

NMRA STANDARDS
S-1.2 Standards for Scale Models

NMRA STANDARD	
General	
Standard Scales	
July 2009	S-1.2

Standard Scale models are those which follow the popular standards scales. This Track and Wheel system sacrifices some scale fidelity of the actual wheel tread profile and track work to improve operation and interchangeability. These are the scales originally developed by the NMRA in 1940s. Only scales, which are maintained by the NMRA Technical Department, are included. Other popular scale standards (for example No.II) are maintained by MOROP in their NEM standards (see www.morop.org).

NAME OF SCALE		SCALE TO FOOT	PROPORTION	TRACK GAUGE		REMARKS
Alpha Numeric	Common/Fractional			Min	Max	
	1"	1" (25.40 mm)	1:12	4.750" (120.65 mm)	4.910" (124.71 mm)	
	3/4"	.750" (19.01 mm)	1:16	3.500" (88.90 mm)	3.605" (91.56 mm)	
F	15 mm	.591" (15.00 mm)	1:20.32	2.783" (70.69 mm)	2.845" (72.26 mm)	(See Note 1)
Fn3	15 mm	.591" (15.00 mm)	1:20.32	1.766" (44.85 mm)	1.793" (45.54 mm)	(See Note 2)
LS	Varied	.375" (9.52 mm)	Varied	1.766" (44.85 mm)	1.793" (45.54 mm)	(See Note 3)
LSn3	Varied	.375" (9.52 mm)	Varied	1.125" (28.6 mm)	1.167" (29.64 mm)	(See Note 3)
O	1/4"	.250" (6.35 mm)	1:48	1.250" (31.75 mm)	1.285" (32.64 mm)	
On3	1/4"	.250" (6.35 mm)	1:48	.750" (19.05 mm)	.772" (19.61 mm)	
On30	1/4"	.250" (6.35 mm)	1:48	.649" (16.50 mm)	.672" (17.07 mm)	(See Note 4)
On2	1/4"	.250" (6.35 mm)	1:48	.500" (12.70 mm)	.522" (13.26 mm)	
S	3/16"	.188" (4.76 mm)	1:64	.883" (22.43 mm)	.905" (22.99 mm)	
Sn3	3/16"	.188" (4.76 mm)	1:64	.563" (14.30 mm)	.585" (14.86 mm)	
OO	4.0mm	.157" (4.0 mm)	1:76.2	.750" (19.05 mm)	.772" (19.61 mm)	(See Note 5)
HO	3.5mm	3.5 mm (.1378")	1:87.1	.649" (16.50 mm)	.672" (17.07 mm)	
HOn3	3.5mm	3.5mm (.1378")	1:87.1	.413" (10.49 mm)	.424" (10.77 mm)	
HOn2	3.5mm	3.5mm (.1378")	1:87.1	.276" (7.01mm)	.290" (7.37 mm)	

NAME OF SCALE		SCALE TO FOOT	PROPORTION	TRACK GAUGE		REMARKS
Alpha Numeric	Common/ Fractional			Min	Max	
TT	1/10"	.100" (2.54 mm)	1:120	.470" (11.94 mm)	.483" (12.27 mm)	
TTn42	1/10"	.100" (2.54 mm)	1:120	.353" (8.97mm)	.367" (9.32 mm)	(See Note 6)
TTn3	1/10"	.100" (2.54 mm)	1:120	.300" (7.62 mm)	.314" (7.98 mm)	
N		.075 (1.91 mm)	1:160	.353" (8.97mm)	.367" (9.32 mm)	
Nn3		.075 (1.91 mm)	1:160	.256" (6.50 mm)	.260" (6.60 mm)	
Nn2		.075 (1.91 mm)	1:160	.177" (4.50 mm)	.189" (4.80 mm)	
Z		.055" (1.40 mm)	1:220	.257" (6.53 mm)	.270" (6.86 mm)	

Notes:

1. Proto:20.32 and F are the same other than flange depth.
2. To ensure compatibility with #1 scale track, Fn3 uses LS scale wheel and track geometries as specified in S-3.2 and S-4.2. However the minimum wheel width, maximum flange depth and minimum flange clearance differ between the two scales.
3. The term LS (Large Scales) is used to refer to range of scales developed to be able to be operated together, typically in an outdoors setting, for example a garden. LS models all use the same wheel and track profiles to facilitate interchange.
4. On30 uses HO scale wheel and track geometries, as specified in S-3.2 and S-4.2.
5. OO uses On3 scale wheel and track geometries, as specified in S-3.2 and S-4.2. OO as practiced in the US is historically based on US prototypes at 4mm scale and using 19.05mm gage. There exist other gages for 4mm modeling used in the world with respective societies governing their standards. Principle among the options is the 16.2mm and 16.5mm gage OO scale, the 18.2mm gage EM scale, and S4/P4 proto scale having 18.83mm gage. Consult The Double O Gauge Association, The E.M. Gauge Society Ltd., and The Scalefour Society for standards and other information. Manufacturers are encouraged to label both the scale and the gauge for these models.
6. TTn42 uses N scale wheel and track geometries, as specified in S-3.2 and S-4.2.