ROMEX®-SYSTEM-GUARANTEE (RSG)

REAL ADDED VALUE FOR FABRICATORS AND BUILDING OWNERS

Folgen Sie uns | Follow us

+49 (0) 2225 70954-20
sales@romex.de | **romex.de**

QUALITÄT
MADE IN GERMANY

ROMEX®

Basics

of permanent paved stone covering built using a bonded method

The correct setup

Traffic routes that are built using paving stones are part of the road construction sector. Road construction consists of calculation, building and maintenance of the road network for vehicles, bicycles and pedestrians. The main requirements of the users of traffic routes are safety and user comfort. This means that those that carry out road construction, need to make sure that the traffic routes are correctly constructed and maintained. The main properties that such traffic routes need to have are, strength, load-bearing capacity, frost resist-ance and to be level and nonslip – irrespective of the type of use and construction.

In order to achieve this, good planning, thorough work preparation, careful carrying out of construction as well as adherence to standard applicable regulations are a necessity. Paved stone coverings can be laid in a loose/unbonded way or as bonded construction. Unbonded laying is the general way of laying paved stones. Bonded paved stone coverings are used for special areas and have a number of advantages compared to unbonded paved stone coverings:

- pedestrians can safely walk on the paved stone surface
- weeds don't grow through the joints
- joints are not washed away by erosion
- good absorbtion of shear force without dislocation of paved stones
- resistant to street sweepers and high pressure cleaners

The technical applicable regulations have also been modified to reflect this development. In August 2007 the following paper was published: FGSV Work Paper "Surface coverings using paving stones and slabs in bonded construction" (Surface strengthening using bonded paved stone coverings and slab surfaces.) This ROMEX® publication aims to show in detail how the jointing and fixing of paved stones outdoors can be done using synthetic resin paving jointing mortars, and to inform you of this still relatively young, only 30 year old, method of jointing.

Subsoil/substructure

The existing ground (subsoil) must be professionally prepared for the paving structure to be laid on top of it, known as the superstructure. It must be profiled, level and load-bearing. This also applies to any substructure that may need to be constructed, e.g. due to special local conditions.

The professionally prepared surface of the subgrade/substructure is referred to as the 'subgrade'. The subgrade must have sufficient strength, at least 45 MPa, and must generally be profiled, i.e. have the same gradient and direction of slope as the subsequent pavement. The subgrade must be as level as possible so that water penetrating the superstructure does not remain in depressions for an unnecessarily long time, thereby compromising the load-bearing capacity and frost resistance of the paving structure. If the soil is susceptible to frost, the subgrade must be constructed with a gradient of at least 4% so that water can drain away from the superstructure more quickly. Deviations from the target height must not exceed +-3 cm (1.18 inches).

All layers above the surface, including the pavement, can be constructed with the standard slope applicable to the pavement. Depending on the type of fasteners used, the pavement must be constructed with a slope of 2.5%, 3.0% or 3.5%.

Paved surfaces in bound construction are made from building material mixtures with binding agents (bedding and joint mortar) for bedding and joint filling. Mixed construction methods in which only the bedding or only the joint filling consists of a building material with a binding agent do not comply with standard construction methods, but can be used successfully depending on local conditions. Paved surfaces in bound construction require special care and sound technical knowledge in the planning, tendering and selection of building materials as well as in the execution. Fastening elements for bound paved surfaces should not exceed the usual dimensions (maximum edge length 320 mm (12.6 inches)). There is not yet sufficient experience with bound paving surfaces with larger stones. In contrast to the unbound design, a bound paving surface behaves like a rigid slab (similar to concrete slab construction, therefore often referred to as 'rigid construction'). This must be taken into account when planning edge borders, built-in components and the formation of expansion joints.

Bedding and jointing mortar must be installed in such a way that they have the required properties in the finished structure. In particular, sufficient adhesive tensile strength must be achieved between the paving stones and the bedding mortar on the one hand and between the paving stones and the joint mortar on the other. The adhesive tensile strength is influenced by factors such as weather and installation conditions, the type, geometry and surface properties of the paving stones and the mortar composition. In order to assess the suitability of bedding and joint mortars, not only the product properties determined in the laboratory should be taken into account, but also the values determined under conditions similar to those on the construction site or on the finished structure. This applies in particular to the adhesive tensile strength values.

Bedding

The purpose of the bedding is to transfer the loads acting on the paving to the subgrade with sufficient resistance to deformation and to compensate for any remaining unevenness between the upper base course and the paving surface. Different types of mortar can be used to produce a bound bedding:

- Hydraulically bound mortar
- Plastic-modified, hydraulically bound mortar or
- Synthetic resin-bound mortar (fastest final hardening, good adhesion and flexural strength values)

The raw materials for each type of bedding mortar must comply with the relevant technical rules, e.g. standards. The basic suitability of a bedding mortar is assessed by determining certain product properties under defined laboratory conditions. Bedding mortars must meet certain requirements in terms of compressive strength, adhesive tensile strength, resistance to frost-thaw cycles and water permeability. These are described in the FGSV (German Association for Surface Stabilisation) information sheet 'Surface stabilisation with paved surfaces and slabs in bound form' (2018 edition). The information sheet also provides recommendations for compliance with the requirements in the finished structure. The processing of bedding mortar generally requires a sufficiently high temperature of the air, the substrate and the materials to be processed. This is at least +5 °C (41 °F) for hydraulically bound bedding mortars and at least +1 °C (34 °F) for synthetic resin-bound bedding mortars (observe manufacturer's instructions). If special bedding mortars are used, processing at lower ambient temperatures may be possible. At lower temperatures, it must generally be taken into account that the hardening time of the bedding mortar is extended. Bedding mortars must not be processed on frozen substrates (< 0 °C (32 °F)). For hydraulic and synthetic resin-bound bedding mortars, the work must be coordinated so that the bedding mortar does not start to set until the paving stones have been aligned in height and fixed in place.

ZTV road construction

Additional, technical contractual conditions

Background and content of the regulations

With the ZTV-Wegebau (Additional technical contract conditions for the construction of paths and squares outside road traffic areas), the standardized and proven construction methods of landscaping, that deviate from the then some of which ATV DIN 18318, have been used as standard for decades and are now presented in a set of rules. This means that jointing with synthetic resin pavement jointing mortar is one of the standards for pavement jointing alongside the traditional jointing methods with sand/grit or cement.
The ZTV-Wegebau thus represents the state of the art and can be used as a contractual condition. ROMEX® pavement jointing mortar fulfills the requirements of the ZTV.

The ZTV is intended to supplement the ATV (General Technical Terms of Contract) in Part C of the German Procurement and contract regulations for construction services) (VOB/A). According to Section 8 (5) VOB/A, special agreements may also be included in the ZTV if similar conditions apply to certain construction works. The ZTV-Wegebau provides the contracting parties with a contractual basis, including the VOB/B, but also without a separate agreement, which can meet the requirements for paved surfaces and slab coverings with lower traffic loads. It also contains requirements and regulations for the so-called „bonded construction methods". In addition, completely new and supplementary requirements are defined for the application of the bonded construction method, in particular for the production and execution of bedding and jointing materials.

Reasons for the ZTV:

- DIN 18318 only considers areas affected by traffic and heavy goods vehicles
  - > Gap in the system for landscaping and low-impact areas
- Lack of consideration of the tied construction method
  - > Production of the bedding
  - > Creating the joint
  - > Requirements for the materials to be used

A distinction is made between the following „load classes":
Usage category N1: Surfaces that can be walked on and not driven on by motor vehicles outside of road traffic areas (e.g. terraces, garden paths, paths in domestic gardens, seating areas in parks).
Usage category N2: Trafficable surfaces up to 3.5 t permissible total weight outside of road traffic areas (e.g. garage access roads, car parking spaces).
Use category N3: Trafficable surfaces like N2, but with occasional use by vehicles up to 20 t gross vehicle weight outside of road traffic areas (e.g. care, maintenance and rescue routes as well as fire department, garage and building access roads).

The following construction methods are discussed in detail:
Unbonded construction method Bedding and joint are unbound on bonded/unbonded base course.
Fully bonded construction method Bedding, joints and (upper) base course are bonded.
Mixed construction method with bonded bedding Base course is unbound, joints and bedding are bound.
Mixed construction with unbonded bedding Base course and bedding are unbound, the joints are bound.
Ceramic tiles Regulation of the laying of ceramic tiles from 2 cm tile thickness for use categories N1 and N2.
Water-permeable coverings Areas with paving slabs or slab coverings as well as honeycomb and grid elements whose joints, openings or structure with a high number of spores have increased water permeability.
Greenable coverings Surfaces with paving or slab coverings as well as honeycomb and grid elements whose joints or openings can be planted with vegetation.

The following binders are suitable for bonded joints according to both sets of regulations:

- **Cement:** ROMPOX® - 301 CEM-PF
- **Reactive resins based on epoxy resin:** ROMPOX® - DRAIN, ROMPOX® - D1, ROMPOX® - D2000, ROMPOX® - D3000, ROMPOX® - TRAFFIC V2, ISATEC® - FLEX
- **Polybutadiene:** ROMPOX® - EASY, ROMPOX® - ECOFINE

Water-permeable, bound joints are to be produced with binders made of reactive resin or polybutadiene.

Movement joints

in the bonded construction method

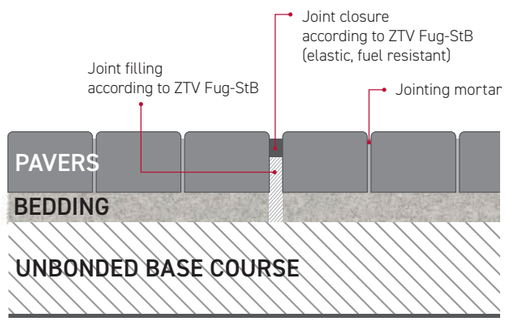
The movement joints required in the bonded construction method have the task of absorbing thermal stresses in order to reduce wild cracks. The occurrence of cracks both in the joint area and within the fastening elements cannot be prevented even by movement joints. The arrangement of the movement joints depends on the block formats and the geometry of the surface and is generally between 4 and 8 m apart. The larger the block formats, the smaller the distance between the movement joints should be. The minimum width of the movement joints is 10 mm. Movement joints from the superstructure must be taken over into the joint. Irrespective of the joint arrangement, movement joints must be created along overhanging components and to rigid edgings to decouple structures and components.

Movement joints can be created according to the ROMEX® system and the german regulation (ZTV Fug-StB) as follows:
1. Apply the lower joint filling with joint tapes/joint roundcord/non-absorbent foam profiles as an auxiliary material. The auxiliary material is fixed 10-20 mm below the stone surface.
2. A permanently elastic joint sealant is then compacted and applied.
3. To visually match the movement joint to the overall jointing, a handful of mortar sand is applied to the compacted mortar using the scattering method before it is mixed with the synthetic resins. The scattered sand is lightly pressed on and the excess carefully removed. Slight, product-related color deviations will even out over time.
4. Any cracks that occur can be easily repaired using the same method during maintenance or repair work.

Connection and movement joints should always be filled with an elastic joint material according to DIN 18540. The color of the elastic joint material should be chosen to match the selected ROMEX® paving mortar as closely as possible. When using natural stone, compatibility should be checked in advance. Follow the instructions of the manufacturer of the joint sealant. According to DIN 52460, the joint sealant used in the movement joints should be checked at regular intervals and replaced if necessary to avoid consequential damage. The sealant is not covered by the warranty.

Movement joints in paving and slab coverings:

Movement joints in grit and gravel-reinforced surfaces:



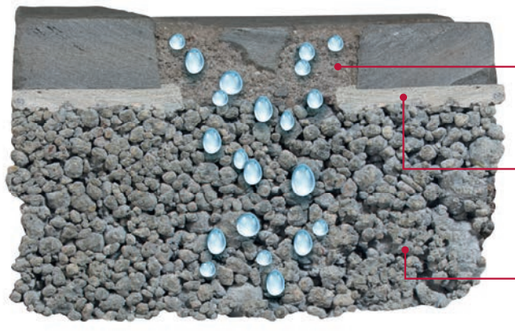
ROMEX®-SYSTEM-GUARANTEE (RSG)

Play it safe

Real added value for fabricators and building owners

Two essential aspects of jointing are that the joint is only as good/strong as its superstructure and substructure and that pavement jointing mortar does not absorb any settlement of the surface. A paved surface must be able to transfer the forces acting on it, e.g. from traffic movements, downwards in a dimensionally stable manner. All jointing mortars can only have a supporting or securing effect here, but cannot prevent damage. Therefore, the requirements for a functioning paving or slab surface are careful planning, taking into account the applicable regulations, as well as flawless workmanship and proper use of the surface. According to the valid german regulations ZTV-Wegebau, VOB and ATV DIN 18318:2019 as well as the guideline M FP and M FBgeb of the German Road and Transportation Research Association different construction methods are possible depending on the use/load. ROMEX® products can be used to create the appropriate construction structures for each of these construction methods. If our products are used as a system, the ROMEX®-SYSTEM-GUARANTEE (RSG for short) applies.

RSG offers real added value and security for installers, clients, planners and specialist companies. When laid professionally in accordance with the applicable regulations using our system consisting of bedding mortar, bonding slurry and pavement jointing mortar, we offer a 10-year guarantee on surfaces within the scope of the ZTV-Wegebau. This means that we effectively „take over" the fiveyear guarantee on the construction work that companies have to give their end customers anyway in accordance with the German Civil Code, and give installers and specialist companies an additional five-year guarantee on the surface.



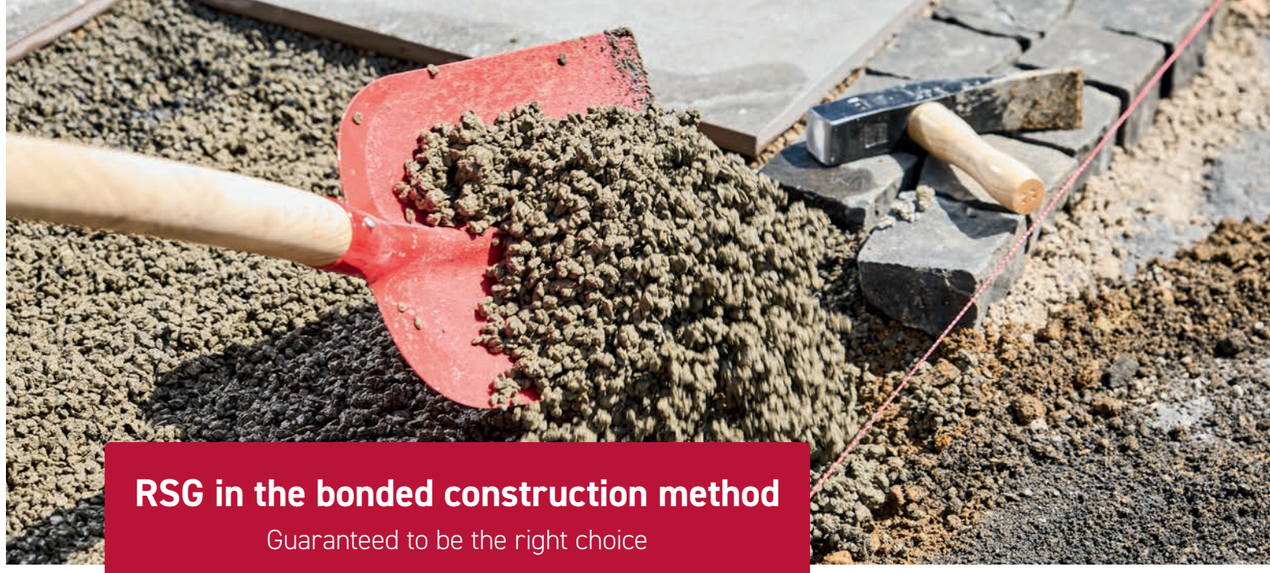
THE ROMEX® SYSTEM

3 Pavement jointing mortar
- No weed growth
- Water-permeable

2 Polymer-modified trass-containing adhesion elutriant
- High composite safety
- Suitable for all stone coverings

1 Trass bedding mortar
- Prevents frost damage
- For pedestrian and traffic loads
- Highly water-permeable

ROMEX® is the first and only manufacturer in the field of paving and slab laying in gardening and landscaping to offer its customers such a guarantee. Take advantage of this unique added value for you and your customers! Contact us for further information and detailed guarantee conditions.



RSG in the bonded construction method

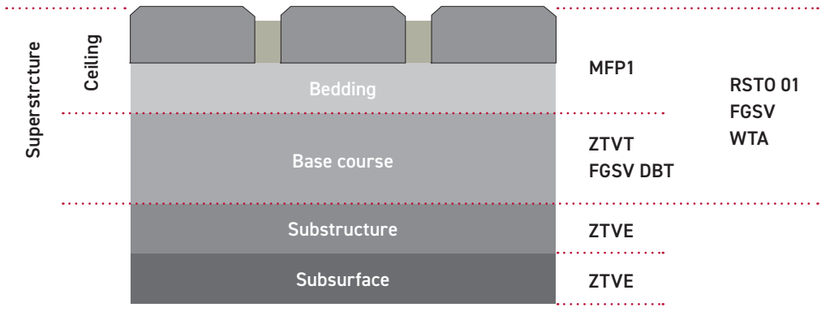
Guaranteed to be the right choice

For all paving and slab coverings made of natural and concrete stone and ceramics

The ROMEX®-SYSTEM-GUARANTEE (RSG) is mainly used within the scope of the german guideline ZTV (Additional technical contract conditions for the construction of paths and squares outside road traffic areas). The ZTV-Wegebau describes all common construction methods for paving and slab coverings for non-public areas and is of great importance for the paving contractor, as it regulates all designs for private clients. Permissible construction methods include the fully bonded construction method and the mixed construction method with bonded bedding for areas that are walked on and for areas that are driven on with vehicles weighing up to 3.5 tons. Ceramic slabs in usage category N1 with a nominal thickness of less than 3 cm must be laid in a bonded bedding and with a fixed joint.

Our high-quality trass bedding mortars are used in fully bonded construction and mixed construction with bonded bedding. These include ROMPOX® - 302 CEM-TB, a ready-mixed bedding mortar that is only mixed with water, and ROMPOX® - 303 CEM-TC, a compound for producing a bedding mortar, as a more cost-effective alternative for larger construction projects. Both variants are highly permeable to water. This means that, on the one hand, water and moisture cannot rise capillary in the bedding layer and, on the other hand, water that penetrates the surface is drained downwards. The trass mineral binds lime particles from the Portland cement and neutralizes them. The major advantage is the greatly reduced risk of waterlogging, efflorescence and discoloration compared to conventional Portland cement products without trass. Our plastic-modified bonded slurry ROMPOX® - 304 CEM-HS is used as a bonded agent between the bedding and the covering. The final step is one of our pavement jointing mortars that meets the requirements. This system, which has been tried and tested for decades, forms the basis of our RSG. With the professional installation of these products, you can create a durable, permanently functional surface and also benefit from our system guarantee.

WHO REGULATES WHAT?



When using ROMPOX® - 303 CEM-TC, in the ROMEX®-SYSTEM-GUARANTEE, aggregates $^{2}/_{5}$; $^{2}/_{8}$; $^{4}/_{8}$ or $^{5}/_{8}$ mm (usually rolled gravel/grit) can be used, which are tested and certified by the ROMEX® laboratory before use.

ROMEX® recommends: Get your bedding mortar from certified concrete filling stations!

ROMEX® SYSTEM BONDED-1-PRIVATE

For the bonded construction of paving and slab coverings
within the usage categories 1–3 (N1/N2/N3) according to ZTV-Wegebau.
For private areas (driveway, patio).

Usage category N1:
Accessible non-motor vehicle pavers outside areas of road traffic (eg. patios, garden paths, paths in the home garden area, seats in parks).

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 20 mm | 3/4"

7 **ROMEX®-Pavement jointing mortar**
(according to ATV DIN 18318 requirements)
Permitted: EASY, ECOFINE, DRAIN, D1
Joint width: 3-10 mm I Compressive strength: ⩾ 5 N/mm²

6 **Ceramic plate**
Minimum panel thickness: 2 cm
Slip resistance according to DIN 51130: at least R10

5 **ROMEX®-Adhesion elutriant**
Adhesive tension: Without loss of bond

4 **ROMEX®-Trass bedding** (in acc. with ATV DIN 18318 requirements)
Compressive strength: ⩾ 4 N/mm² on the finished product
Thickness: ⩾ 6 cm

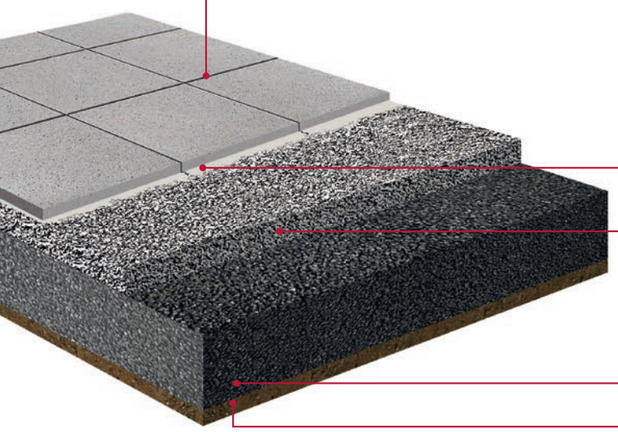
3 **Base course**
Gravel base course 0.32 mm or 0.45 mm
Thickness: ⩾ 10 cm

2 **Frost protection layer**
Gravel base course 0.32 mm or 0.45 mm
Minimum thickness: 27-30 cm depending on frost sensitivity class

1 **Contiguous floor**

Usage category N2 & N3:
Accessible surface coverings for vehicles up to 3.5 t permissible gross weight outside areas of road traffic (eg. garage access, car parking spaces) as well as occasional vehicle traffic up to 20 t permissible total weight with wheel loads ⩽ 5 t outside of road traffic areas (eg. care, maintenance and emergency routes as well as fire brigade, garage and building driveways).

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 80 mm | 3 1/8"



5 **ROMEX®-Pavement jointing mortar**
Depending on the application:

- ROMPOX® - ECOFINE (Usage category N2)
- ROMPOX® - DRAIN (Usage category N2)
- ROMPOX® - D1 (Usage category N3)

Joint depth = fully jointed
(Consumption depending on stone format and joint dimension)

3 **ROMPOX® - 304 CEM-HS**
(Consumption: approx. 5 kg/m² | 1.02 lb/sq ft)

3 **ROMEX®-bedding products:**

- ROMPOX® - 302 CEM-TB ***or***
- ROMPOX® - 303 CEM-TC*

Layer thickness bedding about 4–6 cm | 1 1/2"– 2 3/8"
(Consumption: approx. 100 kg/m² | 20.48 lb/sq ft
or 20 kg/m² | 4.10 lb/sq ft)

2 **Drainage asphalt or drainage concrete layer** (15 cm | 6")

1 **Base/substrate**

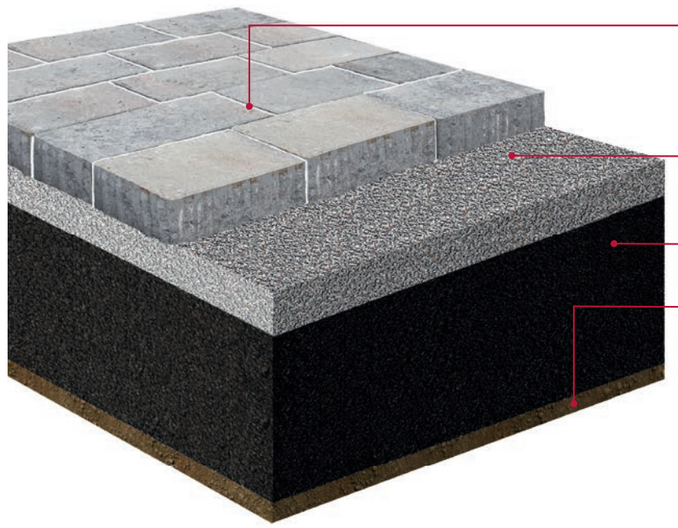
* When using ROMPOX® - 303 CEM-TC aggregates with grainsizes 2/5; 2/8; 4/8 oder 5/8 mm
(usually rolled gravel/grit), which are tested and certified by the ROMEX® laboratory before use can be used.

ROMEX® SYSTEM UNBONDED-1-PRIVATE

For the unbonded construction of paving stone and slab coverings within
the usage categories 1–3 (N1/N2/N3) according to ZTV-Wegebau.
For private areas (driveway, patio).

Usage category N1:
Accessible non-motor vehicle pavers outside areas of road traffic (eg. patios, garden paths, paths in the home garden area, seats in parks).

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 50 mm | 2"



4 **ISATEC®-FLEX**
Joint depth min. 3 cm as joint closure
Minimum joint width 5 mm | 1/4",
(Consumption depending on stone format and joint dimension)

3 **Bed**
3–5 cm | 1 1/4"– 2" aggregates 0/4; 0/5 or 0/8 mm
according to DIN 18318

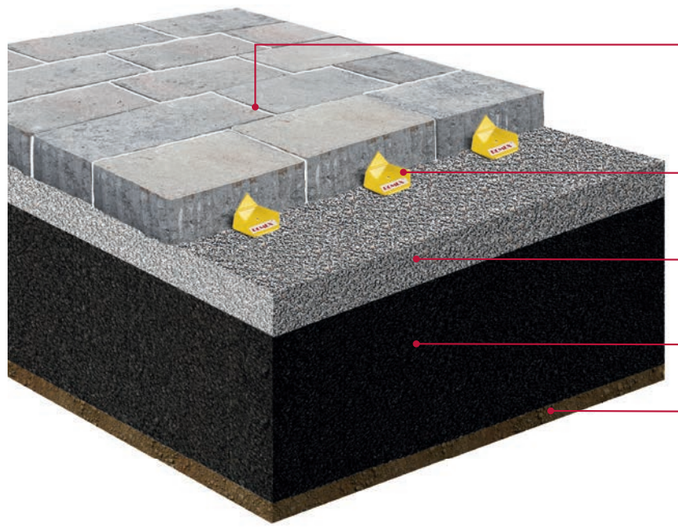
2 **Base course/frost protection layer**
according to ZTV-Wegebau

1 **Base/substrate**

Usage category N2 & N3:
Accessible surface fastenings for vehicles up to 3.5 t permissible gross weight outside areas of road traffic (eg. garage access, car parking spaces) as well as occasional vehicle traffic up to 20 t permissible total weight with wheel loads ⩽ 5 t outside of road traffic areas (eg. care, maintenance and emergency routes as well as fire brigade, garage and building driveways).

Usage category N2:
Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 60 mm | 2 3/8"

Usage category N3:
Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 80 mm | 3 1/8"



5 **ISATEC®-FLEX**
Joint depth min. 3 cm as joint closure
Minimum joint width 5 mm | 1/4",
(Consumption depending on stone format and joint dimension)

4 **ISATEC® - STOP displacement protection**
(Needs assessment based on site plan and hazardous areas)

3 **Bed**
3–5 cm | 1 1/4"– 2" aggregates 0/4; 0/5 or 0/8 mm
according to DIN 18318

2 **Base course/frost protection layer**
according to ZTV-Wegebau

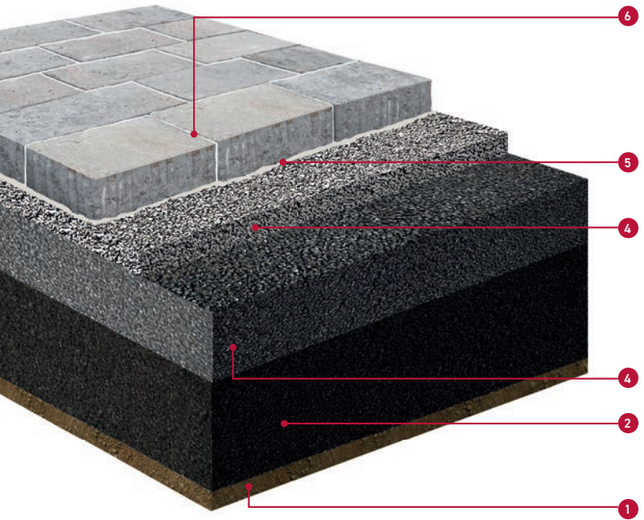
1 **Base/substrate**

ROMEX® SYSTEM BONDED-2-PUBLIC

For the bonded construction of paving stone
and slab coverings from load class 0.3 in accordance with RStO 12.
For public areas (roads, paths, squares).

Load class Bk 0.3 to 1.8:
Passenger car traffic including occasional heavy traffic, through traffic by vehicles of the entertainment industry, eg residential and residential roads, village main street, district and collection roads.

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 80 mm | 3 1/8"



6 **ROMEX®-Pavement jointing mortar**
Depending on the application fully jointed:
- ROMPOX® - D2000 (and higher quality)

Minimum joint width 5 mm | 1/4"
(Consumption depending on stone format and joint dimension)

5 **ROMPOX® - 304 CEM-HS**
(Consumption: approx. 5 kg/m² | 1.02 lb/sq ft)

4 **ROMEX®-bedding products**
- ROMPOX® - 302 CEM-TB ***or***
- ROMPOX® - 303 CEM-TC

Layer thickness bedding approx. 5–7 cm | 2"–2 3/4"
(Consumption: approx. 110 kg/m² | 22.53 lb/sq ft (TB)
or 22 kg/m² | 4.51 lb/sq ft (TC))

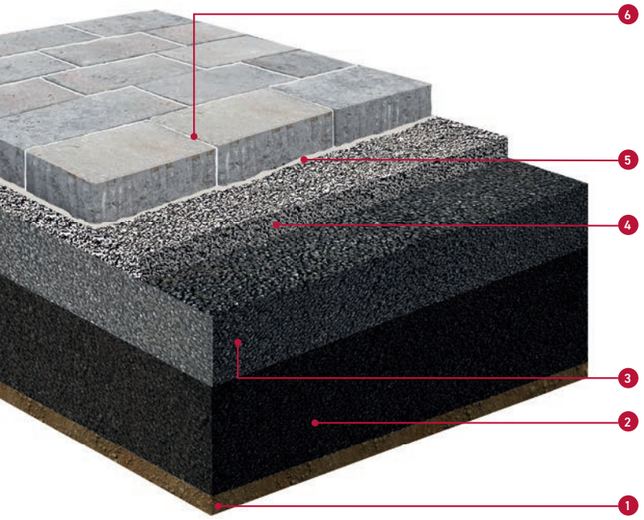
4 **Drainage asphalt or drainage concrete layer** (15 cm | 6")

2 **Frost protection layer** (30 cm | 11 3/4")
from gravel or crushed stone, grit, sand mixture
E_{V2} > 120 MPa/m² | 17 405 psi

1 **Base/substrate**

Load class Bk 1.8 to 3.2
and special cases such as bus stations and bus stops as well as roundabouts.
Passenger car traffic including occasional heavy traffic up to 65 buses/day, eg. commercial street, main shopping street, local commercial street and heavy traffic up to 130 buses/day, eg. local access roads, commercial street, main shopping street, local commercial street.

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 100 mm | 4"



6 **ROMEX®-Pavement jointing mortar**
Depending on the application fully jointed:
- ROMPOX® - TRAFFIC V2

Minimum joint width 8 mm | 3/8"
(Consumption depending on stone format and joint dimension)

5 **ROMPOX® – 304 CEM-HS**
(Consumption: approx. 5 kg/m² | 1.02 lb/sq ft)

4 **ROMEX®-bedding products**
- ROMPOX® - 302 CEM-TB ***or***
- ROMPOX® - 303 CEM-TC*

Layer thickness bedding approx. 5–7 cm | 2"–2 3/4"
(Consumption: approx. 110 kg/m² | 22.53 lb/sq ft (TB)
or 22 kg/m² | 4.51 lb/sq ft (TC))

3 **Drainage asphalt or drainage concrete layer** (15 cm | 6")

2 **Frost protection layer** (30 cm | 11 3/4")
from gravel or crushed stone, grit, sand mixture
E_{V2} > 120 MPa/m² | 17 405 psi

1 **Base/substrate**

* When using ROMPOX® - 303 CEM-TC aggregates with grainsizes 2/5; 2/8; 4/8 oder 5/8 mm (usually rolled gravel/grit), which are tested and certified by the ROMEX® laboratory before use can be used.

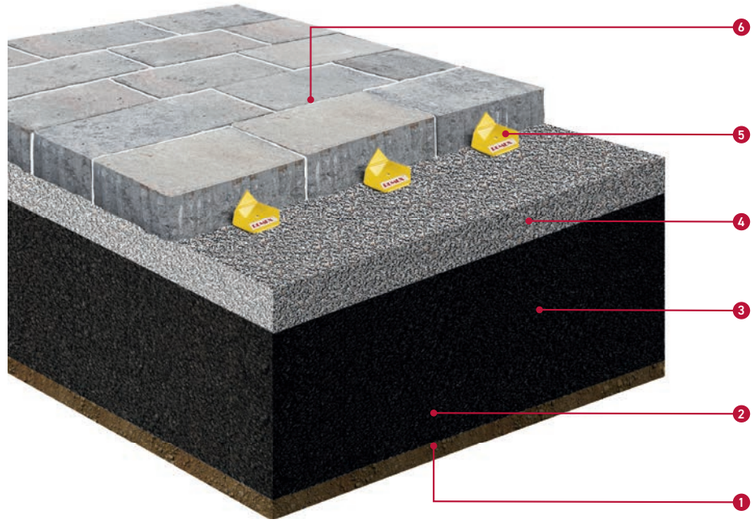
ROMEX® SYSTEM UNBONDED-2-PUBLIC

For the unbonded construction of paving
and slab coverings from load class 0.3 in accordance with RStO 12.
For public areas (roads, paths, squares).

Load class Bk 0.3 to 3.2
and special cases such as bus stations and bus stops as well as roundabouts.
Passenger car traffic including occasional heavy traffic up to 65 buses/day, eg. commercial street, main shopping street, local business street as well as heavy traffic up to 130 buses/day, eg. local access roads.

Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height)= 100 mm | 4"

Special cases such as bus stations and bus stops as well as roundabouts:
Minimum requirement for fastenings/surface covering: Minimum nominal thickness (stone height) = 120 mm | 5"



6 **ISATEC® - FLEX**
Joint depth min. 3 cm as joint closure
Min. joint width 5 mm | 1/4"
(Consumption depending on stone format and joint dimension)

5 **ISATEC® - STOP displacement protection**
(Needs assessment based on site plan and danger areas)

4 **Bedding**
3–5 cm | 1 1/4"–2" aggregates
0/4; 0/5 or 0/8 mm according to DIN 18318

3 **Supporting layer of gravel** (30 cm | 11 3/4")
or gravel, grit, sand mixture
E_{V2}= 150 MPa/m² for paving and 180 MPa/m²
for tile coverings

2 **Frost protection layer of gravel** (20 cm)
or gravel, grit, sand mixture
E_{V2} > 100 MPa/m²

1 **Base/substrate**

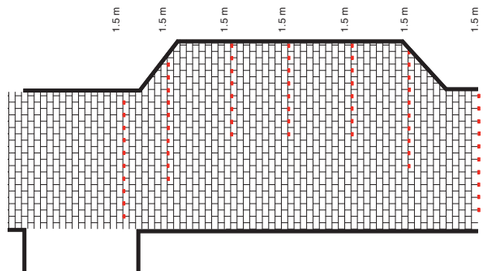
ISATEC® - STOP displacement protection

The ISATEC® - STOP displacement protection is the most cost effective way to prevent damage caused by shifts in paving stones and thus to fulfill the „current technology R2", as described in the leaflet for surface fastenings with large formats (MFG 2013).

The ISATEC® - STOP displacement protection was honoured with the Innovation Medal at the GaLa-Bau trade fair in Nuremberg in 2014.

ISATEC® products are protected by patent.

Deutsches Patent- und Markenamt



ROMEX®-Service:
Our experienced planning engineering staff will be happy to assist you with the positioning of the ISATEC®-STOP safety anchors. Of course, we will also prepare a planning proposal that takes into account the traffic load, the driving relationships and the laying pattern.

A FEW STEPS TO THE GUARANTEE

The ROMEX® SYSTEM-GUARANTEE (RSG) is a real competitive advantage for every customer and at the same time means a high level of security.

1

Registration of the construction project:

Request the ROMEX® SYSTEM WARRANTY APPLICATION (PDF form) and complete it in full.
Your ROMEX® contact persons in the office and in the field will be happy to assist you.
Simply send by e-mail to: info@romex.de.
Alternatively, you can of course print out the application form, fill it in by hand and fax it to us at: 02225 70954-19.

2

Registration of the construction project:

The application is promptly registered and checked by the technical department of ROMEX® and possible open questions will be clarified immediately. The registration number will be entered by ROMEX® into the application, signed and sent to your e-mail address.

3

After completion of the construction project:

In order for the guarantee to become effective and the certificate to be issued please send the following documents and photos in full to ROMEX® (by e-mail or post):

- Photo of completed area
- Acceptance certificate
- Copies of the dealer invoice of the purchased ROMEX® products as well as of the fixed elements (paving-slab covering)

4

Sending/handing over of the certificate:

As soon as all requirements for the fullfillment of the guarantee are met, we will send/hand over the guarantee certificate to you.