

IVD-Instruction Sheet No. 16

Issue March 2012

Perimetre Joints in Dry Construction -Applications of gun-grade Sealants-

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0 Policy Statements on Standardization and Quality



Legal Framework

The following statements refer to the standard EN 15651 anticipated to come into force in 2012. The following requirements resulting from the standard (e.g. use of CE-marking) are also expected to come into force in 2012 together with the standard.

Sealants as a construction product succumb to the European Construction Products Directive (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 Possibly conflicting national standards shall be withdrawn from that date.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 order to assess and to process the connections of plasterboard surfaces to each other and to other components, the knowledge of their construction and anticipated form changes are an absolute requirement.

Within the joints movements in the order of fractions of a millimeter, but also a few millimeters may occur.

In the latter cases, a functional seal with gun-grade sealants - as described in this Instruction Sheet - is not possible.

A basic rule in construction technique, which everybody in construction has to adhere to, is: "Different components expand differently".

In addition, the different structural systems expand differently too.

Unpredictable movements in the perimetre joints must therefore be expected with:

- abutting plasterboard surfaces on different structural systems (e.g., masonry and roof framework)
- large suspended plasterboard ceilings, especially in the case of cut-outs or cuts on columns, projections, etc.
- new wooden substructures or excessive moisture changes within the wood substructure
- construction humidity i.e., the components have not yet reached their balancing moisture level.

It will have to be pondered in individual cases if a seal with motion-compensating sealants is possible or a rigid properly executed joint, possibly as a shadow gap with the help of profiles should be executed. If the buyer requires a seal with gun-grade sealants, the contractor must advise that a mechanical overload of the seal may occur and an occasional renewal of the seal has to be planned.

Joints within plasterboard constructions can be sealed under certain conditions with motion-accommodating gun-grade sealants. For requirements regarding sound insulation (e.g. of partitions) sealants in perimetre joints can have a sound damping function. Fire protection requirements with specific fire resistance classes (e.g. for F 90 walls) for sealants with the building material class B2 (normal flammability) and B1 (flame resistant) with respect to DIN 4102 documented evidence of conformity for usage has to be provided.

Moreover, there is - even if a technically perfect sealing of the connections has been achieved using gun-grade sealants – on painting the aesthetic problem of the formation of cracks in a coating on the sealant surface.

This problem has not been resolved with sealants classified as painting compatible in accordance with DIN 52452-4 too, for which reason the customer must be notified of this problem in writing.

According to DIN 52452-4 motion accommodating sealants must not be painted all over.

According to the quality requirements this applies to the sealants used in compliance with this Instruction Sheet. The common desire of planners, customers or residents for invisible connections cannot always be fulfilled.

2 Scope

This Instruction Sheet applies to connections and joints with drywall construction:

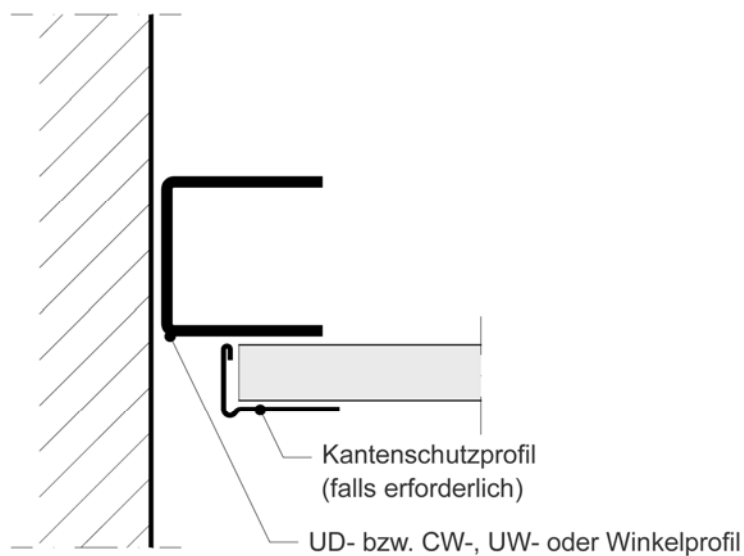
- Connections of plasterboard walls to solid walls or ceilings or between plasterboard walls or plasterboard ceilings
- Connections of plasterboard ceilings to solid walls or to plasterboard walls

This Instruction Sheet does not apply to:

- Connections of plasterboard to wooden substructures (e.g. rafters or timber frame constructions).
These joints should be carried out with solutions in accordance with Information Sheet No. 3 "Gipsplattenkonstruktionen, Fugen und Anschlüsse" (Drywall construction, joints and connections) of the Bundesverband der Gipsindustrie e.V. (Federation of Gypsum Industry).
- Plate butt joints within plasterboard surfaces
the longitudinal and transverse joints between plasterboards within the cladding will be closed with putty made of plaster or plastic.

3 Specification of Perimetre Joints

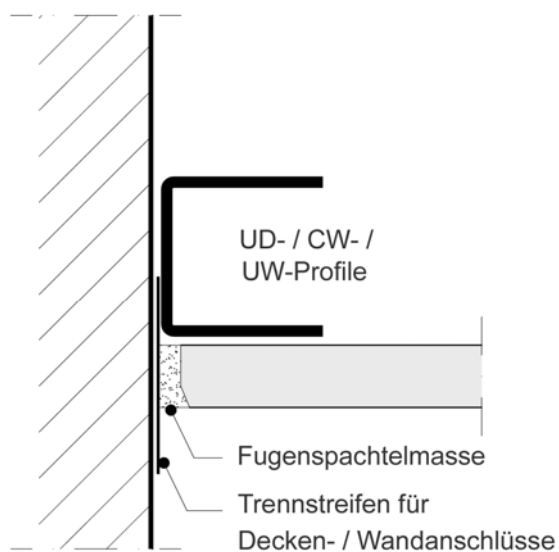
3.1 Construction design as a Shadow Gap



Edge protection
profile (if
necessary)
UD- or CW, UW-
or angle profile

Fig. 1: Connection to suspended ceiling, constructive

3.2 Rigid connection with Joint Filler



UD- / CW, UW-
profile
Joint filler
Dividing strip for
ceiling- / wall
connection

Fig. 2: Execution of the connection according to the state of technology

3.3 Sealing with gun-grade Sealants

3.3.1 Connection of Plasterboard- to Solid component

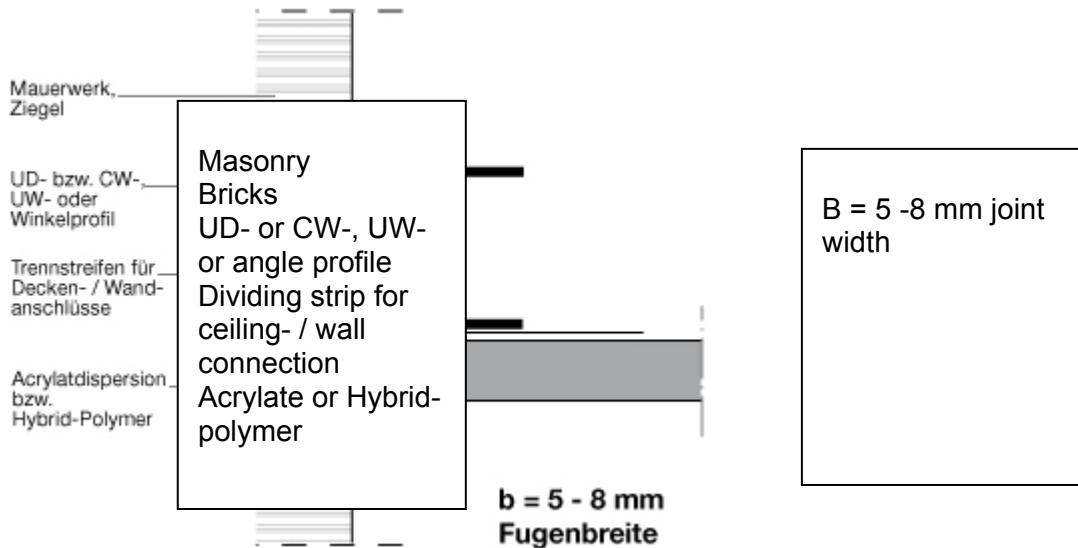


Fig. 3: Technically correct sealing with two-point adhesion. Because of the inserted dividing strip the gun-grade sealant can accommodate the joint movement given adequate joint width.

3.3.2 Connection of Plasterboard- to Solid component

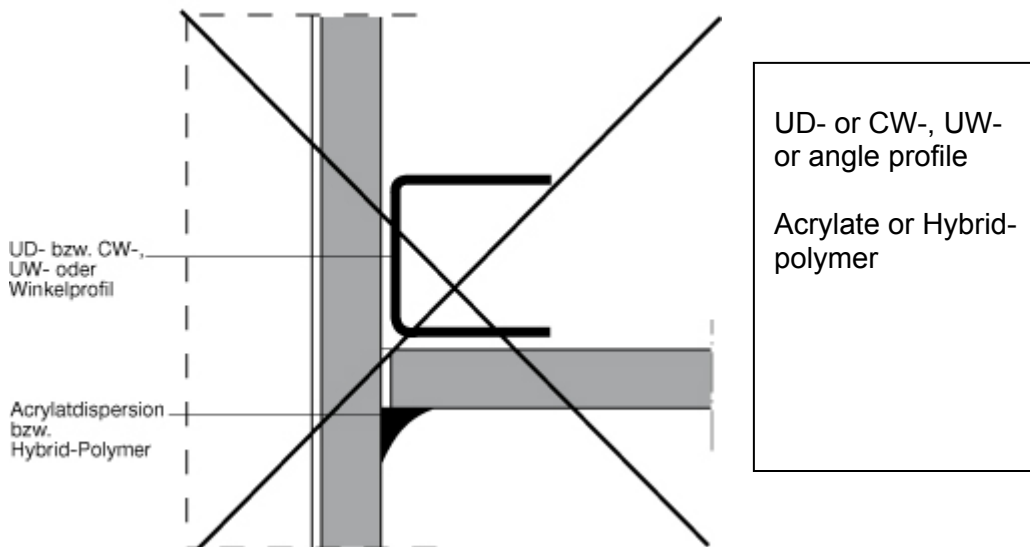


Fig. 4: Generally unsuitable design

3.3.3 Connection plasterboard – to plasterboard component

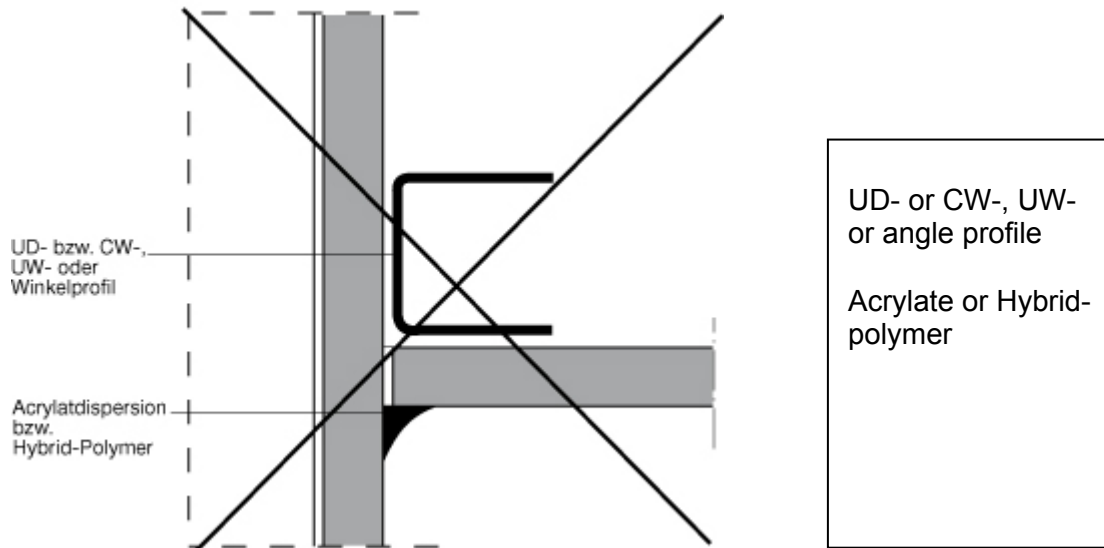


Fig. 4 (5?): Generally unsuitable design

3.3.4 Anschluss Gipsplattenbauteil an Massivbauteil

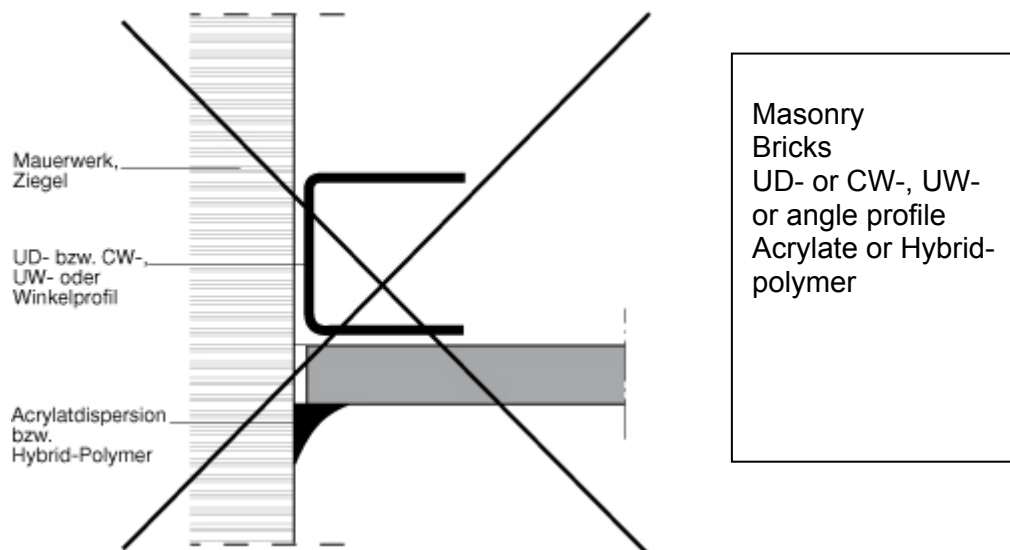
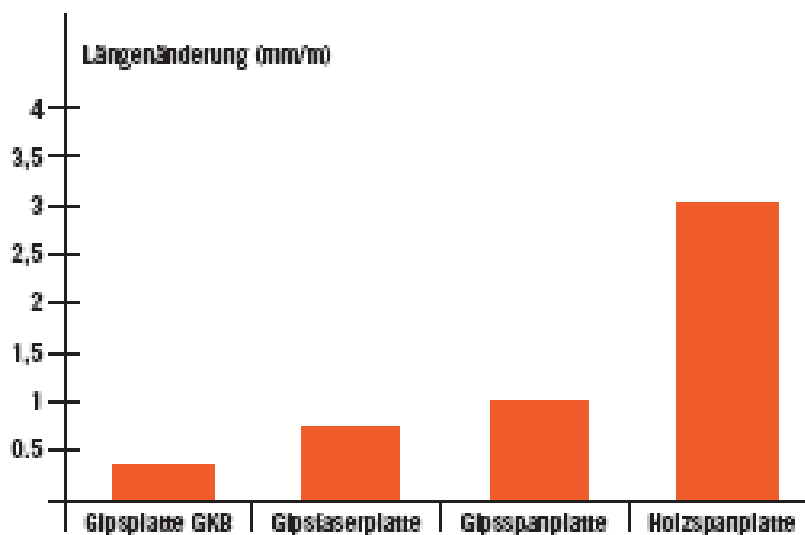


Fig. 5 (6 ?): Critical three-point adhesion. The movement accommodation capability of the sealant is disturbed due to the lack of a dividing strip

4 Loads of the Sealant

Joints in drywall construction according to the scope of this leaflet are movement joints. Due to the different material qualities of the individual components, a different physical behavior, i.e. stability, deformability and thermal expansion coefficient has to be considered.

The chart below shows the hydric changes in length of different panel materials used in interior fittings, which are to be expected at a constant temperature of 20 ° C and a change in relative humidity from 30% to 85%.



Tab. 1: Change in length of different building materials if the relative humidity changes from 30% to 85%.

If there is no professional joint formation for a gun-grade sealant within the connection area (min 5 x 5 mm) or the seal is executed as a triangle chamfer, a cohesive crack in the sealant or edge tearing must be reckoned with.

In a professionally executed joint (see Fig. 3) joint movements from 0,1 to 1 mm can be accommodated by sealants whose maximum movement accommodation is $\geq 12.5\%$ (see section 6).

Joint width	Maximum movement accommodation of the sealant	Max. movement capacity of the sealant
5 mm	12,5 %	0,6 mm
	20 %	1,0 mm
	25 %	1,25 mm
8 mm	12,5 %	0,80 mm
	20 %	1,20 mm
	25 %	2,00 mm

Tab. 2: Maximum movement capacity of a gun-grade sealant in relation to the maximum movement accommodation

If joint movements of > 2 mm are expected, the required joint width has to be considered by the planner.

5 Selection of a Sealant

Due to the material requirements in dry construction gun-grade sealants based on acrylate or hybrid polymer are used.

The selection of the sealant is based on the stresses that result from the mechanical effects, the optical needs of the client and the further treatment of the components (coating, papering, and gluing).

6 Requirements for the Sealant

- Classification according to DIN EN ISO 11600 and IVD Instruction Sheet No. 2
 - plastic (12.5 P)
 - elastic (12.5 E, 20 and LM 25 LM)
- Maximum movement accommodation $\geq 12,5 \%$
- Compatible with the relevant background materials
- Paintability according to DIN 52452-4, Test Methods A1 and A2
- Excellent adhesion, possibly with a recommended primer
- Resistant to ageing
- Non-yellowing white tone
- Easy to use
- Favourable shrinkage behaviour

7 Execution

The joint edges must be clean, dry and free of grease and must be solid and stable. Surfaces must be free of dust and dirt.

They must also be free of such surface treatments, e.g. paints, cleaning residues, sealing, waterproofing agents, affecting the adhesion and curing of the sealant.

Depending on the type of sealant and depending on the substrate, pre-treatment with a primer may be required (ordering an Adhesion Table from the sealant manufacturer is recommended).

Caution: On highly absorbent substrates, especially cut plasterboard, a pre-treatment of the adhesion edges (pre-wet, diluted sealant or primer) is advisable when acrylic sealant is to be used.

The technical guidelines and processing instructions supplied by the manufacturer should be adhered to.

The sealant should be inserted evenly and without bubbles. By pressing and smoothing a good contact with the joint edges should be produced.

A tooling agent compatible with the sealant should be used (see manufacturer's specification).

8 The Painting of a Joint Sealing

Movement accommodating sealants, whose extensibility is greater than that of the coating system shall not be painted over the entire surface (see Preamble).

If a full surface painting is required,

- Due to the lower extensibility a crack in the coating material can be expected
- The sealant must be fully cured (min. 24 hours at standard climate conditions)
- Due to different strengths of coating (opacity) optical differences (marks) between the sealant surface and the adjacent surfaces may occur.

Cracks in the coating material do not constitute a product defect and do not affect the functioning of the joint.

However, it represents an optical defect that is generally objected to by the client and brought forward to the processor. The contractor should advise of the possibility of cracking in the coating in writing before accepting the contract. (VOB / B, No. 4 § 3).

9 Wallpaper works

According to Section 3.1.2. VOB Part C DIN 18 366 – Wall paper hanging – building joints may not be papered over.

To meet this requirement the wall covering may not be bonded over the gun-grade sealant joint.

For visual-aesthetic reasons, the sealant may be in the colour of the wall covering or in consultation with the client a choice of colour can be made.

10 Terms

Gun-grade Sealant

according to DIN EN 26 927 is a substance which is introduced into a joint as a gun-grade mixture and seals it by adhering to appropriate areas in the joint.

Paint compatible

is a sealant used for sealing components coated with paints, without the occurrence of harmful interactions between the sealant, the paint and adjacent components. This applies equally well for a subsequent coating of the components, wherein the paint on the sealant will be limited to 1 mm of the edge region of the joint.

Paintable

is a sealant which can be coated over the entire surface with one or more coats, without resulting harmful interactions.

Plaster board

for the purposes of this instruction sheet is gypsum plasterboard according to DIN 18 180 and DIN EN 520 and gypsum fibreboard.

Perimetre joints in dry construction

are no maintenance joints in accordance with DIN 52 560 Sealing and Glazing; Terms.

11 Reference List

DIN 18180

Gypsum plasterboards - Types and requirements
Beuth-Verlag GmbH, 10787 Berlin

DIN 18181

Gypsum plasterboards for building construction – Application
Beuth-Verlag GmbH, 10787 Berlin

DIN EN 520

Gypsum plasterboards - Definitions, requirements and test methods
Beuth-Verlag GmbH, 10787 Berlin

IGG-Merkblatt (Instruction Sheet) Nr.3

Gipsplattenkonstruktionen, Fugen und Anschlüsse – Plasterboard constructions, joints and connections
Herausgegeben durch die Industriegruppe Gipsplatten im Bundesverband der Gipsindustrie e.V. (www.gips.de)

DIN 52460

Sealing and Glazing; Terms
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 EN ISO 11600

Building construction - Jointing products - Classification and requirements for sealants
Berlin: Beuth-Verlag GmbH

IVD-Instruction Sheet No. 2

Classification of Sealants
IVD INDUSTRIEVERBAND DICHTSTOFFE E.V.

IVD-Instruction Sheet No. 12

The Paintability of movement accommodating Sealants in Building Construction
IVD INDUSTRIEVERBAND DICHTSTOFFE E.V.

IVD-Instruction Sheet Nr. 15

The Maintenance of movement accommodating Sealants and affixed elastic Joint Tapes
IVD INDUSTRIEVERBAND DICHTSTOFFE E.V.

DIN 18366, VOB Contract procedure for building works

Part C: General technical specifications for building works; Wall paper hanging
Beuth-Verlag GmbH, 10787 Berlin

BFS-Merkblatt (Instruction Sheet) Nr. 16

Technische Richtlinien für Wallpaper Tapezier- und Klebearbeiten
(Technical guidelines for Wallpaper hanging and bonding)

Hrsg.: Bundesausschuss Farbe und Sachwertschutz e.V., Frankfurt am Main

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www.abdichten.de

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.



The screenshot shows the website interface with a navigation bar, a search box, and a grid of topic thumbnails. The navigation bar includes links for 'TOP-Themen', 'IVD-Merkblätter', 'IVD-Begriffe', 'Dichtstofflexikon', and 'News'. The search box is located in the top right corner. The main content area features a grid of thumbnails for 'Abdichten von' with categories: Boden, Fassade, Fenster, Sanitärbereich / Nassbereich, Ausbau, Brandschutz, Wartungsfuge, and Klassifikation. A sidebar on the right contains a search box, a link to 'IVD-Merkblätter online' with a featured article 'MB12 - Die Überstreichbarkeit von bewegungsausgleichenden Dichtstoffen im Hochbau', and a promotion for the 'IVD Praxishandbuch Dichtstoffe' with a 25% discount. The footer of the website includes a Twitter link and the copyright notice '© 2011 - www.abdichten.de'.

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