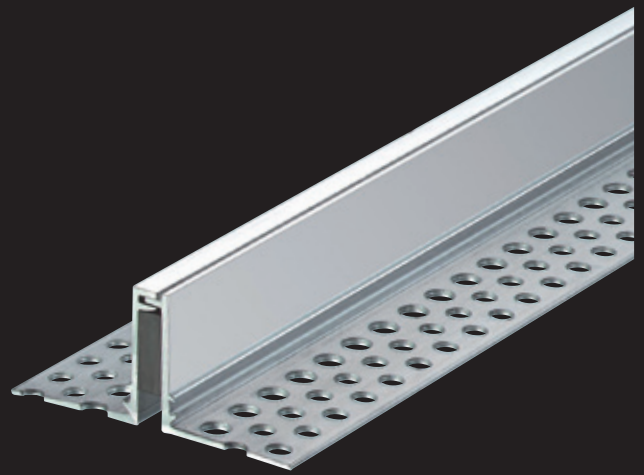


# COMPARTMENTALISATION JOINTS

*FOR FLOOR FINISHES*



**COMBE** ESF 10 AL



**COMBE** ESF 16 AL



**COMBE** ESF 27 AL



**IMPERIALSEALS**

## Forward



With the many building projects sprouting all over the globe, it would be difficult for professional Architects and Engineers to monitor the good functioning of products which was deemed suitable during the design stage of projects.

Alternatively professionals could be influenced by Builders insistent submissions of less expansive products for use in projects. It is common knowledge that when alternative products are submitted for approval for use, it stands predominantly only to benefit the builder in terms of cost saving for items which they have unfortunately not included or have under-priced during the bidding stage.

As a leading supplier of System for joints in building structures, we have the explicable obligation to inform unsuspecting professionals of ill-suited products which have a propensity for non-fulfilment of purpose in the shorter or longer term in building structures.

With some poignant facts and photographs of products in completed projects depicting excruciating failed and failing preformed PVC profiles and Stainless Steel / Neoprene profiles in use, we hope to prevent the duplicity of existing failing product selection practices for the formation and sealing of Compartmentalisation joints in building floor finishes.

DON QUEK



## IMPERIALSEALS

The build-up of layered composites needed to complete floor finishing over concrete floor slabs requires the utilisation of:

1. **Floor levelling screeds** which are made up of cement and sand. Screeds are normally used for the topping up of structural floor slabs to the required finishing levels to provide a good finishing plane for the installation of Floor Finishing's such as Ceramic tiles, Granite, Marble, synthetic sheeting's, polymer overlays and coatings.
2. **Bedding Adhesives**  
Polymer-modified adhesives are widely accepted in the building industry and are often referred to as thin-set mortars for the bedding of ceramic tiles or stones. The blended polymers interact with cement components to improve the physical and mechanical properties in increased adhesion, reduced shrinkage and lower water absorption. In most cases thin sets are suitable for wet or dry installations. Polymer additives add strength and flexibility to cement and sand mortars, without which these bedding mortars would lack adhesion to substrate and will crack easily.
3. **Floor Finishing**  
Tiles are manufactured from clay or other minerals into thin flat slabs of varying shapes and thickness of between 6 mm to 40 mm. They are generally sufficiently wearable and durable to withstand foot and wheel traffic and are coloured and glazed to provide finishing aesthetics to internal walls and floors of building structures.

The three blended composites and the supporting base which is generally the concrete structural slab or brick walls possess different property characteristics during its curing and cured state, each component exhibits different levels of coefficient of thermal expansion.

As such, these build-up of layered overlays encompassing large areas of concrete floor slabs necessitates the formation of joints at intervals which are necessary to undertake and allow movements of the mass to dissipate into pre-emptive relief joints designed by professional Architects and Engineers.

Without due considerations in detailing for joint formation and sealing, the inevitable and unnecessary appearance of cracks and upheaving of floor finishes will but occur.

### GUIDE LINES FOR THE SPACING AND FORMATION OF JOINTS IN TILED SURFACES

- Interior tile works: 6.96 meters to 7.62 meters in each direction.
- Exterior tile works: 2.43 meters to 3.66 meters in each direction.
- Interior Tile works exposed to direct sunlight or moisture: 2.43 meters to 3.66 meters in each direction.
- Interior or exterior tile works which abuts restraining surfaces such as perimeter walls.
- Interior or exterior tile works between dissimilar floor finishes, interior or exterior curbs, column and pipes.

### GUIDE LINES FOR TILE OR OTHER FINISHES OVER STRUCTURES (HORIZONTAL AND VERTICAL)

- Compartmentalisation joints
- Expansion joints
- Seismic joints

These joint must be allowed to continue through the tile or other finishing works.

Tiled or finishing works should stop at the edge of Compartmentalisation joints, Expansion joints and seismic joints.

Joints must never be allowed to be covered up or made narrower with floor finishes. The joint width must conform to the design engineers prescribed recommendation and not be tampered with.

Compartmentalisation joints for floor finishes is unlike structural expansion joints or seismic joints which are normally detailed by Professional Architects.

Imperialseals UK Pte Ltd with over a quarter century of experience and representing renown manufacturers from well developed countries is constantly developing the much needed understanding of systems for compartmentalisation joints, expansion joints, and seismic joint for building structures throughout the region.

Cement and sand screeds or plaster used for the levelling of structural concrete slabs exhibit many surface cracks. These cracks are formed by uncontrollable shrinkages .

Shrinkage cracks are the result of the cement mortar volume decreasing as water is lost from within the mortar mixture. These cracks can still occur some months after the screed layer has been laid.

However, the more rapid the drying process the more likely it is that shrinkage cracks will develop. The same type of cracking occurs in many other situations where moisture is lost from its structure. (E.g. Clay soils will crack in times of low rainfall).

### GUIDE LINES FOR EXPANSION JOINT WIDTH AND FORMATION OF JOINTS IN FLOOR AND WALL TILED SURFACES

- **Exterior floor and wall tiles**

For length of 2.44 meters on centres : joint width 9.5 mm

For length of 3.66 meters on centres : joint width 12.7 mm

Guide Line:

Minimum widths must be increased by 1.59 mm for each 9.49 °C of tile surface temperature change greater than 37.78 °C between summer high and winter low. (Decks exposed to the sky in northern USA usually require 20 mm wide joints on 3.66 m centres)

- **Interior floor quarry and paver tiles**

Joints width could be similar to grout joints but must not be less than 6.35 mm wide.

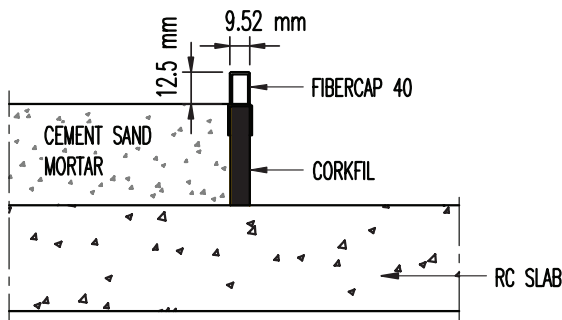
- **Interior floor ceramic, mosaic tiles and glazed wall tiles**

Joint width should not be less than 6.35 mm

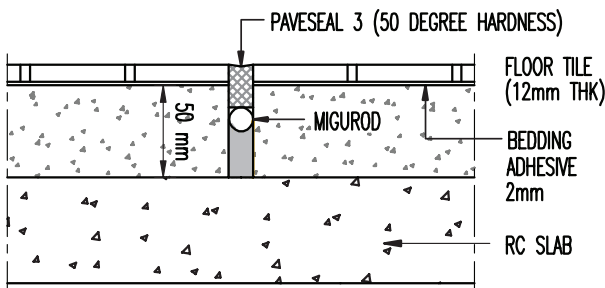


**Installation of Compartmentalisation Joints in tile works:**

- Predetermine the thickness of the tile to be used.
- Predetermine the thickness of the required bedding adhesive.
- Determine the thickness of cement and sand mortar necessary to be laid over the reinforced concrete slab in order to achieve the finishing level.
- Use joint former Corkfil or Fiberfil with Fibercap 40 to form the required finishing 9.5 mm wide joint.
- Cut Corkfil to required height and install Fibercap 40 to form the 9.5 mm wide required joint width.
- Following the removal of formwork, attach the prepared joint filler with Fibercap 40 to the side of the exposed mortar.
- Proceed with the pouring and levelling of the next Bay.



**INSTALL FIBERCAP WITH CORKFIL TO SIDE OF SCREED**



**INSTALL FLOOR FINISHES WITH PAVESEAL 3 SEALANT**

**DEFINATION OF MOVEMENT JOINT TYPES**

The American Concrete Institute has defined the following joints as:

**Construction Joint**

The surface where two successive placement of concrete meet.

**Contraction Joint**

Is a formed, sawed or tooled open joint on a horizontal concrete structure to create a weakened plane to regulate the location of cracking resulting from the dimensional change of different parts of a concrete structure.

**Control Joint**

Is similar as Contraction Joint.

**Expansion Joint**

Is a separation provided between adjoining parts of a structure to allow for movement where expansion is likely to exceed contraction.

It is also applied to a separation between concrete apron or pavement slabs on grade.

Expansion joints widths are formed with compressible fillers such as Corkfil or Fiberfil and sealed with Paveseal 1, 2 or 3 for apron and pavement joints.

Expansion joints in building structures should adopt the use of mechanical joint profiles (such as is found in Imperialseals range of mechanical joint profiles) due mainly to excessive anticipated movement considerations.

Consideration of additional needs to joints of all types must be given with the provision of:

- Water tightness of the joint at different levels so as to prevent water infiltration of liquids through joints
- Fire rating to joints to prevent the spread of flames and smoke.
- Withstand Trafficking.

Subject to requirements, most profiles are designed for either foot trafficking, plastic wheel trafficking and vehicle trafficking.

Expansion joints are also known as Isolation Joints when they are intended to allow for independent movement to take place between adjoining structures

**Isolation Joint**

Is a separation between adjoining parts of a concrete structure at a designated location to prevent undue interference of structures with allowable anticipated movements in three directions to avoid collision of the structural mass and causation of needless fractures.



## IMPERIALSEALS

### FORMATION AND SEALING OF FLOOR TILE EXPANSION JOINTS

#### HISTORY

With the development of polymer based elastomeric sealants decades ago, bitumen based sealants have been declining in usage for the sealing of joints in concrete structures.

Polysulphide polymer, a synthetic rubber was discovered in 1926 and have since grown in usage stretching from the aero industry, medical, electronic, moulding and the building industry where Polysulphide sealants are manufactured for use to seal joints in concrete, tiles, aluminium facades, precast concrete structures, double insulated glass and compartmentalisation joints .

However, despite the successful use of Polysulfide sealants, new innovations made headway into the concrete sealing industry and that is when we saw the introduction of:

1. **Profile strips manufactured from rigid or hard Polyvinyl Chloride (PVC) for use to seal construction, contraction and expansion joints in concrete and floor finishes.**

These PVC joint profiles were probably developed and manufactured in Europe on the onset and its concept was quickly picked up and expanded into South East Asia. Manufacturing companies in China provided the inordinate needs for the South East Asian regions as they had the capacity of moderations in manufacture and supply of these cheapish plastic products which eventually turned into a commodity for deemed perpetual usage.

2. **The world's largest island Australia of 7,692,024 square km too contributed joint profiles for the formation of construction or floor finishing / screed control joints.**

These profiles are made up of two thin metal blades or strips sandwiching a bar of neoprene of approximately 6 mm in thickness. Metal strips could be zinc, aluminium, brass or stainless steel. Its thickness vary from between 1 mm to 1.2 mm and with heights of between 12 mm to 60 mm.

Originally they were used in Australia for the purpose of forming control joints in Terrazzo screed finishes but was further marketed for the formation of control joints for the containment of screed panel sizes for floor tiles and other floor finishing's.

The two innovations are not without failings. Observation has it that many projects seemingly carries the burden of failed or failing installed joint profiles in silence.

Ratification works which implies the extrication of tiles and its bedding mortar and reforming new joint systems would be prohibitive as it causes unprecedented rescheduling for ratification works on an otherwise new facility. Such repairs would bleed additional financial resources from developers who would be most reluctant to allocate funds for defects which occurs from the result of using PVC or Stainless Steel sandwich Neoprene profiles.

These defects will generally be left alone for progressive degradation.

Due to fund restrains, maintenance department of most facilities

such as Shopping Malls, Airports, and other building types would have to adopt ad hoc measures to deal with the profoundly revolting display of failing floor profiles in their facilities.

It is not uncommon to lay eyes on the use of black masking tapes or nails to hold down or camouflage failed profiles from the public eye. These impromptu quick fixes only serves to aggravate visual aversion and lower the eminence of building structures.

#### Contributory rationality to failures of PVC PROFILES

These profiles are made up of polymers and fillers with the addition of:

- antioxidants to protect the polymer from degradation by ozone or oxygen
- ultraviolet stabilizers to protect against weathering
- plasticizers to increase the polymer's flexibility

Without the said, degradation occurs at a much earlier age.

As all contractors or builders are aware, the prevailing lowest market price of a product determines its acceptance for usage and not the quality.

As long as the price, colour and shape is right it does not matter what it is made out of. For suppliers and manufacturers it is not their concern as no one is the wiser. (Milk adulterated with melamine still taste and look like white milk)

Putting chemical properties aside, Plastic profiles for control joints do not really work well.

One would have to realise that:

1. Plastic joint profiles are made up of two walls of hard and stiff plastic with a vulcanised strip of consoling soft PVC strip for finishing at the top to serve as a sealant.
2. These profile assemblies are ultimately transformed into an inflexible mass which is too rigid for the minute or small anticipated movements of the composites consisting of cement screed, tile adhesives, and tile finishes.  
  
The rigidity of the profile will prevent movement from taking place and this profile will serve as a restraining block for the much needed movements which the composite needs.
3. Plastic in itself is brittle and with time it will self-destruct leaving protruding sharp broken edges of plastic to cause injury to unassuming pedestrians.
4. When in place, set plastic profiles rupture due to point loading or self-destruction, unsightly gaps appears along the line of joints and these gaps cannot be restored or mended resulting in an aesthetically displeasing revelation of broken lines of joints to tarnish and degrade the appearance of flooring in buildings.

Cheapish and poorly manufactured innovation with plastic serves only to propagate prolonged breakages thus contributing to visual contempt. Plastic Profiles should not be used in building facilities.

For expansion and contraction of masses to function, space must be designated at appropriate locations with formed gaps or joints to allow expansion or contraction movement to take place.



A space or a joint filled with a solid plate of stainless steel or plastic is but contrary to fulfilling the prerequisites of a relief opening to fulfil its anticipated function of accommodating movements.

### **METAL / NEOPRENE PROFILE**

These profiles may have worked well for joint formation in Terrazzo flooring. However, these profiles exhibits high level of failures in many a project when it is directed for use to form control joints in tile work compartmentalisation.

In general, such profiles are made up of two pieces of metal plates with thickness of 1 mm to 1.2 mm sandwiching a 6 mm thick piece of neoprene or rubber. This neoprene is relatively hard and is unyielding to low compressive pressure. Hence, such metal and rubber profiles are a poor introduction for use in compartmentalisation joints on floor finishes.

It will probably take a ton force to compress these profiles.

Compartmentalisation joints require easily compressible profiles and not a block of solid steel and rubber which serves no true functional purpose.

A simple test of the profiles rigidity is to attempt compressing the profile with ones fingers.

A sample piece of the exposed metal plates and neoprene may look aesthetically alluring. However, these profiles do not look quite the same after installation and having been subjected to foot

and wheel trafficking. The exposed stainless steel blades tend to chip at the edges and these serrations provide constant sparkles of reflected light from the joints.

Alternatively, the stainless steel blades would bend inside out into visually inconceivable deformed wrecks.

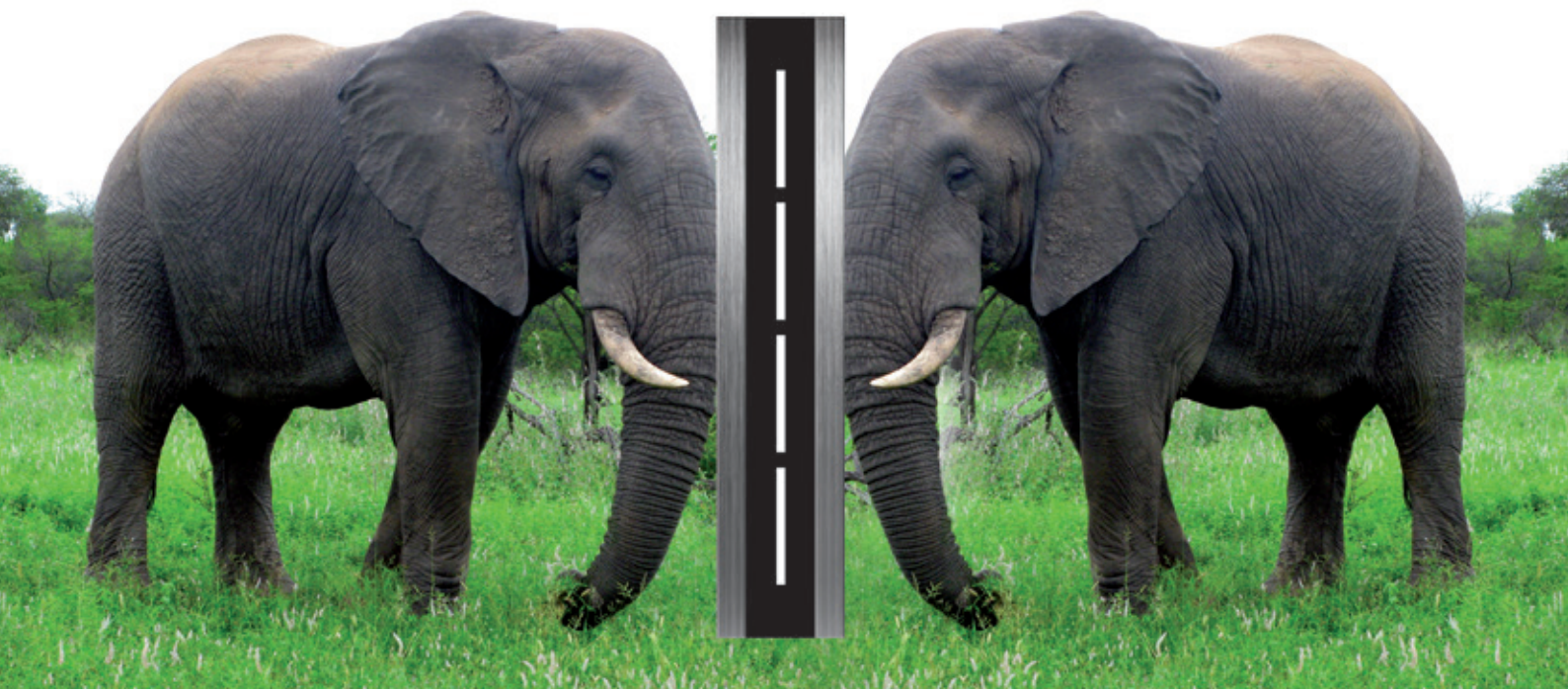
In some projects, the stainless steel blades would dislodge from the neoprene profile and protrude out of the joints exposing sharp metal edges which endangers pedestrian traffic.

Manufactures of these profile types are normally made up of smallish backyard manufactures eager to participate in the ready demand of the market place. They can be found in Australia, Europe, Malaysia and recently in China. Some tiling contractors in Singapore would also be sufficiently proud to lay claim that they too are manufacturers of these profiles.

Organisation hop into the band wagon because of the sheer simplicity of manufacture and high profitability.

Whilst it is bewildering in attempting to understand why so many building projects have adopted failing and non-functional profile devises for compartmentalisation joints in floor finishes. We may have but to assume that it was the trend of the time – (when everyone else is using it, nothing can be wrong.)

Manufacturers and suppliers must take most of the blame for having misled professionals into utilizing contraptions which does not serve a purpose.



**IT MAY TAKE A TON FORCE TO COMPRESS THIS PROFILE**





## IMPERIALSEALS

It is only through observation and scrutiny of completed projects that a fair gauge on material performance in building structures can be realised.

Hence, it is within this concept of this simple mythology of appraisal that we wish to share our research and experiences in material usage which may not have had successes in performance after installation.

Most innovative product can well be propagated into the market place with written papers and inclusive test reports to expound its need of use.

However, not all product categories require such specifics. This is especially so when it comes to products which has proven itself to be functional and is further developed by manufacturers all over the globe to suit the greater needs in design aesthetics for potential users and Professional Architects ..

A water tap is but a functional devise used to control the flow of a liquid with the twist of a knob. However this simple piece of equipment is deemed to be a necessity which necessitates manufacturers to capitalise and develop future demands with altered styling, shapes and colour to gain in roots into developing markets. Product needs such as a water tap will generally not cease to exist as long as building developments are sprouting up all over.

Water taps will be seeing more moulding elegance of shape, newer designs in switching mechanisms, colour and possible use of new material types to attract a sustainable flow of interested buying potential.

Likewise, the floors of buildings these days require absolute detailing due to the varying needs for the protection of floors in industries and the decorative enhancement to floors in buildings and homes.

Whilst floor finishing ranging from linoleum, carpeting, planking, clay tiles, ceramics, granite, and marble are choice material finishing for floors they are still but base finishing's for the hawk eye Architects whose furthering needs for better designed materials is never ending.

Floor finishing is likened to the face of a beautiful woman whose face would be lacking in gorgeous brilliance, if jewellery is not affixed to the normal facial parts such as the ears.

Designers for floors are bounded by technical considerations and aesthetic when it comes to the selection of a floor finish. They may be having to consider guidelines for joint gaps or Compartmentalisation joints which limits large span of floor area to 7.62 meters x 7.62 meters and with gap openings of approximately 9.5 mm.

There is also flexibility to the said guidelines whose recommended dimensions could be enlarged or made smaller by gentle degrees. Limitations to joint gap openings could also be attributed to the material type. For instant, the use of Paraseal a polysulphide sealant would limit the minimum joint gap to 6 mm in width and the maximum joint gap of 50 mm to enable the sealant to be

installed and function well whilst in place. Any deviation from the said would jeopardise the performance of polysulphide sealants.

The selection of a sealant for compartmentalisation joints to floor finishes is crucial. Sealants should exhibit the following qualities.

Standard: To exceed BS 4254

Hardness: minimum 40 degree hardness

Elongation: not greater than 20%

The dictates for such a sealant is on its hardness and minute elongation possibilities. Compartmentalisation joints receive very small regular but sure movements. This is unlike structural expansion joints in buildings where sealants should not be used in totality due to the larger anticipated movements and at most time are designed to have larger joint openings.

The hardness requirement is for the anticipated trafficking where resistance against compression or point loading is essential. The other underlining requirement for such sealants is that it should not pick up or retain dirt. When sealants are too soft and tacky, they have a tendency of picking up and retaining dirt during its service life.

This is most objectionable as the joint will be transformed into lengthy trash bin retaining dirt which are difficult to remove. Hence, the best option to prevent dirt collection in joints will be to select a sealant type with sufficient hardness to rebound dirt from its surface. A product which is worthy of mention is Paveseal 4 (1025). It has a shore A hardness of 70 degree and a 5% tolerance to movement.

### It has the advantages of:

- Having a non-dirt gathering or dirt resistant surface after curing
- Ease of cleaning
- Ability to take on point loading or trafficking.

These stipulated advantages are attributed to its resistant to heavier compression levels as a sealant.

On the contrary, design professionals and site supervising professionals must be sceptical or doubtful over products which are thrown over to them for approval for use. Most of these products are of lesser quality and possibly the cheapest sourced from the market place.

It is not an unknown fact that builders have the tendency of bidding for works at the lowest possible price with the surety that they can overrule specified products spelt out for specific use with much cheaper materials or nothing at all.

There is this prevailing contention that the lowest bidder for contracts are linked to financial institutions with little business sense but have easy and good money to throw away.

Propriety well designed profiles can also be used for the sealing of compartmentalisation joint on condition that such profiles are designed with flexibility in mind and are able to yield to minute or small expansionary and contraction movements of the substrate.



Without Compartmentalisation joints on floor finishes, the expansionary and contraction forces emitted over time will cause adhesion failure between tiles and bedding to substrate to occur. This will result in dislodgement and inevitable uplifting of finishes.

This happens so regularly when compartmentalisation joint are not permitted for use as these joints are viewed as obtrusive or intrusive within an otherwise desired uninterrupted continual flat floor finish.

**COMBE ESF 10 AL**

**COMBE ESF 16 AL**

**COMBE ESF 27 AL**

These profiles are moulded from proprietary aluminium composites which provides for strength and loading capacities of up to 600 KN for wheel traffic. These three well designed profiles are quite unlike the numerous copy adaptations which fails to provide the truly needed composites for moulding in the manufacture of these profiles and the requisites that allows for the extended flexibility needed for compartmentalisation joints.

The exquisite well styling polished design and finishing of COMBE ESF is testimony to its German Quality.

In the design consideration for compartmentalisation joints, special (Cross), (Tee) and (L) intersections are Custom made in the German factory to supplement joint terminations at each compartment.

These special intersections serves to provide clear, clean and sharp joining of profiles at corners and cross intersections. Haphazard butting of profiles into each other to form formation lines can only result in placement misalignments which are unattractive, horrid and revolting. (Refer to picture illustration.)

The design team have also found it necessary to provide clips to be attached to end profiles to insure good connections between connecting lengths to intersections or between continual extended lengths

Clips are attached along the external side of end profiles with protruding clips which will slip smartly into the connecting adjacent intersections or straight lengths.

This will assure and safeguard misalignment at connections.

Aside from engineering and styling qualities, COMBE is manufactured in different widths to cater for aesthetics.

Architects and designers have the prerogative to plan compartmentalisation joint arrangements with wider profiles to provide a manifestation of boldness of outline to floor finishing.

COMBE with its role and advantages will circumvent the neglected qualities of products in the current market place.



**EVOLUTION OF COMPARTMENTALISATION JOINT SEALING**



**EARLY YEARS**  
JOINTS SEALED WITH  
BITUMEN



**DEVELOPMENT & INAUGURATION**  
OF COMBE FOR  
COMPARTMENTALISATION  
JOINTS

**PROGRESSION**  
JOINTS SEALED WITH  
POLYMER BASE  
SEALANTS



**REESTABLISHMENT**  
OF TWO PART  
POLYSULPHIDE SEALANT  
USAGE

**INNOVATION**  
JOINTS FORMED AND  
SEALED  
WITH PVC RIGID PROFILES



**TREPIDATION**  
FAILING &  
NON-PERFORMING  
ARMOURED SS NEOPRENE  
PROFILES



**ENLIGHTENMENT**  
JOINT FORMED AND  
SEALED WITH ARMOUR  
PLATED SS BLADES &  
NEOPRENE



**APPREHENSION**  
FAILING &  
NON-PERFORMING  
PVC PROFILES



**EXTIRPATION**  
OF POLYMER SEALANTS  
FOR JOINTS



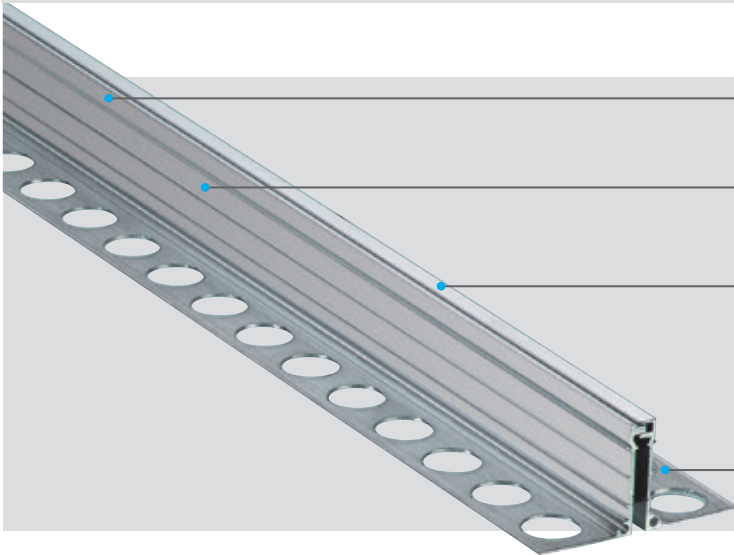


# COMBE

Expansion joint profiles for movement joints




IMPERIALSEALS

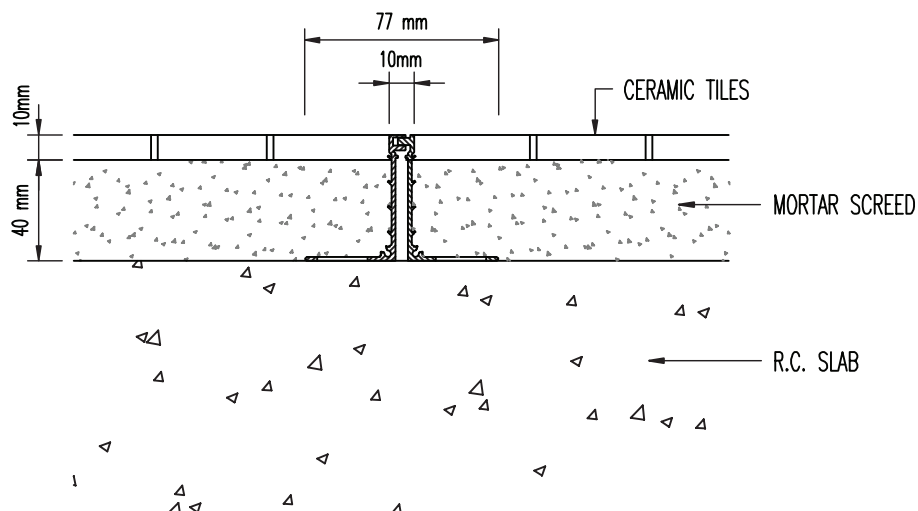
## COMPARTMENTALISATION JOINTS FOR FLOOR FINISHES



### COMBE ESF 10 AL

- Solid all metal-profile**  
Hard wearing, maintenance-free, long lasting
- High load capacity**  
Solid aluminium brackets, suitable for hard plastic tyres
- Small visible surface**  
Slim design, visible width of profile 10 mm only
- MultiHole mounting bracket for secure fixing**  
for secure fixing

Profile	Joint width max. $b_f$ max [mm]	Total Movement $\Delta b_f$ [mm]	Visible width of profile $b_s$ [mm]	Total width of profile $b_t$ [mm]	Installation height $h$ [mm]	Load capacity  [kN]	Load capacity  [kN]	Load capacity  [kg/mm wheel width]
ESF 10/15 AL	10	4 ( $\pm 2$ )	10	77	15	600	130	6,5
ESF 10/17 AL	10	4 ( $\pm 2$ )	10	77	17	600	130	6,5
ESF 10/25 AL	10	4 ( $\pm 2$ )	10	77	25	600	130	6,5
ESF 10/35 AL	10	4 ( $\pm 2$ )	10	77	35	600	130	6,5
ESF 10/40 AL	10	4 ( $\pm 2$ )	10	77	40	600	130	6,5
ESF 10/50 AL	10	4 ( $\pm 2$ )	10	77	50	600	130	6,5
ESF 10/60 AL	10	4 ( $\pm 2$ )	10	77	60	600	130	6,5



COMBE ESF 10/50 AL



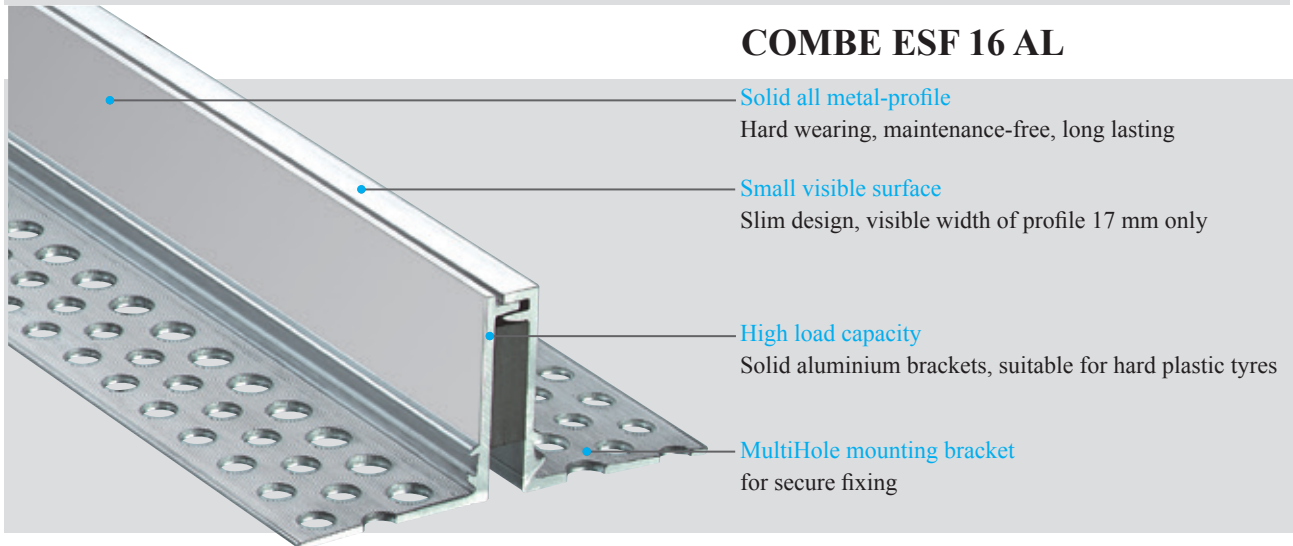
# COMBE

Expansion joint profiles for movement joints

IMPERIALSEALS

## COMPARTMENTALISATION JOINTS FOR FLOOR FINISHES

### COMBE ESF 16 AL



**Solid all metal-profile**

Hard wearing, maintenance-free, long lasting




**Small visible surface**

Slim design, visible width of profile 17 mm only

**High load capacity**

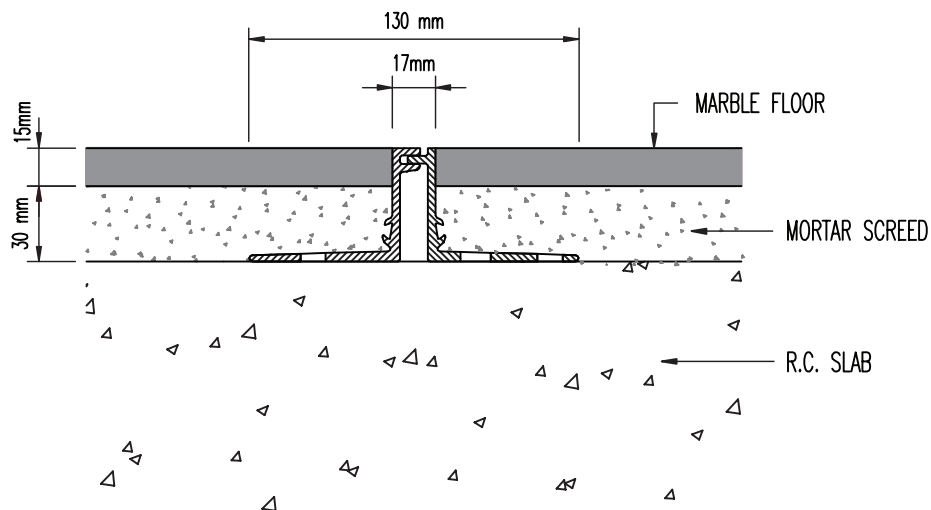
Solid aluminium brackets, suitable for hard plastic tyres

**MultiHole mounting bracket**  
for secure fixing

Profile	Joint width max. $b_f \text{ max}$ [mm]	Total Movement $\Delta b_f$ [mm]	Visible width of profile $b_s$ [mm]	Total width of profile $b_t$ [mm]	Installation height $h$ [mm]	Load capacity  [kN]	Load capacity  [kN]	Load capacity  [kg/mm wheel width]
ESF 16/35 AL	10	6 ( $\pm 3$ )	17	130	35	600	130	8
ESF 16/45 AL	10	6 ( $\pm 3$ )	17	130	45	600	130	8
ESF 16/60 AL	10	6 ( $\pm 3$ )	17	130	60	600	130	8

Larger heights on request

Production length: 4 m



COMBE ESF 16/45 AL



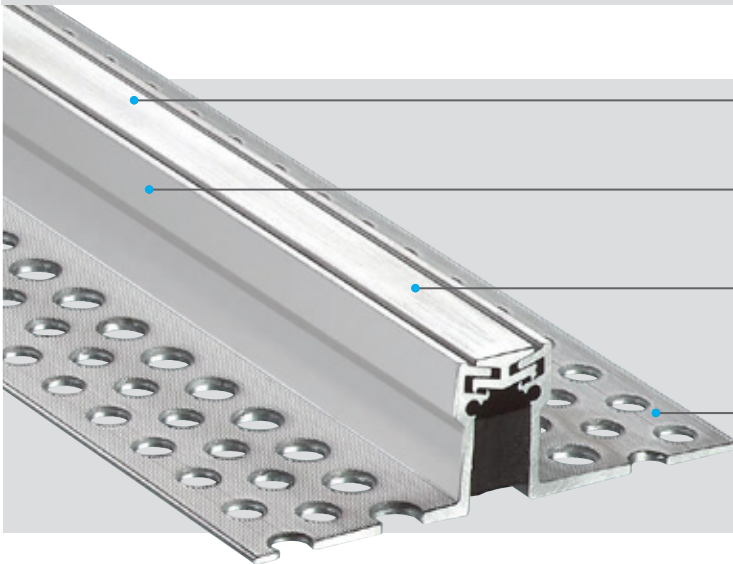
# COMBE

Expansion joint profiles for movement joints

IMPERIALSEALS

## COMPARTMENTALISATION JOINTS FOR FLOOR FINISHES

### COMBE ESF 27 AL

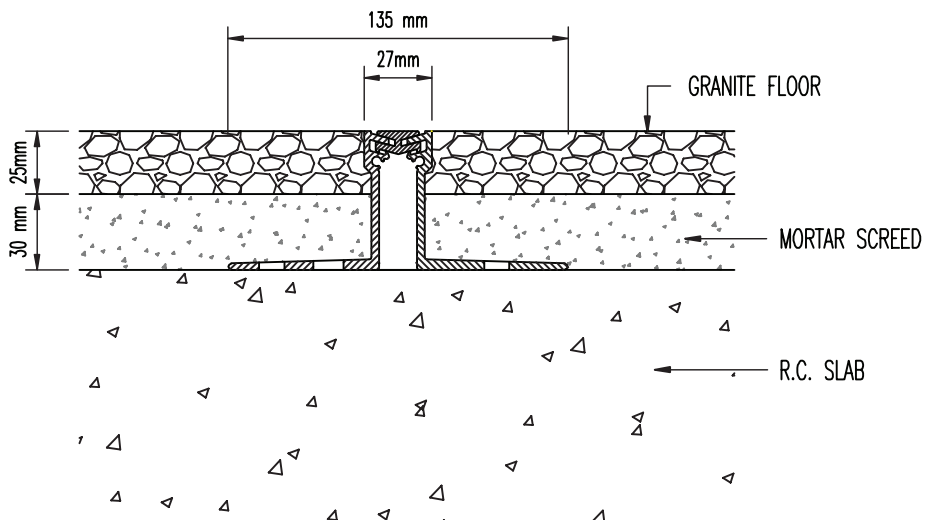


- Small visible surface**  
Slim design, visible width of profile 27 mm only
- Solid all metal-profile**  
Hard wearing, maintenance-free, long lasting
- High load capacity**  
Solid aluminium brackets, suitable for hard plastic tyres
- MultiHole mounting bracket**  
for secure fixing

Profile	Joint width max. $b_f$ max [mm]	Total Movement $\Delta b_f$ [mm]	Visible width of profile $b_s$ [mm]	Total width of profile $b_t$ [mm]	Installation height $h$ [mm]	Load capacity [kN]	Load capacity [kN]	Load capacity [kg/mm wheel width]
ESF 27/30 AL	15	10 ( $\pm 5$ )	27	135	31	600	130	8
ESF 27/35 AL	15	10 ( $\pm 5$ )	27	135	35	600	130	8
ESF 27/40 AL	15	10 ( $\pm 5$ )	27	135	40	600	130	8
ESF 27/55 AL	15	10 ( $\pm 5$ )	27	135	55	600	130	8

Larger heights on request

Production length: 4 m



COMBE ESF 27/55 AL



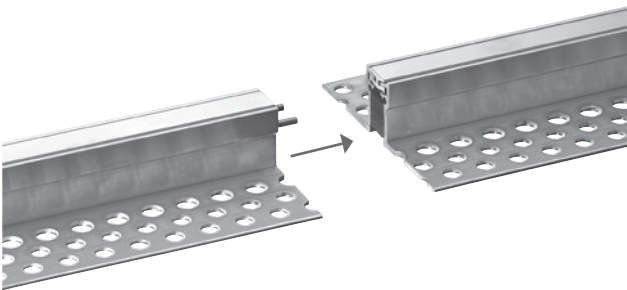
# COMBE

Expansion joint profiles for movement joints

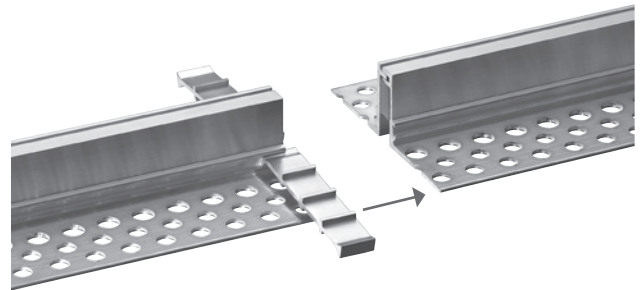
IMPERIALSEALS

## COMPARTMENTALISATION JOINT INTERSECTIONS

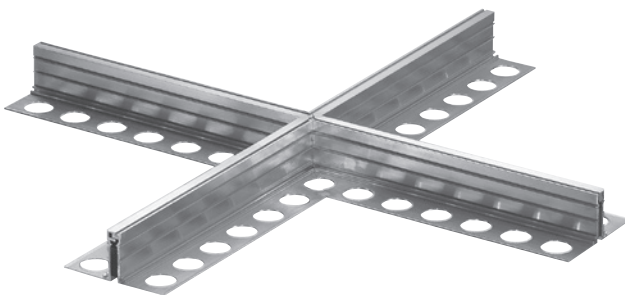
The positive connection of the individual profile lengths is obtained by use of **slide-in connection pins** (Series ESF 10/... and ESF 27/...) or by staggering in **slide-in anchors** in the individual aluminium profiles (Series ESF 16/...).



Slide-in connection pins e.g. ESF 27/40 AL



Slide-in anchors e.g. ESF 16/45 AL



## INSTALLATIONS INSTRUCTIONS COMPARTMENTALISATION JOINT SYSTEMS

A joint filler strip must be placed between the aluminium mounting brackets. This joint filler is not included in our delivery.  
Series ESF 8, ESF 9, ESF 10 = 5 mm, Series ESF 22 = 12 mm,  
Series ESF 16 = 10 mm, Series ESF 27 = 15 mm joint filler.

The height of the joint filler will depend on the overall height required, but it must be sufficient to ensure that the screed is completely separated at the joint locations.

Before installing the profiles ensure that the mounting brackets are completely clean and grease/oil free.

The perforated legs of the profile must be pressed into the first fresh layer of mortar or screed and levelled.

Thereafter apply more screed. Depending on the thickness of the floor finish (measured from top edge of profile) the ESF profile must oversail the screed to suit.

Additional intersection on request.

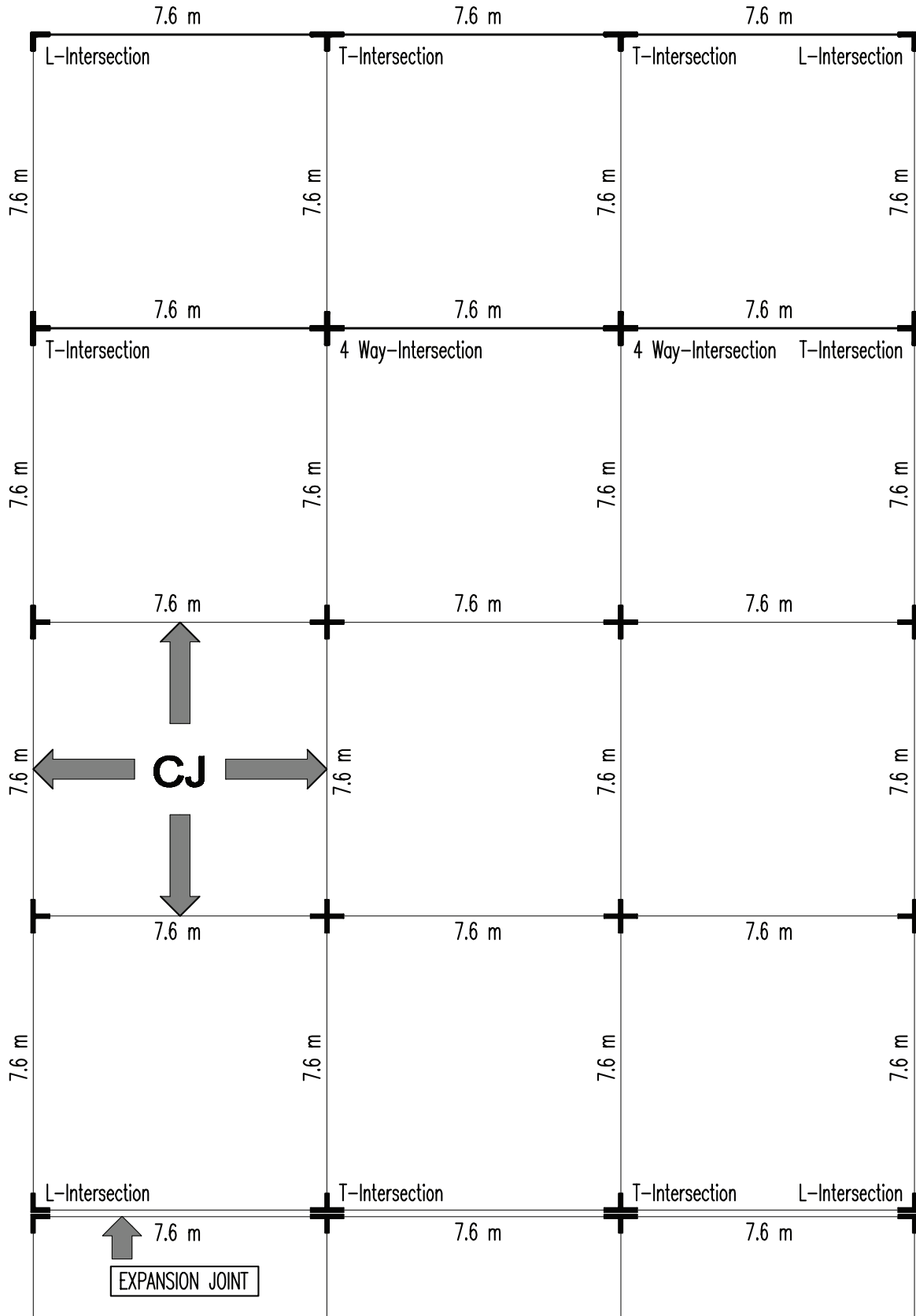


# COMBE

Expansion joint profiles for movement joints

IMPERIALSEALS

## COMPARTMENTALISATION JOINTS LAYOUT PLAN WITH INTERSECTIONS





# PAVESEAL 3

POLYSULPHIDE SEALANT GUN GRADE

**IMPERIALSEALS**



PAVESEAL 3 ARBO 2150 is a Polysulphide sealant manufactured with higher polymer content. Its specifications exceeds the existing British Standard and Euro Standards for Polysulphide sealants.

ARBO 2150 is designed for expansion joints on floors which will be exposed to heavy foot trafficking and industrial wheel trafficking. It will resist high levels of compression.

## APPLICATION

Pave seal 3 Arbo 2150 is recommended for the sealing of expansion, construction and contraction joints in building structures. Pave seal 3 is suitable for both vertical and horizontal joints on factory floors, distribution centres, warehouses, vehicle parking aprons, roads, aircraft runways, aircraft parking aprons and hangers.

It is suitable for use in compartmentalization joints on large open tiled floors where joints are formed in squares of 6 meters x 6 meters to allow for the expansion and contraction of cement screed, tile bedding mortar and tiles or granite finishes. This requirement is mandatory due to the differing coefficient of expansion of the different materials used to build up floor finishes.

Pave seal 3 is technically more suited than using rigid stainless steel blades with neoprene inserts or the use of plastic strips to fill compartmentalization joints.

Joints are formed to allow for expansion and contraction of substrates to take place. As such, materials of high rigidity should never be used to fill compartmentalization joints. Sealants and preformed profiles should be well designed to accommodate anticipated minute moments from compartmentalisation joints. Rigid profile in fills does not serve any functional purpose. Pave seal 3 is recommended in sewage treatment works where bio-degradation resistance is required for aggressive environment.

## SPECIFICATION COMPLIANCES

Exceeds BS 4254 10 : 1983  
Exceeds BS EN ISO 11600 F 25 LM

## JOINT SIZE SUTIABILITY

Minimum joint width : 6 mm  
Maximum joint width : 25 mm single application  
50 mm multiple application

## JOINT DEPTH

Minimum joint depth : 12 mm on porous substrate  
Minimum joint depth : 6 mm on non-porous substrate  
Maximum joint depth : 25 mm

Chemical Resistance : Resistance to :  
Most dilute acids and  
Alkalis  
Petrol  
Diesel,

UV Resistance : Good  
Service Life : 20 years

Movement Accommodation:

Butt Joints (movement in Tension and Compression) 20%  
Lap Joints: ( movement in Shear) 40%

## PACKAGING

In dual pack of : 2 litre pack  
Base & Hardener

**COLOUR** : Black & Grey

**STORAGE LIFE** : 12 Months

## PRIMING

The wall of concrete surfaces and most other substrate need to be primed prior to the application of Pave seal 3.

## Primers

Pave seal AG2 primer 500 ml tins

**Coverage** : 125 meters per tin

**Equipment** : Manual Barrel Gun  
Spiral Mixer  
Follow Base plate.

## WIDTH & DEPTH RATIO

Butt Joints : 2:1 ratio  
Floor Joints : 1:1 ratio

## TECHNICAL DATA

Working Life @ 20°C : Approximately 1hr 30 minutes.  
Application Temperature : +5°C to +40°C  
Service Temperature : - 40°C to 80°C

Shore A Hardness : 50  
 Cure Rate @20°C & 65% RH : 7 Days full cure

**Quantity Estimator**

Joint Size	Meters Per Liter
6 mm x 6 mm	27.8
9 mm x 6 mm	18.5
12 mm x 9 mm	9.3
18 mm x 18 mm	3.0
25 mm x 25 mm	1.6

**APPLICATIONS.**

1. Clean walls of joint from all contamination and insure joint is dry.
2. Mask the edge of joints with masking tape
3. Insert Migurod into joint to determine the depth of sealant and also to prevent adhesion to the base of joint.
4. Prime the walls of joint with primer and allow primer to dry.
5. Mix Paveseal 3 in accordance to instruction and install sealant.

**COUNTRY OF ORIGIN**

This Product is manufactured in the United Kingdom.



**PRUDENT FORTHOUGHTS TO MINIMISE THE RISK OF SELECTING SEALANTS WITH POOR PERFORMING CHARACTERTICS AFTER APPLICATION.**

**CONSIDERATION SHOULD BE GIVEN TO:**

**Country of manufacture:**

It is an acceptable fact that very few countries produce quality two part polysulphide sealants with sufficient base polymers.

Leading UK manufacturers abide to standards in production and have less possibilities of defaulting in standards.

**Manufacturing Experience:**

At least 20 years.

**Hardness:**

Horizontal joints min 35 degree (hardness to prevent dirt gathering onto cured sealants.)

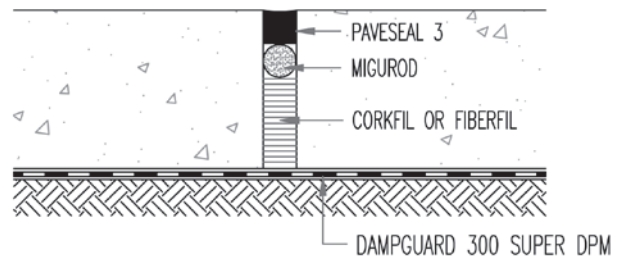
**Modified Sealants:**

Modified Blends of sealants manufactured from Polysulphide and Bitumen are questionable. It pays to use the state of the art Polysulphide sealants.

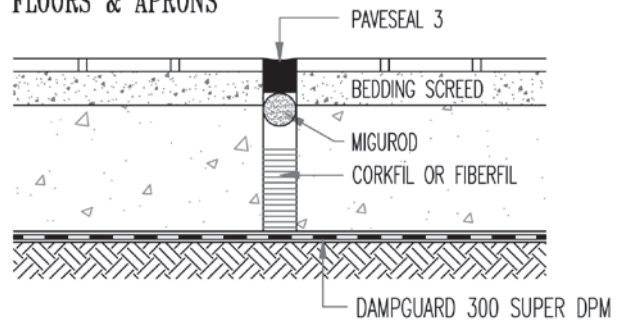
**Standards:**

Polysulphide sealants should conform to prevalent standards or higher.

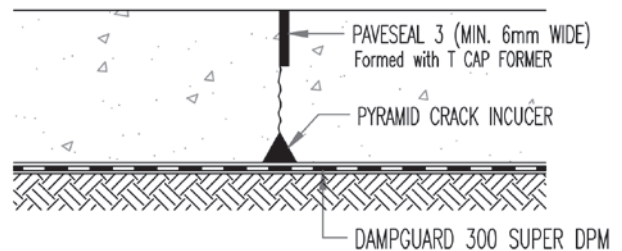
**EXAMPLE OF JOINT TYPES**



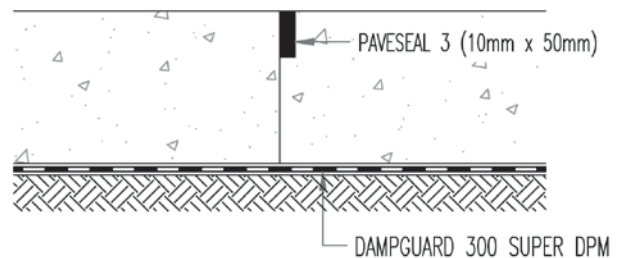
**SEALED EXPANSION JOINT ON CONCRETE FLOORS & APRONS**



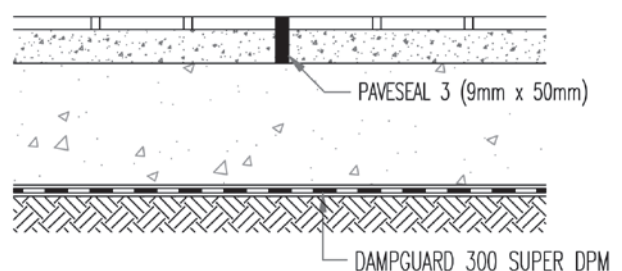
**SEALED EXPANSION JOINT ON TILED CONCRETE FLOOR**



**SEALED CONTRACTION JOINT ON CONCRETE APRONS & HARD STANDINGS**



**SEALED CONSTRUCTION JOINT ON CONCRETE APRONS & HARD STANDINGS**



**SEALED COMPARTMENTALIZATION JOINT**





# PAVESEAL 4

## GUN GRADE EPOXY SEALANT

IMPERIALSEALS



PAVESEAL 4 1025 is a unique two part Epoxy sealant which cures to form a hard wearing seal in construction and compartmentalisation joints. Paveseal 4 is designed to accommodate small movements in extension and compression.

Recommended for use in a variety of internal stress relief joint Systems such as:

- compartmentalisation joints for floor finishes
- swimming pool control joints
- chemical resistant flooring joints on factory floors
- kitchen floor tile pointing
- other areas which will experience continual water resistance
- and a high degree of chemical resistance (especially to common cleaning substances) are required.

### Applications

Paveseal 4 is recommended for joints in swimming pools, tile to tile points on floors of special treatment rooms, compartmentalization joints on large floor surfaces, shower rooms and water retaining structures.

**NB:** Not recommended for structural expansion joints .

### Packaging

1.2 Litre Set, with separate tins for Base and Curing Agent Follower plate

### Colours

Off White, Grey

### Application Instructions

#### Joint Preparation

The joint surfaces must be clean and free from all contamination. Surfaces should be degreased using the appropriate surface cleaner (contact Technical Service Department for further information).

#### Mixing

The ratio of base to curing agent controls the performance properties of 1025 and tins are filled to an exact mixing ratio. It is vital therefore that the whole contents of the curing agent tin are added to the base tin. The 2 components must be thoroughly mixed to ensure complete homogeneity (Spiral "pig tail" mixing equipment is recommended).

#### Application

The usual application method once mixed is to fill the sealant into empty cartridge dispensers using the follower tin supplied with the pack. The cartridge is placed over the hole in the centre of the plate and filled by applying steady downward pressure. Insert the plunger into the cartridge and the mixed sealant is then ready for application using a Caulking Gun. The sealant should be extruded firmly into the joint by maintaining an even pressure on the trigger of the gun.

#### Joint Backing

Where applicable, appropriate joint filler, e.g. closed cell polyethylene foam should be used to provide the correct joint depth. All joint preparation and sealant application should be carried out in accordance with BS8000 Part 16 (British standard for the sealing of joints in buildings)

#### Joint Size Suitability

Joint Width  
Minimum 6mm  
Maximum 20mm (single application)

#### Joint Depth

Minimum 10mm on porous substrates  
Minimum 6mm on non-porous substrates  
Maximum 10mm

#### Width: Depth Ratio

1:1, 1-2

### Health and Safety

Base component is Polyamide based and curing agent contains Epoxy resin. Both components require careful handling.

Application Temperature : +10° C to + 40° C

Service Temperature : -20° C to +90° C

Cure Rate (at 20° C) : 48 hours. At lower temperatures cure rate will be extended.

### Technical Data

Typical Shore D Hardness (cured at 20° C) : 60 – 70

Work Life (Typical at 20° C) : 45 minutes

#### Chemical Resistance:

Resistant to most alkalis and dilute acids, petrol, diesel, jet fuel. Resistant to most cleaning chemicals used in swimming pool situations (neat Hypochlorite crystals should not be applied to 1025 SP).



**PAVESEAL 4**

**Service Life:**

20 years + in non-critical applications.

Use in swimming pools will lower this figure (depending upon application performance required).

**Movement Accommodation:**

Tension 5%

Compression 50 %

**Accessories**

Cleaners

Cleaner 17 - 1 litre Tin

(Xylene based – not suitable for use with plastics or delicate finishes)

Cleaner 16 – 1 Litre Tin (Alcohol Based)

**Equipment**

Bulk Loading Guns

Heavy Duty Follower Plates

**Quantity Estimator**

**Joint Size (mm) Metres/ 1.2 litre set**

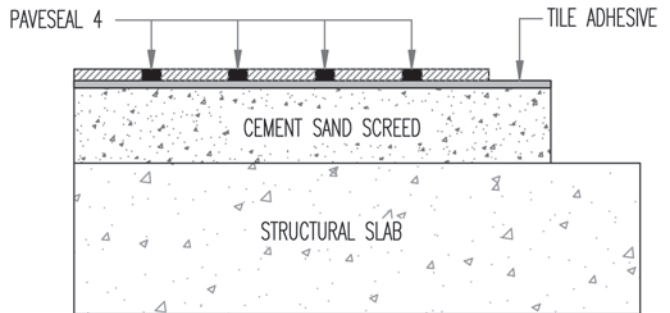
6 x 6 33.3

9 x 6 23

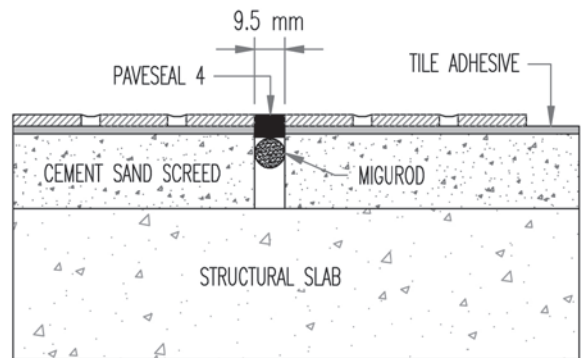
12 x 9 11

20 x 10 6

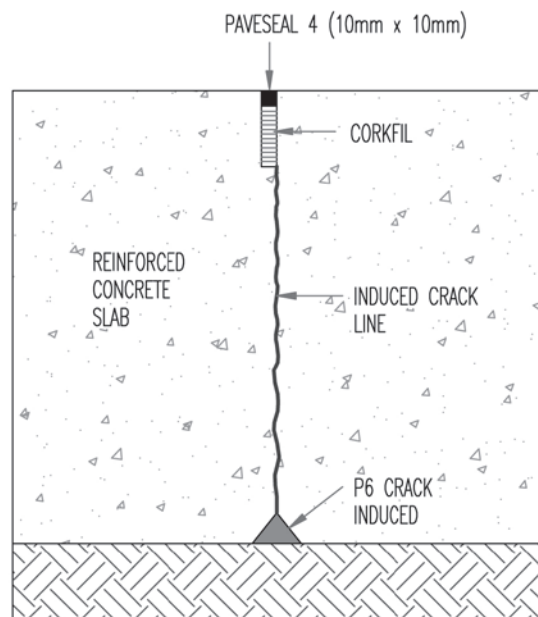
**Important:** The information in this leaflet is given in good faith and based on results gained from experience and tests. However, all recommendations or suggestions are made without guarantee since the conditions of use are beyond our control. Goods are supplied subject to the Company's terms and conditions of sales, a copy of which is available on request.



**PAVESEAL 4 : POINTING OF FLOOR TILES IN KITCHEN**



**PAVESEAL 4 : COMPARTMENTALISATION JOINT FOR FLOORS  
 (7m x 7m x 9.5mm)**



**PAVESEAL 4 : FOR CONSTRUCTION / CONTRACTION JOINT**

# REFLECTIONS

Failed and failing PVC PROFILES in Compartmentalisation Joints and Expansion Joints





# REFLECTIONS

Failed and failing PVC PROFILES in Compartmentalisation Joints and Expansion Joints



# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints





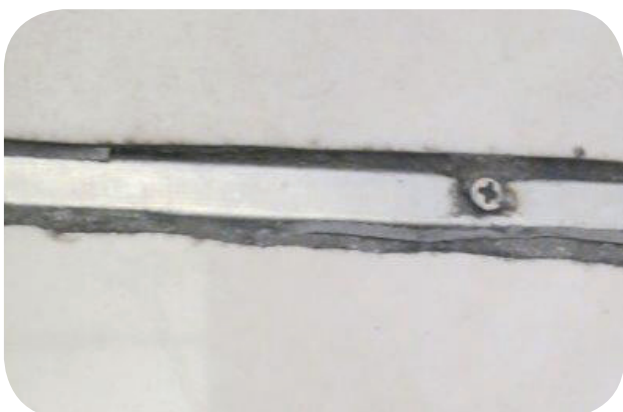
# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints



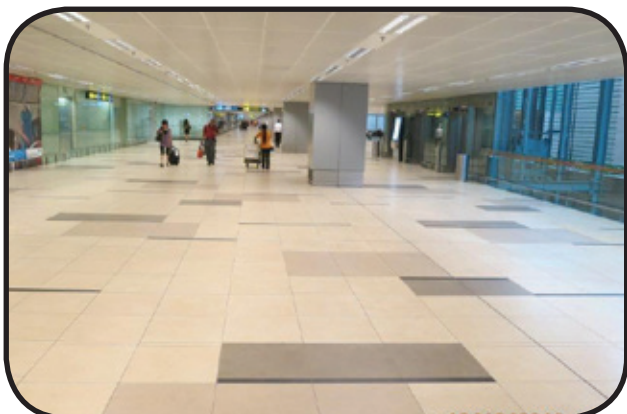
# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints



# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints





# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints





# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints



# REFLECTIONS

Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints





# REFLECTIONS

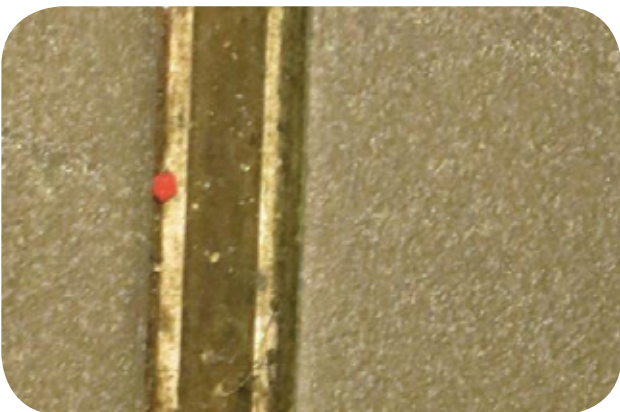
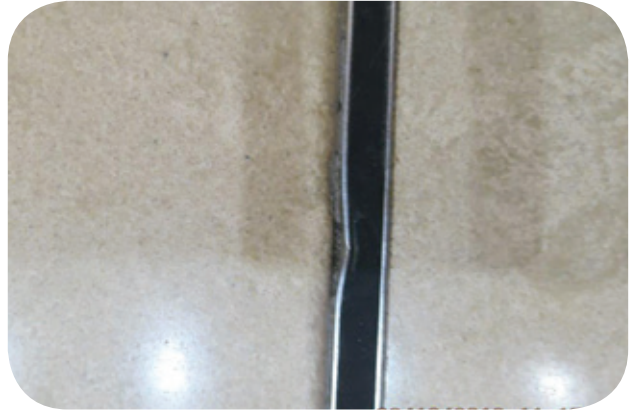
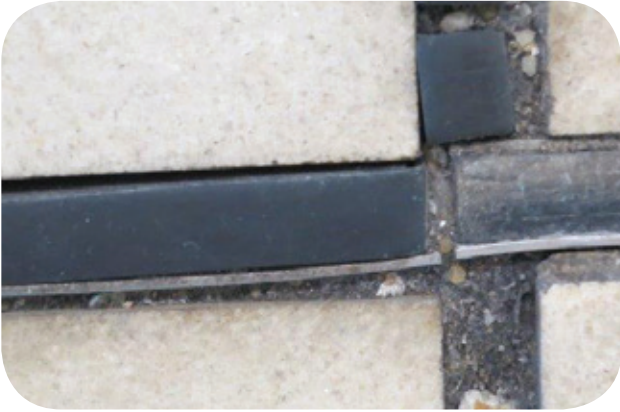
Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints



○

# REFLECTIONS

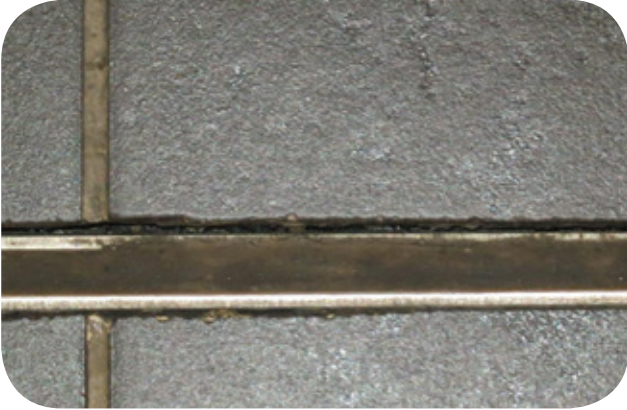
Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints





# REFLECTIONS

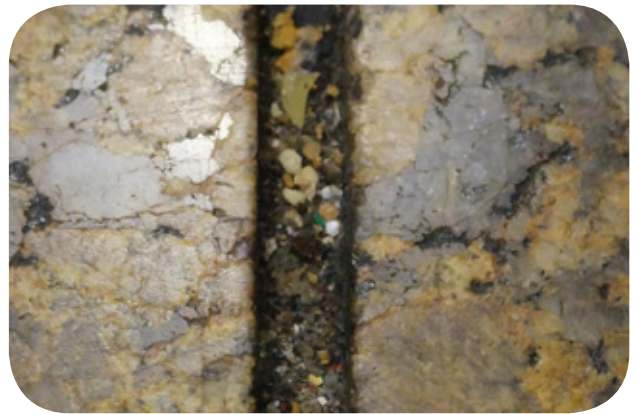
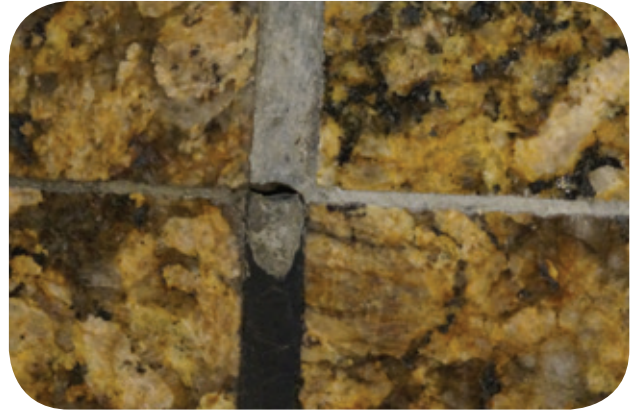
Failed and failing STAINLESS STEEL / NEOPRENE PROFILES in Compartmentalisation Joints



○ **REFLECTIONS**

**Failed and failing SEALANT in Compartmentalisation Joints**

**SEALANTS WITHOUT THE PREREQUISITES OF ELONGATION AND HARDNESS FOR COMPRESSION AND REBOUND SHOULD NOT BE USED IN FLOOR JOINTS. SUB STANDARD SEALANTS WILL ONLY RETAIN DIRT AND DEBRIS IN JOINTS**



- *Protective Wraps / Films*  
SEALWRAP CLEAR  
6 Mils x 20 ft. x 100 ft. rolls  
(152 micron x 6.09 m x 30.48 m)
- *Floor And Wall Protection Boards*  
KIBO FLOOR PROTECTION SYSTEM  
KIBO DUST CONTROL WALL SYSTEM  
KIBO SITE HOARDING SYSTEM
- *Sound Proof Walls & Tunnels*  
UNISON SOUND PROOF WALLS  
UNISON SOUND PROOF TUNNELS
- *Wooden Floor Underlayment*  
TUPLEX AIR FLOW MEMBRANES
- *Damp proofing Membrane*  
DAMPGUARD 300 SUPER DPM
- *Damp proof Course*  
BRICKGRIP
- *Waterstops PVC*  
BLUESTOP (3.5 mm)  
Centrally placed and externally placed
- *Waterstops PVC*  
PRIMETOP (5.5 mm) USA  
Centrally placed and externally placed
- *Waterstops Adhesive*  
SYNKO-FLEX USA  
Centrally placed
- *Waterproofing Membrane*  
POLYGUARD SELF ADHESIVE SYSTEMS
- *Drainage Cells*  
INTERPLAST ISO DRAINS  
PERFORATED PIPES  
PIPE SLEEVES  
FILTER FABRIC
- *Waterproofing for wet areas*  
AQUAFIN
- *Floor Hardeners*  
NON-METALLIC FLOORTOP
- *Compressible Joint Formers*  
FIBERFIL / CORKFIL
- *Elastomeric Joint Sealants*  
PAVESEAL 1    PAVESEAL 2  
PAVESEAL 3    PAVESEAL 4
- *Compartmentalisation Joints for floors*  
COMBE  
PAVESEAL 3 & 4
- *Decorative Floor and Wall Profiles*  
PROFILITEC
- *Building Expansion Joint Systems*  
MIGUA
- *Bridge Bearing Pads*  
MAGEBA  
UNISON : Elastomeric Bearings
  - Pot Bearing
  - Seismic Pot Bearings
  - Lock up devices
  - Spherical Elastomeric Bearings
  - Polyurethane Disc Bearing
  - Energy Dissipation Systems
- *Bridge Expansion Joint Systems*  
IL WON TECH:
  - LRJ System      • LMJ System
  - LSFJ System    • LFJ System
  - LCFJ System    • LE DPS System
  - BFJ System      • LHAJ System
- *Roof Waterproofing Membranes*  
FLEX ROOFING SYSTEMS (USA)  
Flex Evaloy Kee Single ply  
Flex PVC Single ply  
Flex TPO Single ply
- *Roof Waterproof Coatings*  
FLEXIGARD



## IMPERIALSEALS (UK) PTE LTD

MALAYSIA • INDONESIA • THAILAND • CAMBODIA • LAOS • VIETNAM • BRUNEI  
PHILIPPINES • HONGKONG • CHINA • INDIA • SRI LANKA

Singapore

IMPERIALSEALS (UK) PTE LTD Phone: +65 67847811 Fax: +65 67848011 Email: [info@imperialseals.com.sg](mailto:info@imperialseals.com.sg)

Malaysia

IMPSEAL SDN BHD Phone: +60 07 5989188 Email: [impseal@singnet.com.sg](mailto:impseal@singnet.com.sg)