环境一体机
微能源系统
通风管道系统
被动窗系统
智能化生活服务系统
遮阳系统
建筑密封系统
石墨聚苯板保温系统
被动式入户门系统
运营维护
监督检测
技术服务
三位一体的保障体系
N大核心产品及系统
低能耗建筑+
LOWCARN PASSIVE DOOR AND WINDOW SYSTEM

被动式铝包木系统窗
Passive Aluminium-clad Wood System Window

被动式PVC系统窗
Passive PVC system window

被动式铝系统窗
Passive Aluminium System Window

被动式木索系统窗
Passive Cable System Window

被动式门窗系统
Passive door and window system

被动式入门户
Passive Entrance doors
PASSIVE 130 Passive Aluminum clad Wood System Window:

- Applicable zones: Except extremely cold areas
- Thermal insulation performance: $U_w \leq 0.8 \text{ W/(m}^2\cdot\text{K)}$
  - PASSIVE 130 Passive aluminum clad wood system window adopts PA66 thermal insulation profile and wood composite structure, which greatly improves its insulation performance.
  - The hidden drainage system makes the drainage more unobstructed, and the watertightness is significantly improved.
  - Special composite structure adopts modular processing mode to simplify operation.
• It is sealed with EPDM (EPDM) rubber strip of automobile grade.
• The imported flexible super warm edge strip is adopted for the glass spacer strip, which can effectively eliminate the stack difference, overflow and other problems of the glass, with good sound insulation effect; the inert gas is filled, which can significantly reduce the leakage rate and ensure excellent performance. The super spacer strip can be used in extremely cold and hot areas with the tolerance temperature of -51 °C - 127 °C.
• The hardware adopts European standard 13 series hidden anti-theft hardware, which has better bearing, more beautiful and safer.
Feature 1: Flexible super warm edge is adopted for glass

The super spacer strip is completely free of metal and belongs to the real warm edge. The thermal conductivity (Premium: $\lambda = 0.15 \text{ w/m.k}$, standard: $\lambda = 0.162 \text{ w/m.k}$) is a PHA + product certified by PHI. The U value of the whole window can be reduced by 10-15% (about 0.2).
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<table>
<thead>
<tr>
<th>No.</th>
<th>Material</th>
<th>PHI level</th>
<th>Thermal conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SS edging warming strip</td>
<td>phB</td>
<td>0.31</td>
</tr>
<tr>
<td>2</td>
<td>Glass fiber warm edge</td>
<td>phB</td>
<td>0.29/0.14</td>
</tr>
<tr>
<td>3</td>
<td>TPSwarm edge</td>
<td>phB</td>
<td>0.31</td>
</tr>
<tr>
<td>4</td>
<td>Super Spacer</td>
<td>phA+</td>
<td>0.15</td>
</tr>
</tbody>
</table>
The annual leakage rate of argon is far less than 1%, and the hollow loss efficiency of super spacer is one tenth of that of traditional rigid spacer.

It is easy to use super spacer to solve the manufacturing difficulties such as the sagging of spacer, the difficulty in positioning the upper frame and the overflow of butyl rubber.

The insulating glass made of super spacer has been widely used in extremely cold areas such as Alaska in the north and Dubai in the Middle East in the south. The tolerance temperature range of super spacer is -51 °C - 127 °C.
The flexible spacer system realizes the full-automatic hollow production in the true sense without manual participation, and ensures the consistency and stability of product quality. It can produce four glass and three cavity hollow glass and effectively eliminate the stack error.
Feature 2: The insulation strip adopts PA66 material.

WHY PA66?

- PA66 nylon raw material is reinforced nylon 66, melting point is about 280 °C, cooling rapidly when it is cold, it has excellent mechanical properties. At the same time, its thermal expansion and cold shrinkage are similar to that of aluminum, resulting in less deformation stress and more stable performance.
The picture shows PVC insulation strip, which has poor structural stability and serious structural deformation, directly affecting the performance of doors and windows.
• The thermal deformation of PVC is up to 0.9mm, which has a great influence on the performance of the whole window, and the aluminum outside the window is at risk of falling off.

PRODUCT CHARACTERISTICS
Passive 130

- Single maximum deformation (linear displacement): 0.9mm
- Test temperature: 80°C
- Equipment: Blower test box
- Measuring tool: Feeler gauge
- Time:
The maximum thermal deformation of PA66 is only 0.3mm, which can effectively guarantee the performance of the whole window.

- Maximum single deformation (linear displacement): 0.3mm
- Test temperature: 80 °C
- Equipment: blower test box
- Measuring tool: feeler gauge
- Time: 4H
## PRODUCT CHARACTERISTICS

### Passive 130

<table>
<thead>
<tr>
<th></th>
<th>Before heating</th>
<th>After heating</th>
<th>Size change rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PVC</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>199.0</td>
<td>194.0</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>201.0</td>
<td>197.5</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>202.0</td>
<td>198.0</td>
<td>1.8%</td>
<td></td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td><strong>PA66</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200.0</td>
<td>199.5</td>
<td>0.25%</td>
<td></td>
</tr>
<tr>
<td>201.0</td>
<td>200.5</td>
<td>0.25%</td>
<td></td>
</tr>
<tr>
<td>200.0</td>
<td>199.0</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td></td>
<td>0.5%</td>
<td></td>
</tr>
</tbody>
</table>
• PVC composite softened at 70 °C and intensified at 75 °C. It is not easy to recover after deformation.
• Main wall thickness: 1.5mm/2.5mm.

• Nylon composite profile does not soften at 80 °C;
• Main wall thickness: 1.5mm/2.5mm.
PRODUCT CHARACTERISTICS

Passive 130

Tensile strength

PVC材质

尼龙材质
PRODUC T CHARACTERISTICS

Passive 130

PVC
PRODUCT CHARACTERISTICS

Passive 130

PA66
## PRODUCT CHARACTERISTICS

**Passive 130**

Comparative data of tensile strength between PVC composite profile and nylon composite profile

<table>
<thead>
<tr>
<th>Test data</th>
<th>PVC composite profile</th>
<th>Nylon composite profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.161</td>
<td>0.172</td>
</tr>
<tr>
<td>2</td>
<td>0.139</td>
<td>0.250</td>
</tr>
<tr>
<td>3</td>
<td>0.129</td>
<td>0.182</td>
</tr>
<tr>
<td>4</td>
<td>0.028</td>
<td>0.161</td>
</tr>
<tr>
<td>5</td>
<td>0.123</td>
<td>0.165</td>
</tr>
<tr>
<td><strong>平均值</strong></td>
<td><strong>0.130</strong></td>
<td><strong>0.173</strong></td>
</tr>
</tbody>
</table>

Note: remove a minimum value and a maximum value. Unit: KN
Feature 3: high strength graphite material is used for window sill pad
Why is the window sill pad made of high-strength graphite?
The lower opening of the passive window is the weakest part of the thermal bridge because it is unable to press the frame due to the installation of the windowsill. During the preliminary design of the new train town project, PHI clearly proposed that the window sill pad cannot be made of wood.
After a lot of searching, and through a lot of experiments, the final choice of imported high-strength graphite materials.

The heat insulation is four times that of wood

<table>
<thead>
<tr>
<th>No.</th>
<th>Compressive strength IPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.85</td>
</tr>
<tr>
<td>2</td>
<td>2.14</td>
</tr>
<tr>
<td>3</td>
<td>2.78</td>
</tr>
<tr>
<td>4</td>
<td>2.19</td>
</tr>
<tr>
<td>5</td>
<td>2.30</td>
</tr>
<tr>
<td>Average</td>
<td>2.45</td>
</tr>
</tbody>
</table>
Better structural design

No ponding chamber here, only horizontal drain holes can be milled. Water can not be discharged to the outdoor in time, ponding will cause wood to rot, or directly enter the indoor (purple water flow).

Set water collecting chamber to ensure drainage effect.
Two installation solutions: angle steel and Meesenburg subframe

INSTALLATION SCHEME OF PASSIVE DOORS AND WINDOWS
INSTALLATION PLAN

Installation Solutions

Angle steel external hanging type
Installation Solutions

Angle steel external hanging type
blaugelb_Triotherm External mounting
blaugelb_Triotherm External mounting

INSTALLATION PLAN
Installation Solutions
1. Installation introduction of angle external hanging:
   - Heat transfer coefficient of standard window type: \( UW = 0.8 \text{ W/㎡} \cdot \text{K} \); heat transfer coefficient after installation: \( UW \text{ installed} = 0.85 \text{ W/㎡} \cdot \text{K} \) (actually 0.99).
   - Indoor and outdoor use: Waterproof vapor permeable membrane and waterproof vapor barrier membrane, to ensure the overall air tightness of the building, realize the controllability of indoor and outdoor air exchange, and avoid the impact of water vapor on the building.
   - The full-length blaugelb_triotherm energy-saving sub frame is used for the lower opening of the window to support the whole window, ensure the uniform stress, and reduce the additional energy loss caused by the installation of the windowsill.
   - Other three sides use steel fixings with heat insulation gasket to ensure the firmness of installation.

2. Advantages of blaugelb_Triotherm external hanging installation:
   - The heat transfer coefficient of standard window type: \( UW = 0.8 \text{ W/㎡} \cdot \text{K} \); the heat transfer coefficient after installation: \( UW \text{ installed} = 0.81 \text{ W/㎡} \cdot \text{K} \).
   - Three in one pre expansion tape is used between the main and auxiliary frames to ensure the water vapor tightness at the gap.
   - The later maintenance can be replaced; the doors and windows are fixed with the auxiliary frame to realize the disassembly of the doors and windows without damaging the external wall.
   - Simple operation and high construction efficiency.
   - The rear installation of the main frame and the protection effect of the finished product are good; it does not affect the subsequent installation of the insulation, and shortens the overall construction period.
与自然共生    与未来拥抱
SYMBIOSIS WITH NATURE AND EMBRACE OF THE FUTURE
THANKS

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