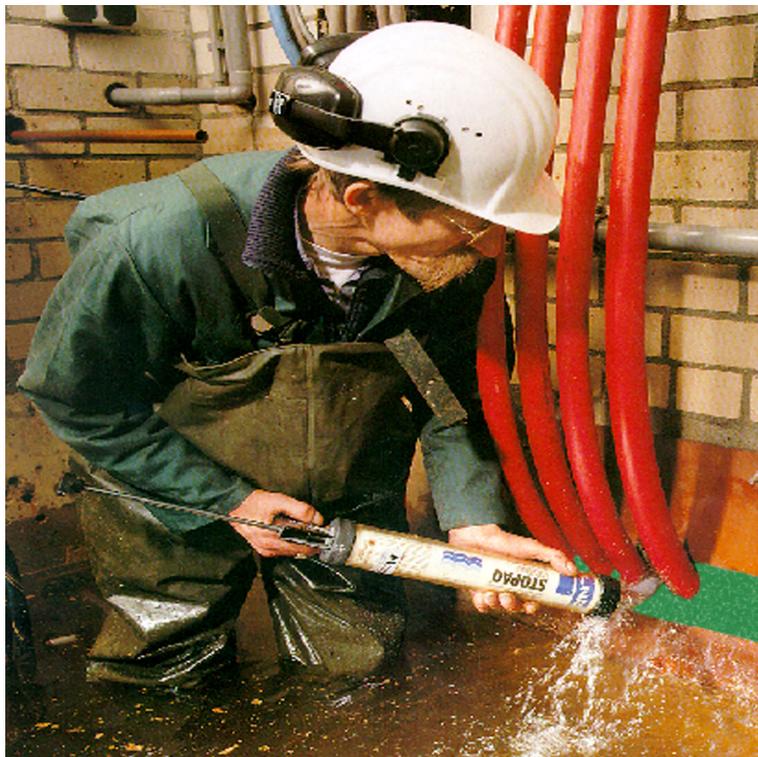


STOPAQ[®] FN2100

SEALING COMPOUND



TECHNICAL MANUAL

1. INTRODUCTION

Rain and groundwater can cause a great deal of damage to goods, equipment and building materials when underground recesses and lead-throughs are inadequately sealed or newly constructed.

Many unsuitable sealants, developed for other areas of use, are used to seal lead-throughs. This may seem to solve the problem in the short term, but leakage will frequently occur in the longer term, resulting in costly resealing operations.

Underground lead-throughs that have been constructed correctly by means of a cast-in pipe sleeve, or mechanically constructed lead-throughs or recesses can easily be given a gas- and watertight seal with **STOPAQ SEALING COMPOUND**.

STOPAQ SEALING COMPOUND has been specifically developed for the durable sealing of recesses and lead-throughs.

Sealing problems are more frequent when lead-throughs deviate from the standard types and, for example, contain several cables or are not round.

With the development of STOPAQ, these specific problems of sealing lead-throughs in practice were taken into account.

Application of STOPAQ in cable or pipe lead-throughs provides a permanent water- and gas-tight barrier.

STOPAQ is produced under stringent internal quality control (**NEN-EN-ISO 9001**), to optimally guarantee the unique properties of **STOPAQ SEALING COMPOUND**.

1.1 PROPERTIES

STOPAQ is a 100% water- and gas-tight, one-component sealing paste. Its exceptional properties allow it to be applied extremely effectively and therefore economically, in all situations.

STOPAQ DOES NOT HARDEN

STOPAQ is a permanently plastic substance with which it is simple to fill the gaps between cables or pipes. This permanent plasticity makes **STOPAQ** extremely easy to apply, allowing the easy sealing of lead-throughs.

The permanent plastic nature of the system allows cables or pipes to be inserted or removed at any time, without damage.

In addition, any possible cable or pipe vibration is absorbed.

STOPAQ EXPANDS WHEN IN CONTACT WITH WATER

The material's ability to expand when in contact with water enables the sealing of small cavities or even leaks caused by for example ground subsidence.

STOPAQ ALSO ADHERES TO DAMP SURFACES

One of **STOPAQ**'s great advantages is that it can be applied to almost any surface, such as concrete, stone, plastics and metal, regardless of whether it is wet or dry.

STOPAQ's potent adhesion enables the sealing of existing leaks, even against the flow of water up to specified depths.

STOPAQ IS ENVIRONMENTALLY FRIENDLY

STOPAQ is made from non-toxic raw materials and can therefore be processed and applied without the use of protective measures.

Furthermore, **STOPAQ** does not corrode any other materials and is therefore safe to use.

STOPAQ HAS AN UNLIMITED SHELF-LIFE

STOPAQ's exceptional properties mean that it has an unlimited shelf life, allowing any remnant material to be used.

STOPAQ IS ECONOMICAL

100 mm of STOPAQ in a lead-through creates a water- and gas-tight barrier. This, in combination with its ease of use and unlimited shelf life, makes STOPAQ extremely economical.

1.0 APPLICATION

1.1 PACKAGING, TRANSPORT AND STORAGE

STOPAQ SEALING COMPOUND is available in tubes or buckets. Standard package sizes are:

- 0.33 kg tube (abt 12 ounces)
- 0.65 kg tube (abt 16 ounces)
- 2 kg polyethene packaging

STOPAQ SEALING COMPOUND is applied with the application tools supplied.

No special measures are required for the transportation of STOPAQ SEALING COMPOUND.

STOPAQ SEALING COMPOUND should be stored in a dry place, below 30°C.

We recommend using the original application tools to obtain optimum results when following the procedures described in this Technical Manual.
An overview and delivery programme is available on request.

2.2 GENERAL METHOD OF WORK WITH OR WITHOUT PIPE SLEEVE; CABLES OR PIPES WITHOUT PROTECTIVE SHEATHING

2.2.1 General

General entails:

- 1) Maximum lead-through diameter 5 inches
- 2) Maximum depth below ground level 3 feet
- 3) Ambient underground temperature (<35°C)
- 4) Cables with a maximum diameter of 1 inch
- 5) Distance between cables and lead-throughs must be a minimum of 0.5 inch and a maximum of 2 inches

2.2.2 One cable

Dust, grit, sand, loose components, loose rust flakes or paint layers on pipes or previous sealants must be removed from the surface and the interior of the lead-through before application of STOPAQ SEALING COMPOUND. Damp or wet surfaces are not a problem.

Setting the depth of the STOPAQ to be applied to a minimum of 4 inches can be done by simply placing a barrier of adhesive foam tape in the recess.

This is done by first wrapping the foam tape without removing the adhesive strip.

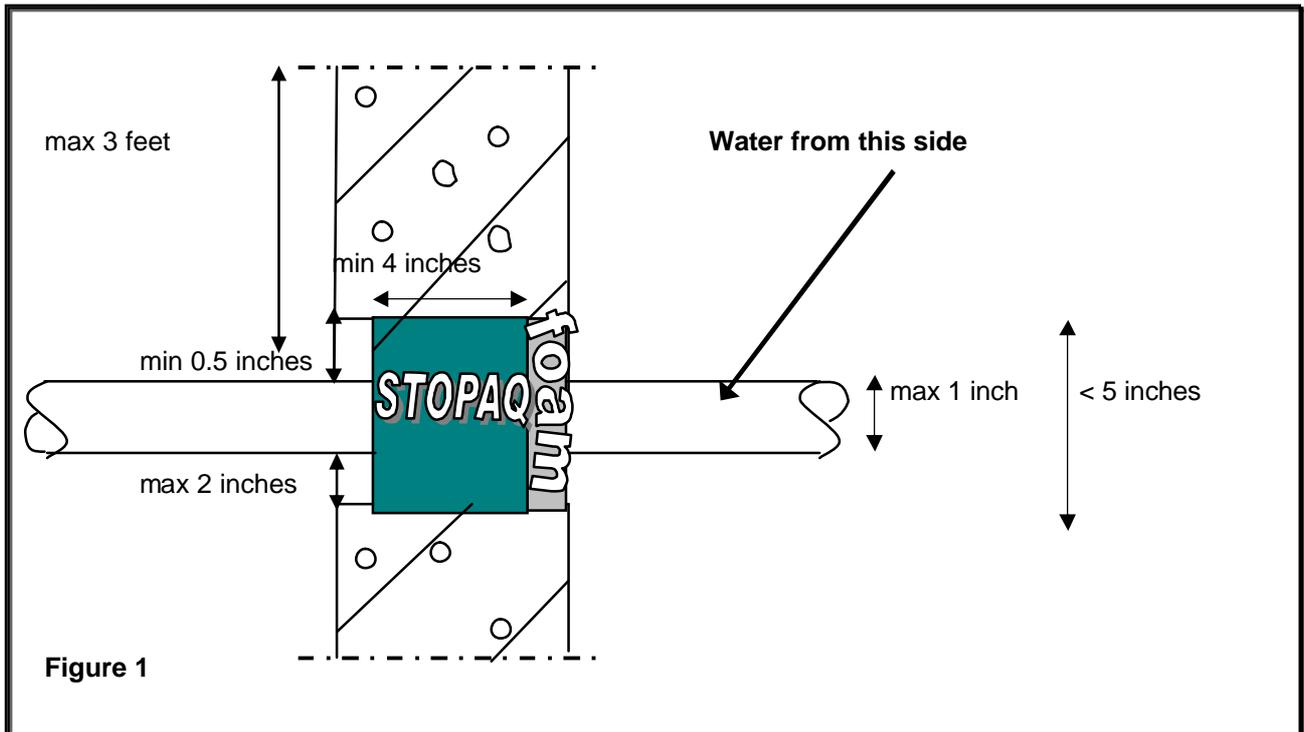
The adhesive strip is then removed and the tape is wrapped around the cable in such a way that a round barrier is created. Ensure that this barrier is 0.5 inches larger in diameter than the lead-through.

Use a screwdriver or a similar tool to push the foam tape approximately 4 inches into the lead-through.

It will now be easy to apply STOPAQ against this barrier, ensuring the optimal filling of all cavities (without trapping air pockets).

Now carefully apply the STOPAQ from the bottom upwards and from the back to the front.

Place the injection nozzle in the rear of the recess (use a flexible injection nozzle for spaces with irregular dimensions) and begin applying the material. Work towards the front, adjusting the rate of progress to the required degree of filling (without trapping air pockets).



Ensure that the injection nozzle remains in contact with the sealing material. This can be done by applying gentle pressure during the extrusion of the product.

Be careful to ensure that STOPAQ is applied thoroughly around the cable or pipe when filling the lead through. The gap between the cable and the lead through must be a minimum of 0.5 inches and a maximum of 2 inches

Now smoothen the STOPAQ with a filling knife or spatula and carefully apply pressure.

2.2.3 Multiple cables

Foam tape can also be used when working with more than one cable.

However, there must be a gap of at least 0.5 inches between the cables.

For example, in the case of two cables, the foam tape is first wrapped around the cables in a figure eight. Here too, the removable strip is left in place.

The strip is then removed and wrapped around the cables.

Once again, the foam tape barrier must be 0.5 inches larger in diameter than the lead-through.

Now use a screwdriver or a similar tool to push the foam tape approximately 4 inches towards the rear of the lead-through.

Apply sufficient STOPAQ between and around the cables, using the flexible injection nozzle.

Work from the bottom upward.

Gently push against the pressure produced by the extrusion of the material, ensuring that STOPAQ fills all the cavities adequately.

Ensure that STOPAQ is applied right around the cable or pipe when filling the lead-through. The gap between the cable and the lead-through must be at least 0.5 inches.

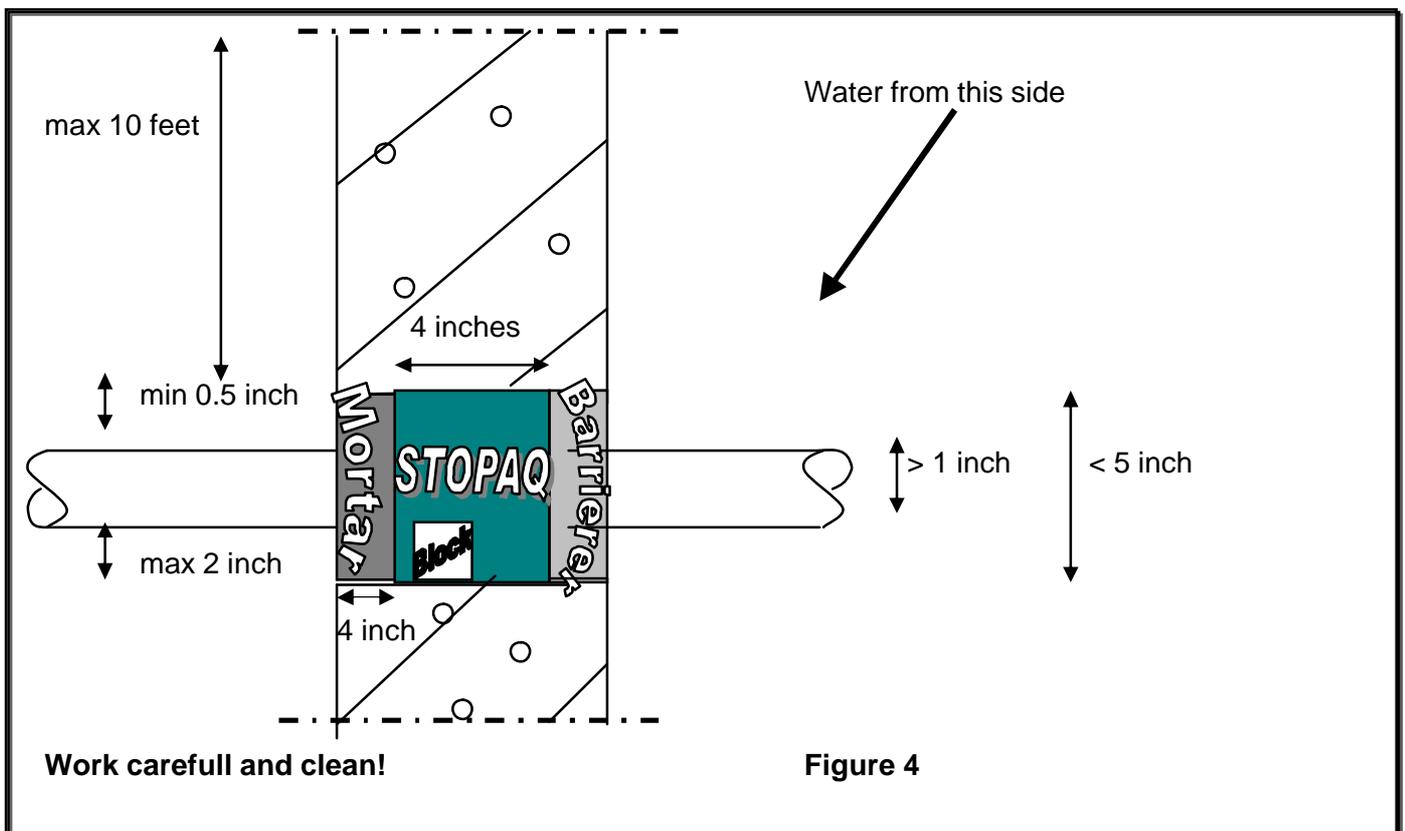
Now smoothen the STOPAQ with a putty knife or spatula and gently apply pressure.

2.3.2 Lead-through at a depth lower than 3 feet under ground level (Figure 4)

STOPAQ's permanent plasticity will necessitate the use of an extra layer of mortar to provide mechanical strength.

When constructing the lead-through, take account of the fact that a gap of 6 to 8 inches will be required inside the lead-through.

If there is no sand layer present, you can create a barrier with, for example, PUR foam. Begin 8 inches from the start of the lead through. If more than one cable is present, the first step is to create gaps between the cables (at least 0.5 inches).



When the PUR foam has hardened, apply 4 inches of STOPAQ as described in 2.2.2 or 2.2.3 (foam tape is not required).

Now apply 4 inches of mortar. The mortar is specified in the Appendices. The substrate must be clean, and the walls of the lead through free of STOPAQ. Alcohol followed by water may be used to clean the surfaces. The surface must be roughened and may be damp to the touch.

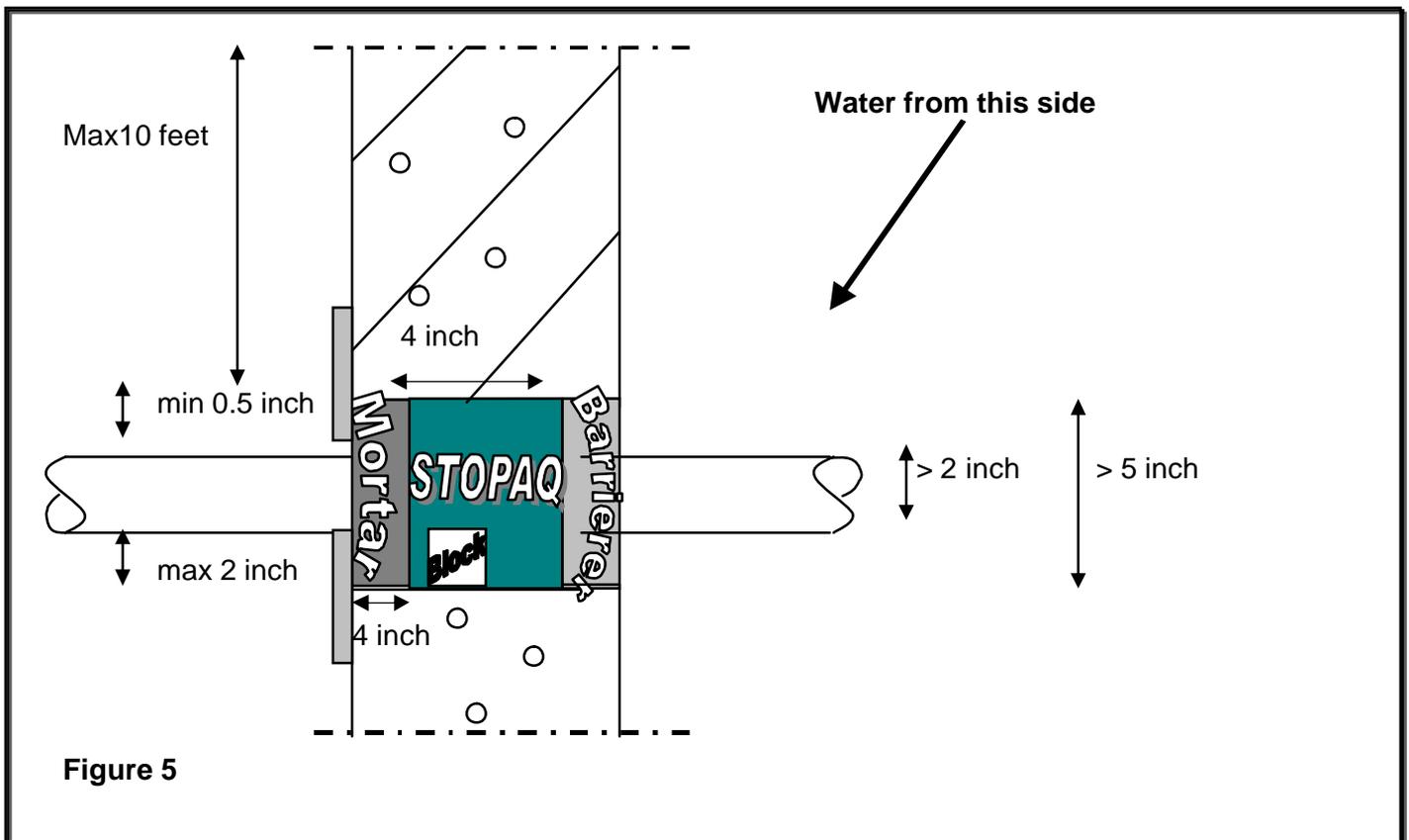
2.2.3 Lead-throughs with larger dimensions (Figure 5)

Extremely large lead-throughs or recesses may also be fitted with a cover plate to absorb the pressure at greater depth, or to allow for different dimensions. This simplifies the injection of STOPAQ, and enables the optimum filling of larger lead-throughs.

Make a hole as large as the end of the injection nozzle 10 mm from the bottom of the mortar or cover plate. Now make an opening of approximately 5 mm (screwdriver) 10 mm from the top of the mortar or cover plate.

Now inject STOPAQ into the bottom of the lead-through until approximately 100 mm of STOPAQ extrudes from the top hole.

Refill the opening with a little mortar.



2.3.2 Cables with protective wrapping (e.g. TELECOM/High voltage)

When cables with a wound protective wrapping (sheathing) are lead through, this discharging wrapping must first be sealed.

Pull the cables a short distance out of the lead-through and unwind the sheathing in such a way that a gap is created between the cable and the sheathing.

Now completely fill a section > 4 inch with STOPAQ and replace the sheathing. Spread any excess STOPAQ over the entire section.

Place the sealed section of cable back into the part of the lead-through, which will then be filled with STOPAQ.

Now seal the lead through in the manner described in 2.2.2 or 2.2.3.

If the sheathing is porous (e.g. jute), at least 70 mm of this sheathing must be removed. Ensure that this 70 mm section is placed centrally in the STOPAQ seal. Ask your supplier or STOPAQ AMCORR INC. for advice on this type of situation.

2.3.3 Industrial fire retardant seals

If circumstances require, **STOPAQ SEALING COMPOUND** may also be used in combination with **STOPAQ** mortar to create a fire retardant finish. This may be the case for potential fire hazards, the prevention of explosions or due to local authority or fire department regulations.

Cable or pipe lead-throughs are first given a watertight seal with STOPAQ SEALING COMPOUND in the manner described in 2.2.2 or 2.2.3.

Bear in mind that sufficient space must be left at the front of the lead through for the application of the fire retardant mortar; examples in Figures 3 and 4.

Now cover the STOPAQ seal with the fire retardant mortar according to the manufacturer's instructions; see attached product specification sheets.

2.3.4 High-temperature pipes (>104 °F)

Ask your supplier or STOPAQ AMCORR INC. for information on the sealing of hot water pipes, industrial pipes or steam pipes.

2.4 OTHER SITUATIONS

2.4.1 Application in polluted (waste) water

STOPAQ FN 2100 is resistant to the acids, leach and pollutants normally present in groundwater.

Ask your supplier or **STOPAQ AMCORR INC.** for advice when dealing with higher concentrations of pollutants.

2.4.2 Exceptional situations

Complex or extremely large recesses containing a great number of cables or pipes can be sealed by specially trained sealing teams equipped with special application tools, suitable for the processing of larger quantities. Frans Nooren B.V. provides this service.

Ask your supplier or **STOPAQ AMCORR INC.** for advice on exceptional situations.

2.4.3 Leading cables or pipes through lead-throughs previously sealed with STOPAQ

It may occur that additional cables must be inserted into a lead-through. STOPAQ's permanent plasticity allows cables or pipes to be lead through at a later date.

- If a double layer of mortar has been used, this must first be penetrated with an awl or similar tool.
- Now take a PVC tube that is a little larger in diameter than the cable to be lead through and somewhat longer than the lead-through itself.
- Adjust the opening to the PVC tube.
- Firmly seal the front of the tube with tape or a plug.
- Push the PVC tube through the STOPAQ.
- Now remove the plug or seal and lead the cable through.
- The PVC tube may be removed once the cable has been lead through.
- Refill the opening with STOPAQ as much as possible by gently pushing against the pressure created by the extrusion of the material.
- Continue working according to 2.2.2 or 2.2.3.

3.0 RESISTANCE TO CHEMICALS

STOPAQ SEALING COMPOUND is resistant to short-term (72-hour) exposure to the following substances:

- Acetic acid (5%)
- Formic acid (5%)
- Hydrochloric acid (5%)
- Sulphuric acid (5%)
- Caustic soda (5%)
- Potassium chloride (saturated)
- Sodium chloride (saturated)
- Concentrations of pesticides or herbicides (p.p.m.)
- Isopropyl alcohol (5%)
- Ethanol (5%)
- Gasoline/diesel oil (< 2%)
- Fuel oil (< 2%)

STOPAQ is resistant to long-term exposure to normal environmental pollutants. For further information on this subject, contact the Frans Nooren Afdichtingsystemen R&D department.



4.0 AVAILABLE RESEARCH REPORTS

Available STOPAQ AFDICHTIGSPASTA research reports:

- TNO-CIVO report V88.248/280061
 - STOPAQ does not irritate the skin
- TNO-CIVO report V88.249/280069
 - STOPAQ does not irritate the eyes
- TNO-CIVO report V88.288
 - STOPAQ is non-toxic
- TNO-CPM report 283/89
 - STOPAQ does not degrade polyethylene
- TNO-CPM report 715/89
 - STOPAQ is watertight and gas retardant
- TUV report (approval)
 - STOPAQ has not had any effect on PVC, even after eight years of exposure

Frans Nooren Afdichtingsystemen B.V. research report (on request)

- Ageing
- Expansion capacity
- Compatibility with various substrates
- Rheological behaviour
- Vibration absorption
- Resistance to chemicals
- The affect of water pressure on STOPAQ
- The affect of pressure on STOPAQ sealing systems.

The reports in this list are available on request from your supplier or **STOPAQ AMCORR INC.**

5.0 Guarantee

For the guarantees on the products mentioned above, please ask your local distributor or contact STOPAQ AMCORR INC.

The information stated in this document is in the best of our knowledge, however STOPAQ AMCORR can not be held responsible for damage and/or incidents due to information, advice, products or combinations with other products; direct and/or indirect.