



PROTHERM LIGHT®

plaster for the **passive fire protection**
of structures



PROTHERM^{light}®

Fireproofing Division

APPLICATION MANUAL . PROTHERM LIGHT®

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APPLICATION MANUAL . PROTHERM LIGHT®

The realization of a manual is a complex operation that needs of several controls on the text, images and sketches that compose it. Experience suggests that it is impossible to publish a manual totally exempt from errors. We will be therefore thankful to the users of the present manual if, finding some mistakes, wanted to signal them to us.

All the instructions contained in this manual are approximated and not binding in a general sense. It should also be specified that our instructions are not irrespective of all due precautions and good practice during installation referable to so-called "workmanlike" execution, which must always and under any circumstances be adopted in addition to following the detailed instructions given in our technical data sheets. All the indications provided in this manual of use are purely approximate and not binding for legal purpose. The data listed has been gathered from laboratory tests and it hence follows that in practical applications on building sites the final characteristics of the products may be subject to substantial variations depending on the meteorological conditions and the installation. The user must always check suitability of the product for its specific use, undertaking all liability implicit in and deriving from use of the product, as well as comply with all methods and instructions for use generally referable to "workmanlike" execution. Edilteco S.p.A. reserves the right to change the contents of this manual of use on its final judgements. Publish and, totally or partially, spread the contents of this Manual without previous license of Edilteco S.p.A., is forbidden.

PROTHERM LIGHT®

what PROTHERM light® is

PROTHERM light® range provides to fireproofing professionals effective tools for the fire protection of buildings, that can be used for infrastructures like airports, hospitals, schools, tunnels and petrochemical plants.

PROTHERM light® range is the result of a constant technological development, aimed at save human lives and protect the building's heritage.



PROTHERM light®
A complete range of plasters for fire protection.

TECHNICAL DATA

- Lightweight premixed thermal insulating plaster based on virgin EPS beads, water bindings and special additives for mechanical application.
- Available colours: grey and white.
- Fireproofing protective system, specifically designed to improve the passive fire resistance of structural elements made of steel, brick, normal and pre-stressed reinforced concrete and on buildings for civil and industrial uses both internally and externally.
- For indoor and outdoor use.
- It does not contain fibres.



UPDATED
according to the
EUROPEAN
REGULATION
ENV 13381

SYSTEM

The insulating plaster called **Protherm Light®** is a fire protecting system used for fireproofing of structural components in steel, masonry, reinforced and prestressed concrete. The special type of chemical composition of its formulation and its proprietary technology to produce this material, make this product brand new respect to any other fire protecting system available on the market. The use of special lightweight elements (such as such virgin expanded polystyrene beads) instead of more traditional inorganic inert materials (such as perlite or vermiculite, for example) normally used to produced fireproofing plasters, is not only a courageous and innovative choice in the field of fire protecting coatings, but it also does not jeopardize the individual characteristics of a material, as one may realize from their excellent reaction and fire resistance features.

PRODUCTION

Protherm Light® is produced according to certified management systems in compliance with the ISO 9001. Protherm Light® is supplied in 18 kg bags (60 litres of volume yield), stacked on 48 packet pallet. In view of its physic characteristics, each Protherm Light® bag shall be completely used; it is not possible to use the content of one single bag in two different moments, even if near in time. This product may not be ensiled. Each bag of Protherm Light® yields about 6 m² of applied product for a 10 mm operation thickness (2,6 - 2,7 kg/m² per 1 cm of thickness).



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APPLICATION

The plaster Protherm Light® has several certifications in accordance with EN 13381, according to the structural elements to be protected. The laying surfaces, on which to apply the product, must be in compliance with what is mentioned in the assessment of the tests.

1.) HOW TO PREPARE THE SURFACES TO BE TREATED

The perfect cleaning of the support on which Protherm Light® is meant to be applied is fundamental. The surface on which to apply the plaster must be free from pollutants or other particles, that could prevent the direct contact or affect the adhesion between the product to be applied and its support. In particular, the support must be without dust, oil residues, grease, release agent traces, brittle and/or non cohesive materials, old plasters not perfectly healthful and/or old paint cycles.

In case of doubt please contact the *Edilteco Technical Department*.

As for compliance with these instructions, is full responsibility of the user to assess and guarantee that the conditions of the support to be treated are suitable for application of the protective coating executed with Protherm Light®.

Application on concrete, reinforced concrete or masonry: clean the support to be protected; in case of surfaces with previous plastering, it is recommended to proceed with a pressure water wash or strong mechanical brushing, followed by a perfect cleaning of the support, in order to eliminate all the layer of incoherent material completely.

Application on steel: Protherm Light® is perfectly adherent to steel, including hot galvanized or treated with inorganic zinc-based paints surfaces. The support must be clean. In case of surfaces with old plaster layers, please proceed with a pressure water wash or a strong mechanical brushing, followed by a perfect cleaning of the support, in order to eliminate the existing paint completely.

Important: if the metal surfaces to be treated are very heated by solar radiation or other causes, before proceeding with the application of Protherm Light®, they should be cooled by sprinkling them with clean water (and then dried) or it will be necessary to wait their natural cooling.

2.) APPLICATION

The insulating plaster Protherm Light®, on supports in cement conglomerate and on steel surfaces, can be done in one or more takes, according to the total required thickness. **In particular:**

- a. For thickness values up to 20 mm:** you can proceed in one coat, until the required thickness is obtained.
- b. For thickness values greater than 20 mm:** you can proceed in more coats, applying maximum product thicknesses not exceeding 20 mm. The first Protherm Light® coat shall uniformly cover the whole surfaces in order to guarantee the perfect adhesion to the support and to provide an homogeneous base for an eventual subsequent coat. The following product coat shall be applied within 24 hours, while allowing at least 4 hours interval between two coats.

After the cleaning and the preparation of the surface to be treated, as in compliance with point 1, apply Protherm Light®, paying attention that the temperature of the environment is between +5 °C and +35 °C.

Please note: during the exchange phase of each pallet, do a check of the amount of water of the mixture.

APPLICATION

3) APPLICATION METHOD

To apply Protherm Light® layer, it is possible to use the plastering machines 220 V or 380 V, **PFT (G4-G5)** type - pict. 1 -, or **IMER (Koine 3 - 220 V)** type - pict. 2 - and similar ones. The machines must have a loping or vertical material loading from the hopper to the mixing chamber, and a load propeller with full blade, in order to guarantee in the dry load phase, the entering of Protherm Light® plaster in the mixing chamber without risks of risks of separation between polystyrene beads and binders.



The plastering machine shall be fitted with some accessories, that are normally supplied by their manufactures, for the use of insulating plasters.

In particular the following items are essential:

- a. Helicoidal mixer for insulating plasters (solid screw - pict. 3 -).
- b. A receiver (stator) for insulating material (minimum capacity 30 litres - pict. 4 -).
- c. Long pitch screw (rotor) (model D8/1,5 super screw conveyor - pict. 4 -).
- d. Plug (or nozzle) diameter 14 mm (- pict. 5 -). It is possible to reduce the diameter of the nozzle up to 10 mm.
- e. A ball valve to be fitted on the lance (- pict. 6 -). The valve shall be immediately closed after interruption of the air flow to keep the hose pressurized and preventing clogging of the nozzle when the work is started again.
- f. Turbo maxi or mini turbo: the use is mandatory to eliminate air gaps during in the spraying phase; it speeds up, improves and facilitates the application (- pict. 7 -). The use of the turbo requires the insertion of a long pitch screw (- pict. 8 -).
- g. Flowmeter: the use of a flowmeter at low calibration (from 0 to 315 L/hour) is recommended.
- h. Water pipe insertion in the lower connection of the mixing chamber.



APPLICATION

Some precautions must be adopted to have a smoother use of the plastering machine. These precautions reduce the margins of error of the applicator during the application of the plaster Protherm Light®.

The most important precautions are listed below:

1. The following checks shall be made to guarantee full efficiency of the equipment: after each break (of more than 30 minutes and anyway in function of external temperatures) clean the delivery tube of the material and of the mixing chamber. After each work shift, clean the mixing chamber.
2. It is recommended the use of lifting the edges of the loading hopper, to enable more product in the hopper and minimize the risk of emptying the machine completely (which would cause laying of inconsistent plaster).
3. The air hose shall be inserted in the spraying lance with its nozzle at 1 cm away from the plug, in order to avoid the formation of occlusions due to separation phase between the polystyrene beads and the binders.
4. Always keep a box near the spraying lance to collect the material coming out the plug after the air flow is stopped. After each application break, don't leave the lance in the box, with the tube filled with material without spraying air. This precaution is necessary to prevent the mixed material from returning into the air hose.
5. It is possible to use a "turbo" or "miniturbo" with a proper screw and pin.
6. We recommend using a pressure ranging between 4 and 5 atmospheres is for air supply.
7. Feed water supply shall be adjusted for flow rates ranging between 150 and 200 L/hour (approximately 10 litres of water for each product bag).
8. For the right application on metal structures, it is recommended the use of a screw-stator of 12 L/min. and flowmeter with low flow rate (from 0 to 315 L/hour) and nozzle (cap) of 10 mm.
9. The use of tubes with different sections (diameters) may cause problems in product flow and homogeneity. The delivery pipe of the product should be, possibly, in one single piece; any joints shall guarantee the same inside diameter. The maximum length of segment machine-lance must not be longer than 25 ml.
10. The material shall be applied while keeping the plaster sprayer lance perpendicular to the surface to be coated and at a distance of at least 30/40 cm from the support (- pict. 9 and 10 -).



pict.9



pict.10

PROBLEMS, FALSE PROBLEMS AND SOLUTIONS

During application of Protherm Light® some problems may arise in various situations of non conformity. The following table shows the main problems and the related technical solutions.

PROBLEM	SOLUTION
Application of a single layer (up to 20 mm): cracking after the application:	It occurs especially when the thickness of the laid layer is excessive; or in case of absorbent surfaces not moisten before the application of Protherm Light®.
Application of more layers (over 20 mm): cracking of the 1 st layer after the application:	The problem will disappear with the application of the following layers and it won't have any impact on the good result of the test.
Cracking of the layer corresponding to joints / casting:	In case of several coats: the problem will disappear with the application of the following layers and it won't have any impact on the good result of the test. In case of application of a single layer: do not create concrete castings and lay.
Lack of adherence to the surface and detachment of the plaster layer just applied (it occurs when the laying time is not respected):	It is necessary to respect the laying time as mentioned in point 2: wait for at least 4 hours between the coats, but not wait for more than 24 hours.
Lack of cohesion in the layer of plaster during the application, and instant detachment from the surface (it occurs when the amount of water used is not proportional to the amount of plaster during the application):	It is necessary to reduce the amount of water during the spraying phase (the water flow rate must be set at 150 / 200 L/hour).
Lack of cohesion among the following layers of laid plaster:	It occurs because of an excessive work on the surface of the last layer during the application.

CHECKS AND COMPLIANCE OF THE APPLICATION

The check of the application must start with the design specification, i.e. the thickness of protection covering indicated in the report of pre-dimensioning and the compliance certifications written by the Fireproofing Technical Advisor. For each element that must be protected, several thickness will be indicated according to the fire resistance class required.

The control method of the application is regulated by UNI 10898-3 "Fire Protection Systems - Methods of application control, part 3: sprayed systems".

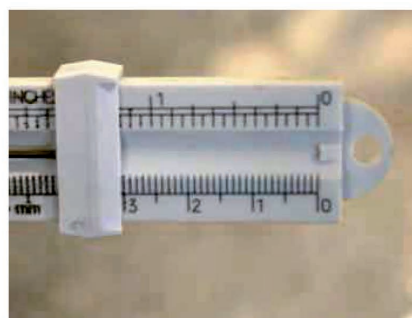
Once selected the measurement areas, it is possible to measure the thickness on the laid dry plaster, using a probe [- pict. 11, 12, 13 -] which goes under the plaster and mark on the graded scale the thickness of covering to lay. In the absence of this specific tool, it is possible to use a workshop gauge.



pict.11



pict.12



pict.13

NB: all the recommendations contained in this manual are indicative and non-binding. However, it is important to specify that our recommendations don't exclude any, prior or in progress, expedient due to the so-called Good Engineering Practice, which must always follow by the executors, as well as the instructions written on our technical data sheets.

Our *Technical Department* is available for any further information and clarification.

FOR ANY DOUBT OR REQUEST CONCERNING THE USE AND THE APPLICATION OF PROTHERM LIGHT[®], PLEASE CONTACT EDILTECO TECHNICAL DEPARTMENT.

CLEANING AND MAINTENANCE OF FAÇADES OR PARTITIONS PROCESSED BY THE PLASTER PROTHERM LIGHT[®]

The features of the based-on cement hydraulic binder and virgin EPS plaster Protherm Light[®], make it poorly absorbent, enabling the washing of its surface, with a low-pressure washer, without affecting the stability and the adhesion to the support.

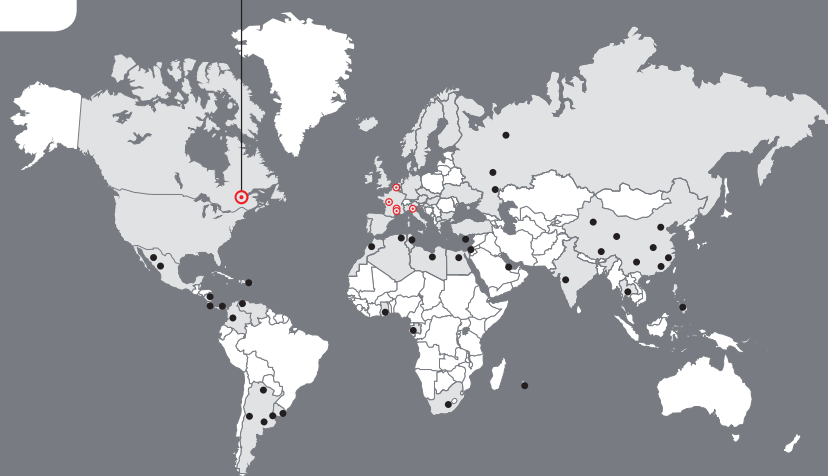
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360° Insulation

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