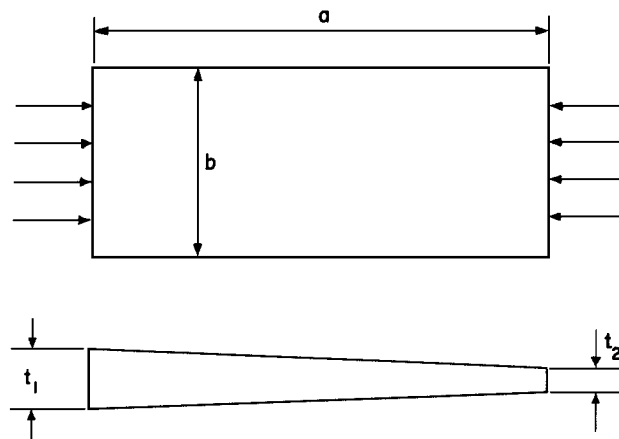


BUCKLING STRESS COEFFICIENTS FOR FLAT RECTANGULAR PLATES TAPERED IN THICKNESS, UNDER COMPRESSION

1. NOTATION

a	length of plate (see Sketch 1.1)	m	in
b	width of plate (see Sketch 1.1)	m	in
E	modulus of elasticity of plate material	N/m ²	lbf/in ²
f	compressive stress at thin end of plate	N/m ²	lbf/in ²
K	buckling coefficient defined by $f = KE\left(\frac{t_2}{b}\right)^2$		
t_1	plate thickness at thick end of plate (see Sketch 1.1)	m	in
t_2	plate thickness at thin end of plate (see Sketch 1.1)	m	in
ν	Poisson's ratio of plate material (assumed to be 0.3)		

Both SI and British units are quoted but any coherent system of units may be used.



Sketch 1.1 Flat rectangular plate tapered in thickness under compressive loading

2. NOTES

Figures 1, 2, 3 and 4 give elastic buckling coefficients, K , for flat rectangular plates tapered longitudinally in thickness, see Sketch 1.1, and carrying a constant longitudinal compressive loading ft_2 distributed uniformly across the width. The buckling coefficient, K , is plotted against the ratio a/b for a range of values of the thickness ratio t_1/t_2 and for various edge conditions.

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Full lines in the figures correspond to plates having no restraint against transverse displacement of the sides. Broken lines correspond to plates having the sides fully constrained against transverse displacement.

For stress in the plastic range the curves will give a conservative result if the tangent modulus appropriate to the stress at the thin end of the plate is substituted for E .

3. DERIVATION

1. POPE, G.G. The buckling of plates tapered in thickness. ARC R & M 3309, 1963.