

UIC CODE

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Translation

OR

Standard wagons

Ordinary two-axle wagons - Characteristics

*Wagons unifiés - Wagons à deux essieux d'usage courant - Caractéristiques
Einheitsgüterwagen - Güterwagen der Regelbauart mit zwei Radsätzen - Merkmale*



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

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V - Transport stock

Application:

With effect from 1 October 2004 for new stock to be built
All members of the International Union of Railways

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2nd edition, January 1967	and 3 Amendments.
3rd edition, July 1963	and 1 Amendment.
4th edition, January 1983	Reprint dated 01.01.96 and 4 Amendments.
5th edition, October 2004	Modifications of points 1 and 4. Adaptation to the editor's guide M1.

Important: the articles (points) in this leaflet have been renumbered in the new edition. The first digit of each point has been increased by one (i.e. 0 becomes 1, 1 becomes 2, and so on). Please take account of this change when using cross-references from other leaflets.

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

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Summary

In order to facilitate the operation of services and the use of wagons by customers, UIC member railways shall undertake to abide by the wagon design standardisation characteristics contained in the leaflet, except in the case of very special requirements.

1 - General

- **1.1** - In order to facilitate the operation of services and the use of wagons by customers, UIC members shall undertake to abide by the wagon design standardisation characteristics contained in this leaflet, except in the case of very special requirements.

1.2 - It is recommended that:

- the types of wagons described in this leaflet which are standardised be constructed in accordance with the series of standard drawings managed by ERRI, and
- to improve aerodynamics, the solutions presented in *ERRI Report B 12/ RP 54* (see [Bibliography - page 16](#)) be used where economically viable.

A list of standardised and partially standardised wagons as well as all standardised sub-assemblies and component parts is given in *ERRI Document DG4* (see [Bibliography - page 16](#)).

- **1.3** - The interchangeable parts listed in *UIC Leaflet 570* (see [Bibliography - page 16](#)) shall be used for the construction of wagons.

- **1.4** - Wagons must meet the following operating requirements:

NB : Covered wagons may be subject to additional requirements (see point 2.4 - page 7)

1.4.1 - With regard to wagons in points [2 - page 4](#), [3 - page 8](#), [4 - page 10](#) (except types 2, 3A and 3B) and [5 - page 14](#):

- their resistance and on-track stability must be such that they can be worked at 100 km/h with maximum permitted loads on lines designed for 20 t axle-loads (lines in category C) when these loads are distributed over the entire wagon length;
- the braking system must allow for running under S conditions with loads of 20 t per axle.

1.4.2 - With regard to wagons of types 2, 3A and 3B in point [4](#) (22,5 t axle-loads)

- the resistance of these wagons and their running quality must be such that they can be worked at 100 km/h with maximum permitted loads on lines designed for 22,5 t axle-loads (lines in category D), and at 120 km/h with loads corresponding to 20 t axle-loads, such loads generally being distributed over the entire wagon length;
- the braking system must allow for running under S conditions with loads of 22,5 t per axle.

○ **1.5 - Wagons shall be built:**

- with or without crossing facility,
- with or without screw brake,

in accordance with the conditions laid down in *UIC Leaflet 535-3* (see Bibliography - page 16).

○ **1.6 - The maximum wagon tare, as shown in this leaflet, is that of air-braked wagons and:**

- in the case of wagons with superstructure, incorporating a crossing gangway complying with the provisions of *UIC Leaflet 535-2* (see Bibliography - page 16) and a screw brake which can be operated from this gangway,
- in the case of wagons without superstructure, incorporating crossing steps complying with the provisions of *UIC Leaflet 535-2* and a screw brake which can be operated from the ground.

The minimum tare (not specified in this leaflet) results from the application of the provisions of *UIC Leaflet 530-2* (see Bibliography - page 16), irrespective of whether the wagon is fitted with a crossing gangway and screw brake or not.

○ **1.7 - In respect of covered wagons built to the British gauge, the tare shall also include the lever and vacuum-brake equipment in accordance with the conditions laid down in *UIC Leaflet 549* (see Bibliography - page 16).**

○ **1.8 - The length of the underframe (between buffer fixing planes) laid down in this leaflet refers to wagons without a crossing gangway.**

In all cases, the length of the underframe must have a positive tolerance (in compliance with the corresponding national standard) after manufacture.

○ **1.9 - The uniformly-distributed loads specified in this leaflet must be placed symmetrically in relation to the longitudinal and transverse centre-lines of the wagon and occupy at least 2 m of the floor width.**

Loads resting on two supports must be placed symmetrically in relation to the longitudinal and transverse centre-lines of the wagon, and the supports must occupy at least 2 m of the width and 0,2 m of the floor length.

○ **1.10 - Permanent additional loading gear may only be fitted in the wagons with UIC approval, to determine whether or not the presence of such gear alters the standard characteristics of the wagon. The application to UIC shall be accompanied by:**

1. a detailed description;
2. presentation of a prototype.

○ **1.11 - It must be possible to lift the wagons by either end when loaded, the lifting device being placed under the headstock in line with the solebars.**

2 - Covered wagons

Covered wagons shall be one of the three following types:

Types 1 and 2 (Gbs/Gs):

these types are only suitable for running on lines to the continental gauge;

Type 3 (Hbfs):

this type is also suitable for running on lines to the British gauge.

These wagons must be suitable for the transport of all types of traffic normally conveyed in covered wagons, including livestock traffic.

o 2.1 - Main dimensions

2.1.1 - Type 1 (Gbs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Inside length of floor (minimum)	12,700 m
Inside width of floor (minimum)	2,600 m
Floor area	approx. 33 m ²
Total capacity	approx. 88 m ²
Wheelbase	8,000 m

2.1.2 - Type 2 (Gs)

Length over buffers	10,580 m
Length of underframe	9,340 m
Inside length of floor (minimum)	9,260 m
Inside width of floor (minimum)	2,700 m
Floor area	approx. 25 m ²
Total capacity	approx. 63 m ²
Wheelbase	6,000 m

2.1.3 - Type 3 (Hbfs)

Length over buffers	14,020 m
Length of underframe	12,780 m
Inside length of floor (minimum)	12,700 m
Inside width of floor (minimum)	2,224 m
Floor area	approx. 28 m ²
Total capacity	approx. 67 m ²
Wheelbase	8,000 m

o 2.2 - Load characteristics

2.2.1 - Maximum tare

NB : This value may exceptionally be exceeded when wagons incorporate additional fittings.

Type 1	Type 2	Type 3
14	12,5	14,5

2.2.2 - The wagons must be capable of carrying the following uniformly-distributed loads in the central part of the floor:

Length of load (m)	Load (t)
1,5	14
3	16

o 2.3 - Equipment

2.3.1 - The floor must be made of wood. The side and end walls must be fitted with plywood panels in accordance with *UIC Leaflet 844-3* (see [Bibliography - page 16](#)) or with panels made of material at least equivalent in terms of strength and thermal insulation.

2.3.2 - Wagons of types 1 and 2 must have an inside height of 2,400 m over a width of at least 2,000 m. Type 3 wagons must have an inside height of 2,400 m over a width of at least 1,200 m.

2.3.3 - Wagons shall be fitted with two sliding doors, each situated in the centre of the side walls. These doors must allow for an unobstructed opening with the following dimensions:

	Types 1 and 2	Type 3
Height (m)	2,150	2,000
Width (m)	2,500	2,500

It must be possible to secure these doors in the open and closed positions, as well as in two intermediate positions affording partial openings of 0,15 m and 0,35 m wide respectively. The doors should open from left to right.

2.3.4 - Ventilation apertures

The ventilation apertures, 8 of which must be provided (4 on each side of the wagon) shall be situated at a distance of at least 1,45 m above floor level; the total free area for the passage of air must be at least 2 m².

It must be possible to close these apertures by means of full-section shutters operated from the outside, sliding vertically and able to be secured from the inside of the wagon and sealed from the outside.

They must be provided with:

- fixed slatted shutters or,
- perforated metal gratings and bars. These gratings and bars must be able to fold inwards against the sidewalls.

Whilst ensuring ventilation when the shutters are open, they must:

- prevent the pilfering of small packages when they are raised,
- make it impossible for the animals conveyed to put their head through when the gratings are folded back, the movable bars being in the upraised position.

In order to ensure uniform ventilation, the ventilation apertures shall be arranged as follows. When facing the side of the wagons from the outside, from left to right on each side:

- fixed slatted shutter;
- hinged grating with collapsible bars;
- fixed slatted shutter;
- hinged grating with collapsible bars.

NB : As an exception, DSB, NSB and SJ are authorised, given the climatic conditions arising from their geographical situation, to fix slatted shutters to all ventilation apertures on their covered wagons, at the same time maintaining the greatest possible free area for the passage of air. For similar reasons, FS are authorised to fit their wagons with additional ventilation apertures,

set in the lower part of the side walls; these apertures shall be fitted with fixed slatted shutters which can be closed by means of full-section shutters operated from the outside, sliding in a vertical direction and capable of being fastened from the inside of the wagon.

2.3.5 - Securing devices located in the walls

Type 1 and 3 wagons must be fitted with at least 36 securing devices (hinged-ring or fixed fastening bar) i.e. 18 on each sidewall, with 8 in the upper row and 10 in the lower row.

Type 2 wagons must be fitted with at least 28 securing devices (hinged-ring or fixed fastening bar) i.e. 14 on each sidewall, with 6 in the upper row and 8 in the lower row.

The securing rings must be made of round steel bar with a diameter of at least 14 mm.

When not in use, these devices must not protrude in a way liable to damage the load.

Each securing device in the upper row must be placed vertically above a securing device in the lower row, both rows being fitted at approximately 1,100 mm and 0,350 mm above the floor respectively.

2.3.6 - Wagons may be fitted with securing devices located in the wagon floor.

When such devices are fitted, they must meet the following conditions:

- There must be twelve devices for type 1 wagons and eight for types 2 and 3 wagons respectively.
- They must be evenly distributed along the internal length of the wagon.
- It must be possible to fit onto these devices any type of fastening used to secure the load, without having to employ other auxiliary means.
- Each device must be able to withstand a tensile force of 85 kN exerted at an angle of 45° to the floor surface and of 30° to the longitudinal centre-line of the wagon.
- When not in use, these devices must not protrude above floor level.

2.4 - Operating conditions

Two-axle covered wagons may be suitable for SS running conditions.

o 3 - Open high-sided (Es) wagons

3.1 - Main dimensions

Length over buffers	10,000 m
Length of underframe	8,760 m
Inside length of floor (minimum)	8,760 m
Inside width of floor (minimum)	2,760 m
Floor area	approx. 24 m ²
Total capacity	approx. 36 m ²
Wheelbase	6,000 m

3.2 - Load characteristics

3.2.1 - Maximum tare: 12,5 t

NB : This value may exceptionally be exceeded when wagons incorporate additional fittings.

3.2.2 - The wagons must be capable of carrying the following uniformly-distributed loads in the central part of the floor:

Length of load (m)	Load (t)
1,50	14
3,00	16

3.3 - Equipment

3.3.1 - The wagon shall be built with one door-opening in the centre of each side wall; the opening shall be 1,8 m wide and with no upper rail. The doors should be double doors.

3.3.2 - Each end wall shall consist of a movable door pivoting from above to enable the wagon to be unloaded by tipping.

When the wagon is fitted with a crossing gangway, the end wall adjacent to it may be fixed.

3.3.3 - The wagon must also be suitable for side-tipping at certain installations equipped for this purpose.

3.3.4 - The floor shall be made of wood. A metal or composite floor may however be permitted provided its construction allows scotches to be secured by nailing, is not likely to cause handling staff to slip and does not involve the use of special repair methods.

3.3.5 - No part of the wagon must be more than 3 metres above rail level.

3.3.6 - Securing devices made of round steel bar at least 16 mm in diameter, used for sheeting or securing the load, shall be fixed to the outside of the vehicle body, 8 on each side wall.

4 - Flat (Ks) wagons

Type 1 (Ks):
flat wagons.

Type 2 (Kns/Kjns):
high-cube flat wagons.

Type 3A (Kins/Kijns):
high-cube flat wagons with sliding walls and fixed end-walls, without stanchions.

Type 3B (Kilns/Kijlns):
high-cube flat wagons with movable cover and fixed end walls, without stanchions.

o 4.1 - Main dimensions

4.1.1 - Wagon in type 1

Length over buffers		13,860 m
Length of underframe		12,620 m
Inside length of floor (minimum)		12,500 m
Inside width of floor (minimum)		2,740 m
Floor area		approx. 35 m ²
Height of drop side or end	version 1	0,450 m
<i>To make the drop sides easier to operate, it is recommended that a unit weight of 65 kg be not exceeded.</i>	version 2	0,520 m
Wheelbase		9,000 m

4.1.2 - Wagon in types 2, 3A and 3B

Length over buffers		16,550 m
Length of underframe		15,200 m
Distance between axles		10,000 m
Loading length		
	wagon with shock-absorbing devices	14,500 m
	wagon without shock-absorbing devices	15,100 m
Loading width		2,850 m
Loading with between side walls		minimum 2,700 m
Loading width between stanchions		minimum 2,800 m

Wagon with drop sides loading height = wall height	0,520 m
Wagon with stanchions loading height = stanchion height above wagon floor	minimum 2,000 m
Loading plane	
wagon with shock-absorbing devices	41,3 m ²
wagon without shock-absorbing devices	43,0 m ²
Loading area	approx. 20,3 m ³
Maximum height of loading plane above rail level (empty wagon - new condition)	< 1,200 m

o 4.2 - Load characteristics

4.2.1 - Maximum tare: 14 t

Type 1	Type 2	Types 3A et 3B
13,5 t	16 t	17,5 t

NB : This value may exceptionally be exceeded when wagons incorporate additional fittings.

4.2.2 - The wagon must be capable of carrying uniformly-distributed loads and loads resting on two supports, as follows:

Length of load or distance between supports (in m)	2	3	6	9	12
Uniformly-distributed loads (in tonnes)	16	17	20	26	40 - tare
Loads resting on 2 supports (in tonnes)	18	18	24	40 - tare	13

4.3 - Equipment

o 4.3.1 - Equipment of wagons in types 1, 2, 3A and 3B

4.3.1.1 - Wagons in types 1 and 2 must be fitted with drop sides and drop ends. These fittings must be foldable towards the outside.

4.3.1.2 - Wagons in types 3A and 3B are fitted with high fixed end walls and with sheets. They do not incorporate foldable drop sides and drop ends.

- **4.3.2** - Wagons must be fitted with a wooden floor and/or non-skid floor.
- **4.3.3** - The drop sides and ends when in horizontal position and the floor must be able to withstand a load corresponding to the movement of vehicles over them, under the conditions laid down in *UIC Leaflet 577* (see Bibliography - page 16), that is:

- **4.3.4 - Provision of stanchions**

4.3.4.1 - Wagons in types 1 and 2 must be fitted with side and end stanchions based on one of the designs in *UIC Leaflet 578* (see Bibliography - page 16).

Wagons in types 1 and 2 must be fitted on each lateral face with:

1. 6 stanchions (8 for wagon in type 2),
2. 8 stanchions (10 for wagon in type 2).

NB : Railways shall be considered as having satisfied this obligation concerning side walls if half of the wagons in their fleet, built after 1 January 1958, are equipped with side stanchions.

On each end face:

1. 2 long steel stanchions, as shown in Plate 3 of *UIC Leaflet 578, Plate 2*, or
2. 2 collapsible stanchions to secure the drop ends. (This provision is allowed only for wagons with pivoting side stanchions).

4.3.4.2 - Wagons in type 3A must be fitted with stanchions based on one of the designs in *UIC Leaflet 578*. These stanchions must be foldable and firmly secured to the wagons. When in the down position, they must not exceed the floor height.

4.3.5 - Housing for stowing the stanchions, as per *UIC Leaflet 578*, may be provided beneath the wagon underframe.

- **4.3.6** - Anchoring devices on wagons in types 1 and 2 must comply with the following conditions:

- the rings must be of round steel with a diameter of 16 mm minimum,
- the bars must be of round steel with a diameter of 16 mm minimum,
- the fixtures in the floor must meet the following conditions:
 - they must be uniformly distributed along each of the front walls,
 - it must be possible to fit onto these devices any type of fastening to secure the load without having to employ other auxiliary means,
 - they must be able to withstand a tensile force of 170 kN exerted at an angle of 45° to the floor surface and of 30° to the longitudinal centre-line of the wagon,
 - when not in use, these devices must not protrude above floor level.

- **4.3.7** - Wagons in type 1 and 2 must be fitted with one of the following securing systems, pursuant to the provisions in point **4.3.6** - page 12:
 - rings or bars on the drop sides for sheeting, to the tune of 24 (30 for wagons in type 2) on the drop sides (outer side) and 8 on the drop ends (outer side),
 - 8 rings or bars (4 per side wall - 10 for wagons in type 2) incorporated into the drop sides (inner side),
 - 12 securing devices (16 for wagons in type 2) in the floor.
- **4.3.8** - Wagons in types 3A and 3B must obligatorily be fitted with the following securing devices, pursuant to the provisions in point **4.3.6** above:
 - 2 devices in the floor, on the side of each end wall,
 - 8 devices in the floor, on each side along the length of the wagon, on the outer edge.
- 4.3.9** - Wagons in types 3A and 3B may be fitted with a lateral load-securing system, to prevent lateral load displacement.
- 4.3.10** - Wagons in types 2, 3A and 3B may be fitted with a shock absorbing device for the conveyance of specially fragile products.

5 - Open high-sided/flat composite (Os) wagons

5.1 - Main dimensions

Length over buffers	13,860 m
Length of underframe	12,620 m
Inside length of floor (minimum)	12,610 m
Inside width of floor (minimum) (drop ends or sides raised or folded inwards)	2,856 m
Floor area	approx. 36 m ²
Height of drop sides	0,800 m
Centre height of drop ends	1,100 m
Minimum capacity	28,5 m ³
Wheelbase	8,000 m

5.2 - Load characteristics

5.2.1 - Maximum tare: 14 t

NB : This value may exceptionally be exceeded when wagons incorporate additional fittings.

5.2.2 - The wagon must be capable of carrying uniformly-distributed loads in the central part of the floor:

Length of load (in m)	Load (t)
2	16
5	19
8	23

5.3 - Equipment

5.3.1 - The floor shall be made of wood. A metal or composite floor may however be permitted provided its construction allows scotches to be secured by nailing, is not likely to cause handling staff to slip and does not involve the use of special repair methods.

5.3.2 - The wagons must be fitted with drop ends and sides enabling them to be used as open high-sided wagons with drop ends and sides raised, or as flat wagons with drop ends and sides folded back onto the floor. These drop ends and sides must be of steel plate with a yield strength of 520 N/mm². The plating should be grooved or of similar design, to prevent slipping when folded back towards the outside.

5.3.3 - When the drop sides are folded back towards the outside, it must be possible for vehicles to pass from loading platforms onto the wagon, and when the drop ends are folded back, it must be possible for vehicles to pass from one wagon to another.

5.3.4 - The drop sides and drop ends when in horizontal position as well as the floor, must be able to withstand a load of up to 5 t per wheel when vehicles are passing over them, under the conditions laid down in *UIC Leaflet 531* (see [Bibliography - page 16](#)).

5.3.5 - The sides and ends of the wagons must be provided with stanchions, to support and hold the drop ends and sides in the raised position, as below:

- 10 pivoting steel stanchions, folding along the underframe, as shown in *UIC Leaflet 578, Plate 2*, on each end wall,
- at least 2 long steel stanchions, as shown in *UIC Leaflet 578, Plate 3*, on each end wall.

5.3.6 - 12 sheeting rings, made of round steel bar with a diameter of at least 16 mm, shall be affixed to the outside edge of the floor along each side wall, and 4 along each end wall.

4 securing rings, made of round steel bar with a diameter of at least 16 mm, must also be affixed to the same edge along each side wall.

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ERRI DG4 : Drawings of standardised rolling stock with conditions governing their acquisition and use, 7th edition, July 1996

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