

SELECTION & SPECIFICATION DATA

Generic Type	Medium density gypsum and EPS based fire resistant mortar with thermal insulation properties for passive fire protection.
Description	Fireproof and ecological mortar for the passive fire protection of steel, concrete, composite concrete-steel sheet slab structural elements, fire compartmentation and fire stop partitions. Fire resistance of up to 4 hours depending on the construction system.
Features	<ul style="list-style-type: none"> • CE Marked & ETA 20/0894 • High performance filler-based formula • Non-combustible • Best thermal conductivity amongst spray-applied gypsum-based mortars • Asbestos free – Complies with regulations 2003/18/EC and RD 396/2006 • Good adhesion on a variety of substrates • Better efficiency of the consumables in spray equipment due to less abrasive nature of the mortar • Best-in-class loadings for fire ratings up to 4 hours <p>Environmental Certifications EPD - Environmental Product Declaration Cradle to Cradle (C2C) Certification VOC content and emission (EN 16516) LEED Compliance (VOC Emission)</p>
Color	Antique white
Finish	Textured Can be troweled
Primer	<p>PERLIFOC HP Eco+ can be applied directly on bare steel and on primed steel. The ETA document highlights compatibility of Berlin with a wide range of primers. For application on galvanised steel, concrete and masonry surface no priming or bond sealer is required.</p> <p>Contact Carboline Technical Service for further information. PERLIFOC HP Eco+ does not promote or prevent corrosion.</p>
Application Thickness	30 mm maximum thickness per coat
Theoretical Coverage Rates	<p>3.5 ± 15% Kg/m²/cm (DISCONTINUOUS machine)¹ 4.1 ± 15% Kg/m²/cm (CONTINUOUS machine)²</p> <p>¹ Average value obtained under laboratory conditions, with a mixing speed of 60 rpm for 90 seconds. If any of these parameters are changed, both the final density and the performance could vary. Lower density at higher speed, and higher density with a shorter mixing time. ² Average value obtained under laboratory conditions.</p>
Limitations	It is not designed for exterior exposure beyond the normal construction phases and timescales. It must not be exposed to the rain or running or pond water. It is not recommended as a refractory mortar or where continuous operating temperatures exceed 90°C.
Topcoats	Generally not necessary. In highly corrosive atmospheres, consult Carboline Technical Service for the selection of the most appropriate coating for the work environment.

SUBSTRATES & SURFACE PREPARATION

General	Before application, the substrates must be clean and free of loose particles, dirt, oil, grease, condensation or any other substance that may affect the adhesion. Contact Carboline Technical Service for further information.
Galvanized Steel	PERLIFOC HP Eco+ can be directly applied to galvanised steel without the need for priming or an adhesion promoter. Ensure that the substrate is clean, free of loose particles, dirt, grease, condensation or salts that could affect the adhesion. Contact the Carboline Technical Service for further information.
Concrete	PERLIFOC HP Eco+ can be directly applied to concrete without the need for priming or an adhesion promoter. Ensure that the substrate is clean, free of loose particles, decorative paints, dirt, grease or condensation that could affect the adhesion. If there are doubts about the condition of the substrate or it has an old coating, the use of a metal mesh prior to the application of the mortar is recommended. Contact the Carboline Technical Service for further information.
Painted/Primed Structural Steel	If the steel structure is not primed, it must be cleaned using an abrasive material to an Sa 2 ½ grade of cleanliness, in accordance with ISO 8501 or equivalent. If it is primed, this must be clean, free of loose particles, dirt, grease or condensation that could affect the adhesion. Furthermore, it must be ensured that the existing primer is compatible with the PERLIFOC HP Eco+ mortar, in accordance with the CE marking. Mesh is not required as per testing standards, however, its use is recommended on beam flanges wider than 500 mm, on columns with only one sprayed face and profiles subject to high deformations. Contact Carboline Technical Service for further information.

PERFORMANCE DATA

All test data was generated under laboratory conditions. Field testing results may vary.

Test Method	Results
Adhesion	> 0.1 MPa (In accordance with EGOLF SM/5)
Asbestos	Does not contain asbestos
Flexural Strength	> 0.2 MPa
Hardened Density	> 480 ± 15% Kg/m ³ (BATCH-MIX machine) ¹⁾ 550 ± 15% Kg/m ³ (CONTINUOUS machine) ²⁾
Powder Density	350 ± 15% Kg/m ³
Reaction to Fire	A1 (In accordance with EN 13501-1)
Resistance to Compression	> 0.2 MPa
Sound Absorption	aw=0.2 (In accordance with UNE-EN-ISO 354 and 20 mm thickness) NRC=0.2 (In accordance with ASTM C423 and 20 mm thickness)
Thermal Conductivity	0.087 W/mK
Wet Density	890 ± 15% kg/m ³

MIXING & THINNING

Mixer	<ol style="list-style-type: none"> 1. BATCH-MIX. Use a gypsum mortar mixer or similar with a capacity of at least 100 litres and capable of rotating at 60 rpm with rubber-tipped blades that wipe the sides of the hopper. 2. CONTINUOUS. Contact Carboline Technical Service for recommendations. Densities may vary when using this type of mixing equipment.
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MIXING & THINNING

Mixing	Always mix with clean drinking water. The mixer should be kept clean and free of any previously mixed material which could cause premature setting of the product. A 2 bag mix with discontinuous machines is recommended. The mixing time should be approximately 1.5 minutes when mixing at 60 rpm. Use 15.3 ± 1.7 litres of water per 17 kg bag. First add water to the hopper with the blades stopped. With the mixer on, add mortar to the water and start to mix.
Density	To obtain information and recommendations on how to obtain adequate density and performance, contact Carboline Technical Service.
Working Time	1 hour at 20°C, the higher the temperature the shorter the usage time. These times are for guidance and can vary depending on the ambient humidity and air currents. The useful life of the material ends when it hardens and becomes unusable.

APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

Pump	This material may be pumped with a wide range of piston, rotor, stator and compressor pumps designed for pumping cement and plaster materials, including: PFT – model # ZP 3 L Multimix (Batch-mix) Putzmeister – model # S5EV (Batch-mix) Wall Goe – model # JP70-L. (Batch-mix) Putzmeister – model # MP25 (Continuous) PFT – model # G4 Smart (Continuous) Essick – model # FM9/FM5E (Continuous) Hy-Flex – model # HZ-30E (Continuous)
Ball Valves	Ball valves must be fitted on at least one end of the spray hose to facilitate cleaning.
Hose Length	Use a flexible spray hose of between 5 and 10 m in length and at least 25 mm inner diameter. Working pressure at least 30 bar.
Nozzle/Gun	From 10 to 16 mm depending on the desired finish.
Compressor	The pump compressor must be capable of maintaining a minimum of 2 bar (30 psi) and from 250 to 300 l/min at the nozzle.
Air Line	Use a line with an inner diameter of 16 mm. Hose with a minimum burst pressure of 7 bar (100 psi).
Spray Lance	Minimum length of 600 mm and minimum inner diameter of 25 mm. With material shut-off ball valve and air shut-off valve.

APPLICATION PROCEDURES

General	Thicknesses of 30 mm or less can be applied in one pass. When additional coats are required to reach the specified thickness, it is recommended to apply the subsequent coats once the previous coat has started to set. If the previous coat has set and is dry, wet the surface with water before applying additional coats. Contact Carboline Technical Service if further information is required.
Finishing	Normally the finish is a sprayed texture.

APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	3°C (37°F)	3°C (37°F)	3°C (37°F)	0%
Maximum	38°C (100°F)	52°C (126°F)	43°C (109°F)	90%

The air and ambient temperatures must be maintained 24 hours before, during and after the application. Gypsum-based mortars are sensitive to water and therefore must be adequately protected. For additional recommendations, contact Carboline Technical Service.

CURING SCHEDULE

Surface Temp.	Dry to Recoat
25°C (77°F)	2 Hours

The overcoat application times are for guidance only and could vary depending on the ambient conditions and air currents. In enclosed areas with little ventilation (basements, confined spaces, etc.), for the mortar to dry properly, it is recommended that the RH does not exceed 60% and there is adequate ventilation, which means at least 4 complete changes of air per hour until the material is dry (or for at least 2 weeks after the end of the application).

CLEANUP & SAFETY

Cleanup	The case, mixer and the hoses should be cleaned with drinking water. Pass sponges or plenty of water through the hoses to remove any material residue that remains in them. Excess wet sprayed mortar should be cleaned with clean drinking water. Dry sprayed mortar may require scraping off to remove it.
Safety	Follow all the safety precautions described in the safety data sheet for the mortar. The use of personal protective equipment is recommended, including overalls, gloves and eye protection.
Overspray	Adjacent surfaces should be protected against damage and splashing. Sprayed fireproof materials can be difficult to remove from surfaces and can damage architectural finishes.
Ventilation	In enclosed areas, ventilation must be no less than 4 complete air exchanges per hour until the material is dry.

TESTING / CERTIFICATION / LISTING

EN Standards	<i>Fire Resistance to EN standards conducted in accredited laboratories:</i> Protection of structural steel elements (EN 13381-4) Open beams and columns and tubular profiles up to R240 Protection of structural concrete elements (EN 13381-3) Columns, beams, slabs and walls up to REI 240 Protection of concrete/profiled sheet steel composite members (EN 13381-5) Protection of mixed slabs up to REI 180 Non loadbearing divisions (EN 1364-1) Vertical compartment walls classified up to EI 120 Fire break strips (following the Spanish Ministry of industry) Strap anchored system up to EI 180
	<i>Reaction to Fire to EN standards conducted in accredited laboratories:</i> Reaction to Fire (Classification to EN 13501-1) Classification A1

PACKAGING, HANDLING & STORAGE

Shelf Life	12 months
Shipping Weight (Approximate)	17 kg/bag (42 bags/pallet)
Storage	Store indoors and in dry environments between 0°C and 50°C. Material must be kept dry or clumping of material may occur.
Packaging	17kg/bag 42 bags/pallet

WARRANTY

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. Carboline warrants our products to be free of manufacturing defects in accord with applicable Carboline quality control procedures. THIS WARRANTY IS NOT VALID WHEN THE PRODUCT IS NOT: (1) APPLIED IN ACCORDANCE WITH CARBOLINE'S SPECIFICATIONS, AND/OR (2) PROPERLY STORED, CURED, AND USED UNDER NORMAL OPERATING CONDITIONS. Carboline assumes no responsibility for coverage, performance, injuries, or damages resulting from use of the product. If this product is found not to perform as specified upon inspection by a Carboline representative during the warranty period, Carboline's sole obligation, if any, is to replace the Carboline product(s) proven to be defective or refund the purchase price thereof, at Carboline's sole option. Carboline shall not be liable for any other losses or damages. This warranty excludes (1) labor and costs of labor for the application or removal of any product, and (2) any incidental or consequential damages, whether based on breach of express or implied warranty, negligence, strict liability or any other legal theory. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated. The whole text of this Product Data Sheet, as well as the documents derived from it, have been written in English, and for legal purposes the English version shall prevail.