

**AD 2902**  
**dd. 07-05-2014**

**ASSESSMENT DIRECTIVE**  
**FOR THE**  
**KOMO® PRODUCT CERTIFICATE**  
**FOR**  
**OPTIMIZED TIMBER FOR NON-LOAD BEARING APPLICATIONS**

**Authorized by the Board of Experts SKH on 28-02-2014**

**Accepted on 07-05-2014**

**Publisher: Certification- and attestation body SKH**

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## **GENERAL INFORMATION**

This assessment directive has been declared binding by the certification body SKH in accordance with the SKH Regulations for Certification and shall be used as from 07-05-2014 for the issuing of a KOMO® product certificate “Optimized timber for non-load bearing applications”.

This assessment directive supersedes assessment directive BRL 2902 “Optimized timber for non-loadbearing applications” dated 2007-10-02.

The Dutch version shall be consulted in case of doubt.

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## **1 INTRODUCTION**

### **1.1 General**

The certification body must be accredited by the Council for Accreditation for the subject of this AD on the basis of NEN-EN-ISO/IEC 17065. Accreditation on the basis of NEN-EN 45011 is permitted until a date to be determined by the Council for Accreditation. The quality declarations to be issued will be denoted as KOMO<sup>®</sup> product certificate. The quality declarations to be issued are indicated as follows: KOMO<sup>®</sup> product certificate.

Besides the requirements set out in this assessment directive, the certification- and attestation-bodies have additional requirements in the sense of general procedure requirements for certification and attestation, as laid down in the general certification- or attestation regulations of the body concerned.

This assessment directive supersedes BRL 2902 "Optimized timber for non-loadbearing applications" 2007-10-02. The quality declarations issued on the basis of that assessment directive retain their validity until 07-05-2015.

### **1.2 Subject and area of application**

This assessment directive gives guidelines for the company, the materials and the manufacturing of optimized timber for non-loadbearing applications. A distinction is made here between the following classes:

- class BGVT; optimized timber for applications in façade joinery such as window and door frames, windows and doors.
- class B; optimized timber for applications other than in façade joinery such as masonry profiles.

### **1.3 Construction Products Directive (CPD)**

No harmonized European product standard applies to the products under this assessment directive. To the extent that this assessment directive refers to other assessment directives, no assessment of products will take place under this assessment directive, insofar as they demonstrably meet the requirements set out in the relevant AD. To the extent that this assessment directive refers to harmonized European product standards, the product characteristics as set out in the relevant harmonized European product standards will be verified under this assessment directive.

### **1.4 Requirements with regard to research institutions**

If a supplier provides reports of research institutes or laboratories in order to demonstrate that the requirements of this assessment directive are met, it must be demonstrated that they have been drawn up by an institution that complies with the applicable accreditation standard for the relevant subject, i.e.:

- NEN-EN-ISO/IEC 17020 for inspection bodies;
- NEN-EN-ISO/IEC 17021 for certification bodies that certify systems;
- NEN-EN-ISO/IEC 17025 for laboratories;
- NEN-EN-ISO/IEC 17065 or NEN-EN 45011\* for certification bodies that certify products.

An institution is considered to meet these criteria when an accreditation certificate for the relevant subject can be provided, issued by the Dutch Accreditation Council (RvA) or an accreditation body with which the Accreditation Council has concluded an agreement of mutual acceptance. If no accreditation certificate can be provided, the certification body itself will verify whether the accreditation criteria are met.

\* The NEN-EN-ISO/IEC 17065 replaces the accreditation standard NEN-EN 45011; during the transitional period indicated by the Accreditation Council, accreditation based on the NEN-EN 45011 standard is therefore allowed.

### **1.5 Quality Declarations**

The quality declaration to be issued based on this assessment directive is indicated as KOMO® product certificate.

The website of the KOMO Foundation ([www.komo.nl](http://www.komo.nl)) lists the requirements the quality certificates to be issued must meet. This concerns:

- requirements for the cover sheet with regard to the layout and texts to be used;
- requirements with regard to the layout and texts to be used.

KOMO® certification means that the quality system and products are initially assessed or tested against the requirements of this assessment directive by or under the responsibility of an accredited institution, whereby the sampling is the responsibility of the accredited institution. The quality system and the products of the manufacturer are also under the continuous supervision of the accredited institution, whereby the continuous compliance of the product with the requirements set out in this assessment directive is assessed or guaranteed, while random assessments or tests are conducted frequently.

A KOMO® quality declaration provides a legitimate confidence that the product complies with all relevant requirements applicable in the Netherlands.

## 2 TERMS AND DEFINITIONS

### 2.1 Moisture content at time of production

Moisture content that shall be maintained during manufacturing. Difference is made between outer and inner moisture content in the case of timber with a thickness in excess of 52 mm.

### 2.2 Closed open time

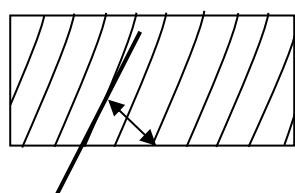
The time that elapses from bringing into contact of both surfaces to be glued until the moment that pressure is applied.

### 2.3 Optimized timber

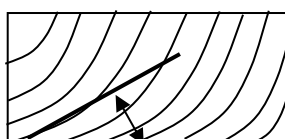
Timber by gluing in the thickness direction of the composite lamella.

### 2.4 Growth Ring Orientation

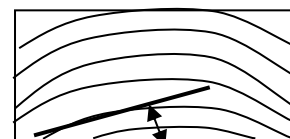
Orientation of the growth rings in relation to the machined surface. The following figures show the various orientations in diagrammatic form.



Quarter sawn (rift)  
 $60^\circ \leq \alpha \leq 90^\circ$



Half quarter sawn (half rift)  
 $30^\circ \leq \alpha \leq 60^\circ$



Plain sawn  
 $0^\circ \leq \alpha \leq 30^\circ$

### 2.5 Internal quality control

The total of activities and decisions taken within a company in order to bring and to keep the product at the quality level desired.

### 2.6 Lamella

A board whether or not provided with one or more longitudinal joints intended to be used for optimized timber.

### 2.7 Open time

The time that elapses between the application of adhesive and the bringing into contact of both surfaces to be adhered.

### 2.8 Processing time (Potlife)

The time during which an adhesive, prepared by the user, may be processed.

### 2.9 Moisture gradient (only applicable to timber thicker than 40 mm)

The difference in moisture content of the surface (about 10 mm under the timber surface) and the core (the intersection between the two diagonals).

### **3 PROCEDURE FOR OBTAINING A PRODUCT CERTIFICATE**

#### **3.1 Start**

The applicant supplies the necessary information for drawing up the technical specification. He indicates which statements have to be included in the product certificate and provides the evidence for these statements.

#### **3.2 Pre-certification inspection**

The attestation-/certification-body assesses whether statements to be included in the product certificate comply with the requirements laid down in chapters 4, 5, 6, 7 and 8 of this assessment directive. During the pre-certification inspection samples are also drawn, which shall be tested externally for:

For class BGVT:

- determination of the resistance to delamination by means of accelerated weathering on dark finished samples (according to paragraph 5.2.1);
- determination of the resistance to delamination by means of the boiling test (according to paragraph 5.2.2).

For class B:

- determination of the resistance to delamination by means of immersion test (according to paragraph 5.2.3).

#### **3.3 Assessment of the quality system by the applicant**

The certification- and attestation-body inspects whether the quality system of the applicant do agree with the requirements laid down in chapter 9.

#### **3.4 Issuing of the product certificate**

The product certificate is issued in accordance with models fixed by the KOMO Foundation in accordance with the general regulations of the certification- and attestation-body, when the pre-certification inspection (3.2) and the assessment of the quality system of the applicant (3.3) have been rounded off in a positive manner.

#### **3.5 External quality management**

Once the product certificate has been issued, the certification- and attestation-body carries out inspections as described in chapter 11.



## **4 PRODUCT REQUIREMENTS**

### **4.1 General requirements**

#### **4.1.1 Lamella thickness**

Maximum lamella thickness:

- 40 mm for timber with a width > 70 mm for classes B and BGVT.
- 35 mm for timber with a width < 70 mm for classes B and BGVT.

Notwithstanding the foregoing, a larger lamella thickness may be used if it has been demonstrated for the relevant lamella thickness that the requirements for the durability of the glued joint are met (section 4.2.4 or 4.3.4 of this AD)

Minimal lamella thickness:

- 10 mm for class B:
- 15 mm for the inner lamellae and 18 mm for the outer lamellae for class BGVT.

#### **4.1.2 Fingerjoints**

Fingerjointed lamellae shall comply with BRL 1704-02.

#### **4.1.3 Tolerances**

The spring, bow and twist of the optimized timber may not be more than 1,5 mm per running metre. The maximum dimensional tolerance of the nominal timber size (finished product) may not be more than +/- 0,5 mm.

### **4.2 Requirements with regards to BGVT**

#### **4.2.1 Adhesives**

Adhesives shall comply with the requirements laid down in BRL 2339 class "exterior laminating".

#### **4.2.2 Timber**

##### **4.2.2.1 General**

Timber to be applied in window frames, windows and doors shall comply with:

- the requirements as mentioned in the basis of assessment "Timber species for application in joinery ; requirements for admission and methods of determination" (see SKH-publication 97-04). Timber species mentioned in SKH-Publication 99-05 or .
- the requirements as mentioned in the Assessment directive 0605 'Modified timber' in combination with the SKH Publication 97-04 for the properties relating to the application of façade joinery. Modified timber species listed in SKH-Publication 13-02 comply with the specified requirements.

#### **4.2.2.2 Quality requirements for timber**

The quality requirements for timber for window frames, windows and doors are given in SKH Publication 99-05. In addition to these quality requirements, the following applies to fingerjointed timber in the class BGV7:

- for softwood and European hardwood, the growth ring pattern between adjacent lamellae should be as small as possible and, to the extent possible, the pattern of the growth rings (seen on the cross-cut end) relative to the glued joint must be situated alternately as much as possible. Situations where plain sawn-plain sawn, plain sawn-half quarter sawn and half quarter sawn-quarter sawn parts are laminated to each other are permitted. Situations where plain sawn parts are laminated to quarter sawn parts are not permitted.

Explanation: an improper structure may result in delamination and cracking while the form stability cannot be adequately guaranteed. (It is inevitable for the glued joints to stand out in the application).

- the difference in density between the parts to be laminated (lamellae) together must be within a tolerance range of 100 kg/m<sup>3</sup>;
- the timber of the lamellae to be glued together must be homogeneous and come from one species or subspecies.

#### **4.2.3 Moisture content**

The moisture content shall be tuned to the product concerned.

Timber must comply with the moisture content prescribed in SKH Publication 99-05. The maximum difference in timber moisture content between two laminated parts is 4%.

Modified timber must comply with the moisture content prescribed in SKH Publication 13-02.

#### **4.2.4 Structure of optimized timber**

##### **4.2.4.1 Wooden frames and windows**

The glued surfaces in the optimized timber for stiles and frame heads may be applied both parallel to the glass surface and perpendicular to it.

The glued surfaces in the optimized timber for transoms and frame sills of frames may only be applied parallel to the glass surface.

The structure must always be symmetric, regardless of the number of lamellae. The outer lamellae should have the same thickness, while the inner lamella or lamellae may deviate from this dimension, provided that all of them are of the same thickness if multiple inner lamellae are used.

Notwithstanding the foregoing, a non-symmetrical structure may be used if it has been demonstrated for the relevant structure that the requirements for the durability of the glued joint are met (section 4.2.5 or 4.3.5 of this AD)

Taking into account the maximum lamella thickness specified in section 4.1.1, optimized timber with a width > 70 mm should be built up of three or more lamellae.

For application in windows, optimized timber with a width of up to 70 mm may be built up of two lamellae of equal thickness.

#### **4.2.4.2 Wooden exterior doors**

The glued surfaces in the optimized timber for exterior doors may be applied both parallel to the glass surface and perpendicular to it.

The structure must always be symmetric, regardless of the number of lamellae. The outer lamellae should have the same thickness, while the inner lamella or lamellae may deviate from this dimension, provided that all of them are of the same thickness if multiple inner lamellae are used.

Notwithstanding the foregoing, a non-symmetrical structure may be used if it has been demonstrated for the relevant structure that the requirements for the durability of the glued joint are met (section 4.2.5 or 4.3.5 of this AD)

For application in stiles and lintels of exterior doors, optimized timber with a width of up to 70 mm may be built up of two lamellae of equal thickness if it is composed of quarter sawn (rift) timber.

#### **4.2.5 Durability of glued joints**

##### **4.2.5.1 Determination of the resistance to delamination by means of accelerated weathering on dark finished test pieces**

After accelerated weathering in accordance with section 5.2.1, an average of 5% open glue joints (measured on 5 test pieces) with a maximum of 10% per individual test piece.

##### **4.2.5.2 Determination of the resistance to delamination by means of the boiling test**

After the boiling test in accordance with section 5.2.2, an average of 5% open glue joints (measured on 10 test pieces) with a maximum of 10% per individual test piece.

#### **4.3 Requirements regarding class B**

##### **4.3.1 Adhesives**

Adhesives shall comply with the class "exterior general" laid down in AD 2339.

##### **4.3.2 Timber**

Timber applied in masonry profiles must at a minimum comply with quality class C in accordance with NEN 5466 with the exception of the following:

- bark is not permitted in the end product;
- cracking in the outer lamellae must at a minimum comply with quality class B in accordance with NEN 5466;
- end shakes and splits in the lamellae are not permitted;
- deformation in the lamellae may not affect the manufacturing of the finger joint and/or a dimensional deviation greater than specified in section 4.1.4;
- mechanical damage in the end product is not permitted.

**4.3.3 Moisture gradient**

The moisture content must be geared to the product concerned and may be a maximum of 20%. The maximum difference in timber moisture content between two laminated parts is 4%.

**4.3.4 Requirements with regard to the structure of optimized timber**

With regard to the situation of the growth rings no additional requirements are laid down.

**4.3.5 Durability of glued joints**

After the immersion test in accordance with section 5.2.3, an average of 2% open glue joints (measured on 10 test pieces) with a maximum per individual test piece of 5% for laminated timber for masonry profiles.

## 5 METHODS OF DETERMINATION

### 5.1 Moisture content

The control of the moisture content shall be executed by means of weighing and drying or with a calibrated electric moisture meter, in accordance with NEN-EN 13183-1, respectively NEN-EN 13183-2.

### 5.2 Durability of glue joint

#### 5.2.1 Determination of the resistance to delamination by means of an accelerated weathering test on dark finished samples

Five test samples with a length of 500 mm taken out of the full cross-section of optimized timber shall, before weathering, be planed on 4 sides in accordance with section 62 of the KVT. The cross-sectional faces shall after that be sealed 2 times with an epoxy. The samples shall subsequently be provided with a paint system, colour RAL 7016, applied in 2 layers with a total dry layer thickness of 80 µm. After complete drying of the paint system the samples shall be weathered in accordance with the following cycle for a period of 3 weeks:

- 8 hours spraying with water  $15 \pm 2^\circ \text{C}$ ;
- 8 hours irradiation till an even surface temperature of  $75 \pm 5^\circ \text{C}$ .

The test samples shall immediately after three weeks be assessed on the percentage of open glue lines. The assessment shall take place along the two longitudinal sides of the test piece.

The results shall be shown as the percentage of the open glue joint of the total length of the glue joint in accordance with the calculation below.

$$\text{Open glue joint (\%)} = \frac{\text{Sum of open glue joints (mm)}}{\text{Sum of total glue joints (mm)}} \times 100\%$$

#### 5.2.2 Determination of the resistance to delamination by means of the boiling test

Test piece with a length of 50 mm shall be sawn out of the full cross-section of the optimized timber (parallel to the fibres). Surplus glue shall be removed and surfaces shall be smooth in order to make an assessment of the glue lines possible.

The initial weight of the test pieces shall be determined with an accuracy of  $\pm 1 \text{ g}$ , after which the test pieces are treated according to the following cycle:

the test pieces shall subsequently be treated in accordance with the following cycle:

- 4 hours immersion in boiling water;
- drying in an oven at  $60 \pm 2^\circ \text{C}$  through mechanical circulation and provided with ventilation holes (inlet and outlet) until reaching 100-110% of the initial weight, whereby:
  - when placing in the oven, the cross-cut end of the test pieces must have a clearance of at least 10 cm and the longitudinal side at least 2 cm;
  - after drying for 1, 2, 3 and 4 hours in the oven the test pieces must be weighed to assess whether the initial weight has been reached;
  - if, after drying for 4 hours the initial weight has not been reached, the oven must be turned off in order to allow it (including the test pieces) to cool off while being closed. After drying in the oven for a maximum of 16 hours, the test pieces must

- be weighed to assess whether the initial weight has been reached;
- if, after the drying and cooling off period the initial weight of the test pieces has not been reached, the test pieces shall be dried further in an oven of  $60 \pm 2$  °C (weigh after every hour).

The percentage of open glue joints of the test pieces shall be assessed within 2 hours after reaching the initial weight. The assessment shall take place around the entire test piece. The results shall be shown as the percentage of the open glue joint of the total length of the glue joint in accordance with the calculation shown in section 5.2.1.

### **5.2.3 Determination of the resistance to delamination by means of the immersion test**

Production samples are sawn into test pieces with a length of 50 mm (parallel to grain). Adhesive residue must be removed, and surfaces must be smooth to allow for an assessment of the glued joints. Subsequently, the test pieces shall be treated according to the following cycle:

- 3 hour immersion in water of  $20 + 2$  °C;
- 3 hour immersion in water of  $60 + 2$  °C;
- 18 hour immersion in water of  $20 + 2$  °C;
- 72 hours of drying in a normal climate:  $20 + 2$  °C and  $65 + 5\%$  RV.

The percentage of open glue joints of the test pieces shall be assessed immediately after the drying period in the oven. The assessment shall take place around the entire test piece.

The results shall be shown as the percentage of the open glue joint of the total length of the glue joint in accordance with the calculation shown in section 5.2.1.

## **6 PRODUCTION REQUIREMENTS**

### **6.1 Storage of adhesives**

Measures shall be taken to use the principle 'first in first out' when storing adhesive and the accompanying materials.

The air temperature in the storage room shall be controlled in such a way that the temperature of the adhesive stored is between temperatures laid down in the processing instructions of this adhesive.

All materials used for the storage of the adhesive that could create a reaction with the adhesive shall be provided with a protective layer preventing such a reaction. Adhesive supplied in vats, as well as accompanying hardeners shall be stored in a room destined for that purpose.

This room shall be arranged in such a way and the vats shall be placed in such a way that the labels of each group of vats are legible. The name, production date and the period of storage life shall be indicated on the labels.

### **6.2 Planing or sandpapering of the lamellae**

The processing of the lamellae shall be at least on both sides in such a way that both faces to be glued are fully planed and/or sandpapered.

The planed and/or sandpapered faces shall be parallel to each other.

The difference between the smallest and the largest thickness of a lamella shall not exceed 0,2 mm. The maximum allowable machine stroke is 0,025 mm.

In case of sandpapering measures shall be taken in order to remove all dust originating from sanding before the next process e.g. by means of compressed air or brushes.

### **6.3 Applying the adhesive**

The time between planing or sandpapering and the application of adhesive shall be as short as possible; the time depends on the processing circumstances such as temperature and relative humidity, but also on the species of timber to be glued.

The maximum allowable time between planing or sandpapering and applying the glue shall not exceed 120 minutes for resinous timber and 24 hours for non-resinous timber. Check before applying the glue whether the moisture content of the timber complies with the requirements according to section 4.2.

The adhesion faces shall be free from dust and attached dirt.

The glue shall then be applied in accordance with the guidelines of the glue supplier.

The glue shall usually be applied by machine and equal on the adhesive faces in a quantity that assures a good fixation to the entire surface of the lamellae.

### **6.4 Pressing of the lamellae**

The pressing of the lamellae shall be done in such a way that the indicated closed open time of the adhesive applied is not exceeded nor too little.

The pressure (mechanical, hydraulic or pneumatic) shall be applied evenly and shall be kept constant during the whole pressing time and in such a way that the surplus adhesive can be pushed aside equally, thus avoiding inadmissibly thick adhesive lines. Within the framework of this assessment directive an inadmissibly thick adhesive line is defined as  $> 0,1$  mm.

In case of softwoods a pressure of at least  $0,4$  N/mm<sup>2</sup> shall be kept in case of a

lamella thickness of about 25 mm and at least 0,6 N/mm<sup>2</sup> in the case of a lamella thickness of 25 – 40 mm. The pressure shall be at least 1,0 N/mm<sup>2</sup> for the laminating of hardwoods.

The pressure and pressing time is also dependent on the manufacturing circumstances and shall be recorded.

**6.5 Hardening of the adhesive**

The required hardening circumstances during the hardening process shall, depending on the type of adhesive , be known and shall be maintained during all actions described above.

**6.6 Processing immediately after manufacturing the optimized timber.**

Processing the timber immediately after manufacturing the optimized timber is not permitted to have any effect on the durability of the glued joint. If any processing takes place to the optimized timber within 7 hours after manufacture, sampling for internal control (as specified in section 8.5) and external control (as specified in section 11.3) shall take place after this processing.

**6.7 Transport and storage of the optimized timber**

The optimized timber shall following on the manufacturing process be stored at least 7 hours under the processing conditions laid down in section 7.2.2.

Until the transfer to the buyer the optimized timber shall be maintained, stored and transported in such a way that the timber shall not be damaged and that no inadmissible moisture movement takes place.



## **7 GENERAL CONDITIONS**

### **7.1 Expertise of the members of staff**

The quality of the optimized timber for non-loadbearing applications is not only dependent on the quality of the materials , the suitability of the machines, installations and equipment, but also on the skill by which the production is accomplished. The company in which the optimized timber for non-loadbearing applications is manufactured shall have expert members of staff.

At least one of the members of staff responsible for production shall have :

- knowledge of the Dutch, English or German language;
- work instructions shall also be available in the Dutch, English or German language as well as in the local language;
- knowledge of the materials being prescribed, are applied and processed;
- knowledge of the storage of semi-manufactured products, of the production process, the processes involved and their sequence, as well as the machines to be used, equipment and other installations, for rounding off the product to be supplied.

### **7.2 Lay-out of production and storage rooms**

#### **7.2.1 General**

Companies manufacturing optimized timber for non-loadbearing applications shall have at their disposal sufficient and for the manufacturing suitable production and storage facilities. The company shall have:

- a working accommodation as well as a covered storage for the benefit of raw materials and end products;
- such facilities for the production of optimized for non-loadbearing applications that weather conditions have no negative influence on the production process.

The layout of the company shall be such that, when storing materials, the quality and the durability remain guaranteed and that no permanent change in shape takes place;

- an adequate machinery adapted for the size of the production.

#### **7.2.2 Processing conditions**

In the adhesive section may, at the time of the application of adhesive , no dust-producing activities take place, unless sufficient measures are taken directed to keep the lamellae with adhesive free from dust.

The surface temperature of the timber may, at the time of gluing, not be lower than 15° C. The limits allowed for the climate when carrying out the gluing process shall be 15° C and 25° C and 40 % and 80 % RH. The processing instructions stated by the adhesive supplier shall be kept within these limits.

Measures shall be taken of an organizational nature when the manufacturing conditions are go below or are exceeded, in order not to exceed the open and closed time of the adhesive applied.

**7.2.3 Machinery and tools**

All processing of the timber shall be carried out with suitable machinery and tools. Chipping machines and machines producing dust shall be connected to a well-functioning suction installation.

Suitable aids (setting tools) and control tools shall be present for the accurate setting of machines and tools. Apparatus shall furthermore be present to be able to control cutting tools and the positioning thereof ( this in consultation with the supplier of the cutting tools).

**7.2.4 General indications for the lay-out of production rooms**

During the setting-up of machinery and apparatus one should bear in mind that, when doing the layout of production rooms, one obtains a logical manner of manufacturing the products. Where necessary there shall be sufficient free space for intermediate storage and/or buffer stock.

**7.2.5 Storage and transport**

Production, internal transport, storage and transport to the buyers shall be done in such a way that the properties indicated are retained. The transport shall take place in such a way that no damage or permanent changes in shape can take place.

## 8 INTERNAL CONTROLS

There shall be an Internal Quality Control Plan in the factory whereby at least the following controls take place.

### 8.1 Registration of temperature and relative humidity

Applying the adhesive, manufacturing the joint, the hardening and the storage temperature and relative humidity shall continuously be registered when processing the timber.

### 8.2 Timber quality/strength class of the timber

Preceding the processing of the adhesive joint shall be controlled whether the quality of the timber or the strength class of the timber complies.

The optimized timber shall be randomly checked for compliance with the product requirements specified in chapter 4. In order to assess an individual batch of optimized timber in regard to timber quality and growth ring orientation (softwood) a random sample must be taken from the batch. The size of this sample depends on the size of the batch. The size of the random sample as a function of the batch size and the maximum allowable number of defective lamellae (maximum 2%) is shown in table 1.

Batch size (N) <sup>1</sup>	Random sample size (n) <sup>1</sup>	Maximum allowable number of defective lamellae <sup>2</sup>
0-150	5	7
151-280	13	17
>280	20	26

<sup>1</sup> Number of laminated beams provided with multiple lamellae. Random sample shall be taken from one production week from laminated timber of a single size.

<sup>2</sup> Total number of individual lamellae in which a defect was detected.

### 8.3 Moisture content

Before manufacturing the adhesive joint shall be checked whether the timber complies with the requirements concerning the moisture content during production. This control shall be executed with a calibrated moisture meter or by means of the oven dry method. The values measured shall be corrected for timber species and temperature of the timber.

### 8.4 Adhesives

At least the following shall be checked before and during the manufacturing of the adhesive joint:

- mixing of adhesive and hardener;
- pot life;
- quantity applied;
- open time;
- open closed time;
- pressure;
- pressing time;
- quantity of adhesive squeezed out.

8.5

**Sampling**

Regularly distributed over the production during the week 10 test samples shall be taken at random per production line and per timber species.

Depending on the class, the test pieces must be prepared in accordance with section 5.2.2 (for class BGVT) or section 5.2.3 (for class B).

8.6

**Testing**

Every production week (after a maximum of 10 working days) the test pieces taken in accordance with section 8.5 must be tested, depending on the class, in accordance with section 5.2.2 (for the class BGVT) or section 5.2.3 (for the class B).

The results of the test must be recorded in the IQC system.

## 9 REQUIREMENTS REGARDING THE QUALITY SYSTEM

### 9.1 General

This chapter includes the requirements with which the manufacturer's quality system must comply.

### 9.2 Responsibility

The responsibility for the manufacturing process of the product, the internal quality monitoring, and the finished product lies with the manufacturer.

### 9.3 Manager of the quality system

Within the organizational structure, an official must be appointed who is charged with the management of the quality system.

### 9.4 Quality system

#### 9.4.1 Document control

The written procedures for inspection and testing must be assessed and approved for suitability and effectiveness by authorized persons in the company before they are issued. Document control must ensure that only valid documents are available for inspection and testing. The documents must be in Dutch, English or German

#### 9.4.2 Internal quality control

The manufacturer shall have an internal quality control in which at least the following components are included and laid down in writing:

- incoming inspection of raw materials
- workplace instructions (including control of the production process)
- control of the end product
- control of measuring equipment
- complaints recording system
- 

##### 9.4.2.1 Registration

Records must be kept of the inspections and tests as described in the IQC scheme. Registered data must be kept for at least 10 years.

##### 9.4.2.2 Calibration

Inspection, measuring and testing equipment must be calibrated at least once a year. Records must be kept of this calibration..

##### 9.4.2.3 Supplies

Raw materials, semi-manufactured products, etc, in regard to which reference is made to another assessment directive, must meet the requirements of the relevant assessment directive. The goods received must be inspected according to the IQC scheme.

##### 9.4.2.4 Laboratory

There must be a separate, properly equipped area for carrying out laboratory activities and all the prescribed measuring and testing equipment must be present.

If an external laboratory is used, it must be approved by the certification body.

The samples used for inspection and testing are clearly identified. Any testing sequence must be clearly recognisable.

The manufacturer must have the following equipment:

**With regard to the climate:**

- equipment for continuously measuring and recording temperature and relative humidity.

**With regard to timber:**

- equipment to determine the moisture content of timber with adjustment possibilities for temperature correction and timber species;
- if applicable, equipment to inspect the density.

**With regard to glue:**

- equipment for measuring mixture compositions;
- equipment for measuring the adhesive yield;
- if applicable, equipment to determine the viscosity (e.g. a DIN cup);
- if applicable, equipment to measure press temperatures in case use is made of a hot press;
- equipment for measuring times, see section 8.4.

**With regard to checking dimensions:**

measuring equipment, e.g. a tape, for determining or checking the dimensions with an accuracy smaller than 1 mm, such as lengths of optimized timber;  
measuring equipment for determining or checking dimensions with an accuracy smaller than 1 mm (e.g. Vernier callipers with an accuracy of 0.05 mm);  
if applicable, equipment for measuring rounding;  
measuring equipment for determining or checking the squareness, warp, twist, etc (for example a try square or straightedge).

**Determination of the resistance to delamination by means of the:**

- boiling test;  
immersion bath and drying oven for the boiling test;  
magnifying glass, magnification at least 10x.

**With regard to checking finger joints:**

- see AD 1704-2.

**9.4.2.5 Non-conformities in products**

Products or parts of products that are found during the production process not to comply with the requirements must be clearly recognisable as such. If necessary, corrective measures must be taken.

**9.4.3 Handling complaints**

The manufacturer (holder of the product certificate) must demonstrably possess an operational complaints registration system concerning the product and its application to which the product certificate applies. There must be a statement regarding every complaint describing how the complaint was analysed and dealt with and any appropriate corrective measures subsequently taken.

**10**

**MARKING**

The optimized timber for non-load bearing applications supplied with the product certificate must legibly bear the KOMO® marking, specified in:

- the KOMO® word or logo; minimum size 5 mm;
- the number of the product certificate;

as well as the information relating to:

- the class in which the timber may be used (BGVT or B);
- the production week\*.

\* The applied production week must relate to the date on which the gluing of the laminated timber was done. If the mark was applied a few days after the gluing was done (after planing, for instance), the producer's quality system must be set up such that the correct production week is put on the laminated timber.

## **11 REQUIREMENTS TO BE MADE OF THE EXTERNAL INSPECTION**

### **11.1 General**

External quality control is specified by the certifying body in accordance with the Regulations for Product Certification of the certification body.

### **11.2 Admission inspection**

During the admission inspection, the certification body checks whether the company in question complies with the requirements stated in this assessment directive. A report will be drawn up of the admission inspection, based on which the KOMO® product certificate is granted, whether or not under certain conditions.

### **11.3 Annual inspection**

The certification body will check, without prior notice and at least 4 x a year, whether the technical specification has been continuously satisfied, whether production meets the specifications laid down by the manufacturer and agreed upon with the certification body, and whether the manufacturer's internal quality control scheme meets the requirements laid down in Chapter 9

A written report of these controls is prepared.

The aforementioned inspection frequency can be adjusted on the recommendation of the Board of Experts based on arguments.

A sample or samples must be taken once every year by application class (B or BGVT) by the certification body for detailed testing by an external laboratory (testing in accordance with section 5.2.1 or 5.2.2 and/or 5.2.3) (at the discretion of the certification body). Should there be reason to do so, additional samples may be taken. The costs of such testing shall be borne by the manufacturer.

In addition to the annual inspections at the manufacturer, the certification body shall be entitled and allowed to inspect the products at the customers of the manufacturer. During these inspections, it will be verified if the products comply with the technical specifications as defined and agreed with the certification body. It is possible that samples are taken for laboratory testing in accordance with section 5.2.1 or 5.2.2 and/or 5.2.3 (at the discretion of the certification body).

Generally speaking, the applicant's country must be safe for the certification body's control visits. If there is a travel advisory, the country will not be visited. In that case the products will be inspected upon arrival in the Netherlands. The manufacturer is obliged to notify the certification body, in good time and in writing, of the deliveries, including the time and location of reception.



## **12 REQUIREMENTS FOR CERTIFICATION-BODIES**

### **12.1 General**

The certification body must be accredited by the Council for Accreditation for the subject of this AD on the basis of NEN-EN-ISO/IEC 17065. Accreditation on the basis of NEN-EN 45011 is permitted until a date to be determined by the Council for Accreditation.

In addition, the body must be accredited by the Council for Accreditation for the topic of this AD or have initiated the application procedure for this.

The certification body must have a set of regulations, or an equivalent document, in which the general rules used for certification are specified. In particular these are:

- The general rules for performing the admission inspection, split up into:
  - The procedure for informing suppliers about the administrative processing of an application;
  - The procedure for implementing the inspection;
  - The procedure for deciding about acceptance based on the initial inspection
- The general rules concerning the performance of inspections and the applied inspection aspects;
- The measures to be taken by the certification body in the event of non-conformities;
- The rules for the termination of a certificate;
- The option of lodging an appeal against decisions or measures taken by the certification body.

### **12.2 Certification staff**

The staff members concerned with the certification process are as follows:

- Inspector: tasked with carrying out the external inspections;
- Initial inspector: tasked with carrying out the admission inspection and assessing the reports of inspectors and laboratory technicians;
- Assessor: assessment of the inspector and initial inspector; decisions on the need for taking corrective measures;
- Decision-maker: tasked with making decisions based on the admission inspections that have been carried out, continuation of certification on the basis of the completed inspections.

### **12.3 Qualification requirements**

Staff involved in the certification process must be demonstrably qualified for carrying out the activities required. The following qualification requirements apply in respect of education, training, expertise and experience:

<b>Certification staff</b>	<b>Education/training</b>	<b>Expertise and Experience</b>
Inspector Initial inspector	Senior secondary vocational education level (MBO level)	<ul style="list-style-type: none"> <li>- Production and application of wooden exterior doors or similar</li> <li>- Training auditor NEN-EN-ISO 9001</li> <li>- Two years' experience in the timber industry or equivalent</li> </ul>
Assessor	Higher professional education level (HBO level)	<ul style="list-style-type: none"> <li>- Structural engineering or equivalent</li> <li>- Production and application of wooden exterior doors</li> <li>- Minimum of 2 years' experience at management level in the timber sector or equivalent.</li> </ul>
Decision-maker	Higher professional education level (HBO level)	<ul style="list-style-type: none"> <li>- Management experience or equivalent</li> <li>- Certification or equivalent</li> <li>- Accreditation criteria or equivalent</li> <li>- Knowledge of relevant certification systems</li> </ul>

Certification staff must be demonstrably qualified by means of assessing training and experience based on the requirements mentioned above. If qualification is based on different criteria, this must be recorded in writing.

#### 12.4

##### **Report to the Board of Experts**

The certification body reports at least annually about the certification work done. In this report the following aspects must be addressed:

- changes in the number of certificates (new/ended);
- number of inspections performed in relation to the prescribed frequency;
- results of the inspections.

**13**

**LIST OF DOCUMENTS REFERRED TO**

NEN-EN 5466:2010	Quality requirements for timber - External characteristics of European softwood
NEN-EN 13183-1: 2002	Moisture content of a piece of sawn timber - Part 1: Determination by oven dry method
NEN-EN 13183-2: 2002	Moisture content of a piece of sawn timber - Part 2: Estimation by electrical resistance method
NEN-EN 45011:1998	NEN-EN 45011
NEN-EN-ISO/IEC 17020:2012	Conformity assessment - General criteria for the operation of various types of bodies performing inspection
NEN-EN-ISO/IEC 17021:2011	Conformity assessment - Requirements for bodies providing audit and certification of management systems
NEN-EN-ISO/IEC 17025:2005	General requirements for the competence of testing and calibration laboratories
NEN-EN-ISO/IEC 17065:2012	Conformity assessment - Requirements for bodies certifying products, processes and services
NEN-EN-ISO 9001:2008+C1:2009	Quality management systems - Requirements
AD 0605:2003	Modified timber, published SKH
AD 1704-02:2012	Fingerjointed timber for non-load bearing applications, publication of SKH
AD 2339:2012	Adhesives for non-load bearing applications published SKH
SKH-Publication 97-04	Beoordelingsgrondslag Houtsoorten voor toepassing in timmerwerk; eisen en bepalingmethoden (Only available in Dutch)
SKH-Publication 99-05	Approved timber species to be used in wooden façade elements (window frames, windows and doors) + appendix quality requirements
SKH-Publication 13-02	Approved modified timber species according to the AD 0605 to be used in wooden façade elements (window frames, windows and doors)
KVT	Quality of wooden façade elements

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**APPENDIX 1: MODEL KOMO® PRODUCT CERTIFICATE**

Name (CB) Logo (CB)  
Address (CB)  
Telephone number (CB)  
Fax number (CB)

**OPTIMIZED TIMBER FOR  
NON-LOAD BEARING APPLICATIONS**

Number:  
Issued:  
Supersedes:

---

**Producer**

**Factory**

**Importer**

**Declaration of CB**

This product certificate has been issued on the basis of BRL 2902 'Optimized timber for non-load bearing applications' dated xx-xx-xxxx, in accordance with the CB Regulations for Certification.

**CI declares that:**

- there is a justified confidence that the optimized timber for non-load bearing applications, manufactured by the producer complies with the technical specification laid down in this product certificate, provided that the optimized timber for non-load bearing applications are marked with the KOMO®-logo as indicated in this product certificate.

For (CB) ,..... director

The certificate is also included in the overview on the website of the KOMO foundation: [www.komo.nl](http://www.komo.nl).

Users of this product certificate are advised to contact (CB) to see if this document is still valid

This product certificate consists of .. pages.

(Illustration of the KOMO® logo.)

The Dutch version shall be consulted in case of doubt.

The following has been assessed: quality system product Periodic inspection
--------------------------------------------------------------------------------------

**1            PRODUCT SPECIFICATION**  
.....

**2.           SUGGESTIONS FOR THE USER**  
.....

## General

This modification sheet correlates to the Assessment Directive (AD) 2902 "Optimized timber for non-load bearing applications" dated 07-05-2014 and shall be used by the certification bodies, which are recognised for this by the Council for Accreditation and which have a licence agreement for this purpose with the KOMO Foundation, when processing an application for, or the maintenance of, a KOMO product certificate.

This modification sheet was:

- Adopted by the SKH Board of Experts on 04-10-2019.
- Accepted by the KOMO Quality and Assessment Board on 29-10-2019.

## Description of the modification

The requirements with regard to the composition of optimized timber have changed in the AD.

The following text must be modified in the AD:

Replace the text of paragraph 1.1; *This Assessment Directive replaces ..... valid until 07-05-2015.* with the following text in this modification sheet:

*This modification sheet is valid from 29-10-2019 and shall be applied in correlation with the accompanying Assessment Directive of 07-05-2014. Until 29-12-2019 at the very latest, the KOMO product certificates shall be issued on the basis of the Assessment Directive excl. modification sheet. The KOMO product certificates issued on the basis of that version shall lose their validity in any case on 29-10-2020.*

## General

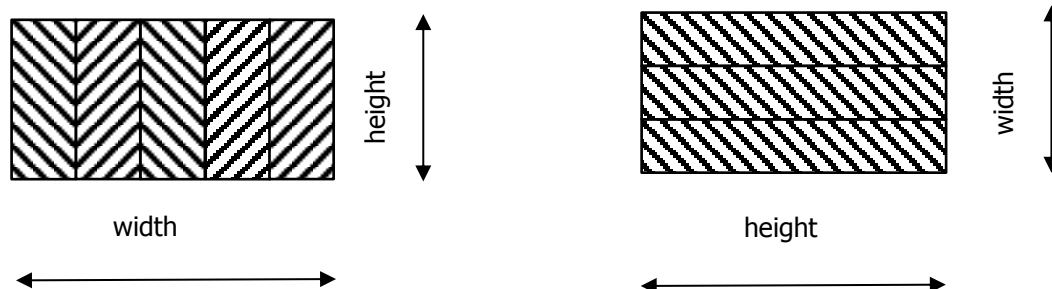
In the entire document, the reference to the NEN-EN 45011 shall lapse. This accreditation standard is not valid upon the publication of this modification sheet and is replaced by the NEN-EN-ISO/IEC 17065.

## Add to Section 2 "TERMS AND DEFINITIONS"

### 2.10 Width and height of optimized timber

The definition of width and height of the optimized timber as used in this AD is presented below.

#### Timber for window frames, windows and doors Timber for windows and doors



Replace par. 4.2.4 "composition of optimized timber" with the paragraph in this modification sheet

### 4.2.4 Composition of optimized timber

#### 4.2.4.1 Timber for window frames

The glue joints in the optimized timber for window frames may only be applied parallel to the glass panel. A combination of glue joints that are parallel and perpendicular to the glass panel in the optimized timber is not permitted (the in-between lamellae of the optimized timber may not be composed of several parts)

Regardless of the number of lamellae, the composition must always be symmetrical.

The outer lamellae must be of the same thickness while the inner lamellae may deviate from this measurement, as long as they are of the same thickness with the application of several inner lamellae.

In derogation of the above, a non-symmetrical composition may be applied if it has been demonstrated that the composition concerned meets the requirements for durability of the glue joints (paragraphs 4.2.5 and 4.3.5 of this AD).

In observance of the maximum lamella thickness under paragraph 4.1.1, the optimized timber for window frames must be composed of three or more lamellae.

#### 4.2.4.2 Timber for windows and outside doors

The glue joints in the optimized timber for windows and outside doors may be applied both parallel and perpendicular to the glass panel. The in-between lamellae of optimized timber for windows and doors with glue joints that are parallel to the glass panel may be composed of several parts as long as the following conditions are met (also see Figure 1)

- For window and door timber up to 120 mm in height, the in-between lamella may only be composed of a maximum of 2 parts
- For window and door timber of 120 mm in height and above, the in-between lamella may only be composed of a maximum of 3 parts
- The minimal height of the lamella is 40 mm

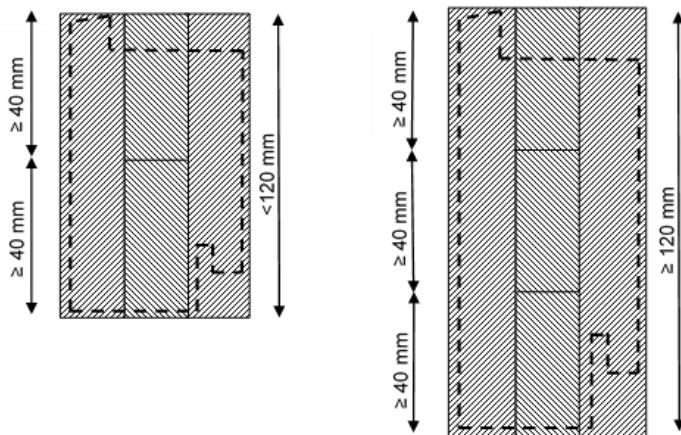
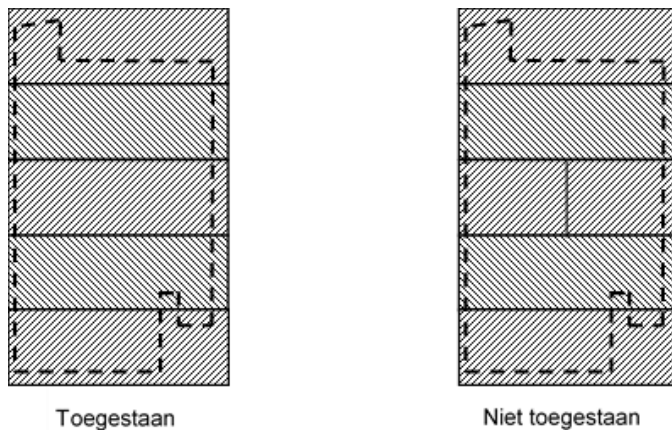


Figure 1: requirements and dimensions of window and door timber and lamella measurements with composition of in-between lamellae of several parts

*The in-between lamellae of optimized timber for windows and doors with glue joints that are parallel to the glass panel may not be composed of several parts (also see Figure 2)*



*Figure 2: optimized timber for windows and doors with glue joints parallel to the glass panel (left: allowed; right: not allowed)*

*Regardless of the number of lamellae, the composition must always be symmetrical.*

*The outer lamellae must be of the same thickness while the inner lamellae may deviate from this measurement, as long as they are of the same thickness with the application of several inner lamellae.*

*In derogation of the above, a non-symmetrical composition may be applied if it has been demonstrated that the composition concerned meets the requirements for durability of the glue line (paragraphs 4.2.5 and 4.3.5 of this AD).*

*For the application in frame posts and sills of outside doors and windows, optimized timber with glue joints parallel to the glass panel up to a maximum width of 70 mm may only be composed of two lamellae unless:*

- *the optimized timber is composed of lamellae of equal thickness.*
- *In case of soft wood, the optimized timber is composed of quarter (rift) sawn timber (for hard wood, no requirements are set for the orientation of the growth rings)*

### **Add to Section 10 "LABELS"**

*as well as the information:*

- *the class in which the optimized timber can be applied (B or BGVT);*
- *the addition:*
  - *KRD: for optimized timber suitable for window frames, windows and doors*
  - *RD: for optimized timber suitable for windows and doors*
- *the production week\*.*



**Replace Section 13 "LIST OF STATED DOCUMENTS" with the list below**

NEN-EN 5466:2010	Quality requirements for timber - External characteristics of European softwood
NEN-EN 13183-1: 2002	Moisture content of a piece of sawn timber - Part 1: Determination by oven dry method
NEN-EN 13183-2:2002/C1:2017	Moisture content of a piece of sawn timber - Part 2: Estimation by electrical resistance method
NEN-EN-ISO/IEC 17020	Conformity assessment - Requirements for the operation of various types of bodies performing inspection
NEN-EN-ISO/IEC 17021	Conformity assessment - Requirements for bodies providing audit and certification of management systems
NEN-EN-ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
NEN-EN-ISO/IEC 17065	Conformity assessment - Requirements for bodies certifying products, processes and services
NEN-EN-ISO 9001:2015	Quality management systems – Requirements
AD 0605: 2018	Modified timber, SKH edition
AD 1704-02: 2012	Finger-jointed wood for non-load bearing applications, SKH edition
AD 2339: 2012	Adhesives for non-load bearing applications, SKH edition
SKH Publication 97-04	Assessment basis 'Timber Species for Use in Joinery; Requirements and Methods of Determination'
SKH Publication 99-05	Approved timber species to be used in wooden facade elements (window frames, windows and doors)
SKH Publication 13-02	Approved modified timber species according to the AD 0605 to be used in wooden façade elements (window frames, windows and doors)
KVT	Quality of wood facade elements

**Remove ANNEX 1 "MODEL KOMO® PRODUCT CERTIFICATE"**