

SUPPLEMENTARY LAYING INFORMATION

for all **ANKER** grades

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1.0 Introductory remarks

The following Supplementary Laying Information is of a general nature. Only proper professional laying in accordance with the “General Technical Regulations” ATV / VOB, part C, DIN 18365 and the latest data sheets and guidelines – or equivalent national standards – will enable the assured characteristics of the carpeting and the carpet tiles to be used over the long term.

These laying instructions are intended for experienced layers and do not make any claim to completeness. Should the recommendations and working instructions of the suppliers of auxiliary materials, e.g. glues and fillers, vary, the manufacturer's instructions are always binding. All materials to be used must be suitable for ensuring a functional assembly – when harmonized with each other. Additionally, no negative effects on the overall structure or the floor covering may arise.

2.0 Planning phase

There is a great deal of truth in the old carpet-layer's saying, “Correctly measuring is half the job!” In this connection, you should not depend on the customer's plans and dimensions, but measure the rooms yourself!

The next step is to draw the carpet lengths into the verified floor plan or your own sketch (which should be to scale!) under consideration of the pattern repeat. This will give you the quantity of carpet to be laid, and you can also calculate the excesses that carpeting entails here.

For continuing patterns, the number of pattern repeats is calculated using the formula “room length divided by repeat length”. If this calculation produces a remainder, round it up to the next pattern repeat. This result multiplied by the repeat length is the required carpet length dimension.

Formula: Room length : repeat length = number of pattern repeats

Example: 4.05 m : 0.90 m = 4.5

(4.5 pattern repeats are rounded up to 5 pattern repeats)

$5 \times 0.9 = 4.5 \text{ m}$ carpet length dimension

According to the General Technical Contract Terms (ATV) of German contract procedures VOB, part C, DIN 18365 Floor work, section 3.4.5 (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010) the contractor decides the laying direction. However, experience shows that a great deal of customer dissatisfaction and complaints can be prevented by advance consultation with the customer regarding the laying direction, seams and the expected trim excess prior to laying.

2.1 Preparing the subsurface

Before starting to lay the carpet, the following should be considered with respect to the subsurface:

- ▶ A dry, even, non-skidding, dust-free and dirt-free surface is absolutely essential for proper carpet laying (according to German contract procedures VOB, part C, DIN 18365 Floor work, section 3.4.5 (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010).
- ▶ Subfloors such as parquet, PVC, Linoleum and ceramic tiles must be free of residues of cleaners and care products.
- ▶ Before laying, it is recommended that you conduct moisture tests and keep a record of the test site and the values.

- ▶ It is also recommended that you test the screed for cavities using a hammer, brush it with a wire brush and perform a grid scratch test using a subsurface hardness tester. The carpet layer should in all cases report any concerns in writing; once he begins laying, he has legally accepted and approved the screed.
- ▶ In case of doubt, test gluings and tearings are recommended; these are usually more productive than long hours spent in dispute with occasionally obstinate screed pourers or site supervisors.
- ▶ In the event of testing, the contractor must in particular report reservations in the case of:
 - Greater unevennesses,
 - Cracking in the subsurface,
 - Insufficiently strong subsurface,
 - Insufficiently dry subsurface,
 - Too porous or too raw subsurface,
 - Soiled subsurface, e.g. from oil, wax, lacquer, paint residues,
 - Necessity of friction locking of expansion joints in subsurface,
 - Incorrect height of subsurface with respect to the height of adjacent structures,
 - Unsuitable subsurface temperature,
 - Unsuitable temperature and air conditions in room,
 - No projection of edge insulation strips,
 - No heating test record for heated floor structures,
 - No marked measuring points for heated floor structures.
- ▶ Existing textile floor coverings and glue residues must be removed completely. In order to ensure that no negative chemical reactions (e.g. odor development) can occur when performing renovation work, it should be considered obligatory to apply filler to the surface as an additional separation layer.
- ▶ Joints and holes in the screed must be leveled using filler.
- ▶ A bonding agent (primer) and a filler may need to be applied.
- ▶ Primers are not a luxury; in a certain sense they are glues that bond the subsurface to the filler. They bind dust, strengthen the surface of the screed and prevent the water in the filler compound from being abruptly absorbed into the screed. Too rapid desiccation of the filler makes it unstable.
- ▶ No primer in the world is able to fix a brittle, dusty, sandy, unsmoothed or unvacuumed screed. In these cases, primers form a "skin" that easily peels off again. To expect the primer to penetrate deeply is extremely unrealistic, as it does not penetrate much more than 1 mm.
- ▶ Observe the specified water quantities for the fillers; they are just as important for gluing as the right toothings!
- ▶ Use cold water. At temperatures above 25 °C (heating in vehicle interior), working can become difficult.

2.2 Evenness tolerances

In their joint data sheet "Tolerances in building construction according to DIN 18201 and DIN 18202", the German Association of Professional Appraisers (ZDB) and the German construction industry association declare, "Components whose dimensional deviations do not impair the technical functions or visual design of the structure should not provide an occasion for disputes just because the accuracy does not fully comply with the standard."

The tolerances are assessed through inspection. In cases of doubt, sampling-type tests are to be conducted according to 18202. The deviations in surface evenness may conform to Table 3, row three of DIN 18202 (note: DIN 18201 has been superseded by DIN 18202). It is the contractor's task to perform such a measurement.

As is generally understood, screeds are also components that are installed on a load-bearing subsurface (e.g. rough concrete floor) and can be used as a floor or for accommodating floor coverings of any type.

Particularly with respect to these, major disputes between the customer and the contractor are a common occurrence.

According to row 3 of this table, a surface on which the measuring points are 1 m apart may have a maximum unevenness of 4 mm. If the measuring points are e.g. 4 m apart, the difference in evenness may not exceed 10 mm. If more demanding requirements are specified (table, row 4), the height differences in the above example may not exceed 3 resp. 9 mm for the same measuring intervals.

The measurement is performed by placing a measuring stick on at least two subsurface peaks. The measurement is performed at the resulting free spaces (valleys) beneath the measuring stick (bridge). Projecting ends may be used for orientation but not as measuring points.

Table 3 respecting evenness tolerances

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Row	Reference	Sampling dimensions as limit values in mm for measuring point spacing in m													
		0.1	0.6	1.0	1.5	2.0	2.5	3.0	3.5	4.0	6.0	8.0	10.0	15.0	
3	Ready-finished floors, e.g. screeds as usable screeds, screeds for laying floor coverings, floor coverings, tile floor coverings, filled and glued coverings	2	3	4	5	6	7	8	9	10	11	11	12	15	
4	Ready-finished floors with greater requirements, e.g. self-leveling fillers	1	2	3	4	5	6	7	8	9	10	11	12	15	

Excerpt from the table "Evenness tolerances" (according to DIN 18202 expanded table 3).

The **boldface** measuring-point spacings represent values contained in Table 3 of DIN 18202. The values for other spacings are interpolated.

These tolerance values specify the minimum performance according to the rules of the trade and should not only be bettered where possible, but can be easily surpassed by skilled tradespersons. Particularly for low-pile carpeting and oblique lighting, such values are unacceptable, as these features are highly visible and thus negatively impact the visual effect of a laid floor covering.

For this reason, the contractor should clarify early on what subsurface work is required for optimum laying. Trowel marks on a filled surface are a sign of poor workmanship, not a matter of evenness tolerances.

2.3 Ambient conditions

To avoid damage, the carpeting must absolutely be allowed to adapt to the room climate before laying. For this purpose, it is laid out unworked in the room for 12 hours. Narrow parameters with respect to climatic conditions must also be observed when using dispersion adhesives with a high water content to glue carpeting.

For the reaction, and thus the necessary strength of the glue, the water present absolutely must escape from the glue. Absorbent subsurfaces are only partly able to absorb this water. Consequently, the remaining water must be absorbed by the

ambient air. Warm, dry air can transport this water much faster and better than cold air. Particularly when the latter has a high moisture content.

Thus, it is essential that laying be performed according to the annotations of German contract procedures VOB, part C, DIN 18365 Floor work, section 3.3.1 (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010): "...When testing, the client must in particular report reservations in the case of: unsuitable temperature and air conditions in room..."

In accordance with these rules and the guide "Evaluating and Preparing Subsurfaces" issued by the German floor-covering industry association "Verband Estrich und Belag" (February 2002) and the annotations of German contract procedures VOB, part C, DIN 18365 Floor work, section 3.3.1 (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010), the working of auxiliary materials (e.g. fillers, glues) is highly discouraged at less than 18°C room temperature and 15°C floor temperature as well as over 75 % relative humidity.

Attention

Humidity values that are too low can also make proper professional working of auxiliary construction materials (fillers and glues etc.) extremely difficult or impossible. When the air is too dry, it takes up the water in the construction materials too fast. This prevents the binding of the individual components, or the necessary chemical processes within the products are completed too soon.

Fillers literally "burn", so that they do not develop any strength. Glues set within just a few minutes and thus can no longer bond.

2.4 Electrically conductive laying

Shop-cut carpet lengths designed to have a good surface conductivity do not need to be laid in any special manner in order to preserve their low ground leakage resistance, neither in the preparation of the subsurface nor when gluing, when this material is laid in normal size rooms ($\geq 8 \text{ m}^2$). Refer to the corresponding product information to find out whether the surface resistance and the ground leakage resistance are sufficient.

Conductive gluing of shop-cut carpet lengths is thus only required when the distribution effect is insufficient due to the small floor areas such as narrow halls or small rooms, or when you are laying carpet types with a low transverse conductivity (some weaves and needle fleece materials).

Requirements with respect to ground leakage resistance are only relevant when it is necessary to dissipate external charges – i.e. static charges that are not generated through contact with the carpeting. Research by the Aachen-based Textile & Flooring Institute (TFI) has shown that the conductivity of shoes plays a key role in dissipating such external charges.

When users wear normal street shoes, the accumulated charge cannot be dissipated via the floor covering. A conductive carpet is thus ineffective.

When laying a carpet so as to be conductive, lay a copper strip 100 - 120 cm long in the glue bed for each 30 m² of carpet or fraction thereof; however, this may not be more than 10 m from the farthest edge of the floor covering. According to German VDE standards, these must be connected to a ground lead provided especially for this purpose (your local electrical standards take precedence). This ensures that charges can be equalized to ground potential via the conductive pile

material, the conductive backing and the conductive glue. Always observe the instructions of the glue manufacturer. When gluing conductive carpeting to a normally prepared subsurface, the conductive glue must be spread over the subsurface evenly in arcs using the toothed spreader that is generally also supplied with the glue.

In order to achieve a low leakage ground resistance for carpet tiles, you may need to pre-treat the subsurface to make it conductive using the aids the manufacturer supplies. Given the great number of systems available, it is not possible to make a general recommendation.

3.0 Product-typical characteristics

For materials, “product-typical characteristics” refers to the changes in appearance that occur during use.

These are caused by:

- ▶ The inherent properties of the base material (e.g. fibers) or material combination.
- ▶ The material structure.
- ▶ The manufacturing process.

As an initial step, the German professional association for interior-design appraisers and comparable occupations, the “Bundesverband der Sachverständigen des Raumausstatterhandwerks und tätigkeitsgleicher Berufe e.V.”, together with other associations, e.g. for the home textiles industry and the upholstered furniture industry, developed a catalog enumerating typical characteristics of various materials.

For velour carpets, shimmering is considered just as much a typical property as the possible occurrence of shading (permanent displacement in the pile) and the clearly visible seam in small-pattern carpets (zipper effect).

This behavior in use is not a defect in the merchandise. However, customers can still sometimes claim damages from the vendor/layer if they are not informed in good time (before they buy) about how the material will behave in use.

In such a case, the principle that the customer had different expectations of the material applies; he regards the change that has occurred as a defect. If he had been aware of the typical properties of the specific material, he would have had the possibility to select a different product.

Thus it is important that you as the seller/layer provide as much information as possible about the typical properties of the materials you are selling or working.

3.1 Zipper effect

The zipper effect is a characteristic that is typical of this product type.

Experience has shown that carpeting with small patterns is impossible to match in the seam area, even with great effort and perfect technique. In Germany, both the professional consensus and the annotations to German contract procedures VOB, part C, DIN 18365 Floor work, section 3.4.6 (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010) agree that such pattern repeat mismatches in the seam area are the state of the art, and thus must be tolerated by the customer.

However, this effect depends mainly on the size of the pattern repeat. In other words, the smaller the repeat, the less it can and must be taken into account. If the pattern repeat is less than 10 mm, it may be ignored entirely.

The visibility of the zipper effect also depends greatly on the pattern and the color scheme. Differences are always more apparent on high-contrast carpet surfaces than low-contrast shading combinations.

3.2 Repeat differences

Laying of repeat pattern carpeting is only possible using suitable stretchers. Without such tools, laying this kind of carpeting is not possible in practice. As carpets as flexible, wide-area structures can show distortions on account of their special characteristic, it is highly recommended that the client and the contractor arrive at an agreement within the following parameters:

Comparison between delivery according to DIN CEN/TS 14 159 and after laying

Type of pattern deviation	In delivered state DIN CEN/TS 14 159	After laying
Pattern repeat deviation between two lengths		
Repeat length ≤ 10 cm	≤ 2 % of pattern repeat	≤ 1 % of shortest repeat length
Repeat length > 10 cm ≤ 100 cm	≤ 1 % of pattern repeat	≤ 0.5 %
Repeat length ≥ 100 cm	Acc. to manufacturer's specifications	
Cumulative pattern shift over any length	≤ 0.5 %	> 0.2 %
Bumps		
Woven carpeting	≤ 10 mm	No distortion
Woven carpeting	≤ 20 mm	≤ 5 mm
Woven carpeting	≤ 0 mm	≤ 10 mm
Tufted carpet	≤ 1 % or roll width/ max. 1 cm/meter roll width	≤ 0.5 %
Linear repeat distortion		
Woven or tufted carpeting	≤ 10 mm for 2 m nominal length	No distortion
Diagonal distortion		
Woven or tufted carpeting	≤ 1 % or roll width/ max. 1 cm/meter roll width	≤ 0.5 % of roll width
Deviation of bumps		
Woven	≤ 0.5 % of piece length	No deviation
Tufted	≤ 0.3 % of piece length	No deviation
Pattern deviation of patterned tiles, modules and punched blanks		
	Not specified	± 0,5 %
Zipper effect		
	Not mentioned	For small patterns (cross-over). transverse ribs are unavoidable (typical feature of merchandise)

Table from VOB 2nd edition April 2010, floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf

This means that for example a repeat difference of up to 5 cm may be present when laying in a 10 m length.

If the differences are greater, the carpet layer must cease work and contact the carpeting manufacture. Once laying is completed, the carpet layer cannot under any circumstances complain that he received distorted merchandise in which the repeat was faulty.

Every trained and experienced carpet layer may be expected to stretch a carpet length 2.5 cm on each side, from the middle of the length. However, if the differences are greater, laying work must be halted until a decision has been received from the carpeting manufacturer. Once laying is completed, the carpet layer cannot under any circumstances complain that he received distorted merchandise in which the repeat was faulty.

4.0 End seams

End seams are seams perpendicular to the direction of manufacture, at which the floor covering lengths are to be joined. They are to be avoided on principle and thus represent an exception. When they must be created, they are only permissible for lengths greater than 500 cm, whereby according to both the acknowledged rules of the trade and German contract procedures VOB, part C, DIN 18365, section 3.4.4, paragraph "End seams", the added length may not be less than 100 cm.

Piecing of floor covering lengths is not permitted. Accordingly, it is not permitted to execute multiple head seams in sequence at an interval of 5 m or less. Additionally, experience shows that a great deal of customer dissatisfaction and complaints can be prevented by advance consultation with the customer regarding the laying direction, seams and the expected trim excess prior to laying.

As an end seam is almost never an attractive feature, planned end seams in particular should be put in the column area, reconsidered once more in advance and, where possible, replaced by more rational, effective or simply better-looking laying solutions.

Particularly to prevent fraying of the nubs of woven bouclé surfaces made of spun fiber yarns, the cut should not be made in the apparent transverse nub groove but in the nub tips.

For carpeting made of endless yarns, on the other hand, such a cut should never be made in the nub tips, but rather always in the transverse groove, as otherwise the seam will be glaringly obvious.

If such a case arises, or you wish to ensure that no fraying occurs in spite of the cut in the loop tip, you should apply an edge stabilizer laterally to the cut edges right after cutting. The best solution by far is to laterally glue the nubs using a water-resistant cold wood glue (e.g. Henkel, Ponal blau). The official edge stabilizer (Roberts, 8015) has proven extremely effective, but it still cannot be considered the best possibility, because the white glue remains white and does not become transparent. This can make application complicated.

A good solution simply for preserving the shape of the nubs is to drip a liquid plastic (Müller, cold welding paste type A) into the seam from above. This solution is particularly suitable for the area around service covers.

5.0 Suitability for stairs

The prerequisite for laying carpet on stairs is that the edges of the steps are rounded and not sharp. The radius of the rounded edges should be about that of a two-euro piece (radius approx. 1.3 cm), and never less than 1 cm.

In addition to longer life of the carpet, this rounding simplifies laying and gluing of the carpet, as it is easier to bend the carpet around a rounded contour than a sharp edge. If it is not possible to round off a sharp edge (e.g. steel or concrete), first putting down an underlay to protect the carpet is extremely helpful. This will absorb pressure, thus reducing wear on the floor covering.

However, when an underlay is used, the carpeting loses its CE certification, as the assured burn behavior of the carpeting becomes invalid. Thus, use underlays at your own risk.

According to the generally accepted rolls of the trade, the direction of the pile **must** show down at a carpet installation on stairs, in which the surface is drawn around the edge of the step. When traffic descends the stairs (and scuffs over the edges) the front edge is subject to particular wear. When the pile direction is forward and downward, the pile is merely compressed.

When the pile direction is upward, however, the situation is different. In this case, traffic descending the stairs presses the upstanding fibers at the step edge down, the pile opens up and the fibers become bent. The carpet at the front edge of the step wears much faster.

When laying with plastic or metal step edge protectors, as are frequently used on high-traffic stairs such as in public buildings and department stores, the pile direction can run upward. The main wear on descending occurs on the edge profiles.

The above corresponds to the recognized rules of the trade. The annotations to German contract procedures VOB, part C, DIN 18365 Floor work, section 3.4.4., Floor coverings (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010) explain the importance of the pile direction of a carpet.

The carpeting is laid on the stairs at an angle of 90°. The weft thread e.g. of woven carpeting (cross-stitch system) is thus always parallel to the edge of the step. By contrast, the warp threads and nub groove are perpendicular to the edge of the step.

To fix the carpet, the stairs are spread with a thin layer of contact glue from top to bottom – step by step. A thin layer of contact glue is also applied to the backing of the floor covering. When the two glue coatings are dry to the touch, the carpet is laid on the stairs, step by step. The glue responds to pressure. The greater the pressure, the stronger the bond.

6.0 Recommendations

6.1 Cover sheeting

When laying is completed, cover sheets are spread to protect the carpeting. These prevent contamination of the new floor covering during other work. Using cover sheeting is considered a separate service. The customer must request and remunerate such services separately. In most cases, such protection is omitted out of ignorance. Trouble on account of unremovable soiling and high follow-on costs for the necessary cleaning is consequently virtually inevitable.

Experience has shown that customers are grateful for this information, and entirely willing to have protective sheeting laid down – for a suitable fee. This can save them a lot of time (e.g. no loss of usage) and money (e.g. no cleaning costs).

6.2 Tools

At a minimum, we recommend the following tools for professional laying:

	Awl		End-seam straight edge
	Roller, 50 kg		Crowbar
	Carpenter's hammer		Laser measuring device
	Rubbing cork/rubbing board	*	Skirting shears
	Carbide ampoules		Large spatula
	CM humidity meter		Seam cutter
	Double-case stretcher/seam stretcher		Wire cutters
	Ventilation roller		Ductor blade
	Moisture tester		Machinist's hammer (200-300 g)
	Pile shears		Steel nails (with ground point)
	Rubber hammer (white)		Strip cutter
	Hand scraper		Thermometer
*	Tack hammer		Step fitter
	Special hammer		Universal shears
	Knee kicker		Subsurface hardness tester
*	Joining tape		Tool box/tool bag
*	Joining tool		Toothed spreaders
Tools marked with * are only necessary for carpet stretching!			

7.0 Don't forget

According to German contract procedures VOB, part C, DIN 18365 Floor work, section 3.1.4. (floor coverings working group in Bundesverband Estrich und Belag e. V., Troisdorf, version 2010), each carpet-layer is at a minimum responsible for giving the customer the opportunity to clean his floor covering or have it cleaned suitably and professionally. For this purpose, he requires the manufacturer's care and cleaning instructions.

Every carpet-layer is thus obligated to provide the customer or his recognized agent with the corresponding written instructions once laying is complete. Should he fail to do so, and should defects or even damage occur over the course of use, he can be liable for damages - which can be substantial.

8.0 Sources

Underlay material	Quality tools
Miltex GmbH Ohmstr. 2 68519 Viernheim, Germany Tel.: 06204 – 70 86 90 Fax: 06204 – 70 86 929 Email: info@miltex.de	Johannes Mittag GmbH Kiefernweg 21 27751 Delmenhorst, Germany Tel.: 04221 – 1 89 16 Fax: 04221 – 1 89 67 E-Mail: info@mittag-gmbh.de

Protective and cover sheets	Rails and strips
Safe Pack GmbH Sicherheitsverpackungen Altenhagener Str. 9 32107 Bad Salzuflen Tel.: 05208 – 91 29 0 Fax: 05208 – 91 29 29 E-Mail: siegfried.scharf@safepack.de	Carl Prinz GmbH & Co. KG Fußbodentechnik Jakobstr. 8 47574 Goch Tel.: 02823 – 97 03-0 Fax: 02823 – 8 04 95 E-Mail: service@carlprinz.de

Glue	Glue
Bostik GmbH An der Bundesstr. Nr. 16 33829 Borgholzhausen, Germany Tel.: 05425 – 8 01-0 Fax: 05425 – 8 01-140 E-Mail: info.germany@bostik.com	Forbo-Erfurt GmbH August-Röbling-Str. 2 99091 Erfurt, Germany Tel.: 0361 – 73041-52 Fax: 0361 – 73041-92 E-Mail: michael.illing@forbo.com

Glue	Glue
Mapei GmbH Bahnhofplatz 10 63906 Erlenbach, Germany Tel.: 09372 – 9 89 50 Fax: 09372 – 98 95 48 E-Mail: mailto@mapei.de	Schönox GmbH Alfred-Nobel-Str. 6 48713 Rosendahl, Germany Tel.: 02547 – 9 10-0 Fax: 02547 – 9 10-101 E-Mail: info@schoenox.de

Glue and Ponal blau	Glue and dry adhesive
Thomsit Henkel KGaA Henkelstr. 67 40191 Düsseldorf, Germany Tel.: 0211 – 7 97-0 Fax: 0211 – 7 97-20 79 E-Mail: thomsit.bautechnik@henkel.com	Uzin Utz AG Dieselstr. 3 89079 Ulm, Germany Tel.: 0731 – 40 97-0 Fax: 0731 – 4 09 71-10 E-Mail: info@uzin.de

Glue	Glue
Wakol GmbH Bottenbacher Str. 30 66954 Pirmasens, Germany Tel.: 06331 – 80 01 131 Fax: 06331 – 80 01 890 E-Mail: info@wakol.de	Wulff GmbH u. Co. KG Wersener Str. 3 49504 Lotte, Germany Tel.: 05404 – 88 10 Fax: 05404 – 88 149 E-Mail: industrie@wulff-gmbh.de

Edge stabilizer “8015”	PVC cold welding paste
Roberts Deutschland GmbH Landsberger Str. 336 80687 Munich, , Germany Tel.: 089 – 46 20 06 55 Fax: 089 – 46 20 06 54 E-Mail: info@verspanntechnik-vogl.de E-Mail: robertsqep@wxs.nl	Müller, Werner GmbH Rudolf-Diesel-Str. 7 67227 Frankenthal, Germany Tel.: 06233 – 37 93 0 Fax: 06233 – 37 93 20 E-Mail: info@mueller-pvc-naht.de

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