



# Leyco-Tile System

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## Introduction

LeycoChem Leyde is a worldwide leading manufacturer of concrete additives and modern building materials. In the past, Leyde products were produced in Iraq and had a good reputation with a big market share in the construction business. However, production stopped in the 1990's due to the political circumstances that took place then. We are proud now to announce that a new joint venture company, LeycoChem Leyde Iraq, has been established and a wide range of Leyde products is being produced now in Iraq. This will contribute significantly in the rebuilding of the nation by ensuring the highest German standard products are readily available in the country.

We are proud to be at the forefront of nation building by offering construction related materials that will ensure quality which will benefit not only our generation but the generations to come.

### LeycoChem Leyde Products:

- Concrete Admixtures
- Water- Proofing Systems & Membranes
- Sealants
- Specialty Mortars
- All types of Cracks Repair
- Epoxies
- **Modern Roofing System**
- Rubber Water Stops, Expansion Joints, Bridge Bearings and Pads
- Foam Concrete Agent and Generator
- Other new construction materials

### High Quality Products: are assured by our company by using:

- The best possible raw materials
- German designed and built plant and machinery
- German trained workforce
- Professional, internationally trained management
- Fully equipped on-site laboratory to guarantee the highest possible standard
- Complete transfer of technology from Germany to Iraq
- Full certification provided with all products

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LeycoChem LEYDE GmbH Germany

## What is the ideal roofing solution in Iraq?

Heavy Concrete tiles are being used in Iraq long time ago as a conventional, simple and economical solution for buildings roofing. Yet, the practical experience shows a number of disadvantages related to using the conventional Concrete tiles for roofing. Such as:

- 1- High cost on the short term as well as the long term due to the annual maintenance needed for this type of buildings roofing.
- 2- No heat insulation with high loss of energy.
- 3- Mastic is used for the joints and must be replaced annually.
- 4- Buildings are exposed to high and continuous humidity.
- 5- Extra and un-necessary loads on the construction due to the heavy concrete tiles used.
- 6- Poor quality of Concrete tiles available in local markets.

## Any alternative solution?

International researches conducted during the past years, led to producing new materials for building and roofing through which all the disadvantages occur by using the conventional roofing materials have been eliminated for the beneficiary of Human beings and also the improvement of construction field.

**Leyco Tile** is one of the newly produced materials used instead of the Concrete tiles as the most ideal solution for roofing in Iraq and the Middle East where temperature varies extremely.



**A Leyco Tile** consists of two layers: 1 cm topping of high strength special mortar and a lower layer of 3-5 cm high density extruded Polystyrene. Extruded closed-cell Polystyrene is used for more than 50 years in construction. It does not absorb water, does not rot and is ideally used for inverted roofing.

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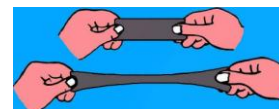
## Advantages of Leyco Tile roofing:

- 1- Heat Insulation in hot and cold seasons.
- 2- Accessible Roof: The topping of Leyco Tile is made of high strength polymeric concrete laminated to extrude polystyrene foam which accepts a load of 6000 kg/m<sup>2</sup>. You can use your roof as before.
- 3- Light weight of Leyco Tiles to avoid extra loads on the buildings' roofs.
- 4- Fast and easy application and replacement.
- 5- Annual maintenance is not required, unlike the conventional Concrete tiles.
- 6- The use of Mastics or any sealants for joints between tiles is not required.
- 7- Small and appropriate size of Leyco Tile (30x30) cm.
- 8- Leyco Tile protects against UV-radiation which shortens the life time of other roofing materials.
- 9- Drainage channels in Leyco Tile allow quick drying and aeration.

## How to apply Leyco Tile roofing system:

- a- It is important to adjust the sloping of the roof to properly discharge rain water.
- b- Apply **Leyco Tekt 1** as primer and let dry. This material fills the concrete pores and acts as a bonding agent between the concrete and the layer to be applied next.
- c- Apply a layer of **Leyco Plast**, a liquid, cold applied material with the following specifications:

- High elongation and flexibility (up to 900 %).
- High density liquid applied by using a roller, brush or by spraying.
- Resistant to flames and extremely high / low temperature.
- After drying, it forms a concrete crack bridging and non-aging membrane.

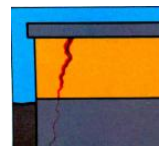


- d- The Leyco Plast layer should be completely covered with **Leyco Fiber Mesh** (as reinforcement).
- e- Apply again another layer of **Leyco Plast** and let dry.
- f- Loosely place Leyco Tiles all over the roof area, one by one, tile by tile next to each other and the work is done.



## The Leyco Tile roofing system gives additional advantages; such as:

- 1- Energy saving: Cool rooms do not need extra air-conditioning or heating systems and hence, using the Leyco Tile roofing saves your money.
- 2- Easy replacement or removal of Leyco Tile if the roof is changed for any reason or building renovation is required. Tiles are just removed and replaced later.
- 3- No special skill for application is required.
- 4- Leyco Tile is fire and flame resistant.





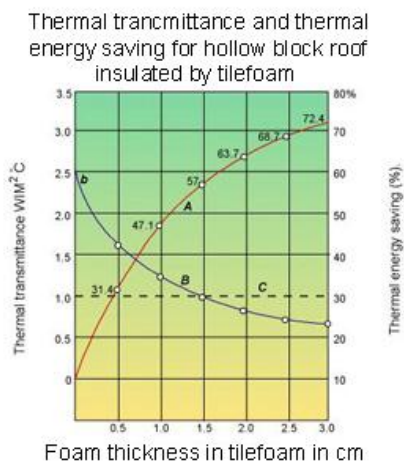
Roof Water Outlet



Fast and easy application of Leyco Tile

The Leyco Tile roofing system can be easily used to repair an existing roof without removing the heavy old concrete tiles. These tiles are normally joined by Mastics, exposed to high temperatures during the day, and low temperatures at night, these extreme temperature cycles soon cause Mastic joints to deteriorate resulting in roof leakage. To repair existing roofs using Leyco Tile system, just clean carefully the surface and follow the same method of application mentioned above and when you finally place the Leyco Tile all over the roof area, you will forget about roofing problems forever!

The diagram below, illustrates the percentage of thermal energy saving (%) and the thermal transmittance ( $c^{\circ}$ ) at different thicknesses of Polystyrene layer in Leyco Tile



- A: Thermal energy saving.
- B: Thermal transmittance.
- C: Max thermal transmittance according to the code.
- b: Thermal transmittance for non-insulated roof.

Thickness of Foam Layer	Energy Saving
1 cm	47.1 %
1.5 cm	57.0 %
2 cm	63.7 %
2.5 cm	68.7 %
3 cm	72.4 %

## Technical Specification

Dimensions:	30 x 30 cm
Foam Layer Material:	Extruded Polystyrene Foam
Thickness of Foam Layer:	3 – 5 cm
Coefficient of Thermal Conductivity of Foam Layer:	0.032 W/mK
Water Absorption by Submersion:	Negligible
Fire Classification (DIN 4102).	B 1 (self-distinguishing)
Surface Layer:	Polymer Cement Concrete
Thickness of Surface Layer:	1 cm
Compressive Strength (ASTM C42) of Surface Layer:	400 – 600 kg/cm <sup>2</sup>
Surface Texture:	Plain
Color of Surface:	Grey

## Reference List of some projects where Leyco-Tile was used:

- Al Ataba Al Husseiniya /Karbala – Iraq
- State Company for Electrical Industries /Ministry of Industry and Minerals / Baghdad-Iraq
- Private Housing Projects – Baghdad, Erbil, Karbala – Iraq
- The German Embassy / Egypt
- The American Embassy / Egypt
- Cairo University- Faculty of Pharmacy & Faculty of Engineering / Egypt
- Greater Cairo Waste Water Project / Egypt
- Artificial Kidney Centre / Egypt

## Application Photos



Applying a second layer of Leyco Plast over the Leyco Mesh

تطبيق طبقة ثانية من اللايكو بلاست - فوق طبقة اللايكو ميش



Surface is ready for the Leyco Tiles

السطح جاهز لتطبيق بلاطات اللايكو



Leyco Tile Roofing System – The Energy Saver

نظام اللايكو تايل للتسطيح – الحل الامثل لتوفير الطاقة



Placing the Leyco Tiles – Easy & Fast application

تطبيق بلاطات اللايكو – سهولة وسرعة في التنفيذ

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