

PROTHERM LIGHT[®]

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



THE MOST
VERSATILE
AND
CERTIFICATED



PROTHERMlight

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
EN 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 40 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).

Application

Protherm Light® plaster has several certifications in accordance with EN 13381, which vary according to the structural elements to be protected. The laying surfaces must be suitable and conform to what mentioned in the assessment tests.

1) HOW TO PREPARE THE SURFACES TO BE TREATED

Perfect cleaning of the base on which Protherm Light® is to be applied is basic.

The surface to be coated with this plaster shall be free from pollutants or other particulate matter preventing direct contact or inhibiting adhesion/bond between the product to be applied and its base.

In particular, the base shall be without dust, oil residues, grease, stripper traces, brittle and/or non cohesive materials, old not perfectly sound plasters and/or old non cohesive or water repellent paint cycles.

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

As for compliance with these instructions, the user shall 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 old plaster, it is suggested to make a pressure hydrowashing or a strong mechanical brushing, followed by a perfect cleaning of the support, to eliminate completely all the layer of incoherent material. It is recommended to execute a precise washing of support eliminating all traces of incoherent materials.

Application on steel: Protherm Light® is perfectly adherent to steel and more generally to all metal surfaces, including those hot galvanized or treated with inorganic zinc based paints. The surface to be coated shall be protected by an anticorrosive paint cycle to withstand weathering agents as well as chemical or physical attacks. There are no special contraindications as to the compatibility between the paint and the plaster to be applied.

Clean the support to be protected; in case of surfaces with old plaster, it is suggested to make a pressure hydrowashing or a strong mechanical brushing, followed by a perfect cleaning of the support, to eliminate completely all the layer of incoherent material. After sand blasting or strong mechanical brushing, it is recommended the use of an anticorrosive base, for the choice of which don't subsist technical qualitative limitations.

2) APPLICATION

The insulating plaster Protherm Light®, may be applied on steel or concrete bases in one or more steps according to the total required thickness. **In particular:**

- a. For thickness values up to 20 mm:** one plaster coat may be applied, wet on wet, until the required thickness is obtained.
- b. For thickness values greater than 20 mm:** wet on wet application of more product coats is recommended, each coat having a maximum thickness not exceeding 20 mm. The first Protherm Light® coat shall uniformly cover the whole surfaces as to guarantee perfect adhesion to the base and to provide an homogeneous base for the next coat. The second product coat shall be applied within 24 hours, while allowing at least hours interval between two subsequent coats (4 hours).

Apply Protherm Light® after having cleaned and prepared the surfaces to be treated, in compliance with the instructions of item 1, while checking that the ambient temperature ranges between +5 °C and +35 °C.

NB: Check the amount of water for the mixture, during the pallet change.

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 type. The machines must have a (sloping or vertical) material loading from the hopper to the mixing chamber, and a helicar mixer with double blade , in order to guarantee the introduction of Protherm Light® in the mixing chamber to avoid risks of detachment between the polystyrene beads and binder.



pict.1



pict.2

The plastering machine shall be fitted with some accessories normally supplied by their manufactures for 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 cock to be fitted on the lance (- pict. 6 -). The cock shall be immediately closed after interruption of the air flow to keep the hose pressurized and prevent clogging of the nozzle when the work is started again.
- f. Maxi turbo (optional): using the turbo, eliminates air pockets in the spraying phase, makes faster, improves and makes application easier (- pict. 7 -). The turbo use requires the introduction of a long-pitched screw with pivot (- pict. 8 -).
- g. Flow-meter: it is recommended the use of a flow-meter at low calibration (from 0 to 315 L/hour).
- h. Water pipe insertion in the lower connection of the mixing chamber.



pict.3



pict.4



pict.5



pict.6



pict.7



pict.8

Application

Some precautions shall be adopted for a smoother use of the plastering machine and, thus to reduce the applicator's error margin during the application of Protherm Light® plaster.

The most important precautions are listed below:

1. The following checks shall be made to guarantee full efficiency of the equipment: after each break (lasting more than 30 minutes) clean the water filters and wash the plaster feed tube and the mixing chamber, after each work shift clean the mixing chamber.
2. We recommend to raise the feed hopper edges to allow for better loading of the hopper and minimize the risk of emptying the machine completely (which would cause plaster without consistency).
3. The air hose shall be inserted in the spraying lance so that its nozzle will be 1 cm away from the plug, to prevent clogging due to phase separation between the polystyrene beads and the binders.
4. Always keep a container near the spraying lance to collect any material leaving the plug after the air flow is stopped. After each application break, don't leave the lance in the container, 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" with a proper screw and pin.
6. We recommend to use 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 litres/hour (corresponding to 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 12L/min and flow-meter with low flow rate (from 0 to 315 L/hour) and nozzle (cap) of 10 mm.
9. The use of tubes/hoses with different sections (diameters) may cause problems in product flow and homogeneity. The product supply tube 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 greater than 25 ml.

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, that is to say with 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 to 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".

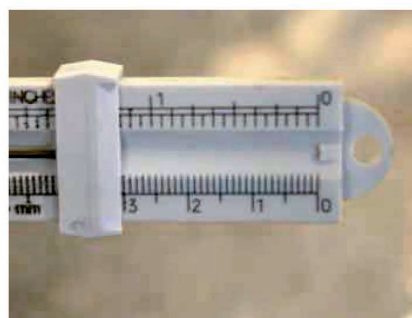
Once selected the measurement areas, it is possible to measure the thickness on the laid dry plaster, using a probe (- pict. 11, 12, 13 -) which goes under the plaster and mark on the graded scale the thickness of covering to lay. In the absence of this specific tool, it is possible to use a workshop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



pict.11



pict.12



pict.13

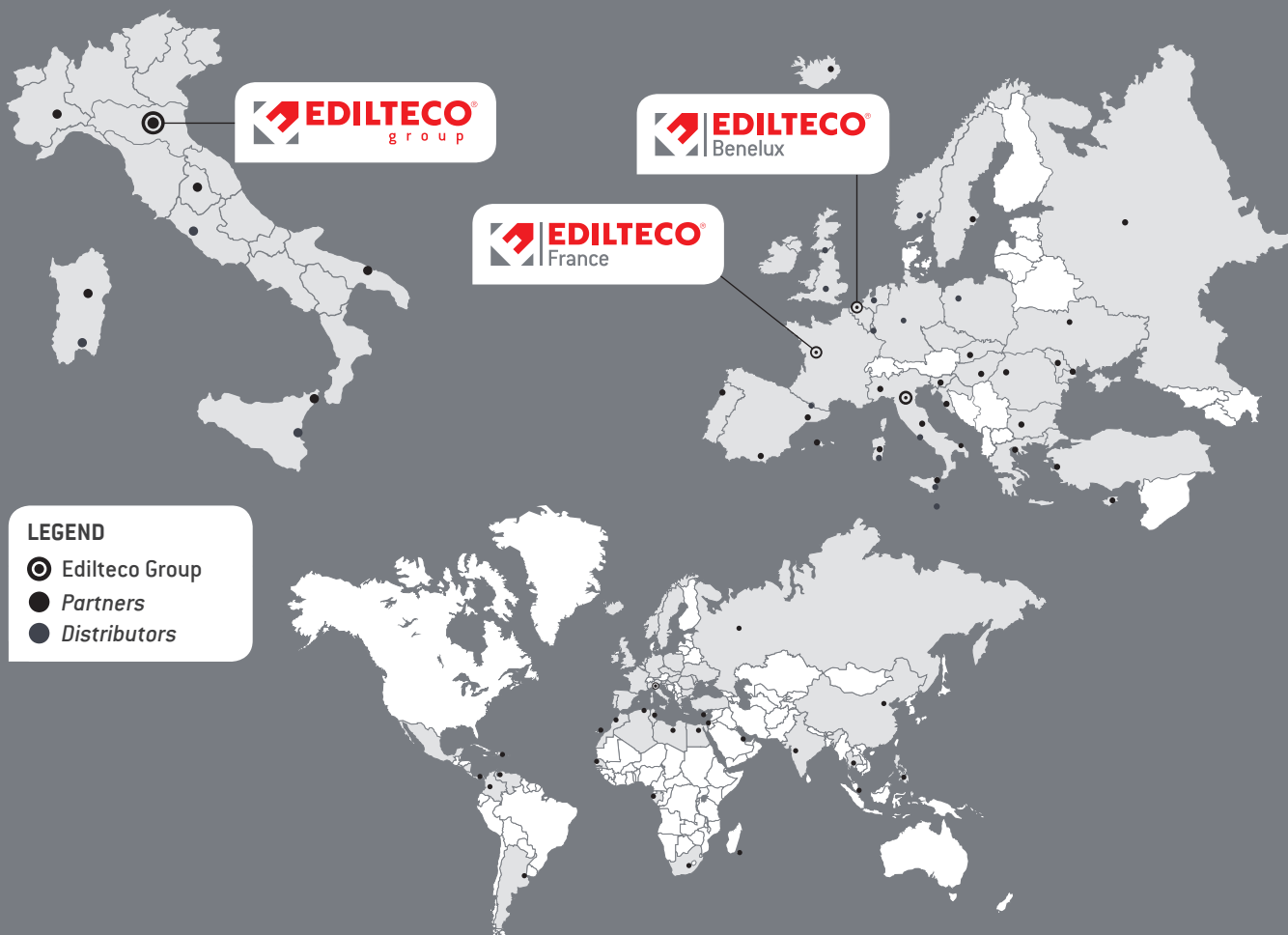
N.B: all the recommendations contained in this manual are indicative and non-binding. However, it is important to specify that our recommendations don't exclude any, prior or in progress, expedient due to the so-called Good Engineering Practice, which must always follow by the executors, as well as the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

EDILTECO, AN INTERNATIONAL SUCCESS

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▶ Consult our technical and application videos on the Edilteco YouTube Channel . www.youtube.com/user/EDILTECOvideo



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