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European & American classification for sealants

FACTSHEET



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GLOBAL LEADER IN ADHESIVE TECHNOLOGIES

Bostik is one of the largest adhesive and sealant companies. Worldwide, we employ some 6,000 people in 50 countries across five continents. Our customers come from diverse markets, most notably the industrial manufacturing, construction and consumer sectors.

SMART INNOVATIONS

Our smart identity is underpinned by innovation. We pursue innovation vigorously, applying the latest technological advances to developing 'smart' adhesives. Our archives are laden with examples of Bostik technologies that have disrupted markets - from potato starch-based wallpaper paste to elastic attachment adhesive for diapers.

Today, our commitment to innovation is as strong as ever. We innovate with our customers through a global R&D network, comprising three international Smart Technology Centres and 8 regional centres. And we differentiate our business through this investment.

GENERAL INFORMATION

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.





EUROPE (EN 15651)

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 15651-3 SEALANTS FOR SANITARY

EN 15651-3 deals with joints in sanitary areas inside buildings exposed to non-pressurized water. This includes joints in:

- Bathrooms
- Toilets
- Showers
- Domestic kitchens

Applications for service and drinking water, underwater (swimming pools, sewer systems, etc.) and applications in contact with food do not fall under the scope of this standard!

This European Standard specifies definitions and requirements for products used when sealing interior sanitary joints exposed to non-pressurised water. Industrial, drinking water, underwater (swimming pools, sewage systems, etc), food contact applications and sealing of glass-ceramic cooktop panels (stove tops, ceramic hobs) are excluded from the scope.



EN 15651-4 SEALANT 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"

EN 15651-3 is divided into two main classes:

- The 'S' class, which refers to a maximum shrinkage of $\leq 55\%$ of the applied sealant
- And the 'XS' class, which refers to a shrinkage of the applied sealant $\leq 20\%$.

The resistance to flow shall be measured accordingly EN ISO 7390. Within both classes 'Type S' and 'Type XS' a range between 1 and 3 provides information on the mold growth intensity. When combined this will give the following table:

Application	Class	Shrinkage	Mould growth intensity	Resistance to flow
Type S	S1	$\leq 55\%$	0 - 1	< 3 mm
	S2		2	
	S3		3 - 5	
Type XS	XS1	$\leq 20\%$	0 - 1	< 5 mm
	XS2		2	
	XS3		3 - 5	

Mould growth intensity:

0. No growth apparent under the microscope
1. No growth visible to the naked eye, but clearly visible under the microscope
2. No growth visible to the naked eye, covering up to 25% of the test surface
3. No growth visible to the naked eye, covering up to 50% of the test surface
4. No growth visible to the naked eye, covering more than 50% of the test surface
5. Heavy growth, covering the entire test surface



AMERICA (ASTM C920-18)

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	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
Type NS Non sag	M Mortar	Class 25	25% expansion / 25% compression
	G Glass	Class 12,5	12,5% expansion / 12,5% compression
Type P Pourable	A Aluminium		
	O Other		

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 nontraffic uses. They can be installed in traffic joints in sloping horizontal surfaces where a self-levelling 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 aluminium (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.



Movement capability related to joint as follows:
Classes 12-1/2, 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 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.