

This software is named as U-value Calculator, which can easily and effectively calculate the U-value of different types of materials.

When it comes to the purpose of designing this software, the main consideration is that although the environmental performance of buildings now focuses on the use of carbon, the thermal performance of building materials still needs to be considered, which relates to the safety and comfort of the people living in the buildings.

Concerning the importance of U-value, it is also known as thermal transmittance, the rate of transfer of heat through a structure (which can be a single material or a composite), divided by the difference in temperature across that structure. The units of measurement are $W/m^2 K$. In most cases, the better-insulated a structure is, the lower the U-value will be.

At present, there are many reference standards for the U value of materials on the network, but the design calculation is often theoretical value, and the specific measurement accuracy depends on many factors, such as the influence of environmental temperature difference, convection and so on. In order to calculate the U value of each material more accurately and conveniently, we designed an online U value calculator. By using our U-value calculator, you can easily compare how the use of different materials, or different thicknesses of materials, can impact the overall thermal performance of a construction. This helps to ensure you specify and install the right thickness of insulation.

The key functions and equations we use are as follows,

$$U = \frac{\lambda}{d}$$
$$R = \frac{d}{\lambda}$$

Where,

U = Thermal Transmittance (W/m^2K)

R = Thermal Resistance (m^2K/W)

λ = Thermal Conductivity (W/mK)

d = Material Thickness (m)

Notice: The U-value of a building element consisting of different layers and surfaces is calculated from the thermal resistances (R-value) of the different parts making up the structure.

$$R_{wall} = R_{brick} + R_{airspace} + R_{block} + R_{plaster}$$

The U-value of a building element is the inverse of the total thermal resistances of the different layers making up the building element.

$$U_{wall} = \frac{1}{R_{wall}}$$

There are two examples of similar products in the market:

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U-value Calculator

The heat transfer number "U-value" represents the heat transfer through a material as a function of the temperature gradient between the warm and the cold side. The U-value calculator can be used to measure the heat loss with one or several insulating materials. The unit of the U-value is W/m^2K (watts per square meter and per Kelvin) and indicates the heat flow through an area of one square meter with a temperature difference of one Kelvin (= $1^{\circ}C$). The higher the U-value, the worse the insulation effect, the lower the U-value, the better the insulation effect.

The U-value calculator is for guidance. Heat transfer resistances of the air are not considered.

Material	Thickness	$\lambda[W/mK]$
Material	Thickness	$\lambda[W/mK]$
Material	Thickness	$\lambda[W/mK]$
Material	Thickness	$\lambda[W/mK]$
Material	Thickness	$\lambda[W/mK]$

Total
Thickness [mm]
R-Value $[(m^2 K)/W]$
R-Value $[(h ft^2 ^{\circ}F)/Btu]$
U-Value $[W/(m^2K)]$

Available at: <https://va-q-tec.com/en/u-value-calculator/>

Mannok U-Value Calculator

Construction Type: Floors Walls Pitched Roof Flat Roof

Construction Type Layer 2: Solid walls

Insulation Solution: Solid walls: internal dry lining - fixed to battens (Mannok Therm

Insulation Thickness: 25mm 40mm 60mm 70mm 80mm 110mm 140mm

I would like to receive my U-Value calculation via email:

Email address Send

U-Value 0.35 W/m^2K

Email my U-Value


Solid walls: internal dry lining - fixed to

U-Value 0.35 W/m^2K

Available at:

[https://uvaluecalculator.mannokbuild.com/?category=Walls&category2=Solid%20walls&product=11&insulation thickness=QW%5E40](https://uvaluecalculator.mannokbuild.com/?category=Walls&category2=Solid%20walls&product=11&insulation%20thickness=QW%5E40)

Here is our core code for calculating the U-value,

 yang-0314 update CW 4

Latest commit #872c6e 4 days ago [History](#)

Ak1 contributor

24 lines (22 slloc) | 685 Bytes

RawBlame

```
1  ### this can work with the typing variable not for GUI
2  def read_and_calculate(K_values, ds, n):
3      ### need change this is variable for the GUI how many variable the user type
4      dict_K = {} ### create two dicts for K and d
5      dict_d = {}
6      i = 0
7      x = 0
8      while i < n: ### this is for the add the value to the dict
9          dict_K[i] = K_values[x]
10         dict_d[i] = ds[x]
11         i = i + 1
12         x = x + 1
13     U_value_2(dict_K, dict_d)
14     return U_value_2(dict_K, dict_d)
15
16 def U_value_2(dict_K, dict_d, n):
17     i = 0
18
19     R_total = 0
20     while i < n:
21         R_total += dict_d[i]/dict_K[i]
22         i = i + 1
23     U_value_1 = 1/(R_total)
24     return U_value_1
```

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