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Translation

OR

Coaches, vans and wagons - Dimensions of buffer heads - Track layout on S-curves

*Voitures, fourgons et wagons - Dimensions des plateaux de tampons - Tracé des courbes en S
Reisezug-, Gepäck- und Güterwagen - Abmessungen der Pufferteller - Linienführung der S-Bogen*



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Summary

This leaflet applies to the wagons, coaches, vans and motive power units of UIC member European Railway Undertakings for standard gauge track as well as for larger track gauges in Spain and in Finland.

It specifies boundary dimensions and the calculations of the width of buffer heads as well as the rules governing track layout on S curves enabling operation of vehicles without the need for special regulations.

1 - Dimensions of buffer heads

o 1.1 - Boundary dimensions

Buffer heads must not exceed the following limits, shown in Appendix [A - page 8](#):

1.1.1 - Towards the outside, the limit of the construction gauge defined, for the vehicle concerned, in the *UIC Leaflet 505* and *UIC Leaflet 506 series*.

1.1.2 - Towards the vehicle centreline:

1.1.2.1 - For wagons, a vertical line situated 600 mm from the vehicle centreline. This limit ensures, generally, the observance of the space to be kept free for the shunter, as defined in *UIC Leaflet 521*;

1.1.2.2 - For coaches and vans, a vertical line situated 540 mm from the vehicle centreline. This limit ensures, generally, the observance of the space to be left free for the shunter, as defined in *UIC Leaflet 521*;

1.1.2.3 - For vehicles with interconnecting gangways, in addition to the vertical line mentioned in point **1.1.2.2**, a line sloping at 60° towards the outside and passing at the level of the horizontal centreline of the buffers at a point 615 mm from the vehicle centreline.

1.1.3 - Towards the ground, a horizontal line situated 250 mm below the centreline of the buffers.

o 1.2 - Calculation of the dimensions of buffer heads

1.2.1 - The buffer heads must completely cover the minimum working surface as shown in Appendix [A - page 8](#).

The curved edges of the buffer heads, the radius of which must not exceed 7 mm ([see point 1.4.8 - page 4](#)), may be accepted as forming a part of the minimum working surface.

1.2.2 - The width Δ of the minimum working surface of the buffer heads shall be calculated on the basis of one of the formulae given in Appendix [B - page 9](#), with the vertical symmetry axis of this working surface at a distance of 875 mm from the vehicle centreline.

1.2.3 - The minimum working surface defined in points **1.2.1** and **1.2.2** above must be observed even if, for special design reasons, the distance between the centrelines of the buffer casings is other than 1 750 mm (e.g. in the case of vehicles accepted for running in transit between France and Spain, or between Finland and standard-gauge RUs).

o 1.3 - General requirements for buffer head materials

Buffers must comply with the requirements set out in appendix [D - page 13](#).

1.3.1 - The roughness value R_a for the surface condition of buffer heads expressed by the mean arithmetic deviation must be ≤ 25 . The hardness value HV of the working surfaces measured at a depth of 0.5 mm must be ≥ 160 . These provisions apply only to buffer heads made of steel.

1.3.2 - Buffer head materials must be compatible with each other and with all buffer heads currently used in service. The list of materials used is given in Appendix E - page 16 and on the UIC Website (<http://www.uic.asso.fr/>)

1.3.3 - The function of buffer head materials must be guaranteed in the temperature range of -40 °C/ +50°C. e.

1.3.4 - Friction conditions between buffer heads and with other materials must not be poorer than with the steel-on-steel combination.

1.3.5 - Buffer head materials must withstand grease, oil, wagon cleaning products and other surrounding influences (e.g. ultra-violet rays).

1.3.6 - Operating safety must be guaranteed with buffer head materials other than steel.

1.3.7 - If the entire surface of the buffer head is not made of the same material, it must be ensured that the transition zone between the two materials does not jeopardise safety.

o 1.4 - Special aspects concerning wagons

1.4.1 - Buffer heads must be convex and the radius of curvature of their spherical working surfaces must be:

- 1 500 mm $\pm$ 100 for wagons built before 31.12.1993 ;
- 2 750 mm $\pm$ 100 for wagons built after 01.01.1994.

1.4.2 - The working surface of buffer heads on new wagons must be symmetrical to the vertical plane passing through the centre-line of the buffer casing and the width of the casing must be chosen from among the standard values given in the tables in points 1.4.3 - page 3 to 1.4.6 - page 4.

1.4.3 - Standard widths of the buffer heads of standard gauge wagons (distance between buffers: 1 750 mm):

Value Δ calculated according to Appendix B	Corresponding standard width
$\Delta \leq 400$ mm	450 mm
$400 < \Delta \leq 550$ mm	550 mm

1.4.4 - Standard widths of buffer heads on wagons accepted for traffic with Spain and complying with the provisions of *UIC Leaflet 430-1* (see Bibliography - page 17) (distance between buffer centres: 1 850 mm): the minimum width Δ' of buffer heads of these wagons must be 100 mm more than the width Δ calculated in accordance with Appendix B - page 9.

Value Δ' $\Delta' = \Delta + 100 \text{ mm}$	Corresponding standard width
$\Delta' \leq 500 \text{ mm}$	550 mm
$500 < \Delta' \leq 650 \text{ mm}$	650 mm

1.4.5 - Standard widths of buffer heads on wagons accepted for traffic with Finland and complying with the provisions of *UIC Leaflet 430-3* (see Bibliography - page 17) (distance between buffer centres: 1 790 mm): the minimum width Δ'' of buffer heads of these wagons must be 40 mm more than the width Δ calculated in accordance with Appendix B.

Value Δ'' $\Delta'' = \Delta + 40 \text{ mm}$	Corresponding standard width
$\Delta'' \leq 400 \text{ mm}$	450 mm
$400 < \Delta'' \leq 550 \text{ mm}$	550 mm

1.4.6 - Standard widths of buffer heads on wagons accepted for traffic with both Spain and Finland: in this case, the provisions of point 1.4.4 above apply.

1.4.7 - The standard height of buffer heads shall be 340 mm, i.e. 170 mm on either side of the centre-line of the casing.

1.4.8 - The buffer heads shall not have any irregularities that might pose problems for shunting staff. The edges of their working surfaces must be rounded with a radius of at least 50 mm and the edge of the buffer head must have a curvature of 5 mm^{+2}_0 .

NB : Document DT 85 compiled by ERRI Experts Committee B 12 defines the profiles of buffer heads with widths of 450, 550 and 650 mm meeting these conditions.

1.4.9 - For buffer heads with widths of 550 or 650 mm, with application of the curvature values specified in point 1.4.8 above, it is no longer possible to comply strictly with the minimum working surface when the calculated value Δ (or Δ' or Δ'') exceeds 524 or 624 mm respectively. The resulting slight reduction in the working surface shall be accepted.