Binding Standard

Edition 2016 (20240907)
(First English Edition)

1. Purpose of the Standard

Because of the lines of the rails on model railways, a scaled computation from prototypical dimensions, as is typically done in model vehicle building, can generally not be applied. Particularly noticeable are the disproportionate reduction of curve radii.

A limiting of the curve radius reduction is driven by both retaining a certain amount of visual realism as well as mechanical restrictions from vehicle running characteristics. In contrast, the prototypically significant kinematic influences of running in curves plays almost no role in the model world, especially not when transition curves are deployed in accordance with NEM 113.

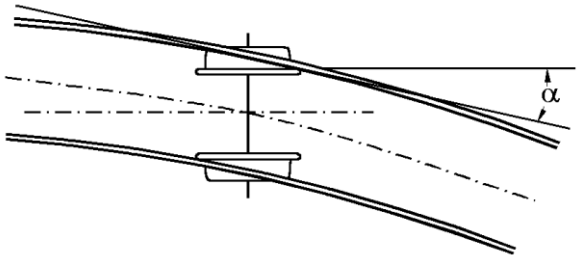
In the establishment of this standard, focus was solely on the mechanical requirements of curve running without consideration of the subjective impressions of realistic appearance.

Thus the minimum radii indicated here should only be utilized in unavoidable circumstances and generally the largest permissible radius should be chosen.

2. Dependency between Vehicle and Curve Radius

2.1 Vehicles with Fixed Wheelbase

On vehicles without radially adjustable end axels, the striking angle (α) of the wheel against the rail is authoritative (see figure). It should not exceed 12°.



To limit the frictional resistance and to maintain the protection against derailment, the minimum radii in curves should not go below the values listed in the table.

2.2 Vehicles with Bogies

On vehicles with bogies, the general mounting method and the lateral deflection of the couplers limit the rotational range of the bogies.

Observance of the minimum radii from the table will also lead to satisfactory curve running in vehicles with bogies.

3. Minimal Curve Radii

3.1 Vehicles with short couplers in accordance with NEM 352 or with model couplers that enforce a distance between buffers

Because of the previously named relationships, and resulting from track type and wagon group (NEM 301) the following minimum curve radii recommendations are established (G = gauge according to NEM 110):

	Normal gauge wagon group			Narrow gauge
	A	B	C	
Smallest permitted curve radius	21.5 G	25 G	30 G	15 G
Recommended smallest curve radius				
- for sidings in stations / yards	25 G	30 G	35 G	20 G
- for primary track on branch lines	30 G	35 G	40 G	25 G
- for primary track on main lines	35 G	40 G	45 G	30 G

3.2 Vehicles with replicas of the UIC-Pull and Push Assembly, wherein the side buffers may be in contact

Prerequisites:
- Car minimum mass according to NEM 302
- Transition curves according to NEM 113 or intermediary straights > longest vehicle
- Buffer plates according to NEM 303, Number 3 (Buffer to scale of the prototype)
- Draw hook rod opening according to NEM 370
- Sprung buffer
- Loosely coupled (distance between the buffers with extended draw hook > 0.07 G)
- Explanation supplement to NEM 111

Car Group und Minimum Radius

For this operating mode the car group A, according to NEM 301, is to be further subdivided, producing the following minimum radii:

Group	Typ of Construction	Prototype Dimension			Minimum Radius R min [x * G]
		max. length over buffer m	max. box length m	max. bogie pivot spacing / wheelbase m	
A1	2 axel cars	9.8		5.0	50
A2	2 und 3 axel cars	14.6		8.0	57
A3		17.5		10.0	71
A	Bogie cars	20.3	20.0	14.0	57
B		24.5	24.2	17.2	60
C		27.5	27.2	19.5	84

Note:

The vehicle groups according to NEM 301 are defined on the basis of the bogie pivot spacing of the vehicles, as this is decisive for the extension of the clearance in the curve.
The vehicle group definition was transferred from NEM 103 to NEM 301 with the 2024 editions.

In contrast, for the buffer on buffer operations the length from buffer to buffer is authoritative, which is why these values are introduced here and shown alongside the box lengths.