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Geometric stress concentration factors: two adjacent unreinforced circular holes in infinite flat plates

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THE PREPARATION OF THIS DATA ITEM

The work on this particular Item, which supersedes Item No. 66035, was monitored and guided by the Stress Analysis and Strength of Components Committee which first met in 1964 and now has the following constitution:

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GEOMETRIC STRESS CONCENTRATION FACTORS: TWO ADJACENT UNREINFORCED CIRCULAR HOLES IN INFINITE FLAT PLATES

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GEOMETRIC STRESS CONCENTRATION FACTORS: TWO ADJACENT UNREINFORCED CIRCULAR HOLES IN INFINITE FLAT PLATES

1. NOTATION

c	shortest distance from smaller hole centre to edge of large hole	m	in
f_R	maximum direct stress acting along boundary of hole radius R	N/m ²	lbf/in ²
f_r	maximum direct stress acting along boundary of hole radius r	N/m ²	lbf/in ²
f_{ref}	reference stress (see Table 2.1)	N/m ²	lbf/in ²
f_x	uniform direct stress in plate, remote from holes, acting in x -direction	N/m ²	lbf/in ²
f_y	uniform direct stress in plate, remote from holes, acting in y -direction	N/m ²	lbf/in ²
K_R	stress concentration factor defined by $f_R = K_R f_{ref}$		
K_r	stress concentration factor defined by $f_r = K_r f_{ref}$		
q	shear stress in plate, remote from holes, acting parallel to x - and y -directions	N/m ²	lbf/in ²
R	radius of larger hole	m	in
r	radius of smaller hole	m	in
α	angle between x -axis and line connecting hole centres	degree	degree

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

Sign convention, tensile and shear stresses positive, compressive stresses negative.