

# PERLIFOC

Fireproofing Mortar for Structures, Ceilings and Wall Systems



**PERLITA**  
Y VERMICULITA

*PERLIFOC APPLICATION GUIDELINES*

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## APPLICATION GUIDELINES PERLIFOC

All values and guidelines included in this document are approximate and non-binding in general terms. The user must consider that these instructions rely on the cautions and good practices that must always be observed during the application process, under any circumstance. These instructions rely as well on the compliance with the instructions detailed in our Product Data Sheets (PDS). The performance data included herein comes from laboratory tests, and therefore, in real application conditions, the final product performance may change significantly depending on the weather and application conditions. The user must always verify the product suitability for each specific use, and follow all guidelines and instructions for the use of the product. The user shall be held fully and solely responsible for any implied liability resulting from the use of the product. Perlita y Vermiculita, S.L.U. reserves the right to change the content of this document. The partial or total publication of these instructions is strictly prohibited without Perlita y Vermiculita, S.L.U. previous consent.

### TECHNICAL DATA

PERLIFOC is a fireproofing and gypsum-based mortar with thermal insulating properties for passive fire protection.

PERLIFOC is made out of expanded and light mineral rocks (perlite and vermiculite). It contains hydraulic binders, setting retarders, additives to improve spraying, and it is asbestos free.

The manufacturing process of PERLIFOC complies with ISO 9001, and ISO 14001 standards. It is packaged in bags of 20 kg, and supplied in pallets of 54 bags (1080 kg). Due to its physical features, once a PERLIFOC bag is opened, it has to be used entirely in that moment; it cannot be closed, stored, and used afterwards, not even for short periods. The theoretical coverage rate of PERLIFOC is  $8.5 \text{ kg/m}^2$  at 1 cm.



### APPLICATION

PERLIFOC is a mortar with CE-marking for different uses, including the performance over structures and walls, and also over air conditioning ducts. Apart from those CE-markings, it has proven its fire and sound protection capacities in homologate independent laboratory tests.

#### 1) Surface Preparation

PERLIFOC must be applied only on thoroughly clean surfaces.

Surfaces must be free of any contaminant agent or any particle interfering with the adhesion of the product. The substrate must be free of dust, wastes of oil, grease, paint remover leftovers, fragile and/or unsticking materials, old plaster layers, and old paint or water-repellent layers. When the adherence of the substrate cannot be guaranteed, a mesh or an adhesion promoter can be used to ensure a correct application.

**Application over concrete and/or reinforced concrete:** Clean the substrate. In case there is a previous plaster layer, it is recommended a pressure washing using high-pressure water equipment, or a mechanical brush.

In certain conditions it is recommended the use of a metal mesh and/or an adhesion promoter. Contact Perlita y Vermiculita, S.L.U. Technical Service for further specific information.

**Application over steel:** PERLIFOC's adherence to this substrate is excellent, and in general to all the metal surfaces always they are perfectly clean; therefore, before applying the product clean the substrate thoroughly. Remove any dust or rust from the substrate. In case there is a previous plaster layer, it is recommended a pressure washing using high-pressure water equipment, or a mechanical brush, after this, to achieve a perfectly clean result, sandblast the surface or treat it with a similar process. For beams and pillars more than 500 mm wide, the use of a mesh attached to the webs is recommended. Moreover, the use of a mesh is also recommended when the application is necessary only on one side of the profile, on square or circular sections that are subjected to significant deformation.

**Application over galvanized steel (profiled steel deck):** PERLIFOC's adherence to this substrate is excellent, and it does not require any adhesion promoter. The substrate must be free of dust, wastes of oil, grease, paint remover leftovers, fragile and/or unsticking materials, old degraded plaster layers, and old paint or water-repellent layers. When the adherence of the substrate cannot be guaranteed, a mesh or an adhesion promoter can be used to ensure a correct application.

**Application over wood beams and pillars:** before applying the product, clean the substrate thoroughly removing all dust or rust from the substrate. In case there is a previous plaster layer, it is recommended a pressure washing using high-pressure water equipment, or a mechanical brush. A thoroughly cleaning of the surface is recommended to remove any other leftover, waste, or remain of old materials. Since wood is a porous and water-absorbing material, before applying PERLIFOC, it is necessary attaching a nervometal mesh to ensure a correct adherence and avoid cracking.

## Application Guidelines

**Application over ventilation ducts (galvanized deck):** before applying the product, clean the substrate thoroughly removing all dust or/and rust. In case there is a previous plaster layer, it is recommended a pressure washing using high-pressure water equipment, or a mechanical brush. Before applying PERLIFOC, it is required attaching a nervometal mesh along the entire perimeter of the conductor.

**Application over other porous and/or absorbent substrates (ceramics, etc...):** before applying the product, clean the substrate thoroughly removing all dust and/or rust. In case there is a previous plaster layer, it is recommended a pressure washing using high-pressure water equipment, or a mechanical brush. Before applying PERLIFOC, it is recommended spraying water over the surface.

In some cases it is recommended the use of a mesh or an adhesion promoter to ensure a correct adhesion to the substrate. For further specific information about this, and in case of doubts regarding the preparation of the surface, contact Perlita y Vermiculita, S.L.U. Technical Service.

Concerning the compliance with these guidelines, the user will be responsible for the evaluation of the substrate, and for gathering the required conditions for the correct application of PERLIFOC mortar.

## 2) Application Procedure

Depending on the total required thickness, PERLIFOC mortar can be applied in one or two coats over the different types of substrate. **Consider the following guidelines:**

**a. For thickness levels up to 30 mm:** a single mortar coat can be applied until reaching the required thickness level.

**b. For thickness levels over 30 mm:** recoating works using PERLIFOC requires that the previous coat must still be wet, the second coat must be applied during the next 24 hours, and waiting a minimum interval of 3-4 hours (the same time intervals should be respected for added layers). Any coat can be more than 30 mm thick. The first coat must provide a uniform layer covering the entire surface, it must be perfectly attached to the substrate, and it has to be applied providing a homogeneous profile for the next coat. The recoat approximate time must be set considering the ambient conditions (temperature, humidity, wind...), and the operator's experience.

The user must apply PERLIFOC after cleaning and preparing the surfaces following the instructions in section 1 of this document. The ambient temperature must be between 3°C and 30°C.

**NOTE:** Verify frequently the amount of water for the mixture. The values of water supplied are described in the next section.

## 3) Application Equipment

PERLIFOC mortar can be applied using a mixer pump with continuous-speed motor (220 V, or 380 V) like PUTZMEISTER MP 25 (picture 1) or similar, or a mixer pump with variable-speed motor (220 V, or 380 V) like PUTZMEISTER S5 (picture 2). The pumps must include a loading area (inclined or vertical) from the hopper to the mixing chamber, and a helical mixer with double blade to ensure the entrance of the product in the mixing chamber and to obtain a homogeneous mixture.

## Application Guidelines



Picture 1 (mixer pump with continuous-speed motor)



Picture 2 (Mixer pump with variable-speed motor)

The manufacturer of the mortar mixing and spraying machine must provide the necessary spare parts for the required use.

### The following elements are required:

- a. **Helical mixer** for fireproofing mortars (picture 3)
- b. **Jacket (estator)** for fireproofing mortars (Picture 4)
- c. **Rotor** suitable for the jacket (picture 4)
- d. **Nozzle** with 12 mm diameter (picture 5). A nozzle with 10 mm diameter can also be used.
- e. **Ball valve** for the injection lance (picture 6). Keep the hose pressurized closing the ball valve right after the interruption of the air flow, this way the material does not get blocked at the nozzle every time the work restarts.
- f. **Maxi turbo (optional)**: while the equipment is spraying the mortar, the turbo eliminates the air blockages, speeds up the material flow, and improves the application of the product (picture 7). The use of a turbo requires a longer rotor with tang (picture 8).
- g. **The flowmeter**: it is recommended the use of a flowmeter calibrated at least from 0 up to 600 l/hour)



## Application Guidelines

Picture 3

Picture 4

Picture 5

Picture 6

Picture 7

Picture 8

Cautions must be taken into account to improve the use of the mortar pump and minimise the margin of error while PERLIFOC is being sprayed.

**These are the most important cautions to be considered:**

1. In order to ensure the total efficiency of the equipment, the user must check the following practices: if the equipment is going to be stopped for more than 30 minutes, clean the water filters, the hose, and the jacket. Clean also the hose and the jacket right after each use.
2. It is recommended lifting up the edges of the hopper to improve the loading of the mortar, and to minimise the risk to empty the mixer (this would reduce the mortar consistency).
3. To correct the consistency of the mortar before the application, and to collect the material coming out of the nozzle once the airflow has been turned off, keep always a container or a bucket next to the injection lance. After each application, do not leave the injection lance full of material without airflow in the bucket. This caution is necessary to prevent the mixed material from getting inside the air hose.
4. It is possible using a turbo with a compatible rotor to the projection machine.
5. The recommended airflow pressure must be between 4 and 5 atm (58.8 and 73.5 psi).
6. The water supply to be used in continuous mixers must be between 500 and 600 l/hour (this water amount equals approximately 10 l per bag when using a variable-speed mixer). The water flow could vary depending on the type of substrate, the ambient conditions, the distance with the substrate and the substrate height, and above all, on the operator's experience and practice.
7. For the application over metal structures it is recommended the use of a jacket with an output capacity of 12 l/min, and a 10 mm nozzle.
8. The use of pipes/hoses with different sections (internal diameters) may cause problems in the material flow and the product consistency. If possible, the hose must be undivided; if it includes joints, they must continue the same I.D. The hose from the pump to the injection lance cannot be more than 25 m long.

The mortar must be applied keeping the mortar injection lance at right angles to the surface and at 30 to 40 cm from it (picture 9)



Picture 9 (mortar spraying application)



## Application Guidelines

### FAILURES AND POSSIBLE CAUSES

During the application of PERLIFOC some problems may arise under certain conditions that may result in non-conformity cases.

The following table shows the main possible failures and their causes.

FAILURES	POSSIBLE CAUSES
Application of a single coat (up to 30 mm): cracking after application	PERLIFOC has been applied with an excessive thickness, or it has been applied over absorbent surfaces that have not been previously wetted
Recoating (final thickness superior to 30 mm): cracking in the first layer after application	The cause of this failure is the same as the previous one, and it can be repaired with the application of the following coats. The reparation will have no effect on the final performance of the product
Interference with the adherence and detachment of recoating layer from the previous coat.	The specified curing times in section number 2 of this document has not been respected: recoating works must be carried out 24 hours after the application of the first coat, but it is necessary waiting a minimum interval of 3 to 4 hours before recoating.
Interferences with the adherence of the product arise during the application, and the mortar coat gets detached from the surface right after application	The water proportion is incorrect. The user must comply with the guidelines concerning the amount of water, though it is necessary considering the operator's practice and the ambient conditions.
Adherence failure between the coats	The previous coat has been applied with an excessive thickness

Contact Perlita y Vermiculita, S.L.U. Technical Service to find the best solution to each failure that may arise when applying PERLIFOC mortar.

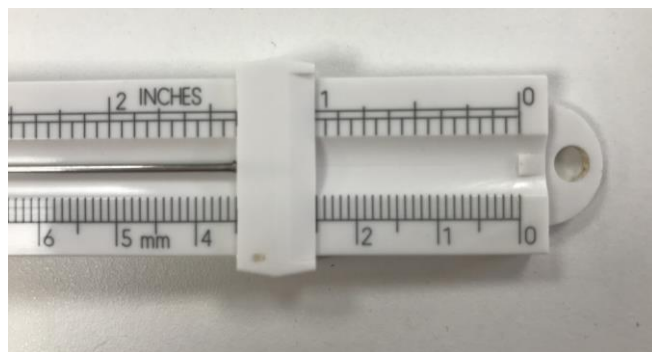
### MEASUREMENTS AND APPLICATION COMPLIANCE

Monitoring the application starts with the product selection. This implies that, in order to control the application, the user must verify the thickness level of the protection coat, based on the project requirements, and on the results of the product tests. A specific thickness level will be specified and it will vary depending on the element and surface to be coated, and on the required fire-resistance rating.

Once the measuring areas have been selected, it is possible to measure the applied mortar dry thickness using a gauge (pictures 10 and 11) that penetrates in the mortar and marks the thickness in a graded scale. A caliper can also be used for the same purpose.



Picture 10 (thickness measure gauge)



Picture 11 (thickness measuring example: 25 mm)

**Note:** The recommendations included in this document are not binding. However, our recommendations are not exclusive to any practice that the operator may consider necessary from his experience and good practice, or to the specifications set in our Product Data Sheets.

For further information and queries, contact Perlita y Vermiculita, S.L.U. Technical Service