

Table 8-2 Summary of damping values^a

Figure	Sample	Damping factor, ξ							
		Sample size	Standard deviation	Maximum	Average	50% Above	75% Above	90% Above	Minimum
8-14	Suspension bridges	64	0.129	0.0839	0.0117	0.0061	0.0036	0.0024	0.0021
8-15	Steel towers	21	0.0057	0.0286	0.0086	0.0064	0.0048	0.0032	0.0016
8-15	Concrete towers	3	0.0040	0.0191	0.0138	—	—	—	0.0095
8-15	All towers	24	0.0058	0.0286	0.0092	0.0080	0.0051	0.0032	0.0016
8-16	Low excitation, steel buildings	42	0.0105	0.0370	0.0151	0.0130	0.0060	0.0038	0.0029
8-16	Low excitation, concrete buildings	8	0.0070	0.0310	0.0170	0.0140	0.0110	—	0.0100
8-16	Earthquake excitation, steel buildings	24	0.0234	0.1130	0.0510	0.0400	0.0320	0.0200	0.0200
8-16	Earthquake excitation, concrete buildings	34	0.0362	0.1640	0.0685	0.0600	0.0400	0.0200	0.0170
8-16	Low excitation, all buildings	50	0.0100	0.0370	0.0154	0.0130	0.0070	0.0040	0.0029
8-16	Earthquake excitation, all buildings	58	0.0327	0.1640	0.0613	0.0520	0.0350	0.0200	0.0170
8-16	All buildings	108	0.0338	0.1640	0.0400	0.0300	0.0130	0.0060	0.0029
8-17	1- to 10-story steel buildings	54	0.0151	0.0600	0.0257	0.0240	0.0110	0.0060	0.0040
8-17	10- to 20-story steel buildings	52	0.0298	0.2000	0.0253	0.0180	0.0073	0.0060	0.0040
8-17	Over 20-story steel buildings	141	0.0109	0.0500	0.0174	0.0144	0.0092	0.0055	0.0020
8-17	1- to 10-story concrete buildings	116	0.0210	0.1240	0.0266	0.0210	0.0148	0.0100	0.0050
8-17	10- to 20-story concrete buildings	69	0.0255	0.1050	0.0319	0.0214	0.0121	0.0096	0.0069
8-17	Over 20-story concrete buildings	81	0.0252	0.1100	0.0257	0.0140	0.0100	0.0080	0.0040
8-17	All 0- to 10-story buildings	170	0.0193	0.1240	0.0263	0.0211	0.0140	0.0085	0.0040
8-17	All 10- to 20-story buildings	121	0.0276	0.200	0.0290	0.0200	0.0110	0.0070	0.0040
8-17	All over 20-story buildings	222	0.0179	0.110	0.0204	0.0141	0.0100	0.0065	0.0020
8-17	All buildings	513	0.0214	0.200	0.0244	0.0180	0.0110	0.0070	0.0020
8-18	Power-plant piping	162	0.0312	0.1770	0.0399	0.0310	0.0190	0.0080	0.0020
8-19	Heat-exchanger tubing, in air	73	0.0145	0.0796	0.0169	0.0120	0.0079	0.0060	0.0020
8-19	Heat-exchanger tubing, in water	84	0.0110	0.0535	0.0196	0.0170	0.0100	0.0073	0.0051
8-19	All heat-exchanger tubing	157	0.0128	0.0796	0.0183	0.0148	0.0092	0.0066	0.0020
8-20	Steam generator	36	0.0123	0.0507	0.0207	0.0194	0.0092	0.0076	0.0066
8-21	Aluminum skin-stringer panels	116	0.0059	0.0380	0.0164	0.0153	0.0130	0.0100	0.0055
8-21	Titanium skin-stringer panels	21	0.0049	0.0275	0.0168	0.0156	0.0123	0.0094	0.0084
8-21	All skin-stringer panels	137	0.0058	0.0380	0.0165	0.0155	0.0120	0.0100	0.0055
8-22	Aluminum honeycomb panels	26	0.0038	0.0270	0.0186	0.0180	0.0150	0.0130	0.0130
8-22	Graphite-epoxy honeycomb panels	42	0.0050	0.0233	0.0111	0.0094	0.0070	0.0060	0.0050
8-22	Kevlar honeycomb panels	7	0.0053	0.0277	0.0193	0.0155	0.0136	—	0.0136
8-22	All honeycomb panels	75	0.0060	0.0277	0.0145	0.0150	0.0083	0.0069	0.0050

^a See figures for references. 50% Above = Median value, that is, value such that 50% of damping factors exceed this value. 75% Above = Semi-Quartile value, that is, value such that 75% of damping factors exceed this value. The Average, 50% Above, and 75% Above values are recommended for design.