



Rev 0
06/24



GRAUTEK A

Self-levelling, shrinkage-compensated rheoplastic mortar for precision anchoring of machineries and structures



DESCRIPTION

GRAUTEK A is a special, ready to use, premixed cement-based mortar, that, if water is added, takes on the characteristics of a self-levelling mortar - castable, with compensated shrinkage, non-segregable, bleeding-free, with high initial and final mechanical strengths, waterproof, durable and with high adhesion to reinforcing bars, metal parts and concrete.

GRAUTEK A is formulated with selected quartz and special additives, to make special mortars for anchoring heavy, vibrating, pulsating, rotating machines, even if subject to thermal variations, whenever the gap between the base and the sub-plate reaches a maximum thickness of 10 cm.

FIELDS OF USE

GRAUTEK A has been formulated to craft special mortars for precision anchoring of machines such as:

- compressors and motor-compressors
- gas or steam turbines, pumps;
- paper machines for paper mills;
- lathes, milling machines, presses;
- hot and cold rolling mills;
- iron structures;
- overhead cranes;
- reinforced and prestressed concrete prefabricated elements;
- any type of dynamically stressed machine, even if structurally operating at temperatures, that are higher than the room temperature.

GRAUTEK A ensures its own dimensional stability.

ADVANTAGES

GRAUTEK A is easy to place and can be used at varying consistencies. Even at superfluid consistency there is no segregation and no water bleeding. The workability time (60 min) at 20°C allows one to work comfortably. Its impermeability ensures a perfect resistance to filtration of water, oils, vapors even if containing sulfates, sulfides and chlorides.

GRAUTEK A is therefore a durable and highly reliable product. Its peculiar formulation makes it resistant

- to impacts,
- to vibrations
- to static stresses
- to dynamic stresses
- to thermal stresses

to which it is subjected.





TECHNICAL FEATURES

Physical state	Powder
Colour	Cement gray
Particle size D_{max}	2 mm
Volumic mass	$2,20 \pm 0,03 \text{ kg / dm}^3$
Yield	1,95 kg / dm^3 of mortar
Application temperature	from + 5 to + 35°C
Plastic phase expansion	+ 0,3%
Waterproof	Excellent
Water bleeding	Absent

High temperature resistance:

GRAUTEK A withstands high temperatures (+ 400°C) over a long period of time without noticeable degradation.

Resistance to freeze-thaw cycles:

GRAUTEK A's high impermeability provides an excellent resistance to freeze-thaw cycles..

Resistance to chemical aggression:

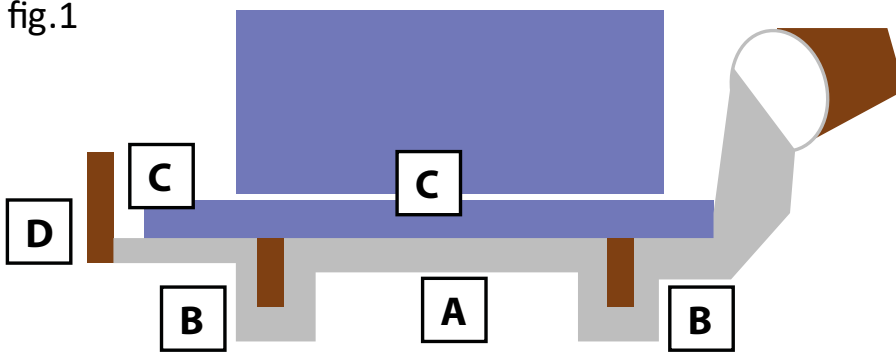
No degradation by natural aggressive agents: carbon dioxide, sulfides, sulfates, chlorides, etc..

INSTRUCTIONS FOR PROPER ANCHORING

In order to achieve an anchor with a guarantee of durability, it is not sufficient to use a "good anti-shrinkage mortar" but it is necessary to carry out a set of preparatory works such as (fig. 1):

1. Check of foundation concrete.
2. Inspection of tie-rods anchor pits.
3. Machine and tie-rods checking.
4. Formwork.

fig.1



Instructions for proper anchoring of small machinery

- A. Check of foundation concrete
- B. Inspection of tie-rods anchor pits
- C. Machine and tie-rods checking
- D. Formwork

1. FOUNDATION CONCRETE CHECK - SUBSTRATE PREPARATION

Remove all the deteriorated concrete pieces from the surface of the foundation block. Remove any grout encrustation using a scarifying or sandblasting machine; do not use mechanical means that could cause micro-lesions or lesions to the foundation concrete. The concrete surface shall be clean, free of dust, oil or grease residue and slightly rough. The concrete of the structure shall be saturated with water for a minimum of 6 hours prior to the placing of the mortar.



2. INSPECTION OF THETIE-RODS ANCHOR PITS

Check and contingent removal of wooden formwork pieces and all inconsistent material. Verification of the walls of the pits that must not be dirty with oil, grease, etc.

3. MACHINE AND TIE ROD VERIFICATION

Make sure that the underside of the machine support plate is free of oil, grease, dust and any other kind of material that could damage GRAUTEK A. This also applies to the anchor rods: make sure that there is no trace of calamine on their surface. It is essential that those responsible for the mechanical placement of the machine are present to guarantee dimensions, alignments and levels, before and during the mortar laying phases, making sure that the final placement does not get modified during the subsequent anchoring operations. If it is expected that the support holders are going to be removed after the anchoring process, they must be covered with a thin layer of mechanical grease.

4. FORMWORK

The formwork must be sized, anchored and contrasted, and joints between formwork and formwork must be sealed, in order to resist the hydrostatic thrust of a very fluid mortar and prevent grout and mortar leakage with consequent collapse of the sash. It is good practice to cast the mortar pouring it from one side only. Therefore, the formwork will have a higher side with a minimum sash of 15-20 cm and a gap between the formwork and the base of about 20 cm.

On the other three sides it will have a sash of 10 cm and a gap between the formwork and the base of 5-10 cm.

For the anchoring of machines with very large bases, it will be possible to use mobile shutters, preparing the formwork with spaces and chambers, in some planned points.

In some cases, it is advisable to pump the mortar at low pressure.

Further tips and suggestions will be provided by the Tekna Chem's technical support.

MORTAR PREPARATION

An amount of approximately 1950 kg of GRAUTEK A is required to make 1 m³ of anchoring mortar. GRAUTEK A must be mixed mechanically, and for each 25kg bag, clean water (from 3,0 to 3,2 kg) must be added. Put approximately 85% of the water into the mixer, continuously pour GRAUTEK A without interruption. Stir for at least 4-5 minutes after having poured the last GRAUTEK A bag and make sure that the mixture is homogeneous and smooth. If the remaining amount of water is needed to reach the desired consistency (in any case do not exceed the recommended dosages), it will be necessary to stir for another 3-4 minutes. For small mixtures (minimum one bag) use a low-speed drill with a mixing rod. In warmer climates, water needs will be close to the maximum limits of the table, while in colder climates the opposite will occur. GRAUTEK A is a cement product, so it is necessary to follow the rules for the placing of any cement mix as described below.

Warm climates

- Store GRAUTEK A in the shade;
- Use cold water for the mixture;
- Carry out works in the early morning hours or in the evening;
- Provide an appropriate protection for the first 48 hours and cure the casting with constantly moistened sheets or by applying the curing membrane.

Cold climates

- Store GRAUTEK A in a heated room if possible;
- Use hot mixing water (max. 50°C) for the mixture;
- Carry out works in the morning;
- Do not carry out the anchoring process at temperatures below 5°C;
- Protect the environment and the casting from the frost;





- Check the temperature of the machine to be anchored. The thermal accumulation of a steel structure is very high. Even days after the thaw, the machine structure can be at temperatures below 0°C.

MORTAR POURING

Saturate with water the concrete of the foundation block, including the tie-rod pits, for at least 6 hours before casting; remove free water with a vacuum, compressed air or rags. The first pour should be slightly more fluid (2-5% more water) in order to saturate the concrete foundation, and the subsequent mixtures should be of normal fluidity, as according to the data sheet.

Before casting the anchor mortar, it is essential to check that the surrounding area involved in the anchoring is not subject to vibrations. If vibrations do occur, the surrounding machines must necessarily be stopped (for at least 12÷16 h) allowing the anchor mortar to finish setting and start hardening. The vibrations may affect the adhesion of the mortar to the underside of the machine plate. Cast continuously, without interruption, avoiding moving or vibrating the mortar underneath the plate, starting from one side to avoid incorporating air. The escape of air should be facilitated by specific through-holes previously drilled in the plate, if the section that separates one side from the other is clogged by some obstacles underneath the plate. Make sure that the mortar has completely filled the space between the foundation and the underside of the plate. To facilitate the filling, use flexible rods or steel ropes, alternately sliding them underneath the machine base in the direction of the casting. Once the casting process is complete, it is recommended to protect the fresh mortar with wet TNT or with our TEKNAPUR for at least 12.

FINISHING

After having removed the containment formwork, it is possible to take away the surrounding mortar with a chisel and a hammer, making sure that the cast has already hardened. If the supports must be removed, it is necessary to wait at least 2÷3 days from the casting, and such operation has to be facilitated by greasing them beforehand. When using GRAUTEK A, it is not necessary to remove the supports (unless it is expressly indicated by the machine's manufacturer), since with the rheoplastic mortar a homogeneous and perfect support has been created, putting the base and the plate in cohesion. Once the machine has started working, it is good practice to check that the anchor bolts (base pullers) are well tightened, using a calibrated wrench in order to obtain a uniform tightening.

PACKAGING AND STORAGE

GRAUTEK A is packaged in 25 kg bags.

In its original packaging, correctly stored under cover and in a dry place, the product will preserve its characteristics for one year.

For the correct anchorage of machineries or structures where the gap between the base and the sub-plate reaches a maximum thickness of 10 cm, GRAUTEK A, a ready-to-use rheoplastic mortar with compensated shrinkage by TEKNA CHEM, will be used.

The instructions and precautions to be taken must comply with the recommendations given by the manufacturer TEKNA CHEM SpA, which will provide technical assistance upon request.

WARNINGS

Since it is a cement product, it features the same recommendations as for the use of cement. See the safety data sheet.



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TECHNICAL FEATURES GRAUTEK A

CONSISTENCY AS A FUNCTION OF THE PERCENTAGE OF WATER INPUT ACCORDING TO EN 13395-2		
Consistency	Sliding test (mm)	Mixing water (%)
Superfluid	>50	12.5

MEDIUM MECHANICAL STRENGTHS, TESTS CARRIED OUT ON 4x4x16 mm SAMPLES ACCORDING TO UNI EN 196				
Curing (days)	1	3	7	28
Flexural Strength (Mpa)	≥ 6	≥ 7	≥ 9	≥ 10
Compressive strength	≥ 40	≥ 50	≥ 70	≥ 80

The data shown in the table refer to the mixture (perfectly homogeneous) obtained by mechanically mixing the product with 12.5% of water.

PERFORMANCE CHARACTERISTICS MIXTURE WATER 12.5%			
PERFORMANCE CHARACTERISTIC	TEST METHOD	REQUIREMENTS ACCORDING TO EN1504-3 FOR CLASS R4 MORTARS	PRODUCT PERFORMANCE
BLEEDING	UNI 8998		Absent
COMPRESSIVE STRENGTH (MPa)	EN 12190	≥ 45 (after 28 days)	>50 MPa at 1 day >70 MPa at 3 days >80 MPa at 7 days >100 MPa at 28 days
FLEXURAL STRENGTH (MPa)	EN 196/1	Nessuno	>6 MPa at 1 day >7 MPa at 3 days >9 MPa at 7 days >11 MPa at 28 days
ELASTIC MODULUS IN COMPRESSION (GPa)	EN 13412	≥ 20 GPa (after 28 days)	>25 Gpa
ADHESION ON CONCRETE - ADHESIVE BOND - DIRECT TRACTION (support type MC 0,40 ratio w/c=0,40 according to EN 1766	EN 1542	≥ 2 MPa (after 28 days)	>4 Mpa
ADHESION ON CONCRETE - THERMAL COMPATIBILITY - FROST/THAW WITH THAWING SALTS (support type MC 0,40 ratio w/c=0,40 according to EN 1766	EN 13501-1	≥ 2 MPa (Forza di legame dopo 50 cicli)	>2,2 MPa
AIR-CONTRASTED EXPANSION (µm/m)	UNI 8147 method A	Nessuno	>400 µm at 24h
AIR-CONTRASTED SHRINKAGE/EXPANSION (µm/m)	EN 12617-4	≥ 2 MPa	>2 MPa
CRACKING RESISTANCE	"O Ring Test"	No crack 180 days	Specification exceeded
HYGROMETRIC FREE EXPANSION TO AIR	Linear rod	Convex arching at 24 hours	Specification exceeded
EXPANSION IN PLASTIC PHASE at 20°C and U.R. 65% (µm/m)	UNI 8996	None	≥ 0,3%
SLIP RESISTANCE (LOAD 75 KN)	UNI EN 1881	≤ 0,6 mm	< 0,5 mm



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PERFORMANCE CHARACTERISTICS MIXING WATER 16.5%			
PERFORMANCE CHARACTERISTIC	TEST METHOD	REQUIREMENTS ACCORDING TO EN1504-3 FOR CLASS R4 MORTARS	PRODUCT PERFORMANCE
SHEAR STRENGTH	UNI EN 12615		> 6 MPa
RESISTANCE TO ACCELERATED CARBONATION	EN 13295	Carbonation Depth(dK) ≤ of the reference concrete reference MC (0,45)	Specification exceeded
WATERPROOF in PRESSURE (mm) -depth of penetration water-	EN 12390/8	None	None
CAPILLARY ABSORPTION (kg/m ² *h ^{1/2})	EN 13057	< 0,5	<0,08
CHLORIDE ION CONTENT	EN 1015-17	≤ 0,05%	<0,02%
REACTION TO FIRE	EN 13501-1	Euroclass A1	A1

LEGAL NOTES

The information contained in this technical data sheet, even though it represents the most advanced stage of knowledge, does not exempt the user from running accurate preliminary tests under their own conditions of use and operation. We therefore decline any responsibility for the improper use of the product.