

Planitop 3D [NA]

Fiber-Reinforced Mixture for 3D Printing



**BLACK
BUFFALO**
A Black Buffalo
3D Licensed Product

NORTH AMERICA [NA]

DESCRIPTION

Planitop® 3D [NA] is a fiber-reinforced cementitious mortar that is designed to be machine-applied using the three-dimensional printing process for concrete. *Planitop 3D [NA]* is a special blend of hydraulic binders, fiber and well-graded aggregates.

FEATURES AND BENEFITS

- Low slump but pumpable
- Fiber-reinforced

INDUSTRY STANDARDS AND REFERENCES

- ICC-ES AC509 requirements

WHERE TO USE

- Interior and exterior use
- For 3D-printed structures
- Vertical, overhead and horizontal concrete surfaces

SURFACE PREPARATION

- Refer to ICC-ES AC509 guidelines.

MIXING

Before product use, take appropriate safety precautions. Refer to the Safety Data Sheet for details and PPE required.

- Utilize 11% to 13% of potable water by weight of the powder for mixing. Mix to a homogenous consistency. Mix times may vary depending on equipment. For optimal printing, the water content must be adjusted depending on ambient weather conditions and printer settings.

PRODUCT APPLICATION

- Conduct a test trial before application to ensure consistency, flowability and pumpability.

CURING

- Cure with wet burlap or a polyethylene sheet during the first 3 days of curing. Alternatively, apply a water-based curing compound conforming to ASTM C309.

CLEANUP

- Clean tools and equipment with water before *Planitop 3D* [NA] hardens. Hardened material must be mechanically removed.

LIMITATIONS

- Do not install over substrates containing asbestos.
- The minimum ambient and surface temperatures are from 50°F (10°C) and rising at the time of application, up to 85°F (29°C).
- For best results, condition *Planitop 3D* [NA] from 65°F to 85°F (18°C to 29°C) at least 24 hours before use.
- Planitop 3D* [NA] can be applied at thicknesses between 1.2" and 2.4" (3 to 6 cm) per lift.
- For temperatures outside the above-mentioned range, refer to the American Concrete Institute (ACI) for hot/cold weather application guidelines.

Product Performance Properties

Laboratory Tests	Results
Specific gravity	2.20
pH	> 12.5
Dry-solids content	100%
Compressive strength – ASTM C109 (CAN/CSA-A5)	
1 day	> 1,000 psi (6.90 MPa)

7 days	> 4,000 psi (27.6 MPa)
28 days	> 6,000 psi (41.4 MPa)
Flexural strength – ASTM C348	
7 days	700 psi (4.83 MPa)
28 days	1,000 psi (6.90 MPa)
Splitting tensile strength – ASTM C496	
28 days	> 500 psi (3.45 MPa)
As Printed	Results (Typical)
Compressive strength – ASTM C39	
28 days (shell mix)	10,115 psi (69.8 MPa)
28 days (fill mix)	3,430 psi (23.7 MPa)
Length change – ASTM C157	
28 days (air cure)	-0.041%
Extrusion interval (bond strength) – ASTM E518	
28 days (5 minutes)	130 psi (0.90 MPa)
28 days (15 minutes)	95 psi (0.66 MPa)

Shelf Life and Product Characteristics

before mixing

Shelf life	1 year when stored in original, unopened packaging at 73°F (23°C) in a dry area
Physical state	Powder
Color	Concrete gray

Protect containers from freezing in transit and storage. Provide for heated storage on site and deliver all materials at least 24 hours before work begins. Containers must be stored in dry conditions with a cover to protect from weather, direct sunlight and moisture conditions.

Application Properties

Consistency of mix	Thixotropic
Mixing ratio	11% to 13% of water by weight of powder
Application temperature range	50°F to 85°F (10°C to 29°C)
Initial set at 73°F (23°C)	Less than 6 hours

CSI Division Classification

Maintenance of Concrete	03 01 00

Packaging

Size
Super sack: 3,000 lbs. (1 361 kg)

Approximate Yield*

23.8 cu. ft. (0.674 m ³)

* Coverage varies depending on the amount of water utilized.

ADDITIONAL INFORMATION

Refer to the Safety Data Sheet (SDS) for specific data related to health and safety as well as product handling.

For information on MAPEI's commitment to sustainability and transparency, as well as how MAPEI products may contribute to green building standards and certification systems, contact sustainability_USA@mapei.com (USA) or sustainability-durabilite@mapei.com (Canada).

WARNING

The test results shown in the TECHNICAL DATA table were obtained in compliance with test methods and curing cycles, if applicable, defined in the industry standards referenced on the Technical Data Sheet. Please note that the use of test procedures or methods other than those indicated in the table could lead to different values and that, in such cases, any liability of our company is excluded.

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