></p> <p>Forro madeira (1,0cm) Câmara de ar (&gt; 5,0 cm) Telha cerâmica</p>			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2,02</td> <td style="text-align: center;">26</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	2,02
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]			
2,02	26			

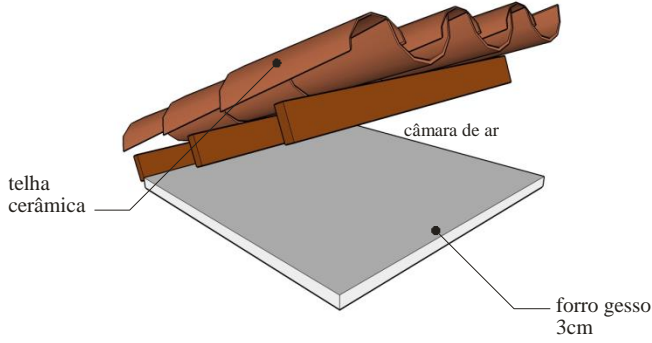


Diagram showing a cross-section of a roof assembly. From top to bottom: a layer of ceramic tiles (telha cerâmica), a 3cm gypsum board (forro gesso 3cm), and an air cavity (câmara de ar). The tiles are supported by wooden battens.

**Descrição:** 8

Forro gesso (3,0cm)  
 Câmara de ar (> 5,0 cm)  
 Telha cerâmica (1cm)

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
1,94	37

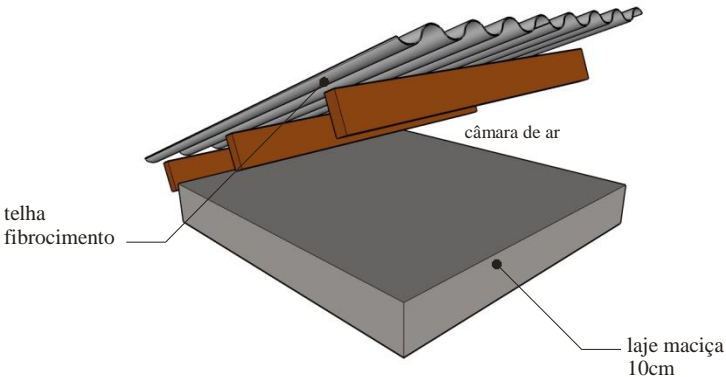


Diagram showing a cross-section of a roof assembly. From top to bottom: a layer of fibrocimento tiles (telha fibrocimento), a 10cm solid slab (laje maciça 10cm), and an air cavity (câmara de ar). The tiles are supported by wooden battens.

**Descrição:** 9

Laje maciça (10,0cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
2,06	233

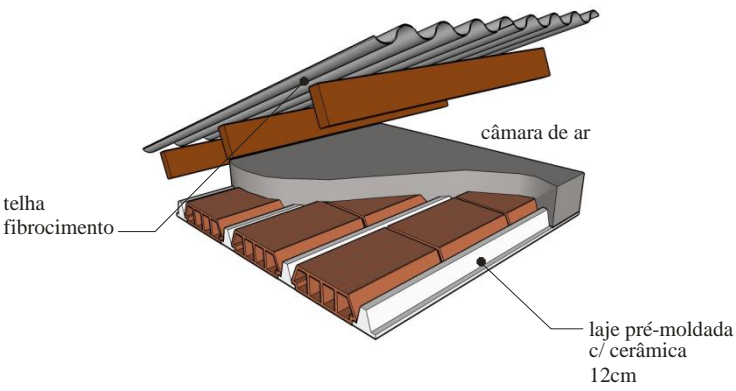


Diagram showing a cross-section of a roof assembly. From top to bottom: a layer of fibrocimento tiles (telha fibrocimento), a precast slab with ceramic tiles (laje pré-moldada c/ cerâmica 12cm), and an air cavity (câmara de ar). The tiles are supported by wooden battens.

**Descrição:** 10

Laje pré-moldada 12cm (concreto 4cm + lajota cerâmica 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento 0,8cm

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
1,79	180

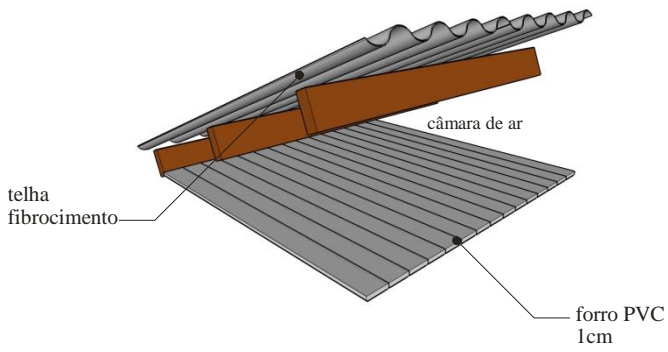
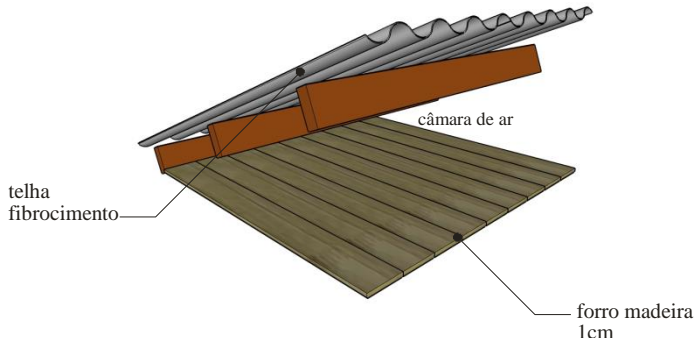


Diagram showing a cross-section of a roof assembly. From top to bottom: a layer of fibrocimento tiles (telha fibrocimento), a 1cm PVC board (forro PVC 1cm), and an air cavity (câmara de ar). The tiles are supported by wooden battens.

**Descrição:** 11

Forro PVC (1,0cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento

U	C <sub>T</sub>
[W/(m <sup>2</sup> K)]	[kJ/m <sup>2</sup> K]
1,76	16



telha fibrocimento

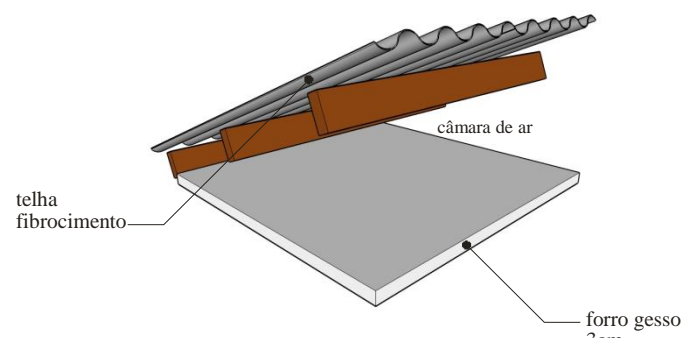
câmara de ar

forro madeira 1cm

**Descrição:** 12

Forro madeira (1,0cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
2,02	21



telha fibrocimento

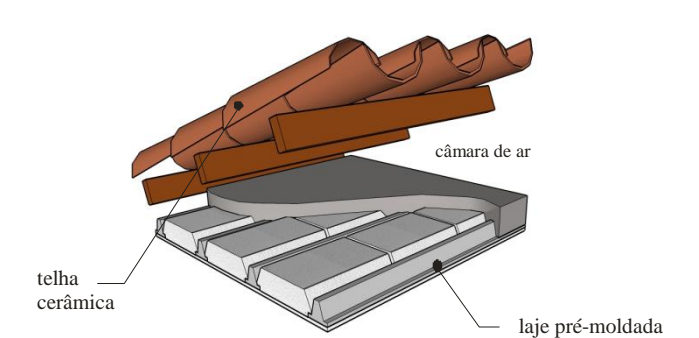
câmara de ar

forro gesso 3cm

**Descrição:** 13

Forro gesso (3,0 cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
1,95	32



telha cerâmica

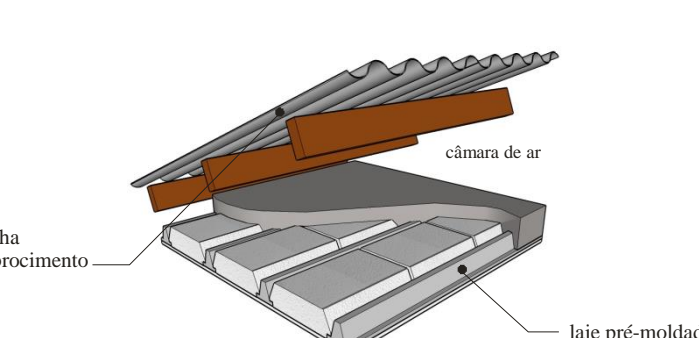
câmara de ar

laje pré-moldada com EPS 12cm

**Descrição:** 14

Laje pré-moldada 12cm (concreto 4cm + EPS 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha cerâmica

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
1,52	150



telha fibrocimento

câmara de ar

laje pré-moldada com EPS 12cm

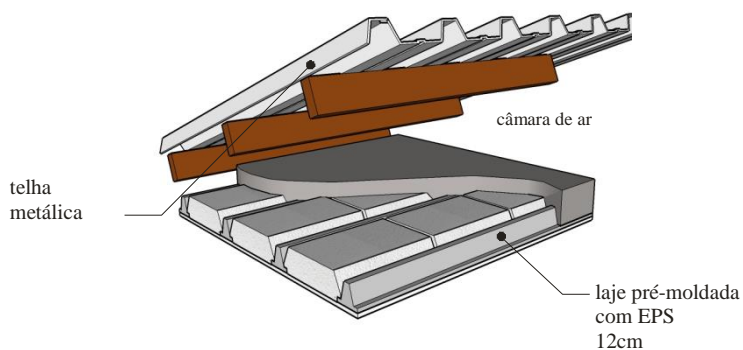
**Descrição:** 15

Laje pré-moldada 12cm (concreto 4cm + EPS 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha fibrocimento

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
1,52	145

## Descrição:

16

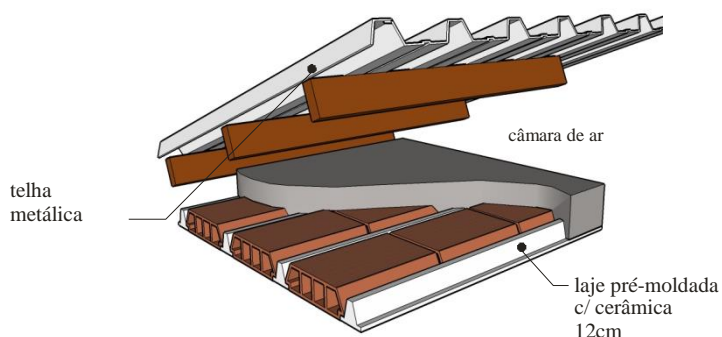


Laje pré-moldada 12cm (concreto 4cm + EPS 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha metálica 0,06cm

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,54	134

## Descrição:

17

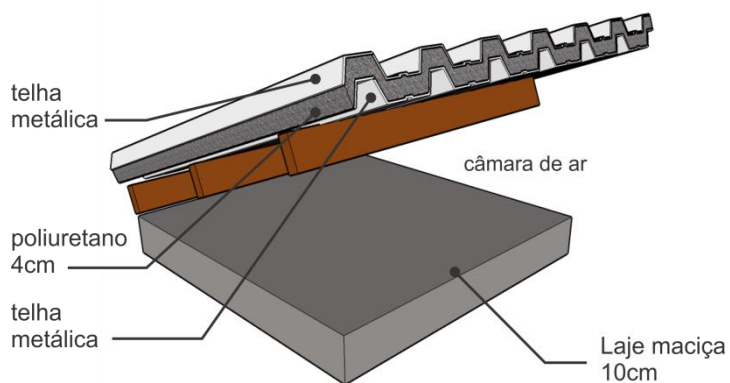


Laje pré-moldada 12cm (concreto 4cm + lajota cerâmica 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha metálica 0,6cm

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,82	169

## Descrição:

18



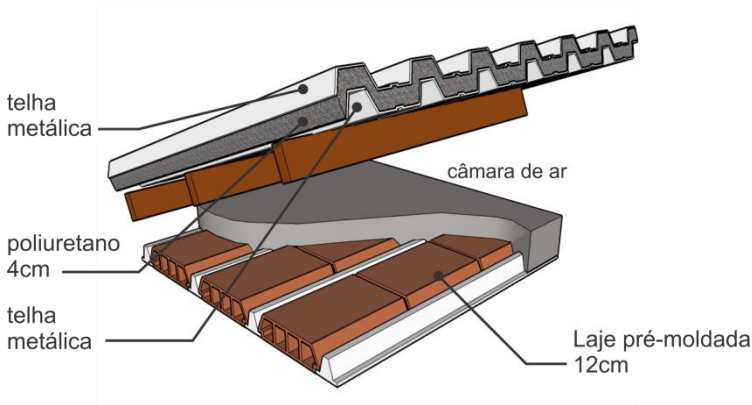
Laje maciça 10,0cm  
 Câmara de ar (> 5,0 cm)  
 Telha metálica\* 0,1cm  
 Poliuretano 4,0cm  
 Telha metálica\* 0,1cm

\* A transmitância térmica independe se a telha tem formato trapezoidal ou ondulada

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
0,55	230

Descrição:

19



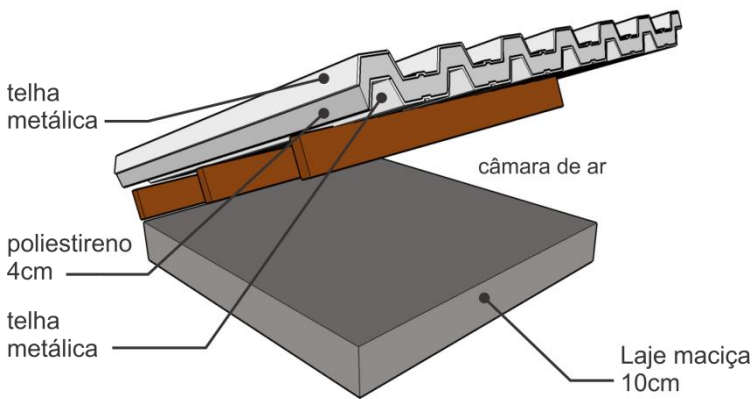
Laje pré-moldada 12cm (concreto 4cm + EPS 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha metálica\* 0,1cm  
 Poliuretano 4,0cm  
 Telha metálica\* 0,1cm

\* A transmitância térmica independe se a telha tem formato trapezoidal ou ondulada

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
0,53	176

Descrição:

20



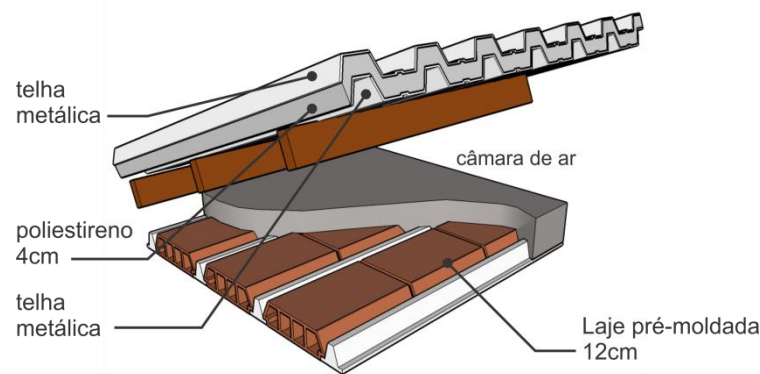
Laje maciça 10,0cm  
 Câmara de ar (> 5,0 cm)  
 Telha metálica\* 0,1cm  
 Poliestireno (isopor) 4,0cm  
 Telha metálica\* 0,1cm

\* A transmitância térmica independe se a telha tem formato trapezoidal ou ondulada

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
0,68	229

Descrição:

21



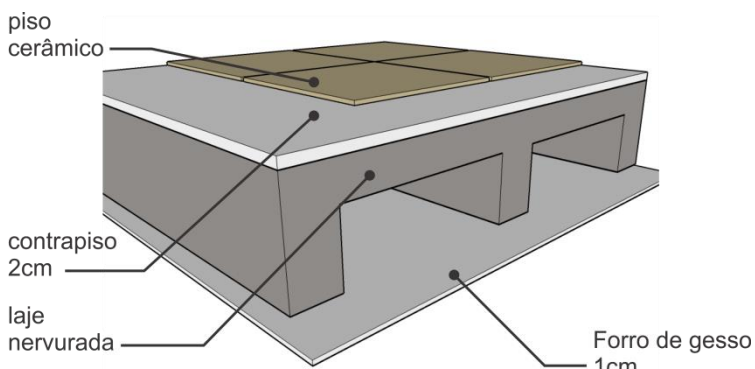
Laje pré-moldada 12cm (concreto 4cm + EPS 7cm + argamassa 1cm)  
 Câmara de ar (> 5,0 cm)  
 Telha metálica\* 0,1cm  
 Poliestireno 4,0cm  
 Telha metálica\* 0,1cm

\* A transmitância térmica independe se a telha tem formato trapezoidal ou ondulada

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
0,65	176

Descrição:

22

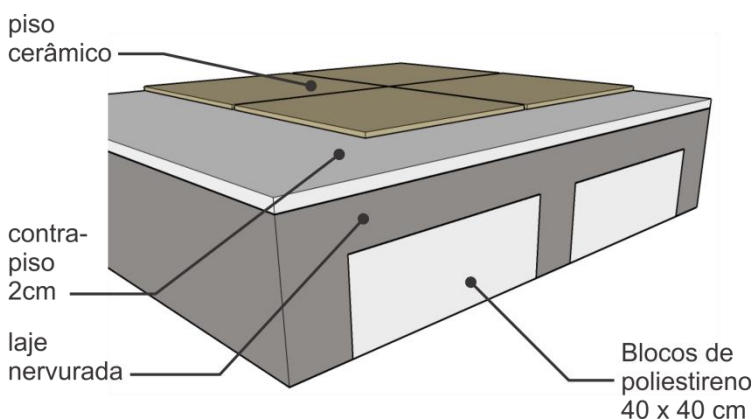


Forro de gesso (1cm)  
 Laje nervurada - Altura 22,5cm (altura da nervura 15cm, largura da nervura 10cm, espessura da lâmina 7,5cm, Distância entre vãos 50cm)  
 Vazios sem preenchimento (câmara de ar) 40 x 40cm  
 Contrapiso (2cm)  
 Piso cerâmico (0,75cm)  
 Sem telhamento

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
2,22	278

Descrição:

23

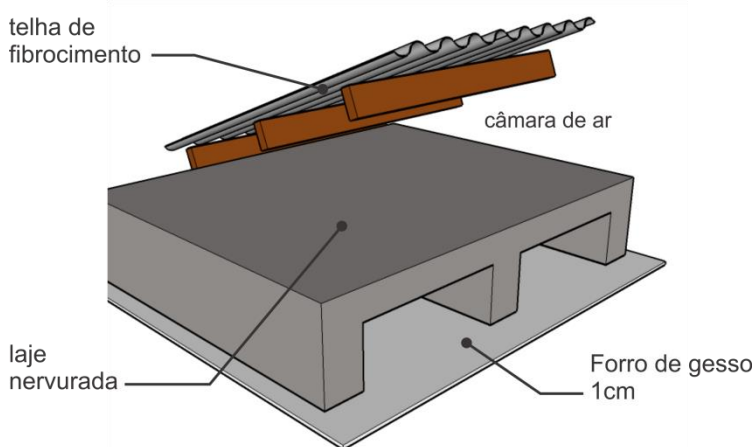


Sem forro de gesso  
 Laje nervurada - Altura 22,5cm (altura da nervura 15cm, largura da nervura 10cm, espessura da lâmina 7,5cm, Distância entre vãos 50cm)  
 Vazios com preenchimento de poliestireno 40 x 40cm  
 Contrapiso (2cm)  
 Piso cerâmico (0,75cm)  
 Sem telhamento

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,75	279

Descrição:

24

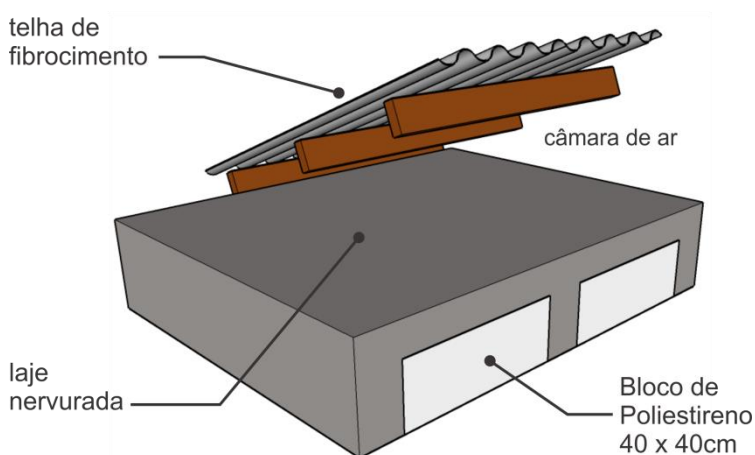


Forro de gesso (1cm)  
 Laje nervurada - Altura 22,5cm (altura da nervura 15cm, largura da nervura 10cm, espessura da lâmina 7,5cm, Distância entre vãos 50cm)  
 Vazios sem preenchimento (câmara de ar) 40 x 40cm  
 Câmara de ar (> 5,0 cm)  
 Telha de fibrocimento

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,55	237

Descrição:

25

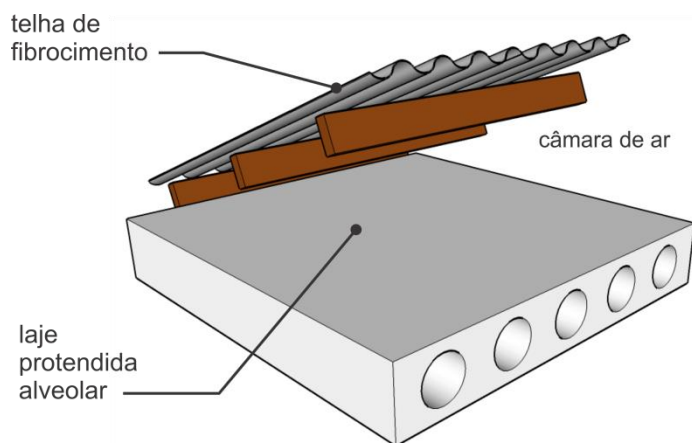


Laje nervurada - Altura 22,5cm (altura da nervura 15cm, largura da nervura 10cm, espessura da lâmina 7,5cm, Distância entre vãos 50cm)  
 Vazios com preenchimento de poliestireno 40 x 40cm  
 Câmara de ar (> 5,0 cm)  
 Telha de fibrocimento

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,31	238

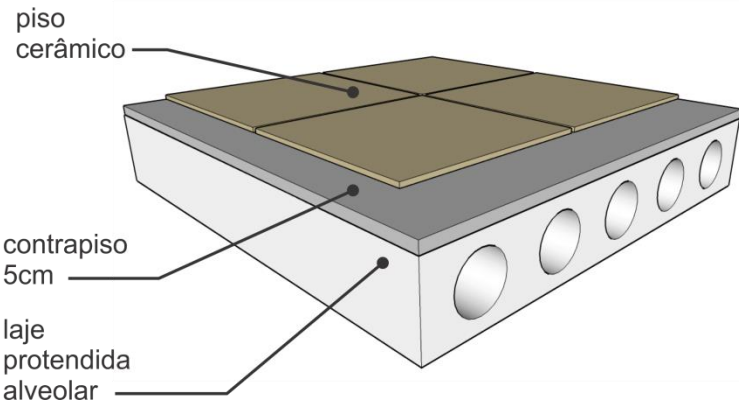
Descrição:

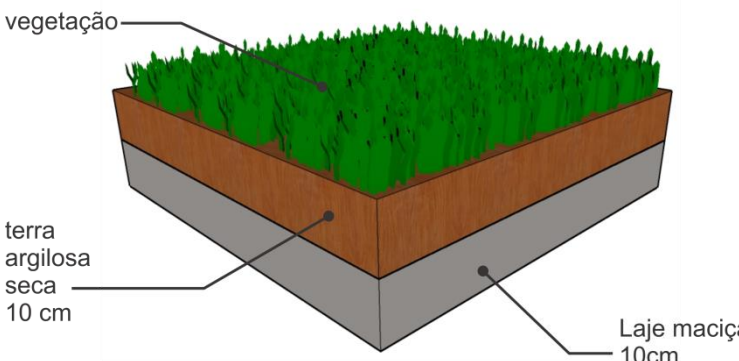
26

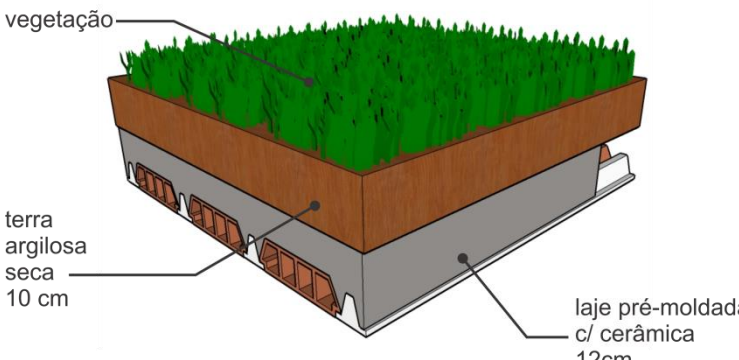


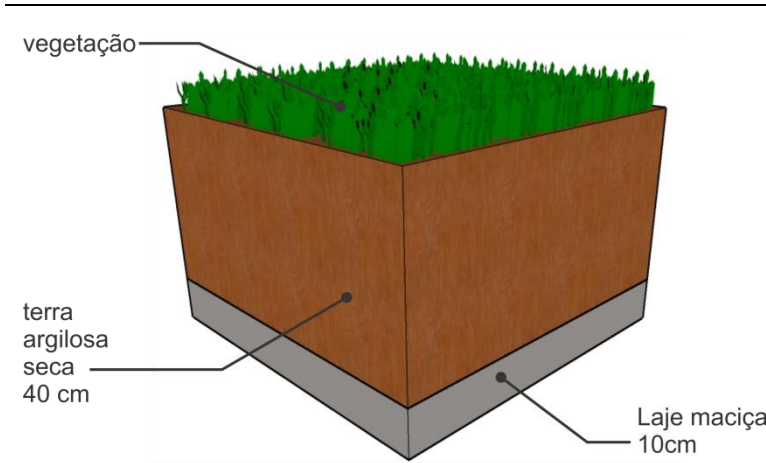
Laje protendida alveolar sem preenchimento e sem capa (15cm)  
 Câmara de ar (> 5,0 cm)  
 Telha de fibrocimento

U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]
1,75	268

 <p>piso cerâmico</p> <p>contrapiso 5cm</p> <p>laje protendida alveolar</p>	<p>Descrição:</p> <p>Laje protendida alveolar sem preenchimento e sem capa (15cm)</p> <p>Contrapiso (5cm)</p> <p>Piso cerâmico (0,75cm)</p> <p>Sem telhamento</p>	27			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2,48</td> <td style="text-align: center;">369</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	2,48	369
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]				
2,48	369				

 <p>vegetação</p> <p>terra argilosa seca 10 cm</p> <p>Laje maciça 10cm</p>	<p>Descrição:</p> <p>Telhado vegetado extensivo:</p> <p>Laje maciça 10,0cm</p> <p>Terra argilosa seca (10cm)</p> <p>Vegetação</p>	28			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2,18</td> <td style="text-align: center;">363</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	2,18	363
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]				
2,18	363				

 <p>vegetação</p> <p>terra argilosa seca 10 cm</p> <p>laje pré-moldada c/ cerâmica 12cm</p>	<p>Descrição:</p> <p>Telhado vegetado extensivo:</p> <p>Laje pré-moldada 12cm (concreto 4cm + lajota cerâmica 7cm + argamassa 1cm)</p> <p>Terra argilosa seca (10cm)</p> <p>Vegetação</p>	29			
	<table border="1"> <thead> <tr> <th>U [W/(m<sup>2</sup>K)]</th> <th>C<sub>T</sub> [kJ/m<sup>2</sup>K]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1,88</td> <td style="text-align: center;">310</td> </tr> </tbody> </table>	U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]	1,88	310
U [W/(m <sup>2</sup> K)]	C <sub>T</sub> [kJ/m <sup>2</sup> K]				
1,88	310				

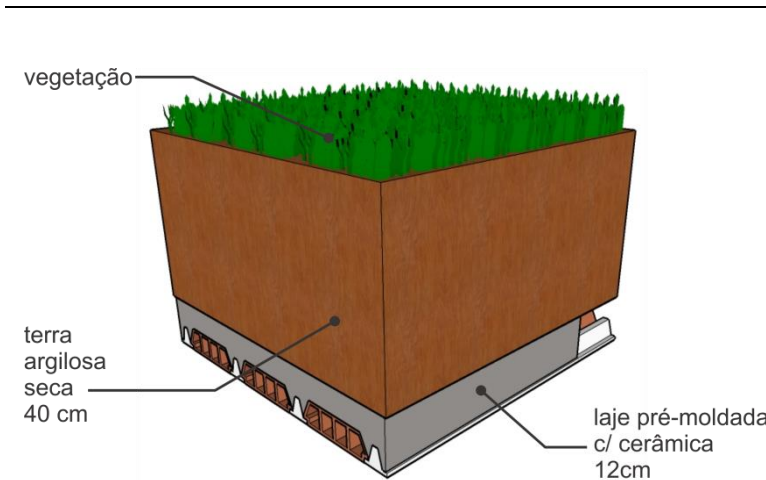


Descrição:

30

Telhado vegetado intensivo:  
Laje maciça 10,0cm  
Terra argilosa seca (40cm)  
Vegetação

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
0,96	791



Descrição:

31

Telhado vegetado intensivo:  
Laje pré-moldada 12cm (concreto 4cm + lajota cerâmica 7cm + argamassa 1cm)  
Terra argilosa seca (40cm)  
Vegetação

U [W/(m²K)]	C <sub>T</sub> [kJ/m²K]
0,90	738