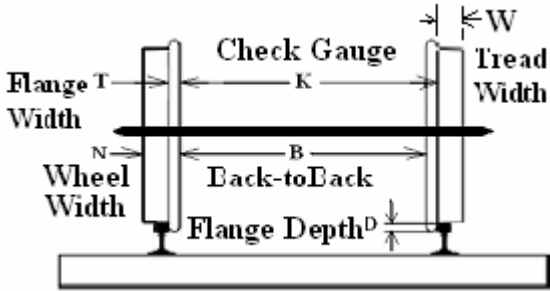


*GRAPHIC for S3.x TRACK*



*GRAPHIC for S4.x WHEELS*

*'Wmin' is the wheel tread = Nmin-Tmax  
Used in verification of track Gmax allowance*

# LARGE SCALES Standards D R A F T v1.6

## TRACK (S3.2 Standard Scale):

Scale	Scale Ratio	Standard S3.2 Guarded using Target and Asymmetric <b>Imperial (inch)</b> Tolerance												
		G			C			S			F			H
		Gage at Frog			Check Gage			Span			Flangeway			
		Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	MIN
LS	Varied	1.772	0.010	0.006	1.652	0.010	0.004	1.537	0.018	0.002	0.116	0.002	0.025	0.118

Scale	Scale Ratio	Standard S3.2 Guarded using Target and Asymmetric <b>METRIC (mm)</b> Tolerance												
		G			C			S			F			H
		Gage at Frog			Check Gage			Span			Flangeway			
		Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	MIN
LS	Varied	45.00	0.25	0.15	42.00	0.25	0.10	39.04	0.46	0.05	2.95	0.05	0.64	3.00

## WHEELS (S4.2 Standard Scale):

Scale	Scale Ratio	Standard S4.2 Wheels using Target and Asymmetric <b>Imperial (inch)</b> Tolerance												
		K			B			N		D	T			
		Target	Plus	Minus	Target	Plus	Minus	Min	Max	Max	Nom	Plus	Minus	
LS	Varied	1.633	0.015	0.014	1.575	0.019	0.015	0.236	0.271	0.066	0.059	0.002	0.018	

Scale	Scale Ratio	Standard S4.2 Wheels using Target and Asymmetric <b>Metric (mm)</b> Tolerance												
		K			B			N		D	T			
		Target	Plus	Minus	Target	Plus	Minus	Min	Max	Max	Nom	Plus	Minus	
LS	Varied	41.48	0.38	0.36	40.00	0.48	0.38	6.00	6.88	1.68	1.50	0.05	0.46	

Relationships Tests		#1	#2	#3	#4	#5	#6	#7
LS	Sx.2	0.050	0.000	0.000	0.000	0.005	0.030	0.073

**Imperial Tests**

#1 Gmin - Bmax - 2Tmax      #3 Gmin - Fmax - Cmin      #5 Bmin - Smax      #7 Kmin + Nmin - Gmax  
 #2 Cmin - Kmax      #4 Nmin - 2Fmax      #6 Fmin - Tmax

1.648    1.648

#8	#9	ALL tests <b>MUST</b> equal zero or positive
0.052	0.196	

Relationships Tests		#1	#2	#3	#4	#5	#6	#7
LS	Sx.2	1.27	0.04	0.05	0.00	0.12	1.87	1.87

**Metric Tests**

#1 Gmin - Bmax - 2Tmax      #3 Gmin - Fmax - Cmin      #5 Bmin - Smax      #7 Kmin + Nmin - Gmax  
 #2 Cmin - Kmax      #4 Nmin - 2Fmax      #6 Fmin - Tmax

0.000    6.380

#8	#9	ALL tests <b>MUST</b> equal zero or positive
1.3	5.8	

### LS Track NOTES:

- 1) The term "LS" for "Large Scales" standards covers all common commercial scales running on LS 45mm gauge track (1:32, 1:29, 1:24, 1:22.5, and 1:20.3) without regard as to whether the trains are standard or narrow gauge.
- 2) Due to the inherent nature of large scale trains, the wheel and track standards for "Standard" (Sx.2) and "Deep Flange" (Sx.3) are identical except in terms of flange width and depth, thus the track H depth also is changed.
- 3) With regard to 1:20.3 (also designated "F" scale), trains built to that scale running on LS 45mm gauge track are also classified Fn3. Standards for Fn3 track and wheels are identical to those for LS, with exception given to more specific targets given for tread width and flange depth. Track standards for Fn3 are to be identical to those used for LS 45mm gauge.

### LS Wheel NOTES:

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- 3) Developing a single wheel profile for all of large scale is not recommended nor needed due to the fact that there are multiple scales running on the same LS 45mm gauge track. Each scale has developed its own scale-specific profile, all of which conform to LS 45mm gauge standard.
- 4) While there is a stated “target” wheel width, manufacturers should take into consideration the scale of their models in determining where in that spectrum their wheels would best fall. For instance, .271” scales out to the proper width for a 5.5” wheel in 1:20.3, but would be oversized for a 1:32 model, for which .236” is more appropriate.
- 5) With regard to 1:20.3 (also designated "F" scale), trains built to that scale running on LS 45mm gauge track are also classified Fn3. Standards for Fn3 wheels are identical to those for LS, with exception the wheels are given more specific targets for tread width and flange depth. Track standards for Fn3 are to be identical to those used for LS 45mm gauge.
- 6) The standards do not specify a fillet between the tread and flange, but common practice has proven such to be beneficial to the performance of the wheel. A fillet radius between .020” and .030” depending on the proportional width of the tire is highly recommended.
- 7) A wheel tread taper of 3 degrees is recommended for all wheels.
- 8) It is traditionally viewed in the large scale community that the back-to-back spacing on the wheels is a primary dimension. Should a manufacturer opt to use flanges closer to the specified maximums, it is understood that the back-to-back spacing may have to be narrowed from target to compensate and still fall within check-gauge tolerances for the wheels. The adjusting of the back-to-back spacing in production is highly recommended to meet the target wheel check gauge (‘K’) specification.

*NOTE: Standards will include and show F and Fn3 (1:20.3) separately from LS standards. The Fn3 (45mm gage) is the same as LS standards except only for S3.2 and S4.2 but not for the Sx.3. The F (70,69mm gage) is distinctly a separate designation.*

# LARGE SCALES Standards D R A F T v1.6

## LARGE SCALES Draft version 1.4 – Based on Committee Recommendations

### TRACK (S3.3 Deep Flange):

Scale	Scale Ratio	Standard S3.3 Guarded using Target and Asymmetric <b>Imperial (inch)</b> Tolerance												
		G			C			S			F			H
		Gage at Frog			Check Gage			Span			Flangeway			
		Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	MIN
LS	Varied	1.772	0.010	0.006	1.652	0.010	0.004	1.537	0.018	0.002	0.116	0.002	0.025	0.118

Scale	Scale Ratio	Standard S3.3 Guarded using Target and Asymmetric <b>METRIC (mm)</b> Tolerance												
		G			C			S			F			H
		Gage at Frog			Check Gage			Span			Flangeway			
		Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	Target	Plus	Minus	MIN
LS	Varied	45.00	0.25	0.15	42.00	0.25	0.10	39.04	0.46	0.05	2.95	0.05	0.64	3.00

### WHEELS (4.3 Deep Flange):

Scale	Scale Ratio	Standard S4.3 Wheels using Target and Asymmetric <b>Imperial (inch)</b> Tolerance											
		K			B			N		D	T		
		Target	Plus	Minus	Target	Plus	Minus	Min	Max	Max	Nom	Plus	Minus
LS	Varied	1.633	0.015	0.014	1.575	0.019	0.015	0.236	0.271	0.118	0.074	0.002	0.014

Scale	Scale Ratio	Standard S4.3 Wheels using Target and Asymmetric <b>Metric (mm)</b> Tolerance											
		K			B			N		D	T		
		Target	Plus	Minus	Target	Plus	Minus	Min	Max	Max	Nom	Plus	Minus
LS	Varied	41.48	0.38	0.36	40.00	0.48	0.38	6.00	6.88	3.00	1.88	0.05	0.36

Relationships Tests	#1	#2	#3	#4	#5	#6	#7
LS	0.020	0.000	0.000	0.000	0.005	0.015	0.073

Sx.3  
**Imperial Tests**  
 #1 Gmin - Bmax - 2Tmax      #3 Gmin - Fmax - Cmin      #5 Bmin - Smax      #7 Kmin + Nmin - Gmax  
 #2 Cmin - Kmax  
 1.648    1.648      #4 Nmin - 2Fmax      #6 Fmin - Tmax

#8 0.000	#9 0.193	ALL tests MUST equal zero or positive
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Relationships Tests	#1	#2	#3	#4	#5	#6	#7
LS	0.51	0.04	0.05	0.00	0.12	1.87	1.87

Sx.2  
**Metric Tests**  
 #1 Gmin - Bmax - 2Tmax      #3 Gmin - Fmax - Cmin      #5 Bmin - Smax      #7 Kmin + Nmin - Gmax  
 #2 Cmin - Kmax  
 0.000    6.380      #4 Nmin - 2Fmax      #6 Fmin - Tmax

#8 0.0	#9 5.5	ALL tests MUST equal zero or positive
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