

rascor®

*System engineering
for waterproof structures.*



RASCOTec

RASCOTec the patented waterproofing system.

Injection channels, injection collars, expansion joint units, crack-inducing and stop end units

Waterproofing is one of the most demanding areas in both general construction and special engineering applications.

Construction joints, penetrations, expansion joints and also crack formation require particular attention. Broadly speaking, systems can be divided into those in which the

- **waterproofing measures are executed in conjunction with concreting e.g.** waterbars, sheet metal jointing sections or hydrophilic strip, bedded in the fresh concrete; here the concreting contractor bears the full responsibility for waterproofing, the definitive seal being in place after concreting

and those in which the

- **waterproofing measures are performed on the hardened concrete e.g.** the various grouting systems

The concept of waterproofing structural fabric by the injection of grout through a specially incorporated transport system is nothing new.

Hose systems – though not so much systems as individual solutions – have long been known. The inventions described here, however, set out to exploit the benefits of the injection hoses, while avoiding their drawbacks, and provide a single, integral system covering **all areas** of waterproofing.

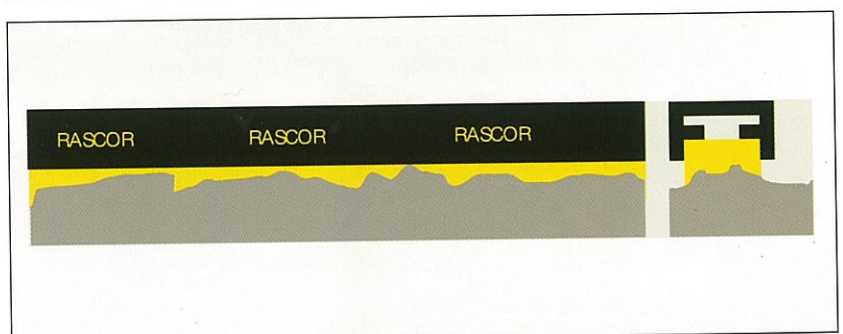
The solution has a name: RASCOTec!

RASCOTec is the only system currently on the market that reliably covers all areas of the water-impermeable concrete „white tank“ systems, providing a comprehensive solution.

The RASCOTec ►
injection channel –
waterproofing system
for construction joints.



The special ►
RASCOTec foam
ensures close contact
to the concrete
surface.
No infiltration!



RASCOTec systems are the result of development work carried out by RASCOR alone, with patents pending or already granted in over fifty countries.

RASCOTec systems comprise a range of different components all designed for injection with elastic grouting products after the concrete has hardened. These grouts have been specially developed for and adapted to the individual units. These units are as follows:

System components for fixing

- RASCOTec injection channels for waterproofing construction joints
- RASCOTec injection collars for waterproofing penetrations
- RASCOTec multiple-penetration units for waterproofing bundles of pipes and cables
- RASCOTec crack-inducing units for controlled crack formation and waterproofing
- RASCOTec stop end units for forming and waterproofing walls and slabs
- RASCOTec spacers
- RASCOTec expansion joint units for waterproofing expansion joints

All RASCOTec units are designed with a large contact area to the existing concrete and fulfil three major functions. Firstly they create an artificial void in the cast concrete, while remaining securely connected to the „old“ concrete. This void in turn allows efficient transportation of the grout to all parts of the section being grouted. Finally the large void serves as storage space for the expansive grout. In case of extreme concrete shrinkage, the grout deposited here will swell upon contact with water to form a safe and permanent seal. This process is termed „self-healing“.

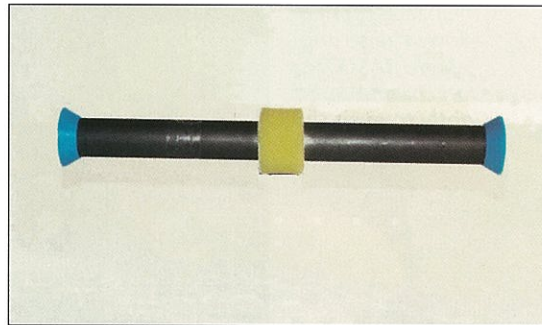
Grouting systems

Apart from state-of-the-art components for incorporation, a first-rate system solution also requires high-quality grouts specially tailored to these products. Only such a combination truly merits the name „system“. The product of decades of experience in remedial waterproofing, RASCOflex injection resins easily meet these requirements in every respect. Together with RASCOTec systems, they offer an unbeatable solution – the system solution.

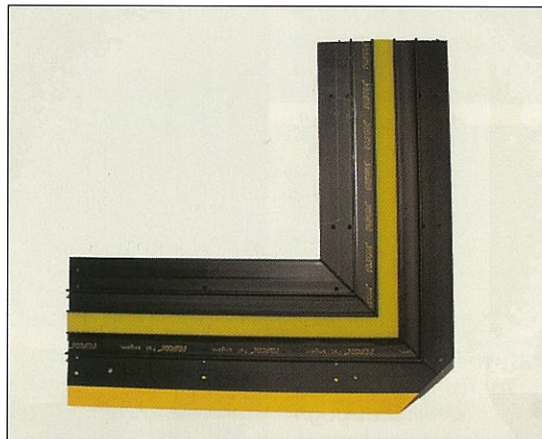
RASCOTec + RASCOflex = **the** system solution for waterproof structures!



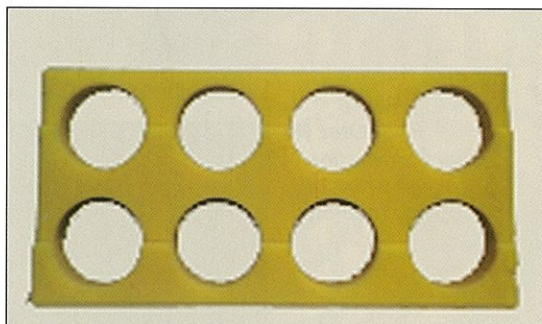
◀ The RASCOTec expansion joint unit – accommodates movement while still providing a barrier against water under pressure.



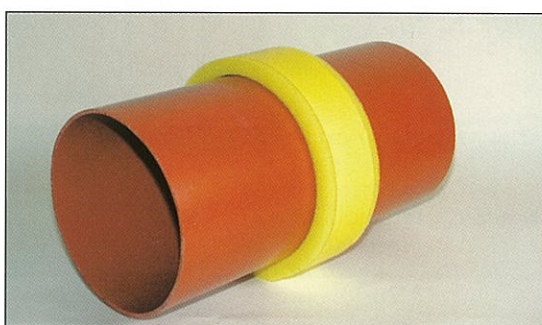
◀ Injectable RASCOTec formwork spacer – guarantees waterproof formwork connections.



◀ RASCOTec crack-inducing units can be specially manufactured in all sizes and formats.



◀ The RASCOTec multiple-penetration unit seals bundles of cables etc. regardless of shape and material combination.

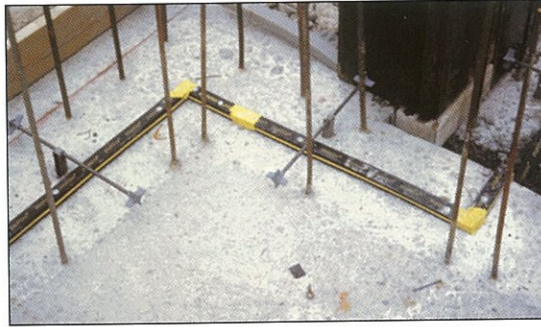


◀ The RASCOTec injection collar allows easy sealing of individual penetrations regardless of material.

The system components one by one

RASCOTec injection channels

Example showing ►
incorporation
in floor-wall joint.



Special foam ►
allows the strong,
flexible RASCOTec
injection channel to fit
tightly to even the
roughest of surfaces.



RASCOTec injection ►
channel at junction
between an
intermediate slab and a
diaphragm wall.



Easy to install – holes ►
for fixings are drilled
directly through
the injection channel.



RASCOTec ►
injection channels
are fixed
using nail plugs.



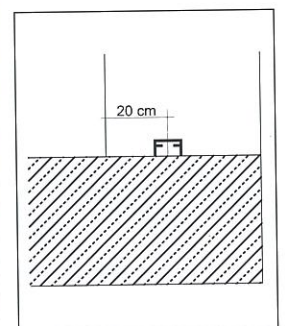
After concreting next ►
bay, the units are
drilled into and
grouted; grouting with
RASCOflex protects
reinforcement from
corrosion.



RASCOTec injection channels are fixed directly to the existing concrete through the unit by means of nail plugs. Infiltration by cement fluid below the contact surface is prevented by means of a porous foam which is compressed during fixing. The top part of the unit accommodates an open, longitudinal channel allowing rapid distribution and permeation of the grout throughout the section being grouted. RASCOTec injection channels are capable of resisting all standard mechanical loads at both high and low temperatures.

Little base preparation is necessary, i.e. the base must be swept clean and loose particles removed. Measures such as grit blasting, high-pressure water jetting or the application of set retarding admixtures to the concrete surface with subsequent high-pressure cleaning are not required.

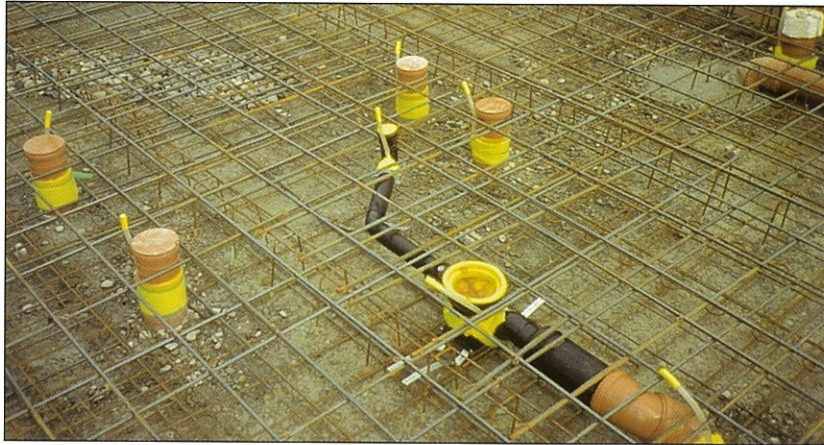
▼ Diagram showing
RASCOTec injection
channel fixed
in floor-wall joint.



RASCOTec injection collars

RASCOTec injection collars are simply placed around the built-in component (pipework, groundwater relief pipe, shaft, underwater floodlight or other penetration), with no other measures, e.g. incorporation of flanges, rubber seals etc., being required.

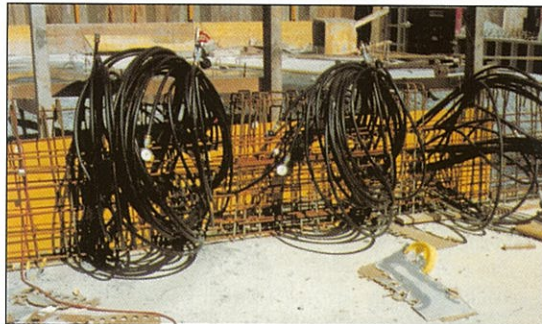
Regardless of their constituent material, pipes do not require any special fittings (e.g. adaptors or sleeves), i.e. there does not have to be any change of material at the penetration. The only requirement is for the compressive strength of the penetrating component to be adequate to withstand the relevant loads.



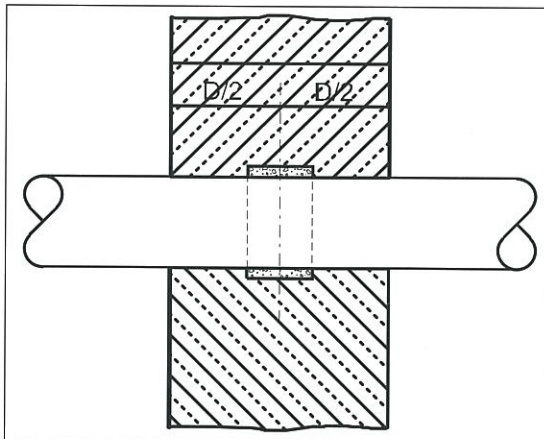
◀ Drainage pipework in ground slab.



◀ Sealing of a groundwater relief pipe in a ground slab.



◀ Pipes for a heat pump.



▲ Where injection collars are directly cast in, these are drilled into and grouted after concreting.



◀ Detail showing fixing of RASCOTec foam.



◀ View after completion.

RASCOTec crack-inducing units

RASCOTec crack-inducing units are effectively simple, stiffened plastics boards with a continuous injection channel down the middle for simultaneous grouting on both sides and foam cover strips. Unlike other products, these units allow „two-way“ grouting in a single operation. They are supplied in widths corresponding to the thickness of the concrete and fixed between the inner and outer reinforcement in walls and the top and bottom reinforcement in slabs. If required, a triangular fillet can be inserted in the formwork on the exposed side of walls to form a dummy joint. Properly integrated RASCOTec crack-inducing units often obviate the need for expansion joints.

RASCOTec crack-inducing units allow casting of unlimited lengths of wall. They systematically control the formation of cracks which are subsequently injected with elastic grout via the unit.

With slabs they allow concrete bays of unlimited size, thus making shrinkage gaps and alternate bay („chequer-board“) construction a thing of the past. An enormous reduction in effort and increased reliability are the result, with savings in time significantly reducing concreting costs.

With both walls and slabs, the use of RASCOTec crack-inducing units often means that expansion joints are no longer needed.

Division of ground slab using RASCOTec crack-inducing units.

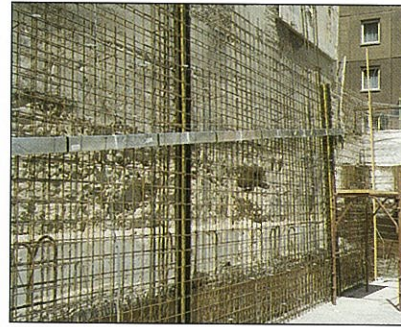
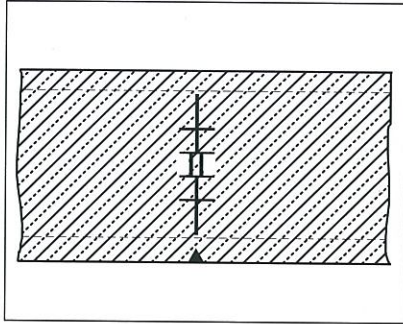
No alternate bay construction, no shrinkage gaps necessary!



RASCOTec crack-inducing unit incorporated in ground slab.

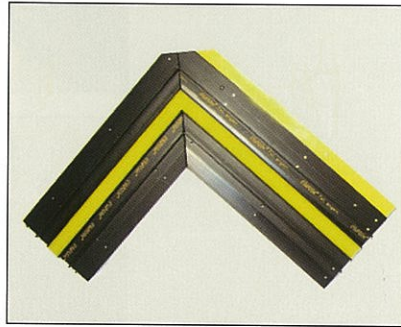


Diagram (section) ▶
showing position
of RASCOTec
crack-inducing unit
between
reinforcement.



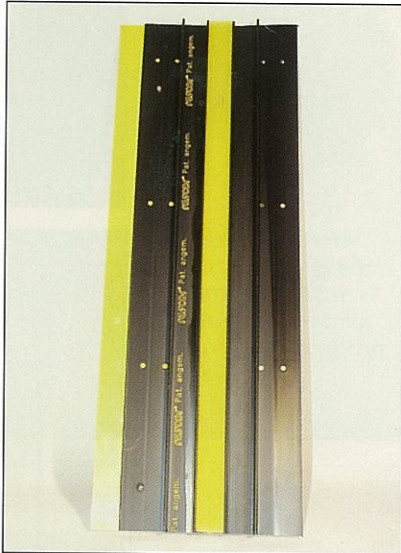
◀ With walls concreting
in stages becomes
unnecessary, making
operations faster and
more efficient.

RASCOTec ▶
crack-inducing unit
incorporated in
wall formwork.



◀ RASCOTec
crack-inducing units
can be adjusted
to fit any shape.

◀ RASCOTec
crack-inducing unit,
widened construction
(width freely selectable).



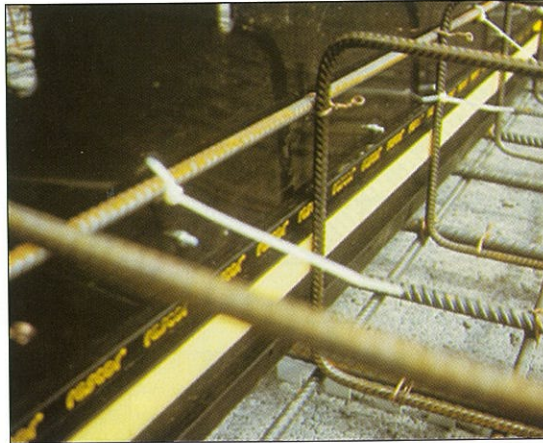
▼ Widened
RASCOTec crack-inducing
unit after concreting.

Widened RASCOTec ▶
crack-inducing unit
between
reinforcement.



RASCOTec stop end units

RASCOTec ►
stop end unit with
slots cut into edges
to accommodate
reinforcement bars.



Cast-in ►
RASCOTec
stop end unit.



After concreting, ►
the injection channel
is drilled into and the
joint fully grouted to
produce a waterproof
barrier.



▲ Detail showing
cast-in RASCOTec
stop end unit.

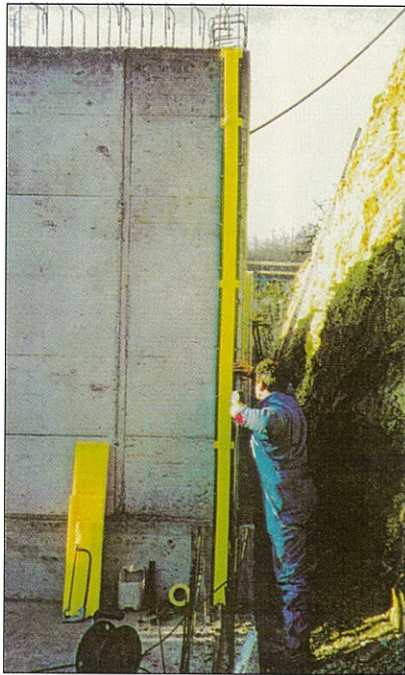
Division of ground ►
slab using RASCOTec
stop end units/
crack-inducing units.
No alternate bay
construction,
no shrinkage gaps
necessary!



RASCOTec stop end units are the latest addition to the RASCOTec range. From a technical point of view, they resemble the crack-inducing units, with grouting also being carried out after concreting. The difference is that these units are not placed between the reinforcement, but fit over it, guiding it through slots cut into the edges, i.e. the units fit between the two faces of wall formwork, from lower face of ground slab to upper face of ground slab or from upper face of soffit formwork to upper face of concrete, where they also serve as screed rails for screeding. If required, slotted triangular units may be inserted for walls to allow neat joint formation. Unlike all other technologies used to date, RASCOTec stop end units are left in place as permanent formwork, considerably reducing both formwork erection and striking time as well as material costs.

RASCOtec expansion joint units

RASCOtec expansion joint units, comprising two special injection channels and a RASCOtec foam layer, are plugged to the existing concrete. Their thickness is roughly equivalent to double the expansion joint width. Resistance to movement and the integrity of the seal are thus ensured even under extreme conditions, e.g. with sewage tanks. Grouting operations are similar to those for the other units and should be carried out as late as possible after concreting, i.e. when the joints have achieved their maximum width. The lower the temperature of the structural fabric, the more this widening effect is favoured.



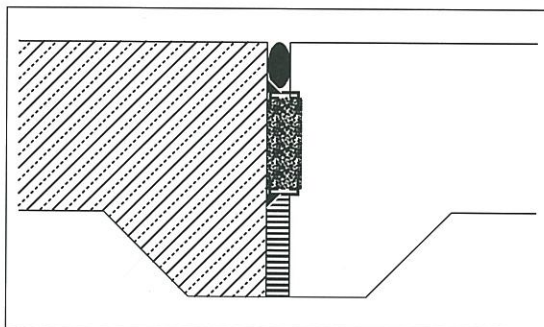
▲ Easy to install – drilling and fixing to wall with nail plugs.



◀ RASCOtec expansion joint units can also be incorporated in movement joints designed to transmit transverse loads.



◀ Angle formation of RASCOtec expansion joint unit.



◀ Diagram showing composition of expansion joint in slab.

Summary of main features:

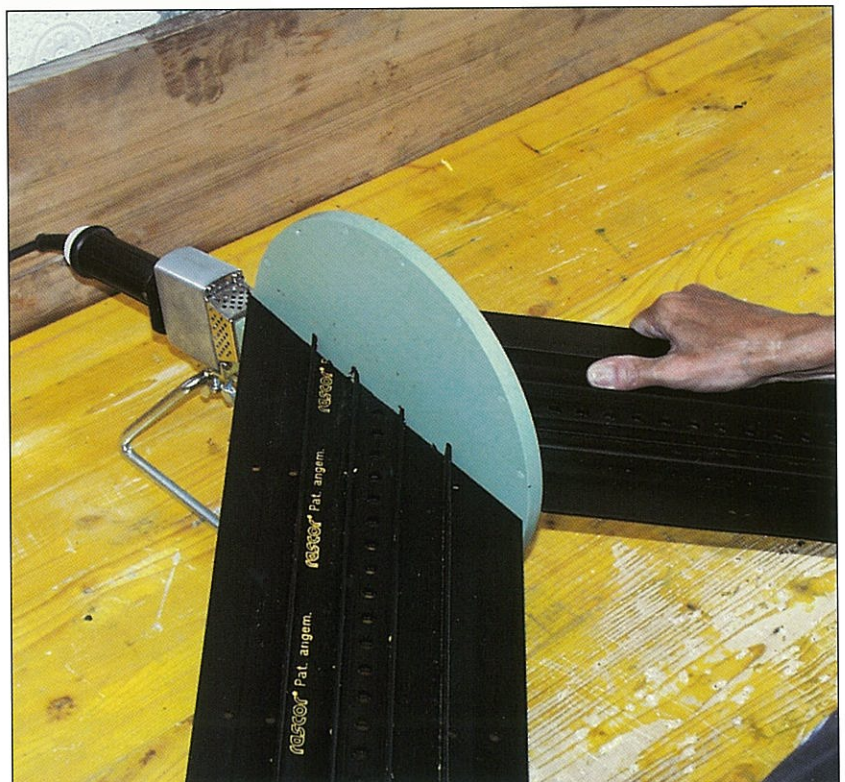
Overall RASCOtec system range

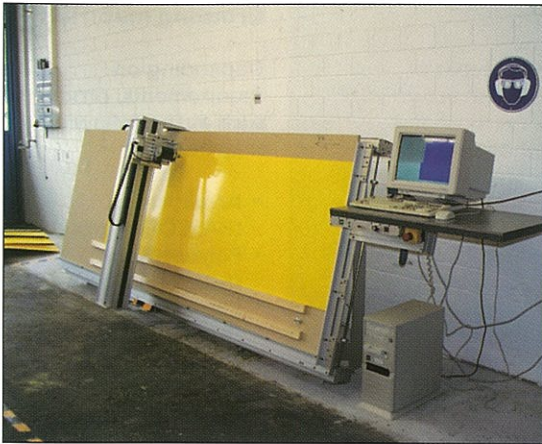
- Logical system of built-in components, simplified design
- No special pretreatment of concrete required
- Fixing in all weathers
- Less effort required for construction planning
- No interruptions in construction programme
- Savings in time for contractor
- Maximum reliability

RASCOtec injection channels

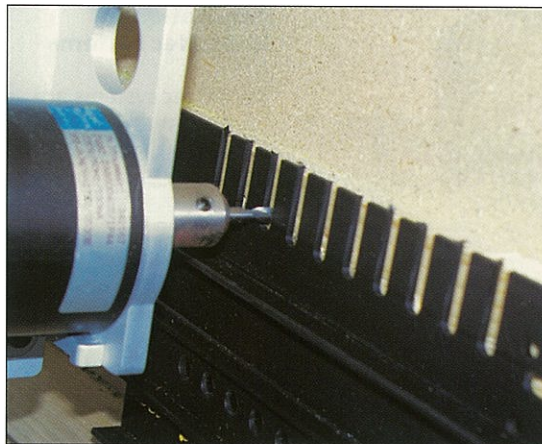
- No infiltration due to tight contact with „old“ concrete
- Direct drilling into channels, no formwork penetrations required
- Channel units simply butted to produce sections for grouting
- Separation of individual sections for grouting simply by leaving gap (min. 5 cm, max. 10 cm) between adjacent sections
- Fixing directly through channel by means of nail plugs or stud gun
- No special measures required for incorporation of units
- Logical system of built-in components
- High flexibility
- Regrouting possible at any time
- Small gravel pockets can usually be grouted at same time as channels
- Suitable for injection with a wide range of grouts
- Fixing to one-day-old concrete, i.e. no waiting times before concreting can continue
- No obstruction of steelfixing or formwork erection

RASCOtec ►
crack-inducing units
can be easily butt
welded, allowing all
shapes and lengths to
be produced.





▲ RASCOTec units are cut to required size using CNC technology.



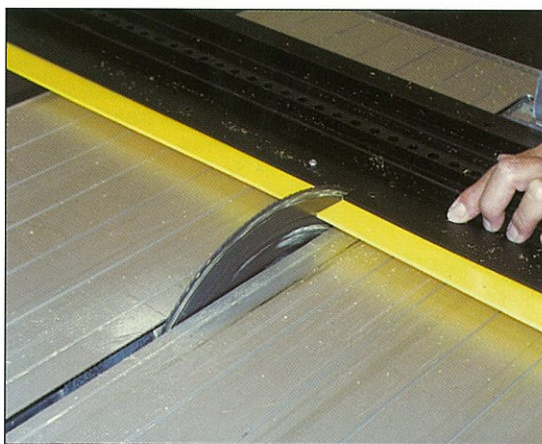
◀ This allows all shapes and sizes to be produced.

RASCOTec crack-inducing units and RASCOTec stop end units

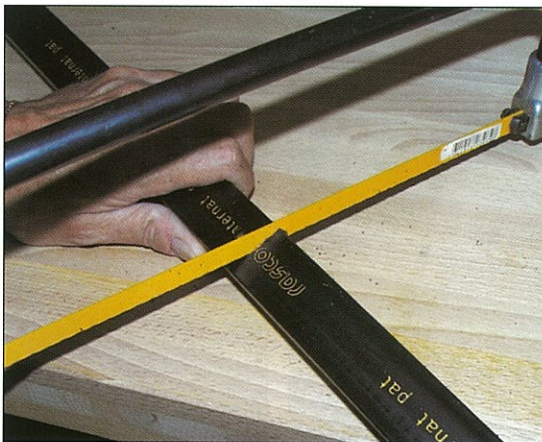
- Size of concrete bays and lifts etc. are no longer determined by the physical and chemical properties of concrete – unlimited daily production
- Concreting of unlimited lengths of wall
- Concreting of any size of slab in single operation
- No need for shrinkage gaps in walls and slabs
- No need for alternate bay („chequer-board“) construction for ground and suspended slabs
- Fewer expansion joints required
- Stop end units are left in place
- Savings compared to use of conventional stop ends
- No striking necessary

RASCOTec injection collars

- No special units for penetrations
- No change of material at penetrations (plastics, steel, stainless steel, cast iron, concrete etc.)
- Reliable waterproofing and no restraint in case of longitudinal thermal movement



◀ All standard woodworking machines can be used on RASCOTec units.



◀ Cutting by hand is just as simple.



◀ Connections are easily formed by riveting and welding.

RASCOtec

Special engineering applications

Application of RASCOtec systems

RASCOtec systems are used for waterproofing in special civil engineering works to prevent the infiltration of water, whether under pressure or not, or loss of liquid from containers, and also for structural bonding and grouting, e.g. with

- Tank-shaped structures subject to groundwater pressure
- Basement car parks
- Potable water containers
- Sewage treatment plants
- Soil water containers
- Drainage/sewage systems
- Shafts
- Underpasses
- Locks and sluices
- Bridges
- Aqueducts
- Tunnels
- Dams
- Power stations
- Headings etc.

for

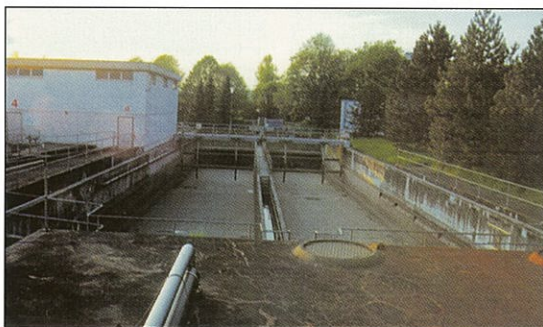
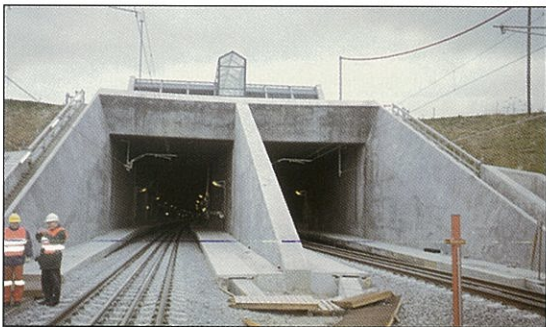
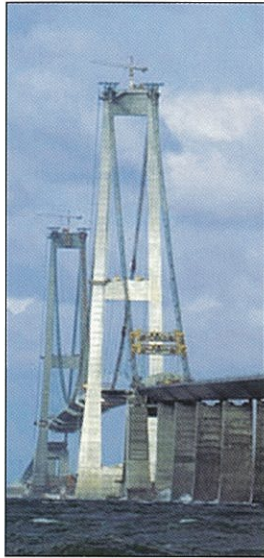
- All types of construction joint (vertical and horizontal)
- Major structural joints
- Shrinkage joints
- Expansion joints (combined system)
- Butt joints
- Division of concrete lifts in walls
- Division of concrete bays in slabs
- Junctions between elastic and rigid seals
- Joints between precast units
- Pipe and cable penetrations
- Pipe connections
- Underwater floodlights
- Groundwater relief pipes
- Piezometers

Grouting materials

Depending on requirements, products such as the following may be used:

- Acrylic resins (RASCOflex grouts)
- Polyurethanes (RASCOpur grouts)
- Epoxy resins (RASCOpox grouts)
- Microcements (RASCOsol)
- Bentonites etc.





RASCOtec

General building construction and civil engineering

Application of RASCOtec systems

RASCOtec systems are used for waterproofing in general construction to prevent the infiltration of water, whether under pressure or not, or loss of liquid from containers, and also for structural bonding and grouting, e.g. with

- Residential and industrial buildings
- Tank-shaped structures subject to groundwater pressure
- Basement car parks
- Swimming pools
- Underpasses
- Bridges
- Aqueducts etc.

for

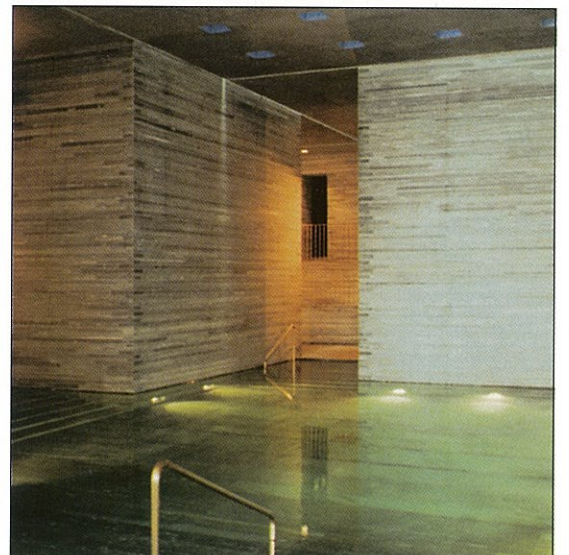
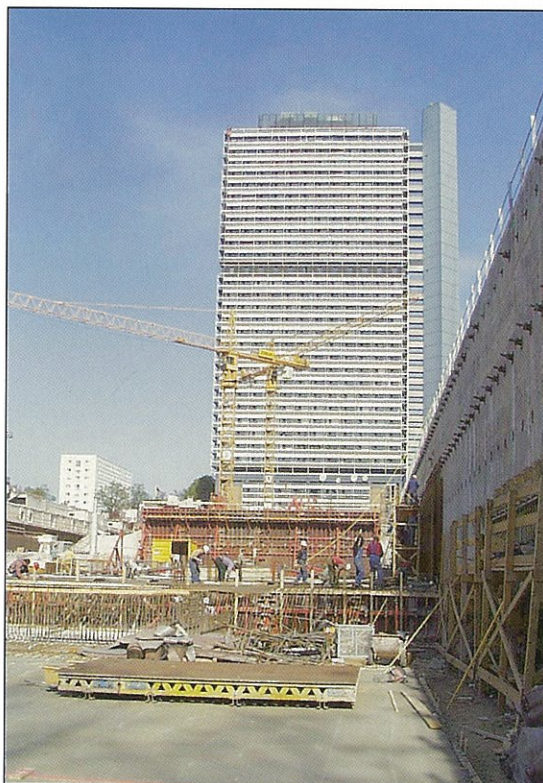
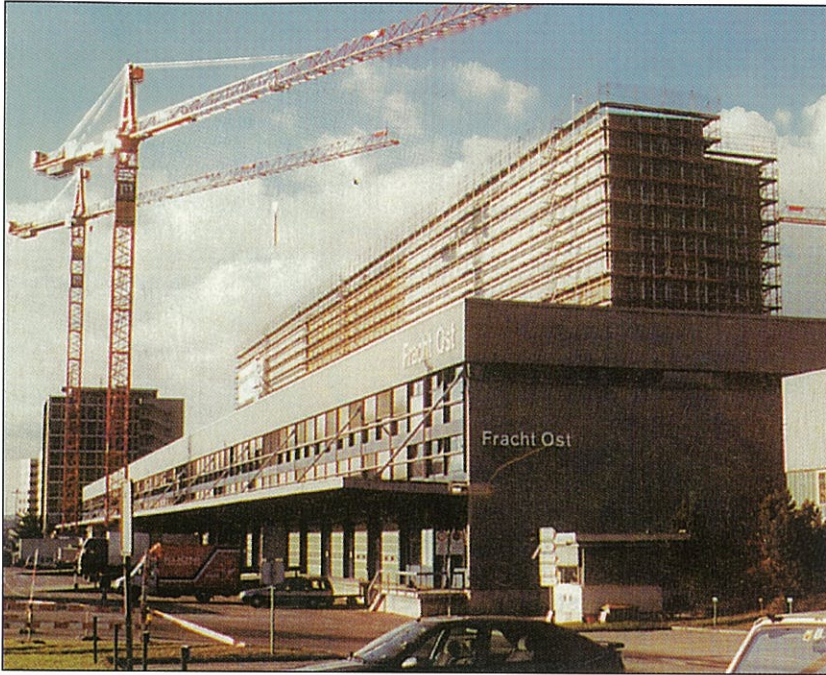
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System engineering
for waterproof structures.

For detailed information please request the relevant technical notes and test reports.

RASCOfec – the patented waterproofing system for all structures extending below groundwater level.

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