

DEUTSCHES INSTITUT FÜR BAUTECHNIK

Anstalt des Öffentlichen Rechts

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General Building Supervision License

License Number: Z-9.1-299

Applicant: Holzindustrie Pfeifer
GmbH & Co. KG
Brennbichl 103
AUSTRIA

Object of the license: Timber formwork supports Pfeifer H 20, Pfeifer S 20 and
Rhönschalung H 20

Period of validity until: 31st March 2009

The above specified object of the license is herewith licensed according to general building supervision.* This general building supervision license comprises seven pages and three attachments.

* This general building supervision license replaces the general building supervision license No. Z-9.1-299 dated 21st June 2004, amended by the ruling on 20th January 2006.
The object was licensed for the first time according to general building supervision on 25th April 1994.

I. GENERAL PROVISIONS

- 1 With the general building supervision license, the usability or applicability of the object of the license is proven in the sense of the state building regulations.
- 2 The general building supervision license does not replace the legally prescribed authorizations, consents and certificates for the execution of building projects.
- 3 The general building supervision license is granted irrespective of the rights of third parties, in particular private patents.
- 4 Manufacturer and distributor of the object of the license must, irrespective of more extensive regulations in the "Special Provisions", provide the user of the object of the license with copies of the general building supervision license and point out, that the general building supervision license must be available at the place of use. On request, the authorities involved are to be provided with copies of the general building supervision license.
- 5 The general building supervision license may only be duplicated in its entirety. An extract-wise publication requires the consent of the Deutschen Instituts für Bautechnik. Texts and drawings of advertising publications must not contradict the general building supervision license. Translations of the general building supervision license must contain the notice "Translation of the German original version not checked by the Deutschen Institut für Bautechnik".
- 6 The general building supervision license is granted revocable. The provisions of the general building supervision license can be subsequently supplemented and amended, in particular, when this is required as a result of new technical findings.

II. SPECIAL PROVISIONS

1 Object of the License and Scope of Application

1.1 Object of the License

The timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 are glued, solid I-supports of the nominal height 200 mm with the shapes and dimensions illustrated in the attachments (see e.g. Attachment 1). They are up to 15 m long. They consist of an upper- and lower boom made from pine wood and a three-ply glued web made from pine wood.

1.2 Scope of Application

The timber formwork supports may only be used as formwork supports for ceiling- and wall shuttering and only for such loads, which result from the direct support of the ceiling- or wall shuttering in concrete construction, however not for greater single loads (e.g. breastsummers). The span of the supports must not exceed 4.00 m.

2 Provisions for the Timber Formwork Supports

2.1 Characteristics and Composition

2.1.1 Booms

Upper- and lower boom of the timber formwork supports H 20, Pfeifer S 20 and Rhönschalung H 20 must be made from pine wood (solid wood) with a width of 80 mm and a height of 40.5 mm. For deviations in cross-section, the dimensional tolerance class 2 of DIN EN 3361 is applicable. For the booms, only pine wood according to DIN 40742 may be used which corresponds at least to the mechanical strength class C27M or at least the visual sorting class S 10. In the event that visually sorted boom timbers are used, with regard to compression wood, the timber must correspond to sorting class S13 and the annual ring width must be maximum 3 mm. The boom timbers must be planed at four sides and the edges of the planed boom timbers chamfered.

2.1.2 Webs

The three-ply glued webs made from pine wood at least of sorting class S 10 must have the dimensions according to table 1:

Table 1 Dimensions of the Web

Web Dimensions	Timber formwork support Pfeifer H 20 (See attachment 1)	Timber formwork support Pfeifer S 20 (See attachment 2)	Timber formwork support Rhönschalung H 20 (See attachment 3)
Total thickness in mm	33.9 ± 0.9	31.0 ± 0.9	26.6 ± 0.9
Thickness of the outer ply in mm	7.2 ± 0.3	5.75 ± 0.3	8.8 ± 0.6
Thickness of the inner ply in mm	19.5 ± 0.3	19.5 ± 0.3	9.0 ± 0.3

¹ DIN EN 336:2003-09 Structural timber for support purposes – dimensions, admissible deviations –

² DIN 4074-1:2003-06 Classification of timber according to load-bearing capacity – Part 1: Coniferous sawn timber

2.1.3 Adhesive

For the manufacture of the supports an adhesive according to DIN EN 301³ must be used, which fulfills the requirements on the type of adhesive according to DIN EN 301 based on tests according to DIN EN 302-1 to -4⁴ and with regard to the usability characteristics according to DIN 68141⁵. The adhesive must be approved for the gluing used for the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 and the use of the support as formwork support (freely constructed). Alternatively, an adhesive with a general building supervision license for this purpose may be used.

2.2 Manufacture and Identification

2.2.1 Manufacture

2.2.1.1 The timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 must be 200 mm ± 2 mm high.

2.2.1.2 The three plies of the webs are to be glued together in a plate press. The direction of the grain of the outer plies must be parallel, the direction of the grain of the inner plies must run at right angles to the longitudinal axis of the support (see attachments 1, 2 and 3). For the outer plies the narrow sides must also be glued.

2.2.1.3 The longitudinal joint of the web must be performed through dovetailing according to attachments 1, 2 and 3.

The booms may have dovetail joints according to DIN 68140⁶.

2.2.1.4 The web is to be joined to the booms by means of dovetailing according to attachments 1, 2 and 3. The dovetail milling for the web must be performed at the left-side surface of the boom (at the width side farthest away from the mark tubes).

2.2.1.5 All dovetail joints must have a perfect fit at the time of gluing (adequate space in the dovetail base), in order to ensure the necessary press fit in the dovetail flanks.

2.2.1.6 The manufacturer of the timber formwork supports must be in possession of a valid certificate concerning the evidence of the suitability for gluing this construction according to DIN 1052⁷. The joining together and gluing of the timber formwork supports must be carried out in a special installation suitable for this purpose.

The gluing may only take place in the gluing rooms specifically equipped for this purpose. The temperature in the gluing room during gluing must not fall below 18°C and not exceed 25°C. After gluing, the temperature can be increased for faster curing of the adhesive. The timbers used for gluing must have a temperature of at least 18°C.

³ DIN EN 301:2006-09 Adhesives for supporting timber elements, phenolic plastics and amino resins – Classification and performance requirements.

⁴ DIN EN 302-1:2004-10 Adhesives for supporting timber elements – Test procedure – Part 1: Determination of the longitudinal tensile shearing strength

DIN EN 302-2:2004-10 Adhesives for supporting timber elements - Test procedure – Part 2: Determination of the delamination resistance.

DIN EN 302-3:2004-10 Adhesives for supporting timber elements - Test procedure – Part 3: Determination of the influence of acid damage of the wood fibers due to temperature- and humidity cycles on the transverse pull strength.

DIN EN 302-4:2004-10 Adhesives for supporting timber elements - Test procedure – Part 4: Determination of the influence of timber contraction on the shearing strength.

⁵ DIN 68141:1995-08 Timber adhesives; Test of the usability characteristics of adhesives for supporting timber elements.

⁶ DIN 68140-1:1998-02 Timber dovetail joints – Part 1: Dovetail joints of pine wood for supporting structural elements.

⁷ The following technical building provisions are applicable:

DIN 1052-1:1988-04 – Timber structures; Calculation and Execution

DIN 1052-2:1988-04 - Timber structures; Mechanical joints

DIN 1052-1A1 to -2/A1:1996-10 Amendment A1

or DIN 1052:2004-08 Design, calculation and dimensioning of timber structures; General dimensioning rules and dimensioning rules for high-rise buildings

The processing instructions for the adhesives are to be observed.

2.2.1.7 A timber protection treatment of the timber formwork supports may be dispensed with.

2.2.2 Identification

The timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 must be identified by the manufacturer with the conformity symbol (Ü-symbol) according to the conformity symbol ordinance of the countries. The identification may only be carried out if the preconditions according to section 2.3 are fulfilled.

The name of the manufacturing works, the license number Z-9.1-299, the object of the license and the day of manufacture must be specified permanently on the timber formwork supports.

2.3 Evidence of Conformity

2.3.1 General

The confirmation of the conformity of the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 with the provisions of this general building supervision license must take place for every manufacturing works with a conformity certificate on the basis of an in-house production control and a regular third-party monitoring including a first test of the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 according to the specifications of the following provisions. For the granting of the conformity certificate and the third-party monitoring including the product tests to be thereby performed, the manufacturer of the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 must engage a certification agency as well as a monitoring agency approved for this purpose.

The certification agency must provide the Deutschen Institut für Bautechnik with a copy of the conformity certificate that it has granted for reference.

2.3.2 In-house Production Control

In every manufacturing works an in-house production control is to be set up and implemented. An in-house production control is regarded as the continuous monitoring of the production carried out by the manufacturer, with which it is ensured, that the building products manufactured by him conform to the provisions of this general building supervision license.

The in-house production control should at least include the following listed measures:

- Description and verification of the ingoing material and the components:

Dimensions of the booms and webs

Dimensions and fit of the dovetail joints in the booms and in the web

Type of wood

Sorting class

Expiry-, manufacture- or delivery date of the adhesive, specification of the adhesive batch

Existence of the Ü-symbol or CE-symbol of the ingoing products for the purpose in hand

- Controls and tests that are to be performed during the manufacture are:

Wood moisture

Fit of the joint between boom and web

Room climate during gluing and curing

- Evidence and inspections that are to be performed on the finished building product are:

Dimensions of the supports

Visual inspection of the supports

The results of the in-house production control are to be recorded and evaluated. The records must at least include the following details:

- Description of the building product, resp. the starting material and the components
- Type of control or test
- Date of manufacture and the inspection of the building product, resp. the starting material and the components
- Result of the controls and inspections and, if applicable, comparison with the requirements.
- Signature of the person(s) responsible for the in-house production control

The records are to be safeguarded for at least five years and presented to the monitoring agency engaged for the third-party monitoring. They are to be presented on demand to the Deutschen Institut für Bautechnik and the responsible chief supervisory authority for building.

In the event of an unsatisfactory test result, the manufacturer is required to immediately implement the measures necessary to eliminate the defect. Building products which do not conform to the requirements are to be handled in such a way, that confusion with conforming products is excluded. After eliminating the defect – insofar as technically possible and to provide evidence of the elimination of the defect – the tests concerned are to be repeated without delay.

2.3.3 Third-Party Monitoring

In every manufacturing works, the in-house production control is to be checked regularly by a third-party monitoring agency, however at least two times per year.

In the framework of the third-party monitoring, a first test of the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20 is to be performed, and samples for random sample tests can also be taken. In each case the sampling and tests are the responsibility of the approved monitoring agency.

In the framework of the third-party monitoring of the timber formwork supports Pfeifer H 20, Pfeifer S 20 and Rhönschalung H 20, in each case every month 5 supports, whose production data are spread roughly evenly over the month in question, are to be taken from the store in the manufacturer works.

If less than 10,000 running meters are manufactured every month, then one support is to be taken approx. every 2,000 running meters. The supports are to be unmistakably identified. After inward delivery of the supports in the monitoring agency, it is to be checked whether the requirements defined in the general building supervision license are fulfilled. Compared with the admissible cutting conditions specified in section 3, the supports must achieve at least a 3-fold safety during six successive tests with the same cause of break in the equipment; the smallest single value must result in a 2.5-fold safety. During the tests it must be ensured, that the supports are tested in such a way, that the dovetail joints of the booms and/or webs are also included also in unfavorable arrangements.

The results of the certification and third-party monitoring are to be safeguarded for at least five years. They are to be presented to the Deutschen Institut für Bautechnik and the responsible chief supervisory authority for building by the certification agency or the monitoring agency on demand.

3 Provisions for the Dimensioning

3.1 General

In particular DIN 1052 and DIN 4421⁸ are valid, insofar as nothing to the contrary is determined in the following.

3.2 Dimensioning according to DIN 1052:1988-04

The cutting conditions specified in the following must not be exceeded at any place on the timber formwork support:

Admissible $Q = 11.0$ kN (admissible lateral force),
Admissible $M = 5.0$ kNm (admissible bending moment).

Deviating from DIN 1052-1:1988-04, section 8.2.1.2, reductions of the lateral forces are not permitted.

Applicable for the admissible bearing pressure $\text{zul } \sigma_{D\perp}$ is DIN 1052-1:1988-04, table 5, row 5a (value without greater indentations) and section 5.1.11 of this standard.

3.3 Dimensioning according to DIN 1052:12004-08

The following specified characteristic load-bearing capacity values must not be exceeded at any place on the timber formwork support:

$V_k = 23.9$ kN (characteristic limit value of the lateral force),
 $R_{b,k} = 47.8$ kN (characteristic limit value of the support resistance)
 $M_k = 10.9$ kN (characteristic limit value of the bending moment).

Deviating from DIN 1052:2004-08, section 10.2.9 (2) and (3), reductions of the lateral forces are not permitted.

The partial safety coefficient for the actions is to be set at $\gamma = 1.5$ and the partial safety coefficient for the strength characteristic at $\gamma = 1.3$. The modification factor may be assumed at $k_{\text{mod}} = 0.9$. With evidence of pressure at right-angles to the direction of the grain of the timber, the lateral pressure coefficient $k_{c,90}$ for the timber formwork support H 20 may be 1.10 and for the timber formwork supports Pfeifer S 20 and Rhönschalung H 20 must be set at 1.0. For the characteristic strength pressure at right-angles to the direction of grain of the timber $f_{c,90,k}$ the value for the strength class C 30 may be applied.

4 Provisions for the Execution

The span of the timber formwork support may not exceed 4.00 m.

The formwork shell is to be placed directly on the upper boom and nailed on. The timber formwork supports are to be secured against tilting according to static requirements.

5 Provisions for Usage, Maintenance, Service

Before every usage of the timber formwork supports, these are to be checked for perfect condition by the installation firm. Supports weakened due to damage or rotting are to be excluded from use.

Henning

certified

⁸ DIN 4421:1982-08 Load-bearing structures; Calculation, construction and design

Attachment 1

CROSS SECTION

DOVETAIL JOINT BOOM-WEB

LONGITUDINAL JOINT IN WEB

VIEW OF THE SUPPORT

Dovetail joint I-20 DIN 68140

Hole Ø 21

Dovetail joint in web

Attachment 2

CROSS SECTION

DOVETAIL JOINT BOOM-WEB

LONGITUDINAL JOINT IN WEB

VIEW OF THE SUPPORT

Dovetail joint I-20 DIN 68140

Hole Ø 21

Dovetail joint in web

Attachment 3

CROSS SECTION

DOVETAIL JOINT BOOM-WEB

LONGITUDINAL JOINT IN WEB

VIEW OF THE SUPPORT

Dovetail joint I-20 DIN 68140

Hole \varnothing 21

Dovetail joint in web