



Ron • Bending

Contact Wagner regarding fabricated tube railings.

RAILING FORMULAS

The following railing formulas may be used to determine maximum post spacing under a uniform load and stress at the base of the post under a concentrated load. Consult your local code to determine your structural requirements.

Uniform Load:

$$L = \frac{f_s \times S}{w/12 \times h}$$

Result will provide you with the maximum allowable span between the post centerlines.

Concentrated Load:

$$f = \frac{F \times h}{S}$$

Result will provide you with the stress at the base of the post. Compare to *Allowable Stress* for the aluminum alloy to determine it's suitability.

- L = Span between centerline of posts (inches)
- f = Unit Stress (psi)
- f_s = Allowable Stress (psi)
- S = Section Modulus (in³)
- w = Uniform Load (lb/ft)
- F = Concentrated Load (lb)
- h = Post Height (inches)

Load Distribution:

In pipe railing load distribution is fairly uniform. On railings having two or fewer spans, multiply the concentrated load (F) by .85 for end posts and .65 for intermediate posts. On railings having three or more spans, multiply the concentrated load (F) by .84 for end posts and .60 for intermediate posts.

Aluminum Alloy	Allowable Stress (psi)	Minimum Yields (psi)	Modulus of Elasticity (psi x 10 ⁶)
6061-T6 Pipe	24,000	35,000	10.0
6063-T6 Pipe	18,000	25,000	10.0

Pipe Size	Schedule	Outside Diameter	Inside Diameter	Wall	Section Modulus
1½"	40	1.900"	1.610"	.145"	.326 in ³
1½"	80	1.900"	1.500"	.200"	.412 in ³

For current information regarding the *Americans with Disabilities Act Accessibility Guidelines*, refer to page 264.



WAGNER RAIL SYSTEM

GLASS RAILING

CABLE RAILING

SPIRAL STAIRS BALCONIES

ALUMINUM RAILINGS

BRASS / SS FITTINGS