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VIII - Technical Specifications

**Amendments**

1 - 01.10.83 .....	.....
2 - 01.01.94 .....	.....
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**Preliminary remarks :**

A double vertical line (||) in the margin denotes modifications introduced on the date shown at the foot at the page.

Enforcement of this leaflet is governed by the provisions listed under the heading "Application" at the end of the document.

Technical specification  
for the supply  
of paper hand-towels

**NUMERISATION DANS  
L'ETAT DU DOCUMENT**



International Union of Railways

## Note

This leaflet is part of a series which also includes :

Leaflet 563                      Fittings provided in coaches in the interests of hygiene and cleanliness.

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# 1 - Object

## 1.1 - Scope

This specification defines the technical characteristics with which paper hand-towels must comply. It completes the provisions in Leaflet 563 "Fittings provided in coaches in the interests of hygiene and cleanliness".

All particulars relevant to implementation of the contract, especially those concerning application of the following paragraphs :

2-2-1-1, 2-2-2-1, 2-2-4-1 , 4-1-2, 5-1 and 5-2

shall be specified in the purchase order or its appended documents.

## 1.2 - Classification

Paper hand-towels are classified into 3 categories :

- TC : top category
- OC : ordinary category
- NC : normal category

Hand-towels shall be manufactured from crinkled paper.

Paper hand-towels may, if required and with the agreement of the purchasing Railway, be coloured, printed and multi-layered.

## 1.3 - Reference documents

UIC Leaflet 563	:	Fittings provided in coaches in the interests of hygiene and cleanliness.
Recommendation ISO/R 187 - 1961	:	Method for the conditioning of paper and board test samples.

International Standard ISO 536 - 1976:	Determination of grammage.
International Standard ISO 1924 - 1976:	Paper and board - Determination of tensile strength.
International Standard ISO 2144 - 1974:	Paper and board - Determination of ash
International Standard ISO 2470 - 1973:	Paper and board - Measurement of diffuse blue reflectance factor (ISO brightness).
International Standard ISO 3781 - 1976:	Paper and board - Determination of tensile strength after immersion in water for a specified period.

# 2 - Characteristics

## 2.1 - Component materials

### 2.1.1 - Paper

The paper pulp used for obtaining the paper from which hand-towels are manufactured shall have the following fibre content :

- TC : 100 % pure cellulose (100 % new chemical pulp),
- OC : ≥ 75 % cellulose fibres  
          ≤ 25 % ligneous fibres (reprocessed)
- NC : 100 % ligneous fibres (reprocessed)

The fibre content shall be checked in accordance with the particulars given in § 4.1.4.1 of the present specification.

**2.1.2 - Bactericides**

The addition of bactericides to the pulp is only allowed if they are physiologically harmless.

**2.1.3 - Dyes and inks**

Any dyes added to the paper pulp, and any printing inks which may be used on the towels, shall be non-poisonous, as required by the prevailing legislation in the purchasing Railway's country, and must not cause skin irritation.

**2.2 - Products****2.2.1 - Geometrical characteristics****2.2.1.1 - Dimensions**

The dimensions of paper hand-towels shall be those specified in the order or its appended documents, within the tolerances stipulated.

If no measurements are mentioned in these documents, the dimensions and tolerances given in Table 1 below shall apply.

**Table 1**

Towels		Length in mm	Width in mm
Unfolded	fold A (1)	$500_{-5}^0$	$250_{-5}^0$
	fold B (1)	$390_{-5}^0$	
Folded		$250_{-5}^0$	$100_{-5}^0$

(1) See Appendix 1

The dimensions shall be checked in accordance with the provisions in § 4.1.4.2 of this specification.

**2.2.2 - Physical characteristics****2.2.2.1 - Number of basic layers and crinkling method**

In general, the paper hand-towels shall consist of a single basic layer. However, with the agreement of the purchasing Railway, paper hand-towels with a larger number of basic layers may be accepted, provided they comply with the various other conditions stipulated.

The choice of crinkling method shall be left to the manufacturer's discretion.

Compliance with these conditions shall be checked in accordance with the particulars contained in § 4.1.4.3 of this specification.

**2.2.2.2 - Appearance**

The paper hand-towels shall be free from holes, lumps, ridges, roller creases, wrinkles, twisting, etc.

Compliance with these conditions shall be checked in accordance with the particulars contained in § 4.1.4.4 of this specification.

**2.2.2.3 - Whiteness**

The minimum degree of whiteness, expressed as a percentage, shall be as follows for each category :

- TC } 75
- OC } 53.
- NC }

The degree of whiteness shall be checked in accordance with the provisions laid down in § 4.1.4.5 of this specification.

**2.2.2.4 - Weight per square metre in normal conditioned state**

The weight in normal conditioned state, expressed in grammes per square metre, must be equal to, or higher than 45 g for Category TC and 40 g for Categories OC and NC.

The weight shall be checked in accordance with the provisions laid down in § 4.1.4.6 of this specification.

**2.2.2.5 - Water absorbency**

Water absorbency, expressed in terms of a maximum absorbency time, in seconds, must be as follows for each category :

- TC : 20
- OC } 90.
- NC }

Water absorbency shall be checked in accordance with the provisions laid down in § 4.1.4.7 of this specification.

**2.2.3 - Mechanical characteristics**

**2.2.3.1 - Tensile strength in conditioned state**

Tensile strength (direction of manufacture) in conditioned state, expressed by the minimum tearing strength (in Newtons), must be as follows, according to the category :

- TC : 7 N
- OC } 7 N } for 15 mm test pieces
- NC }

Tensile strength in conditioned state shall be checked in accordance with the provisions laid down in § 4.1.4.8 of this specification.

**2.2.3.2 - Tensile strength in wet condition**

Tensile strength (direction of manufacture), in wet condition, expressed by the minimum tearing strength (in Newtons), must be as follows according to the category :

- TC : 1.4 N
- OC } 1.4 N } for 15 mm pieces
- NC }

Tensile strength, in wet condition, shall be checked in accordance with the provisions laid down in § 4.1.4.9 of this specification.

**2.2.4 - Chemical characteristics**

**2.2.4.1 - Ash content**

Unless otherwise stipulated in the purchase order or its appended documents, the ash content, expressed as a percentage of the initial weight, must not be more than 5 % for Category TC and 15 % for Categories OC and NC.

Ash content shall be checked in accordance with the provisions laid down in § 4.1.4.10 of this specification.

**2.2.5 - Hygiene characteristics**

Paper towels must not contain pathogenic germs.

### 3 - Manufacture

#### 3.1 - Preparation of materials

The preparation of raw materials used in the manufacture of paper shall not be subject to any special condition, except that no bactericides shall be added to the pulp, and the finished product must fulfil the conditions laid down in this specification.

#### 3.2 - Manufacture of hand-towels

The manufacture of hand-towels shall not be subject to any special condition, except that the finished product must fulfil the conditions laid down in this specification.

#### 3.3 - Elimination of defects, if any

Any procedure designed to conceal a defect shall be prohibited.

### 4 - Inspection

#### 4.1 - Inspection of paper hand-towels

##### 4.1.1 - Presentation

##### 4.1.1.1 - Condition of hand-towels for presentation

Hand-towels shall be presented in delivery condition.

##### 4.1.1.2 - Batching

Hand-towels of the same type and manufacture, and subject to the same presentation, shall be taken as forming one batch.

#### 4.1.1.3 - Notification of presentation

When the purchase order stipulates that the goods are to be presented at factory, the purchasing Railway shall be so advised by means of an appropriate document drawn up by the manufacturer, signed by the works manager or his representative, and stating :

- the date of presentation,
- the references of the purchase order,
- the size of the batches presented, specifying for each of them the number of hand-towels presented.

#### 4.1.2 - Nature and proportion of checks and tests

The hand-towels shall be checked to ensure that they comply with the characteristics listed in chapter 2 of this specification.

Unless otherwise stipulated in the purchase order or its appended documents, the number of tests required according to the size of the batch is that given in Table 2 below :

Table 2

Size of batch (Number of hand-towels N)	Number of test series
$N \leq 1\ 000\ 000$	2
$1\ 000\ 000 < N \leq 4\ 000\ 000$	3
$N > 4\ 000\ 000$	4

Each test series shall include the checks and tests mentioned in Table 3.

Table 3

Type of checks and tests	§ in present leaflet		Number of test pieces per test series		Size of test pieces (in mm)
Fibre content	4.1.4.1		1		A sufficient part
Size	4.1.4.2	}	At the discretion of the representative of the purchasing Railway	}	The hand-towels themselves
Number of layers	4.1.4.3				
Appearance	4.1.4.4				
Whiteness	4.1.4.3		10		75 x 150
Weight	4.1.4.6		20		200 x 250
Water absorbency	4.1.4.7		10		100 x 100
Tensile strength in conditioned state	4.1.4.8		Direction of manufacture : 10		15 x 250
Tensile strength in wet condition	4.1.4.9		Direction of manufacture : 10		15 x 250
Ash content	4.1.4.10		1		A sufficient part

#### 4.1.3 - Removal, preparation of samples and test pieces

##### 4.1.3.1 - Removal of samples

Hand-towel bundles from which the towels for checking and testing are taken shall be removed at random from each batch presented.

The bundles as well as the towels removed must keep their indelible identification markings.

#### 4.1.3.2 - Removal and preparation of test pieces

Test pieces shall be removed and conditioned in accordance with the methods stipulated for each test.

When conditioning is not stipulated, the conditions in ISO Recommendation R 187 - 1977 (20° C ± 1° C, HR 65 % ± 2 %).

#### 4.1.4 - Performance of checks and tests

##### 4.1.4.1 - Fibre content

Fibre content shall be checked in accordance with national standards. Otherwise, the following method shall be used.

1 or 2 grammes from the sample shall be crushed into a fibrous pulp, and test pieces with a diameter of about 2 mm placed on a microscope slide. After dampening with glycerine, a drop of iodised potassium is added and, after a short reaction, is absorbed by blotting or filter paper; a drop of zinc-iodide chloride solution is then added. The fibre material is examined under microscope under incident or reflected light, against a white background.

The fibre content shall then have the following colour patterns :

- mechanical pulp : yellow to deep yellow,
- cellulose : blue to crimson red,
- rag paper : slight or deep ruby red.

The results to be obtained are those stipulated in § 2.1.1 of this specification.

**4.1.4.2 - Dimensions**

The dimensions shall be checked on all sides, at a distance of 5 to 10 mm from the edges, by means of suitably calibrated standard devices.

The results to be obtained are those stipulated in § 2.2.1.1 of this specification.

**4.1.4.3 - Number of basic layers and crinkling method**

The provisions laid down in § 2.2.2.1 of this specification must be observed.

**4.1.4.4 - Appearance**

The conditions stipulated in § 2.2.2.2 of this specification must be observed.

**4.1.4.5 - Whiteness**

Whiteness shall be checked in accordance with the provisions laid down in Recommendation ISO 2470 - 1973.

The result to be obtained is that stipulated in § 2.2.2.3 of this specification.

**4.1.4.6 - Weight per square metre in normal conditioned state**

The weight in normal conditioned state shall be checked in accordance with the provisions laid down in international standard ISO 536 - 1976.

The result to be obtained is that stipulated in § 2.2.2.4 of this specification.

**4.1.4.7 - Water absorbency**

Water absorbency shall be checked in accordance with the following provisions.

After completion of the conditioning process laid down in § 4.1.3.2 of this specification, the test piece shall be placed on a support of similar size. This support shall have a circular hole of 40 mm  $\pm$  2 mm in the centre.

Using a cruets with stop-cock, 0.05 cm<sup>3</sup> of distilled water at a temperature of 20° C  $\pm$  2° C is dropped from a height of 40 mm so as to form a drop on the test piece.

The time elapsed and measured since the release of the drop until its full absorption by the test piece (absence of reflection when looking slantwise at the place where the drop was located) gives the value of water absorbency time.

The result to be obtained is that described in § 2.2.2.5 of this specification.

**4.1.4.8 - Tensile strength, in conditioned state**

Tensile strength (direction of manufacture) in conditioned state shall be checked in accordance with the provisions laid down in international standard ISO 1924 - 1976.

The result to be obtained is that described in § 2.2.3.1 of this specification.

**4.1.4.9 - Tensile strength, in wet condition**

Tensile strength (direction of manufacture) in wet condition shall be checked in accordance with the provisions laid down in international Standard ISO 3781 - 1976, and with the following stipulations :



During the test carried out according to the usual procedure, the immersion time shall be 10 mn.

The result to be obtained is that described in § 2.2.3.2 of this specification.

**4.1.4.10 - Ash content**

Ash content shall be checked in accordance with the provisions laid down in international standard ISO 2144 - 1974.

The result to be obtained is that described in § 2.2.4.1 of this specification.

**4.2 - Conclusion of inspection**

Should the result of any inspection or test fail to meet the requirements of this specification, the corresponding batch may be rejected.

**5 - Delivery**

**5.1 - Folding and packing of hand-towels**

The purchase order must specify one of the following methods described in Appendix 1. The number of hand-towels shall be  $150 + \frac{5}{0}$  per bundle surrounded with a plain paper strip.

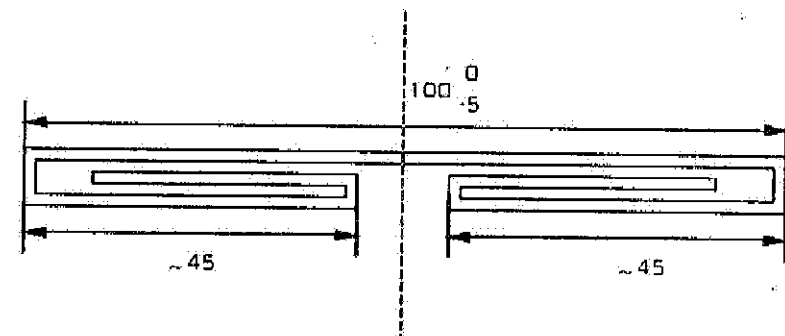
**5.2 - Conditioning and packing**

the method of conditioning and packing of the 150-towel bundles shall be specified in the purchase order or its appended documents.

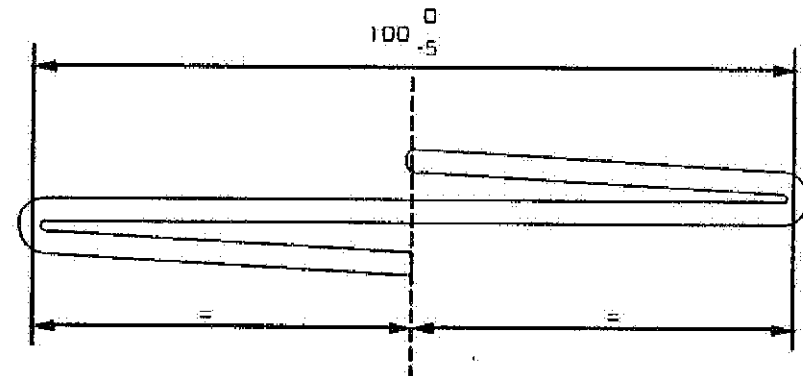
*APPENDIX 1*

**Folding of paper hand-towels (dimensions in mm)**

**Fold A**



**Fold B**



## Application

With effect from 1 September 1980, except :

- points 1.2, 2.2.1, 2.2.2.4, 2.2.2.5, 2.2.3.1, 2.2.3.2,  
2.2.4.1, 5.1, } 1.1.94
- table 1

All Members of the Union.

## Record References

Headings under which the question has been dealt with :

- Revision of UIC Leaflet 890  
(Sub - Committee for Specifications : Paris, 1993).

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