



SC804 Loading Tables

EN13381-6: Concrete Filled Hollow Columns



Table I
Fire Resistance Period: 30 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	0.932	0.717	0.539	0.391	0.359	0.336	0.334	0.264	0.256	0.202	0.202	0.202	0.202	0.202
3.5	0.900	0.677	0.507	0.373	0.344	0.323	0.321	0.258	0.251	0.202	0.202	0.202	0.202	0.202
4.0	0.846	0.610	0.452	0.342	0.319	0.302	0.300	0.248	0.242	0.202	0.202	0.202	0.202	0.202
4.5	0.791	0.544	0.398	0.312	0.293	0.280	0.278	0.238	0.233	0.202	0.202	0.202	0.202	0.202
5.0	0.737	0.477	0.343	0.281	0.268	0.258	0.257	0.228	0.225	0.202	0.202	0.202	0.202	0.202
5.5	0.683	0.411	0.289	0.251	0.243	0.237	0.236	0.218	0.216	0.202	0.202	0.202	0.202	0.202
6.0	0.629	0.345	0.235	0.220	0.217	0.215	0.215	0.208	0.207	0.202	0.202	0.202	0.202	0.202
6.3	0.596	0.305	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
6.5	0.590	0.303	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
7.0	0.576	0.300	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
7.5	0.562	0.296	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
8.0	0.547	0.292	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
8.5	0.533	0.288	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
9.0	0.519	0.285	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
9.5	0.504	0.281	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
10.0	0.490	0.277	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
10.5	0.475	0.273	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
11.0	0.461	0.270	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
11.5	0.447	0.266	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
12.0	0.432	0.262	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
12.5	0.418	0.258	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
13.0	0.403	0.255	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
13.5	0.389	0.251	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
14.0	0.375	0.247	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
14.5	0.360	0.243	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
15.0	0.346	0.240	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
15.5	0.331	0.236	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
16.0	0.317	0.232	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
16.5	0.303	0.228	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
17.0	0.288	0.225	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
17.5	0.274	0.221	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
18.0	0.260	0.217	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
18.5	0.245	0.213	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
19.0	0.231	0.210	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
19.5	0.216	0.206	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202
20.0	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

PLEASE NOTE: The critical temperatures in this loading table are as defined for offices in accordance with BS5950-8:2003 as per Table 18 of the ASFP 5th Edition Yellow Book. The Yellow book also gives new critical temperatures to comply with several different building uses either to the Eurocodes for steel design or BS5950-8:2003. Alternative loadings tables to other critical temperatures are available from the Nullifire Technical Desk on request.



SC804 Loading Tables

EN13381-6: Concrete Filled Hollow Columns



Table 2
Fire Resistance Period: 45 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	1.787	1.513	1.279	1.079	1.035	1.005	1.001	0.908	0.898	0.737	0.679	0.587	0.414	0.223
3.5	1.749	1.469	1.230	1.026	0.981	0.950	0.947	0.851	0.841	0.685	0.633	0.550	0.393	0.221
4.0	1.686	1.395	1.148	0.937	0.890	0.859	0.855	0.757	0.746	0.599	0.556	0.488	0.359	0.218
4.5	1.623	1.321	1.065	0.848	0.800	0.768	0.764	0.662	0.651	0.513	0.479	0.426	0.325	0.214
5.0	1.559	1.247	0.983	0.759	0.709	0.676	0.672	0.568	0.556	0.426	0.402	0.364	0.291	0.211
5.5	1.496	1.174	0.901	0.670	0.619	0.585	0.581	0.473	0.461	0.340	0.325	0.301	0.257	0.207
6.0	1.433	1.100	0.819	0.581	0.528	0.493	0.489	0.378	0.366	0.254	0.248	0.239	0.223	0.204
6.3	1.395	1.056	0.770	0.527	0.474	0.439	0.434	0.322	0.310	0.202	0.202	0.202	0.202	0.202
6.5	1.378	1.043	0.761	0.523	0.470	0.435	0.431	0.320	0.308	0.202	0.202	0.202	0.202	0.202
7.0	1.334	1.012	0.741	0.511	0.460	0.426	0.422	0.316	0.304	0.202	0.202	0.202	0.202	0.202
7.5	1.291	0.981	0.720	0.499	0.450	0.418	0.414	0.311	0.300	0.202	0.202	0.202	0.202	0.202
8.0	1.247	0.950	0.699	0.487	0.440	0.409	0.405	0.307	0.296	0.202	0.202	0.202	0.202	0.202
8.5	1.204	0.919	0.678	0.475	0.430	0.401	0.397	0.302	0.292	0.202	0.202	0.202	0.202	0.202
9.0	1.160	0.887	0.658	0.463	0.420	0.392	0.388	0.298	0.288	0.202	0.202	0.202	0.202	0.202
9.5	1.117	0.856	0.637	0.451	0.410	0.383	0.380	0.294	0.284	0.202	0.202	0.202	0.202	0.202
10.0	1.073	0.825	0.616	0.440	0.400	0.375	0.371	0.289	0.281	0.202	0.202	0.202	0.202	0.202
10.5	1.030	0.794	0.596	0.428	0.390	0.366	0.363	0.285	0.277	0.202	0.202	0.202	0.202	0.202
11.0	0.986	0.763	0.575	0.416	0.380	0.357	0.355	0.281	0.273	0.202	0.202	0.202	0.202	0.202
11.5	0.942	0.732	0.554	0.404	0.371	0.349	0.346	0.276	0.269	0.202	0.202	0.202	0.202	0.202
12.0	0.899	0.701	0.533	0.392	0.361	0.340	0.338	0.272	0.265	0.202	0.202	0.202	0.202	0.202
12.5	0.855	0.669	0.513	0.380	0.351	0.332	0.329	0.268	0.261	0.202	0.202	0.202	0.202	0.202
13.0	0.812	0.638	0.492	0.368	0.341	0.323	0.321	0.263	0.257	0.202	0.202	0.202	0.202	0.202
13.5	0.768	0.607	0.471	0.356	0.331	0.314	0.312	0.259	0.253	0.202	0.202	0.202	0.202	0.202
14.0	0.725	0.576	0.451	0.345	0.321	0.306	0.304	0.254	0.249	0.202	0.202	0.202	0.202	0.202
14.5	0.681	0.545	0.430	0.333	0.311	0.297	0.295	0.250	0.245	0.202	0.202	0.202	0.202	0.202
15.0	0.638	0.514	0.409	0.321	0.301	0.288	0.287	0.246	0.241	0.202	0.202	0.202	0.202	0.202
15.5	0.594	0.482	0.388	0.309	0.291	0.280	0.278	0.241	0.237	0.202	0.202	0.202	0.202	0.202
16.0	0.550	0.451	0.368	0.297	0.281	0.271	0.270	0.237	0.233	0.202	0.202	0.202	0.202	0.202
16.5	0.507	0.420	0.347	0.285	0.271	0.262	0.261	0.233	0.229	0.202	0.202	0.202	0.202	0.202
17.0	0.463	0.389	0.326	0.273	0.261	0.254	0.253	0.228	0.226	0.202	0.202	0.202	0.202	0.202
17.5	0.420	0.358	0.306	0.261	0.252	0.245	0.244	0.224	0.222	0.202	0.202	0.202	0.202	0.202
18.0	0.376	0.327	0.285	0.250	0.242	0.237	0.236	0.219	0.218	0.202	0.202	0.202	0.202	0.202
18.5	0.333	0.295	0.264	0.238	0.232	0.228	0.227	0.215	0.214	0.202	0.202	0.202	0.202	0.202
19.0	0.289	0.264	0.243	0.226	0.222	0.219	0.219	0.211	0.210	0.202	0.202	0.202	0.202	0.202
19.5	0.246	0.233	0.223	0.214	0.212	0.211	0.210	0.206	0.206	0.202	0.202	0.202	0.202	0.202
20.0	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

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Table 3
Fire Resistance Period: 60 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	2.641	2.309	2.019	1.767	1.711	1.674	1.669	1.552	1.539	1.347	1.285	1.191	1.022	0.830
3.5	2.598	2.261	1.966	1.711	1.654	1.616	1.611	1.492	1.479	1.282	1.218	1.120	0.943	0.769
4.0	2.526	2.179	1.877	1.616	1.557	1.519	1.514	1.392	1.378	1.175	1.107	1.000	0.810	0.668
4.5	2.454	2.098	1.789	1.521	1.461	1.422	1.417	1.291	1.278	1.068	0.995	0.880	0.678	0.567
5.0	2.382	2.017	1.701	1.426	1.365	1.325	1.320	1.191	1.177	0.961	0.884	0.761	0.546	0.465
5.5	2.310	1.936	1.612	1.332	1.269	1.228	1.223	1.091	1.077	0.854	0.772	0.641	0.414	0.364
6.0	2.238	1.855	1.524	1.237	1.173	1.131	1.126	0.991	0.976	0.746	0.661	0.522	0.281	0.263
6.3	2.195	1.807	1.471	1.180	1.115	1.073	1.067	0.930	0.916	0.682	0.594	0.450	0.202	0.202
6.5	2.173	1.786	1.452	1.166	1.102	1.060	1.055	0.920	0.905	0.675	0.588	0.446	0.202	0.202
7.0	2.120	1.733	1.406	1.130	1.068	1.028	1.023	0.893	0.879	0.658	0.574	0.437	0.202	0.202
7.5	2.066	1.681	1.360	1.094	1.035	0.996	0.991	0.867	0.853	0.640	0.559	0.428	0.202	0.202
8.0	2.013	1.629	1.313	1.059	1.002	0.965	0.960	0.840	0.827	0.623	0.545	0.419	0.202	0.202
8.5	1.959	1.576	1.267	1.023	0.968	0.933	0.928	0.813	0.801	0.605	0.531	0.410	0.202	0.202
9.0	1.906	1.524	1.221	0.987	0.935	0.901	0.897	0.787	0.775	0.588	0.517	0.401	0.202	0.202
9.5	1.852	1.471	1.174	0.952	0.902	0.869	0.865	0.760	0.749	0.570	0.502	0.392	0.202	0.202
10.0	1.799	1.419	1.128	0.916	0.868	0.838	0.834	0.734	0.723	0.552	0.488	0.383	0.202	0.202
10.5	1.745	1.367	1.082	0.880	0.835	0.806	0.802	0.707	0.697	0.535	0.474	0.374	0.202	0.202
11.0	1.691	1.314	1.036	0.845	0.802	0.774	0.770	0.680	0.671	0.517	0.459	0.365	0.202	0.202
11.5	1.638	1.262	0.989	0.809	0.768	0.742	0.739	0.654	0.645	0.500	0.445	0.356	0.202	0.202
12.0	1.584	1.210	0.943	0.773	0.735	0.710	0.707	0.627	0.619	0.482	0.431	0.347	0.202	0.202
12.5	1.531	1.157	0.897	0.737	0.702	0.679	0.676	0.601	0.593	0.465	0.416	0.338	0.202	0.202
13.0	1.477	1.105	0.850	0.702	0.668	0.647	0.644	0.574	0.567	0.447	0.402	0.329	0.202	0.202
13.5	1.424	1.052	0.804	0.666	0.635	0.615	0.613	0.548	0.541	0.430	0.388	0.320	0.202	0.202
14.0	1.370	1.000	0.758	0.630	0.602	0.583	0.581	0.521	0.515	0.412	0.374	0.311	0.202	0.202
14.5	1.317	0.948	0.711	0.595	0.568	0.552	0.549	0.494	0.488	0.395	0.359	0.301	0.202	0.202
15.0	1.263	0.895	0.665	0.559	0.535	0.520	0.518	0.468	0.462	0.377	0.345	0.292	0.202	0.202
15.5	1.210	0.843	0.619	0.523	0.502	0.488	0.486	0.441	0.436	0.360	0.331	0.283	0.202	0.202
16.0	1.156	0.791	0.572	0.488	0.469	0.456	0.455	0.415	0.410	0.342	0.316	0.274	0.202	0.202
16.5	1.103	0.738	0.526	0.452	0.435	0.424	0.423	0.388	0.384	0.325	0.302	0.265	0.202	0.202
17.0	1.049	0.686	0.480	0.416	0.402	0.393	0.391	0.361	0.358	0.307	0.288	0.256	0.202	0.202
17.5	0.996	0.634	0.434	0.380	0.369	0.361	0.360	0.335	0.332	0.290	0.273	0.247	0.202	0.202
18.0	0.942	0.581	0.387	0.345	0.335	0.329	0.328	0.308	0.306	0.272	0.259	0.238	0.202	0.202
18.5	0.889	0.529	0.341	0.309	0.302	0.297	0.297	0.282	0.280	0.255	0.245	0.229	0.202	0.202
19.0	0.835	0.476	0.295	0.273	0.269	0.266	0.265	0.255	0.254	0.237	0.231	0.220	0.202	0.202
19.5	0.782	0.424	0.248	0.238	0.235	0.234	0.234	0.229	0.228	0.220	0.216	0.211	0.202	0.202
20.0	0.728	0.372	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
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Table 4
Fire Resistance Period: 75 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	3.495	3.105	2.759	2.456	2.387	2.343	2.337	2.196	2.181	1.956	1.891	1.796	1.630	1.437
3.5	3.447	3.052	2.702	2.395	2.326	2.281	2.276	2.133	2.117	1.889	1.822	1.721	1.546	1.344
4.0	3.366	2.964	2.607	2.295	2.224	2.179	2.173	2.027	2.011	1.777	1.705	1.597	1.405	1.188
4.5	3.285	2.876	2.513	2.194	2.123	2.076	2.070	1.921	1.904	1.664	1.589	1.473	1.264	1.032
5.0	3.204	2.787	2.418	2.094	2.021	1.973	1.967	1.815	1.798	1.552	1.473	1.349	1.123	0.876
5.5	3.123	2.699	2.323	1.993	1.919	1.871	1.865	1.709	1.692	1.440	1.356	1.225	0.982	0.719
6.0	3.042	2.611	2.229	1.893	1.817	1.768	1.762	1.603	1.585	1.328	1.240	1.101	0.841	0.563
6.3	2.994	2.557	2.172	1.833	1.756	1.707	1.700	1.539	1.522	1.260	1.170	1.026	0.756	0.470
6.5	2.969	2.533	2.148	1.809	1.733	1.685	1.678	1.519	1.502	1.245	1.156	1.014	0.748	0.466
7.0	2.906	2.471	2.088	1.751	1.677	1.630	1.624	1.471	1.454	1.206	1.121	0.984	0.728	0.456
7.5	2.844	2.410	2.028	1.692	1.620	1.575	1.569	1.422	1.406	1.167	1.085	0.954	0.708	0.446
8.0	2.781	2.348	1.968	1.633	1.563	1.520	1.514	1.373	1.358	1.129	1.050	0.924	0.687	0.437
8.5	2.718	2.287	1.908	1.574	1.506	1.465	1.460	1.324	1.310	1.090	1.015	0.894	0.667	0.427
9.0	2.656	2.225	1.848	1.516	1.450	1.410	1.405	1.275	1.262	1.052	0.979	0.864	0.647	0.417
9.5	2.593	2.164	1.788	1.457	1.393	1.355	1.350	1.227	1.213	1.013	0.944	0.834	0.627	0.407
10.0	2.531	2.102	1.728	1.398	1.336	1.300	1.296	1.178	1.165	0.974	0.909	0.804	0.607	0.397
10.5	2.468	2.041	1.668	1.340	1.280	1.245	1.241	1.129	1.117	0.936	0.873	0.774	0.586	0.388
11.0	2.405	1.979	1.608	1.281	1.223	1.191	1.186	1.080	1.069	0.897	0.838	0.744	0.566	0.378
11.5	2.343	1.918	1.548	1.222	1.166	1.136	1.132	1.031	1.021	0.859	0.803	0.713	0.546	0.368
12.0	2.280	1.856	1.488	1.164	1.109	1.081	1.077	0.983	0.973	0.820	0.767	0.683	0.526	0.358
12.5	2.218	1.795	1.428	1.105	1.053	1.026	1.022	0.934	0.924	0.781	0.732	0.653	0.505	0.349
13.0	2.155	1.733	1.368	1.046	0.996	0.971	0.968	0.885	0.876	0.743	0.697	0.623	0.485	0.339
13.5	2.093	1.672	1.308	0.988	0.939	0.916	0.913	0.836	0.828	0.704	0.661	0.593	0.465	0.329
14.0	2.030	1.610	1.248	0.929	0.883	0.861	0.858	0.788	0.780	0.665	0.626	0.563	0.445	0.319
14.5	1.967	1.549	1.188	0.870	0.826	0.806	0.804	0.739	0.732	0.627	0.591	0.533	0.424	0.309
15.0	1.905	1.487	1.128	0.811	0.769	0.751	0.749	0.690	0.684	0.588	0.555	0.503	0.404	0.300
15.5	1.842	1.426	1.068	0.753	0.712	0.696	0.694	0.641	0.635	0.550	0.520	0.473	0.384	0.290
16.0	1.780	1.364	1.008	0.694	0.656	0.641	0.639	0.592	0.587	0.511	0.485	0.443	0.364	0.280
16.5	1.717	1.303	0.948	0.635	0.599	0.586	0.585	0.544	0.539	0.472	0.449	0.413	0.344	0.270
17.0	1.654	1.241	0.888	0.577	0.542	0.532	0.530	0.495	0.491	0.434	0.414	0.383	0.323	0.261
17.5	1.592	1.180	0.828	0.518	0.486	0.477	0.475	0.446	0.443	0.395	0.379	0.352	0.303	0.251
18.0	1.529	1.118	0.769	0.459	0.429	0.422	0.421	0.397	0.395	0.356	0.343	0.322	0.283	0.241
18.5	1.467	1.057	0.709	0.401	0.372	0.367	0.366	0.348	0.346	0.318	0.308	0.292	0.263	0.231
19.0	1.404	0.995	0.649	0.342	0.315	0.312	0.311	0.300	0.298	0.279	0.273	0.262	0.242	0.222
19.5	1.342	0.934	0.589	0.283	0.259	0.257	0.257	0.251	0.250	0.241	0.237	0.232	0.222	0.212
20.0	1.279	0.872	0.529	0.225	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

PLEASE NOTE: The critical temperatures in this loading table are as defined for offices in accordance with BS5950-8:2003 as per Table 18 of the ASFP 5th Edition Yellow Book. The Yellow book also gives new critical temperatures to comply with several different building uses either to the Eurocodes for steel design or BS5950-8:2003. Alternative loadings tables to other critical temperatures are available from the Nullifire Technical Desk on request.



Table 5
Fire Resistance Period: 90 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	-	3.902	3.498	3.144	3.063	3.012	3.005	2.841	2.822	2.566	2.498	2.400	2.239	2.045
3.5	-	3.844	3.438	3.080	2.999	2.947	2.940	2.774	2.755	2.496	2.425	2.323	2.152	1.950
4.0	-	3.749	3.337	2.974	2.891	2.839	2.832	2.662	2.643	2.378	2.304	2.194	2.008	1.793
4.5	-	3.653	3.236	2.868	2.784	2.730	2.724	2.550	2.531	2.261	2.183	2.066	1.865	1.635
5.0	-	3.557	3.136	2.762	2.677	2.622	2.615	2.438	2.419	2.143	2.061	1.937	1.721	1.478
5.5	-	3.462	3.035	2.655	2.569	2.514	2.507	2.326	2.307	2.026	1.940	1.809	1.577	1.320
6.0	-	3.366	2.934	2.549	2.462	2.406	2.398	2.215	2.195	1.909	1.819	1.680	1.433	1.163
6.3	3.793	3.308	2.873	2.485	2.397	2.341	2.333	2.148	2.128	1.838	1.746	1.603	1.346	1.068
6.5	3.764	3.280	2.846	2.459	2.371	2.314	2.307	2.121	2.102	1.814	1.724	1.583	1.330	1.055
7.0	3.693	3.209	2.777	2.391	2.304	2.248	2.240	2.056	2.036	1.755	1.667	1.531	1.288	1.024
7.5	3.621	3.139	2.708	2.324	2.237	2.181	2.174	1.990	1.971	1.695	1.611	1.480	1.246	0.992
8.0	3.549	3.068	2.639	2.257	2.170	2.114	2.107	1.925	1.905	1.635	1.555	1.429	1.204	0.961
8.5	3.478	2.997	2.570	2.189	2.103	2.048	2.040	1.859	1.840	1.575	1.498	1.378	1.163	0.929
9.0	3.406	2.927	2.501	2.122	2.036	1.981	1.974	1.794	1.774	1.516	1.442	1.327	1.121	0.897
9.5	3.334	2.856	2.432	2.055	1.969	1.914	1.907	1.728	1.709	1.456	1.385	1.276	1.079	0.866
10.0	3.263	2.786	2.363	1.988	1.903	1.848	1.841	1.663	1.643	1.396	1.329	1.225	1.037	0.834
10.5	3.191	2.715	2.294	1.920	1.836	1.781	1.774	1.597	1.578	1.337	1.273	1.174	0.996	0.803
11.0	3.119	2.644	2.225	1.853	1.769	1.715	1.707	1.532	1.512	1.277	1.216	1.122	0.954	0.771
11.5	3.048	2.574	2.156	1.786	1.702	1.648	1.641	1.466	1.447	1.217	1.160	1.071	0.912	0.739
12.0	2.976	2.503	2.087	1.719	1.635	1.581	1.574	1.401	1.381	1.157	1.104	1.020	0.870	0.708
12.5	2.904	2.432	2.018	1.651	1.568	1.515	1.508	1.335	1.316	1.098	1.047	0.969	0.829	0.676
13.0	2.833	2.362	1.949	1.584	1.501	1.448	1.441	1.269	1.250	1.038	0.991	0.918	0.787	0.645
13.5	2.761	2.291	1.880	1.517	1.435	1.381	1.374	1.204	1.185	0.978	0.935	0.867	0.745	0.613
14.0	2.689	2.220	1.812	1.450	1.368	1.315	1.308	1.138	1.119	0.919	0.878	0.816	0.703	0.581
14.5	2.618	2.150	1.743	1.382	1.301	1.248	1.241	1.073	1.054	0.859	0.822	0.764	0.661	0.550
15.0	2.546	2.079	1.674	1.315	1.234	1.182	1.175	1.007	0.989	0.799	0.766	0.713	0.620	0.518
15.5	2.475	2.008	1.605	1.248	1.167	1.115	1.108	0.942	0.923	0.739	0.709	0.662	0.578	0.486
16.0	2.403	1.938	1.536	1.180	1.100	1.048	1.042	0.876	0.858	0.680	0.653	0.611	0.536	0.455
16.5	2.331	1.867	1.467	1.113	1.034	0.982	0.975	0.811	0.792	0.620	0.596	0.560	0.494	0.423
17.0	2.260	1.796	1.398	1.046	0.967	0.915	0.908	0.745	0.727	0.560	0.540	0.509	0.453	0.392
17.5	2.188	1.726	1.329	0.979	0.900	0.849	0.842	0.680	0.661	0.501	0.484	0.458	0.411	0.360
18.0	2.116	1.655	1.260	0.911	0.833	0.782	0.775	0.614	0.596	0.441	0.427	0.407	0.369	0.328
18.5	2.045	1.584	1.191	0.844	0.766	0.715	0.709	0.549	0.530	0.381	0.371	0.355	0.327	0.297
19.0	1.973	1.514	1.122	0.777	0.699	0.649	0.642	0.483	0.465	0.321	0.315	0.304	0.286	0.265
19.5	1.901	1.443	1.053	0.710	0.632	0.582	0.575	0.418	0.399	0.262	0.258	0.253	0.244	0.234
20.0	1.830	1.372	0.984	0.642	0.566	0.515	0.509	0.352	0.334	0.202	0.202	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

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Table 6
Fire Resistance Period: IO5 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	-	-	-	3.832	3.739	3.680	3.673	3.485	3.464	3.176	3.104	3.004	2.847	2.652
3.5	-	-	-	3.765	3.672	3.612	3.605	3.414	3.393	3.102	3.028	2.924	2.759	2.556
4.0	-	-	-	3.653	3.559	3.498	3.491	3.297	3.276	2.980	2.902	2.791	2.612	2.397
4.5	-	-	-	3.541	3.445	3.385	3.377	3.179	3.158	2.857	2.776	2.658	2.465	2.239
5.0	-	-	-	3.429	3.332	3.271	3.263	3.062	3.040	2.735	2.650	2.525	2.318	2.080
5.5	-	-	-	3.317	3.219	3.157	3.149	2.944	2.922	2.612	2.524	2.392	2.172	1.921
6.0	-	-	-	3.205	3.106	3.043	3.035	2.827	2.805	2.490	2.398	2.259	2.025	1.762
6.3	-	-	3.575	3.138	3.038	2.975	2.966	2.756	2.734	2.416	2.322	2.180	1.937	1.666
6.5	-	-	3.543	3.108	3.008	2.945	2.937	2.727	2.704	2.387	2.293	2.151	1.911	1.645
7.0	-	-	3.466	3.032	2.933	2.870	2.862	2.653	2.631	2.314	2.218	2.079	1.848	1.592
7.5	-	-	3.388	2.956	2.858	2.795	2.787	2.580	2.558	2.240	2.144	2.006	1.785	1.538
8.0	-	-	3.310	2.880	2.782	2.720	2.712	2.506	2.484	2.167	2.070	1.934	1.721	1.485
8.5	-	-	3.232	2.804	2.707	2.645	2.637	2.433	2.411	2.094	1.996	1.862	1.658	1.431
9.0	-	-	3.154	2.729	2.632	2.570	2.562	2.359	2.337	2.021	1.922	1.790	1.595	1.378
9.5	-	-	3.076	2.653	2.556	2.495	2.487	2.285	2.264	1.948	1.847	1.718	1.532	1.324
10.0	-	-	2.998	2.577	2.481	2.420	2.412	2.212	2.190	1.874	1.773	1.646	1.468	1.271
10.5	-	-	2.920	2.501	2.406	2.345	2.337	2.138	2.117	1.801	1.699	1.573	1.405	1.217
11.0	-	-	2.842	2.425	2.331	2.270	2.262	2.065	2.043	1.728	1.625	1.501	1.342	1.164
11.5	-	-	2.764	2.349	2.255	2.195	2.187	1.991	1.970	1.655	1.551	1.429	1.278	1.111
12.0	-	-	2.686	2.274	2.180	2.120	2.112	1.918	1.896	1.582	1.476	1.357	1.215	1.057
12.5	-	-	2.608	2.198	2.105	2.045	2.037	1.844	1.823	1.509	1.402	1.285	1.152	1.004
13.0	-	-	2.531	2.122	2.029	1.970	1.962	1.770	1.749	1.435	1.328	1.212	1.088	0.950
13.5	-	-	2.453	2.046	1.954	1.895	1.887	1.697	1.676	1.362	1.254	1.140	1.025	0.897
14.0	-	-	2.375	1.970	1.879	1.820	1.812	1.623	1.602	1.289	1.179	1.068	0.962	0.843
14.5	-	-	2.297	1.894	1.803	1.745	1.737	1.550	1.529	1.216	1.105	0.996	0.898	0.790
15.0	-	-	2.219	1.818	1.728	1.670	1.662	1.476	1.455	1.143	1.031	0.924	0.835	0.736
15.5	-	-	2.141	1.743	1.653	1.595	1.587	1.403	1.382	1.069	0.957	0.852	0.772	0.683
16.0	-	-	2.063	1.667	1.577	1.520	1.512	1.329	1.308	0.996	0.883	0.779	0.708	0.630
16.5	-	-	1.985	1.591	1.502	1.445	1.437	1.255	1.235	0.923	0.808	0.707	0.645	0.576
17.0	-	-	1.907	1.515	1.427	1.370	1.362	1.182	1.162	0.850	0.734	0.635	0.582	0.523
17.5	-	-	1.829	1.439	1.352	1.295	1.287	1.108	1.088	0.777	0.660	0.563	0.519	0.469
18.0	-	-	1.751	1.363	1.276	1.220	1.212	1.035	1.015	0.703	0.586	0.491	0.455	0.416
18.5	-	-	1.673	1.288	1.201	1.145	1.137	0.961	0.941	0.630	0.512	0.419	0.392	0.362
19.0	-	-	1.595	1.212	1.126	1.070	1.062	0.888	0.868	0.557	0.437	0.346	0.329	0.309
19.5	-	-	1.518	1.136	1.050	0.995	0.987	0.814	0.794	0.484	0.363	0.274	0.265	0.255
20.0	2.380	1.873	1.440	1.060	0.975	0.920	0.913	0.740	0.721	0.411	0.289	0.202	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

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Table 7
Fire Resistance Period: 120 Minutes

Thickness (mm) Required for a Design Temperature of

Wall Thickness (mm)	350°C	400°C	450°C	500°C	512°C	520°C	521°C	547°C	550°C	600°C	620°C	650°C	700°C	750°C
	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)	DFT (mm)
3.2	-	-	-	-	-	-	-	-	-	3.785	3.710	3.608	3.455	3.259
3.5	-	-	-	-	-	-	-	-	-	3.709	3.632	3.526	3.365	3.163
4.0	-	-	-	-	-	-	-	-	-	3.581	3.501	3.388	3.216	3.002
4.5	-	-	-	-	-	-	-	-	-	3.454	3.370	3.251	3.066	2.842
5.0	-	-	-	-	-	-	-	-	-	3.326	3.239	3.114	2.916	2.682
5.5	-	-	-	-	-	-	-	-	-	3.198	3.108	2.976	2.767	2.521
6.0	-	-	-	-	-	-	-	-	-	3.071	2.977	2.839	2.617	2.361
6.3	-	-	-	3.791	3.680	3.609	3.600	3.365	3.340	2.994	2.899	2.756	2.527	2.265
6.5	-	-	-	3.757	3.646	3.576	3.566	3.332	3.307	2.962	2.866	2.723	2.493	2.235
7.0	-	-	-	3.673	3.562	3.492	3.483	3.251	3.226	2.881	2.785	2.640	2.408	2.159
7.5	-	-	-	3.588	3.479	3.409	3.400	3.169	3.144	2.800	2.704	2.557	2.323	2.084
8.0	-	-	-	3.504	3.395	3.325	3.316	3.087	3.063	2.720	2.623	2.474	2.238	2.009
8.5	-	-	-	3.419	3.311	3.242	3.233	3.006	2.981	2.639	2.541	2.391	2.154	1.933
9.0	-	-	-	3.335	3.227	3.159	3.150	2.924	2.900	2.558	2.460	2.308	2.069	1.858
9.5	-	-	-	3.250	3.144	3.075	3.066	2.843	2.818	2.478	2.379	2.225	1.984	1.783
10.0	-	-	-	3.166	3.060	2.992	2.983	2.761	2.737	2.397	2.298	2.142	1.899	1.708
10.5	-	-	-	3.082	2.976	2.909	2.900	2.679	2.656	2.316	2.217	2.059	1.814	1.632
11.0	-	-	-	2.997	2.892	2.825	2.816	2.598	2.574	2.236	2.136	1.976	1.729	1.557
11.5	-	-	-	2.913	2.808	2.742	2.733	2.516	2.493	2.155	2.054	1.893	1.645	1.482
12.0	-	-	-	2.828	2.725	2.658	2.650	2.435	2.411	2.074	1.973	1.810	1.560	1.407
12.5	-	-	-	2.744	2.641	2.575	2.566	2.353	2.330	1.994	1.892	1.727	1.475	1.331
13.0	-	-	-	2.660	2.557	2.492	2.483	2.271	2.248	1.913	1.811	1.644	1.390	1.256
13.5	-	-	-	2.575	2.473	2.408	2.400	2.190	2.167	1.832	1.730	1.562	1.305	1.181
14.0	-	-	-	2.491	2.390	2.325	2.316	2.108	2.085	1.752	1.649	1.479	1.220	1.105
14.5	-	-	-	2.406	2.306	2.241	2.233	2.027	2.004	1.671	1.567	1.396	1.135	1.030
15.0	-	-	-	2.322	2.222	2.158	2.150	1.945	1.922	1.590	1.486	1.313	1.051	0.955
15.5	-	-	-	2.238	2.138	2.075	2.066	1.863	1.841	1.510	1.405	1.230	0.966	0.880
16.0	-	-	-	2.153	2.054	1.991	1.983	1.782	1.759	1.429	1.324	1.147	0.881	0.804
16.5	-	-	-	2.069	1.971	1.908	1.900	1.700	1.678	1.348	1.243	1.064	0.796	0.729
17.0	-	-	-	1.984	1.887	1.824	1.816	1.618	1.596	1.268	1.162	0.981	0.711	0.654
17.5	-	-	-	1.900	1.803	1.741	1.733	1.537	1.515	1.187	1.080	0.898	0.626	0.578
18.0	-	-	-	1.816	1.719	1.658	1.650	1.455	1.434	1.106	0.999	0.815	0.541	0.503
18.5	-	-	-	1.731	1.636	1.574	1.566	1.374	1.352	1.026	0.918	0.732	0.457	0.428
19.0	-	-	-	1.647	1.552	1.491	1.483	1.292	1.271	0.945	0.837	0.649	0.372	0.353
19.5	-	-	-	1.562	1.468	1.408	1.400	1.210	1.189	0.864	0.756	0.566	0.287	0.277
20.0	2.931	2.373	1.895	1.478	1.384	1.324	1.316	1.129	1.108	0.784	0.675	0.483	0.202	0.202

- Tables are applicable to equally to circular and square concrete filled hollow columns
- Tables are applicable to columns of 88.9 mm diameter/width and higher.
- DFT for 20 mm wall thickness columns can be applied to thicker columns, with no maximum limit.

PLEASE NOTE: The critical temperatures in this loading table are as defined for offices in accordance with BS5950-8:2003 as per Table 18 of the ASFP 5th Edition Yellow Book. The Yellow book also gives new critical temperatures to comply with several different building uses either to the Eurocodes for steel design or BS5950-8:2003. Alternative loadings tables to other critical temperatures are available from the Nullifire Technical Desk on request.