

## Stainless Steel Movement Joint Specification and Finishes Guide

Atrim manufacture a professional range of stainless steel movement joints for ceramic and natural stone coverings. Designed to give excellent movement absorption and tile edge protection. Polyurethane infill bonded to metal giving exceptional performance in compression and point loading. Suitable for use in high traffic areas, industrial or commercial applications

Atrim profiles need to be checked at point of specification, for suitability of application in any given area. Chemical reaction, intermetallic corrosion and mechanical stresses must all be taken into consideration.

Composition Specification:			Components:		
Grade	Unit	Standard	Process	Anchoring Leg	Polyurethane
British Standard	-	BS 5385	Material Grade	304	Bonathane 4NA45A
Hardness Shore A	45	-	Manufacture Process	Machine rolled	Moulded
100% Modulus MPA	-	1.00	Finish	Rolled / matt	Guillotined
300% Modulus MPA	-	1.70			
Tensile Strength MPA	-	11.2			
Elongation at break %	800	-			
Tear Strength	kN/m	23.6			
Compression set	%	22			
Abrasion loss	mm <sup>3</sup>	50			
Resilience	%	63			
Specific gravity	g/cm <sup>3</sup>	1.19			

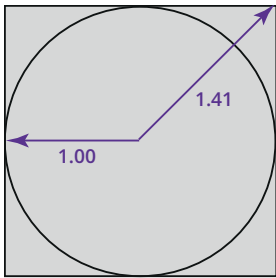
### Overview:

Atrim stainless steel movement joints are specified for a wide range of industrial and domestic situations, including car showrooms, exhibition halls, airports and hotels. Selecting colours and materials is a balance of aesthetic, structural and maintenance needs. Atrim suggest the following as a guide:

Building or Application	Joint Trim	Joint Core
Motorised Traffic, Airports, Wet Walkways, Chemicals, Food Production, Swimming Pools, Decorative, Shopping Areas, Foyers, Car Showrooms	Stainless Steel	Neoprene
High Fire Risk, Underground Railways	Stainless Steel	Vamac

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## Where Movement Joints Should Be Fitted:



### The ideal field size

Ratio of the shortest to the longest distance from the centre of the force should be approximately 1:1.5



### Not an ideal field size

Cracks are probable if the ratio of the shortest to the longest distance from the centre of the force exceeds 1:1.5

The theory is to create “tile fields” large enough to absorb differential movement between the substrate and the ceramic or stone covering. Movement joints must be installed in certain areas and positions to prevent tiles or grout from cracking and in some cases prevent the tiles from tenting and breaking the bond to the substrate.

But the exact positioning of movement joints is vital to their successfully protecting the installation. If they’re installed in the wrong place they won’t work.

Industry guidelines suggest that the maximum tile field should be no more than ten metres in each direction - but in practice, depending on the individual applications, it tends to be between five and eight metres.

BS 5385-3:2007-Section 3 - 19.1.1 states that the building designer should assess the magnitude of any stresses and decide where movement joints should be located, having regard to all relevant factors, including the type of flooring, bed and substrate.

While the floor areas to be tiled come in all shapes and sizes there is a general formula for working out where movement joints should be placed.

A circle provides the best configuration for movement joints, because the forces from the centre are equal in each direction. However, in practice, because hardly any floors are circular, it is best to look at square floors and rectangular floors. In a square configuration the ideal field size is where the ratio of the shortest to the longest distance from the centre of the force is approximately 1:1.5 (see figure 1) - for example 5 x 7.5 metres. Generally, the tile “field” should be kept as square as possible, and where under floor heating is present, the tile field should not exceed 40 square-metres.

However, most floors tend to be rectangular, rather than square, though. And rectangular shapes tend not to be the best configuration, as the ratio of the shortest to the longest distances exceeds 1:1.5. In the example shown in figure 2 the crack risk is at the centre of the area. If no movement joint has been installed, cracking of the tiled surface is highly likely.

In large floors it is advisable to incorporate movement joints forming bays at no more than 30-metre intervals. Each bay is then sub-divided into smaller bays by stress relieving joints not greater than ten metres apart.

On suspended floors, stress-relieving joints should be inserted where flexing is likely to occur, for instance, over supporting walls or beams. And, as always, joints must be situated directly over any joints in the substrate, and at any changes in the substrate, such as timber to screed.

For areas less than two metres wide perimeter joints are not normally required, unless conditions generate stresses which are likely to become extreme, for example temperature changes.

Bibliography: BS 5385-3:2007. Wall and floor tiling. Design and installation of internal and external ceramic floor tiles and mosaics in normal conditions. Code of practice.

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## Where should I install movement control joints?

Movement control joints are normally installed to form flooring modules into discrete bays, each of which is isolated from its adjoining bay by the intervening movement control joint.

This creates 'continents' of finishes that are able to move without affecting abutting bays. Typically, movement control joints are installed in internal applications to form bays of side 8 to 10 metres long, and externally at 4.5 metre centres.

Particular care should be taken where movement control joints are to be sited in floors of suspended construction. In this case, movement control joints should be installed directly over all beams and at the mid-point of spans where the anticipated deflection exceeds 20mm and hard tile paving is being installed. In all cases bay lengths should not exceed 10 metres.

## Are there any Standards or Norms that apply to movement control joints?

There are a number of International Standards that direct attention and give advice on the type and location of movement control joints including:

British Standard: BS 5385 Parts 1 to 5 inclusive.  
UK Stone Federation: Code of Practice 2001.  
US Standard: ANSI 108.3  
French Norms: DTU26.2 and DTU 56.1  
German Norm: DIN 18157  
Australian Standard: AS 3958.1

## Positioning and layout:

Movement joints must be inserted into the ceramic or natural stone floor covering based on the following criteria: size (format) of tile, width of movement joint, overall colour and positioning in relation to doorways, exposure to sunlight, heavily trafficked areas and nature of tile composition.

Tiled areas within a perimeter of Atrim Movement joint must not exceed 100 sq. m. and any side length must be less than 15 m. Tiled areas within Atrim Movement Joints must be of proportions between the ratios 2:1 and 1:1.

For tile formats over 750 x 750mm or for floors with grout joints less than 1.5mm, these maximums must not exceed 36 sq. m., nor must any side length be more than 8 m.

Changes in the sub-floor composition and substrate movement joints must be followed through the tiling surface with an Atrim Movement Joint. Atrim Movement Joints must be placed across doorway thresholds. The resultant continuous tiled area must be oblong (not L-shaped) and as square as possible.

Perimeters of any tiled area of 6 sq. m. or with any side length greater than 3 m, bounded by walls or vertical fixtures must be fitted with Atrim Perimeter Movement Joint.

## Choice of Joint:

The depth of the Atrim Movement Joint chosen must be equal to or up to 1mm less than the total height of tile covering and adhesive.

## Method:

Tile or natural stone covering is laid adjacent to the pre-positioned Atrim Movement Joint, overlapping the punched leg, allowing 1.5mm minimum gap. Tiles or stone covering is laid in accordance with good tiling practice and sight of circumstantial factors.

Tile or stone covering must abut Atrim Movement Joint evenly and must cover the tile edge to within 1mm, but must not lie proud of finish tile surface.

Lengths of Atrim Movement Joint may be cut to size. The use of a mitre block is advised for all Atrim Movement Joints, and sharp edges must be cleaned off with an appropriate abrasive before laying.

## Safety:

Caution: cutting of metals requires eye protection and appropriate regulatory PPE. Use gloves when handling.