

External Thermal Insulation System **Kelyfos**

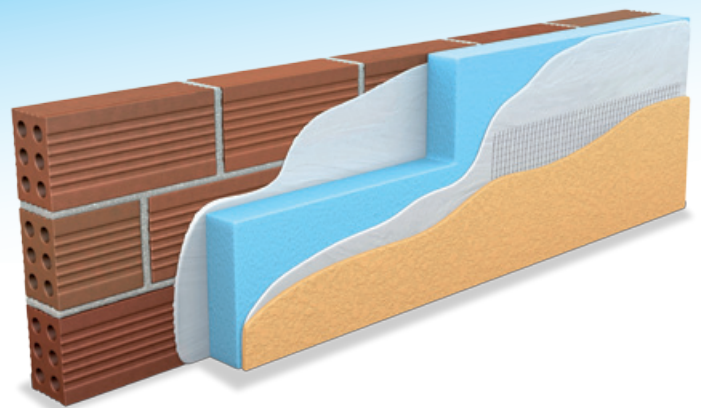
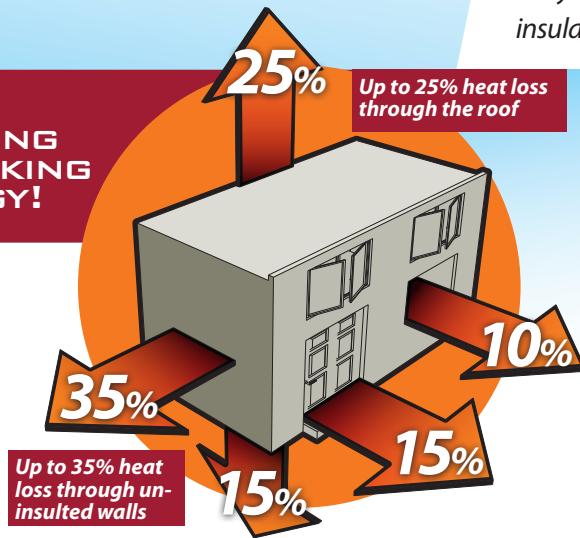
THE ULTIMATE SOLUTION FOR NON INSULATED BUILDINGS

ISOMAT, DOW and POLYKEM, three of the top companies in the construction market, joined their power and manpower to create, develop and promote a certified and reliable external rendering system in the market.

WHAT IS KELYFOS?

"KELYFOS" is an external thermal insulation composite system consisting of extruded polystyrene (XPS) thermal insulation boards Styrofoam IB-SL by Dow, adhesives and plaster by Isomat and other materials such as mechanical fixing, fiberglass mesh and more by Polykem. KELYFOS system is the ultimate solution for non or semi-insulated buildings.

**YOUR
BUILDING
IS LEAKING
ENERGY!**



THE SOLUTION FOR THE PROBLEM

Buildings' energy saving is a topic that has multiple times drawn the attention of the State as well as of the technical world. In the nearby future, all new constructions shall have external thermal insulation by law.

Regardless of the legislation, energy saving is part of common sense, especially in an era where the concern for corrosion of the system has become quite intense, while there is a galloping price increase of fuel oil. The rational use of energy contributes not only in the natural resource savings, but also in an incremental financial resource savings.

Within this energy saving concept, ISOMAT in cooperation with DOW and POLYKEM, has introduced KELYFOS, the first external thermal insulation and renovation composite system consisting of extruded polystyrene thermal insulation boards and Greek colored plaster. KELYFOS comes to provide the perfect solution, offering the following:

- The ideal solution for existing non-insulated buildings, as it reduces the cool/heat loss through the wall (energy saving up to 55%, according to CRES, Centre for Renewable Energy Sources).
- Comfortable conditions throughout the year
- Energy savings: lower expenses for heating during winter and cooling during summer

- Takes advantage through the wall's thermal capacity, i.e. the house preserves a desired temperature much longer, as the wall play the role of thermal "storage"
- Protection of the building's shell against the ever changing weather conditions
- Stops the formation of thermal bridges and vapor condensation within the building materials themselves
- Zero annoyance for the tenants during installation
- Building renovation that is both inexpensive and swift
- Short depreciation period of the initial investment
- KELYFOS is one of the few certified thermal insulation systems available.
- It is the result of collaboration of three major companies in the construction market
- It offers a holistic thermal insulation solution of the building shell (external wall, roof)
- It offers all the abovementioned advantages, at the same price with other competitive ones in the market that use cheaper or unknown materials.

WHERE KELYFOS IS APPLIED

- In non or semi-insulated buildings
- In buildings that express an interest in external renovation
- Both old & new buildings

HOW KELYFOS IS APPLIED

The system is properly applied by a team of trained applicators that are trained both in theory and practice.

SYSTEM'S CERTIFICATION

"KELYFOS" system is certified by EOTA (European Organization of Technical Approvals) according to ETAG004 guidelines regarding external thermal insulation systems. Additionally, the Centre for Renewable Energy Sources (CRES) in Athens has performed full scale experiments & feasibility study regarding the energy savings by using KELYFOS. The test results are presented in the following table:

Styrofoam 5 cm	Saving in heating	Saving in cooling	Total energy savings
C Climatic Region MALTA	38 - 40%	53 - 55%	46 - 49%
Styrofoam 3 cm	Saving for heat	Saving for cold	Total energy saving
C Climatic Region MALTA	24 - 26%	32 - 34%	28 - 30%

Styrofoam IB-A 3 & 5 cm

Regarding the end choice of the insulation material width (3 or 5 cm), the cost difference for the end buyer is quite small. In particular, for a typical detached house, the difference ranges between €4 and €6 per m². Using Styrofoam of 5 cm, one will achieve energy savings of up to 55%. Respectively, using thermal insulation of 3cm, the greatest energy savings one can reach is 34%. As a result, one may invest a small amount of extra money for a thicker insulation material, to be more energy efficient and achieve a shorter amortization period.



PROPERTY	STANDARD	UNIT	VALUE
Minimum Density	EN 1602	kg/m ³	32
Thermal Conductivity λ	EN 12164	W/mK	0.035
90 Days in 10° C		kcal/mh °C	0.03
COMPRESSION STRENGTH	EN 826	KPa	250
(value at yield limit or at 10% deformation)		kp/cm ²	2.5
Hydro-Absorptivity	EN 12087	% by volume	1.5 max
Temperature Coefficient of Linear Expansion		mm/mK	0.07
Fire resistance	EN 13501-1		Euroclass E
	DIN 4102		Class B2
Hair Cracks			None
Resistance to Vapor Permeability μ (Air $\mu=1$)	EN 12086		100mij
Minimum / Maximum Limits of Temperature at application		°C	-50 / +75
Dimensions	Length	mm	1250
	Width	mm	600
Thicknesses	EN 823	mm	30, 50
Panel Surface			Without extrusion skin

Thickness of Extruded Polystyrene sheet mm	R Value m ² K/W	U Value W/(m ² K)
30	0.86	1.17
50	1.43	0.70