IVD-Instruction Sheet No. 12
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The Paintability of movement accommodating Sealants in Building Construction

- Requirements and Implications -

End of validity for previous versions – release version see on: www.abdichten.de

Content

0 Policy Statements on Standardization and Quality

Legal Framework

The following statements refer to the standard EN 15651 anticipated to come into force in 2014.
The following requirements resulting from the standard (e.g. use of CE-marking) are also expected to come into force in 2014 together with the standard.

Sealants as a construction product succumb to the European Construction Products Directive, CPD (in Germany transposed into national law by the Construction Products Act). Building products are by definition intended to remain permanently in the building. The Construction Products Directive forms the legal basis for defining the requirements for a general fitness of the products and the elimination of technical barriers to trade within the EU.
The directive itself only states targets, but not how to achieve them. These targets are summarized in the six essential requirements:

1. Mechanical resistance and stability
2. Fire Protection
3. Hygiene, health and environmental protection
4. Safety in use
5. Sound insulation
6. Energy saving and thermal protection

These essential requirements provide the basis for the creation of so-called "harmonized" standards. Such standards are prepared on the basis of a mandate from the European Commission, by CEN. The necessary compliance of a construction product with the harmonized standard is documented by the CE-mark. Without CE-mark a product must not be placed onto the market!
In developing the harmonized standards, the different circumstances of member states have to be taken into account via the introduction of classes, so that local products can still be placed on the market, i.e. the CE-mark only indicates suitability for distribution in the EU, which does not necessarily imply a high quality standard.

The harmonized standards are created as EN standards and then adopted as DIN EN standards in Germany. Possibly conflicting national standards shall be withdrawn from that date. However, some further parts of the national standards continue to exist as a so-called "residual rules". Thus, if essential national building code regulations are affected, a

product not compliant with these rules may not be used in this country, despite the CE-mark.

1 Preamble

In daily practice it is often the case that coatings, developed for solid materials such as concrete, plaster, wood or metal and having their function there, are applied, for different reasons, onto the adjacent joints sealed with sealants.

2 Scope

This instruction sheet serves as a complement to the standards to be observed in practice, e.g. DIN EN ISO 11600, DIN 18540, DIN 18545, BFS-Merkblätter (Instruction Sheets) Nos. 18 and 23.
It expressly applies only to movement accommodating sealants with stress A of DIN 52452 - 4 and not for curing or plastic putty with constant stress B of DIN 52452-4.

3 Remarks

The following applies:

- the client requires, for aesthetic reasons, a full-surface reworking to adjust the joints of the surrounding area
- the company executing the operation simply works over the joints in order to avoid tedious masking
- the matching colour of the sealant is not available
- the supplier of the sealant makes sweeping, often not correct statements that do not exclude an all-over painting.

A full-surface painting of movement accommodating sealants without a specific test and / or recommendation by the sealant manufacturer, however, is a non-intended use of the coating. Before that must be strongly cautioned.

According to DIN 18363 - Painting work - the contractor must check the substrate to see whether it is suitable for carrying out his work. The contractor has to inform his client promptly of his concerns in writing (see VOB Part B - DIN 1961 - § 4, No. 3).

No sealant should be painted unconsidered. This generally applies to all commodity groups (acrylate, hybrid sealant, polyurethane, silicone, and polysulfide) and all applications. Examples are: exterior wall joints, perimetre joints of windows and exterior doors, glass seals, joints in dry construction etc.

The terms relating to the compatibility between sealants and coatings and the paintability of sealants are defined in the DIN 52 460 Sealing and Glazing, terms and the compatibility between the sealant and coating upon contact in DIN 52452-4 Testing of sealing compounds in building constructions - Compatibility of sealing products– Part 4: Compatibility with other protection coatings tested and evaluated.

Paint compatibility and paintability are two different terms.

4 The Paint Compatibility

The paint compatibility assesses and evaluates

- the adhesive area underneath the sealant (test / stress A 1) and
- the area adjacent to the sealant (test / stress A 2)

The definition according to DIN 52460 reads as follows:
Paint Compatible
Sealants usable for sealing components coated with paints, without experiencing harmful interactions between the sealant, the paint and adjacent materials.
This applies equally to a subsequent coating of the components, where the paint on the sealant has to be limited to 1 mm of the edge of the joint.

Test A 1 in DIN 52452-4:
For assessing the compatibility between existing coating and subsequent sealant.

Test A 2 in DIN 52452-4:
For assessing the compatibility between the fully reacted sealant and a subsequent coating of the adjacent area.

5 The Paintability

The paintability assesses and evaluates

- the holohedral coated sealant surface

The definition according to DIN 52460 reads as follows:

Paintable is a sealant that can be coated holohedral with one or more coatings without damaging interactions.

Test A 3 in DIN 52452-4:

For the evaluation of the coating on the sealant surface observable defects cannot be noted.
The test to A3 however, envisions according to Table 1, to load the painted specimen in an expansion/ compression cycle to the percentage indicated by the sealant manufacturer as maximum movement accommodation:

Maximum Movement Accommodation of the Sealant according to the Technical Data sheet	**Test expansion and –compression of painted material**
12,5%	12,5%
20%	20%
25%	25%

Tab. 2 shows as a consequence that certain joint areas can hardly be free of defects:

Maximum Movement Accommodation of the Sealant according to the Technical Data sheet	**Test expansion and –compression of painted material**
exterior wall joints in building acc. to DIN 18540	25%
Sealing of glazing acc. to DIN 18545-2, Group E	25%
Perimetre Joints of Windows in the interior zone (IVD-Instruction Sheet No. 9)	12,5%
Perimetre Joints of Windows in the exterior zone (IVD-Instruction Sheet No. 9)	25%

Movement accommodating sealants thus can not, for understandable technical reasons, be painted holohedral.

If this should be required or necessary in exceptional cases the coating of the sealant must participate in the accommodation movements without visual and / or mechanical defects.

Remark:

The evaluation according to A 3 of DIN 52452-4 allows both the manufacturer of a sealant as well as that of a coating material to assess his product whether it bears all the essential characteristics for a functional application in conjunction with the respective other material. The term paintable in accordance with this standard does not only include the indication of the coating system in the desired optical final state, but also that the system sealant / coating has to meet the following demands:

- defect-free coating of the sealant surface
- proper drying of the coating
- no colour change of the coating
- adhesion of the coating on the sealant
- expansion without cracking in the coating

An aid to the processors in the daily practice shall be the following Tab. 3, which allows an evaluation and assessment of visible defects.

When painting a movement accommodating sealant the following problems can be expected and must be considered:

Fault	**Occurrence**	**Cause**	**Where does the Fault occur?**
VS* = paint flaw	Wetting and adhesion of the coating coming on the sealant flawed	Incompatibility of systems, especially with silicone sealants	Can occur with all sealing materials and coating systems
KL* = no drying, sticky surface	Coating both visually and mechanically flawed, high fouling risk	Incompatibility of products, mostly due to plasticizer migration	Can occur with all sealing materials and coating systems, especially in hybrid polymers, polyurethane and polysulphide sealants
KH = no adhesion of the cured coating to the substrate in the adjacent area. Cross-cut test according to DIN 53151	Visible poor coating, wetting and adhesion of the coating on the substrate visibly partially disturbed. Limited function of the coating	Contamination of adjacent joint areas such with sealant components e.g. on smoothing with too much wetting agent, or distributing the sealant into the joint border areas with smoothing spatula	Especially with silicone sealants
RU* = Wrinkles in the coating	Coating both visually and mechanically flawed	Incompatibility of the products, compression of the sealant with excessive demands on the movement accommodation of the coating	Can occur with all sealing materials and coating systems

VF* = Colour change	Optical flaw of the coating	Interaction as a result of the incompatibility of the products	Can occur with all sealing materials and coating systems, e.g. due to plasticizer migration
RB* = Cracks in the coating	Coating both visually and mechanically flawed	- The coating is less deformable (ductile) as the sealant - Hairline cracks in the coating during the drying phase of the coating, particularly for highly filled systems - toe-cracking of the coating with subsequent sealant damage (possible cohesion cracks) and optical flaws (stains on the surface)	Can occur with all sealing materials and coating systems, if motion accommodating sealants are painted
Coating on the sealant surface is optically different, e.g. a little darker (marking)	Optical flaw of the coating on the sealant and the adjacent component surfaces	Different application thicknesses (opacity) of the coating on the sealant surface and the adjacent surfaces	Mainly in connection with acrylic sealants, used for filling plaster cracks and -holes, connections to wallpapers, drywalls and other interior applications

*= the abbreviations are taken from DIN 52452-4

Especially the cracking of the paint system is observed frequently in practice, and reason for complaint. It is usually caused by thermally induced changes in length or settling of components, e.g. in exterior wall joints according to DIN 18540 and in perimetre joints between different components, e.g. on windows and doors and other components. The extent of movements in reality is frequently underestimated in the planning of the execution.

If such faults occur, they usually cannot be removed without lots of effort. The removal of the faulty coating from the sealant e.g. by washing with a suitable solvent is hardly possible without damaging the adjacent components or damaging the sealant surface. In many cases the cutting out and replacement of the sealant is the only solution.

6 The Claim of a Sealant

Only if all requirements are fulfilled, the statement
"To be painted with..."
may be made stating the trade name of the coating. The documented evidence of conformity has to be in accordance with DIN 52452-4 A 3.

7 The Documentation of a Sealant

The statements for painting a sealant shall be documented as follows:

- Notice published on the cartridge or package:
  - Paintability
    see technical instruction sheet (Data Sheet),
    or: see details in the technical instruction sheet (Data Sheet)
- required information in the technical data sheet:
  - Paintable with the following coating systems (Brand / Manufacturer and type designation).
  - Tested according to DIN 52452-4 A 3

8 Reference List

DIN EN ISO 11600
Building construction - Jointing products - Classification and requirements for sealants
Berlin: Beuth-Verlag GmbH

DIN EN 18540
Sealing of exterior wall joints in building using joint sealants
Berlin: Beuth-Verlag GmbH

DIN EN 18545
Sealing of glazings with sealants
Beuth-Verlag GmbH, 10787 Berlin

DIN 1961, German construction procedures (VOB)
Part B: General conditions of contract relating to the execution of construction work
Beuth-Verlag GmbH, 10787 Berlin

DIN 52452-4
Testing of sealing compounds in building constructions - Compatibility of sealing products–
Part 4: Compatibility with other protection coatings
Beuth-Verlag GmbH, 10787 Berlin

DIN 52460
Sealing and Glazing; Terms
Beuth-Verlag GmbH, 10787 Berlin

BFS-Merkblatt (Instruction Sheet) Nr. 18
Beschichtungen auf Holz und Holzwerkstoffen im Außenbereich
(Coatings on wood and wooden materials in the exterior zone)
Hrsg.: Bundesausschuss Farbe und Sachwertschutz e.V.,
Frankfurt am Main 2006

BFS-Merkblatt (Instruction Sheet) Nr. 23
Technische Richtlinien für das Abdichten von Fugen im Hochbau und von Verglasungen
(Technical guidelines for sealing joints in building construction and glazing)
Hrsg.: Bundesausschuss Farbe und Sachwertschutz e.V.,
Frankfurt am Main 2005

IVD-Instruction Sheet No. 2
Classification of Sealants
IVD INDUSTRIEVERBAND DICHTSTOFFE E.V.

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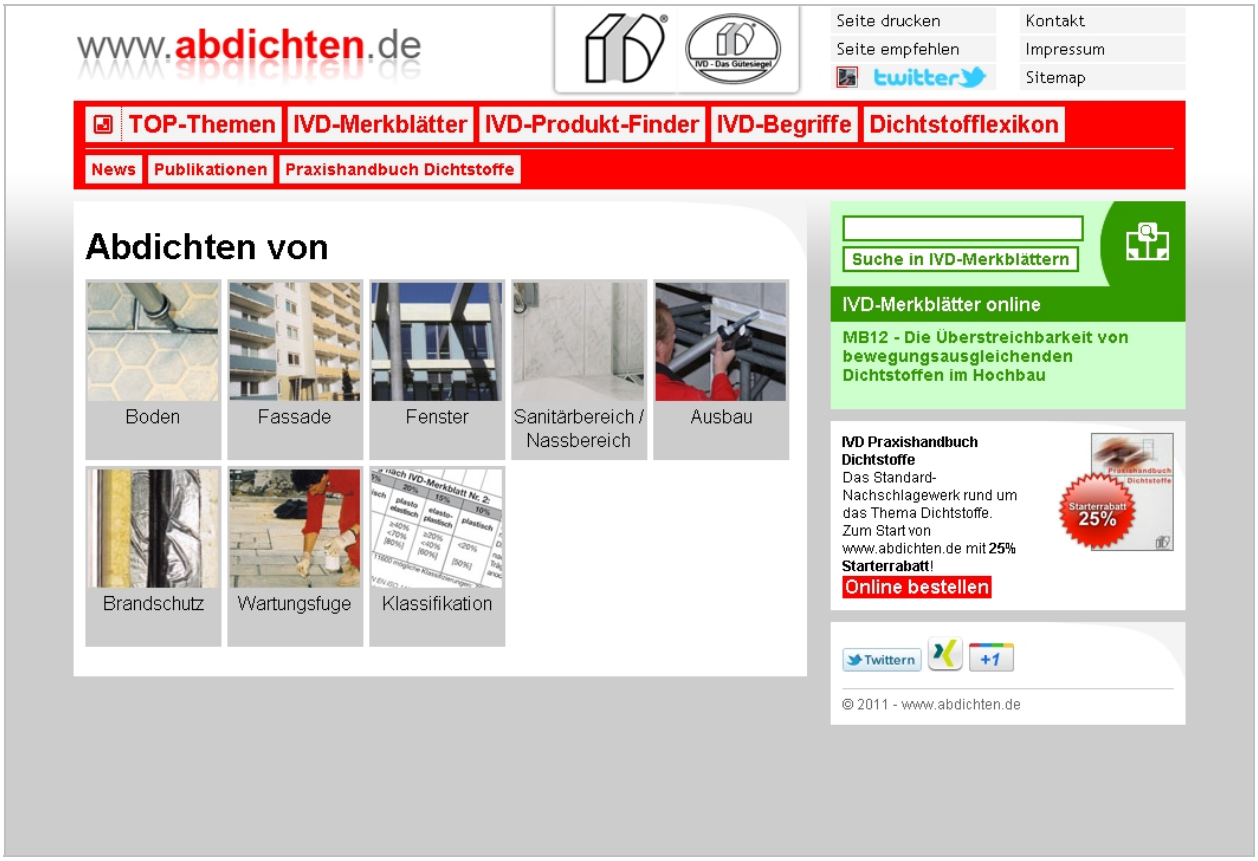
In addition, all information about the joint-sealing in the areas of soil, facade, windows, sanitary and water construction.

As well as the IVD term search, the entire sealant online lexicon and continuously updated news about the topic.



www.abdichten.de – Your internet platform for joint sealing.

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