

**Part III. Approvals – Directory:**

page  
2 - 10

- 1.0 Max. permitted spindle way of Layher scaffold spindles
- 2.0 Bracing regulations for stage heights  $\geq 80$  cm – 200 cm
- 3.0 Mixed installation of different types of nivtec legs in stages
- 4.0 Mixed installation of different types of nivtec legs in galleries
- 5.0 Stages for events with rhythmic loads such as dancing
- 6.0 Stages for presentations with high point loads
- 7.0 nivtec base constructions for stairways, ramps & rolling risers
- 8.0 nivtec safety rails for stairs and ramps

**Part III. Certificates - Directory:**



11 - 19

- Collective certificate nivtec alu for nivtec stages and galleries
- nivtec stage, heights up to max 1.40 m
- nivtec stage, with extension legs, heights up to max. 1.40 m
- nivtec stage, heights up to max. 2.00 m
- nivtec seated gallery, heights up to max. 2.00 m
- nivtec stage platforms with multiplex plywood panel, 12 mm, special shapes
- nivtec stage platforms with acrylic glass pane PMMA, 12 mm, special surfaces
- nivtec stage platforms with multiplex plywood panel BFU 100 ,9 mm untreated, for indoor use
- nivtec safety rail, height 100 cm
- nivtec stairway made of nivtec system platforms with nivtec safety rails, height 100 cm
- nivtec VERTICAL BARS safety rail, height 110 cm
- nivtec stairway made of nivtec system platforms with nivtec VERTICAL BARS safety rail 110 cm
- nivtec rail, height 100 cm, adjustable
- Monitoring Inspection of the Manufacturing Facility nivtec-flexibel Bühnensysteme GmbH

- Data Sheet wooden panel WISA-Hexa 12 mm**
- Data Sheet acrylic panel PMMA 12 mm**

20 - 26  
27 - 28

nivtec load distributor leg



nivtec  
alu

The System for  
Stages, Galleries & more  
certified acc. to DIN EN 13814

Part III. Approvals & Certificates

Edition 1.0 - 2026

## Part III. Approvals & Certificates

The nivtec certificates issued by TÜV Thüringen are valid exclusively for nivtec stages and nivtec galleries and only for constructions set up acc. to nivtec regulations (f.e. when using specified Layher parts) as well as using the original nivtec parts listed in the certificates. This also means that the nivtec certificates expire if components from other stage manufacturers are used, even if these components have their own approvals. In this case, the sole responsibility for the operation of such stages and galleries is transferred to the operator.

### Excerpt from our portfolio of Approvals & Certificates:

#### Approvals – Directory: page 2 - 10

Stage building with nivtec Staging System: Safety Instructions for the assembly of stages, galleries and other structures in accordance with certificate 3300-12623-2025

- 1.0 Max. permitted spindle way of Layher scaffold spindles
- 2.0 Bracing regulations for stage heights  $\geq 80$  cm – 200 cm
- 3.0 Mixed installation of different types of nivtec legs in stages
- 4.0 Mixed installation of different types of nivtec legs in galleries
- 5.0 Stages for events with rhythmic loads such as dancing
- 6.0 Stages for presentations with high point loads

Stage building with nivtec staging system: Safety instructions for the assembly of stairways, ramps and rolling risers in accordance with certificate 3300-12623-2025

- 7.0 nivtec base constructions for the construction of stairways, ramps & rolling risers
- 8.0 nivtec safety rails for the construction of stairs and ramps

#### Certificates - Directory: 11 - 19

No. 3300-12623-2025 Collective certificate nivtec alu for nivtec stages and galleries

No. 3300-12623-2025 BT nivtec stage, heights up to max 1.40 m  
No. 3300- 7317-2015 Load nivtec stage, heights up to max. 1.40 m

No. 3300-12645-2025 BT nivtec stage, with extension legs, heights up to max. 1.40 m  
No. 3300- 7409-2015 Load nivtec stage, with extension legs, heights up to max. 1.40 m

No. 3300-12644-2025 BT nivtec stage, heights up to max. 2.00 m  
No. 3300- 7946-2016 Load nivtec stage, heights up to max. 2.00 m

No. 3300-12646-2025 BT nivtec seated gallery, heights up to max. 2.00 m  
No. 3300- 5585-2012 Load nivtec stage platforms with multiplex plywood panel, 12 mm, special shapes

No. 3300- 5585-2012 Load nivtec stage platforms with acrylic glass panel PMMA, 12 mm, special surfaces

No. 3300- 5568-2012 Load nivtec stage platforms with multiplex plywood panel BFU 100 , 9 mm untreated, for indoor use

No. 3300- 5550-2012 Load nivtec safety rail, height 100 cm  
No. 3300- 5563-2012 Load nivtec stairway made of nivtec system platforms with nivtec safety rails, height 100 cm

No. 3300- 5562-2012 Load nivtec VERTICAL BARS safety rail, height 110 cm  
No. 3300- 5564-2012 Load nivtec stairway made of nivtec system platforms with nivtec VERTICAL BARS safety rail, height 110 cm,

No.3300- 5565-2012 Load nivtec rail, height 100 cm, adjustable  
Monitoring Inspection of the Manufacturing Facility nivtec-flexibel Bühnensysteme GmbH

Data Sheet wooden panel WISA-Hexa 12 mm 20 - 26

Data Sheet acrylic panel PMMA 12 mm 27 - 28



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Ihr Zeichen	Ihre Nachricht	Unser Zeichen	Direktkontakt	Datum
—		Schu	35	05.11.2025

#### Stage Building with nivtec Staging System Safety Instructions for the assembly of stages, galleries and other structures in accordance with certificate 3300-12623-2025

Testing Specification: - DIN EN 13814: 2005-06  
- Guideline for Assembly and Operation of Temporary Structures  
(M-FIBauR) as of June 2010  
- VdTÜV instruction leaflet 1507:2013-04

other applicable documents: - catalogue of nivtec-flexibel Bühnensysteme GmbH  
- assembly instructions, set-up rules and set-up schemes  
nivtec-flexibel Bühnensysteme GmbH  
(additions valid at date of stage assembly)

The safety instructions listed below

- 1.0 – max. approved spindle way of Layher scaffolding spindles
- 2.0 – bracing specifications for stage heights  $\geq 80$  – 200 cm
- 3.0 – mixed installation of various nivtec leg types in stages
- 4.0 – mixed installation of various nivtec leg types in galleries
- 5.0 – stages for events with rhythmic loads such as dancing
- 6.0 – stages for presentations with high point loads

were created in close coordination with TÜV Thüringen as a supplement to the existing documentation such as catalogues and assembly instructions.

The specifications contained herein must be strictly adhered to in order to ensure the stability of the stage and gallery constructions and thereby the safety of the users.

Dipl.-Ing. S. Schubert

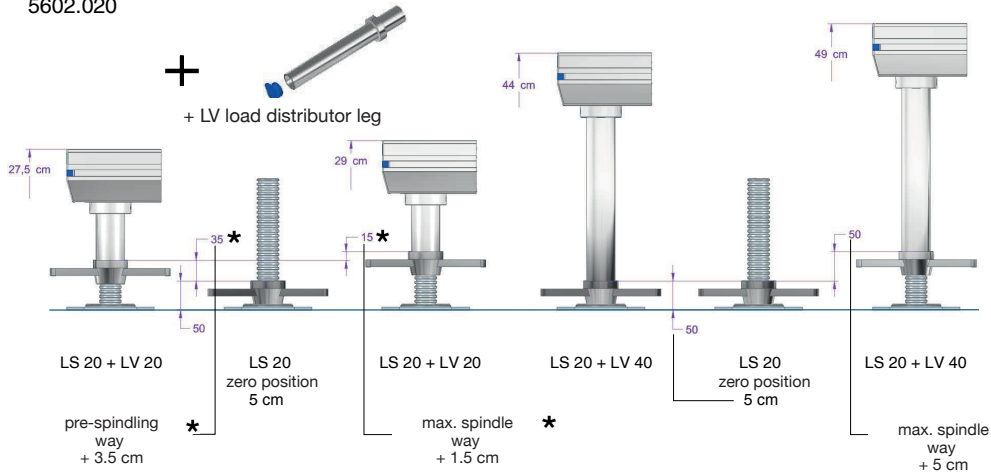
Attachments: Safety Instructions 1.0 to 6.0

## Stage Building with nivtec Staging System

### Maximum permitted spindle way for Layher LS scaffold spindles in combination with nivtec LV aluminium load distributor legs

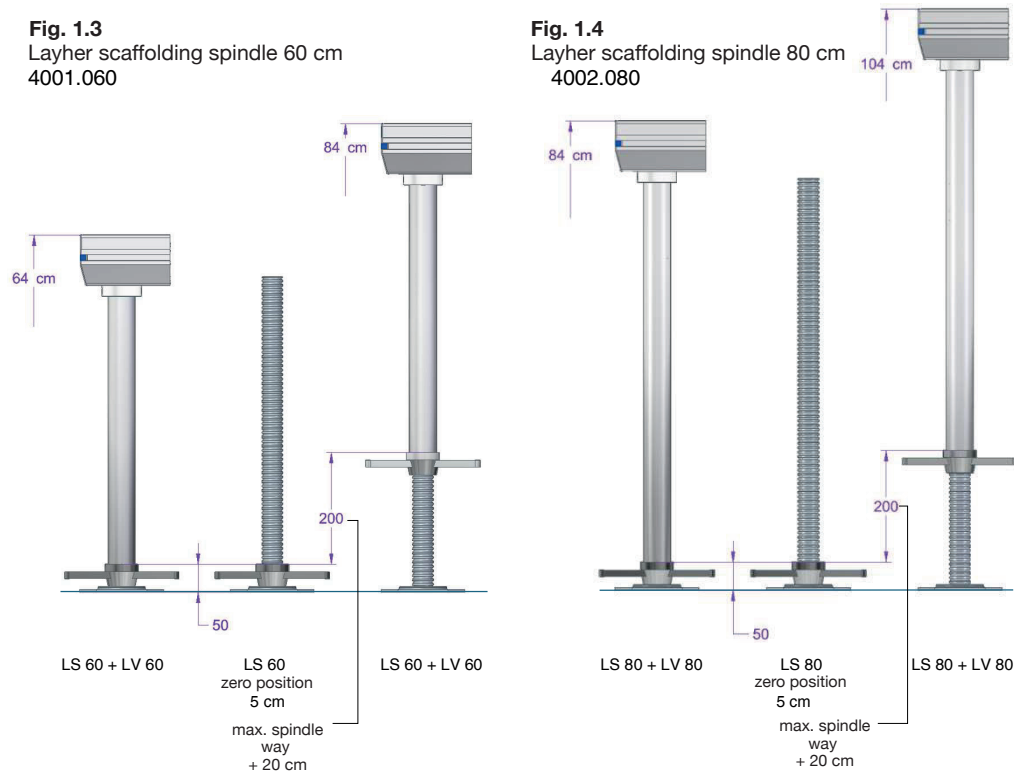
**Fig. 1.1**

Layher scaffold spindle 20 cm  
5602.020



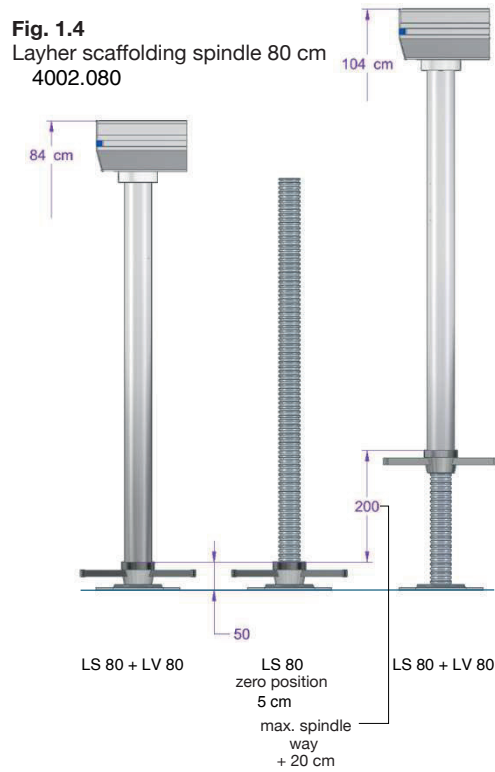
**Fig. 1.3**

Layher scaffolding spindle 60 cm  
4001.060



**Fig. 1.4**

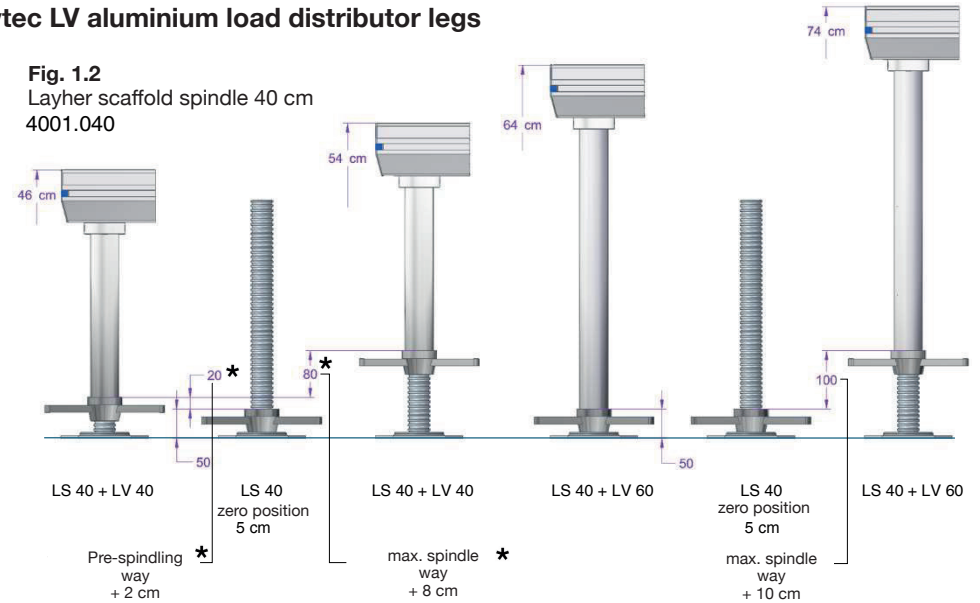
Layher scaffolding spindle 80 cm  
4002.080



## Safety Instruction 1.0

**Fig. 1.2**

Layher scaffold spindle 40 cm  
4001.040



height +/- 0,5 cm = top edge of platform in cm	LS in cm	max. permitted spindle way in cm	LS + nivtec LV leg for sh in cm
27,5 – 29	20	1,5 *	20
44 – 49		5	40
46 – 54	40	8 *	40
64 – 74		10	60
64 – 84	60	20	60
84 – 104		20	80
84 – 104	80	20	80
104 – 124		20	100
124 – 144		20	120
144 – 164		20	140
164 – 184		20	160
184 – 200		16	180

When using Layher LS scaffold spindles in combination with nivtec LV aluminium load-distributor legs, it is essential to not exceed the maximum permitted spindle way specified in Fig. 1.1, Fig. 1.2, Fig. 1.3 and Fig. 1.4.

The production of interchangeable legs in steel and/or aluminium versions in special lengths for use with Layher scaffold spindles has been discontinued at nivtec. Existing legs and bracings made of steel must be used in accordance with the nivtec aluminium bracing regulations.

Detailed information on the mixed installation of different types of nivtec legs made of aluminium and/or steel as well as the positioning of the diagonal and horizontal bracing made of aluminium and/or steel is provided in safety instruction 3.0 for stages and in safety instruction 4.0 for galleries. These requirements must be strictly adhered to.

- \* when using a 20 cm leg, a pre-spindle way of 3.5 cm is mandatory
  - \* when using a 40 cm leg, a pre-spindle way of 2 cm is mandatory
- Diagonal bracing from stage height  $\geq 80$  cm  
additional horizontal bracing from stage height  $>140$  cm

## Stage Building with nivtec Staging System

### Bracing regulations for stage heights ≥ 80-200 cm with positioning of the aluminium diagonal and horizontal bracing

The bracing of the nivtec staging system with aluminium diagonal and horizontal braces must be executed in accordance with the aluminium bracing regulations nivtec alu in the aluminium variant.

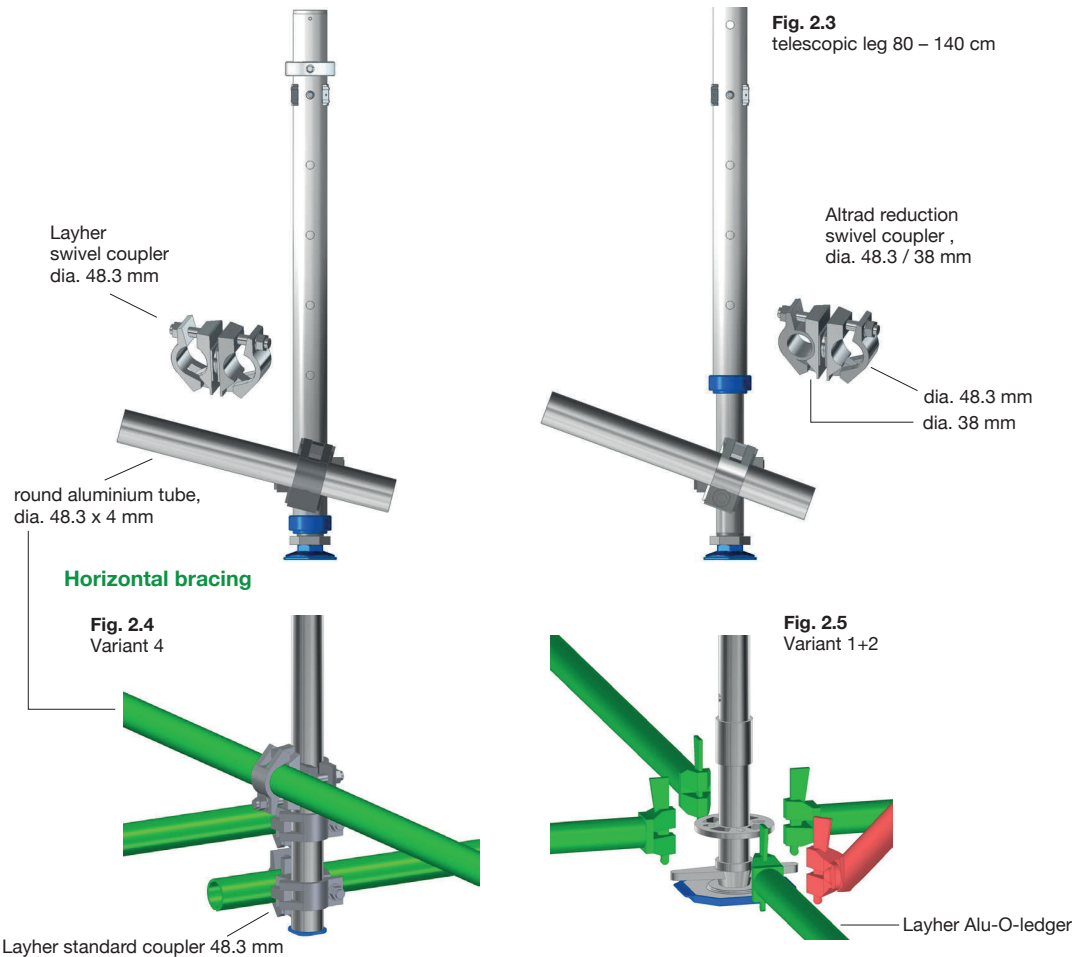
For bracing variant 4 – swivel coupler /swivel coupler – the regulations as per Fig. 2.1 apply.

For the other bracing variants 1 – wedge head / wedge head, 2 – wedge head / semi coupler and 3 – semi coupler / semi coupler, the regulations as per Fig. 2.2 apply.

When using Layher LS scaffold spindles in combination with nivtec LV aluminium load distributor legs, it is mandatory to adhere to the maximum permitted spindle ways in accordance with safety instruction 1.0. The production of interchangeable legs in steel and/or aluminium versions in special lengths for use with Layher scaffold spindles has been discontinued at nivtec. Existing legs and braces made of steel must be used in accordance with bracing regulations nivtec alu.

Detailed information on the mixed installation of different types of nivtec legs made of aluminium and/or steel as well as the positioning of the diagonal and horizontal bracing made of aluminium and/or steel is provided in safety instruction 3.0 for stages and in safety instruction 4.0 for galleries. These requirements must be strictly adhered to.

#### Diagonal Bracing



## Safety Instruction 2.0

**Fig. 2.1. Bracing regulations variant 4 diagonal bracing from stage height ≥ 80 cm**

for leg length	for leg distance	Art. No.	article description
80 – 100 cm	100 / 85 cm	200 31 1	Aluminium diagonal BL: 100/ 85 cm sh: 80-100cm L: 1300 mm
80 – 100 cm	200 / 185 cm	200 31 3	Aluminium diagonal BL: 200/185 cm sh: 80-100cm L: 2250 mm
>100 – 140 cm	100 / 85 cm	200 31 2	Aluminium diagonal BL: 100/ 85 cm sh: >100-140 cm L: 1500 mm
>100 – 140 cm	200 / 185 cm	200 31 4	Aluminium diagonal BL: 200/185 cm sh: >100-140 cm L: 2400 mm
>140 – 180 cm	100 / 85 cm	200 32 4	Aluminium diagonal BL: 100/ 85 cm sh: >140-180 cm L: 1500 mm
>140 – 180 cm	200 / 185 cm	200 31 6	Aluminium diagonal BL: 200/185 cm sh: >140-180 cm L: 2500 mm
>180 – 200 cm	100 / 85 cm	200 32 0	Aluminium diagonal BL: 100/ 85 cm sh: >180-200 cm L: 1750 mm
>180 – 200 cm	200 / 185 cm	200 32 1	Aluminium diagonal BL: 200/185 cm sh: >180-200 cm L: 2750 mm

**Attention:** When using LS 60 cm with LV 60 cm, an Altrad reduction swivel coupler 48.3 / 38 mm must be attached at the bottom of the scaffold spindle in the same manner as at the inner tube of extended telescopic legs – see Fig. 2.3.

**additional horizontal bracing from stage height > 140 cm Fig. 2.4**

for leg length	for leg distance	Art. No.	article description
> 140 - 200 cm	100 / 85 cm	200 31 7	Aluminium horizontal BL: 100/ 85 cm L: 1100 mm
	200 / 185 cm	200 31 5	Aluminium horizontal BL: 200/185 cm L: 2100 mm

**Abb. 2.2. Bracing regulations variant 1, 2, 3 diagonal bracing from stage height ≥ 80 cm**

Variant 1 (wedge/wedge) Variant 2 (wedge/semi coupler) Variant 3 (semi coupler/semi coupler)	max. stage height	aluminium diagonal bay height	rosette		
			Variant 1	Variant 2	Variant 3
nivtec aluminium leg 60 cm	60 cm				
nivtec aluminium leg 60 cm + Layher spindle 60	80 cm	0,475 m	1 + 1*	1*	0
nivtec aluminium leg 60 cm + Layher spindle 60 + base collar	100 cm	0,475 m	1	0	
nivtec aluminium leg 80 cm	80 cm	0,475 m	2	1	0
nivtec aluminium leg 80 cm + Layher spindle 80	100 cm	0,475 m	2	1	0
nivtec aluminium leg 80 cm + Layher spindle 80 + base collar	120 cm	0,675 m	1	0	
nivtec aluminium leg 100 cm	100 cm	0,675 m	2	1	0
nivtec aluminium leg 100 cm + Layher spindle 80	120 cm	0,675 m	2	1	0
nivtec aluminium leg 100 cm + Layher spindle 80 + base collar	140 cm	0,875 m	1	0	
nivtec aluminium leg 120 cm	120 cm	0,875 m	2	1	0
nivtec aluminium leg 120 cm + Layher spindle 80	140 cm	0,875 m	2	1	0
nivtec aluminium leg 120 cm + Layher spindle 80 + base collar	160 cm	1,075 m	1	0	
nivtec aluminium leg 140 cm	140 cm	1,075 m	2	1	
nivtec aluminium leg 140 cm + Layher spindle 80 + base collar	180 cm	1,275 m	1	0	
nivtec aluminium leg 160 cm + Layher spindle 80 + base collar	200 cm	1,475 m	1	0	

**\*Attention:** When using LS 60 cm with LV 60 cm, a threaded rosette must be attached at the bottom of the scaffold spindle.

**additional horizontal bracing from stage height > 140 cm Fig. 2.5**

Art. No.	article description
0703.017	Layher AR Alu-O-Ledger L: 2,00 m - wedge/wedge
0701.620	Layher AR Alu-O-Ledger L: 1,00 m - wedge/wedge
0710.011	Layher AR Alu-O-Ledger L: 1,85 m - wedge/wedge
0712.677	Layher AR Alu-O-Ledger L: 0,85 m - wedge/wedge

## Stage Building with nivtec Staging System

### Mixed installation of different nivtec leg types in stages

For stages built with nivtec stage platforms the exclusive use of nivtec original legs equipped with thread adapter and load ring is mandatory. Any approved nivtec leg types can be used: load distributor legs, levelling legs, telescopic legs, combination of load distributor legs with Layher spindles.

The legs can be used both in the current aluminium variant and in the steel variant manufactured until 2015. For this, the following conditions apply:

When using Layher scaffold spindles in combination with nivtec load distributor legs, it is essential to ensure that the nivtec aluminium regulations for the maximum spindle way of the scaffold spindle used are adhered to.

For the bracing of stages, the following applies:

For set up and bracing, the currently applicable set up rules, setup schemes and assembly instructions nivtec alu must be adhered to.

**The legs connected with braces must be of the same leg type.**



For stage height 80 cm Fig. 3.1, nivtec load distributor legs LV 80 cm are used.



For stage height 100 cm, Fig. 3.2, use Layher scaffold spindles LS 80 cm, reinforced, in combination with nivtec load distributor legs LV 80 cm with removable leg corks.

#### The following applies to bracing variant 4:

The diagonal braces (for stage heights  $\geq 80$  cm) and horizontal braces (additionally for stage heights  $> 140$  cm) can be made of aluminium (EN AW-6005A T6) as well as steel (S235) with a cross-section tube diameter of 48.3 x 4 mm and corresponding couplers.

#### The following applies to bracing variants 1-3:

The diagonal bracing (for stage heights  $\geq 80$  cm) and horizontal braces (additionally for stage heights  $> 140$  cm) can be executed with Layher aluminium diagonal braces or Layher O-ledgers specified by nivtec. The O-ledgers for bay lengths 100 / 85 cm and 200/185 cm can be used in both aluminium and steel variant.

## Safety Instruction 3.0

Fig. 3.1 Stage height 80 cm



Fig. 3.2 Stage height 100 cm



## Stage Building with nivtec Staging System

### Mixed installation of different nivtec leg types in galleries

For galleries built with nivtec stage platforms the exclusive use of nivtec original legs equipped with thread adapter and load ring is mandatory. Any approved nivtec leg types can be used: load distributor legs, levelling legs, telescopic legs, combination of load distributor legs with Layher spindles.

The legs can be used both in the current aluminium variant and in the steel variant manufactured until 2015. For this, the following conditions apply:

When using Layher scaffold spindles in combination with nivtec load distributor legs, it is essential to ensure that the nivtec aluminium regulations for the maximum spindle way of the scaffold spindle used are adhered to.

**For galleries it is mandatory that for each level only one leg type is used.**

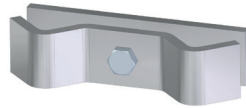
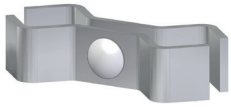
**For galleries where the combination of Layher scaffold spindles and nivtec load distributor legs is used for one or more levels, an identical leg distance of 15 cm must be ensured for the entire gallery.**

For galleries with leg distance 110 mm, Fig. 4.1, the following links are used:

leg link 110 mm

+

rail link 110 mm



For galleries with leg distance 150 mm, Fig. 4.2, the following links are used:

leg link 150 mm

+

rail link 150 mm, reinforced



For the bracing of galleries, the following applies:

For set up and bracing, the currently applicable set up rules, setup schemes and assembly instructions nivtec alu must be adhered to.

#### The following applies for bracing variant 4:

The diagonal braces (for stage heights  $\geq 80$  cm) and horizontal braces (additionally for stage heights  $> 140$  cm) can be made of aluminium (EN AW-6005A T6) as well as steel (S235) with a cross-section tube diameter of 48.3 x 4 mm and corresponding couplers.

#### The following applies for bracing variants 1-3:

The diagonal braces (for stage heights  $\geq 80$  cm) and horizontal braces (additionally for stage heights  $> 140$  cm) can be executed with Layher aluminium diagonal braces or Layher O-ledgers specified by nivtec. The O-ledgers for bay lengths 100 / 85 cm and 200/185 cm can be used in both aluminium and steel variant.

## Safety Instruction 4.0

Fig. 4.1 Gallery with leg distance 110 mm

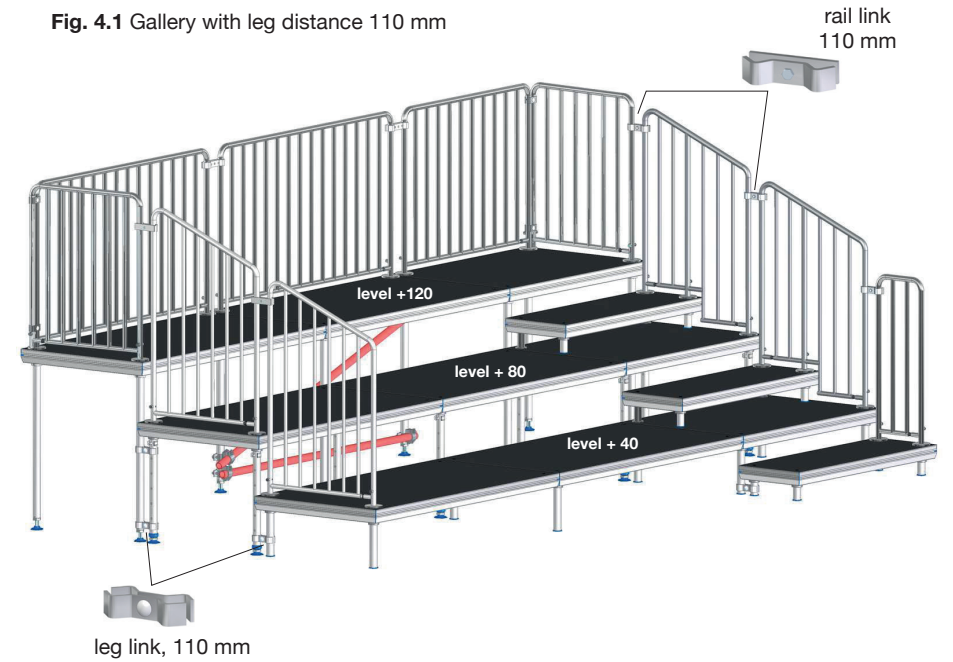
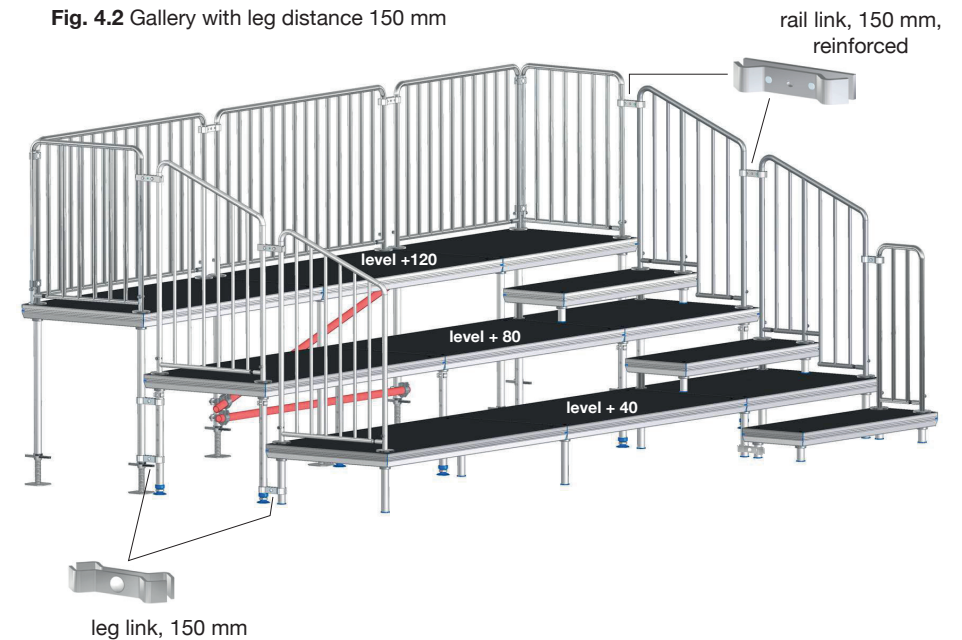


Fig. 4.2 Gallery with leg distance 150 mm



## Stage Building with nivtec Staging System

### Stages for events with rhythmic loads such as dancing

During dance events on stages, lively movements create a rhythmic load. To absorb this load in a suitable way, the height and size of the stage must be set in relation to the type of dance in advance.

Given the enormous variety of stage sizes and heights, as well as the different types of events, it is impossible to draw up uniform regulations that apply absolutely identically to all projects. Therefore, our recommendations below should be considered as guidelines when planning your stage.

- With rhythmic loads, the permitted distributed load is reduced from 7.5 kN/sqm to 5.0 kN/sqm.
- The stages should definitely be fitted with **rails on three sides**. This ensures the safety of the stage users and has a positive effect on the stability of the stage.
- **The ground surface must be as level as possible** to allow for the use of **fix load distributor legs LV** as the first choice. If other legs are used, the height of the stage and the levelling spindle way must be reduced. Skid-proof floor protectors must be used.
- In terms of safety, restrictions must be accepted with regard to flexibility; **the levelling spindle way must be cut in half for all legs:**
  - for VS legs to max. +1.5 cm – see Fig. 5.1
  - for TF legs to max. + 5 cm, the raster pitch must be selected accordingly,
    - max. stage heights must be reduced:
      - for TF 40 - 60 cm to max. 55 cm – see Fig. 5.2
      - for TF 60 -100 cm to max. 80 cm – see Fig. 5.3
      - for TF 80 -140 cm to max.120 cm – see Fig. 5.4
- For set up and bracing, the currently applicable set up rules, set up schemes and assembly instructions nivtec Alu must be adhered to. In addition to the regulations standard stages, additional bracing regulations must be complied with:

#### • Stage heights ≥ 80 – 120 cm:

The diagonals marked with \* must also be used for height 80 cm. In the bracing-free corners of the stages, additional diagonal axis braces should be installed – see Fig. 5.5. For a 6 x 6 m sample stage, this means 4 pieces on the outer sides. For larger stages, additional diagonal axis braces must also be used every 6 m.

#### • Stage heights > 120 cm to 200 cm:

In addition to the diagonal bracing, horizontal bracing must be installed in all axes and rows in the same manner as for standard stages exceeding 140 cm. The spindle way must be cut in half.

#### • Stage heights < 80 cm:

Depending on the dance event and especially when using telescopic legs, diagonal braces must also be used for stage heights below 80 cm. The first diagonal brace is installed in row 1 at the start platform, all other diagonal braces follow after every 2 metres in a clockwise direction – see Fig. 5.6. For a sample stage 6 x 6 m, 6 diagonal braces are required. For larger stages, additional diagonal axis braces must be used every 6 m.

A rehearsal performance of the planned dance event after the set up in accordance with the set up schemes and additional regulations is an indispensable measure to test the stability of the stage with regard to the actual rhythmic load to be expected. If necessary, a third swivel coupler can be attached to the otherwise free-standing centre leg at the outer diagonal axis braces as a further stabilisation measure.

Please check your stock of materials in good time before the next event so that you can obtain the necessary parts in good time to be able to ensure the stability of the stages and thereby the safety of the users.

## Safety Instruction 5.0

### Spindle way & maximum stage height

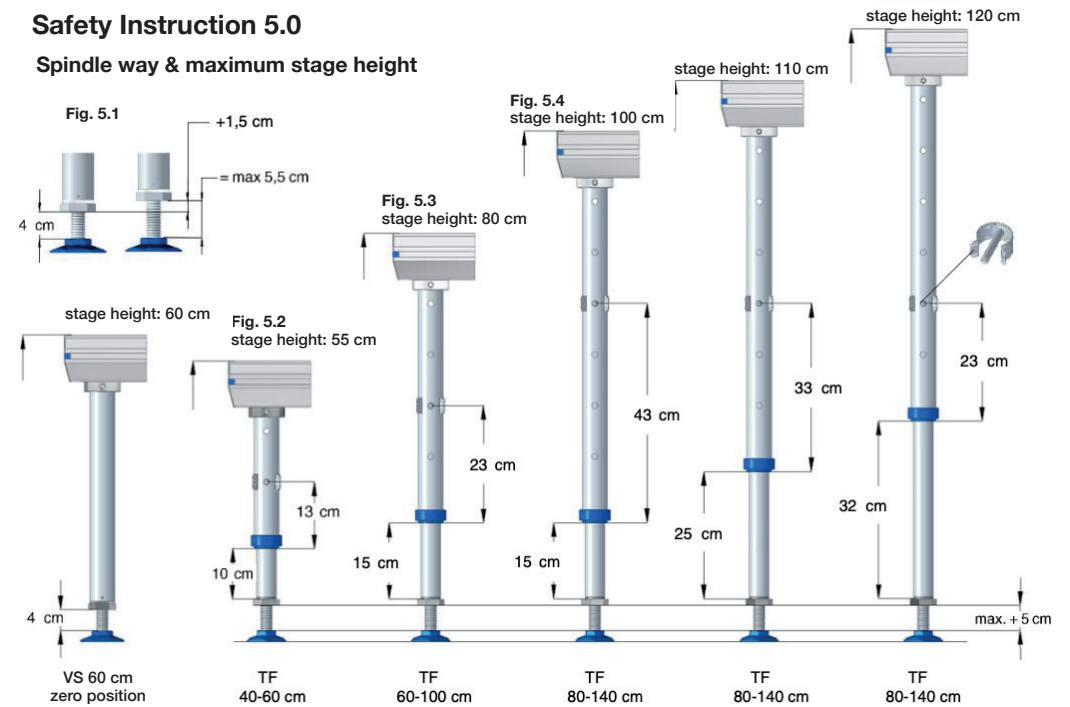


Fig. 5.4 set up schemes for stages ≥ 80 - 120 cm

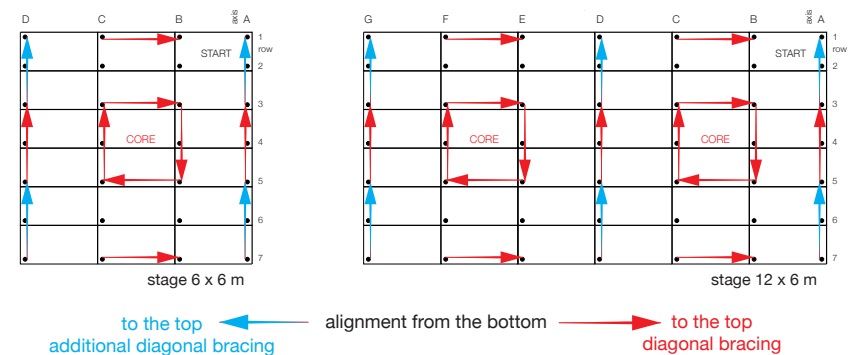
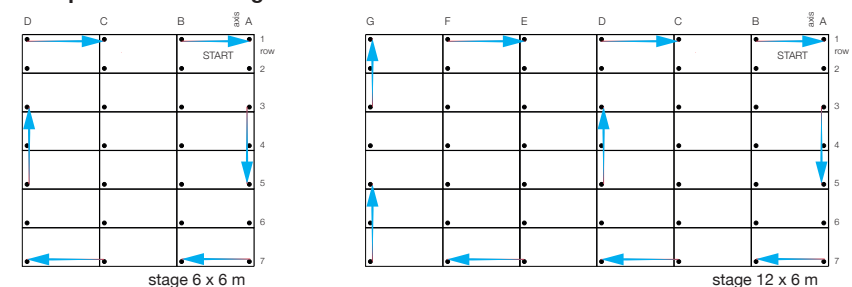


Fig. 5.6 set up schemes for stages < 80 cm



## Stage Building with nivtec Staging System

### Stages for presentations with high point loads

nivtec stages made of nivtec platforms with 12 mm multiplex plywood panels have a maximum distributed load of 7.5 kN/sqm, tested in accordance with DIN EN 13814 – temporary mobile structures.

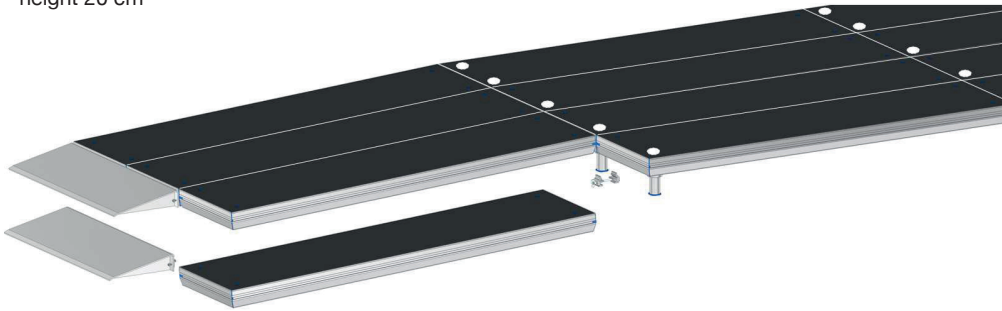
Mobile stages / temporary mobile structures are usually open to one side (the audience areas), demarcated from the audience, usually raised playing areas / scenic areas, which serve for the performance of participants, individual persons or groups.

If stages or parts of stages are used for other purposes, the existing stability certificates are not sufficient from the point of view of construction law. If necessary, further calculations must be made. Point loads are not permitted on the platforms when the stages are in use, i.e., wheel loads from heavy musical instruments, machines or other objects must always be distributed over an area in a suitable manner. This is achieved either by placing suitable material on the stage surface or by applying an extensive underpinning in that area below the stage. The same applies to ramps and other constructions created with nivtec material.

Presentation areas are typically smaller than 6 m in width and/or depth and are to be regarded as small stages. - see Fig. 6.1. They are often constructed with platforms in smaller dimensions, for example 200 x 50 cm. - see Fig. 6.2., Fig. 6.3. and Fig. 6.4. The bracing core is the same size as when using 200 x 100 cm platforms. The use of platforms with dimensions smaller than 200 x 100 cm does not exempt the user from the requirement to distribute the point loads over a wide area.

During set up and bracing, the current set up rules, set up schemes and assembly instructions nivtec Alu must be adhered to. In addition to the regulations, additional measures must be taken. A trial set up is an indispensable measure to test the stability of the structure. nivtec shall accept no liability for the installation or rolling up of heavy objects with high point loads on nivtec stages.

**Fig. 6.2 Stage 4 x 2 m with ramp**  
2 x 2 m made of 4 platforms 2 x 0.5 m  
height 20 cm

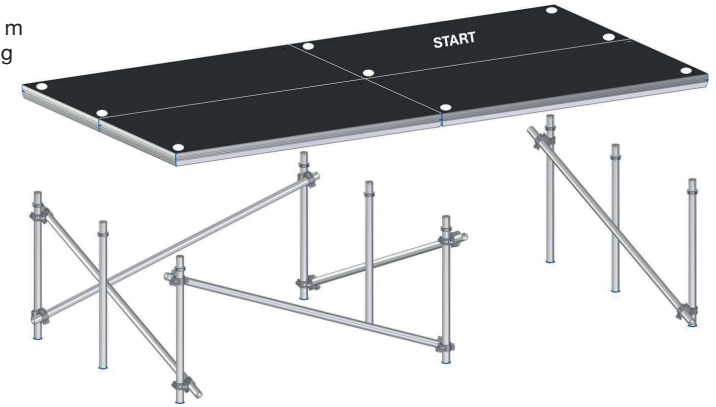


The set up may only be carried out in accordance with the nivtec principle 4-2-2-1.

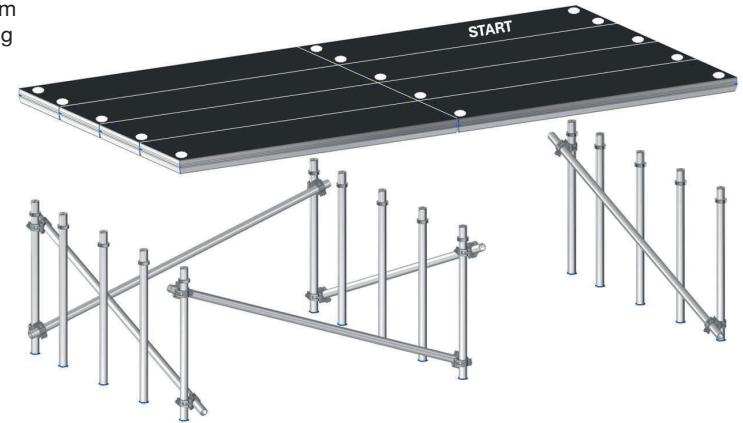
**\*Stages with uneven stage sizes** are frequently constructed first along the depth (Start 1) and subsequently expanded laterally across the width. For this, platforms with smaller dimensions (usually 1 m) are hooked into the 2 m groove side of the transverse-positioned platforms. (Start 2) with their tongue side. In this case, additional legs must be installed. It is best to set up the complete first row of platforms, which is hooked in, as with a standard stage starting with the first platform on 4 legs and then add all further platforms to the front equipped with 2 legs each. Without additional legs, there is otherwise a weak point here from a structural point of view, which leads to bending of the frame profiles and thereby to stresses in the panels during use.

## Safety Instruction 6.0

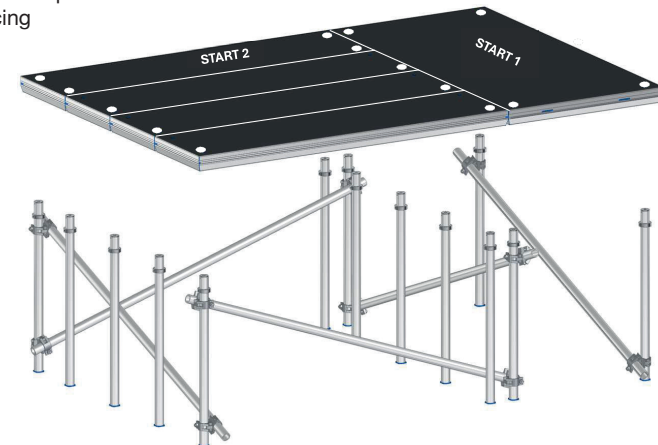
**Fig. 6.1 Stage 4 x 2 m**  
made of 4 platforms 2 x 1 m  
height 100 cm with bracing



**Fig. 6.3 Stage 4 x 2 m**  
made 8 platforms 2 x 0.5 m  
height 100 cm with bracing



**Fig. 6.4 Stage\* 3 x 2 m**  
made of platform 2 x 1 m & 4 platforms 2 x 0.5 m  
height 100 cm with bracing



**TÜV Thüringen e.V.**

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Ernst-Ruska-Ring 6  
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Vorstandsvorsitzender  
Volker Höhnisch  
Vereinsregister Erfurt, VR 160061

E-Mail: fliebau@tuev-thueringen.de  
Internet: www.tuev-thueringen.de

Prüfstelle für Festigkeit und  
Fliegende Bauten

TÜV Thüringen e.V. Ernst-Ruska-Ring 6 07745 Jena

nivtec-flexibel Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid

Ihr Zeichen	Ihre Nachricht	Unser Zeichen	Direktkontakt	Datum
		Schu	35	12.02.2026

**nivtec base constructions for stairways, ramps and rolling risers**

In accordance with certificate 3300-12623-2025-01/02 we herewith confirm as follows:  
A combination of nivtec legs in steel & alu version is not only possible for nivtec stages but also allowed for stairways, ramps and rolling risers.

**Stairways with tier heights 20 cm & 16,66 cm (theatre tier height) with nivtec levelling legs VS**  
Stairways are built with nivtec platforms in combination with levelling legs made of round alu tube Ø 48,3 mm at tier height 20 cm. Stairways with tier height 16,66 cm show an even higher stability due to the reduced height from 20 cm to 16,66 cm. For stairways with tier height 20 cm and 16,66 cm as well as extended show stairways a distributed load of 7,5 kN/m<sup>2</sup> can be confirmed. VS legs and fix legs (LV) both in steel and alu versions well as telescopic legs can be combined for stairways.

**Ramps with gradients of 3,44° (=gradient 6 %), 5° or 7,5° with nivtec ball bearing legs KG**  
Ramps are built with nivtec platforms in combination with ball bearing legs specially designed for ramps for gradients of 3,44° (=gradient 6 %), 5° or 7,5°. Calculations for nivtec stages are available. An additional horizontal load occurs due to the inclination angle of 3,44° - 7,5°, which already has been integrated in these calculations. Therefore, the distributed load of 7,5 kN/m<sup>2</sup> can also be confirmed for ramps.  
First KG-legs have been made of round steel tubes (mat. S235), today they are made of round alu tubes (mat. EN AW-6005 A T6) with Ø 48,3 mm and wall thickness 4 mm. KG-legs can be used in steel & alu version can be combined for ramps. KG-legs are produced in fixed sizes from 15 to max. 120 cm for stage sizes up to max. 140 cm. Identical to stages ramps have to equipped with braces. Regulations nivtec alu have to be observed.

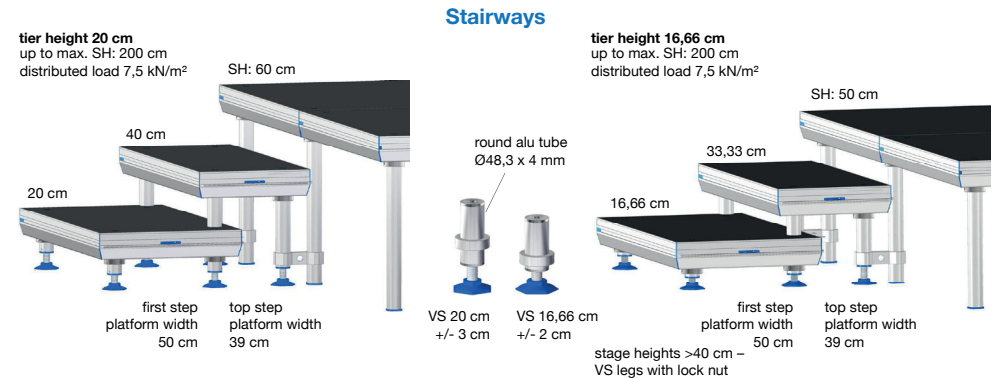
**Rolling Risers with wheels Ø 10 cm or Ø 16 cm with nivtec extension adapters RR**  
Rolling risers can be built with nivtec platforms in combination with nivtec transport wheels Ø 10 cm resp. Ø 16 cm and extension adapters RR. The assembly has to be executed according to the nivtec principle 4-2-2-1. Rolling risers may only be used on flat and level surfaces. The maximum size is 24 m<sup>2</sup>. The maximum height is 80 cm without diagonal bracing.  
The following distributed loads may not be exceeded:  
wheels Ø 10 cm / wheel capacity 200 kg / permitted distributed load 1,5 kN/m<sup>2</sup>  
wheels Ø 16 cm / wheel capacity 350 kg / permitted distributed load 2,5 kN/m<sup>2</sup>  
For combinations of both wheel sizes the distributed load for wheels Ø 10 cm is permitted. Extension adapters RR have first been made of round steel tubes (mat. S235), today they are made of round alu tubes (mat. EN AW-6005 A T6) with Ø 48,3 mm and wall thickness 4 mm. Extension adapters RR both in steel and alu version can be combined.

S. Schubert  
Dipl.-Ing. S. Schubert

attachment: nivtec base constructions  
for stairways, ramps and rolling risers

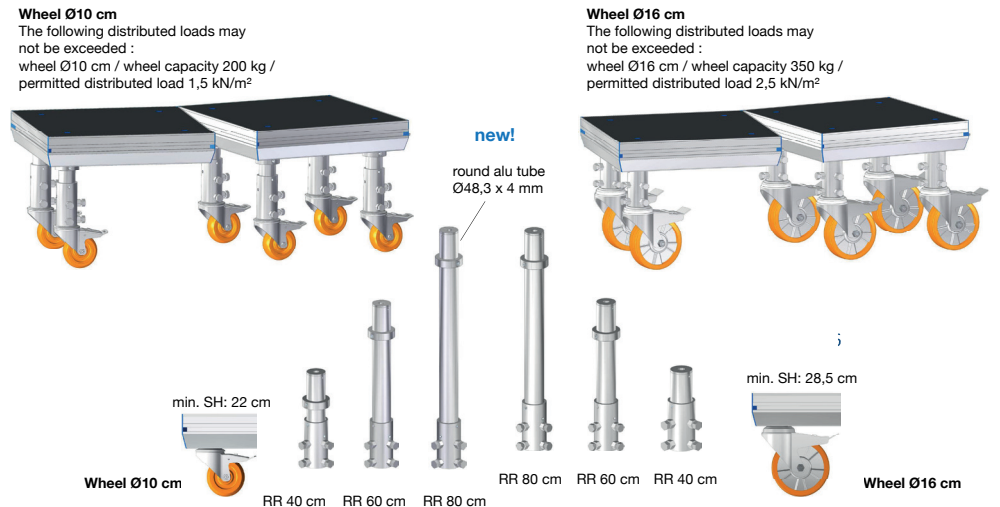
Qualität und Sicherheit aus dem Herzen Deutschlands

Attachment: nivtec base constructions for stairways, ramps and rolling risers



**Rolling Risers**

The assembly has to be executed according to the nivtec principle 4-2-2-1. Rolling risers may only be used on flat and level surfaces. The maximum size is 24 m<sup>2</sup>. When using nivtec transport wheels in combination with nivtec extension adapters RR rolling risers can be built at heights 40 cm, 60 cm and 80 cm without diagonal bracing.





# Technischer Überwachungs-Verein Thüringen e.V.

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and Temporary Structures  
Ernst-Ruska-Ring 6  
07745 Jena  
Germany

Tel.: 03641/3997-35  
Fax: 03641/3997-55

**Certificate No.: 3300 – 12623 – 2025 – 01/02**

## Examination of stages

Item under inspection: **nivtec stages**  
(Description see Annex)

Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid  
Germany

Testing Specification: - DIN EN 13814: 2005-06  
- Guidelines for Assembly and Operation of Temporary Structures (M-FIBauR), edition June 2010  
- VdTÜV: Instruction Sheet 1507:2013-04

other applicable documents: - nivtec catalog  
- nivtec assembly instructions  
(at the time of set up)

We hereby confirm that the static analysis of the nivtec stages meets the above mentioned requirements and is complete and correct.

This certificate is only valid in connection with the test reports by TÜV Thüringen e.V., Prüfstelle für Festigkeit und Fliegende Bauten listed in annex and the documents listed therein. As well in connection with the reports of load tests performed by TÜV Thüringen e.V., Prüfstelle für Festigkeit und Fliegende Bauten, according to the annex.

Validity period: until **30.04.2030**

TÜV Thüringen e.V.  
Prüfstelle für Festigkeit  
und Fliegende Bauten



Place / Date:  
Jena, 24.03.2025

*S. Schubert*  
Dipl.-Ing. S. Schubert

This is a translation of Zertifikat Nr. 3300-12623-2025-01/02.  
In any case of doubt, the German original is valid.

3300-12623-2025-01\_02 Zertifikat Alu\_EN.docx

Technischer Überwachungs-Verein Thüringen e.V.  
Digital signed by Technische Überwachungs-Verein Thüringen e.V. DN: cn=Technischer Überwachungs-Verein Thüringen e.V., c=DE, o=Technischer Überwachungs-Verein Thüringen e.V., email=3300-12623-2025-01\_02 Zertifikat Alu\_EN.docx

## Annex to Certificate No.: 3300 –12623 – 2025 – 01/02

Test Report	Product	load capacity	lateral load
	<b>stages of nivtec® system platforms with multiplex plywood panel, 12 mm - with alu legs, heights up to 180 cm - reduced quantity of legs - with alu braces for heights from 80 cm</b>		
3300-12623-2025 BT, 3300-7317-2015 Last	nivtec stage, heights up to max. 1,40 m	7,5 kN/m <sup>2</sup>	
3300-12644-2025 BT, 3300-7946-2015 Last 3300-7408-2015 Last	nivtec stage, heights up to max. 2,00 m	7,5 kN/m <sup>2</sup>	
3300-12645-2025 BT, 3300-7409-2015 Last	nivtec stage, with extension legs heights up to max. 1,40 m	7,5 kN/m <sup>2</sup>	
3300-12646-2025 BT	nivtec seat gallery heights up to max. 2,00 m	7,5 kN/m <sup>2</sup>	
	<b>stages of nivtec® system platforms accessories: rails and stairways platforms: various executions</b>		
3300-5550-2012 Last	nivtec safety rail, height: 100 cm		1 kN/m
3300-5563-2012 Last	stairway of nivtec® system platforms with nivtec safety rail, height: 100 cm	7,5 kN/m <sup>2</sup>	1 kN/m
3300-5562-2012 Last	nivtec safety rail with vertical bars, height: 110 cm		1 kN/m
3300-5564-2012 Last	stairway of nivtec® system platforms with nivtec safety rail with vertical bars, height: 110 cm	7,5 kN/m <sup>2</sup>	1 kN/m
3300-5565-2012 Last	nivtec safety rail, height 100 cm, adjustable		0,5 kN/m
	<b>various executions of platforms</b>		
3300-5585-2012 Last Sonderformen	nivtec platforms with multiplex plywood panel, 12 mm, special shapes	7,5 kN/m <sup>2</sup>	
3300-5585-2012 Last Oberflächen	nivtec platforms – special surfaces (acrylic glass PMMA, 12 mm)	5 kN/m <sup>2</sup>	
3300-5566-2012 Last	nivtec platforms with opening + cover, multiplex plywood panel, 12 mm	5 kN/m <sup>2</sup>	
3300-5568-2012 Last	nivtec platforms with multiplex panel BFU 100, 9 mm, untreated, for indoor use	5 kN/m <sup>2</sup>	



3300-12623-2025-01\_02 Zertifikat Alu\_EN.docx

**TEST REPORT NO.: 3300 - 12623 - 2025 BT**

Report on the examination of the structural documents for a temporary structure  
for the purpose of issuing a final approval

(Extension of validity of type review No. 3300-7317-2015 BT)

**1. General details:**

- 1.1 Facility / examination object: **Stage 6,0 m x 4,0 m  
made of nivtec® system platforms  
- with aluminium legs  
- heights up to maximum 1,40 m  
- reduced quantity of legs  
- for 7,5 kN/m² distributed load**
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Author of structural documents  
(static calculation) Beyer – Bos & Partner  
Vohwinkeler Str. 58  
42329 Wuppertal
- 1.5 Scope of examination: structural documentation of project
- 1.6 Validity of type review: **until 30.04.2030**  
Only valid with associated type examination report on  
structural documents for original construction  
Issuing of final approval is permitted until the expiry date  
of type review provided relevant technical structural con-  
ditions have not considerably changed.  
Extensions of the final approval can be allowed irrespec-  
tive of the type review validity.
- 1.7 Testing Specification:  
(if applicable) - Guidelines for Assembly and Operation of Temporary  
Structures in the current version for the relevant  
states  
- DIN EN 13814: 2005-06  
- VdTÜV Instruction Sheet 1507: 2013-06



**TEST REPORT NO.: 3300 - 7317 - 2015 LAST**

Report on loading tests

**1. General details:**

- 1.1 Facility / examination object: **Stage 6,0 m x 4,0 m  
made of nivtec® system platforms  
- with aluminium legs  
- heights up to maximum 1,40 m  
- reduced quantity of legs  
- for 7,5 kN/m² distributed load**
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Author of structural documents:  
static calculation Beyer – Bos & Partner  
Vohwinkeler Str. 58  
42329 Wuppertal
- 1.5 Test Report structural documents: Type Review Report No. 3300-7317-2015 BT by  
TÜV Thüringen e.V., Prüfstelle für Festigkeit  
und Fliegende Bauten
- 1.6 Testing Specification:  
(if applicable) - Guidelines for Assembly and Operation of Temporary  
Structures in the current version for the relevant  
states  
- DIN EN 13814: 2005-06  
- VdTÜV Instruction Sheet 1507 in the current version
- 1.7 Testing location: nivtec flexibel production premises at Remscheid
- 1.8 Date of test: 26.03.2015, 27.03.2015
- 1.9 Scope of inspection: load tests of 4 stages



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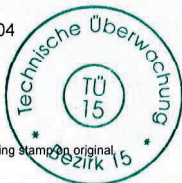
Inspection Authority for the Stability  
of Temporary Structures

**TEST REPORT NO.: 3300 - 12645 - 2025 BT**

Report on the examination of the structural documents for a temporary structure  
for the purpose of issuing a final approval

(Extension of validity of type review No. 3300-7409-2015 BT)

- |  |  |
|--|--|
| <b>1. General details:</b>                                 |  |
| 1.1 Facility / examination object:                         | <b>Stage 6,0 m x 4,0 m</b><br>made of nivtec <sup>®</sup> system platforms<br>- with extension (telescopic) legs<br>- heights up to maximum 1,40 m<br>- reduced quantity of legs<br>- for 7,5 kN/m <sup>2</sup> distributed load   |
| 1.2 Applicant:   | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.3 Manufacturer:  | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.4 Author of structural documents<br>(static calculation) | Beyer – Bos & Partner<br>Vohwinkeler Str. 58<br>42329 Wuppertal  |
| 1.5 Scope of examination:                                  | structural documentation of project  |
| 1.6 Validity of type review:                               | <b>until 30.04.2030</b><br>Only valid with associated type examination report on<br>structural documents for original construction<br><u>Issuing of final approval</u> is permitted until the expiry date<br>of type review provided relevant technical structural con-<br>ditions have not considerably changed.<br><u>Extensions of the final approval</u> can be allowed irrespec-<br>tive of the type review validity. |
| 1.7 Testing Specification:<br>(if applicable)              | - Guidelines for Assembly and Operation of Temporary<br>Structures in the current version for the relevant<br>states<br>- DIN EN 13814: 2005-06<br>- VdTÜV Instruction Sheet 1507: 2013-04   |



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07745 Jena  
Germany

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Inspection Authority for the Stability  
of Temporary Structures

**TEST REPORT NO.: 3300 - 7409 - 2015 LAST**

Report on load tests

- |   |  |
|---|--|
| <b>1. General details:</b>                                |  |
| 1.1 Facility / examination object:                        | <b>Stage 6,0 m x 4,0 m</b><br>made of nivtec <sup>®</sup> system platforms<br>- with extension (telescopic) legs<br>- heights up to maximum 1,40 m<br>- reduced quantity of legs<br>- for 7,5 kN/m <sup>2</sup> distributed load |
| 1.2 Applicant:  | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.3 Manufacturer:   | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.4 Author of structural documents:<br>static calculation | Beyer – Bos & Partner<br>Vohwinkeler Str. 58<br>42329 Wuppertal  |
| 1.5 Test Report structural documents:                     | Type Review Report No. 3300-7409-2015 BT by<br>TÜV Thüringen e.V., Prüfstelle für Festigkeit<br>und Fliegende Bauten   |
| 1.6 Testing Specification:<br>(if applicable)             | - Guidelines for Assembly and Operation of Temporary<br>Structures in the current version for the relevant<br>states<br>- DIN EN 13814: 2005-06<br>- VdTÜV Instruction Sheet 1507 in the current version                         |
| 1.7 Testing location:                                     | nivtec flexibel production premises at Remscheid   |
| 1.8 Date of test:   | 26.03.2015, 05.08.2015   |
| 1.9 Scope of inspection:                                  | load tests of 2 stages   |



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Inspection Authority for the Stability  
of Temporary Structures

**TEST REPORT NO.: 3300 - 12644 - 2025 BT**

Report on the examination of the structural documents for a temporary structure  
for the purpose of issuing a final approval

(Extension of validity of type review No. 3300-7946-2016 BT and 3300-7408-2015BT)

- |  |  |
|--|--|
| <b>1. General details:</b>                                 |  |
| 1.1 Facility / examination object:                         | <b>Stage 6,0 m x 4,0 m<br/>made of nivtec® system platforms</b><br>- with aluminium legs<br>- heights up to maximum 2,00 m<br>- reduced quantity of legs<br>- for 7,5 kN/m² distributed load   |
| 1.2 Applicant:   | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.3 Manufacturer:  | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.4 Author of structural documents<br>(static calculation) | Beyer – Bos & Partner<br>Vohwinkeler Str. 58<br>42329 Wuppertal  |
| 1.5 Scope of examination:                                  | structural documentation of project  |
| 1.6 Validity of type review:                               | <b>until 30.04.2030</b><br><br>Only valid with associated type examination report on<br>structural documents for original construction<br><u>Issuing of final approval</u> is permitted until the expiry date<br>of type review provided relevant technical structural<br>conditions have not considerably changed.<br><u>Extensions of the final approval</u> can be allowed irrespec-<br>tive of the type review validity. |
| 1.7 Testing Specification:<br>(if applicable)              | - Guidelines for Assembly and Operation of Temporary<br>Structures in the current version for the relevant<br>states<br>- DIN EN 13814: 2005-06<br>- VdTÜV Instruction Sheet 1507: 2013-04   |



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Inspection Authority for the Stability  
of Temporary Structures

**TEST REPORT NO.: 3300 - 7946 - 2016 LAST**

Report on load tests

- |   |  |
|---|--|
| <b>1. General details:</b>                                |  |
| 1.1 Facility / examination object:                        | <b>Stage 6,0 m x 4,0 m<br/>made of nivtec® system platforms</b><br>- with aluminium legs<br>- heights up to maximum 2,00 m<br>- reduced quantity of legs<br>- for 7,5 kN/m² distributed load             |
| 1.2 Applicant:  | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.3 Manufacturer:   | nivtec-flexibel<br>Bühnensysteme GmbH<br>Walter-Freitag-Str. 31<br>42899 Remscheid   |
| 1.4 Author of structural documents:<br>static calculation | Beyer – Bos & Partner<br>Vohwinkeler Str. 58<br>42329 Wuppertal  |
| 1.5 Test Report structural documents:                     | Type Review Report No. 3300-7946-2016 BT by<br>TÜV Thüringen e.V., Prüfstelle für Festigkeit<br>und Fliegende Bauten   |
| 1.6 Testing Specification:<br>(if applicable)             | - Guidelines for Assembly and Operation of Temporary<br>Structures in the current version for the relevant<br>states<br>- DIN EN 13814: 2005-06<br>- VdTÜV Instruction Sheet 1507 in the current version |
| 1.7 Testing location:                                     | nivtec flexibel production premises at Remscheid   |
| 1.8 Date of test:   | 26.03.2015   |
| 1.9 Scope of inspection:                                  | load tests of one stage  |



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and Temporary Structures  
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07745 Jena  
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Inspection Authority for the Stability  
of Temporary Structures

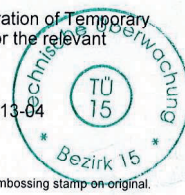
**TEST REPORT NO.: 3300 - 12646 - 2025 BT**

Report on the examination of the structural documents for a temporary structure  
for the purpose of issuing a final approval

(Extension of validity of type review No. 3300-7945-2016 BT)

**1. General details:**

- 1.1 Facility / examination object: **Seat Galleries  
made of nivtec® system platforms**  
- with aluminium base construction  
- for heights of max. 2.00 m  
- step heights up to max. 0.40 m  
- reduced quantity of legs  
- for 7.5 kN/m<sup>2</sup> distributed load
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Author of structural documents  
(static calculation) Beyer – Bos & Partner  
Vohwinkeler Str. 58  
42329 Wuppertal
- 1.5 Scope of examination: structural documentation of project
- 1.6 Validity of type review: **until 30.04.2030**  
Only valid with associated type examination report on  
structural documents for original construction  
Issuing of final approval is permitted until the expiry date  
of type review provided relevant technical structural con-  
ditions have not considerably changed.  
Extensions of the final approval can be allowed irrespec-  
tive of the type review validity.
- 1.7 Testing Specification:  
(if applicable) - Guidelines for Assembly and Operation of Temporary  
Structures in the current version for the relevant  
states  
- DIN EN 13814: 2005-06  
- VdTÜV Instruction Sheet 1507: 2013-04



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07745 Jena

Tel. 03641/3997-35  
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**TEST REPORT NO.: 3300 – 5585 – 2012 Last – special shapes**

**Load test report**

**1. General details:**

- 1.1 Facility / test object: **nivtec® stage platforms with special shapes  
for distributed loads of 7.5 kN/m<sup>2</sup>**  
- triangle 1m x 1m  
- quarter circle 1m x 1m  
- triangle 2m x1m
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing specification:  
(insofar as applicable) - Guidelines on the construction and operation of  
temporary structures, as amended by the federal  
states of Germany from time to time  
- DIN EN 13814: 2005-06  
- VdTÜV Instruction Sheet 1507 in the current version
- 1.5 Testing location: nivtec flexibel works premises in Remscheid
- 1.6 Date of test: 06.01.2009
- 1.7 Scope of inspection: loading tests



TEST REPORT NO.: 3300 – 5585 – 2012 Last – special surfaces

Load test report

1. General details:

- 1.1 Facility / test object: **nivtec® stage platforms with special surfaces**
- acrylic glass PMMA, thickness 12 mm,
  - glazed on one side
  - Polyester PETG, thickness 10 mm,
  - glazed on one side
  - pressed steel lattice, thickness 11 mm
  - for distributed loads of 5.0 kN/m<sup>2</sup>
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing specification:  
(insofar as applicable)
- Guidelines on the construction and operation of temporary structures, as amended by the federal states of Germany from time to time
  - DIN EN 13814: 2005-06
  - VdTÜV Instruction Sheet 1507 in the current version
- 1.5 Testing location: nivtec flexibel works premises in Remscheid
- 1.6 Date of test: 06.01.2009
- 1.7 Scope of inspection: loading tests



TEST REPORT NO.: 3300 – 5568 – 2012 Last

Load test report

1. General details:

- 1.1 Facility / test object: **nivtec® stage platforms with special panel**
- multiplex plywood / BFU 100 glued
  - untreated
  - birch, thickness 9 mm
  - for distributed loads of 5.0 kN/m<sup>2</sup>
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing specification:  
(insofar as applicable)
- Guidelines on the construction and operation of temporary structures, as amended by the federal states of Germany from time to time
  - DIN EN 13814: 2005-06
  - VdTÜV Instruction Sheet 1507 in the current version
- 1.5 Testing location: nivtec flexibel works premises in Remscheid
- 1.6 Date of test: 01.03.2012
- 1.7 Scope of inspection: loading tests of one platform



TEST REPORT No.: 3300-5550-2012 Load

Load test report

1. General details:

- 1.1 Facility / examination object: **nivtec Safety Rail, height 100 cm, for nivtec stages and nivtec galleries**
- Rail width 0.35 m to 1.85 m
  - for 1 kN / m horizontal load on handrail
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: Fa. nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing Specification: (if applicable) Guidelines for Assembly and Operation of Temporary Structures in the current version for the relevant states  
DIN EN 13814: 2005-06  
VdTÜV Instruction Sheet 1507 in the current version
- 1.5 Testing location: Factory premises of the company nivtec-flexibel in Remscheid
- 1.6 Date of test: 29 Feb. 2012
- 1.7 Test scope: Load tests on 4 rails



TEST REPORT No.: 3300-5563-2012 Load

Load test report

1. General details:

- 1.1 Facility / examination object: **Stairway built with nivtec® system platforms with nivtec safety rail, height 100 cm, for nivtec stages and nivtec galleries**
- for 1 kN / m horizontal load on handrail
  - designed for a distributed load of 7.5 kN/m²
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: Fa. nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing Specification: (if applicable) Guidelines for Assembly and Operation of Temporary Structures in the current version for the relevant states  
DIN EN 13814: 2005-06  
VdTÜV Instruction Sheet 1507 in the current version
- 1.5 Testing location: Factory premises of the company nivtec-flexibel in Remscheid
- 1.6 Date of test: 29 Feb. 2012
- 1.7 Test scope: Load test on a stairway with safety rail



TEST REPORT No.: 3300-5562-2012 Load

Load test report

1. General details:

- 1.1 Facility / examination object: **nivtec safety rails with vertical bars, height 110 cm, for nivtec stages and nivtec galleries**
- Rail width 0.35 m to 1.85 m
  - for 1 kN / m horizontal load on handrail
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: Fa. nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing Specification: Guidelines for Assembly and Operation of Temporary Structures in the current version for the relevant states  
(if applicable)  
DIN EN 13814: 2005-06  
VdTÜV Instruction Sheet 1507 in the current version
- 1.5. Testing location: Factory premises of the company nivtec-flexibel in Remscheid
- 1.6 Date of test: 29 Feb. 2012
- 1.7 Test scope: Load tests on 4 rails



TEST REPORT No.: 3300-5564-2012 Load

Load test report

1. General details:

- 1.1 Facility / examination object: **Stairway built with nivtec® system platforms with nivtec safety rail with vertical bars, height 110 cm, for nivtec stages and nivtec galleries**
- for 1 kN / m horizontal load on handrail
  - designed for a distributed load of 7.5 kN/m²
- 1.2 Applicant: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.3 Manufacturer: Fa. nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid
- 1.4 Testing Specification: Guidelines for Assembly and Operation of Temporary Structures in the current version for the relevant states  
(if applicable)  
DIN EN 13814: 2005-06  
VdTÜV Instruction Sheet 1507 in the current version
- 1.5. Testing location: Factory premises of the company nivtec-flexibel in Remscheid
- 1.6 Date of test: 29 Feb. 2012
- 1.7 Test scope: Load test on a stairway with safety railing



**TEST REPORT No.: 3300-5565-2012 Load**

**Load test report**

**1. General information**

- 1.1 Facility/test object: **nivtec rail, height 100 cm, adjustable width for nivtec stages only to be used for closing gaps**
- Adjustable width 150 cm max.
  - for 0.5 kN / m horizontal load on handrail
- 1.2 Client: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid, Germany
- 1.3 Manufacturer: nivtec-flexibel  
Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid, Germany
- 1.4 Test specifications: (if applicable)
- Guidelines on the construction and operation of temporary structures, as amended by the federal states of Germany from time to time
  - DIN EN 13814: 2005-06
  - VdTÜV information sheet 1507 as amended from time to time
- 1.5 Test site: Factory premises of the company nivtec-flexibel in Remscheid
- 1.6 Test date: 29 Feb. 2012
- 1.7 Test scope: Load tests on one rail



TÜV Thüringen e.V. Ernst-Ruska-Ring 6 07745 Jena

nivtec-flexibel Bühnensysteme GmbH  
Walter-Freitag-Str. 31  
42899 Remscheid

Ihr Zeichen	Ihre Nachricht	Unser Zeichen	Direktkontakt	Datum
		Schu	35	11.05.2026

**Monitoring Inspection of the Manufacturing Facility  
nivtec-flexibel Bühnensysteme GmbH**

TÜV Thüringen e.V., Testing centre for stress analysis and temporary structures, conducts an annual monitoring inspection at the manufacturing facility. The last inspection has been executed on 06.05.2026.

Certificate 3300-12623-2025-01/02 which contains all parts used in nivtec stages and galleries provides the basis for the inspection.

Content of the inspection are:

- site inspection
- inspection of compliance with determined operation procedures,
- storage configuration,
- sampling tests of incoming goods inspections (quality of material, verification of material, compliance with specified tolerances).
- inspection of actuality of material certificates
- inspection of production process of stage platforms

Additionally the following topics are reviewed:

- coordination of planned optimisations in production or material input
- coordination of planned clarifications and optimisations of set up rules and processes.

*S. Schubert*

**Dipl.-Ing. S. Schubert  
Sachverständige**

## Data Sheet wooden panel WISA-Hexa 12 mm



WISA-Hexa Grip 12 mm



## Special version of WISA®-Hexa for the nivtec company

**WISA®-Hexa** is a non-slip, decorative coated plywood panel for flooring in transport and building applications. The panel is made from birch veneers that are glued together crosswise. WISA-Hexa is a film-coated veneer plywood with a hexagonal embossed pattern. WISA-Hexa is the right choice for floor panels where slip resistance and a visually appealing surface are required.

**More value. More protection. More aesthetics.**

Our product has been specially developed for nivtec – to meet even the highest demands. The colour of the phenolic coating has been individually matched to **black brown**, giving it a particularly elegant look. In addition, the grammage of the coating has been increased to **440 g/m<sup>2</sup>** for greater protection. This allows us to combine design and function in a quality that impresses.

**Technical Characteristics:**

The PERFORMANCE DECLARATION, UPM PLYWOOD No. UPM007CPR (see appendix) applies.

**Fire Resistance Class**

In accordance with EN 13501-1, the underlying WISA® Hexa plywood panel (thickness 12 mm) achieves classification B<sub>1</sub>-s1

**Slip Resistance Class**

In accordance with DIN 51130, the underlying WISA® Hexa plywood panel achieves the classification R11

**Statement of use for WISA® Hexa birch plywood – use as platforms (stages)**

WISA® Hexa is ideal for platforms and stage surfaces used indoors and, for short periods, outdoors. The durable phenolic resin coating with hexa structure provides a slip-resistant surface and protection against mechanical stress and abrasion – crucial properties for temporary and permanent stage constructions, event platforms, and work platforms.

**Information on material properties and care**

Like other wood-based materials, plywood is a naturally hygroscopic product. This means that it absorbs moisture and can also release it again. This can lead to slight changes in dimensions. If the plywood absorbs moisture due to prolonged contact with water, this can lead to visual changes in the surface. The wood fibers expand (swell) and can cause the surface of the board to warp. This is a visual change. The technical properties of the board remain unchanged. It is essential to dry the surface quickly after precipitation or cleaning. It is recommended to protect the boards from prolonged contact with water. The same applies to intense sunlight in order to preserve the high-quality appearance of the board material.

## DECLARATION OF PERFORMANCE, UPM PLYWOOD

### No. UPM007CPR

1. Unique identification code of the product-type:  
Structural birch plywood, uncoated or coated, 6,5–50 mm
2. Intended uses:  
For internal use as a structural component in dry conditions, EN 636-1  
For protected external use as a structural component in humid conditions, EN 636-2  
For external use as a structural component with coating and edge sealing, EN 636-3
3. Manufacturer:  
WISA®  
UPM Plywood Oy  
P.O. Box 203  
FI-15141 Lahti, Finland  
www.wisaplywood.com
5. System of AVCP:  
AVCP system 2+
- 6a. Harmonised standard:  
EN 13986:2004 + A1:2015

#### Notified body:

Inspecta Sertifiointi Oy No. 0416 has performed the initial inspection of the manufacturing plant and a factory production control and continuous surveillance, assessment and evaluation of factory production control and issued the certificates of conformity of the factory production control 0416-CPR-7108 (Joensuu), 0416-CPR-7110 (Pellos), 0416-CPR-7111 (Savonlinna), 0416-CPR-7112 (Chudovo), 0416-CPR-7113 (Otepää).

### 7. Declared performance:

Essential characteristics	Performance	Harmonised standard
Point load strength and stiffness	NPD	EN 13986:2004+A1:2015
Racking resistance	Calculation according to EN 1995-1-1	
Impact resistance	NPD	
Water vapour permeability $\mu$	Wet 90, dry 220 (uncoated)	
	Mean density 680 kg/m <sup>3</sup>	
Release of formaldehyde	E1	
Content of pentachlorophenol (PCP)	≤ 5 ppm	
Airborne sound insulation	NPD	
Sound absorption $\alpha$	0,10/0,30	
Thermal conductivity $\lambda$	0,17 W/mK	
Embedment strength	Calculation according to EN 1995-1-1	
Air permeability	NPD	
Bonding quality (acc. to EN 314-2)	Class 3	
Biological durability	Use class 2 (uncoated)	
	Use class 3 (coated and edge sealed)	

Reaction to fire			
End use condition <sup>(6)</sup>	Minimum thickness (mm)	Class <sup>(7)</sup> (excluding floorings)	Class <sup>(8)</sup> (floorings)
Without an air gap behind the wood-based panel <sup>(1), (2), (5)</sup>	9	D-s2, d0	D <sub>fl</sub> -s1
With a closed or an open air gap not more than 22 mm behind the wood-based panel <sup>(3), (5)</sup>	9	D-s2, d2	–
With a closed air gap behind the wood-based panel <sup>(4), (5)</sup>	15	D-s2, d1	D <sub>fl</sub> -s1
With an open air gap behind the wood-based panel <sup>(4), (5)</sup>	18	D-s2, d0	D <sub>fl</sub> -s1
Any <sup>(5)</sup>	4	E	E <sub>fl</sub>

- <sup>(1)</sup> Mounted without an air gap directly against class A1 or A2-s1, d0 products with minimum density 10kg/m<sup>3</sup> or at least class D-s2, d2.  
<sup>(2)</sup> A substrate of cellulose insulation material of at least class E may be included if mounted directly against the wood-based panel, but not for floorings.  
<sup>(3)</sup> Mounted with an air gap behind. The reverse face of the cavity shall be at least class A2-s1, d0 products with minimum density 10 kg/m<sup>3</sup>.  
<sup>(4)</sup> Mounted with an air gap behind. The reverse face of the cavity shall be at least class D-s2, d2 products with minimum density 400 kg/m<sup>3</sup>.  
<sup>(5)</sup> Veneered, phenol- and melamine-faced panels are included for class excl. floorings.  
<sup>(6)</sup> A vapour barrier with a thickness up to 0,4 mm and a mass up to 200 g/m<sup>2</sup> can be mounted in between the wood-based panel and a substrate if there are no air gaps in between.  
<sup>(7)</sup> Class as provided for in Table 1 of the Annex to Decision 2000/147/EC.  
<sup>(8)</sup> Class as provided for in Table 2 of the Annex to Decision 2000/147/EC.

Nominal thickness	6,5	9	12	15	18	21	24	27	30	32	35	40	45	50	
Number of plies	5	7	9	11	13	15	17	19	21	23	25	29	33	37	
Essential characteristics															
Characteristic bending strength N/mm <sup>2</sup>	f <sub>m  </sub>	44,6	46,4	42,9	41,3	40,2	39,4	38,9	38,4	38,1	37,8	37,6	37,2	36,9	36,7
	f <sub>m⊥</sub>	18,5	27,4	33,2	33,8	34,1	34,3	34,4	34,5	34,6	34,6	34,7	34,7	34,8	34,8
Characteristic compression strength N/mm <sup>2</sup>	f <sub>c  </sub>	29,3	28,3	27,7	27,4	27,2	27,0	26,9	26,8	26,7	26,7	26,6	26,5	26,5	26,4
	f <sub>c⊥</sub>	22,8	23,7	24,3	24,6	24,8	25,0	25,1	25,2	25,3	25,3	25,4	25,5	25,5	25,6
Characteristic tension strength N/mm <sup>2</sup>	f <sub>t  </sub>	42,2	40,8	40,0	39,5	39,2	39,0	38,8	38,7	38,5	38,4	38,4	38,3	38,2	38,1
	f <sub>t⊥</sub>	32,8	34,2	35,0	35,5	35,8	36,0	36,2	36,3	36,5	36,6	36,6	36,8	36,8	36,9
Mean MOE in bending N/mm <sup>2</sup>	E <sub>m  </sub>	11400	10850	10719	10316	10048	9858	9717	9607	9519	9448	9389	9296	9227	9173
	E <sub>m⊥</sub>	4270	6060	6781	7184	7452	7642	7783	7893	7981	8052	8111	8204	8273	8327
Mean MOE in compression and tension N/mm <sup>2</sup>	E <sub>t,c  </sub>	9844	9511	9333	9223	9148	9093	9052	9019	8993	8972	8953	8925	8904	8887
	E <sub>t,c⊥</sub>	7656	7989	8167	8277	8352	8407	8448	8481	8507	8528	8547	8575	8596	8613
Char. panel shear N/mm <sup>2</sup>	f <sub>v  </sub>	9,5	9,5	9,5											
	f <sub>v⊥</sub>	9,5	9,5	9,5											
Char. Planar shear N/mm <sup>2</sup>	f <sub>r  </sub>	3,2	2,6	2,6											
	f <sub>r⊥</sub>	1,8	2,4	2,4											
Mean MOR in panel shear N/mm <sup>2</sup>	G <sub>v  </sub>	620	620	620											
	G <sub>v⊥</sub>	620	620	620											
Mean MOR in planar shear N/mm <sup>2</sup>	G <sub>r  </sub>	170	205	205											
	G <sub>r⊥</sub>	120	160	180											
Strength and stiffness under point load	NPD														
Impact resistance	NPD														
K <sub>mod</sub> and K <sub>def</sub> values according to EN 1995-1-1															

Harmonised standard EN 13986-2004+A1:2015

The performance of the product identified above is in conformity with the set of declared performances. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

Lahti, Finland, April 27th, 2021

Sirkku Salmikuukka, Product Manager  
UPM Plywood

Customer

UPM-Kymmene Wood Oy  
Niemenkatu 16  
15141 Lahti  
Finland



RST Rail System Testing GmbH  
Walter-Kleinow-Ring 7  
16761 Hennigsdorf

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### Summary report no. P60-17-8040en

### Fire testing

Order number: 60-17-0252  
Date: 26.06.2017  
Editor: Dr. Brehme  
Documentation: bs

This report consists of  
2 page(s) and 0 enclosure(s).

Fon: 03302 49982 60

**Delivery date specimen:** 18.03.2016; 09.05.2017; 06.06.2017

**Test date:** 05.04.2016; 16.05.2017 until 21.06.2017

**Test specimen:** WISA Hexa Grip, 9 mm and 15 mm  
Order number: 4500300956  
Order date: 28.04.2017

**Test specification:** Test methods to classify floorings according to DIN EN 13501-1 (01/2010) „ Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests“

**Objective:** Evaluation according to DIN EN 13501-1 (01/2010)  
Classification for floorings (point 12)

**Test results:** **With the obtained test results, the material reached the following classification: B<sub>fl</sub>-s1 in both thicknesses, 9 mm and 15 mm.**

**Remark:** The classification is valid only in conjunction with the test reports listed on page 2. Please refer to the test reports for details.

Stefan Harder  
Head of Fire Lab

The results refer only to the specimens mentioned above.  
This Test Report must always be copied entirely. Any copying of extracts and publication require the prior consent of the Laboratory.  
Our company is currently not a notified body. No legal claims arise from any misinterpretation of the test report.

## 1 Details about the specimens

### Material or combination of materials:

WISA Hexa Grip

### Manufacturer:

UPM-Kymmene Wood Oy  
Niemenkatu 16  
15141 Lahti  
Finland

### Dimensions of samples:

1053 mm × 230 mm × ca. 9 mm  
1053 mm × 230 mm × ca. 15 mm  
250 mm × 90 mm × 9 mm  
250 mm × 90 mm × 15 mm

## 2 Summary of results

The material was tested for use as flooring according to DIN EN 13501-1 in 9 mm and 15 mm thickness.

Test report no.	Standard	Parameter	Unit	Result
P60-16-0263en	DIN EN ISO 9239-1	CHF	kWm <sup>-2</sup>	>11,2
P60-16-0263en	DIN EN ISO 9239-1	Smoke density (integral)	% x min	9,24
P60-17-0455en	DIN EN ISO 11925-2	Flame spread	mm	30
P60-17-0468en	DIN EN ISO 9239-1	CHF	kWm <sup>-2</sup>	>11,2
P60-17-0468en	DIN EN ISO 9239-1	Smoke density (integral)	% x min	7,89
P60-17-0372en	DIN EN ISO 11925-2	Flame spread	mm	30

The requirements for class **B<sub>fl</sub>-s1**:

- DIN EN ISO 11925-2, vertical flame spread does not exceed 150 mm
  - DIN EN ISO 9239-1, CHF ≥ 8,0 kW/m<sup>2</sup>
  - DIN EN ISO 9239-1, Smoke ≤ 750 % × min
- are fulfilled in both thicknesses.

Sign  
Test engineer: *Bre*

# PRÜFBERICHT TEST REPORT

Nr./No.: 2022 20956/3210

## über die Prüfung der Rutschhemmung von Bodenbelägen slip resistance test of floorings

<b>1 Auftraggeber/ Customer</b>	UPM Plywood Niemenkatu 16 P.O. Box 203 15141 Lahti Finland
<b>2 Prüfmuster/ Test specimen</b>	Beschichtete Birkensperrholzplatte/ Coated birch plywood plate Typ / Type: WISA®-Hexa
<b>2.1 Hersteller/ Manufacturer</b>	UPM Plywood Niemenkatu 16 P.O. Box 203 15141 Lahti Finland
<b>2.2 Bauart, Bezeichnung/ Type, designation</b>	Birke Sperrholzplatte mit Phenolharzbeschichtung, entsprechend Abbildung und beiliegendem Datenblatt/ Birch plywood plate with phenol resin coating according to picture and attached data sheet
<b>2.3 Bestimmungsgemäße Verwendung/ Intended use</b>	Einsatz in Arbeitsräumen und Arbeitsbereichen mit Rutschgefahr / Use in working areas with slipping hazards
<b>2.4 Datum der Herstellung/ Date of fabrication</b>	--
<b>2.5 Weitere Angaben/ Further details</b>	Größe / Size [cm]: Prüfmuster 50 x 100 Test sample 50 x 100  Farbe / Colour: dunkelbraun / dark brown  Oberfläche / Surface: rau, 10 mm Sechseckknoppen mit Siebprägung, matt/ rough, 10 mm hexagonal knobs with mesh pattern, matt

### 3 Prüfung/ Testing

- 3.1 Art der Prüfung/  
Type of test Baumusterprüfung /  
Type examination
- 3.2 Zeitraum der Prüfung/  
Period of test 15.03.2022
- 3.3 Prüfverfahren, -grundlagen/  
Test principles DIN EN 16165:2021-12 Anhang B; Bestimmung der  
Rutschhemmung von Fußböden – Prüfung durch  
beschuites Begehen einer schiefen Ebene und Bewertung  
nach nationalem Anhang NB.2 /  
DIN EN 16165:2021-12 annex B; Determination of slip  
resistance of pedestrian surfaces - Shod ramp test and  
evaluation according to annex NB.2
- E DIN 51133:2021-12 - Prüfung von Fußböden -  
Bestimmung des Verdrängungsraums /  
E DIN 51133:2021-12 - Testing of floor coverings -  
Determination of the displacement space

### 4 Prüfergebnis/ Test result

- 4.1 Gesamtmittelwert des Neigungswinkels: /  
Total mean of inclination angle: **26,0°**
- 4.2 Gesamtmittelwert des Verdrängungsraumes: /  
Total mean of displacement volume: **--**

### 5 Beurteilung, Eignung/ Assessment, suitability

- 5.1 Bewertungsgruppe für die Rutschhemmung: /  
Evaluation group of slip resistance: **R 11**
- 5.2 Bewertungsgruppe für den Verdrängungsraum: /  
Evaluation group of displacement volume **--**

### 6 Gültigkeit des Prüfberichtes/ Validity of test report

Die ermittelten Ergebnisse gelten nur für die geprüften Objekte. /  
The test results apply to the tested object only.

### 7 Allgemeine Hinweise/ General remarks

Dieser Prüfbericht besteht aus 5 Seiten.  
The present test report consists of pages.

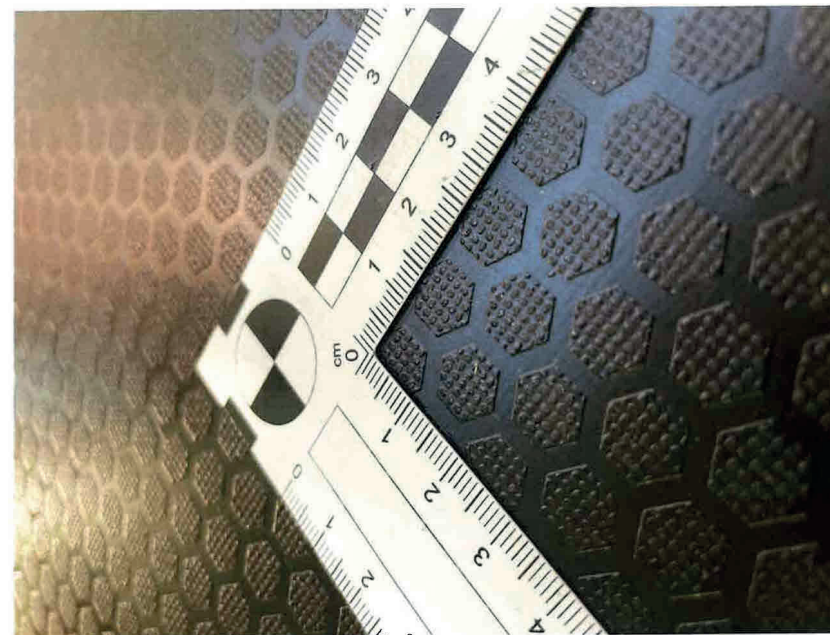
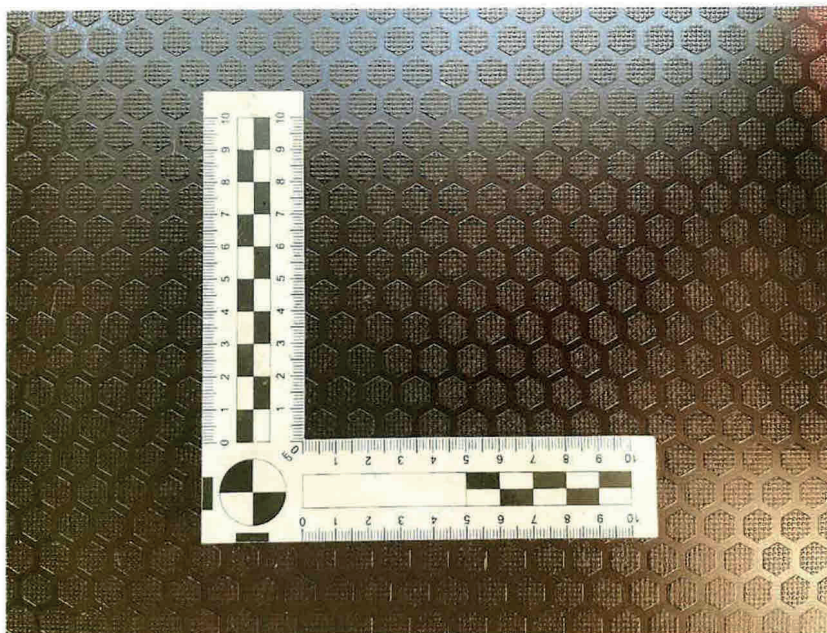
Das Datenblatt ist Bestandteil dieses Prüfberichtes. /  
The data sheet is part of this test report.

Dieser Prüfbericht darf nur vollständig veröffentlicht werden. /  
This Test Report must only be published in full wording.

**Dieser Prüfbericht berechtigt nicht zur Verwendung des GS-Zeichens,  
DGUV Test-Zeichens oder der CE-Kennzeichnung.  
The present test report does not warrant the use of the GS-label,  
DGUV Test-label or CE-marking.**

Im Übrigen gilt die Prüf- und Zertifizierungsordnung der Prüf- und Zertifizierungsstellen im  
DGUV Test in Verbindung mit den Allgemeinen Geschäftsbedingungen der Deutschen  
Gesetzlichen Unfallversicherung e. V.  
In all other respects, the Testing and Certification Regulation of the Test and Certification  
Bodies in DGUV Test shall apply in conjunction with the General Business Conditions of the  
Deutsche Gesetzliche Unfallversicherung e. V.

**8 Abbildung/  
Picture**



Für die Prüfung  
For the testing:



Orhan Ceylan

Leiter(in) des Prüflabors  
Head of test laboratory

Ref 54|Bodenbelag|IFA 2010|Prüfberichte IFA 2021 - 2022|UPM Plywood F.N 2022 20956.docx

Diese Anlage ist Bestandteil des Prüfberichtes Nr. 20220356/3210  
/2021

## WISA®-Hexa

WISA-Hexa ist ein filmbeschichtetes Furniersperrholz mit Sechseckprägung. WISA-Hexa ist die richtige Wahl für Bodenplatten, bei denen Rutschwiderstand und eine optisch ansprechende Oberfläche benötigt werden.

### Verwendung

Zur Verwendung als Bodenplatte im Fahrzeugbau wie Transporter- oder Servicewagenböden, in PKW- und Pferdeanhängern sowie im Gerüst- und Bühnenbau.

### Basisplatte

Birkenfurniersperrholz durchgehend aus Birkenfurnieren.

### Verleimung

Die kreuzweise aufeinandergelegten Furniere sind mit Phenolharz wetterfest gemäß der Norm EN 314-2 / Klasse 3 verleimt.

### Oberfläche

**Vorderseite:** Wahlweise braune oder graue Phenolharzfilmbeschichtung. Graue Beschichtung mit erhöhter UV-Beständigkeit. Jeweils mit Sechseckprägung mit ca. 10 mm Durchmesser.

**Rückseite:** Glatte Phenolharzbeschichtung als Feuchtigkeitssperre mit Logofilm "WISA Special Plywoods". Andere Beschichtungen sind auf Anfrage möglich.

**Kantenschutz:** Akrylharzlack.

### Bearbeitungen

CNC- und Kantenbearbeitungen nach Kundenzeichnungen sind auf Anfrage erhältlich.

### Plattendicken und Gewichte

Nennstärke (mm)	Anzahl der Lagen	Dicke (mm)	Gewicht (kg/m²)	Maxiplatten Dicke min. - max. (mm)
9	7	8,8 - 9,5	6,5	8,3 - 9,0
12	9	11,5 - 12,5	8,5	11,0 - 12,0
15	11	14,3 - 15,3	10,5	13,8 - 14,8
18	13	17,1 - 18,1	12,3	16,6 - 17,6
21	15	20,0 - 20,9	14,6	19,5 - 20,5
24	17	22,9 - 23,7	16,6	-
27	19	25,2 - 26,8	18,4	-
30	21	28,1 - 29,9	20,7	-

Plattenfeuchte ab Werk 8-10%



UPM **BIOFORE**  
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Diese Anlage ist Bestandteil des Prüfberichtes Nr. 20220356/3210  
/2021

### Plattenformate

**Standardformate**  
1000 x 2500/3000 mm  
1220 x 2440 mm  
1250 x 2500 mm  
1525 x 2500/3050 mm  
Die größte Standardabmessung ist 1525 x 3660 mm  
Andere Abmessungen auf Anfrage

### Maxiformate

1800 x 3000 mm  
2000 x 3000 mm  
Die größten Formate sind 4000 x 2000 mm

### Formattoleranzen

< 1000 mm ±1 mm  
1000 - 2000 mm ±2 mm  
2000 - 4000 mm ±3 mm

### Rechtwinkligkeit

±1 mm / 1000 mm

### Eigenschaften der Plattenoberfläche

Taber Abraser (DIN 53799) ca. 570 Umdrehungen.  
Rolltest (SS 923502) ca. 1750±35 % Zyklen.  
Die Feuchtigkeitssaufnahme durch die Oberflächenbeschichtung ist niedrig.  
Die Beschichtung ist resistent gegen leichte Alkalien.  
Direkte Sonnenstrahlung kann die Alterung der Oberfläche beschleunigen und Farbveränderungen verursachen.  
Graue Beschichtung nur bedingt für Außenanwendung geeignet.

### Umwelt

WISA-Produkte werden nach strengsten Nachhaltigkeitskriterien in Europa hergestellt. Kunden, die sich für WISA entscheiden, können die Gewissheit haben, dass ihr Sperrholz und Furnier ausschließlich aus legalen Quellen stammt und alle relevanten Normen und Vorschriften erfüllt, einschließlich der EU-Holzhandelsverordnung (EUTR).

UPM führt die Bio- und Forstindustrie in eine nachhaltige Zukunft, die durch Innovation, Verantwortung und Ressourceneffizienz geprägt ist.

Das Handbuch über Finnisches Sperrholz enthält Information über technische Werte. Siehe [www.wisaplywood.de](http://www.wisaplywood.de).

Weitere Auskunft über Einbau, Instandhaltung, Entsorgung, Umweltfragen usw. bekommen Sie von Ihrem Plattenhändler oder von UPM [www.wisaplywood.de](http://www.wisaplywood.de).



[www.wisaplywood.de](http://www.wisaplywood.de)  
[www.upm.com](http://www.upm.com)

UPM verfolgt die Politik einer kontinuierlichen Verbesserung. Wir behalten uns das Recht vor, ohne vorherige Ankündigung oder Rücksprache Produktänderungen vorzunehmen.

03/2019

## Data Sheet acrylic panel PMMA 12 mm

Plazit PMMA Chemical Resistance, edition 2018



for more see Plaskolite Optix Guidebook

### 4.6 Typical Properties – Optix Super – Extruded High Impact Acrylic Sheets

Properties	Method	Units	S25 (R7700)	S30 (R7400)	S50 (R7500)	S75 (R7800)	S100 (R7600)
<b>General</b>							
Density	ISO 1183	g/cm <sup>3</sup>	1.19	1.19	1.18	1.17	1.16
Water Absorption	ISO 62 (1)	%	0.3	0.3	0.3	0.3	0.3
<b>Mechanical</b>							
Tensile Strength	ISO 527-2	MPa	57	54	50	45	40
Elongation at break	ISO 527-2	%	22	26	30	35	40
Tensile Modulus	ISO 527-2	MPa	2450	2275	2100	1900	1700
Flexural Strength	ISO 178	MPa	88	84	79	71	62
Flexural Modulus	ISO 178	MPa	2470	2285	2100	1950	1800
Rockwell Hardens	M scale		77	73	68	56	44
Impact Resistance (Charpy unnotched)	ISO 179/1fu	kJ/m <sup>2</sup>	51	59	67	71.5	76
Impact Resistance (Charpy notched)	ISO 179/1eA	kJ/m <sup>2</sup>	4.3	5.3	6.2	6.9	7.6
Impact Resistance (Izod notched)	ISO 180/1A	kJ/m <sup>2</sup>	4	4.5	5	5.6	6.3
<b>Optical</b>							
Refractive Index	ISO 489		1.49	1.49	1.49	1.49	1.49
Light Transmission	ASTM D1003	%	92	92	92	92	92
(3mm transparent sheet)	ASTM D1003	%	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
<b>Thermal</b>							
Vicat Softening Temp. (50N)	ISO 306	°C	99	98	97	94	90
Heat Deflection Temp. (1.82 MPa)	ISO 75-1	°C	92	91	90	85	83
Coeff. of Linear Thermal Expansion (0-50°C)		µm/m°C	70	80	100	105	110
Maximum Continuous Service Temp.		°C	65	63	63	62	62
Maximum Short Time Service Temp.		°C	86	83	81	76	74
Minimum Temp.		°C	-20	-20	-20	-20	-20

## Technical Properties

### 4.7 Chemical Properties

Optix sheets have good resistance to water, alkalis, aqueous inorganic salt solutions and most common dilute acids. Some substances do not produce any effect on Optix, some cause staining, swelling, crazing, weakening or dissolve it completely. The chemical resistance table below gives an indication of the chemical resistance of Optix to a range of common chemicals, judged by visual examination of small unstressed samples immersed in various liquids at 20°C. This information should be used with caution since the performance of articles is influenced by temperature and by stresses applied to the material when machined or thermoformed or under service conditions. In case of doubt, it is recommended that appropriate tests be carried out to simulate the actual service conditions of the intended application. Please contact PLASKOLITE for information regarding special applications.

#### IMPORTANT NOTE:

Any substance that comes with contact with PMMA should be checked for compatibility. Even if the supplier confirms that the material is suitable for PMMA, please apply it first to a hidden area to see if there are any effects. However this will cover you for short-time effects only. To assess long-term effects of substances on PMMA, laboratory testing is required.

Chemical	Concentration	Compliance(dB)	Chemical	Concentration	Compliance(dB)
Acetaldehyde		Dissolved	Chromic acid	10% aqueous	Not affected
Acetic acid		Dissolved	Chromic acid		Dissolved
Acetic acid	10% aqueous	Not affected	Citric acid		Not affected
Acetic anhydride		Affected	Cyclohexane		Dissolved
Acetone		Dissolved	Cyclohexanone		Dissolved
Acetonitrile	Aqueous	Dissolved	Dibutyl phthalate		Affected
Ammonia		Dissolved	Dichloride		Dissolved
Ammonium chloride	Saturated	Affected	Diesel oil		Not affected
Amyl acetate		Dissolved	Diethyl ether		Dissolved
Aniline		Dissolved	Diethyl phthalate		Affected
Benzaldehyde		Dissolved	Epichlorohydrin		Dissolved
Benzene		Dissolved	Ethyl acetate		Dissolved
Benzyl alcohol		Dissolved	Ethyl alcohol	10% aqueous	Not affected
Butyl acetate		Dissolved	Ethyl alcohol	50% aqueous	Affected
Butyl alcohol		Dissolved	Ethyl alcohol		Dissolved
Calcium chloride	Saturated	Not affected	Ethyl dichloride	90% aqueous	Dissolved
Carbon dioxide		Not affected	Ethylene glycol		Not affected
Carbon disulfide		Dissolved	Formaldehyde	40% aqueous	Not affected
Carbon tetrachloride		Dissolved	Formic acid	10% aqueous	Not affected
Chlorine	2% aqueous	Affected	Formic acid		Dissolved
Chlorine	Gas	Not affected	Glycerin		Not affected
Chlorine	Conc.	Not affected	Hexane		Not affected
Chlorobenzene		Dissolved	Hydrochloric acid		Not affected
Chloroform	Saturated	Dissolved	Hydrofluoric acid	90% aqueous	Dissolved
			Hydrogen peroxide	10% aqueous	Not affected

Chemical	Concentration	Compliance(dB)	Chemical	Concentration	Compliance(dB)
Hydrogen peroxide		Dissolved	Salt water		Not affected
Isopropyl alcohol	Up to 30%	Dissolved	Silicone F110		Affected
Isopropyl alcohol	50% aqueous	Affected	Silicone F130		Affected
Lactic acid		Not affected	Silicone R220		Affected
Lanoline		Not affected	Sodium carbonate	Saturated Saturated Saturated	Not affected
Methyl alcohol		Dissolved	Sodium chlorate	40% aqueous	Not affected
Methyl alcohol	50% aqueous	Not affected	Sodium hydroxide		Not affected
Methyl alcohol	10% aqueous	Affected	Sodium thiosulfate		Not affected
Methyl ethyl ketone		Dissolved	Sulfuric acid		Dissolved
Methyl salicylate		Dissolved	Sulfuric acid	30% aqueous	Not affected
Nitric acid	95% aqueous	Dissolved	Sulfuric acid	10% aqueous	Not affected
Nitric acid	10% aqueous	Not affected	Tetrahydrofuran		Dissolved
Nitrobenzene	98% aqueous	Dissolved	Tetraline		Dissolved
Nitrogen		Not affected	Toluene		Dissolved
n-octane		Affected	Trichloroethane		Dissolved
Olive oil		Not affected	Trichloroethylene		Dissolved
Oxygen		Not affected	Turpentine oil		Not affected
Paraffin		Not affected	Water		Not affected
Phosphoric acid		Dissolved	Xylene		Dissolved
Phosphoric acid	10% aqueous	Not affected			
Potassium hydroxide	Saturated	Not affected			

### 4.8 ESC (Environmental Stress Cracking)

ESC (Environmental Stress Cracking) is a well-known phenomenon in plastics including PMMA, and a common reason of product failure. ESC is a result of the combination of stress and chemical exposure. Under harsh chemical environment, stressed sheets will fail by cracking and crazing. The level of stress needed for ESC is lower than the normal failure mechanical stress of PMMA in a chemical-free environment. Stresses can be induced during forming and fabrication. These can be eliminated by an annealing process (see machining and forming instructions). Stresses can be induced also by improper installation (see installation instructions). Cold bended sheets under permanent induced stress or sheets under periodic stress (fatigue) are also susceptible to ESC.

### 4.9 Heat Transmission

The U-Factor, or overall heat transmission coefficient, is the amount of heat which will pass through one square meter in one second for a specific thickness of material. The following table presents the summer and winter U-Factors for horizontal and vertical installations.