



Fornaci Briziarelli Marsciano



DETAILS

The EU directive n° 91/year 2002 on energy production in building trade has been absorbed in Italy through the decree n° 192 on August 19th, 2005; subsequently modified by the decree n° 311 on December 29th, 2006.

The decrees above aim at establishing new terms and criteria in order to improve energy production in building trade, promote energy saving, introduce sustainable resources and reduce the production of greenhouse gas on a national basis, as established by the Kyoto Protocol.

It is a well-known fact that 65% of the final energy consumption in the civil field is to be attributed the housing sector (year 2003, source: ENEA).

In order to control the buildings' operating costs (for heating or air conditioning), new project parameters have been introduced, such as transmittance and walls' surface mass.

Several studies in the field proved that the presence of some sort of mass – as thermic inertia – and some insulating material – as a waste barrier – are both essential in terms of energy saving and thermic comfort.

Basically, a massive construction casing, with good heat storage capacity and appropriate insulation, can assure energy saving and a permanent sensation of thermic comfort.

The benefits are assessed through:

- Reduction of the heating/cooling system, with consequent energy saving;
- Reduction of carbon dioxide emission

Several european countries prefer to use big-sized walls, either monolithic or double, with the insertion of insulating, with or without insulating plaster.

This attitude is supported by several Public Administrations in Italy, which are providing deductions of the extra-shim of the perimetrical structures, to help enhancing the energy saving.

Referring to the technical literature and the policies sbove described, the decree n° 311, year 2006, states as follows:



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1. TRANSMITTANCE U (W/sqm K)

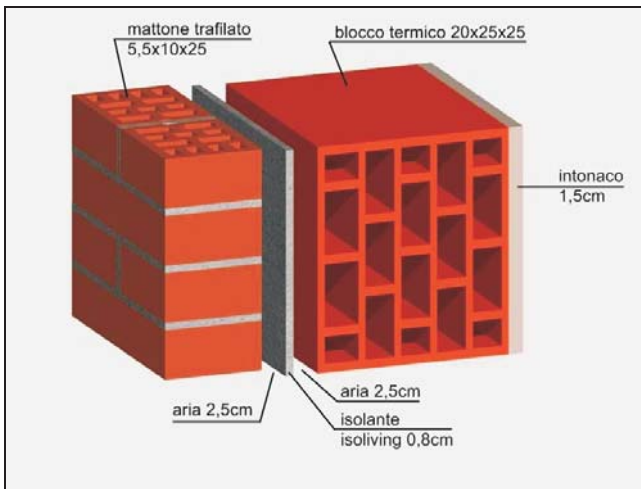
Climate zone	From the 1st of January, 2006 U (W/sqm K)	From the 1st of January, 2008 U (W/sqm K)	From the 1st of January, 2010 U (W/sqm K)
A	0,85	0,72	0,62
B	0,64	0,54	0,48
C	0,57	0,46	0,40
D	0,50	0,40	0,36
E	0,46	0,37	0,34
F	0,44	0,35	0,33

2. SURFACE MASS

M (s) must be higher than 230 Kg/ square metre, except for the F climate zone, where the average monthly irradiance on the horizontal plane during maximum summer isolation period I(m)(s) is equal to or higher than 290 W/ square metre. The positive effects due to M(s) can otherwise be obtained through the employment of special material, in order to reduce the oscillation of the rooms' temperature, according on solar irradiation.

The IsoLiving® insulating material, examined as follows, can assure the features shown above, therefore, if used, the surface mass does not have to be higher than 230 Kg/square metre.

F.B.M. spa provides a range of suitable technical options in order to help builders and designers to put the existing policies into practice. Among the options provided, the employment of drawn and hand-made bricks, together with perforated bricks, thermic blocks and different kinds of mortar and insulating material.



Wall composition:

- Drawn brick 5.5x10x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

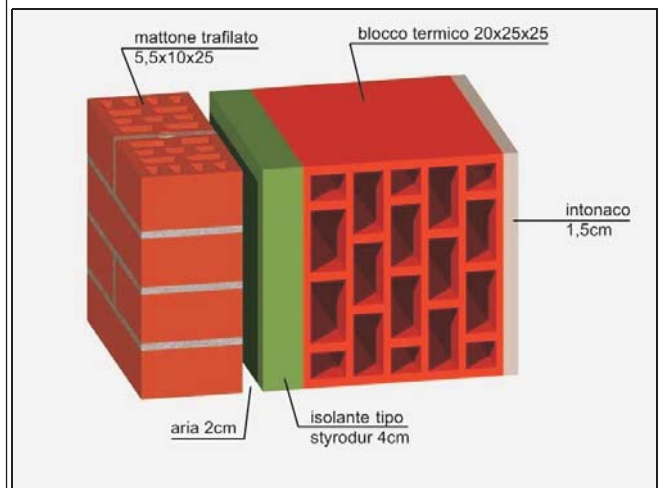
U = 0.415 W/sqm K (mortar $\lambda = 0.90$ W/mK)
U = 0.379 W/sqm K (mortar $\lambda = 0.60$ W/mK)
U = 0.331 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall composition:

- Drawn brick 5.5x10x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.464 W/sqm K (mortar $\lambda = 0.90$ W/mK)
U = 0.430 W/sqm K (mortar $\lambda = 0.60$ W/mK)
U = 0.386 W/sqm K (mortar $\lambda = 0.28$ W/mK)

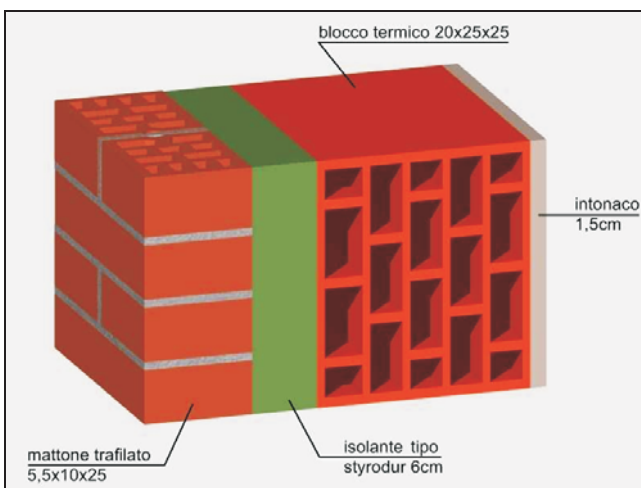


Wall composition:

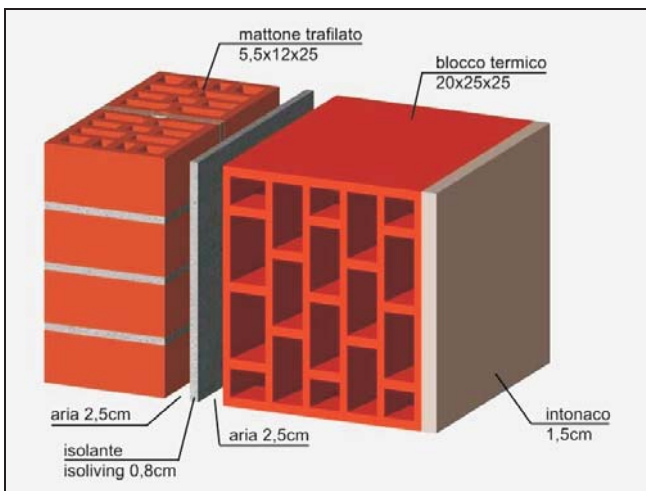
- Drawn brick 5.5x10x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.420 W/sqm K (mortar $\lambda = 0.90$ W/mK)
U = 0.387 W/sqm K (mortar $\lambda = 0.60$ W/mK)
U = 0.342 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 250 Kg/sqm



Wall composition:

- Drawn brick 5.5x12x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.406 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.370 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.328 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall composition:

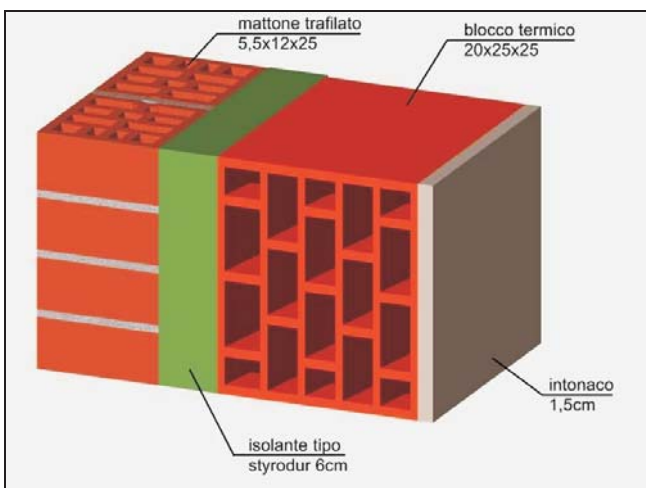
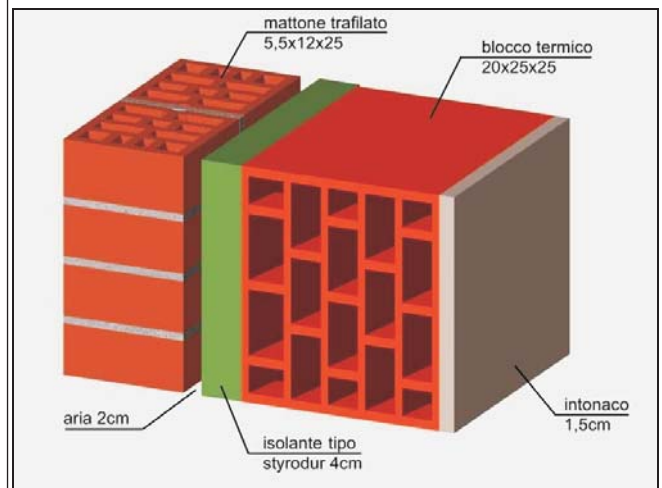
- Drawn brick 5.5x12x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.453 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.420 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.377 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall composition:

- Drawn brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

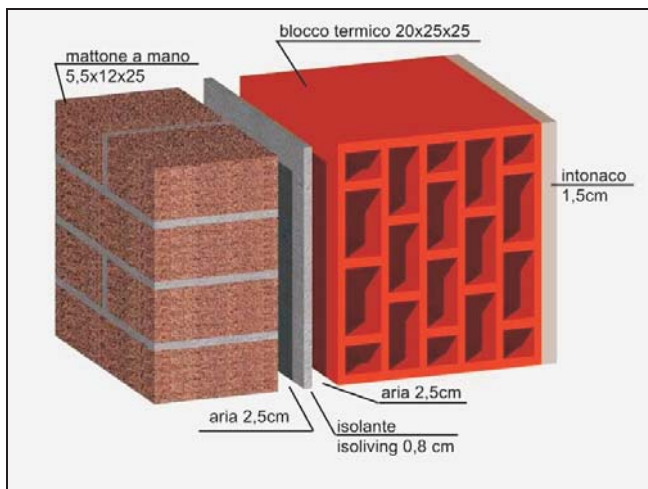
Wall transmittance:

U = 0.410 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.377 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.334 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall mass (except for plasterwork and insulating material) = 270Kg/sqm



Wall composition:

- Hand made brick 5.5x12x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.410 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.376 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.330 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall composition:

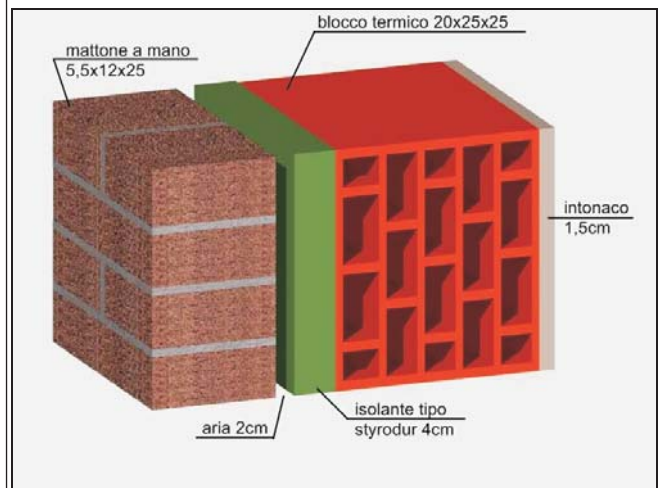
- Hand made brick 5.5x12x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.460 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.427 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.384 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall composition:

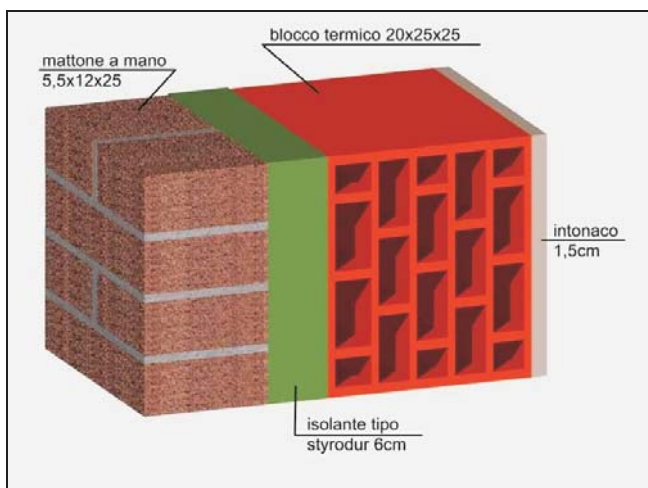
- Hand made brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

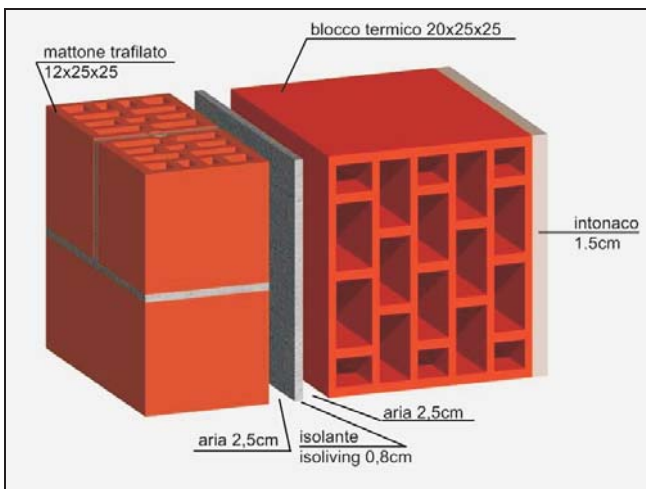
U = 0.415 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.382 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.339 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 300 Kg/sqm



Wall composition:

- Drawn brick 12x12x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

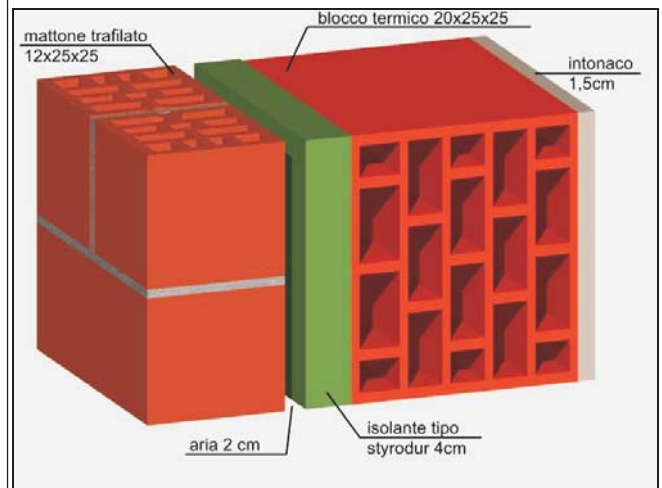
- U = 0.403 W/sqm K** (mortar $\lambda = 0.90$ W/mK)
- U = 0.366 W/sqm K** (mortar $\lambda = 0.60$ W/mK)
- U = 0.326 W/sqm K** (mortar $\lambda = 0.28$ W/mK)

Wall composition:

- Drawn brick 12x12x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

- U = 0.450 W/sqm K** (mortar $\lambda = 0.90$ W/mK)
- U = 0.418 W/sqm K** (mortar $\lambda = 0.60$ W/mK)
- U = 0.377 W/sqm K** (mortar $\lambda = 0.28$ W/mK)

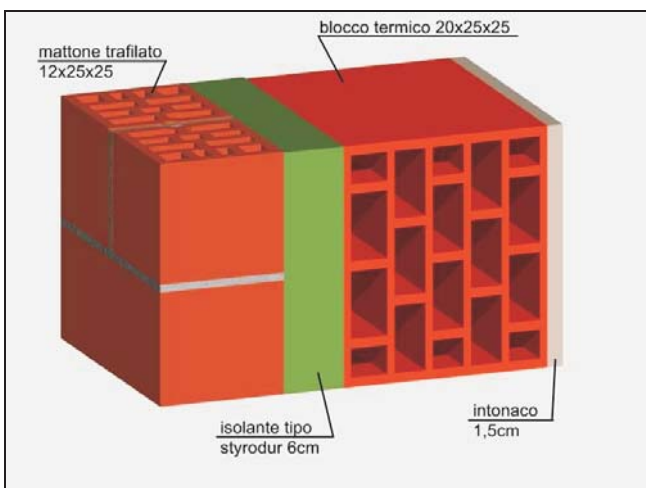


Wall composition:

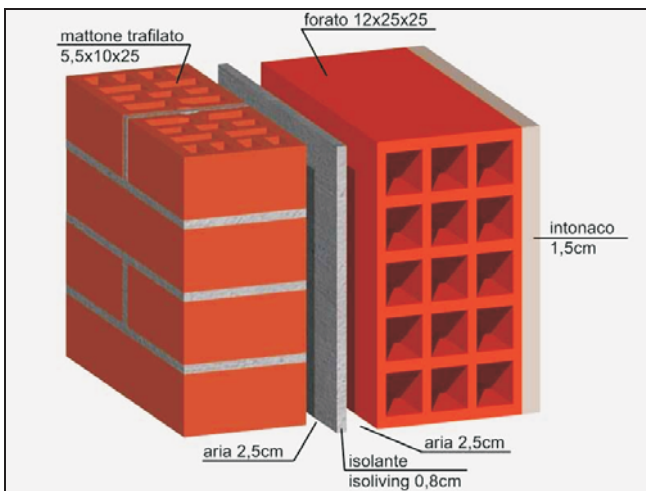
- Drawn brick 12x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Thermal block 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

- U = 0.408 W/sqm K** (mortar $\lambda = 0.90$ W/mK)
- U = 0.376 W/sqm K** (mortar $\lambda = 0.60$ W/mK)
- U = 0.334 W/sqm K** (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 255 Kg/sqm



Wall composition:

- Drawn brick 5.5x10x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.460 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.408 W/sqm K (mortar $\lambda = 0.28$ W/mK)

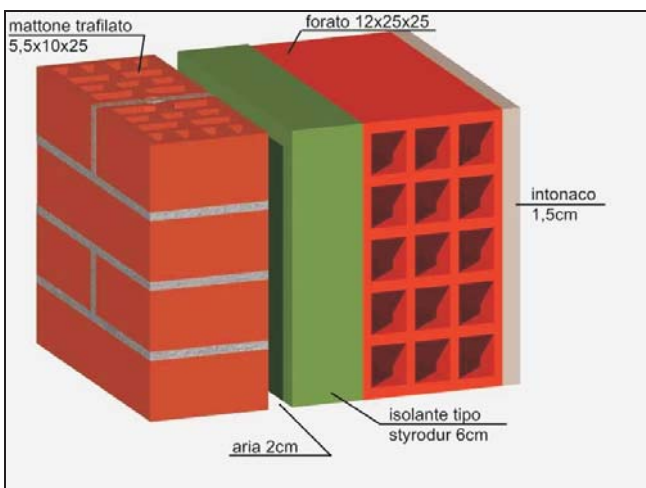
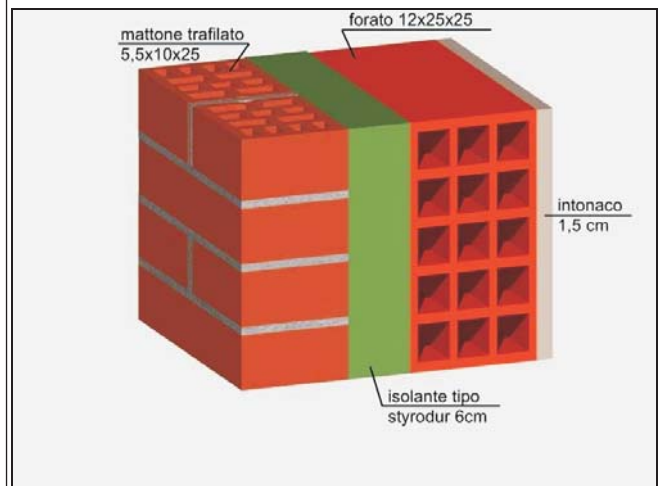
Wall composition:

- Drawn brick 5.5x10x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.447 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.406 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall composition:

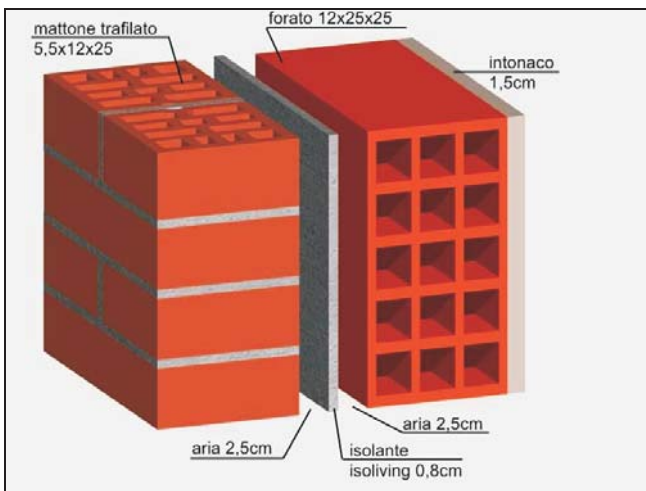
- Drawn brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.444 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.389 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall mass (except for plasterwork and insulating material) = 201 Kg/sqm



Wall composition:

- Drawn brick 5.5x12x25
- Thermoacoustic insulating material Isoliving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.454 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.399 W/sqm K (mortar $\lambda = 0.28$ W/mK)

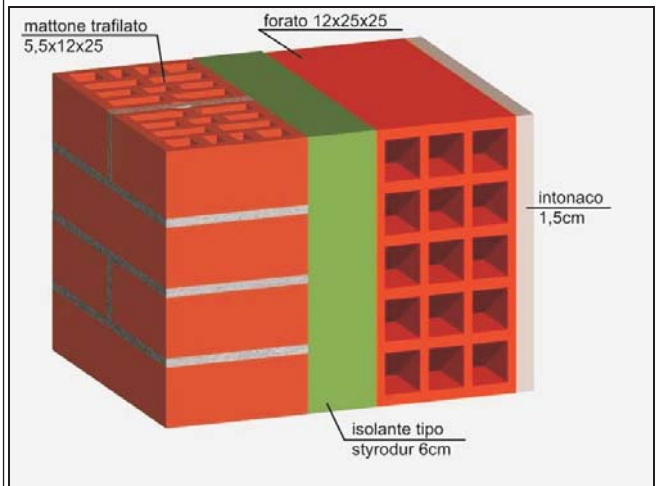
Wall composition:

- Drawn brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 20x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.447 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.395 W/sqm K (mortar $\lambda = 0.28$ W/mK)



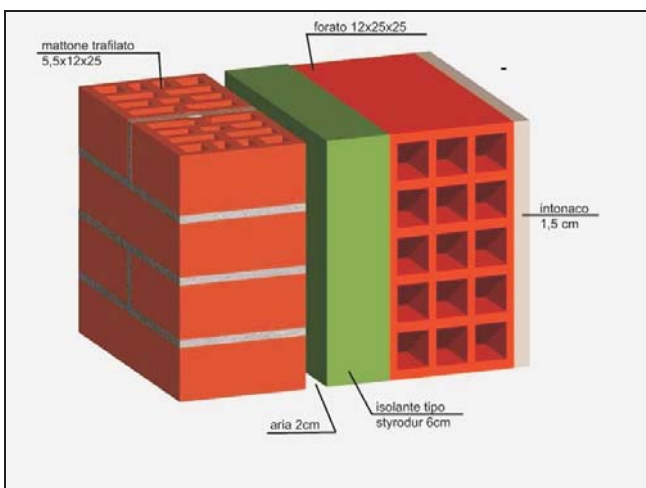
Wall composition:

- Drawn brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 20x25x25
- Traditional internal plasterwork s=1.5 cm

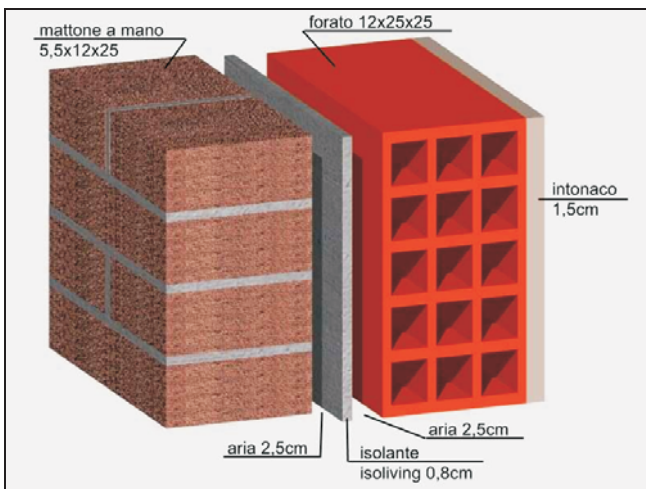
Wall transmittance:

U = 0.430 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.377 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 225 Kg/sqm



Wall composition:

- Hand made brick 5.5x12x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.461 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.407 W/sqm K (mortar $\lambda = 0.28$ W/mK)

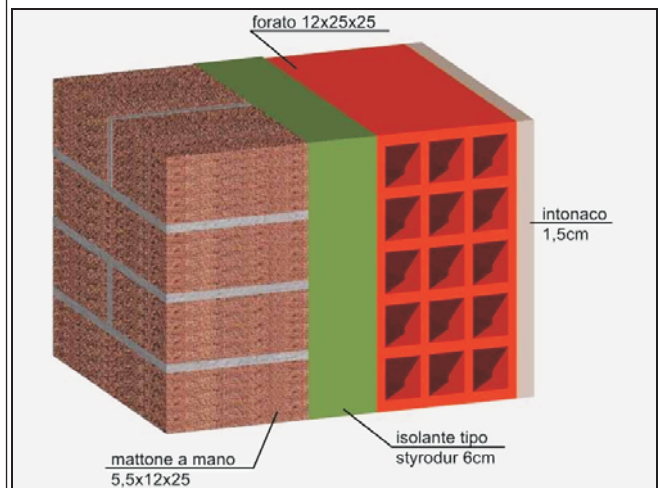
Wall composition:

- Hand made brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.456 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.402 W/sqm K (mortar $\lambda = 0.28$ W/mK)



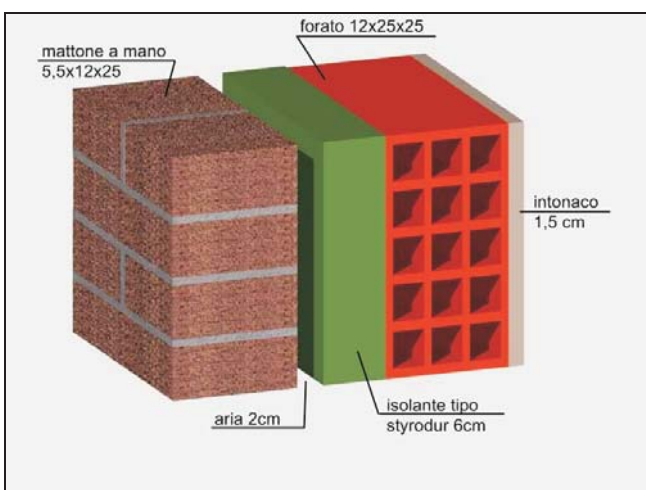
Wall composition:

- Hand made brick 5.5x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

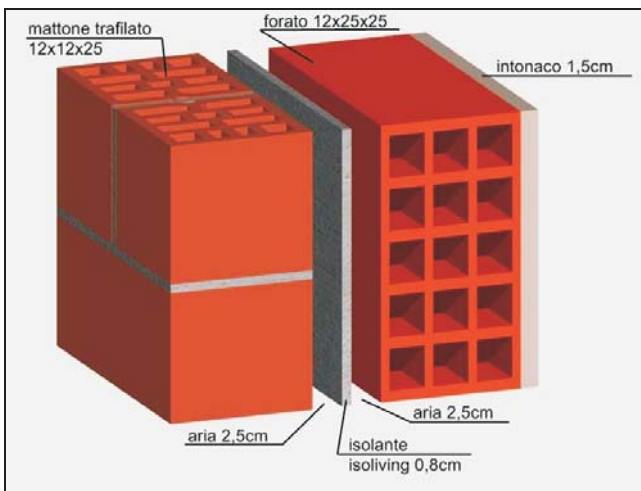
Wall transmittance:

U = 0.437 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.384 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 255 Kg/sqm



Wall composition:

- Drawn brick 12x12x25
- Thermoacoustic insulating material Isoliving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.452 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.399 W/sqm K (mortar $\lambda = 0.28$ W/mK)

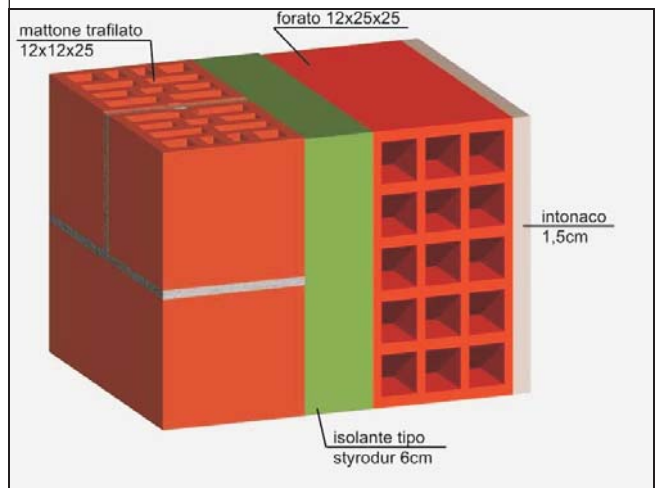
Wall composition:

- Drawn brick 12x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

Wall transmittance:

U = 0.447 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.395 W/sqm K (mortar $\lambda = 0.28$ W/mK)



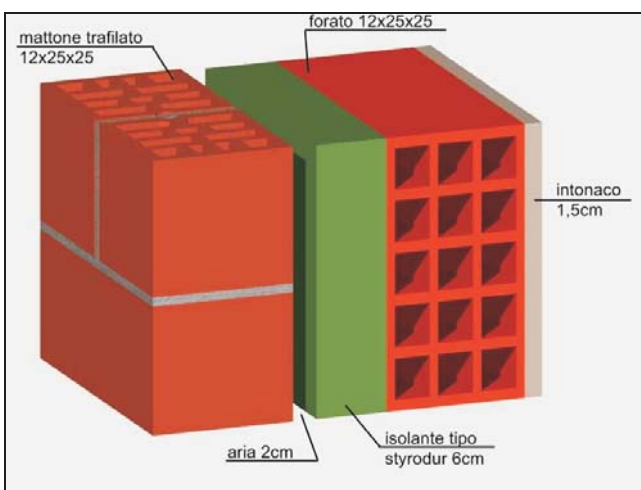
Wall composition:

- Drawn brick 12x12x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 12x25x25
- Traditional internal plasterwork s=1.5 cm

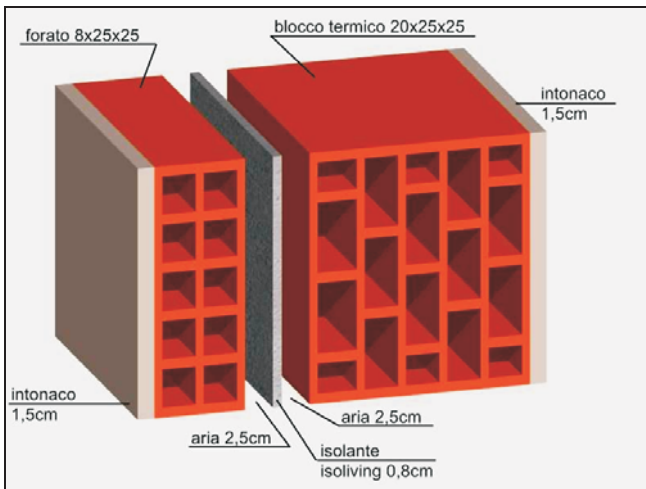
Wall transmittance:

U = 0.430 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.377 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall mass (except for plasterwork and insulating material) = 210 Kg/sqm



Wall composition:

- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 8x25x25

Wall transmittance:

U = 0.410 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.375 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.328 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall composition:

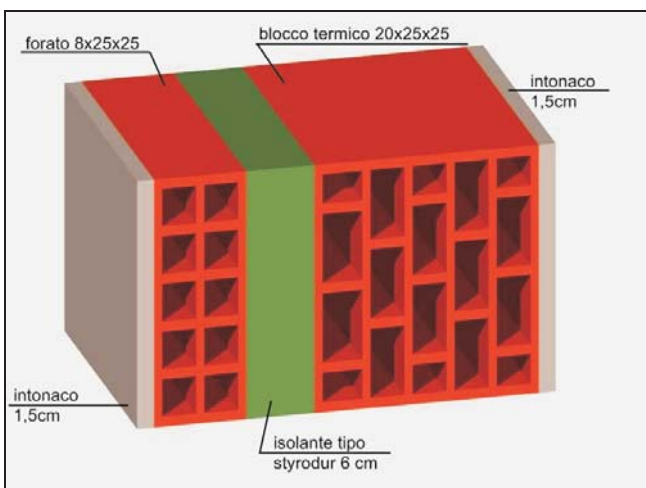
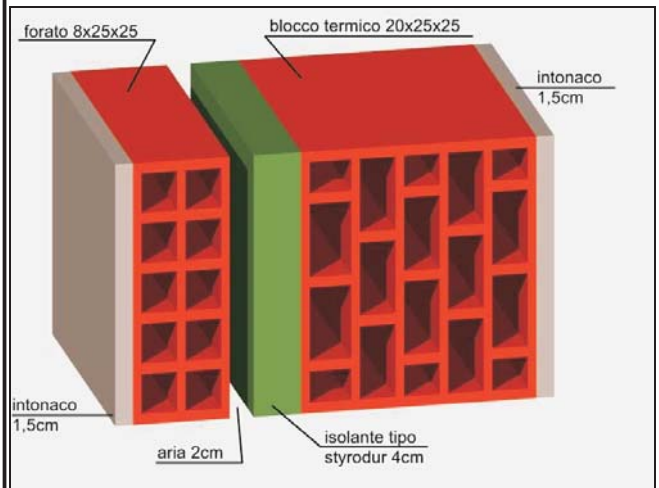
- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 8x25x25

Wall transmittance:

U = 0.462 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.428 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.385 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall composition:

- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 8x25x25

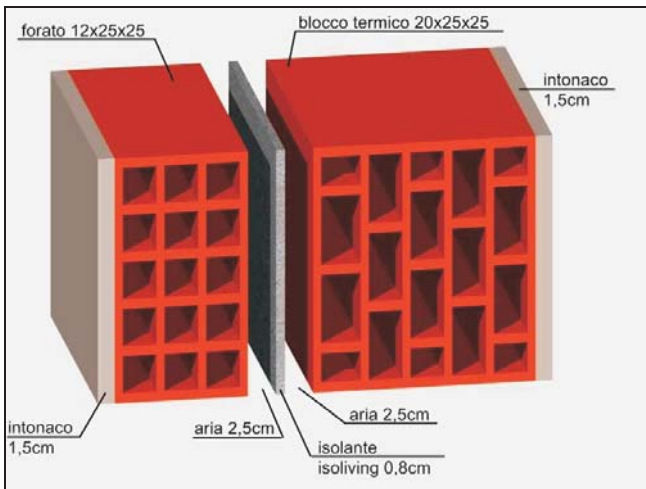
Wall transmittance:

U = 0.420 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.386 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.341 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall mass (except for plasterwork and insulating material) = 175 Kg/sqm



Wall composition:

- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Thermoacoustic insulating material Isolving® (placed between two gaps measuring 2.5 cm each)
- Hollowed brick 12x25x25

Wall transmittance:

U = 0.387 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.354 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.310 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall composition:

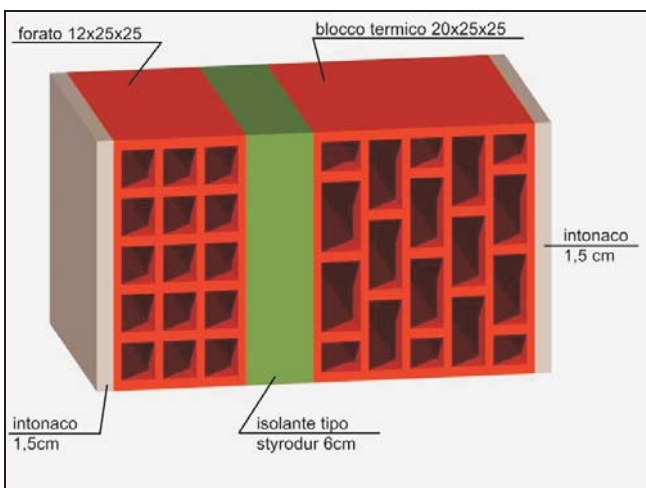
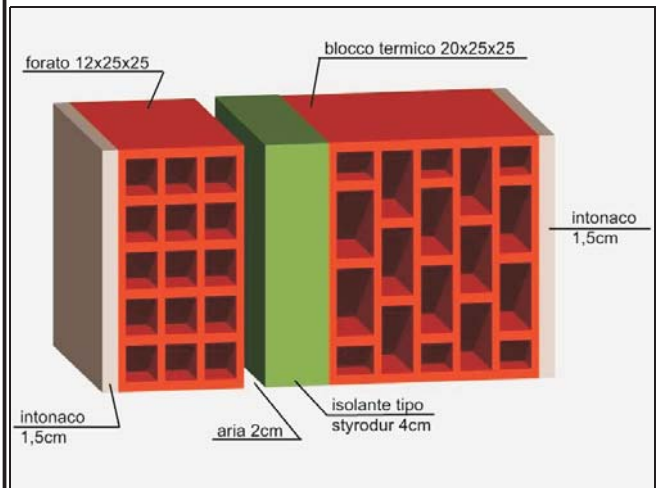
- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Insulating material s = 4 cm ($\lambda = 0.35$ W/mK)
- Air s = 2 cm
- Hollowed brick 12x25x25

Wall transmittance:

U = 0.435 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.403 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.359 W/sqm K (mortar $\lambda = 0.28$ W/mK)



Wall composition:

- Traditional internal and external plasterwork
- Thermal block 20x25x25
- Insulating material s = 6 cm ($\lambda = 0.35$ W/mK)
- Hollowed brick 12x25x25

Wall transmittance:

U = 0.398 W/sqm K (mortar $\lambda = 0.90$ W/mK)

U = 0.366 W/sqm K (mortar $\lambda = 0.60$ W/mK)

U = 0.321 W/sqm K (mortar $\lambda = 0.28$ W/mK)

Wall mass (except for plasterwork and insulating material) = 195 Kg/sqm