



## 1. General

This standard contains guidelines for determining the mass of wagons required for safe operation for industrial or self-made model wagons. It does not apply to traction units.

The wagon mass must be dimensioned in such a way that the tipping safety is guaranteed for journeys in the usual track curves for model railroad systems, even with subsequent train load.

## 2. Minimum mass

The minimum mass shown in the following table can be used if there are no factors affecting tipping risks. Such negative factors are, for example,

- High center of gravity of the vehicle
- large overhang (distance buffer plate - end axis)
- unfavorable suspension point of the coupling (favorable is a point near the end axis or the rotary pin)
- Coupling suspension on the bogie

**Minimum mass** per mm wagon length via buffer

Scale	Z	N	TT	H0	S	0	I	II
Mass (g/mm)	0.12	0.17	0.25	0.40	0.60	1.00	2.00	4.00

## 3. Increased mass

The car mass according to the table should not be increased by more than 30%. It must be taken into account when compiling trains if it exceeds this margin.

A car mass increased compared to the minimum mass is to be achieved in industrial products by ballast (for example sheet metal plates) if possible. The buyer should be able to easily remove or change the ballast.

## 4. Other criteria

When operating on small track radii and when applying an elevation in the track curve (NEM 114), there is an increased risk of tipping, especially for wagons with the negative factors mentioned in 2. This can be partially compensated by additional ballast (for example loading).

In the case of model vehicles that use buffer-to-buffers in operation, mostly in combination with original coupling replica (NEM 111, paragraph 3.2 and supplement page), this recommendation on wagon mass is mandatory.