



Construction & Facade

SMART BUILDING SOLUTIONS FOR THE PROFESSIONAL





BOSTIK, SMART ADHESIVES

The new logo and the new house style with the characteristic green gecko is more than just a visual appearance. “Smart Adhesives” is a reflection of our positioning with regard to the development of smart and innovative sealing and bonding solutions that are safe, flexible and efficient.

We develop innovative sealing and bonding solutions that, whatever is constructed, connected or built, are smarter and can adjust better to the forces and challenges in our daily life.

THE GECKO – INSPIRING ADHESION

For centuries, scientists have been inspired by geckos because of their unique bonding mechanism. They can stick to almost any surface, can climb super-fast against smooth polished glass and can easily carry their entire body weight with just one toe.

The Bostik gecko is flexible, easy to adapt to environments, is open to new situations and is courageous. It symbolizes Bostik's smart and innovative sealing and bonding solutions for the challenges which today's market faces.

1. Introduction

At the forefront

Bostik is one of the largest and leading adhesive and sealant companies. Worldwide, we employ 6,000 people in more than 50 countries across all continents. Our smart adhesive and sealing systems are used globally in the construction of new buildings and refurbishment projects. Bostik is rightfully the market leader and can be seen at the forefront of bonding and sealing solutions with a complete portfolio of 'smart' products.

In the architectural world the façade of a building is often the most important aspect of its design. 'Façade' comes from the French, which in turn comes from the Italian facciata, from faccia meaning face or front; and ultimately from the post-classical Latin facia.

The earliest usage of the word recorded by the Oxford English Dictionary was in 1656. From an engineering perspective, the façade is also of great importance to the building due to its impact on energy efficiency.

Luckily a lot of improvements and developments have taken place since 1656 and Bostik offers a portfolio of smart products that are fully adaptable and in line with building specifications and requirements.

What hasn't changed over the centuries is the movement of building materials due to temperature differences and mechanical loads. Bostik offers a comprehensive portfolio of high-end sealants for movement and expansion joints.





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2. Certification

The new Bostik Construction & Façade range complies to many well-known industry standard certifications. Below we highlight and explain the certification in more detail.

CE Classification (Europe)

In today's world globalization and harmonization have become common and familiar terms. This is also true at building standards and regulations. Within Bostik we embrace this movement and strive for a globalized standard which provides transparency and simplicity in sealing and bonding.

ASTM (Americas)

The ASTM C920-18 'Standard Specification for Elastomeric Joint Sealants' covers the properties of a cured single- or multicomponent cold-applied elastomeric joint sealant for sealing, caulking, or glazing operations on buildings, plazas, and decks for vehicular or pedestrian use, and types of construction other than highway, airfield pavements and bridges. A sealant qualifying under this specification shall be classified as to type, grade and class.

GEV-EMICODE EC1 Plus

EMICODE® is a protected product classification system and at the same time an Eco label. Installation materials, adhesives and construction materials are submitted to a strict certification procedure where the quantity of emitted volatile organic compounds (VOC) is examined. When products come with the EC1 Plus certification, they can be easily adapted in the BREAAM and LEED schemes.

M1 Certification

Various chemicals are emitted from building and interior decoration materials into indoor air. The classification presents emission requirements for the building materials, fixtures and furniture, with and without padding or textile coverings used in ordinary work spaces and residences with respect to good indoor air quality. M1 stands for low emissions.

A+ Certification

A+ is a compulsory French VOC emissions labelling of construction products installed indoors, based on emission testing. This regulation foresees that any covered product placed on the market has to be labelled with emission classes based on their emissions after 28 days, as tested with ISO 16000 and calculated for European reference room. The same holds true for EMICODE, GUT and Blue Angel. Also other valid information can be used as a basis for this assignment of class, such as tests based on ISO 16000, but with shorter testing duration.

ETA

The European Technical Assessment (ETA) is an alternative for construction products not covered by a harmonised standard. It is a document providing information on their performance assessment. The procedure is established in the Construction Products Regulation and offers a way for manufacturers to draw up the Declaration of Performance and affix the CE marking. It contributes to the free movement of construction products and the creation of a strong Single Market.

3. The route to a perfect joint

What is a sealant?

A sealant is a soft, pliable material that is used to seal cracks or joints where structural strength is not required. In technical terms, a sealant has a Shore A hardness below 40 and an E-module maximum of 0.7N/mm².

These soft materials can accommodate building and civil engineering structure movement and assuring a durable, sustainable and above all functional tightness throughout their operational life.

Sealants need to meet market requirements depending on function and location of the joint. The following information gives more detail on the ASTM and CE Marking required by sealants for use in façade, glazing, sanitary and pedestrian walkway applications.

SEALANT TYPES

Silicone sealants

Silicone sealants are construction sealants with excellent resistance to weathering and ageing. They are used to seal all types of construction joints. Silicone sealants cure by absorbing moisture from the air to form a silicone rubber seal capable of extreme movement ($\pm 25\%$ or more).

Silicone advantages

- Excellent extensibility
- Excellent recovery
- Extreme resistance to weathering (including UV) and ageing
- Easily applied at all temperatures
- Good to excellent adhesion

Hybrids

Hybrid is the fast growing elastic sealant and adhesive technology. It combines a wide adhesion spectrum, paintability, bubble-free curing and applicability to damp substrates. In addition, hybrids products contain no isocyanates.

Hybrid advantages

- Good adhesion to most substrates
- Hydrophilic; even adhesion to damp surfaces
- High mechanical resistance
- Isocyanate free
- Paintable* (Tests prior to the application is recommended for all systems)

PRODUCT	TECHNOLOGY	CE PART 1	CE PART 2	ASTM	 EC1	EMISSION CLASS FOR BUILDING MATERIAL M1	
BOSTIK H985 SEAL'N'FLEX WEATHER SHIELD	HYBRID	F-EXT-INT-CC 25 LM			●	●	●
BOSTIK S955 SEAL'N'FLEX NON-STAINING	SILICONE	F-EXT-INT-CC 25 LM			●		●
BOSTIK P795 SEAL'N'FLEX PREMIUM	POLYURETHANE	F-EXT-INT-CC 25 HM			●		●
BOSTIK S735 SEAL'N'FLEX CURTAIN WALL	SILICONE	F-EXT-INT-CC 25 LM	G-CC 25LM		●		
BOSTIK H725 SEAL'N'FLEX FACADE	HYBRID	F-EXT-INT-CC 25 LM		●	●		●
BOSTIK H560 SEAL'N'FLEX ALL WEATHER	HYBRID	F-EXT-INT-CC 25 LM			●		●
BOSTIK P360 SEAL'N'FLEX MULTI-PURPOSE	POLYURETHANE	F-EXT-INT-CC 25 HM		●			●
BOSTIK H360 SEAL'N'FLEX ALL IN ONE	HYBRID				●	●	●
BOSTIK S350 SEAL'N'FLEX FRAME SEALANT	SILICONE	F-EXT-INT-CC 12.5 E	G-CC				●
BOSTIK S320 SEAL'N'FLEX PERIMETER	SILICONE	F-EXT-INT-CC	G-CC				●

Polyurethanes

Polyurethane sealants cure by absorbing moisture from the air. Polyurethane sealants can be used for general construction sealing and caulking in which moderate movement can be expected. Typically, one-part polyurethane sealants are capable of $\pm 25\%$ joint movement. Newer polyurethanes have a lower modulus properties, allowing them to seal joints with high amounts of dynamic movement.

Polyurethane advantages

- Good adhesion to most common substrates
- Good recovery
- Very good resistance to weathering
- No shrinkage
- Rapid cure in the correct environment
- Paintable (only water based and 2c paints)
- Hydrophilic

Requirements

Choosing the correct sealant for a specific application can be complicated and dependent on a range of criteria. To make the correct decision we need to ask some questions:

- What type of substrate are we dealing with? (e.g. porous vs. non-porous, dark vs light coloured...?)
- What is the expected movement of the adjacent substrate?
- What is the best sealant chemistry for the application?
- What material are the adjacent substrates for a correct compatibility?
- Should it be compatible with paints and if so which paint type?
- Is substrate staining a concern?
- What are the minimum required adhesion properties?
- What is the application environment?
- Must the sealant be UV and weather resistance?
- Is the product applied outside (permeable) or at the inside (airtight)?

4. Application areas



BOSTIK P360 SEAL'N'FLEX MULTI PURPOSE

High modulus universal polyurethane sealant for construction and expansion joints.

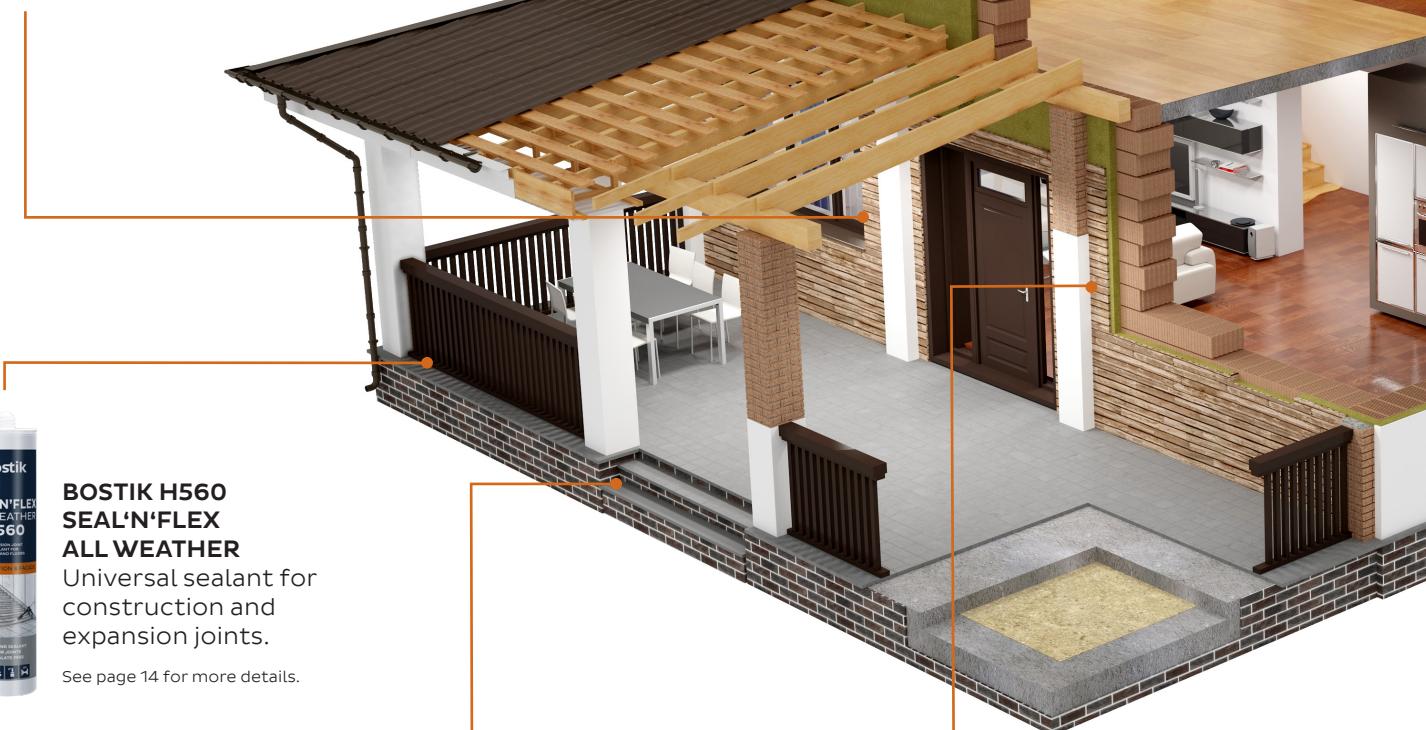
See page 14 for more details.



BOSTIK S320 SEAL'N'FLEX PERIMETER

Universal low modulus perimeter silicone sealant

See page 15 for more details.



BOSTIK H560 SEAL'N'FLEX ALL WEATHER

Universal sealant for construction and expansion joints.

See page 14 for more details.



BOSTIK H725 SEAL'N'FLEX FACADE

Premium flexible sealant for facade and perimeter joints.

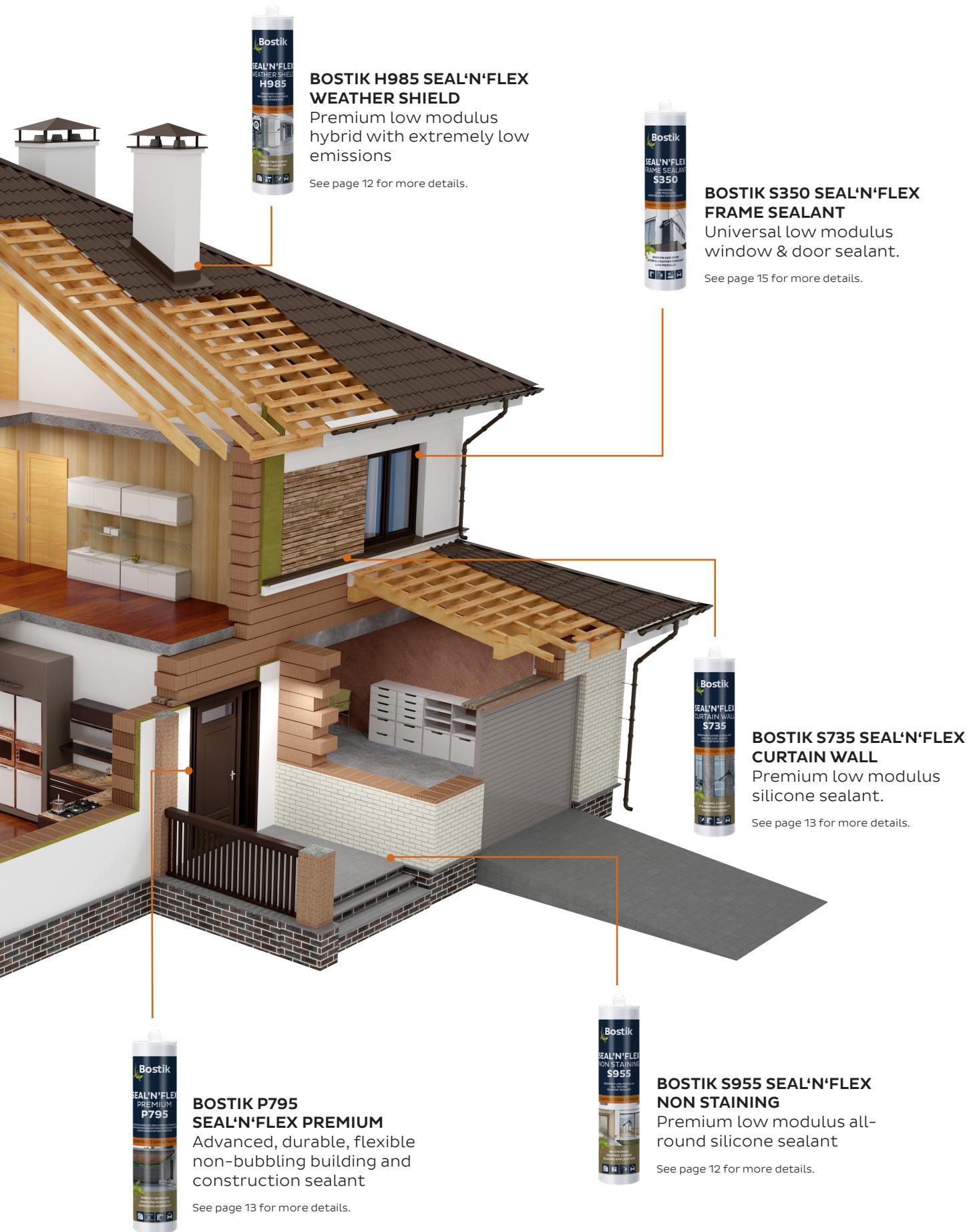
See page 14 for more details.



BOSTIK H360 SEAL'N'FLEX ALL-IN-ONE

Universal sealant for construction and expansion joints.

See page 14 for more details.



All products are widely applicable in multiple applications. This image is just an indicative display. Please use the table shown at page 7 and the product descriptions starting from 12 to make the correct product choice.



5. Portfolio

Bostik offers a wide range of sealants for the professional construction and façade industry. A combination of innovation, technology, certification and cost efficiency means it fulfils the sealing and bonding requirements of even the most advanced type of job.





BOSTIK H985 SEAL'N'FLEX WEATHER SHIELD

Premium low modulus hybrid with extremely low emissions

Product description

BOSTIK H985 SEAL'N'FLEX WEATHER SHIELD is a premium phthalate, tin and solvent free quality low modulus sealant for construction and dilation joints.

Most important characteristics

- Free of isocyanates, solvents, phthalate, tin and silicones
- Durable, permanent soft elastic
- 100% bubble free curing
- High elongation at break and movement capacity
- Good resistance to UV, weather and water
- Paintable
- Adheres perfectly without primer on most, even damp, surfaces

Certificates

- Emicode® EC1 R Plus
- M1
- BREEAM International Compliant
- EN 15651-1: F-EXT-INT-CC 25LM
- EN 15651-4: PW-EXT-INT-CC 25LM
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, ivory, concrete grey, mid grey, anthracite, black
foil pack of 600 ml	12 pieces per box	



BOSTIK S955 SEAL'N'FLEX NON STAINING

Premium low modulus all-round silicone sealant

Product description

BOSTIK S955 SEAL'N'FLEX NON-STAINING is a plasticizer free neutral silicone sealant for sealing all type of joints in facades, including natural stone substrates without the risk of staining.

Most important characteristics

- Non-staining, suitable for natural stone applications
- Neutral curing
- Applicable to a wide range of building materials
- Almost odourless
- Perfect adhesion without primer to most substrates
- UV, water, moisture and weather resistant
- Colourfast

Certificates

- EN 15651-1: F-EXT-INT-CC 25LM
- EN 15651-2: G-CC 25LM
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 300 ml	12 pieces per box	White, transparent, ivory, concrete grey, mid grey, anthracite, black

BOSTIK P795 SEAL'N'FLEX PREMIUM

Advanced durable flexible building and construction sealant

Product description

BOSTIK P795 SEAL'N'FLEX PREMIUM is a premium is a new generation high modulus bubble free curing advanced paintable polyurethane sealant for sealing construction and expansion joints and joints in pedestrian walkways.

Most important characteristics

- Bubble free curing
- Excellent toolability
- Suitable for wider joints
- Permanently elastic
- High mechanical resistance
- No shrinkage
- Adheres perfectly without primer on most, even damp, surfaces

Certificates

- ISEGA
- EN 15651-1: F-EXT-INT-CC 25HM
- EN 15651-4: PW-EXT-INT-CC 25HM
- SNJF F25E
- A+ French VOC Regulation



Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, ivory, concrete grey, mid grey, dark grey, anthracite, black
foil pack of 600 ml	12 pieces per box	

BOSTIK S735 SEAL'N'FLEX CURTAIN WALL

Premium low modulus silicone sealant

Product description

BOSTIK S735 SEAL'N'FLEX CURTAIN WALL is a high quality professional low modulus silicone sealant for curtain wall constructions, glazing applications and construction and dilatation joints.

Most important characteristics

- Neutral curing MEKO free silicone
- Excellent toolability
- Low modulus
- Durable, permanent soft elastic
- Excellent resistance to UV, water and weather
- Good adhesion to most common substrates
- No shrinkage

Certificates

- Emicode® EC1 Plus
- Blue Angel (RAL UZ 123)
- BREEAM International Compliant
- E1 EN 717-1S
- Indoor Air Comfort Gold®
- EN 15651-1: F-EXT-INT-CC 25LM and EN 15651-2: G-CC 25LM
- A+ French VOC Regulation



Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, ivory, concrete grey, mid grey, anthracite, black
foil pack of 600 ml	12 pieces per box	



BOSTIK H725 SEAL'N'FLEX FACADE

Premium low modulus flexible construction sealant

Product description

BOSTIK H725 SEAL'N'FLEX FACADE is a professional quality sealant for construction and dilatation joints

Most important characteristics

- Bubble free curing
- Excellent toolability
- Low modulus
- No isocyanates and solvents
- Permanently elastic
- Resistance to moisture and weather influences
- Adheres perfectly without primer on most, even damp, surfaces

Certificates

- Emicode® EC1 Plus
- EN 15651-1: F-EXT-INT-CC 25LM
- EN 15651-4: PW-EXT-INT-CC 25LM
- ASTM C-920
- SNJF F25E
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, ivory, concrete grey, mid grey, dark grey, anthracite, black
foil pack of 600 ml	12 pieces per box	



BOSTIK H560 SEAL'N'FLEX ALL WEATHER

Universal sealant for construction and expansion joints

Product description

BOSTIK H560 SEAL'N'FLEX ALL WEATHER is a professional low modulus hybrid sealant for construction and dilatation joints.

Most important characteristics

- Solvent free
- Low modulus
- Bubble free curing
- Low shrinkage
- Good resistance to UV, weather and water

Certificates

- Emicode® EC1 R Plus
- EN 15651-1: F-EXT-INT-CC 25LM
- EN 15651-4: PW-EXT-INT-CC 25LM
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, concrete grey, dark grey, black
foil pack of 600 ml	12 pieces per box	

BOSTIK P360 SEAL'N'FLEX MULTI PURPOSE

High modulus universal polyurethane sealant for construction and expansion joints

Product description

BOSTIK P360 SEAL'N'FLEX MULTI PURPOSE is a professional quality high modulus polyurethane sealant for construction and dilatation joints.

Most important characteristics

- Excellent adhesion without primer on most, even damp, surfaces
- High mechanical performances
- Permanently elastic

Certificates

- EN 15651-1: F-EXT-INT-CC 25HM
- A+ French VOC Regulation
- SNJF F25E
- ASTM C-920
- NF P 85-610



Packaging	Packed per	Colours
cartridge of 290 ml	12 pieces per box	White, concrete grey, dark grey, black
foil pack of 600 ml	12 pieces per box	

BOSTIK H360 SEAL'N'FLEX ALL-IN-ONE

Universal sealant for construction and expansion joints

Product description

BOSTIK H360 SEAL'N'FLEX ALL-IN-ONE is a hybrid sealant for connection joints with a low movement capability.

Most important characteristics

- Solvent free
- Clean room applications
- Good resistance to UV, weather and water

Certificates

- EN 15651-1: F-EXT-INT-CC 12,5E
- ISEGA
- A+ French VOC Regulation



Packaging	Packed per	Colours
foil pack of 600 ml	12 pieces per box	White, concrete grey, dark grey, black



BOSTIK S350 SEAL'N'FLEX FRAME SEALANT

Universal low modulus window & door sealant

Product description

BOSTIK S350 SEAL'N'FLEX FRAME SEALANT is neutral cure versatile silicone which can be used for sealing most building, construction and glazing joints. This silicone is almost odourless and cures with atmospheric moisture to form a durable rubber seal.

Most important characteristics

- Neutral curing
- Seals most building, construction and glazing joints
- Durable elastic

Certificates

- EN 15651-1: F-EXT-INT-CC 12.5E
- EN 15651-2: G-CC
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 300 ml	12 pieces per box	White, transparent, grey, black



BOSTIK S320 SEAL'N'FLEX PERIMETER

Universal low modulus perimeter silicone sealant

Product description

BOSTIK S320 SEAL'N'FLEX PERIMETER is a versatile acetoxy silicone sealant for expansion and construction joints which cures by reacting to moisture to form a durable elastic rubber seal. The product is UV and weather resistant.

Most important characteristics

- Excellent resistance to UV, water and weather
- Perfect adhesion to glass, painted wood, ceramic and enamelled substrates
- Permanently elastic

Certificates

- EN 15651-1: F-EXT-INT-CC
- EN 15651-2: G-CC
- A+ French VOC Regulation

Packaging	Packed per	Colours
cartridge of 300 ml	12 pieces per box	White, transparent, grey, black

6. Accessories

BOSTIK FINISHING SOAP

Joint sealant finishing additive

Product description

BOSTIK FINISHING SOAP is a ready mixed neutral universal additive for the wet tooling of sealants in joints. Bostik FINISHING SOAP is more than 99% Biodegradable.

Most important characteristics

- Ready to use
- Pre mixed to the correct ratio
- 99% Biodegradable

BOSTIK BACKER ROD PU

Bostik BACKER ROD PU (Polyurethane) round open cell foam rod used to fill joints between building materials to assure a correct joint width and depth. Bostik BACKER ROD PU is available in various diameters, Ø6 till 50 mm.

BOSTIK BACKER ROD PE

Bostik BACKER ROD PE (Polyethylene) round closed cell foam rod used to fill joints between building materials to assure a correct joint width and depth. Bostik BACKER ROD PE is available in various diameters, Ø6 till 50 mm.

7. Harmonized Building Standards

CE Classification (Europe)

In today's world, globalization and harmonization become commonly used and familiar terms. This is also true at building standards and regulations. Within Bostik we embrace this movement and strive for a globalized standard which provide transparency and simplicity in sealing and bonding.

One of the most familiar, and for Europe mandatory standards in the sealant industry is the CE Classification, or also known as the standard EN 15651. This norm is divided into 4 categories:

- **EN 15651-1 Sealants for Facade**
- **EN 15651-2 Sealants for Glazing**
- **EN 15651-3 Sealants for Sanitary**
- **EN 15651-4 Sealants for Pedestrian Walkways**

Type testing

The objective of type testing is to determine the type of product as set out in EN 15651 and, where applicable, to define the intended use in more detail. Type testing consists of a complete series of tests that are to be executed according to the standard for a certain product type. Type testing must be executed by a notified testing laboratory. The only exception to this are Type F-INT sealants ("interior facade applications"). This is the only case in which the manufacturer carries out type testing and determines product type.

Type testing must be carried out to determine the performance of the product placed on the market according to the specifications of the applicable European harmonized product standard (i.e. EN 15651-1, EN 15651-2, EN 15651-3 or EN 15651-4).

EN 15651-1 Sealants for Facade

EN 15651-1 deals with the definition and the requirements for non-structural facade sealants. The areas in which these joint sealants are used are:

- Outside of a building
- Window and door frames, including visible faces in indoor areas



EN 15651-2 Sealants for Glazing

EN 15651-2 sets out definitions and requirements for non-structural, elastic joint sealants for sealing glazing in buildings. Included are glazing joints at an angle of 7° to the horizontal. The areas in which these joint sealants are used are:

- Glass to glass
- Glass to frames
- Glass to porous carrier materials

EN 15651-4 Sealants for Pedestrian Walkways

EN 15651-4 deals with the definition of and requirements on cold applied, non-structural, elastic sealants for movement joints in floors for interior and exterior use. Included in the scope are:

- Floor joints in pedestrian walkways
- Floor joints in surfaces with pedestrian traffic along with, e.g. trollies, etc.
- Floor joints in public areas
- Movement joints between concrete slabs, e.g. in balconies, terraces and warehouses

Pursuant to EN 15651, products are divided into the following product types (identification codes) (for an explanation, see table 'Sealants for facade, glazing & pedestrian walkways'):

- Type F-INT
- Type F-EXT-INT
- Type F-EXT-INT-CC
- Type G
- Type G-CC
- Type S
- Type PW-INT
- Type PW-EXT-INT
- Type PW-EXT-INT-CC

In addition, EN 15651-1 and EN 15651-4 also allows a classification of joint sealants. Joint sealants are divided into the following classes:

- Class 25LM
- Class 25HM
- Class 20LM
- Class 20HM 12.5E, 12.5P and 7.5P
- Class 25LM-CC
- Class 25HM-CC
- Class 20LM-CC
- Class 20HM-CC and 12.5E-CC
- Class "only suitable for use in interior areas"



What does it mean?

We can look at the full declaration of a sealant in detail. Below is a table showing the technical behaviour of a sealant, including its application areas:

- Type F is for construction sealants in buildings other than glazing joints
- Type G is for glazing sealants
- Type PW is for pedestrian walkway

The movement capability and the elastic behaviour of the sealant describes its performance when subjected to expansion or contraction caused by the adjacent building elements.

'Class' abbreviations mean:

- LM refers to a 'softer' sealant and stand for low modulus. Low modulus performing sealants can withstand a movement capability of 20 and 25%.
- HM refers to a 'harder' sealants and stand for high modulus. High modulus performing sealants can withstand a movement capability of 20 and 25%.
- E refers to a lower performing 'elastic' sealant and can withstand a movement capability of 12,5%.
- P stands for 'plastic' and these type of sealants have a very limited movement capacity of 12,5% resp. 7,5%.
- EXT stands for external applications
- INT stands for internal applications
- CC for cold(er) climate applications (-30°C)

Application	Movement Capability	Class	Elastic Recovery	Loss of Volume Reactive Systems	Loss of Volume WBA Systems
Type F	± 25%	25LM 25HM	≥ 70% ≥ 70%	≤ 10% ≤ 10%	≤ 25% ≤ 25%
	± 20%	20LM 20HM	≥ 60% ≥ 60%	≤ 10% ≤ 10%	≤ 25% ≤ 25%
	± 12,5%	12,5 E	≥ 40%	≤ 25%	≤ 30%
	± 7,5%	7,5 P	< 40%	≤ 25%	≤ 25%
Type G	± 25%	25LM 25HM	≥ 70% ≥ 70%	≤ 10% ≤ 10%	
	± 20%	20LM 20HM	≥ 60% ≥ 60%	≤ 10% ≤ 10%	
Type PW	± 25%	25LM 25HM	≥ 70% ≥ 70%	≤ 10% ≤ 10%	
	± 20%	20LM 20HM	≥ 60% ≥ 60%	≤ 10% ≤ 10%	
	± 12,5%	12,5 E	≥ 40%	≤ 25%	

ASTM INTERNATIONAL (American Society for Testing and Materials)

The ASTM C920-18 'Standard Specification for Elastomeric Joint Sealants' covers the properties of a cured single- or multicomponent cold-applied elastomeric joint sealant for sealing, caulking, or glazing operations on buildings, plazas, and decks for vehicular or pedestrian use, and types of construction other than highway and airfield pavements and bridges. A sealant qualifying under this specification shall be classified as to type, grade and class.

Type

Type defines whether products are premixed or require mixing at the jobsite as follows:

- Type S products are those supplied in pre-packaged cartridges or other forms in which no jobsite mixing is required.
- Type M products are those supplied in two or more parts for mixing at the jobsite. Multicomponent products include those with two components consisting of a base and a catalyst or with three components consisting of not only a base and catalyst but also a separate colour component. Multicomponent products cure faster than their single-component counterparts

Grade

Grade defines the flow characteristics of the sealant as follows:

- Grade P products have sufficient flow to fill joints in horizontal surfaces and remain level and smooth at temperatures as low as 40 deg. F (5°C). This designation generally applies to products rated for traffic use.
- Grade NS products are suitable for installation in joints in vertical surfaces without sagging at temperatures between 40 and 122 deg. F (5 and 50°C). This designation can apply to sealants classified for both traffic and non traffic uses. They can be installed in traffic joints in sloping horizontal surfaces where a self-leveling type would flow downhill.

Use

Use classifications related to joint substrates are designated as follows:

- Use T classifies sealants designed for joints in surfaces subject to pedestrian and vehicular traffic.
- Use NT classifies sealants designed for nontraffic exposures.
- Uses M, G, and A refer to sealants that remain adhered, within given parameters, to various standard specimens including, respectively, mortar (M), glass (G), and aluminum (A) when tested for cyclic movement and adhesion-in-peel. It is important to understand that the specimens related to these designations are not those specified for the Project but those that comply with restrictive material specifications in the ASTM test methods. Mortar is always Portland cement mortar, glass is clear float glass, and aluminium is clear anodized aluminium of a specific alloy. These standard substrates are covered in ASTM C 1375, Guide of Substrates Used in Testing Building Seals and Sealants.
- Use O refers to substrate materials other than M, G, and A. Unless it is definitely known that the joint substrate materials for the Project are identical to the materials designated by M, G, and A, retain Use O.

	USE	MOVEMENT CAPABILITY	
Type S Single Comp.	T Traffic	Class 100/50	100% expansion / 50% compression
Type M Multi Comp.	NT Non Traffic	Class 50	50% expansion / 50% compression
	I Immersed	Class 35	35% expansion / 35% compression
Grade NS Non sag	M Mortar	Class 25	25% expansion / 25% compression
	G Glass	Class 12,5	12,5% expansion / 12,5% compression
	A Aluminum		
	O Other		

Movement capability related to joint as follows:

Classes 12,5, 25, 35, 50, and 100/50 are the five designations in ASTM C 920 for rating movement capability. Although sealants ought to perform in the field as well as they do during testing, it is more prudent to design joints that impose lesser extremes of movement than that demonstrated in the laboratory because of the unknowns present in the field relative to qualities of joint preparation, sealant application, construction tolerances producing varying joint widths, and the effect of installation temperatures on joint widths. With the recognition of new classes 12,5, 25, 35, 50, and 100/50, the sealant industry has finally acknowledged sealants with this higher movement capability after years of resistance by manufacturers who did not offer products with these extra movement capabilities.

8. Service & Support



8.1 How to calculate a joint dimension

Joint movement can be caused by many factors: wind loading, deformation or displacement of the building frame, vibrations and of course thermal expansion and contraction as well as subsequent movement from moisture absorption and evaporation. It is generally recognized that the movement expected in a sealant joint determines the design dimensions and frequency of the joints.

Joint movement, caused by thermal expansion and contraction, can be determined by a coefficient of linear expansion formula. The coefficient of expansion is simply defined as the amount a given material increases or decreases in size with temperature changes. The composition of building materials, their length, and the temperature gradient (or rate of change) all determine the degree of expansion and contraction. The amount of expected movement in a substrate is one of the factors that determines which sealant should be used on a specific job. In other words, which sealant will be most compatible with the degree of movement and the substrate used.



Example 1: Standard correctly applied flexible and elastic joint sealant on a backer rod with the correct installation depth and width.



Example 2: Expansion of the building materials due to temperature absorption. Result is that the joint in between the adjacent building materials will be 'smaller'.



Example 3: Contraction of the building materials due to temperature remittance. Result is that the joint in between of the adjacent building materials will be 'wider'.

Expansion

Coefficient of expansion is simply defined as the amount a given material increases and decreases in size with temperature changes. The difference in the coefficient of expansion between different building materials must be considered when determining which sealant should be used.

For example, the most popular metal used in storefronts and curtain walls is aluminum. Aluminum expands 2.5 times more than glass under the same conditions. Looking at the expansion table, it is evident that when using aluminum the best sealant choice must:

- Remain elastic when extended
- Adhere to the glass and substrate
- Return to its original shape

Coefficient of expansion

The coefficient of linear thermal expansion is the change, per unit of length, for each degree of temperature. This ratio (of expansion or contraction per degree of temperature change compared to the length of the material before the temperature change) is a constant for each particular material and is expressed as a decimal or a fraction. The following values are expressed in a rate of expansion per linear meter and over a 100° temperature change:

Material	Linear thermal expansion coefficient per °C	Linear thermal expansion of 1 meter material at a temperature difference of 100°C
Marble	5×10^{-6}	0,5 mm
Wood	5×10^{-6}	0,5 mm
Brick	7×10^{-6}	0,7 mm
Glass	8×10^{-6}	0,8 mm
Stone	8×10^{-6}	0,8 mm
Concrete	12×10^{-6}	1,2 mm
Aerated concrete	12×10^{-6}	1,2 mm
Limestone	12×10^{-6}	1,2 mm
Steel	12×10^{-6}	1,2 mm
Aluminum	24×10^{-6}	2,4 mm
Polyester (fiberglass reinforced)	30×10^{-6}	3,0 mm
Polyester	80×10^{-6}	8,0 mm
PVC	80×10^{-6}	8,0 mm
PMMA (polyacrylate)	80×10^{-6}	8,0 mm
Polycarbonate	80×10^{-6}	8,0 mm

How to calculate

Based on a concrete slab of 5 meters length, the maximum temperature of which is + 30°C , with a minimum of - 10°C. The difference in temperature is 40°C.

The formula how to calculate the movement is:

$$\rightarrow M_t = CTE * \Delta T * Length$$

M_t : movement in mm

CTE : coefficient thermal expansion in mm mtr/1°C

ΔT : temperature difference in °C

Length : length of element in mm

In this example:

$$\rightarrow Mt = 12 \times 10^{-6} * 40 * 5.000$$

$\rightarrow Mt = 2,4$ mm movement

How to apply sealants

Once the forecasted movement (M_t) of the elements has been calculated, we need to determine the minimum required joint width to accommodate the movement capability of the applied sealant. If we recommend a low modulus sealant with a movement capability for the façade (F-EXT-INT-CC-25LM) of 25% the minimum required joint width can be calculated as follow:

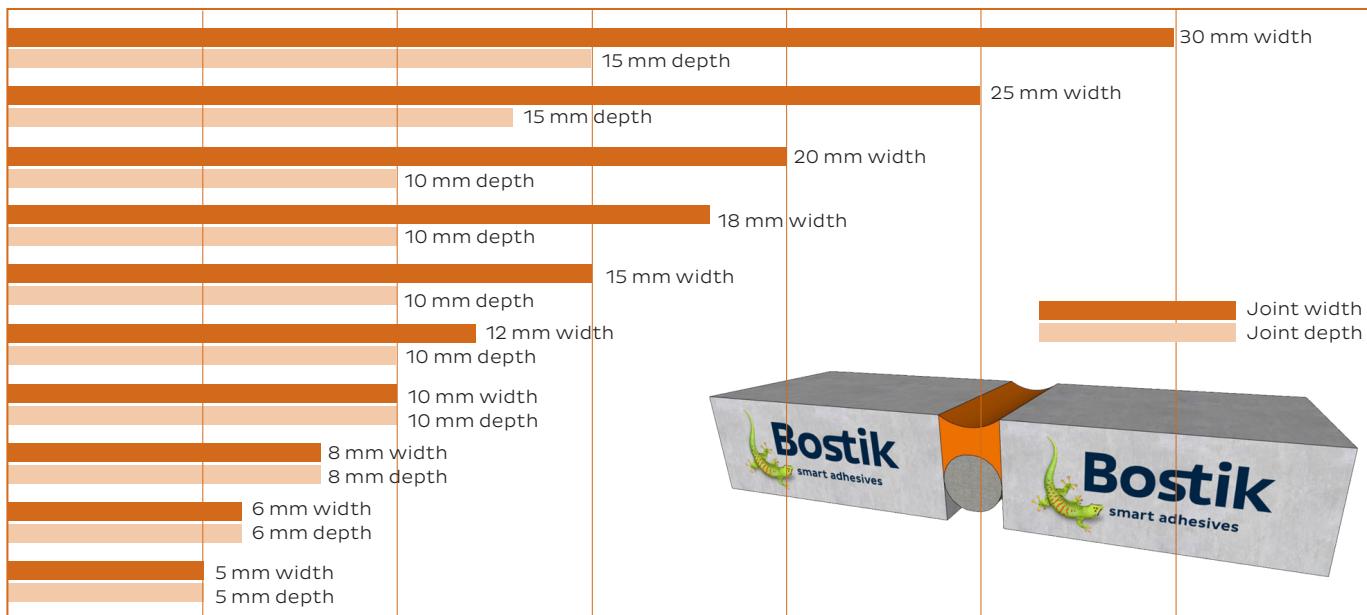
- $(100/25) \times 2,4$ mm = 9,6 mm
- Rounded up till 10 mm

The correct width and depth of the joint are important. The depth depends on the width and is calculated by using the formula below.

- joint depth = (joint width/3) + 6 mm

So with a joint width of 10 mm the right joint depth is: $(10/3) + 6$ mm = 10 mm

Note: calculations are indicative as we only know the linear behaviour of the building products. The temperatures used to make these calculations are not the responsibility of Bostik.



To apply the sealant with the correct depth, a backer rod is used. Backer rods are used to control the depth of sealant, to provide backing for the sealant during application and to prevent triple bonding. Materials used as backer rods should be weaker than the sealant itself and not obstruct the movement capability of the sealant, whilst compressing or expanding.

Most suitable backer rods are:

- **BOSTIK PU Backer rod (open cells)**
- **BOSTIK PE Backer rod (closed cells)**

The rounded shape of the foam creates a good dimension of the joint. Relatively large bonding surface compared to the thinner layer in the middle of the sealant-joint. PU Backer rod is used in non-mechanical joints, or joints unexposed to water (for example facade joints).

PE Backer rod is used in mechanical joints of those exposed to water. The use of PE Backer rods is more critical than PU Backer rods. Damage to PE Backer rods during application in the joint can release propellant, which can cause blistering in the sealant joint. If air is locked between the rod and the sealant, direct sunlight could cause blisters. Backer rods of wooden battens, rubber hoses, 1-component polyurethane foam, etc. are not suitable for expansion joints. Polystyrene foam is less suitable, especially when bonding primer is applied to the joint. The polystyrene can be dissolved by the primer. When the depth of the joint is too small to use a backer rod, self-adhesive PE foam tape can be used, or a PE foil. The cured sealant will not bond to Polyethylene, preventing bonding to 3 surfaces, allowing the sealant to move freely in the joint.

Open-cell polyurethane backer rod allows the sealant to cure through the backer rod, which is beneficial when fast sealant cure is desired. Open-cell polyurethane backer rod can absorb water, which may have a detrimental effect in certain joint types. Closed-cell polyethylene backer rod may outgas if punctured during installation, requiring it to be left for 20 minutes before application of the sealant.

Application considerations

- The joint substrate surfaces should be clean, dry, frost-free, and free of contaminants and surface tension reducing materials such as water repellents and other coatings.
- The backer rod should be correctly sized for the opening and should be compatible with the sealant.
- The backer rod or bond breaker tape should be carefully and properly installed to result in a consistent joint profile. Variations in backer rod setting depth can greatly affect joint geometry and performance.
- The sealant should be installed using proper tools to result in a consistent and uniform application.
- The sealant should be tooled as soon as possible after application. Tooling is a critical step to compact the sealant, thereby providing an appropriate profile and ensuring adhesion to the substrates.
- All sealant materials have a shelf-life. Always confirm that the sealants are within their shelf life limit before being used.
- Once the cartridge or sausage is opened and placed in the gun, the nozzle is cut to the right width. Normally the width of the nozzle should correspond to the width of the joint. The nozzle is cut at an angle of 45°, as the caulking gun should be held at this angle during application.
- Apply the sealant with care. It is important to fill the entire joint. This can be done by applying sufficient sealant to the back of the joint or the backer rod. This causes the sealant to be pressed to both sides of the joint, creating a good surface for bonding between sealant and joint.
- Once applied the sealant surface must be finished smoothly. This can be done with Bostik FINISHING SOAP. The surface of the sealant and adjacent materials are then moistened with Bostik FINISHING SOAP.

8.2 Installation of an expansion joint

It isn't difficult to create the perfect expansion joint as long as you use the right tools and products. The method below ensures a beautiful and long lasting expansion joint. For additional information, please watch the video tutorial on our website or youtube channel.



Apply the Backer Rod at the right depth. Make sure that the size of the Backer Rod is 150% of the width of the joint.



Apply Primer with a brush and let it dry for approximately 30 minutes.



Cut the cartridge nozzle at a 30 degree angle and at the width that corresponds to the size of the joint.



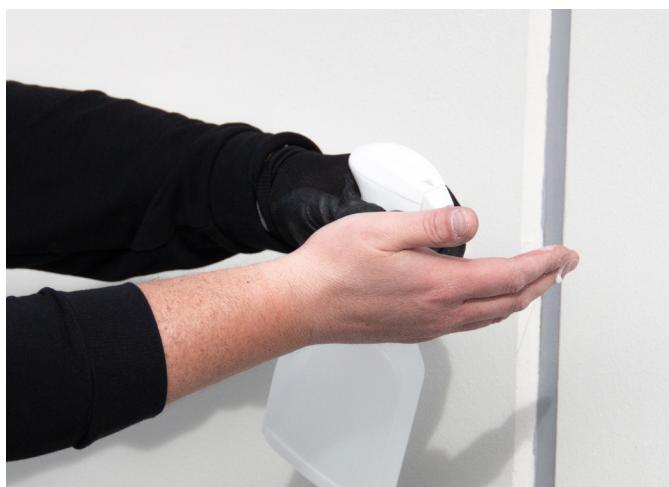
Apply the sealant at a steady pace and in sufficient volume to fill the joint. Make sure the sealant makes contact to both adhesion surfaces.



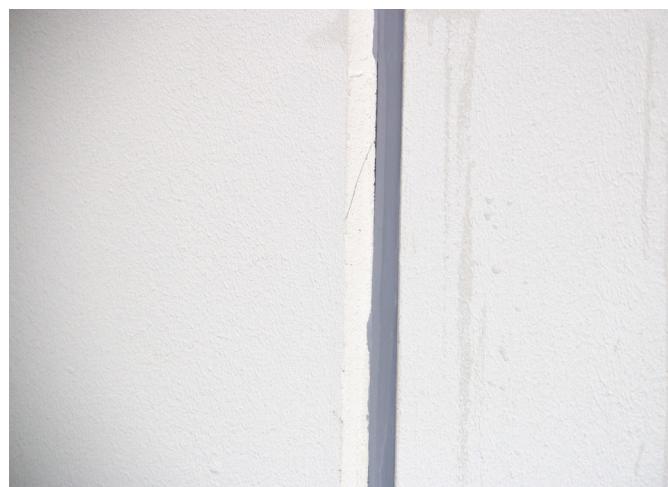
Use Finisher and a wooden spatula to tool the fresh joint. Only wet the spatula with Finisher. Do not spray directly onto the fresh sealant.



Tool the fresh sealant joint with the wetted spatula.



For a perfectly smooth finish, use your finger wetted with Finisher.



You now have created a perfect expansion joint.

8.3 Explanation of the icons

The brand new packaging of the Bostik Construction & Facade range comes with icons that tell something about the properties of the product. Below we explain in detail what these icons mean.



Outside and indoor use

The product can be used indoor and outside.



Outside use

The product can be used outside.



Indoor use

The product can only be used indoor.



Rain resistant

The product can be used outside and is resistant to rain.



Flexible

The cured product is flexible.



Low VOC

The product is free of solvents that could harm you and the environment.



No staining

The product is stain-free. The adjacent surfaces will not be contaminated.



Easy to apply

The product has excellent application properties and is easy to use.



Easy to use

The product is very easy to use.



Construction

The product is very suitable for various construction applications.



25% flexible

The cured product is has a flexibility of 25%.



25% flexible

The cured product is has a flexibility of 12,5%.



Paintable

The product can be overpainted.



Paintable

The product has excellent overpaintable properties.



Toolable

The product has excellent tooling properties.



Glazing

The product can be used for sealing glass in windows.



Water resistant

The product has excellent resistance against water and weather conditions.



UV resistant

The product has excellent resistance against ultra violet beams.

8.4 Technical Training

End-users expect up-to-date knowledge and technical support from shop-employees. Bostik supports with training programs focusing on products and applications. We co-develop training programs with producers and resellers to combine the knowledge of paint products with knowledge on dedicated Bostik products.



Better results through Knowledge

Expansion joints are a serious market segment which deserves a dedicated approach. Bostik constantly gathers knowledge about expansion joints upstream and downstream, from chemical supplier to end-user. The collection of this knowledge is a continuous process and provides us with the latest insights.

Centre of Excellence

In our recently built Centre of Excellence we share knowledge within the Bostik group, with our customers and with end-users. We are pleased to receive our partners and end-users to provide them with the latest knowledge and new insights. This new information enables our partners to achieve higher efficiency and better results.

Bostik professional product portfolio

The rest of the Bostik professional product portfolio you can find at bostik.com and read more about them in the product application brochures





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