

Nonset 400 FF

Frostproof, expanding mortar for foundations and concrete repairs



AREA OF USE

Nonset 400 FF is used for all types of foundation and concrete repairs in thicknesses of up to 150 mm at temperatures down to -10°C . Mixed mortar must be placed within 30 minutes after mixing to avoid losing expansion.

Examples of use:

- Structural rebuilding of reinforced concrete beams and pillars
- Foundations and installation of concrete elements
- Foundations for installation of machinery
- Foundations for sleepers and crane rails
- Grouting horizontal non-moving joints

TECHNICAL DATA

Nonset 400 FF is a cement-based dry mortar, which expands 1 - 3 % before setting. The mortar is composed of cement, well-graded sand, expanding, stabilising and plastifying substances. The mortar is viscous and requires tight shuttering.

Nonset 400 FF contains additives which ensure that the cement sets and will not crack even at surface and air temperatures down to -10°C .

Nonset 400 FF complies with the principles of NS-EN 1504-9 "Products and systems for reparation of concrete structures: Definitions, requirements, quality control and evaluation of compliance. General rules for the use of products and systems", and the requirements of NS-EN 1504-3 "Repair mortar for structural and non-structural repairs, class R3".

RECOMMENDATIONS

- Do not use **Nonset 400 FF** on vertical surfaces
- Do not add cement or other additives to **Nonset 400 FF**
- Do not add water once the mix has begun to set
- Do not use **Nonset 400 FF** if the sack is damaged or has been opened previously

GUIDELINES FOR USE

Preparation

Remove loose concrete and contaminants on the surface. The surface must be free of dust, oil and grease which can reduce adhesion. The casting surface must be sufficiently coarse. Wet the surface with clean water to make it slightly absorbent. **Do not apply water at temperatures below freezing point.**

Mixing

Nonset 400 FF must only have 3 - 4 l lukewarm or hot water added per 25 kg sack, adjusted to ensure the temperature of the mix will be approx. $+20$ to $+30^{\circ}\text{C}$. Mix for at least 3 minutes to a smooth consistency. Do not use more water and soften the mix more than is necessary to avoid separation, reduction of firmness and poor results.

Use a drill and mortar whisk for mixing small amounts. Use a standard cement mixer for large volumes.

Nonset 400 FF

APPLICATION

Construct shuttering which is sealed, adheres well and projects 25 - 50 mm above the top surface level. The shuttering must be arranged to make it easy to fill.

Leave 10 - 20 mm clearance at the sides, to make it easy to check filling and to insert poles in the mix. Filling from one side is important, to allow air to escape. If using a pump, place the hose in the middle of the mould so that the mix flows to all edges.

Pour the mix into the mould when casting foundations. Carefully hammer the shuttering side, and insert a long thin object (e.g. reinforcement rod) into the mix to make it flow better and avoid air pockets. Mixing and casting must be performed non-stop until the mould is full. Suitable pumping equipment is recommended for large jobs.

Finish:

We recommend membrane cure **Mapecure 1** applied immediately to exposed surfaces, and apply water over the next 3 - 4 days. Covering with plastic sheet is also effective, and is preferable when a finish will be applied to the surface.

CLEANING

Fresh mortar can be removed from tools and equipment using water. Hardened material must be removed mechanically.

MIX

1.9 - 2.1 kg mortar per litre mix.

PACKAGING

Nonset 400 FF is supplied in 25 kg sacks.

STORAGE

Store in a dry place. Shelf life 12 months in unopened packaging.

SAFETY PRECAUTIONS

Nonset 400 FF contains cement, which can lead to a slight irritating alkaline reaction or allergic reaction in some people if in contact with sweat or other bodily fluids.

Wear gloves and safety glasses. See the relevant safety data sheet for health, safety and environmental protection at

www.mapei.com

PRODUCT FOR PROFESSIONAL USE

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above - information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the technical data sheet, available from our web site www.mapei.com

**All relevant references
for the product are available
upon request and from
www.mapei.com**

TECHNICAL DATA (typical values)

PRODUCT IDENTIFICATION

Strength class according to EN 1504-3:	R3
Type:	CC
Appearance:	powder
Colour:	grey
Maximum aggregate size (mm):	4.0
Dry solids content (%):	100
Chloride ions content – minimum requirements ≤ 0.05 % - according to EN 1015-17 (%):	≤ 0.05
Storage:	12 months in original packaging in a dry place
Hazard classification according to CE Directive 1999/45:	Xi, R37/38, R41
Customs class:	38245000

PRODUCT APPLICATION DATA (at +20°C-50%RH)

Colour of mix:	grey			
Mixing ratio:	100 parts of Nonset 400 FF with 12 - 16 parts water (approx. 3 - 4 l per 25 kg sack)			
Exposure class/ water additive l/sack:	M40 3.5	M45 3.9	M50 4.3	Risk for separations at high water additive
Consistency of mix:	fluid			
Density of mix (kg/m ³):	2 200			
pH of mix:	> 12			
Application temperature range:	from -10°C to +5°C			
Expansion (%):	1 - 3			
Bleeding (%):	≤ 0.5			
Pot life of mix:	ca. 30 minutes			

FINAL PERFORMANCE (16 % blending water)

Performance characteristic	Test method	Minimum requirements according to EN 1504-3 for R3 class mortar	Product performance
Compressive strength (MPa):	EN 12190	≥ 25 (after 28 days)	At -10°C: > 2.0 (after 2 days) > 10 (after 7 days) > 25 (after 28 days) At +20°C: > 30 (after 28 days)
Flexural strength (MPa):	EN 196-1	none	At -10°C: > 0.5 (after 2 days) > 2.5 (after 7 days) > 5.0 (after 28 days)
Carbonation resistance:	EN 13295	$D_k \leq$ control concrete (MC(0.45))	Passes
Modulus of elasticity in compression (GPa):	EN 13412	≥ 15 (after 28 days)	23.9 (after 28 days)
Bond strength to concrete (MC 0.40 type substrate water/cement ratio = 0.40) according to EN 1766 (MPa):	EN 1542	≥ 1.5 (after 28 days)	> 2.0 (after 28 days)
Capillary absorption (kg/m ² ·h ^{0.5}):	EN 13057	≤ 0.5	< 0.5
Thermal compatibility to freeze-thaw cycles with deicing salts measured as according to EN 1542 (MPa):	EN 13687-1	≥ 1.5 (after 50 cycles)	> 2.0
Reaction to fire:	Euroclass	Value declared by manufacturer	A1



Vallsetvegen 6, 2120 Sagstua (Norway)

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Nonset 400 FF

Concrete repair product for structural and non-structural repair, CC

Compressive strength:	Class R3 (≥ 25.0 MPa)
Chloride ion content:	≤ 0.05 %
Adhesive Bond:	≥ 1.5 MPa
Carbonation resistance:	Pass
Elastic modulus:	≥ 15 GPa
Thermal compatibility part 1:	≥ 1.5 MPa
Capillary absorption:	$< 0.5 \text{ kg}\cdot\text{m}^{-2}\cdot\text{h}^{-0.5}$
Dangerous substances:	See SDS
Reaction to fire:	Class A1



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