

4th edition, January 2004

*Translation*

# O

## **Technical specification for the supply of rough and machined planks for wagon floorboards**

*Spécification technique pour la fourniture de planches brutes et usinées pour planchers de wagons  
Technische Lieferbedingungen für unbearbeitete und bearbeitete Fussbodenbohlen für Güterwagen*



UNION INTERNATIONALE DES CHEMINS DE FER  
INTERNATIONALER EISENBAHNVERBAND  
INTERNATIONAL UNION OF RAILWAYS

---

## Leaflet to be classified in Volumes:

V - Rolling stock

VIII - Technical specifications

## Application:

With effect from 1 January 1970.

All members of the International Union of Railways

A derogation from applying this leaflet is, however, granted:

- to DB, as regards the dimensions of knots in deciduous and resinous timber;
- to DSB, NSB, SJ, VR, for regulations concerning flaws and knots in resinous timber;
- to ÖBB as a temporary measure.

## Record of updates

**3rd edition, January 1968**                      with its Amendment dated 1.1.70

**4th edition, January 2004**                      Retyped in FrameMaker

*The person responsible for this leaflet is named in the UIC Code*

# Contents

<b>Summary .....</b>	<b>1</b>
<b>1 - Scope .....</b>	<b>2</b>
1.1 - Purpose .....	2
1.2 - Grading .....	2
<b>2 - Required characteristics .....</b>	<b>3</b>
2.1 - Characteristics of logs .....	3
2.1.1 - Deciduous species .....	3
2.1.2 - Resinous species and birch .....	4
2.2 - Characteristics of the planks.....	4
2.2.1 - Geometrical characteristics.....	4
2.2.2 - Physical characteristics.....	5
2.2.3 - Humidity .....	6
2.3 - Marks .....	6
<b>3 - Manufacture.....</b>	<b>7</b>
3.1 - Felling, cutting-up of logs.....	7
3.2 - Manufacture of planks .....	7
3.3 - Retouching .....	7
<b>4 - Acceptance conditions.....</b>	<b>8</b>
4.1 - Submission for acceptance.....	8
4.2 - Nature of checks.....	8
4.3 - Interpretation of checks - Additional tests.....	8
4.4 - Method of sampling and preparation of test pieces .....	8
4.5 - Moisture check.....	9
4.6 - Marking .....	9

<b>Appendix A - Physical characteristics of the planks (tolerances) .....</b>	<b>10</b>
<b>Appendix B - Knots - Definition .....</b>	<b>11</b>
B.1 - Dimension of the flat section of a knot.....	11
B.2 - Soundness.....	11
B.3 - Adherence .....	11
<b>Appendix C - Tolerances on knots.....</b>	<b>13</b>
C.1 - Planks made of oak or tropical species .....	13
C.2 - Planks made of resinous species or birch .....	13
<b>Appendix D - Gravimetric method - Sampling - Preparation of the test piece -     Procedure .....</b>	<b>14</b>
<b>Bibliography .....</b>	<b>15</b>

---

## Summary

This specification concerns the supply of planks delivered either rough and unseasoned (planks delivered in unseasoned condition must be seasoned before being assembled), or rough or machined in a seasoned condition, intended for the construction of wagon floors.

# 1 - Scope

## 1.1 - Purpose

This specification concerns the supply of planks delivered either rough and unseasoned (planks delivered in unseasoned condition must be seasoned before being assembled), or rough or machined in a seasoned condition, intended for the construction of wagon floors.

## 1.2 - Grading

The planks to which this specification refers are of two categories:

- planks made from hardwood deciduous species,
- planks made from resinous species and birch,

the minimum quality characteristics of which are given as follows.

## 2 - Required characteristics

### 2.1 - Characteristics of logs

When the purchasing Railway Undertaking (RU) does not stipulate a certain species on the order, the supplier shall be free to choose from the species listed below in respect of each category, concerning the logs from which the planks are to be cut.

#### 2.1.1 - Deciduous species

Common oak (*Quercus pedunculata*)

Robur (*Quercus sessiliflora*)

In exceptional cases, after prior agreement with the purchasing RU, American oaks (*Quercus Borealis* and *Quercus Alba*) and the following tropical species may be used:

Douka (*Mimusops africana* or *Dumoria africana*)

Doussie (*Azelaia* spp)

Iroko (*Chlorophora excelsa*)

Makore (*Mimusops Heckelii* or *Dumoria Heckelii*)

Mukulungu (*Mimusops letestui* or *Autranella congolensis*)

Movingui (*Disthemonanthus Benthamianus*)

Padouk (*Pterocarpus Soyauxii*)

Yang

Keruing

Apitong

Gurjun

} (Dipterocarpus spp)

Azobe (*Lophira procera*) (reserved for open high-sided wagons)

## 2.1.2 - Resinous species and birch

Epicea (*Picea excelsa*)

Pine (*Abies pectinata* or *Abies alba*)

Larch (*Larix Europaea*)

Norway pine (*Pinus sylvestris*)

Douglas fir (*Pseudotsuga taxifolia* or *Douglasii*)

Laricio pine (*Pinus Laricio Corsicana* and *Calabrica*)

In exceptional cases, after prior agreement with the purchasing RU, one of the following species may be used:

Sea-pine (*Pinus Pinaster*)

Black Austrian pine (*Pinus Laricio Austriaca*)

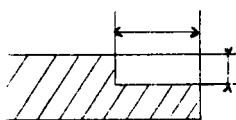
Verrucose birch (*Betula verrucosa*)

## 2.2 - Characteristics of the planks

### 2.2.1 - Geometrical characteristics

The dimensions of the planks must be in accordance with those in the working instructions. The tolerances applicable to these dimensions must also be as shown in the above documents; where no indication is given, the tolerances to be applied are as shown below:

Tolerances on	Unseasoned	Seasoned	
	Rough planks	Rough planks	Machined planks
Length (when stated on the order)	+200 mm 0	+200 mm 0	+10 mm 0
Width	+6 mm 0	+2 mm 0	+2 mm 0
Thickness	+3 mm 0	+2 mm 0	+1 mm 0
End jointing			+0,5 mm 0
Sag	≤ 0,15 % of the lengths	≤ 0,30 % of the lengths	≤ 0,15 % of the lengths





In addition:

- rough planks must have one of their ends cut perpendicularly to the longitudinal edges; the other end need not be cut perpendicularly to these edges, provided that the entire length of the plank remains within the tolerances specified above;
- machined planks must have both ends cut perpendicularly to the longitudinal edges.

In the case of resinous species except larch, flaws no larger than 1/4 of the thickness of the plank may be permitted on one edge only, the measurements being taken on the flaws themselves. In the case of planks made from deciduous species or larch, one fault of the same nature and dimension can be tolerated when the sapwood has been completely eliminated, otherwise the planks must have clean-cut edges along their entire length.

## **2.2.2 - Physical characteristics**

Irrespective of the species used, the planks must be absolutely sound; they must be especially free from the following faults: curls, heart shakes, cup shakes, frost cracks, circular edge defects, blistering, rot, pitting, splinters, flaking, foreign matter and traces of mistletoe.

In addition, in the case of resinous species, with the exception of sea-pine, the average annual rate of growth must be between 1 and 6 mm; this average shall be calculated from 10 consecutive annual ageings, at a point where the latter are either at their widest or narrowest.

In the case of sea-pine, the width of the annual-growth rings may be ignored.

### **2.2.2.1 - Planks made from oak or tropical species**

The tolerances concerning the following faults are given in Appendix **A - page 10**:

- sapwood,
- enclosed heart, exposed heart,
- traversing cracks, non-traversing cracks,
- worm holes,
- between bark,
- stains and coloured streaks,
- direction of the grain and twisted fibres.

#### **Knots:**

Definitions : See Appendix **B - page 11**

Tolerances : See Appendix **C - page 13**

### 2.2.2.2 - Planks made from resinous species or birch

The tolerances concerning the following faults are given in Appendix A - page 10:

- sapwood,
- enclosed heart, exposed heart,
- traversing cracks, non-traversing cracks,
- pockets of resin,
- between bark,
- stains and coloured streaks,
- direction of the grain and twisted fibres.

#### **Knots:**

Definitions : See Appendix B - page 11

Tolerances : See Appendix C - page 13

### 2.2.3 - Humidity

Unless otherwise laid down, planks delivered in a seasoned condition must not have a water content exceeding 22% of their anhydrous mass.

The purchasing RU can also lay down a minimum value which it considers suitable for the water content.

## 2.3 - Marks

At the request of the purchasing RU, each plank must be inscribed with the manufacturing marks laid down in the working instructions, especially:

- the supplier's mark.

## **3 - Manufacture**

### **3.1 - Felling, cutting-up of logs**

Except in the case of tropical species and species growing at high altitudes, felling after the sap has risen must only be carried out in special cases. In this event, the logs of resinous species must be stripped of bark as soon as they are felled. Conveyance to the rail head must take place with the least possible delay, to enable the log to reach the sawmills within a month of felling.

### **3.2 - Manufacture of planks**

Machined planks must be placed on all surfaces.

### **3.3 - Retouching**

Any repair carried out without the agreement of the purchasing RU or for the purpose of concealing a fault, is strictly forbidden and can lead to the rejection of the entire supply.

Filling, in particular, must not take place unless the purchasing RU's prior express agreement has been obtained.

## 4 - Acceptance conditions

### 4.1 - Submission for acceptance

The planks shall be submitted in batches made up of items of the same category arranged in stacks of uniform section and length.

**NB :** rough or machined planks ordered in a seasoned condition need only be submitted for acceptance once, i.e. at the time of delivery.

### 4.2 - Nature of checks

At the producing factory <sup>a</sup>	}	Dimensional checks : approximately 10% of the planks.
		Appearance checks: all surfaces of each item.
At the producing factory or at the laboratory of the purchasing RU, according to the wishes of the latter	}	Moisture check: 1 per 10 cubic-metres of planks (on planks delivered in a seasoned condition only).

a. If it so desires, the purchasing RU can carry out the acceptance procedure on its own premises, provided this is specially stipulated on the order.

### 4.3 - Interpretation of checks - Additional tests

Any characteristic which is found not to comply with the required conditions, in the course of the checks, may lead to the rejection of the batch in question.

In cases where the purchasing RU is able to agree to additional tests, the number of the latter must be fixed by special agreement between the supplier and the RU.

### 4.4 - Method of sampling and preparation of test pieces

The planks intended for the dimensional and moisture checks shall be selected at random by the receiving inspector from each batch submitted.

A sample of similar section to that of the plank and between 100 mm and 200 mm in length, must be sawn from each plank intended for the moisture check, at a point approximately 500 mm from one of the ends. Immediately prior to the test laid down in point [4.5 - page 9](#), a test piece of similar section to the plank and approximately 10 mm in length is sawn from the centre of the length of the sample selected.

The planks from which the samples have been taken must retain the marks of the receiving inspector.

## 4.5 - Moisture check

### 1. Method of testing.

The following may be used to determine the moisture content:




- a hygrometer approved by the purchasing RU, provided the calibration is checked at frequent intervals;
- or the gravimetric method shown in Appendix D - page 14. This method is more reliable and must be used in cases of dispute.

### 2. Results to be obtained: see point 2.2.3 - page 6.

## 4.6 - Marking

When inspection takes place on the supplier's premises, each plank accepted by the receiving inspector must be endorsed in a permanent manner with the latter's inspection mark.

## Appendix A - Physical characteristics of the planks (tolerances)

Faults	Tropical species	Oak	Resinous species - Birch
Sound sapwood	Not allowed, except in the case of dipterocarpus spp.	Allowed on one edge of one face only provided it does not exceed: - 1/3 of the thickness of the plank, - 1/5 of the width of the plank.	Allowed without restriction in species where the sapwood is differentiated; in the case of larch, however, restrictions may be applied by the purchasing RU.
Heart			
enclosed heart	Not allowed.	Allowed on 25% of the number of planks, whether it exists over whole or part of the length.	
exposed heart	Not allowed.	Allowed without restriction provided it is sound.	
Non-traversing cracks			
heart cracks		Allowed in seasoned wood when their individual lengths do not exceed 1/2 the width of the plank.	
superficial seasoning cracks	Hair-line cracks may be disregarded. Other superficial cracks may be allowed in small numbers, but their length must not exceed 1/2 the width of the plank.		
Traversing cracks (freshly-sawn timber)	<p>The following are allowed:</p> <ul style="list-style-type: none"> <li>- one crack at one end, the length of which does not exceed the width of the plank,</li> <li>- one crack at each end, when the sum of their lengths does not exceed the width of the plank.</li> </ul> <p>In all cases, the edges of the crack must not be more than 5 mm apart.</p>		
Non-traversing pockets of resin			Allowed under the same conditions as superficial cracks.
Superficial worm holes	Sparse holes may be allowed provided they are not more than 5 mm in depth.		
Between bark	Per plank: one non-traversing between bark surrounded by sound wood and not more than 1/2 the width of the plank in length, may be allowed.		
Stains and coloured streaks	Allowed.	Allowed except for "red heart".	Allowed together with slight blueing of sapwood. "Stiff vein" not allowed.
Direction of grain and twisted fibres	<p>The slope of the general direction of the fibres may not exceed 5% on the edges.</p> <p>This slope shall be measured over a distance at least equivalent to twice the width of the plank without taking into consideration minor local deviations.</p>		

## Appendix B - Knots - Definition

### B.1 - Dimension of the flat section of a knot

The dimension of a knot in a section is conventionally the distance between the tangents to the knot drawn parallel to the longitudinal edges of the piece of timber.

**NB :** where a knot appears in both the adjacent surfaces at the edge of the plank, the dimensions of the knot in each face shall be determined at the distance between the tangent to the boundary of the knot parallel to the axis of the plank and the edge of the plank, measured separately on each face. The total dimension of the knot is the sum of these two dimensions.

### B.2 - Soundness

#### B.2.1 - Sound section

Section with no trace of deterioration or rot and, in the case of resinous species, an unglazed appearance.

#### B.2.2 - Unsound section

Section showing deterioration over 1/3 of its surface area or less.

#### B.2.3 - Knot considered as sound

The following knots are considered as sound:

- any knot with 2 visible sections, one of which is sound and the other sound or unsound,
- any knot with only one sound or unsound section visible.

Any knot not coming within the categories defined above shall not be considered as sound.

### B.3 - Adherence

#### B.3.1 - Adhering section

A section of a knot shall be considered as adhering if:

1. in the case of freshly-sawn timber, the annual-growth layers in the section adhere to those of the timber surrounding the whole of its perimeter;
2. in the case of seasoned timber, the annual-growth layers in the section adhere to those of the surrounding timber over at least 3/4 of its perimeter.

#### B.3.2 - Partially-adhering section

A section where the annual-growth layers adhere to those of the surrounding timber over at least half of its perimeter.

## **B.3.3 - Knots considered as adherent**

A knot shall be considered as adherent when one of its sections is adherent (even if its other sections, where these exist, are partially or non-adherent).

In the case of seasoned timber, knots where all the sections are partially adherent are also considered as adherent.

Any knot not coming within the categories defined above shall be considered as non-adherent.



## Appendix C - Tolerances on knots

### C.1 - Planks made of oak or tropical species

	Individual dimensions			Groups
	See <sup>a</sup>	Sound adhering	Non-adherent	
Irrespective of the position of the knot	df dc	≤1/4 l with a maximum of 50 mm ≤1/2 e	/	In any section of plank 150 mm in length, one or more knots shall be allowed, of which the sum of the dimensions on one face and both edges is not more than 1/4 of the width of the plank.

### C.2 - Planks made of resinous species or birch

Type of knot	Individual dimensions				Groups
	See <sup>a</sup>	Sound adhering <sup>b</sup>	Non-adhering <sup>b</sup>		
			non-traversing	traversing	
If the knot does not affect any edge	df or dc	≤1/4 l with a maximum of 50 mm ≤1/2 e	≤30 mm ≤1/2 e	≤10 mm /	In any section of plank 150 mm in length, one or more knots shall be allowed, of which the sum of the dimensions on one face and both edges is not more than 1/3 of the width of the plank:  - only the dimensions taken on the edges shall be taken into account in the case of edge knots;  - only the dimensions taken on the edge surfaces shall be taken into account in the case of knots cutting two edges.  <b>NB :</b> when filling of knots is authorised, the dimensions of the fillings shall be taken in place of the repaired knots when arriving at the total.
If the knot affects one edge only (edge knot)	df dc	≤1/3 l ≤1/3 e	≤1/4 l ≤1/4 e	/	
If the knot affects both edges of the same surface	df	≤30 mm	/	≤10 mm	

a. Key:  
 l : width of the plank  
 e : thickness of the plank  
 df : dimension of the knot on the face of the plank  
 dc : dimension of the knot on the edge of the plank

b. *Planks made of resinous species*  
 In cases where filling is authorised, the maximum dimensions shown for sound and adherent knots may be applied, provided, however, that the filling does not overlap or cut an edge, and is not more than 50 mm in diameter.  
 The following may be disregarded: *superficial* flat knots if their dimension on the edge of the plank is less than 5 mm (or when they do not affect the edges).  
*Planks made from any species*: small dimensions less than 10 mm in size may be disregarded.

## Appendix D - Gravimetric method - Sampling - Preparation of the test piece - Procedure

A sample of similar section to that of the plank and between 100 mm and 200 mm in length must be sawn from each plank intended for the moisture check, at a point approximately 500 mm from one of the ends.

Immediately prior to the test, a test piece of similar section to the plank is sawn from the centre of the length of the sample selected. This test piece is weighed immediately: let  $M$  be the mass recorded.

After drying to a water-free condition, i.e. until a constant weight is obtained, in an oven at a temperature of  $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , the test piece is weighed again: let  $M_0$  be the mass recorded.

The humidity rate will be :  $H \% = \frac{M - M_0}{M_0} \times 100$

Weighing shall be carried out with an accuracy of at least one part in a thousand.

# Bibliography

## 1. Minutes of meetings

### **International Union of Railways (UIC)**

*5th Committee J.Q. (Preparation of standards for side planks and floorboards of wagons), May 1961*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons), May 1962*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons), May 1963*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons), May 1964*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons), May 1965*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons: in particular, revision of Leaflet 844-2), May 1966*

*5th Committee J.Q. (Preparation of specifications for side planks and floorboards of wagons: revision of Leaflets 844-1 and 844-2, especially as regards the conditions of Leaflet 844-1 relating to knots), May 1967*

*Rolling Stock and Motive Power Committee (Preparation of specifications for side planks and floorboards of wagons: final revision of Leaflets 844-1 and 844-2), June 1969*

### **Warning**

No part of this publication may be copied, reproduced or distributed by any means whatsoever, including electronic, except for private and individual use, without the express permission of the International Union of Railways (UIC). The same applies for translation, adaptation or transformation, arrangement or reproduction by any method or procedure whatsoever. The sole exceptions - noting the author's name and the source - are "analyses and brief quotations justified by the critical, argumentative, educational, scientific or informative nature of the publication into which they are incorporated".

(Articles L 122-4 and L122-5 of the French Intellectual Property Code).

© International Union of Railways (UIC) - Paris, 2004

Printed by the International Union of Railways (UIC)  
16, rue Jean Rey 75015 Paris - France, January 2004  
Dépôt Légal January 2004

ISBN 2-7461-0666-3 (French version)  
ISBN 2-7461-0667-1 (German version)  
ISBN 2-7461-0668-X (English version)