

## Simply supported thin square plate

**REFERENCE** Selected Benchmarks for Forced Vibration, Ref . R0016, NAFEMS, Glasgow, 1993

**MODEL FILENAME** Thin square plate\_TrMod.nfx

A dynamic system consisting of a thin square cantilever plate is shown in Figure 1. Time-variation of the load is selected: a transient step load. Load is uniformly distributed spatially and applied in the transverse direction of the plate. The peak displacement and stress are obtained either in the time domain. The results are obtained at the center point using modal superposition method. The results from the NAFEMS benchmark problems are taken as reference.

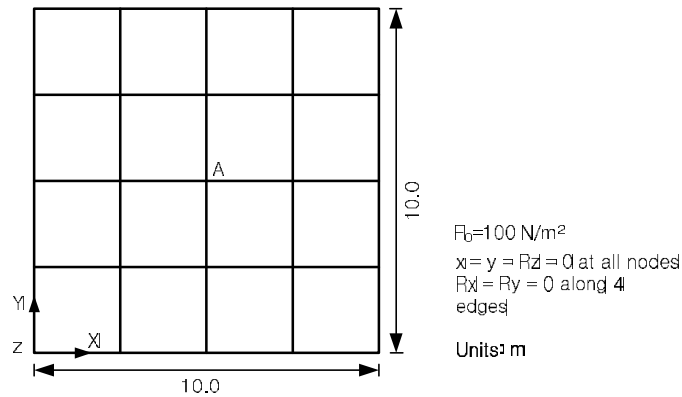


Figure 1. Simply supported thin square plate model

Material data	Young's modulus	$E = 200 \text{ GPa}$
	Poisson's ratio	$\nu = 0.3$
	Density	$\rho = 8000 \text{ kg/m}^3$
	Modal damping	$\xi = 0.02$
Section property	Thickness	$t = 0.05 \text{ m}$
Forcing function	Transient	$F = F_0 \quad t > 0$

Table 1. Peak responses of thin plate subjected to transient step load

		Peak $u_z^A$ [mm]	Peak Time [sec]	Peak $\sigma^A$ [MPa]	Static $u_z^A$ [mm]
Reference		<b>3.523</b>	<b>0.210</b>	<b>2.484</b>	<b>1.817</b>
Element type	Number of elements	Modal	Modal	Modal	Modal
QUAD-4	8x8	<b>3.487</b>	<b>0.212</b>	<b>2.435</b>	<b>1.770</b>