PRODUCT CATALOGUE

ISOTEX,

MAXIMUM SEISMIC SAFETY
AND LIVING COMFORT,
always.

BUILDING SYSTEM
ISOTEX®
Wood-cement Blocks and Floor Slabs

EUROPEAN LEADER
FOR OVER 40 YEARS

BUILDING SYSTEM

ISOTEX®

Wood-cement Blocks and Floor Slabs

THE BUILDING SYSTEM THAT COMBINES THE STRENGTH OF REINFORCED CONCRETE WITH THE THOUSAND QUALITIES OF NATURAL MINERALISED WOOD

Isotex facility

In 1985, ISOTEX began to produce and market cement-bonded wood fibre blocks in Italy, after this building system had already been in use in Germany since 1946.

From then until now, over 400.000 homes throughout Europe have been constructed with ISOTEX systems, of which approximately 100.000 in Italy alone, thanks to the high-regard held by technicians, builders and end-users for the ISOTEX company and its products.

1976

14 storey skyscraper Nuremberg (Germany)

1985

Residential Area Parma (Italy)

2019

7-storey buildings in Bologna (Italy)

2025

Elderly Assistance Hub Bergamo (Italy)

CONTENTS

ISOTEX BUILDING SYSTEM

Simple, complete and compliant with all applicable regulations

The ISOTEX building system, with blocks and panels in cement-bonded wood fibre, is the most widely used alternative to traditional systems. Thanks to ease of use, exceptional technical characteristics, excellent living comfort and competitive costs, ISOTEX is held in high regard by technicians, builders and buyers alike.

ISOTEX blocks and floor slabs are made of spruce and Portland cement, and the wood is mineralized with a natural mineral, which makes it inert and therefore resistant to fire and atmospheric agents.

Production is carried out entirely in our own factory with next-generation machinery, which is fully automated for high quality and precision products.

See the video and enter the heart of ISOTEX production:

http://en.blocchiisotex.com/about-us-our-values/

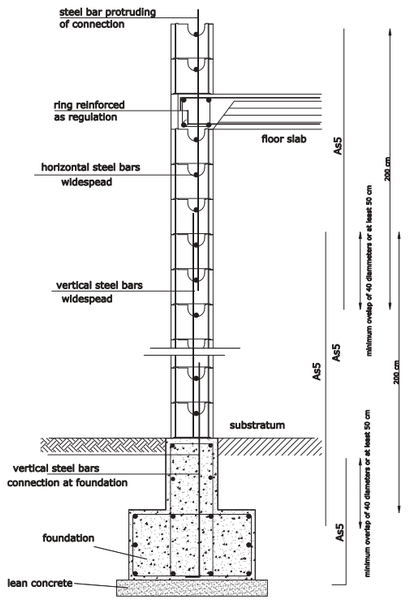
Much importance is given to the quality, performance, precision and quantities of the insulating materials we introduce into the mould block.

Block HDIII 38/14 with Neopor® BMB-cert by BASF for external load-bearing walls.

Block HB 25/16 for internal load-bearing walls.

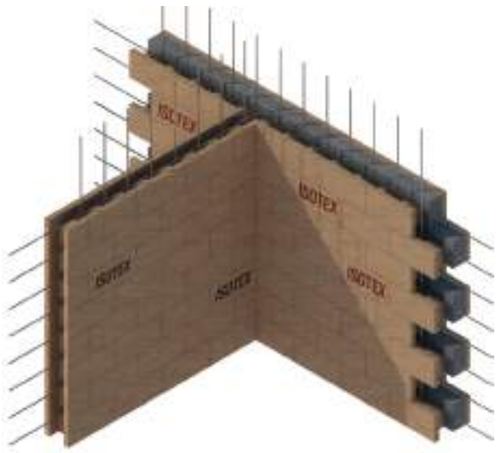
Enlargement of the mineralised wood. The close air pores are clearly visible.

Raw materials: untreated spruce and Portland cement.



WALL REINFORCEMENT IN BLOCKS

rebars from the foundation or bed (25 cm centres).



Vertical and horizontal steel reinforcement scheme with 25 cm centres.

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DRY LAYING

reduces construction times and costs

Watch the video and discover the shutter speed

https://en.blocchiisotex.com/easy-laying/

Great care must always be taken regarding costs. Considering that labour accounts for about 50% of the costs of construction of buildings, ISOTEX has developed its products over time to greatly reduce required man hours. In this sense, the ISOTEX building system's main strength is that with a **single quick and easy laying operation** all the requirements of law are perfectly satisfied, including those related to seismicity, fire resistance and thermo-acoustic insulation, both vertically and horizontally.

Also greatly reduced is the risk of incorrect installation due to the intervention of various figures (e.g. carpenters, masons, thermal and acoustic insulation layers).

As a result, buildings constructed with ISOTEX products offer **higher performance and lower costs**. Indeed, those who use ISOTEX products always recognize the better value for money compared to other building systems.

Laying of the first row with spirit level for levelling

All subsequent rows laid dry

Filling of the blocks with concrete (every 6 rows)

Fresh casting insertion of vertical seismic steel reinforcements

Chasing of wall with a router

Laying of the floor slabs, calculated and made to measure.

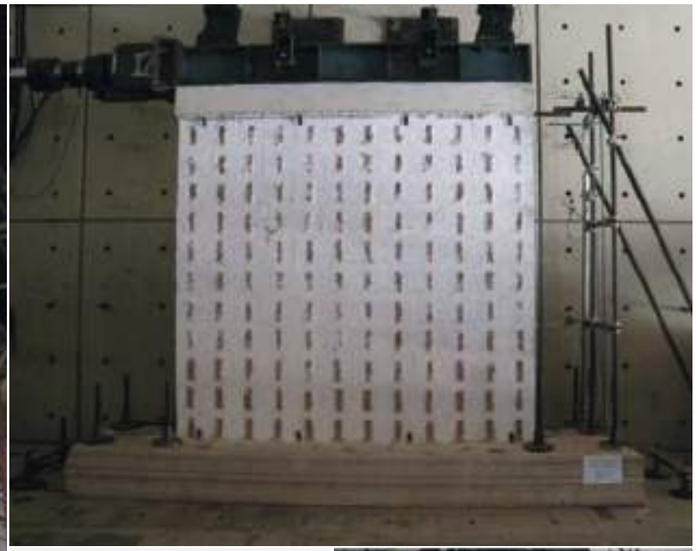
PROVEN SEISMIC SAFETY

4 devastating earthquakes in a few decades gives food for thought …

In 1994, ISOTEX embarked on a partnership with the prestigious University of Bologna, whose laboratory has conducted a series of highly successful, full-scale tests to verify the seismic behaviour of ISOTEX walling system.

In 2000, through the laboratory of the Department of Structural Testing of the same University of Bologna (see photo below), a sample building, constructed with **ISOTEX blocks and panels, was subjected to testing with Vibrodina,** a machine capable of simulating earthquakes with the application of horizontal forces at several points on each floor of the building. The tests, conducted at the maximum intensity (well over the magnitude 6 on the Richter Scale) of forced vibrations for approximately 20 minutes, **did not cause the slightest damage to the building.**

Building constructed with Isotex blocks and panels, tested with the Vibrodina of the University of Bologna.



Left: Seismic test on ISOTEX two-storey wall
Above: Seismic test on full ISOTEX wall
Rights: Seismic test on ISOTEX wall with window

GUIDELINES FOR THE DESIGN AND CALCULATION OF STRESSED-SKIN PANELS BUILDING SYSTEMS BASED ON HEAT-INSULATED BLOCKS AND CAST-IN-PLACE LIGHTLY REINFORCED CONCRETE

From 2005 to 2014 ISOTEX (see photo above and left), continued research on the seismic behaviour of its building system with a vast campaign of experimental tests on walls and structures, carried out at the Eucentre Laboratory of the University of Pavia, one of the most authoritative bodies at European level for research into seismicity, also in this case with excellent results. **The experimental tests were also carried out in full compliance with the provisions of the 2011 Ministerial Guidelines** (see cover left).

Look at the post-earthquake testimonies
https://en.blocchiisotex.com/earthquake-resistant-structure/

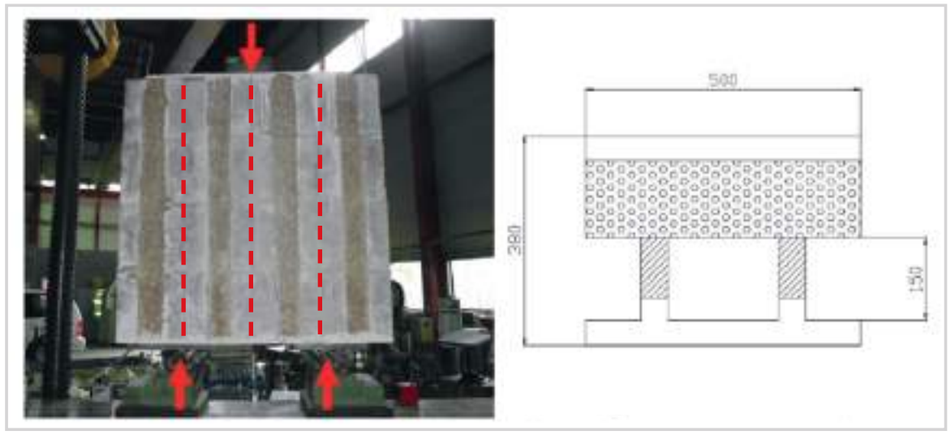
BEHAVIOUR FACTOR q_0= 3

Reduced reinforcement = reduced costs

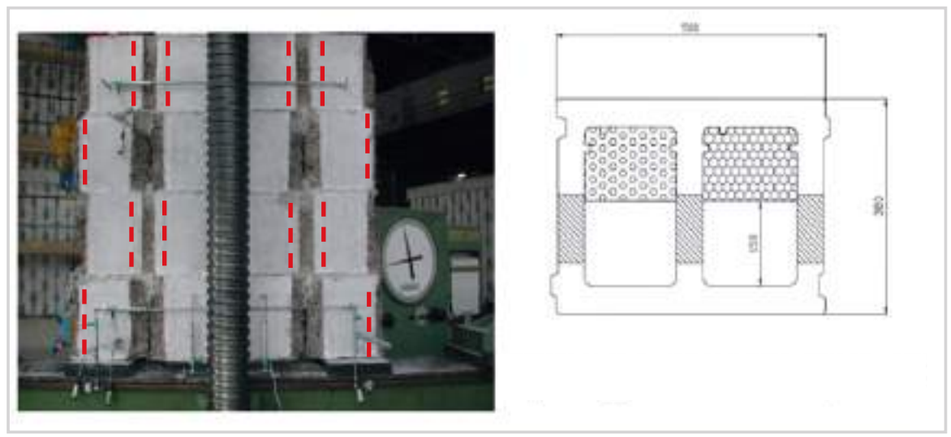
In compliance with the Guidelines of the Ministry of Public Works, the University of Pavia has carried out numerical analyses, supported by the results of the experimental tests on ISOTEX walls, which allow to assign to the construction system with type "H" two rib formwork blocks, the behaviour factor q_0 = 3.

This value indicates the excellent qualities of ISOTEX walls and **makes it possible to reduce the quantity of reinforcements required for checks on seismic stresses** compared to the previously used behaviour factor q_0= 2 relative to formwork blocks with "D" type 3 ribs.

"H" block with 2 ribs q_0 = 3
Useful section of concrete 15x20 = 300 cm² per pillar
+ 45% load-bearing capacity



"D" block with 3 ribs q_0= 2
Useful section of concrete 15x14 = 210 cm² per pillar



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ISOTEX

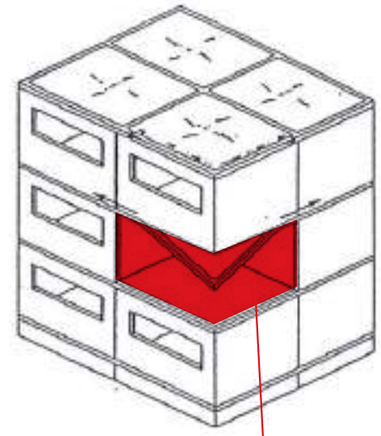
Works perfectly as a beam/wall

To further demonstrate the safety of buildings and the people who live in them, **Prof. Claudio Ceccoli** (distinguished professor at the Department of Structural Engineering of the University of Bologna), in collaboration with the **engineer Gilberto Dallavalle**, demonstrated that, in the event of an explosion, even if the two corner walls of an intermediate floor of a building are missing, the building does not suffer progressive collapse, as the system of vertical and horizontal steel reinforcements contained in the concrete, inside the formwork blocks, make the ISOTEX wall work as a beam/wall. The 6-metre Isotex wall alone (without beam below) broke at 3,011 kN, while the 4-metre wall broke at 3,800 kN (Tests drawn up by the University of Pavia - Italy). It is shown that, structurally, the ISOTEX wall has the same performance as a reinforced concrete wall. **Therefore there is absolutely no danger of collapse.**

Images taken from "ISOTEX seismic resistant construction method" by Prof. engineerClaudio Ceccoli and Gilberto Dallavalle.

Request the Test Report drawn up by the University of Pavia (Italy)
https://en.blocchiisotex.com/experimental-tests-on-beam-walls/

Experimental tests carried out at the Eucentre of Pavia (Italy) to verify the functioning of the ISOTEX construction system as a beam-wall.



Following an explosion on the middle floor, the ground floor and the second floor remain intact.

BUILDING SYSTEM ISOTEX Wood-cement Blocks and Floor Slabs

MAXIMUM RESISTANCE TO SEISMIC EVENTS

Of the approximately 90,000 homes built since 1985 in Italy, many are in areas that have suffered major seismic events: from the earthquake in Umbria in 1997) and in Friuli in 1998 to the latest in Abruzzo in 2009, in Emilia in 2012 and in Central Italy in 2016, **no building has suffered any damage, not even a crazing** (see photographs and testimonials from our clients).

POST-EARTHQUAKE **TESTIMONIALS**

Read. all. testimonials:

http://en.blocchiisotex.com /earthquake-resistant-structure/

Nursery school in Ganaceto (MO) - 2011

Apartment buildings in Nocera Umbra (PG) - 1997

Gym in Novi (MO) - 2012

Apartment buidlings in Teramo (TE) - 2008

Apartment building in Novi (MO) - 2002

All this highlights how the ISOTEX building system ISOTEX, beyond the excellent results of university tests, has passed the real field test, with real, inhabited buildings, which have survived unscathed the most devastating earthquakes in the last 30 years. **This is a guarantee of safety for those who live in Isotex buildings**, unlike thousands of buildings made of different and traditional construction systems that have collapsed, caused the deaths of hundreds and been rendered uninhabitable.

Post-earthquake testimonial from Central Italy 2016

*I am sending you some pictures of the residence built in Norcia (PG) in ISOTEX HDIII 38/14 Blocks with graphite and reinforced concrete conglomerate. We, as the construction company Boccanera Ivo e Fratelli Snc, are very pleased with the product, especially for its earthquake resistance. We would like to take this opportunity to confirm to you that **the house did not suffer any damage as a result of the magnitude 6.5 earthquake that occurred** a few days ago. - Engineer Boccanera, August 2016.*

ISOTEX BUILDINGS DO NOT COLLAPSE

REI certifications

Another significant aspect, regarding the safety of buildings and those who live in them, is the fire resistance of walls and their ability to maintain load-bearing strength in case of fire or explosions inside the home.

The mineralization process which the wood is subjected to makes it inert and thus resistant to fire and insect, rodent and mould infestation.

Fire resistance tests conducted on plaster-less ISOTEX blocks and panels and cement-bonded wood fibre in direct contact with a flame have determined resistance classes REI 120 and REI 240 respectively. The 21 cm of polystyrene contained within and protected by the blocks (also fire resistance tested) maintains very low temperatures and thus does not burn and **does not emit toxic gases.**

What is REI Classification?

REI is an acronym used to indicate the fire resistance of a building element (component or structure):

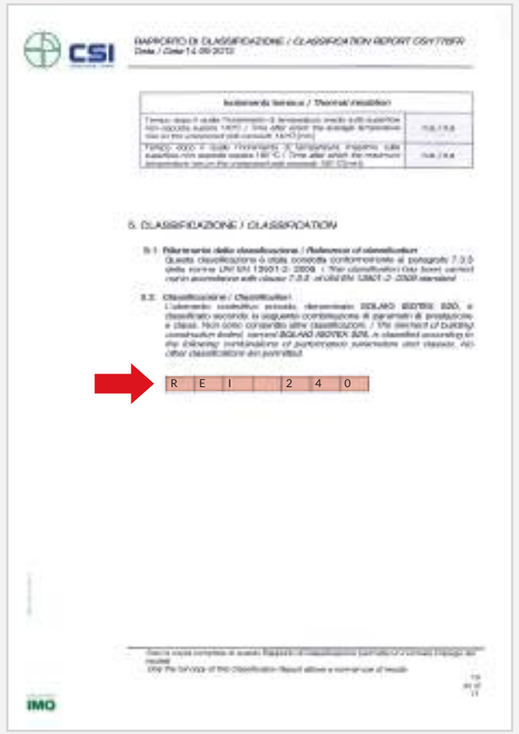
R, indicates stability in terms of mechanical load-bearing strength when exposed to fire.

E, indicates integrity in preventing flames and hot gases from being produced when exposed to fire and from passing through to the unexposed side.

I, indicates thermal insulation in terms of slowing down the transmission of heat.

The numbers that follow the acronym are used to indicate the minutes of stability, integrity and insulation when the element is exposed to fire.

FLOOR SLABS - REI 240 certificate



CSI

RAPPORTO DI CLASSIFICAZIONE / CLASSIFICATION REPORT CSI1776FR

Data / Date 14/09/2012

5. CLASSIFICAZIONE / CLASSIFICATION

5.1 Riferimento della classificazione / Reference of classification

Questa classificazione è stata condotta conformemente al paragrafo 7.3.2 della norma UNI EN 13501-2: 2009. / This classification has been carried out in accordance with clause 7.3.2 of EN 13501-2: 2009 standard

5.2 Classificazione / Classification

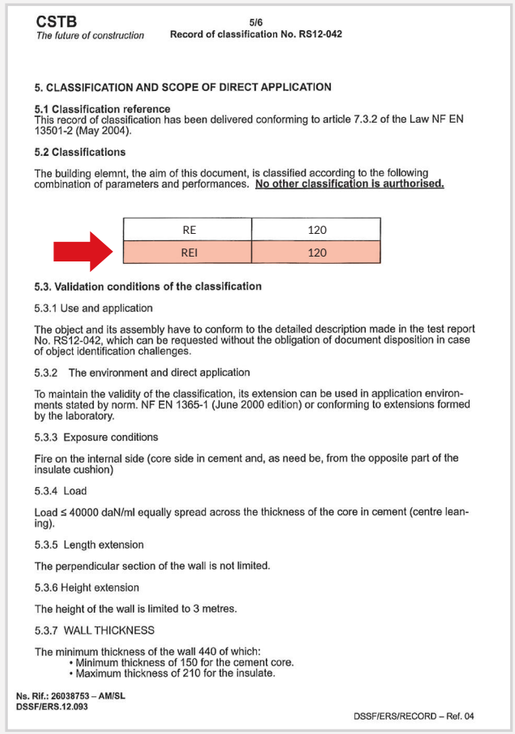
L'elemento costruttivo descritto nell'RDLAB EDITEC 820, è classificato secondo la seguente combinazione di parametri di prestazione e classe. Non sono consentite altre classificazioni. / The element of building construction detailed in the RDLAB EDITEC 820, is classified according to the following combination of performance parameters and classe. No other classifications are permitted.

R	E	I		2	4	0

IMO

Certification of resistance to fire of plaster-less floor slabs

BLOCKS - REI 120 certificate



CSTB
The future of construction

5/6
Record of classification No. RS12-042

5. CLASSIFICATION AND SCOPE OF DIRECT APPLICATION

5.1 Classification reference
This record of classification has been delivered conforming to article 7.3.2 of the Law NF EN 13501-2 (May 2004).

5.2 Classifications

The building elemnt, the aim of this document, is classified according to the following combination of parameters and performances. **No other classification is aurthorised.**

RE	120
REI	120

5.3. Validation conditions of the classification

5.3.1 Use and application

The object and its assembly have to conform to the detailed description made in the test report No. RS12-042, which can be requested without the obligation of document disposition in case of object identification challenges.

5.3.2 The environment and direct application

To maintain the validity of the classification, its extension can be used in application environments stated by norm. NF EN 1365-1 (June 2000 edition) or conforming to extensions formed by the laboratory.

5.3.3 Exposure conditions

Fire on the internal side (core side in cement and, as need be, from the opposite part of the insulate cushion)

5.3.4 Load

Load ≤ 40000 daN/ml equally spread across the thickness of the core in cement (centre leaning).

5.3.5 Length extension

The perpendicular section of the wall is not limited.

5.3.6 Height extension

The height of the wall is limited to 3 metres.

5.3.7 WALL THICKNESS

The minimum thickness of the wall 440 of which:
- Minimum thickness of 150 for the cement core.
- Maximum thickness of 210 for the insulate.

Ns. Rif.: 26038753 – AM/SL
DSSF/ERS.12.093

DSSF/ERS/RECORD – Ref. 04

Certification of resistance to fire of plaster-less blocks

TEMPERATURE DIAGRAMS

Very significant are the temperature diagrams (see photo) that demonstrate that the side of the wall and the floor where temperature sensors are located register 33°C after 180 minutes of fire exposure (of over 1.100°C) in the case of the blocks and 25°C after 240 minutes of fire exposure (of over 1.100°C) in the case of the floor slabs.

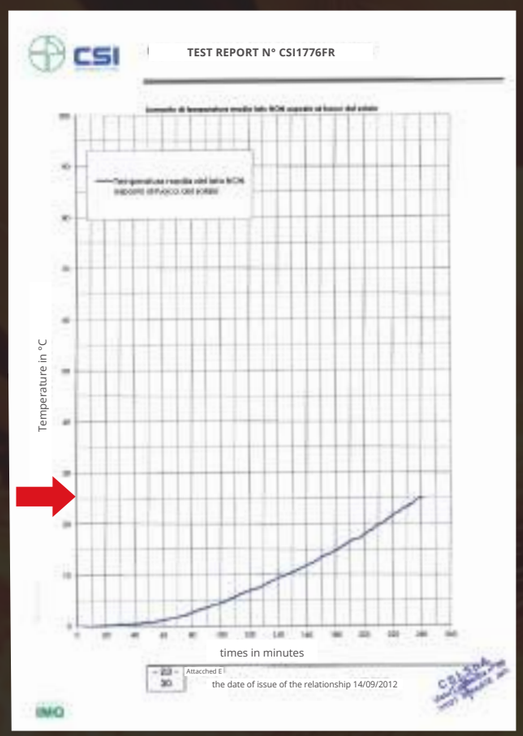
This exceptional fire resistance highlights two very important advantages:

1. **The building does not collapse** in case of fire. The ISOTEX constructive elements, with reinforced concrete cores, retain their load-bearing capacity and insulation properties, without suffering damage.

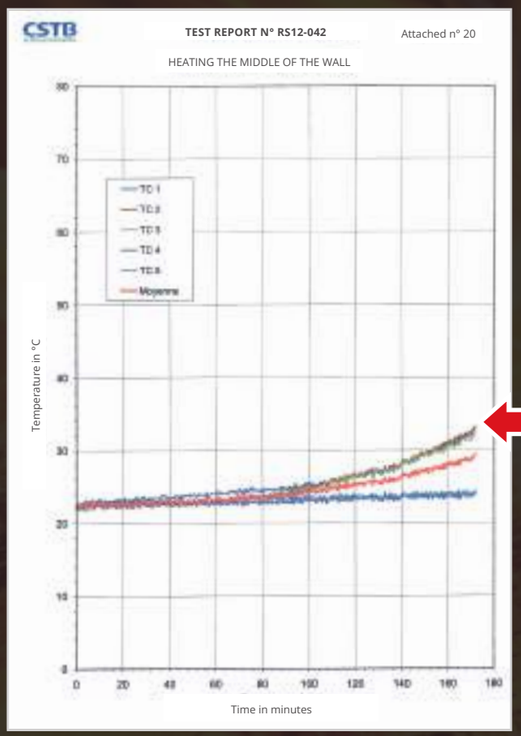
2. **Thermally exceptional.** Excellent thermal insulation and inertia uneasily matched by other building systems.

FLOORS SLABS temperature

BLOCKS temperature



Temperature of 25°C measured on the extrados of the panel after 240 minutes of exposure to fire with temperatures on the flame side of 1.000°C.



Temperature of 33°C measured on the opposite side to the flame after 180 minutes of fire exposure with temperatures on the flame side of 1.000°C.

ISOTEX BRILLIANTLY PASSES THE TEST OF FAÇADE FIRE BEHAVIOUR OF BUILDINGS (LEPIR2)

After the tragic fire of London's Grenfell Tower in 2017 (see photo) member states of the European Union are now legislating to regulate the **fire behaviour of building façades.** Countries such as France, the United Kingdom, Germany, Hungary, and Sweden are some of countries that already implemented regulations for the fire behaviour of buildings façades at the beginning of 2020. The remaining countries will soon have to follow suit. **ISOTEX Srl, which exports to over 14 countries, immediately adapted to this important legislation,** testing a façade wall made with its own blocks in a **renowned French laboratory called "Efectis"** accredited for this type of test.

Grenfell Tower London - 2017

Moro Tower Milan - 2021

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How the façade fire behaviour test is carried out (Lepir 2)

1

A 5.5x7 metre wall was built with a 44/23 Basf-Neopor® graphite block.

2

The Isotex wall had 2 openings on the ground floor and 2 on the first floor, plus a rib without openings at the top.

3

The inside was filled with 600 kg of pine wood pallets and the fire was started.

4

The test lasted 60 minutes. Isotex passed the test with flying colours.

5

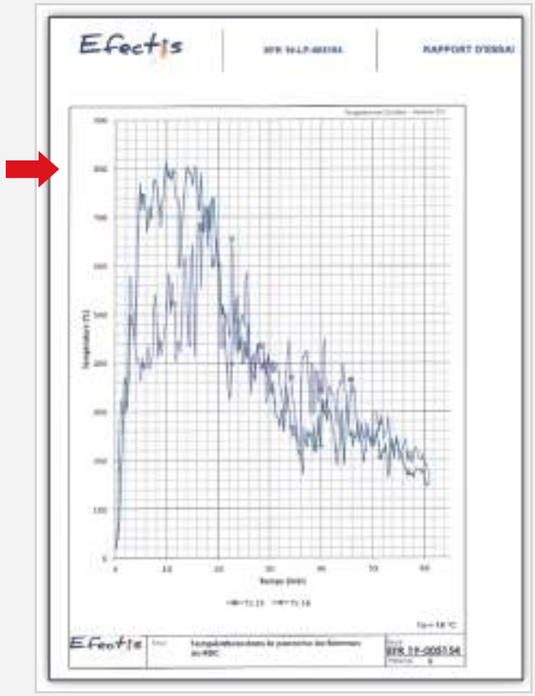
During the demolition phase, the insulation was perfectly intact. Absence of gas emissions harmful to human health.

Watch the video of the Lepir2 test

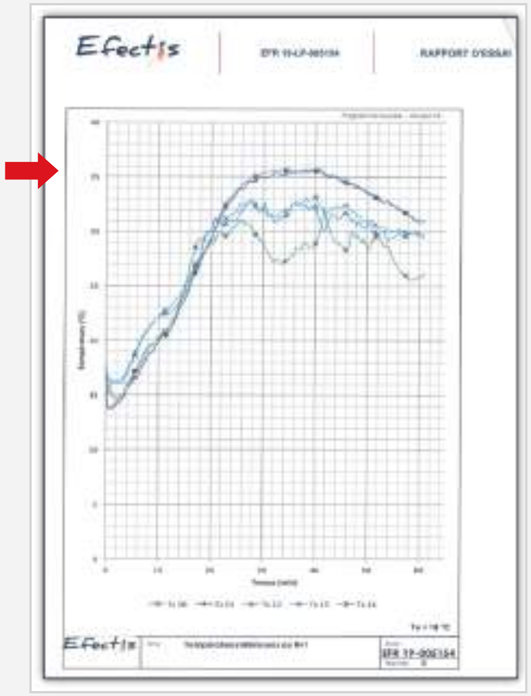
https://en.blocchiisotex.com/test-of-facade-fire-behaviour-of-buildings-lepir-2/

Test results lepir 2:

The test produced excellent results, both in terms of fire behaviour and absence of toxic gases emitted that are harmful to human health (see certifications). Suffice it to say that in the 60-minute test period, during exposure to fire, the temperature detectors on the ground floor recorded **a peak of over 800 °C internally while on the 1st floor a peak of only 35 °C.**



The ground floor detected a peak of 800 °C



The first floor detected a peak of only 35 °C

Conclusions of the test: Isotex is a guarantee of long-lasting safety!

Those who use the ISOTEX® wood-cement construction system will be fully compliant as soon as the new façade fire behaviour regulations become mandatory and those who purchase these homes will have made an **excellent long-term investment, both in terms of safety and living comfort.**

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Reaction to fire Class B-s1,d0

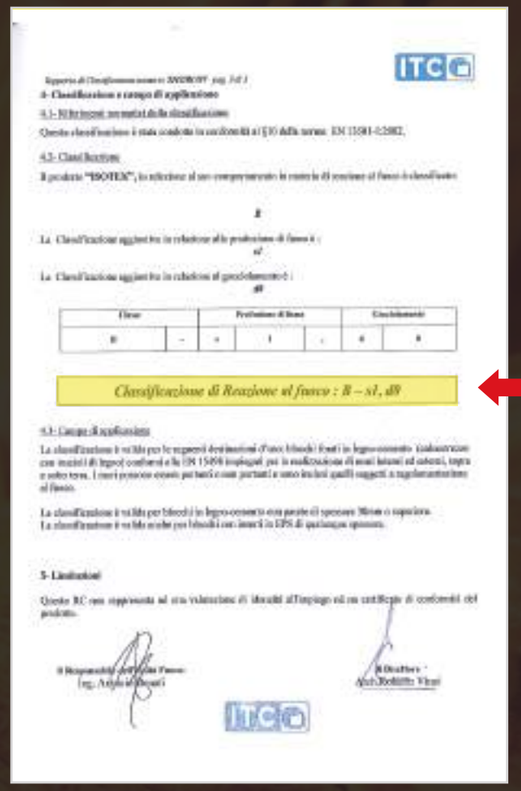
MAIN OBJECTIVE:

To limit the risk of a façade fire and its subsequent spread due to fire originating both internally and externally.

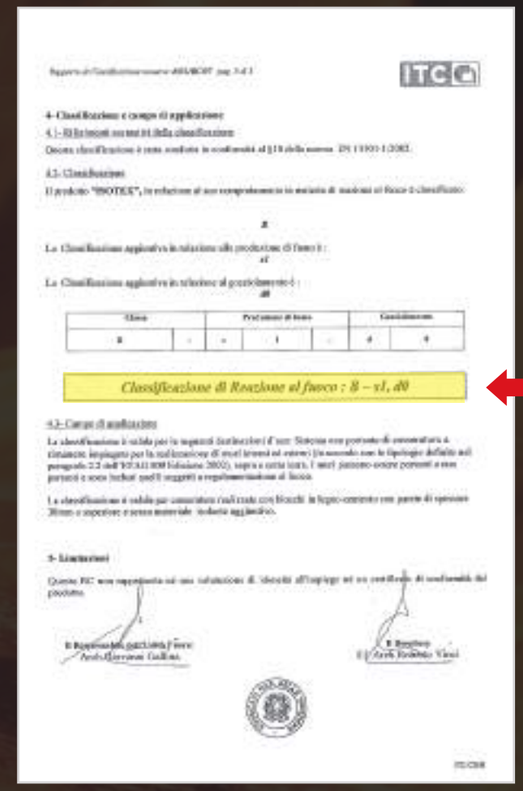
RESULTS OBTAINED:

Isotex has been certified for Reaction to fire Class B-s1,d0 and therefore fully meets the fire safety requirements for building façades.

Reaction to fire classification with insulation



Reaction to fire classification without insulation



BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

ISOTEX BLOCKS & FLOOR SLABS

Functionality and elimination of thermal bridges

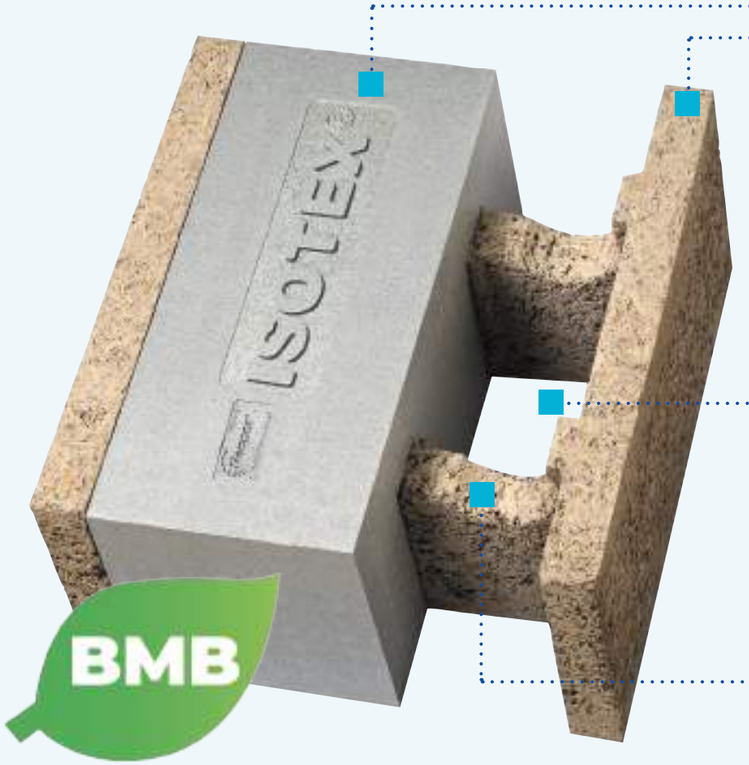
Another goal that ISOTEX has always pursued is the living comfort and optimal microclimate within a home.

To produce hollow blocks and panels, ISOTEX uses a cement-bonded wood fibre conglomerate with excellent thermal insulation characteristics (λ=0,104 W/mK), thus obtaining insulation on both walls of the elements (see drawing below). To achieve such excellent values of **thermal insulation (U=0,11 W/m²K)**, a variable thickness polystyrene and graphite insert is introduced into the block (see side photo) in order to obtain the same insulating effects as a "**protective coat**".

It should be noted that the insulation of the block (and therefore the wall) is homogeneous since, where the polystyrene is not present, the larger thickness of the cement-bonded wood fibre ribs, which connect the two walls of the block, compensates for the lack of polystyrene.

Furthermore, **the type of blocks with 2 ribs** (instead of 3 ribs), in addition to improving **thermal insulation by 15/18% and load bearing by 45%,** completely eliminates the thermal and acoustic bridge between one block and another (see thermographs on page 19).

Isotex® wood-cement formwork block



1 Formwork block in mineralised wood and cement

2 BASF Neopor® BMB cert insulating insert

3 Cavity for casting and vertical reinforcement

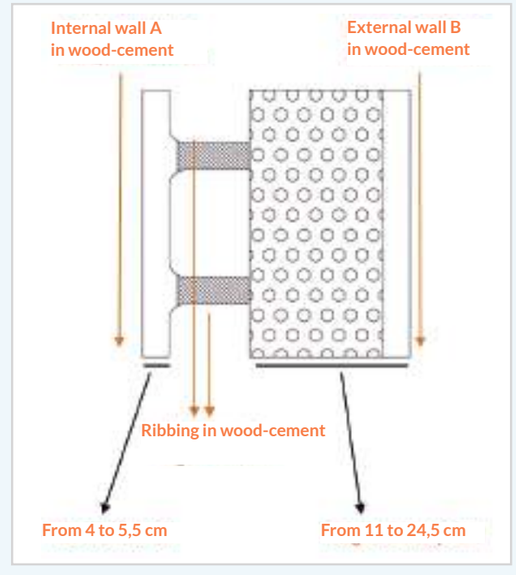
4 Cavity for housing the horizontal reinforcing rods

The Block
Block thickness = 20 to 44 cm

The insulation
Insulation thickness = 7 to 23 cm

The outer wall of the ISOTEX block, whose thickness ranges from 11 to 24,5 cm, thus acts as protective coat, keeping the heat out during the summer.

On the other hand, the inner wall of the ISOTEX block, which ranges from 4 to 5,5 cm of cement-bonded wood fibre, facilitates a faster attainment of the desired temperature for an environment when the heating is switched on in winter. What's more, the surface temperature of the inner wall, since it is insulated, has the same temperature as the environment, thus **providing a great sensation of wellbeing.**



TWO-RIBBED BLOCK

CONTINUOUS ISOLATION AND MAXIMUM SECTION OF CONCRETE

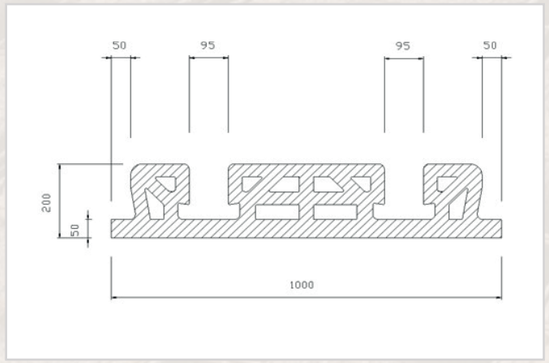
BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

THE WINNING COMBINATION – BLOCKS & FLOOR SLABS

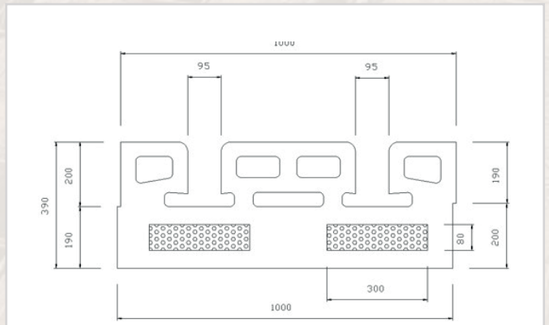
The above discussion regarding blocks, also applies to ISOTEX floor slabs, whose thicknesses range from 20 to 49 cm. Under the structural joists there are from 5 to 19 cm of cement wood and polystyrene towards the inside of the house which considerably reduce thermal and acoustic bridges (*see drawings below*).

It is important to specify that the outer envelope accounts for 80% of energy savings, thus walls, floors and openings have decisive role.

ISOTEX has developed its own building system that completely eliminates thermal bridges (see thermograph below) with the use of special pieces such as corners, architraves, spandrel blocks and shoulder blocks for doors and windows (see photo at page bottom).

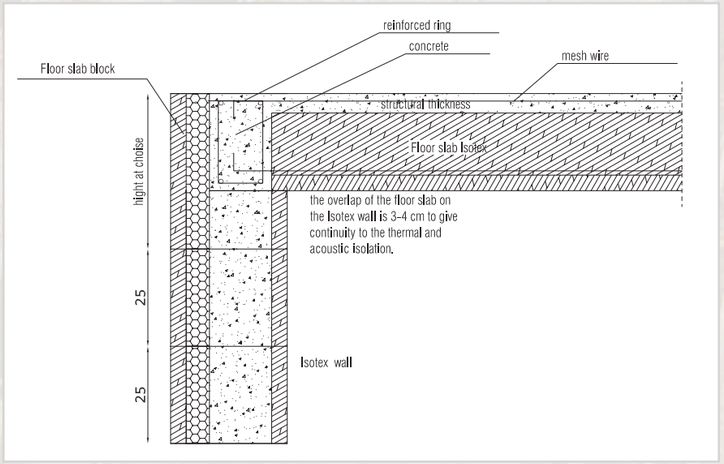


ISOTEX S20 wood-cement floors slab.

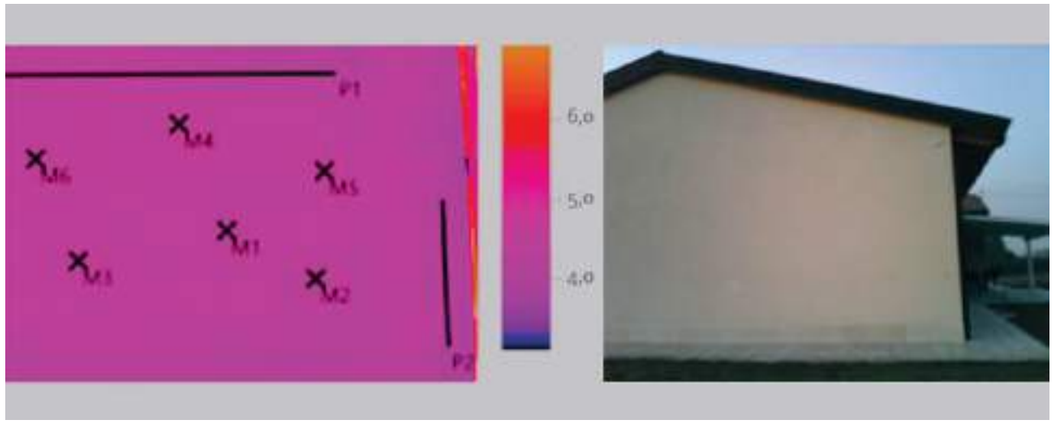


ISOTEX S39 wood-cement floor slab for coverings and unheated spaces (e.g. basements, garages)

Thermal report compiled by the National Association for Thermal and Acoustic Insulation (ANIT). Full and downloadable version on the website: www.blocchiisotex.com



Floor curb constructive detail



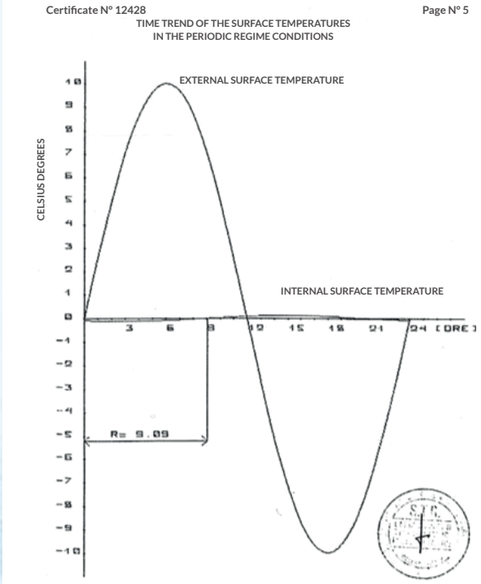
The fuchsia colour is homogeneous indicating that the temperatures is equal over the entire wall. This confirms the absence of thermal bridges. Excerpt from report by Arch. Vittorio Righetti. For further information visit the site *www.blocchiisotex.com.*

Special pieces for the elimination of thermal bridges.

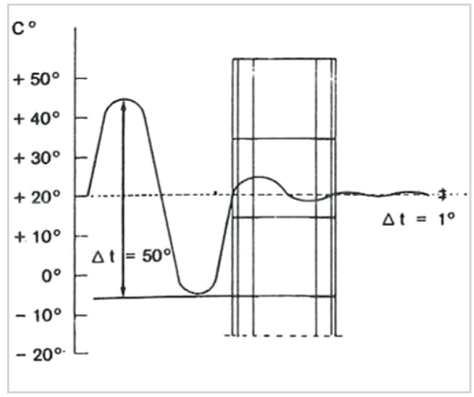
ISOTEX ELIMINATES TEMPERATURE FLUCTUATIONS

ISOTEX hollow blocks are laid dry and then filled every 6 rows with lightly reinforced concrete in order to create **a massive wall with exceptional thermal inertia. This reduces to a minimum temperature variations in the home** that occur routinely throughout the day (see diagrams below).

This directly influences living comfort, since the temperature is kept constant inside the home in both winter and summer, thus also reducing heating and cooling consumption.



Temperature variation throughout the day in winter. The test starts at a temperature of 0°C in the two environments separated by an ISOTEX wall of 25 cm. One environment is brought to +10°C before falling to -10°C over the course of 24 hours. The variation in temperature recorded in the adjacent environment is imperceptible (approximately 0,04°C). The phase shift is over nine hours.



Temperature variation throughout the day in summer with 30 cm wall. As in the previous test, the external environment of the wall changes from an initial +20°C to +45°C and then -5°C. The variation in temperature in the other environment is an imperceptible +1°C.

The diagrams above have been obtained from experimental tests conducted in the laboratory. The National Association for Thermal and Acoustic Insulation has produced for ISOTEX a technical manual for energy efficiency in compliance with the Ministerial Decree of 26/06/2015 in which technical requirements are indicated (see page 12).

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

EXCELLENT THERMAL INSULATION

Also regarding thermal insulation, ISOTEX products achieve excellent results. For blocks, transmittance ranges from **0,34 to 0,16 W/m²K** in external load-bearing walls and from **0,79 to 0,56 W/m²K** in internal load-bearing walls.

Concerning to the UK Market, having different regulations (as minimum thickness of concrete 12 cm), it is intended to increase the thickness of the 3 cm more of insulation with new insulating insert **low carbon Neopor® BMBcert by BASF.**

External load-bearing walls

HDIII 30/7 Neopor® BMBcert by BASF
U=0,34 W/m²K

HDIII 33/10 Neopor® BMBcert by BASF
U=0,27 W/m²K

HDIII 38/14 Neopor® BMBcert by BASF
U=0,21 W/m²K

HDIII 44/20 Neopor® BMBcert by BASF
U=0,15 W/m²K

Isotex Air ventilate block
HDIII 44/11 with Neopor® BMBcert
by BASF - ***U=0,19 W/m²K***

Periodic thermal transmittance, attenuation and phase shift

Plastered wall of block:	Mass excluding plaster (Kg/m²)	Y_{IE} (W/m²K)	Attenuation	Phase shift
HDIII 30/7 eps + graphite	401,8	0,019	0,064	12 h 19'
HDIII 33/10 eps + graphite	402,5	0,014	0,060	12 h 43'
HDIII 38/14 eps + graphite	408,5	0,008	0,048	14 h 06'
HDIII 44/20 eps + graphite	419,5	0,004	0,032	16 h 22'
HDIII 44/11 eps + graphite (Isotex AIR ventilated block)	440,0	0,006	0,030	15 h 42'

EXCELLENT THERMAL INSULATION - *FLOOR SLABS*

As for panels, values range from **0,63 to 0,60 W/m²K** for intermediate floor slabs and from **0,17 to 0,28 W/m²K** for floor and covering panels (see photo below).

Cold environment and covering floor slabs

*Floor slab S39 - **U=0,24 - 0,28 W/m²K***

*Floor slab S49 - **U=0,17 - 0,19 W/m²K***

Intermediate floor slabs

*Floor slab S20 - **U=0,63 W/m²K***

*Floor slab S25 - **U=0,60 W/m²K***

*Floor slab S25 + 5 - **U=0,60 W/m²K***

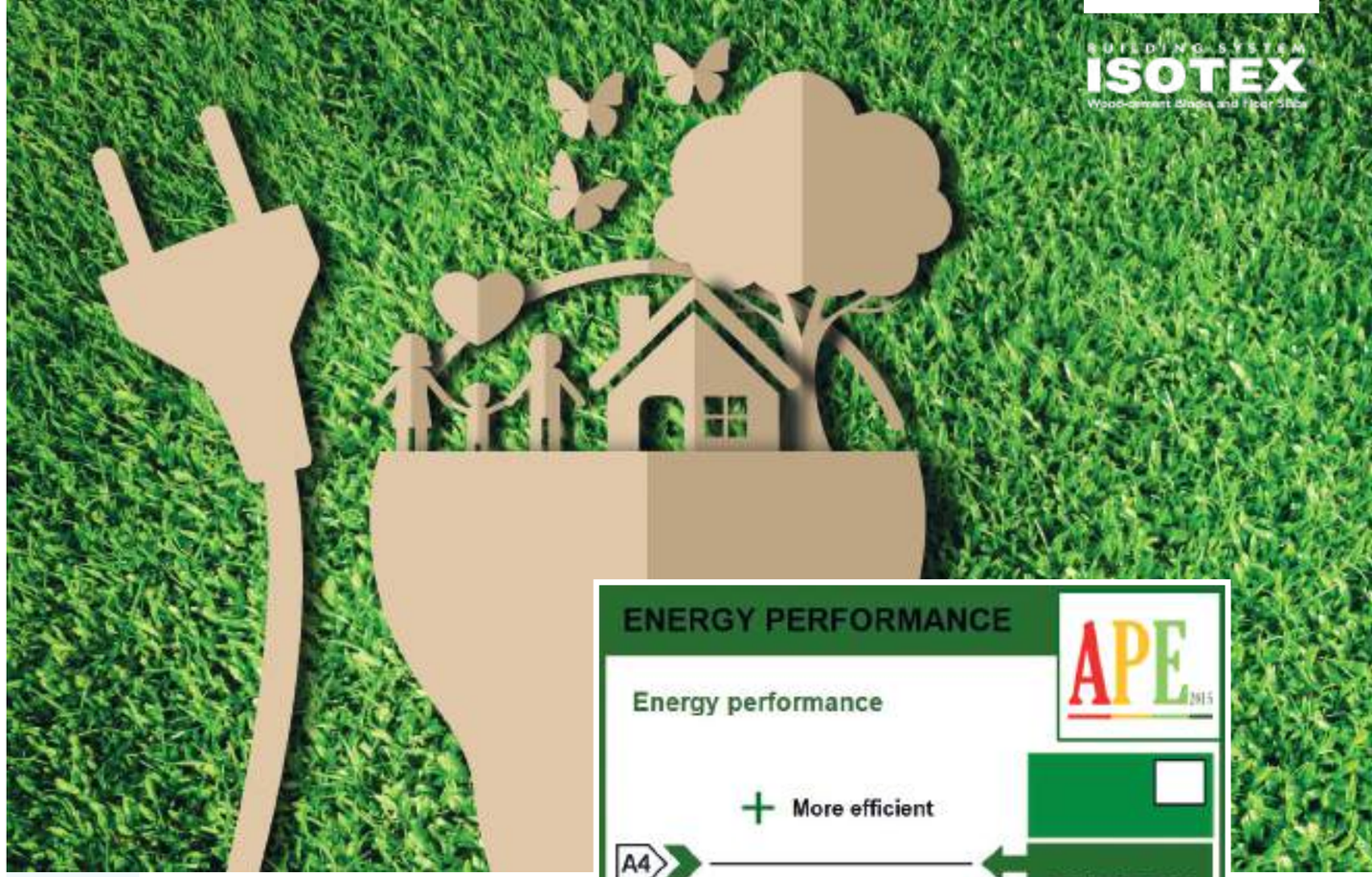
Thermal transmittance of intermediate floor slabs (full system)					
	R	Rlim	Rfin	R	U[1] (W/m²K)
S 20*	0,846	0,20	0,542	1,588	0,629723
S 25*	0,921	0,20	0,542	1,663	0,601323
S 39 (8 cm eps+graphite)**	3,407	0,14	0,542	4,089	0,244557
S 49 (18 cm eps+graphite)**	5,05	0,14	0,542	5,732	0,174

Thermal transmittance for covering floor slabs					
	R	Rlim	Rfin	R	U[1] (W/m²K)
S 39 (8 cm eps+graphite)**	3,407024	0,14	-	3,547024	0,281926
S 49 (18 cm eps+graphite)**	5,05	0,14	-	5,26	0,19

Thermal resistance added by the eventual finishing			
	Thickness (cm)	λ (W/mk)	Rfin (m²K/W)
Lightened CONC. subfloor	8	0,28	0,286
Soundproofing	0,7	0,35	0,200
CONC. screed 1800 Kg/m³	4	0,93	0,043
Ceramic floor	1,3	1	0,013
			0,542

S39 (8 cm eps + graphite)	Winter values	Summer values
Periodic thermal transmittance yie [W/m²K]	0,003	0,003
Attenuation	0,011	0,012
Phase shift	25 h 36'	25 h 28'

*existing floors calculated λ (wood cement) = 0,11 W/mk
**new floors calculated λ (wood cement) = 0,10 W/mk



CLASS A4

The best energy classification

All these thermal transmittance values are obtained using a three-dimensional calculation, as required by applicable regulations (**UNI EN ISO 6946**), specific to the peculiarities of ISOTEX blocks and Floor slab.

The excellent thermal transmittance values of ISOTEX products, combined with the excellent characteristics of the other components required for the energy calculation, allow ISOTEX buildings to achieve the best energy classification, namely **Class A4** (see table to the side).

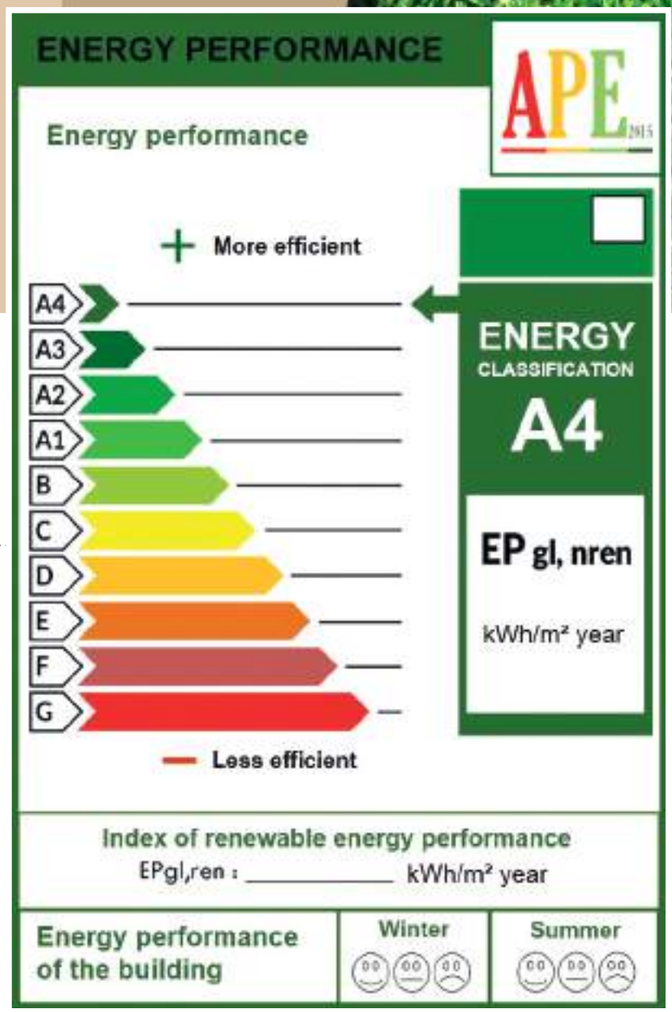
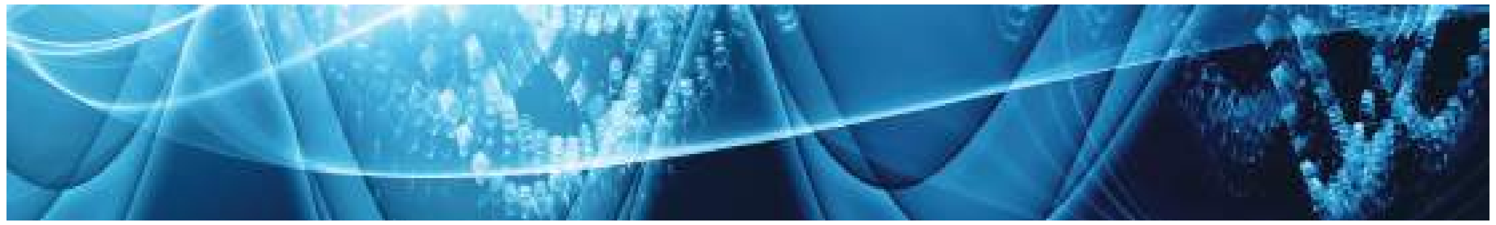


Table for classification efficiency reference NEW Ministerial Decree of 26/06/2015

MAXIMUM CLASSIFICATION of the buildings in the REDUCTION OF NOISE TRANSMISSION at low and high frequencies

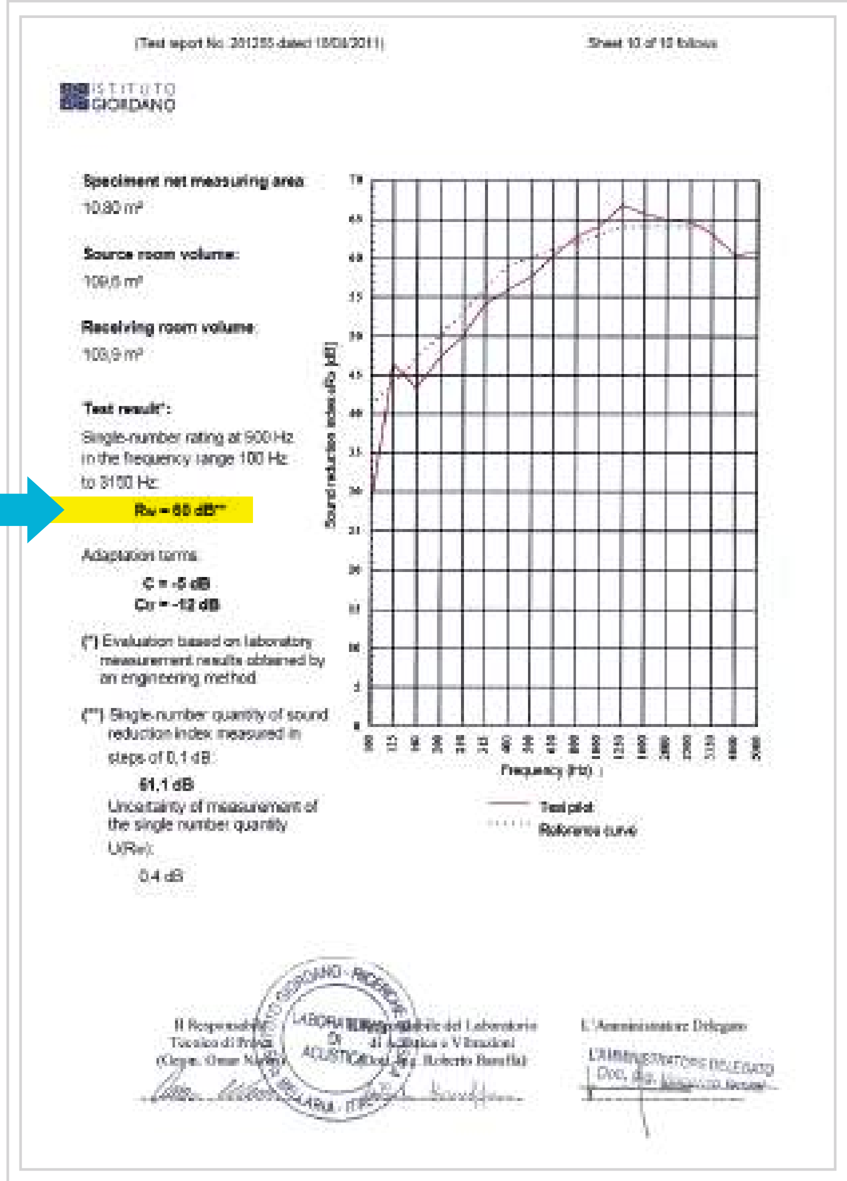


The massive structure of ISOTEX hollow blocks and panels in cement-bonded wood fibre with the use of structural concrete, used inside the blocks as a bearing structure and as the structural concrete topping of floors or panels, also favours excellent acoustic isolation both from aircraft noise and from footfalls, adding another benefit to the living comfort of the environment (see certificates below).

Block HB 44/15-2

Rw = 60 dB

The block HB 44/15-2 allows, with just a single laying, the attainment of two loading-bearing walls, which separate the horizontal structures and thus eliminate the transmission of noise through walls and flooring.



ISTITUTO GIORDANO

Specimen net measuring area: 10,80 m²

Source room volume: 109,6 m³

Receiving room volume: 103,9 m³

Test result*:

Single-number rating at 500 Hz in the frequency range 100 Hz to 3150 Hz:

Rw = 60 dB**

Adaptation terms:

C = -5 dB

Ctr = -12 dB

(*) Evaluation based on laboratory measurement results obtained by an engineering method

(**) Single-number quantity of sound reduction index measured in steps of 0,1 dB:

61,1 dB

Uncertainty of measurement of the single number quantity U(Rw):

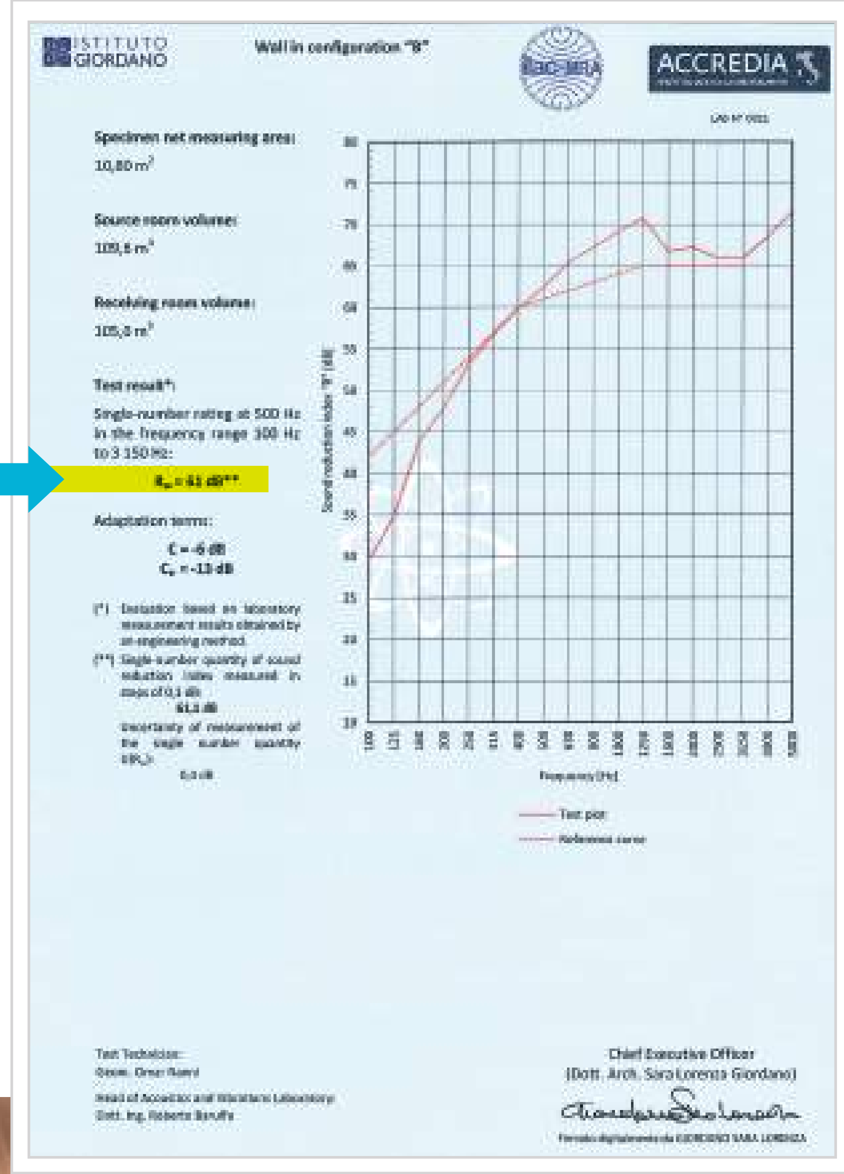
0,4 dB

Block HB 25/16

Rw = 61 dB

The wall tested in the laboratory, with the plastered block HB 25/16, obtains a noise reduction of 56 dB, with no finishes each side.

The wall with the block HB 25/16, **without plaster**, with 2 panels of IsolGypsum Fibra of 3.2 cm each obtains a noise reduction of 61 dB.



ISTITUTO GIORDANO

Wall in configuration "B"

ACCREDIA

Specimen net measuring area: 10,80 m²

Source room volume: 109,6 m³

Receiving room volume: 105,0 m³

Test result*:

Single-number rating at 500 Hz in the frequency range 100 Hz to 3 150 Hz:

R_w = 61 dB**

Adaptation terms:

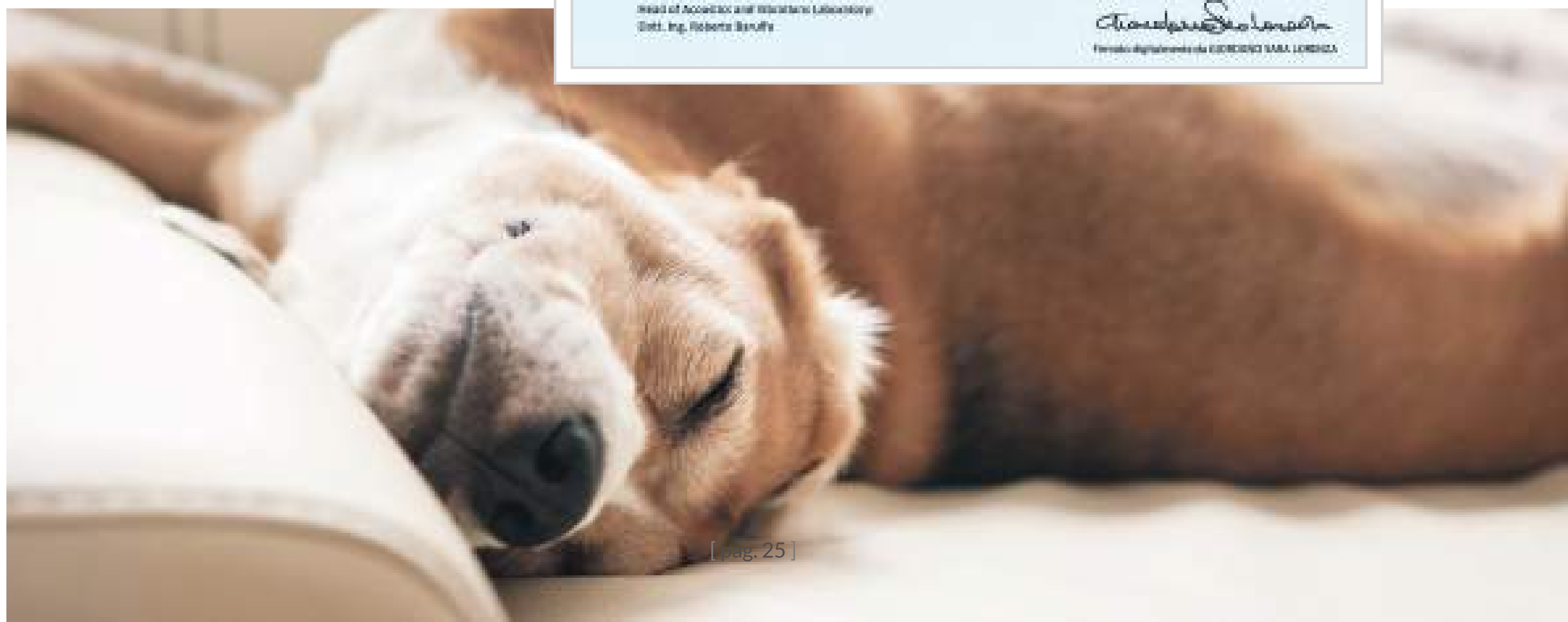
C = -6 dB

C_{tr} = -13 dB

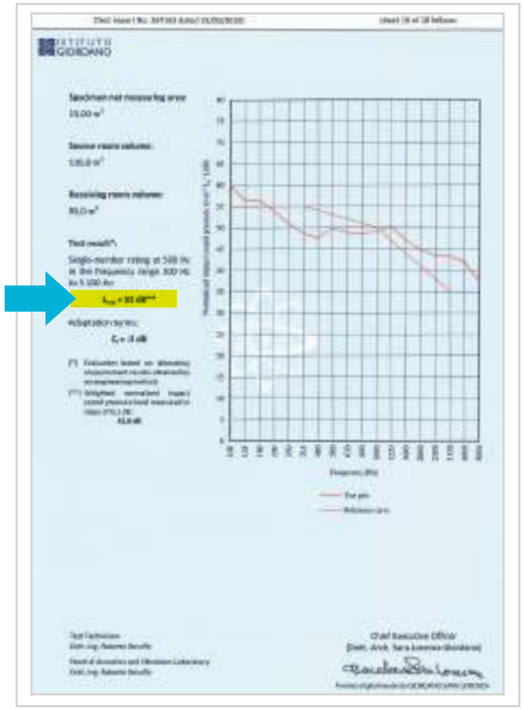
Test Technician:

Chief Executive Officer

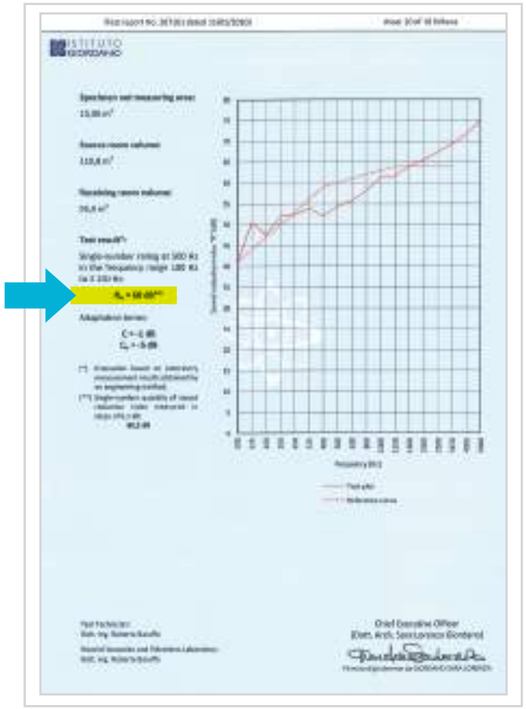
(Dott. Arch. Sara Lorenza Giordano)



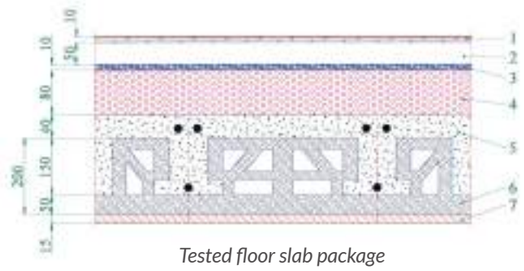
HOW TO ELIMINATE AIRCRAFT AND FOOTFALL NOISE TRANSMISSION



Footfall noise **Ln,w = 53 dB**



Aircraft noise **Rw = 60 dB**



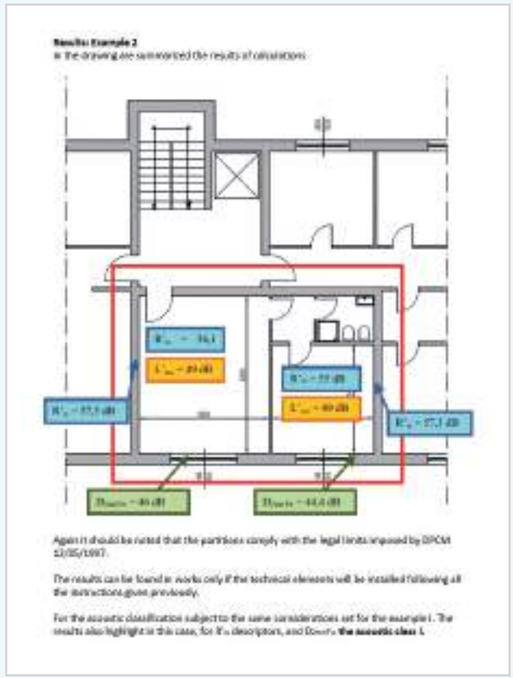
Tested floor slab package

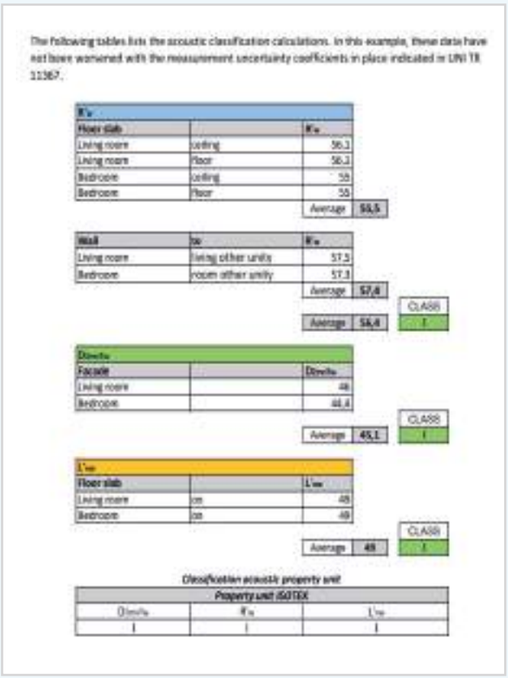
1. Flooring: stoneware tiles, dimensions 320x320 mm, nominal thickness 8 mm and nominal surface mass 19Kg/m².
2. Concrete screed, nominal thickness 50 mm and nominal density 1800 Kg/m³.
3. Elastic separating material "ISOLMANT UNDERSPECIAL", nominal total thickness 8 mm and nomical density 30 Kg/m³, formed by physically cross-linked polyethylene panels, closed cell expanded foam, goffered and serigraphed on the upper surface, nominal thickness 5 mm, bonded on the lower side with special needle-punched fibre, nominal thickness 3 mm.
4. Levelling layer lightened with virgin expanded polystyrene beads, cement and sand, nominal thickness 80 mm and nominal density 400 Kg/m³.
5. Poured concrete, nominal minimal thickness 40 mm, nominal maximum thickness 190 mm and nominal density 2400 Kg/m³.
6. ISOTEX S20 panel made with mineralized wood fibre and cement, nominal thickness 200 mm and nominal surface mass 120 Kg/m².
7. Layer of traditional cement mortar plaster, nominal thickness 15 mm and nominal density 1900 Kg/m³.

BUILDING SYSTEM
ISOTEX®
Wood-cement Blocks and Floor Slabs

Acoustic insulation report by the National Association for Thermal and Acoustic Insulation.
Full version downloadable on the website www.blocchiisotex.com

ISOTEX has designed and tested its products and solutions to offer performance deserving of the best acoustic insulation classification, Class I (from the Acoustic Report prepared by ANIT, see above).



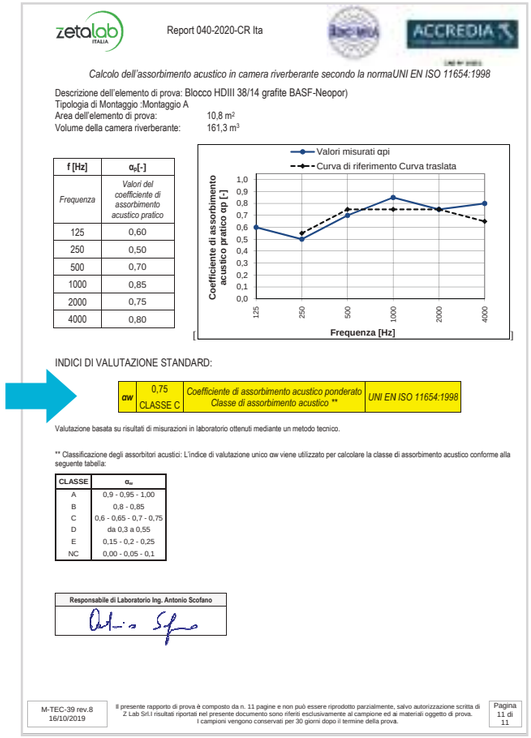


SOUND ABSORPTION TEST

A useful tool for the construction of school buildings and other structures...

On 23 December 2020 **Isotex obtained the certificate "Measurement of sound absorption in a reverberation room" according to the European standard UNI EN ISO354:2003,** by carrying out the sound absorption test prepared by the authorised laboratory. The results achieved with this test prove the **excellent soundproofing performance of the blocks.**

In Italy there are regulations that make it mandatory, for public tenders, that the internal environments must be suitable for achieving the values indicated for the acoustic descriptors reported in the UNI 11532 standard. The publication of the new standard UNI 11532-2:2020 *"Internal acoustic characteristics of confined spaces - Design methods and evaluation techniques - Part 2: School sector"* has filled a regulatory gap, at least for tenders of school buildings.In fact, this standard indicates the values of reverberation time (T), speech intelligibility (STI) and other parameters that must be respected in schools. **Therefore, the results of the sound absorption test performed on Isotex® products allow the Professionals in charge to meet these requirements both in the acoustic design phase and in the final verification phase (on-site testing).**



zetalab ITALIA — Report 040-2020-CR Ita — ACCREDIA

Calcolo dell'assorbimento acustico in camera riverberante secondo la normaUNI EN ISO 11654:1998

Descrizione dell'elemento di prova: Blocco HDIII 38/14 grafite BASF-Neopor)
Tipologia di Montaggio :Montaggio A
Area dell'elemento di prova: 10,8 m²
Volume della camera riverberante: 161,3 m³

f [Hz]	α_s [-]
Frequenza	*Valori del coefficiente di assorbimento acustico pratico*
125	0,60
250	0,50
500	0,70
1000	0,85
2000	0,75
4000	0,80

INDICI DI VALUTAZIONE STANDARD:

αw	0,75 CLASSE C	*Coefficiente di assorbimento acustico ponderato Classe di assorbimento acustico ***	*UNI EN ISO 11654:1998*

Valutazione basata su risultati di misurazioni in laboratorio ottenuti mediante un metodo tecnico.

** Classificazione degli assorbitori acustici: L'indice di valutazione unico αw viene utilizzato per calcolare la classe di assorbimento acustico conforme alla seguente tabella:

CLASSE	α_w
A	0,9 - 0,95 - 1,00
B	0,8 - 0,85
C	0,6 - 0,65 - 0,7 - 0,75
D	da 0,3 a 0,55
E	0,15 - 0,2 - 0,25
NC	0,00 - 0,05 - 0,1

Responsabile di Laboratorio Ing. Antonio Scofano

M-TEC-39 rev.8 16/10/2019

Il presente rapporto di prova è composto da n. 11 pagine e non può essere riprodotto parzialmente, salvo autorizzazione scritta di Z Lab Srl.I risultati riportati nel presente documento sono riferiti esclusivamente al campione ed ai materiali oggetto di prova. I campioni vengono conservati per 30 giorni dopo il termine della prova.

Pagina 11 di 11

School complex in Massarosa (LU) - Italy

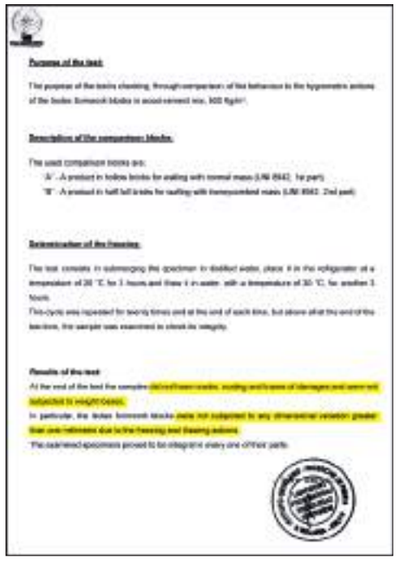
School sports hall in Novi (MO) - Italy

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

ABSENCE OF RISING DAMP

freeze-thawing and water absorption by the wood fibre, is eradicated thanks to its mineralization

Absence of rising damp test



Freeze-thawing and dimensional stability test

Water absorption and release test

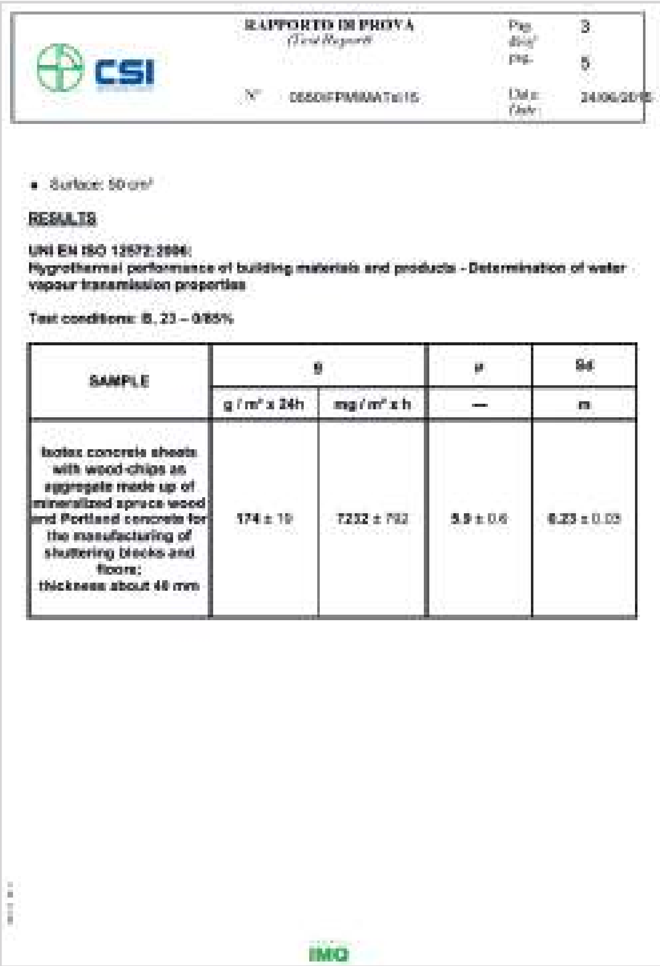
VAPOUR PERMEABILITY
made possible by preferential channels. No condensation.

An aspect that is certainly not negligible for living comfort and the home microclimate is the passage of vapour through the walls.

ISOTEX blocks are made from cement-bonded wood fibre, which has a very low resistance to vapour μ=5.9 (see certificate below). The ribs which connect the two walls of the hollow block form preferential channels through which water vapour passes (see figure below).

These ribs are not made from concrete or insulation, which have much higher values of water vapour resistance than the cement-bonded wood fibre.

This peculiarity, added to the complete absence of structural thermal bridges and adequate air circulation, equates to the **total elimination of condensation and mould.**


RAPPORTO DI PROVA (Test Report)
CSI
N° 0550\FPM/MATe/15 — Pag. 3 di 5 — Data 24/06/2015

- Surface: 50 cm²

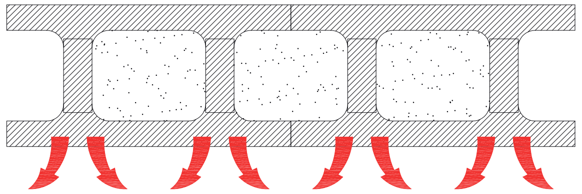
RESULTS

UNI EN ISO 12572:2006:
Hygrothermal performance of building materials and products - Determination of water vapour transmission properties

Test conditions: B, 23 – 0/85%

SAMPLE	g		μ	Sd
	g / m² x 24h	mg / m² x h	—	m
Isotex concrete sheets with wood-chips as aggregate made up of mineralized spruce wood and Portland concrete for the manufacturing of shuttering blocks and floors; thickness about 40 mm	174 ± 19	7232 ± 792	5.9 ± 0.6	0.23 ± 0.03

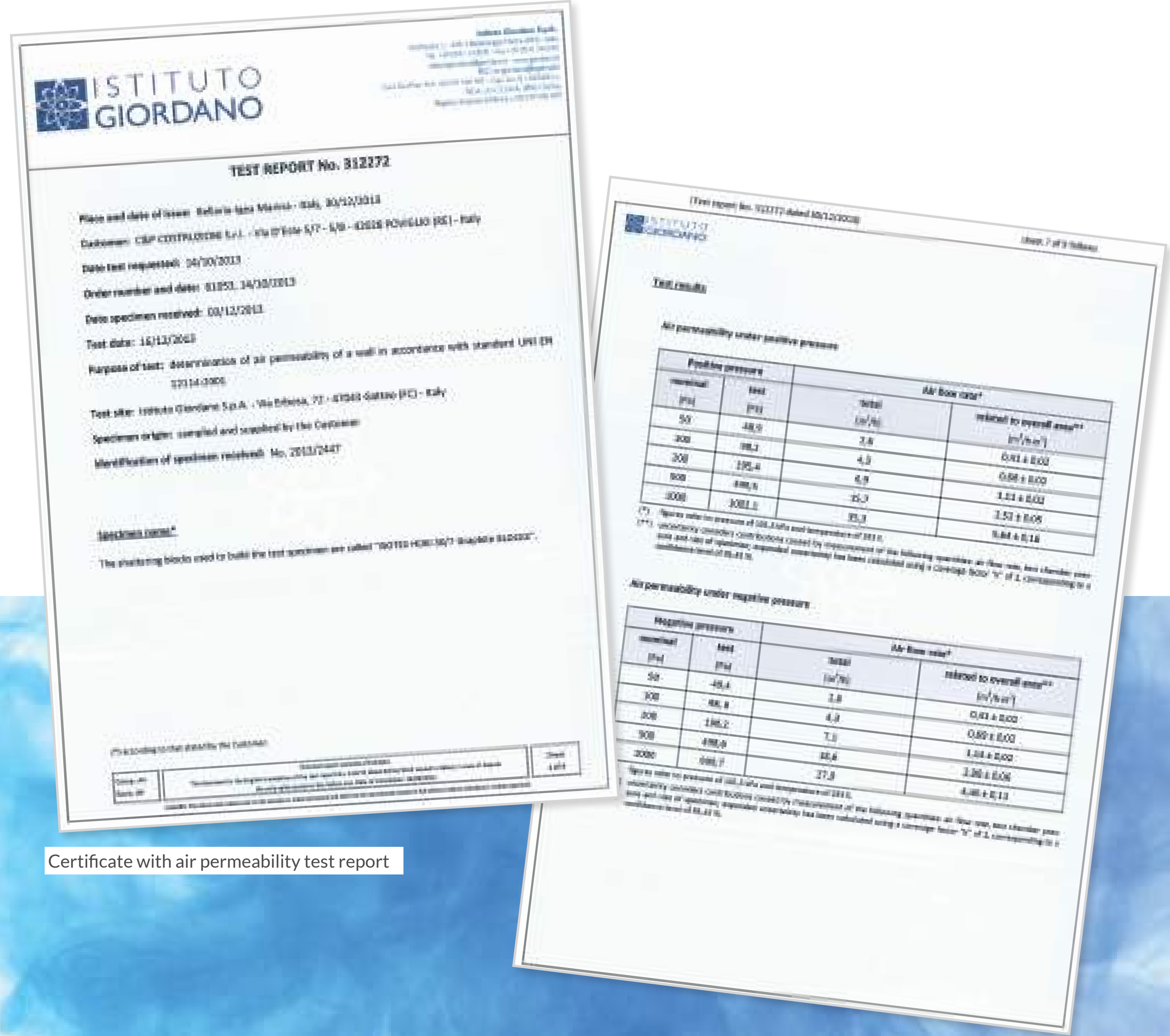
Certificate of water vapour permeability



The ribs, which connect the inner wall to the outer wall of the cement-bonded wood fibre block, form preferential channels for the passage of the water vapour produced inside the dwelling.

AIR IMPERMEABILITY (Blower Door Air tighness-test)
no air leaks through walls, minimizing heat dispersion

Walls made of ISOTEX blocks have been tested for air permeability (see certificate below) with excellent results. **This means that there are no air leaks from the walls, therefore minimizing heat loss.** Naturally, all the essential qualities of the outer envelope can be further preserved with the use of suitable windows and openings.


ISTITUTO GIORDANO

TEST REPORT No. 312272

Certificate with air permeability test report

ISOTEX BLOCKS AND FLOOR SLABS OBTAIN EUROFINS INDOOR AIR COMFORT AND INDOOR AIR COMFORT GOLD CERTIFICATION

Why is it important to choose a low VOC building system such as Isotex?

Today we spend around 90% of our time indoors, breathing in up to 20 cubic metres of air per day, the quality of which can affect our living comfort and our health; this is why **the demand for building systems and products that are not harmful to human health has increased significantly.**

An often overlooked but extremely important factor is **air quality.**

An increasing number of public and private building projects require low VOC emissions as a requirement.

What are VOCs and why are they harmful to health?

VOC stands for **Volatile Organic Compound.** Building and furnishing materials can contain hazardous chemicals that pose significant health risks when released in significant quantities. The determination of the release of these substances into indoor air is measured by means of the **VOC EMISSION TEST.**

VOC tests allow manufacturers to measure the emissions and contents of their products against specific limits for levels of harmful substances in indoor air.

A VOC emission test determines the quantity and quality of volatile organic compounds (VOC) that a product emits into indoor air. It goes without saying that different materials have a maximum amount of harmful substances they can emit.

Consumers can distinguish low-emission products from normal ones through protocol labels (Italian CAM, French Regulation, BREEAM, LEED), both mandatory and non-mandatory, which determine the competitiveness of manufacturers on the market.

Request VOC Test certifications from Eurofins

https://en.blocchiisotex.com/certification/

What is the VOC Test and what are the Certification Levels?

The **EUROFINS "Indoor Air Comfort"** certification is a well-established tool to demonstrate the compliance of the product with **low VOC emission criteria established in Europe.** The test involves placing the product under analysis in an empty chamber under conditions similar to indoor environments and sampling and analysing the air in the chamber several times over a period of 28 days. At the end of the analysis and based on the results, the product is labelled according to a series of classes of merit.

Possible certification levels are:

"Indoor Air Comfort": demonstrates product emission compliance with all legal specifications set by the authorities of the European Union and its Member States.

"Indoor Air Comfort GOLD": ensures further conformity of product emissions to the criteria of many voluntary highly sustainable specifications **(LEED, BREEAM, etc.).**


eurofins | Product Testing

VOC EMISSION TEST REPORT
Indoor Air Comfort GOLD

1 Sample Information

2 Brief Evaluation of the Results

Isotex: Indoor Air Comfort and Indoor Air Comfort GOLD certified

Isotex® wood cement blocks and floor slabs are in the **very low VOC emission category, meeting the strictest European and international standards.**

The tests performed showed that the TVOC (Total VOC) values of only 9.9 μg/m³ for the wood cement sample and 180 μg/m³ for the wood cement + EPS sample **were well below the maximum permitted values of 1000/1500 μg/m³.**

The results were excellent in that the Isotex wood cement sample was classified **Indoor Air Comfort GOLD** and the Isotex wood cement + EPS sample obtained **Indoor Air Comfort** certification (in addition to obtaining individually LEED, BREEAM etc. Class A+).

These awards are yet another demonstration **of the company's focus on technological innovation applied to sustainability and well-being**. This shows how **Isotex® wood cement blocks and floor slabs are safe and healthy and do not endanger the health of the operators and inhabitants** of the buildings where our materials are used.

SUSTAINABILITY & EFFICIENCY

For the health of buildings and their inhabitants, it is essential to use natural building materials.

ISOTEX has always paid close attention to the raw materials that make up its products, with strictly untreated spruce and 99% pure cement. **For such reasons, ISOTEX cement-bonded wood fibre products have attained an important certification for green construction (see certificate),** which indicates that the products are not dangerous to human health or the environment. **Furthermore, tests carried out regarding radioactivity give negligible values: I = 0,115 ± 0,010** (see certificate on page 48 and the website *www.blocchiisotex.com*).


ICEA certifica

N° EDIL.2009_006

Certificato di Conformità

Istituto per la Certificazione Etica ed Ambientale

ISOTEX s.r.l.

< ISOTEX ®>

Indicatori

ANAB

CERTIFICATO PER LA

National Association for Bio-ecological Architecture (ANAB) / Institute for Ethical and Environmental Certification (ICEA) certificate of conformity for green construction materials

Pavullo school complex (MO) - Italy

Considering all the above, it is reasonable to say that the **ISOTEX building system is the best system to guarantee the safety of buildings, those who live in them and the highest level of comfort.** This is evidenced by further additional certifications in the field of environmental ethics such as the LEED Credits (see certificate bottom left) and ITACA Protocol prepared by the National Association for Thermal and Acoustic Insulation (see image below right).

The percentage of recycled material must be shown using various options, amongst which and most importantly, an **Environmental Declaration of Type III Products (EPD)** in conformity with Standard UNI EN 15804 and Standard ISO 14025. All ISOTEX® products answer to this requirement and are equipped with the related EPD (or FDES = EPD also complete with health data) verified by third party bodies, and published and consultable on the European portal www.eco-platform.org.


Environmental Product Declaration

EPD® THE INTERNATIONAL EPD® SYSTEM

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

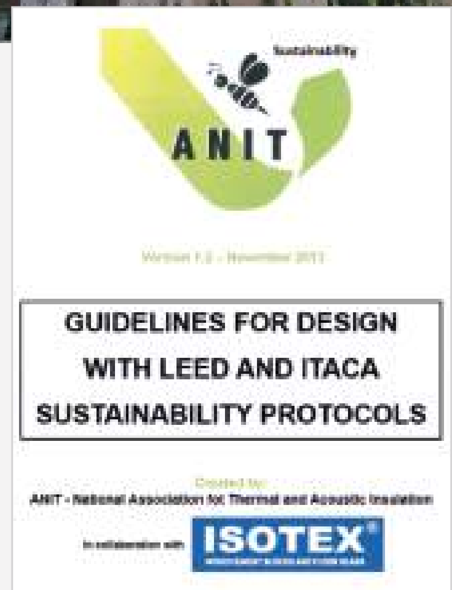
WOOD CEMENT FORMWORK BLOCKS

from

ISOTEX SRL

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-01472
Publication date:	2018-12-18
Revision date:	2024-03-20
Valid until:	2029-03-20

EPD (Environmental Product Declaration) obtained for the whole range of blocks, flooring and acoustic barrier elements.



Guidelines for design with LEED and ITACA sustainability protocols, prepared by the National Association for Thermal and Acoustic Insulation.

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

NEW ECO-SUSTAINABLE RANGE:

Isotex Total Green insulation (100% recycled)

Isotex Green insulation (15% recycled)

Isotex, for ever greener construction!

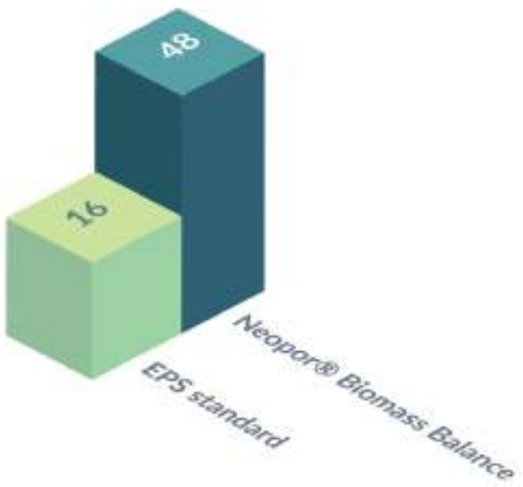
For the production of its products, **Isotex uses only natural materials: 100% recycled wood, low CO2 emissions cement** and a natural mineral to make it inert and therefore resistant to fire, moulds and insects.

Much importance is also given to quality and sustainability of the insert inside the Isotex® formwork block as **BASF's made of Neopor® BMBcert insulation** deriving from renewable sources, Biomass, was chosen.

Since 2022 Isotex has decided to upgrade by realizing two lines of products both eco-sustainable:
- **Isotex Green** with **15% recycled** insulating insert
- **Isotex Total Green** with **100% recycled** insulating insert

Reducing CO_2 emissions is possible thanks to the use of Isotex + BASF Neopor® BMBcert

With Biomass Balance, CO_2 emissions can be reduced by up to 42%



What is Neopor® BMBcert by BASF?

BASF's Neopor® BMBcert is based on the **Biomass Balance** of expandable polystyrene (EPS) with traditional Neopor® graphite. With the Biomass Balance Method (BMB), the primary fossil sources, necessary for production, **are replaced with certified and sustainable renewable sources or from biomass** (such as organic waste and production waste) and attributed to the respective final products **using a certification scheme** internationally recognised as **REDcert²**.

The Biomass Balance Method (BMB) not only **contributes to saving primary fossil sources,** but also **further improves the environmental profile of insulating products: CO_2 emissions are significantly reduced** compared to traditional Neopor® products.

What is Biomass?

We mean those organic materials - such as waste from agro-food production, the organic fraction of urban solid waste, residues from the woodworking industry that can be used or transformed. They are therefore **renewable sources** that have important advantages for the environment: **their use preserves fossil sources (non-renewable), reduces greenhouse gas emissions, contributes to mitigating climate change and global warming.**

From biomass we obtain bio-gas or bio-naphtha from which the thermal insulation made of **Neopor® BMBcert by BASF originates**.

The advantages of the new Isotex products:

100% recycled wood and Neopor® BMB insulating insert **(up to 100% recycled)**, certified according to the scheme REDcert²

Insulating insert of equal quality and technical properties of the products previously present on the market but with **superior characteristics in terms of environmental sustainability and circular economy.**

Saving of non-renewable primary fossil resources thanks to the use of Biomass

Construction of **green buildings by reducing consumption and polluting emissions** as required by the main sustainability protocols (e.g. LEED, EPD, ICEA-ANAB, remade in Italy and VOC Test.

Reduction of CO_2 emissions starting from the production process of the material up to its use in the building.

Guarantee of **material always ready** for supply on site.

ISOTEX EXOSKELETON:

One installation, double intervention: earthquake-proofing and thermal insulation

If you do not want to opt for demolition/reconstruction, the new solution conceived by ISOTEX for the redevelopment of existing buildings is represented by an **intervention of seismic and energy adaptation of the building by means of "Isotex Exoskeleton".**

In these cases, retrofitting with ISOTEX walls is the **ideal solution**, in addition to the fact that it is **non-invasive,** allowing those who already live inside the buildings **not to have to move while the work is being carried out.**

The reinforcing ISOTEX walls, creating a **perimeter exoskeleton bonded to the existing structure,** allow both a seismic adaptation intervention and a "protected coat" thermal insulation intervention to be carried out at the same time.

In fact, ISOTEX technology's excellent anti-seismic performance enables seismic retrofitting of the existing structure, and **BASF's Neopor® BMBcert EPS insulating insert,** which is contained inside the formwork blocks, enables the installation of a "protected coat" with exceptional energy efficiency properties.

The study was drawn up by the University of Pavia by Prof. Alberto Pavese, to be requested directly from the company or on our website www.blocchiisotex.com

DICAR

Dipartimento di Ingegneria Civile e Architettura
dell'Università degli Studi di Pavia

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Fax (0382) 985589 - 524422 - 985419
Codice Fiscale 80007270186 Partita IVA 00462870189

Intervento di adeguamento sismico di un edificio con struttura in cemento armato attraverso l'uso di pareti Isotex

23 aprile 2021

ISOTEX S.r.l.
Via D'Este 5/7 Poviglio (RE) - Italia

RESPONSABILE DEL PROGETTO	
Prof. Ing. ALBERTO PAVESE	
Firma	
Emissione: Marzo 2021	Elaborato: Relazione Tecnica facciate: 45
Revisione:	Nome file: adeguamento sismico – relazione edificio1
Revisione:	
Revisione:	

Il seguente certificato può essere riprodotto solo integralmente e deve essere assoggettato a bollo in caso d'uso ai sensi del DPR 642/72

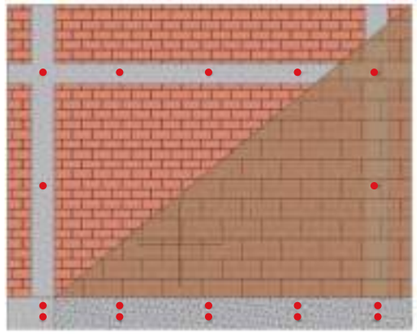
Find out more and request the Technical Documentation

https://en.blocchiisotex.com/product-category/thermal-anti-seismic-exoskeleton/

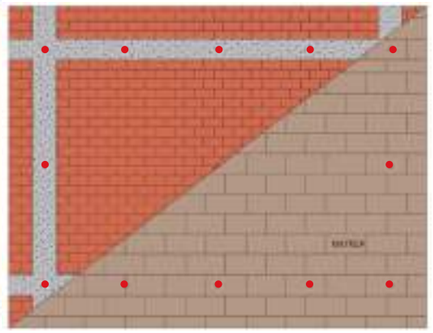
Positioning of connectors

Connections between the existing wall and the ISOTEX Exoskeleton are provided at:

- Foundation
- Elevation structure
- Floor slabs
- Any infill



Positioning of connectors in the edge beams and infills



Positioning of connectors in foundation beams

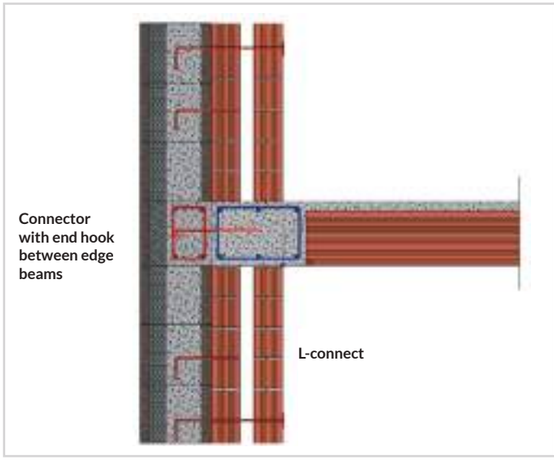
The advantages of seismic and energy retrofitting with an Isotex exoskeleton

1 **Non-invasive intervention**: the exoskeleton built on the external side of the existing perimeter walls allows tenants to remain in their homes during the work

2 **A double intervention is obtained with a single laying operation**: anti-seismic and thermal insulation

3 **The remarkable speed of installation**, which characterises the Isotex construction system, ensures that building occupants can **greatly reduce construction time**

4 The innovative insulating inserts in EPS Neopor® BMBcert from BASF, inside the ISOTEX formwork blocks, guarantee **excellent performance in terms of energy efficiency and environmental sustainability**



ISOTEX BLOCK RANGE

Mineralised spruce wood, Portland cement and BASF Neopor® BMBcert polystyrene

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

Made of Neopor® BMBcert® provided by BASF

BMB

	STANDARD BLOCKS									CUSTOM BLOCKS							
						INFILL BLOCKS								PARTICULAR BLOCKS			VENTILATE BLOCK
LEGEND: **HB** blocks without polystyrene; the first digit is the thickness of the block, the second the thickness of the concrete. **HD** III blocks with insulation; the first digits is the thickness of the block, the second the insulation.	Partition	HB 20	HB 25/16	HB 30/19	HB 44/15-2	HD III 30/07 with graphite	HD III 33/10 with graphite	HD III 38/14 with graphite	HD III 44/20 with graphite	HD III 30/10 with graphite	HD III 33/13 with graphite	HD III 38/17 with graphite	HD III 44/23 with graphite	HD III 38/10 with graphite	HD III 44/14 with graphite	HD III 44/17 with graphite	HD III 44/11 with graphite
																	
Indicative permitted capacity (t/m) R'cK ≥ 30 N/mm² interp. H = 3.00 m	-	-	37	45	32+32	35	35	35	35	28	28	28	28	45	49	42	35
Thermal transmittance U of the plastered wall including boundaries W/m²K of wall. 3D method *	-	-	0,79	0,68	0,56	0,34	0,27	0,21	0,15	-	-	-	-	0,27	0,21	0,18	–
Thermal transmittance U of the plastered wall including boundaries W/m²K of wall. 2D method **	-	-	-	-	-	0,30	0,23	0,18	0,13	0,23	0,19	0,15	0,11	0,23	0,18	0,15	0,19
Thermal periodic transmittance Y_{IE} [W/m²K]	-	-	-	-	-	0,019	0,014	0,008	0,004	0,020	0,020	0,010	0,010	0,008	0,008	0,008	0,006
Acoustic insulation *** (dB) (R'W) [Dmntw] RW [D2mntw]	46	-	56****	55*****	60***	54***	54****	54****	53****	53	53	53	53	54****	53****	53****	53****
Concrete volume requirement l/m²	-	110	138	161	236	130	130	130	130	104	104	104	104	161	178	154	130
Weight of the blocks Kg/m² (± 10%)	6,5	56	80	85	128	80	83	88	95	80	83	88	95	88	95	95	128
Weight of the wall filled with non-plastered concrete Kg/m²	62	310	382	445	694	392	395	400	407	330	333	338	345	475	522	465	440
Block wall thickness (cm)	3,25	3	4,5	5,5	4,5	4	4	4,5	4,5	4	4	4,5	4,5	4,5	4,5	4,5	4,5
Concrete thickness (cm)	-	14	16	19	15+15	15	15	15	15	12	12	12	12	19	21	18	15
Polystyrene, graphite, cork thickness (cm)	-	-	-	-	-	7	10	14	20	10	13	17	23	10	14	17	11
REI Class fire resistance (loaded and unplastered wall)	120	-	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

* The calculation of thermal transmittance has been performed according to the criteria of standards UNI 10355 and UNI EN ISO 6946, using a three-dimensional finite element calculation application validated according to EN 10211/1 and on the basis of thermal conductivity data obtained from experimental evidence (see website www.blocchiisotex.com).

• For this block, the technical characteristics are not given, since it does not meet current applicable regulations.

Concerning to the UK Market, having different regulations (as minimum thickness of concrete 12 cm), it is intended to increase the thickness of the 3 cm more of insulation with New EPS low carbon NEOPOR® BMBcert (Biomass Balance Method) by BASF.

** Indicative two-dimensional calculation according to standards UNI-TS 13788, UNI 10355 and UNI 10351.

*** Note: the test certificates can be requested from ISOTEX or consulted on the website www.blocchiisotex.com. The tests were field tests in which the data was elaborated according to the indications provided by technical standards UNI EN ISO 140 and UNI EN ISO 717.

**** Tests performed in the laboratory according to standards UNI EN ISO 140-3:2006 and UNI EN ISO 717-1:2007.

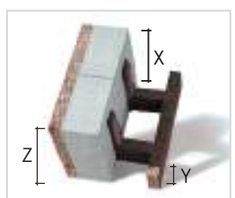
***** Tests performed in the laboratory according to standards UNI EN ISO 10140-2:2010 and UNI EN ISO 717-1:2007.

ISOTEX HOLLOW BLOCKS CONFORM TO THE GUIDELINES APPROVED BY THE SUPREME COUNCIL FOR PUBLIC WORKS (JULY 2011)

SPECIAL BLOCKS

Block with custom angle (thicknesses of 25-30-33-38-44 cm)

Spandrel flooring block:
X= custom,
Y= custom,
Z= X + Y



COMPLETATIONS BLOCKS

Wall pillar block of:
33 cm section concrete 25x38 cm
38 cm section concrete 30x38 cm
44 cm section concrete 33x39 cm

Half block
for 44 cm shoulder

COMPLETATIONS BLOCKS

PASS block
of 30-33-38-44 cm

Shoulder block
of 38-44 cm

Universal (UNI) block
of 38-44 cm for external corners

Universal (UNI) block of
30-33 cm for external corners and shoulders

Block for internal corners
of 30-33-38-44 cm

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

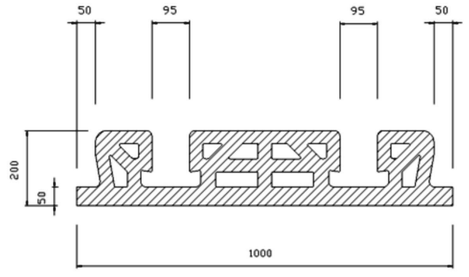
ISOTEX FLOOR SLABS RANGE

Mineralized spruce wood and Portland cement

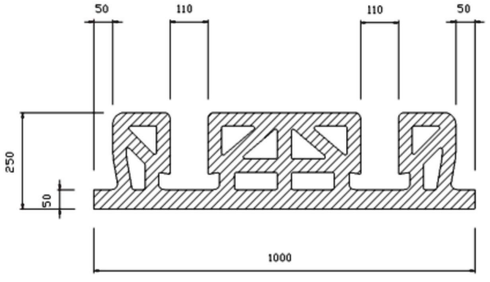
The tables below have been compiled on the basis of resistance criteria, considering materials with the following characteristics: Concrete C25/30, fyk = 25 N/mm², Steel B450C.

Relevant evaluations of the deformability limits are to be made case by case. If necessary, appropriate precautions must be adopted to absorb shear stresses (in case of additional brackets, elimination of hollow end blocks, etc.).

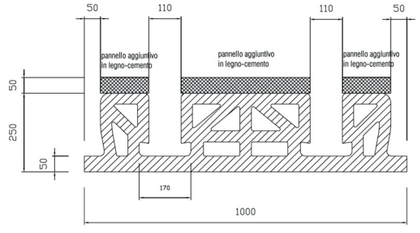
Floor slab S20



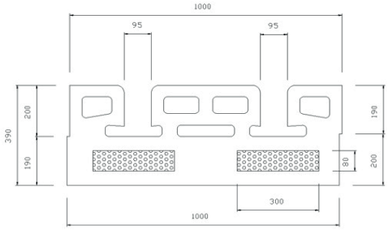
Floor slab S25



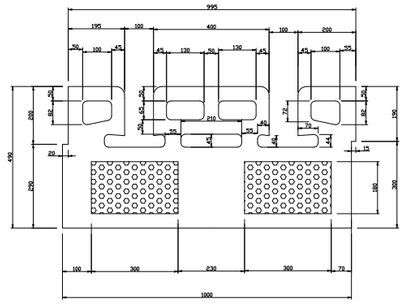
Floor slab S25+5



Floor slab S39



Floor slab S49



Structural use of ISOTEX wood-cement foor slabs

PANEL DESIGN INDICATIONS	S20 thickness 20 cm
Height of factory cast joist	**5 cm**
Weight	(0,016 x 2 500) = **40 kg/m²**
Weight of the factory produced panel	4 (elements) x 20 kg each = 80 + 40 = **120 kg/m²**
Volume of structural concrete	0,02 + 0,015 (filling of wood cement element) + 0,040 base thickness 4 cm) = **0,075 m³/ m²**
Weight of structural concrete	0,075 x 2 400 = **180 kg/m²**
Total weight of the completed panel	40 + 80 + 180 = **300 kg/m²**

PANEL DESIGN INDICATIONS	S25 thickness 25 cm
Height of factory cast joist	**5 cm**
Weight	(0,016 x 2 500) = **40 kg/m²**
Weight of the factory produced panel	4 (elements) x 20 kg each = 96 + 40 = **136 kg/m²**
Volume of structural concrete	0,03 + 0,023 (filling of wood cement element) + 0,040 base thickness 4 cm) = **0,093 m³/ m²**
Weight of structural concrete	0,093 x 2 400 = **224 kg/m²**
Total weight of the completed panel	40 + 96 + 224 = **360 kg/m²**

Total sustainable load beyond own weight

(indicative reinforcement with 50 cm centres)

	LOADS				
OPEN-INGS	300 kg/m²	400 kg/m²	500 kg/m²	600 kg/m²	700 kg/m²
3.00	1ø8	1ø10	1ø10	1ø12	1ø12
4.00	1ø12	1ø14	1ø10+1ø12	1ø16	2ø12
5.00	1ø16	1ø12+1ø14	1ø12+1ø16	1ø14+1ø16	2ø16
6.00					
7.00					

	LOADS				
OPEN-INGS	300 kg/m²	400 kg/m²	500 kg/m²	600 kg/m²	700 kg/m²
3.00	1ø8	1ø8	1ø10	1ø10	2ø8
4.00	2ø8	1ø12	1ø8+1ø10	1ø8+1ø12	1ø10+1ø12
5.00	1ø8+1ø12	1ø10+1ø12	2ø12	1ø12+1ø14	2ø14
6.00	1ø12+1ø14	1ø12+1ø16	1ø14+1ø16	2ø16	1ø16+1ø18
7.00					

Structural use of ISOTEX wood-cement foor slabs

PANEL DESIGN INDICATIONS	S25+5 thickness 25 cm + 5 CM
Height of factory cast joist	**5 cm**
Weight	(0,016 x 2 500) = **40 kg/m²**
Weight of the factory produced panel	4 (elements) x 28 kg each = 112 + 40 = **152 kg/m²**
Volume of structural concrete	0,04 + 0,029 (filling of wood cement element) + 0,040 base thickness 4 cm) = **0,109 m³/ m²**
Weight of structural concrete	0,109 x 2 400 = **262 kg/m²**
Total weight of the completed panel	152 + 262 + 224 = **414 kg/m²**

PANEL DESIGN INDICATIONS	S39 thickness 39 cm
Height of factory cast joist	**5 cm**
Weight	(0,016 x 2 500) = **40 kg/m²**
Weight of the factory produced panel	4 (elements) x 39 kg each = 156 + 40 = **196 kg/m²**
Volume of structural concrete	0,03 (filling of wood cement element) + 0,040 base thickness 4 cm) = **0,07 m³/ m²**
Weight of structural concrete	0,07 x 2 400 = **168 kg/m²**
Total weight of the completed panel	40 + 156 + 168 = **364 kg/m²**

PANEL DESIGN INDICATIONS	S49 thickness 49 cm
Height of factory cast joist	**5 cm**
Weight	(0,016 x 2 500) = **40 kg/m²**
Weight of the factory produced panel	4 (elements) x 45 kg each = 180 + 40 = **220 kg/m²**
Volume of structural concrete	0,03 (filling of wood cement element) + 0,040 base thickness 4 cm) = **0,07 m³/ m²**
Weight of structural concrete	0,07 x 2 400 = **168 kg/m²**
Total weight of the completed panel	40 + 180 + 168 = **388 kg/m²**

Total sustainable load beyond own weight

(indicative reinforcement with 50 cm centres)

	LOADS				
OPEN-INGS	300 kg/m²	400 kg/m²	500 kg/m²	600 kg/m²	700 kg/m²
3.00	1ø10	1ø12	1ø12	1ø12	1ø12
4.00	1ø8+1ø10	1ø14	1ø10+1ø12	1ø16	2ø12
5.00	1ø16	1ø12+1ø14	1ø12+1ø14	2ø14	2ø14
6.00	2ø14	1ø14+1ø16	1ø14+1ø16	2ø16	1ø16+1ø18
7.00	2ø16	1ø16+1ø18	2ø18	2ø14+1ø18	3ø16

	LOADS				
OPEN-INGS	300 kg/m²	400 kg/m²	500 kg/m²	600 kg/m²	700 kg/m²
3.00	2ø8	2ø8	1ø12	1ø12	2ø10
4.00	1ø14	1ø10+1ø12	1ø10+1ø12	1ø16	2ø12
5.00	2ø12	1ø12+1ø14	2ø14	1ø12+1ø16	1ø14+1ø16
6.00	1ø12+1ø16	1ø14+1ø16	2ø16	1ø16+1ø18	2ø18
7.00					

RECOMMENDATIONS FOR CORRECT APPLICATION OF PLASTERS AND COLOURED FINISHES

The plaster must only be applied on dry surfaces. Therefore, avoid application on walls that are wet from rain or frost, or from improper curing. Do not apply the plaster at temperatures below 4°C, since the significant slowing of hardening makes it difficult to check when it is right to apply the finish. The week before applying plaster, close any gaps caused by incorrect laying with mortar in order to **avoid notable thicknesses of plaster** which might result in areas of crazing. The walls should be adequately levelled and squared during installation as the application of thicknesses of plaster to straighten and square off walling is inconceivable and ineffective. A thickness of greater than 2 cm may lead to the formation of crazing and cracks. Where more than 2 cm of plaster thickness is necessary, it is essential that the plaster is applied in two coats, with maturation of the first coat of at least 28 days.

Given these important premises, pre-mixed or traditional plaster can be applied, taking into account that, since the plaster has the function of protecting the wall from weather and wear, it should have a thickness as uniform as possible of approximately 15 mm, bearing in mind that a less or greater thickness can facilitate the formation of crazing and cracks. Over the last few years, insulation is becoming ever more efficient which makes it all the more important to consider inserting a suitable netting, in **alkali-resistant fibre glass with CE marking,** positioned half way through the plaster; that being 7-8 mm from the support.

Any application of fine mortar or similar must always be made after a coat of adhesive on the hardened plaster, following, on average, an interval of 3-4 weeks. Naturally, this time interval will vary according to weather and climatic conditions. This type of finish (for exteriors), which for its success must be made with a base coat (15 mm.) fully matured in order to avoid the formation of shrinkage cracks, is not recommended by Isotex Srl, given the enormous difficulty in verifying that the right conditions and timings of applications are met.

The solution recommended by Isotex, given positive experience gained since 1995 on various construction sites and the increased use of thermally high performing blocks, which subject the plaster to increased stress, is to apply to the plaster base coat (15mm), levelled with a straight edge and matured for 4-6 weeks, a thick colour finish.

This solution does not require fine mortar or similar. Remember that when you apply the base coat and level it with a straight edge, make sure that the result is as consistent and solid as possible, in order to avoid chalking. Isotex Srl can provide data sheets regarding the characteristics of these products for external finishes and methods of application, which in any case must always ensure the water impermeability of the wall and low resistance to the passage of vapour.

For interiors, Isotex recommends a 4-5 day interval between the plaster base and the fine mortar or similar, so that there is a good thorough maturation of the plaster before application of the mortar itself. Consider the particularities of the S39-S49 panelling, which for thermal reasons has joints but not concrete between the panels. In correspondence with these joints micro-cracks may form and therefore, to avoid this, it is recommended to use a plasterboard finish.

For **intermediate floors (S20-S25-S30),** if a plaster finish with a thickness of 15mm (no less) is chosen, the recommendation is to “embed” half way through the thickness, a reinforcing net in alkali-resistant fibre with CE marking. Then wait 4/5 days, depending on the season, before applying the finish and 4/6 weeks before painting. Please note that, Isotex Srl, due to the fact that it is unable to physically monitor on a day to day basis compliance with these recommendations, the quality of materials used (plaster and coloured finishes) and timings between applications, disclaims any responsibility for issues that may occur in the future.

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

EXTERNAL FINISHES ON ISOTEX® WALLS

One of the ways to thermally insulate a wall is to apply a consistent layer of insulation to the outside of the wall. To ensure maximum durability of this insulation over time, to prevent the insulation from detaching or being damaged due to impact or hail and to prevent cracks in the finishing plasters, resulting from expansion or settlement, it is advisable to protect it appropriately (protective coat).

The construction system with ISOTEX formwork **blocks ensures that the Neopor® BMBcert by BASF insulation,** inserted in the internal part of the formwork block, is protected by a layer of wood-cement which **guarantees maximum protection while also allowing it to breathe. In this way an excellent “protective coat” insulation is obtained, which will last over time, without the need for maintenance.**

The ISOTEX “protective coat” guarantees **excellent adhesion and hold for plasters** and adhesives, it can therefore be covered with exposed bricks, tiles or stone - improving the building’s look even more- and also create ventilated facades.

Stone and matchboard cladding

Marble cladding

Various steps involved in porcelain stoneware cladding

Brick cladding

One side with tile cladding and the other with ventilated façade

SPECIFICATIONS REGARDING WOOD-CEMENT BLOCKS AND FLOOR SLABS

SPECIFICATIONS OF WOOD-CEMENT BLOCKS

Exterior and interior load-bearing walls from H-form Isotex® cement-bonded wood fiber blocks of density 534 ± 10% kg/m3 to be laid dry and staggered by half a block, cast with concrete every 5-6 courses layers and with a single continuous cavity for concrete casting. The walling is reinforced with horizontal and vertical steel rods at 25 cm intervals and concrete casting of a consistency of no less than S4. The range of blocks is complete with a number of special units such as half-blocks, corner blocks, flooring curb blocks, architrave blocks and pillar blocks. The blocks contain EPS inserts made of Neopor® BMBcert by BASF, certified by Bureau Veritas Italia under the ReMade in Italy® scheme, in Class C with 15% recycled content (ISOTEX GREEN insulating insert) or Class A+ with 100% recycled content (ISOTEX TOTAL GREEN insulating insert). It should have CE marking in accordance with European Technical Approval and European harmonized standard UNI EN 15498, certifications on thermal transmittance values "U" according to European standards UNI EN ISO 6946, UNI 10355 and EN 10211, dynamic and hydrometric thermal characteristics as provided for by D.M 26/06/2015, air impermeability test (Blower-Door-Test) according to EN 12114, frost test (freeze-thaw) and dimensional stability according to UNI EN 14474, acoustic tests according to UNI EN ISO 140 and UNI EN ISO 717 for acoustic insulation, UNI EN ISO 354 and UNI EN ISO 11654 for acoustic absorption, fire resistance tests (REI 120) carried out with load-bearing walls according to EN 1365-1 and EN 13501-2, façade fire performance test LEPIR 2 according to the Decree of the French Ministry of the Interior of 10/09/1990 and its application protocol, approved by CECMI on 11/06/2013, materials certification according to the requirements of green construction and Type III-EPD environmental label according to ISO 14025:2006 and UNI EN 15804:2012+A2:2019/AC:2021 issued by the relevant structures and Eurofins product certifications "Indoor Air Comfort" and "Indoor Air Comfort GOLD" according to UNI EN 16516 or UNI EN ISO 16000-9, demonstrating the compliance of the product with the criteria of low VOC emissions (Volatile Organic Components) with respect to the mandatory regulations of individual European countries and voluntary labels (LEED, BREEAM INTERNATIONAL, etc.).

Formwork block system with ETA (ETA 08/0023), European Technical Assessment. The ETA is issued in accordance with Regulations: EAD 340309-00-0305 (non-structural) and EAD 340309-00-0305-v01 (structural). Experimental tests on the structural characterization of the formwork block system carried out in full compliance with European standard: EAD 340309-00-0305-v01.

Blocks production department

SPECIFICATIONS OF WOOD-CEMENT FLOOR SLABS

The Isotex® cement-bonded wood fiber panel system for highly thermo-acoustic insulated horizontal or inclined structures consists of pre-assembled 100 cm x(20/25/30/39/49) panels of lengths up to 6.5-7 m, with horizontal and vertical cavities to eliminate thermal and acoustic bridges, reinforcing rods and concrete filling. The flooring system is completed on site with reinforcing rods, partitioning wire mesh and concrete casting.

Isotex® floor panels are CE marking in accordance with the harmonized European standard UNI EN 15037-1, certifications of fire resistance (REI 240), thermal transmittance (D.M. 26/06/2015), in-situ acoustic tests in accordance with UNI EN ISO 140 and UNI EN ISO 717 standards, structural tests, material certifications in accordance with the requirements for green building and the Type III-EPD environmental label in accordance with ISO 14025:2006 and UNI EN 15804:2012+A2:2019/AC:2021 standards issued by the relevant structures, and Eurofins "Indoor Air Comfort GOLD" product certifications in accordance with UNI EN 16516 or UNI EN ISO 16000-9 standards, demonstrating the product's compliance with the criteria of low VOC emissions (Volatile Organic Components) with respect to the mandatory regulations of individual European countries and voluntary labels (LEED, INTERNATIONAL BREEAM,etc.).

Download Isotex Blocks and Slabs specifications
https://en.blocchiisotex.com/technical-specifications-formwork-blocks-and-cement-wood-floors/

Floor slabs production department

BUILDING SYSTEM ISOTEX® Wood-cement Blocks and Floor Slabs

ALL THE SERVICES DEDICATED TO YOU

To optimize the use of its products according to building type, customers needs and in order to achieve the absolute best performance, ISOTEX freely offers a continuous, qualified assistance service to technicians and builders, including ISOTEX use structural feasibility studies, consultation regarding correct structural, thermal and acoustic analyses and technical assistance for construction sites from preparatory works until the final painting of the buildings.

From January 2018, ISOTEX has adopted the BIMobject portal for BIM design. Download all the subjects free of charge from the site www.blocchiisotex.com

FEASIBILITY STUDY

The feasibility study is designed to evaluate whether the architectural design is suitable for the use of ISOTEX blocks as load-bearing walls, or if minor adjustments are necessary.

BIM OBJECT

From January 2018, ISOTEX has adopted the BIMobject portal for BIM design. Download all the subjects free of charge from the site www.blocchiisotex.com

FLOORING CALCULATION

If the ISOTEX floor slabs to be produced have not already been calculated by the structural engineer, our technical department will see to it.

DESIGNER & SITE ASSISTANCE

ISOTEX provides a complete and professional assistance service to technicians and construction sites that use its cement-bonded wood fibre blocks and panels.

FREE VIDEO COURSES

Follow the first online laying courses from ISOTEX. 8 free video courses that show, simply and quickly, the techniques for the correct laying of ISOTEX cement-bonded wood fibre blocks and panels.

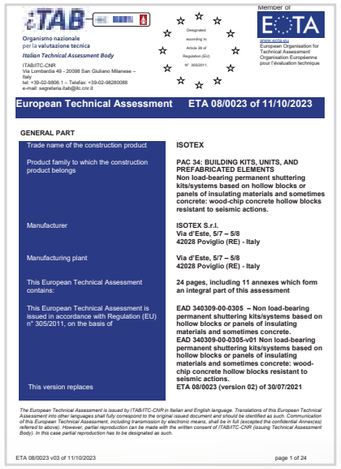
ISOTEX FINDS YOU A HOME!

ISOTEX will help you find the perfect home in the area of your choice by putting you into contact with those who have chosen to build homes with ISOTEX blocks and panels.

ISOTEX CERTIFICATIONS

Continuous and strict controls are carried out in the company and associated bodies.

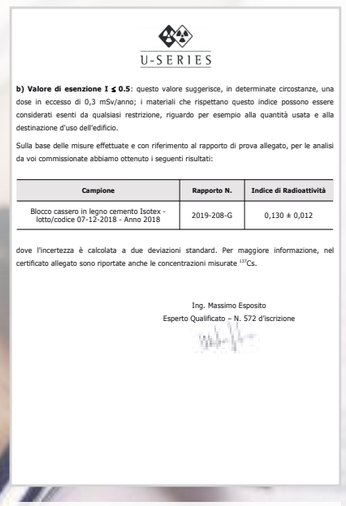
CE marking



European Technical Approvals ETA 08/0023 (EAD 34 0309-00-0305)

Flooring panel CE marking obligatory since 01/01/2011

Quality Certificate ISO 9001 : 2008



Proof of absence of radioactivity

Interpretive report and experimental test results

ISOTEX

awards and acknowledgements

In 2002, Isotex was given the prestigious PREMIO COSTRUIRE award, for which eight university academics chose our construction technology for walls and flooring.

YouBuild Awards 2022, Honorable Mention in the Recycle, Circularity and Biobased Cycles category for our ISOTEX TOTAL GREEN 100% Blocks range.

SHE Venezia Project, Preganziol (TV)

SAIE Innovate, Integrate and Build Award given to ISOTEX for the best sustainable project with the presentation of the 44/18 HDIII Graphite Block.

Isotex was awarded as the best construction system during the Edilsocial Expo 2023 in Dubai.

Jury Mention for the project "Casanova" as the first energy-efficient building in Reggio Emilia in the environmentally friendly innovation competition "Premio all'INNOVAZIONE AMICA dell'AMBIENTE" 2007.

Thanks from Mogol to ISOTEX for the realization of the musical school Centro Europeo Tuscolano Terni-Italy.

The project "LE QUERCE" received the ENDESA Barcelona Award for "Most Environmentally Friendly Real Estate Project" 2009, the Eco-building Award Paris 2009, the Klimahouse Trend Award Bolzano 2016 and the Casa Clima Gold Award 2016.

HOMES CONSTRUCTED

Isotex begins its history in Germany in 1946 and has been operating in Italy since 1985, realizing in total about 400,000 eco-sustainable homes ensuring safety and experience.

Isotex Srl has always stood out for research, innovation and product quality, becoming the largest European reality in the formwork block production sector e concrete wood floors slab.


Social Housing - Parma (Italy)


Social Housing - Parma (Italy)


Social Housing - Granarolo (Italy)


School - Treviso (Italy)


School - Torino (Italy)


School of music - Terni (Italy)


Veterinary hospital - Cremona (Italy)

ISOTEX REFERENCES

https://en.blocchiisotex.com/projects/


Eco-sustainable village - Modena (Italy)


Residential Area 96 homes - Verona (Italy)


Hotel - Trento (Italy)


Residential Building - France


Luxury Villa - Lithuania


Luxury resort - Israel

CONSTRUCTION SYSTEMS COMPARISON

As explained above in the preceding pages, ISOTEX has applied all the principles of **safety and living comfort** to develop its building system, which is certified in all aspects according to applicable regulations in Italy and Europe.

We invite technicians, builders and buyers to compare ISOTEX with other building systems, on which we make some brief remarks below:

STRUCTURAL FRAMES & NON-LOAD-BEARING WALLS:

Pillars and beams have been widely used over the last few decades. The realization of the structural frame then requires the installation of non-load-bearing walls.

Non-load-bearing walls must be securely anchored to the structural frame in order to prevent them from collapsing, in case of an earthquake, and causing damage to persons and property. In order to insulate and eliminate thermal bridges, **coating insulation** must then be used (see side paragraph). Finally, to comply with the regulations on sound insulation, specific action must be with suitable materials.

Clearly, the sum of all these requirements significantly increases the time and costs of construction, exposing the site to the risk of **IMPROPER INSTALLATION**, which may compromise the final technical performance of the building.

EXTERNAL WALL INSULATION (E.W.I):

Coating insulation can be found on the market with considerable differences in costs per square metre, closely linked to the quality of insulation itself, and the final result depends highly on the professionalism of the applicators. Considerable attention must therefore be paid to avoid any unpleasant surprises over time. It is also extremely difficult (if not impossible) to apply finishes to the coating.

INSULATED CONCRETE EPS FORMWORK (I.C.F.):

For supporters of the ethics of green construction, polystyrene blocks would not seem the ideal solution. It must also be considered that, in case of fire, polystyrene fumes are harmful to human health and the environment. Similar considerations as for the coating insulation also apply.

TIMBER FRAME:

Though advertised as a natural product, the adhesives used for the assembly of wooden boards, in order to make them structurally robust, and the paints used to protect them from the elements can be discussed at length.

Does it still seem natural to you?

Also regarding fire resistance, there are still considerable doubts and many buildings have had problems.

Furthermore, wooden houses are lightweight structures, which raise many questions concerning thermal inertia and sound insulation. Finally, wood, when exposed to the elements, requires constant maintenance.

AERATED CONCRETE BLOCKS:

Their little mass raise significant questions about thermal inertia sound insulation. Also, the lack of reinforcement in the structure limits its seismic integrity.

More information:
www.blocchiisotex.com

PLUG TIGHTNESS AND TEAR RESISTANCE TESTS ON ISOTEX WALLS

On our site www.blocchiisotex.com you can find the reports of the complete tests and the technical sheets for different fixing methods.


fischer

Product design and development

TEST REPORT

Subject: ISOTEX® products load bearing tests.


fischer

Product design and development

TEST REPORT

Subject: ISOTEX® products load bearing tests.

Maximum safety and living comfort, always

MUROTEX
INNOVATION.STRENGTH.SUSTAINABILITY.

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UNI EN 15037-1
UNI EN 15498
ETA 08/0023

07 - 2025