

Ø mm	Espessura da Parede em mm																			
	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75	3,00	3,50	4,00	4,50	5,00	5,50	6,00	6,50	7,00	8,00	9,00	10,00
11	0,247	0,301	0,351	0,399	0,444	0,486	0,524	0,560	0,592	0,647	0,691	0,721	0,740	-	-	-	-	-	-	-
12	0,271	0,331	0,388	0,442	0,493	0,541	0,586	0,627	0,666	0,734	0,789	0,832	0,863	0,882	-	-	-	-	-	-
13	0,296	0,362	0,425	0,486	0,543	0,597	0,647	0,695	0,740	0,820	0,888	0,943	0,986	1,017	-	-	-	-	-	-
14	0,321	0,393	0,462	0,529	0,592	0,652	0,709	0,763	0,814	0,906	0,986	1,054	1,110	1,153	-	-	-	-	-	-
15	0,345	0,424	0,499	0,572	0,641	0,707	0,771	0,831	0,888	0,993	1,085	1,165	1,233	1,289	-	-	-	-	-	-
16	0,370	0,455	0,536	0,615	0,691	0,763	0,832	0,899	0,962	1,079	1,184	1,276	1,356	1,424	1,480	1,523	-	-	-	-
17	0,395	0,486	0,573	0,658	0,740	0,818	0,894	0,966	1,036	1,165	1,282	1,387	1,480	1,560	1,628	1,683	-	-	-	-
18	0,419	0,516	0,610	0,701	0,789	0,874	0,956	1,034	1,110	1,252	1,381	1,498	1,603	1,695	1,776	1,843	-	-	-	-
19	0,444	0,547	0,647	0,744	0,838	0,929	1,071	1,102	1,184	1,338	1,480	1,609	1,726	1,831	1,924	2,004	-	-	-	-
20	0,469	0,578	0,684	0,788	0,888	0,985	1,079	1,170	1,258	1,424	1,578	1,720	1,850	1,967	2,072	2,164	-	-	-	-
21	0,493	0,609	0,721	0,831	0,937	1,040	1,141	1,238	1,332	1,511	1,677	1,831	1,973	2,102	2,220	2,324	2,417	-	-	-
22	0,518	0,640	0,758	0,874	0,986	1,096	1,202	1,306	1,406	1,597	1,776	1,942	2,096	2,238	2,368	2,485	2,589	-	-	-
23	0,543	0,670	0,795	0,917	1,036	1,151	1,264	1,373	1,480	1,683	1,874	2,053	2,220	2,374	2,515	2,645	2,726	-	-	-
24	0,567	0,701	0,832	0,960	1,085	1,207	1,326	1,441	1,554	1,769	1,973	2,164	2,343	2,509	2,663	2,805	2,935	-	-	-
25	0,592	0,732	0,869	1,003	1,134	1,262	1,387	1,509	1,628	1,856	2,072	2,275	2,466	2,645	2,811	2,966	3,107	-	-	-
26	0,617	0,763	0,906	1,047	1,184	1,318	1,449	1,577	1,702	1,942	2,170	2,386	2,589	2,781	2,959	3,126	3,280	3,551	-	-
27	0,641	0,794	0,943	1,090	1,233	1,373	1,511	1,645	1,776	2,028	2,269	2,497	2,713	2,916	3,107	3,286	3,453	3,749	-	-
28	0,666	0,825	0,980	1,133	1,282	1,429	1,572	1,712	1,850	2,115	2,368	2,608	2,836	3,052	3,255	3,607	3,789	4,143	-	-
29	0,691	0,855	1,017	1,176	1,332	1,484	1,634	1,780	1,924	2,201	2,466	2,719	2,959	3,187	3,403	3,607	3,789	4,143	-	-
30	0,715	0,886	1,054	1,219	1,381	1,540	1,695	1,848	1,998	2,287	2,565	2,830	3,083	3,323	3,551	3,676	3,971	4,430	-	-
31	0,740	0,917	1,090	1,262	1,430	1,595	1,757	1,916	2,072	2,374	2,663	2,941	3,206	3,459	3,699	3,927	4,143	4,538	4,883	-
32	0,765	0,948	1,128	1,306	1,480	1,651	1,819	1,984	2,146	2,460	2,762	3,052	3,329	3,594	3,847	4,088	4,316	4,735	5,105	-
33	0,789	0,989	1,165	1,349	1,529	1,706	1,880	2,052	2,220	2,546	2,861	3,163	3,453	3,370	3,995	4,248	4,488	4,932	5,327	-
34	0,814	1,010	1,202	1,393	1,578	1,762	1,942	2,119	2,294	2,633	2,959	3,274	3,576	3,866	4,143	4,408	4,661	5,130	5,549	-
35	0,838	1,040	1,239	1,435	1,628	1,817	2,004	2,187	2,368	2,719	3,058	3,385	3,699	4,001	4,291	4,569	4,834	5,327	5,771	-
36	0,863	1,071	1,276	1,478	1,677	1,873	2,065	2,255	2,441	2,805	3,157	3,496	3,823	4,137	4,439	4,729	5,006	5,524	5,993	6,412
37	0,888	1,102	1,313	1,521	1,726	1,928	2,127	2,323	2,515	2,892	3,255	3,607	3,946	4,273	4,587	4,889	5,179	5,721	6,215	6,659
38	0,912	1,133	1,350	1,564	1,776	1,984	2,189	2,391	2,589	2,978	3,354	3,718	4,069	4,408	4,735	5,049	5,352	5,919	6,437	6,905
39	0,937	1,164	1,387	1,608	1,825	2,039	2,250	2,458	2,663	3,064	3,453	3,829	4,192	4,544	4,883	5,210	5,524	6,116	6,659	7,152
40	0,962	1,195	1,424	1,651	1,874	2,095	2,312	2,562	2,737	3,151	3,551	3,940	4,316	4,680	5,031	5,370	5,697	6,313	6,881	7,398
41	0,986	1,225	1,461	1,694	1,924	2,150	2,374	2,594	2,811	3,237	3,650	4,051	4,439	4,815	5,179	5,530	5,869	6,511	7,103	7,645
42	1,011	1,256	1,498	1,737	1,973	2,206	2,435	2,662	2,885	3,323	3,749	4,161	4,562	4,951	5,327	5,691	6,042	6,708	7,324	7,882
43	1,036	1,287	1,535	1,780	2,022	2,261	2,497	2,730	2,959	3,409	3,847	4,273	4,686	5,086	5,475	5,851	6,215	6,905	7,546	8,138
44	1,060	1,318	1,572	1,823	2,072	2,317	2,559	2,798	3,033	3,496	3,946	4,384	4,809	5,222	5,623	6,011	6,387	7,103	7,768	8,385
45	1,085	1,349	1,609	1,867	2,121	2,372	2,620	2,865	3,107	3,582	4,044	4,495	4,932	5,358	5,771	6,172	6,560	7,300	7,990	8,632
46	1,110	1,380	1,646	1,910	2,170	2,428	2,682	2,933	3,181	3,668	4,143	4,606	5,056	5,493	5,919	6,332	6,733	7,497	8,212	8,878
47	1,134	1,410	1,693	1,953	2,220	2,483	2,744	3,001	3,255	3,755	4,242	4,717	5,179	5,629	6,067	6,492	6,905	7,694	8,434	9,125
48	1,159	1,441	1,720	1,996	2,269	2,539	2,805	3,069	3,329	3,841	4,340	4,827	5,302	5,765	6,215	6,652	7,078	7,892	8,656	9,371
49	1,184	1,472	1,757	2,039	2,318	2,594	2,867	3,137	3,403	3,927	4,439	4,938	5,426	5,900	6,363	6,813	7,250	8,089	8,878	9,618
50	1,208	1,503	1,794	2,082	2,368	2,650	2,929	3,204	3,477	4,014	4,538	5,049	5,549	6,036	6,511	6,973	7,423	8,286	9,100	9,865
52	1,258	1,564	1,868	2,169	2,466	2,761	3,052	3,340	3,625	4,186	4,735	5,271	5,795	6,307	6,807	7,294	7,768	8,681	9,544	10,358
54	1,307	1,626	1,942	2,255	2,565	2,872	3,175	3,476	3,773	4,359	4,932	5,49	6,042	6,578	7,103	7,614	8,114	9,075	9,988	10,851
56	1,356	1,688	2,016	2,341	2,663	2,983	3,298	3,611	3,921	4,532	5,130	5,715	6,289	6,850	7,398	7,935	8,459	9,470	10,432	11,344
58	1,406	1,749	2,090	2,428	2,762	3,093	3,422	3,747	4,069	4,704	5,327	5,937	6,535	7,121	7,694	8,255	8,804	9,865	10,876	11,833
60	1,455	1,811	2,164	2,514	2,861	3,204	3,545	3,883	4,217	4,877	5,524	6,159	6,782	7,392	7,990	8,576	9,149	10,259	11,320	12,331
62	1,504	1,873	2,238	2,600	2,959	3,315	3,668	4,018	4,365	5,049	5,721	6,381	7,029	7,664	8,286	8,897	9,459	10,654	11,764	12,824
64	1,554	1,934	2,312	2,687	3,058	3,426	3,792	4,154	4,513	5,222	5,919	6,603	7,275	7,935	8,582	9,217	9,840	11,048	12,207	13,317
66	1,603	1,996	2,386	2,773	3,157	3,537	3,915	4,290	4,661	5,395	6,116	6,825	7,522	8,206	8,878	9,538	10,185	11,443	12,651	1,810
68	1,652	2,058	2,460	2,859	3,255	3,648	4,038	4,425	4,809	5,567	6,313	7,047	7,768	8,477	9,174	9,858	10,530	11,838	13,095	14,304
70	1,702	2,119	2,534	2,946	3,354	3,759	4,162	4,561	4,957	5,740	6,511	7,262	8,015	8,749	9,470	10,179	10,876	12,232	13,539	14,797
72	1,751	2,181	2,608	3,032	3,453	3,870	4,285	4,696	5,105	5,913	6,708	7,491	8,262	9,020	9,766	10,500	11,221	12,627	13,983	15,290
74	1,800	2,243	2,682	3,138	3,551	3,981	4,408	4,832	5,253	6,085	6,905	7,713	8,508	9,291	10,062	10,820	11,566	13,021	14,427	15,783
76	1,850	2,304	2,756	3,204	3,650	4,092	4,532	4,968	5,401	6,258	7,103	7,935	8,755	9,562	10,358	11,141	11,912	13,416	14,871	16,277
78	1,899	2,366	2,830	3,291	3,749	4,203	4,655	5,103	5,549	6,430	7,300	8,157	9,001	9,834	10,654	11,461	12,257	13,810	15,315	16,770
80	1,948	2,428	2,904	3,377	3,847	4,314	4,778	5,239	5,697	6,603	7,497	8,379	9,248	10,105	10,950	11,782	12,602	15,205	15,759	17,263
82	1,998	2,489	2,978	3,463	3,946	4,425	4,901	5,375	5,845	6,776	7,694	8,601	9,495	10,376	11,246	12,103	12,947	14,600	16,203	17,756
84	2,047	2,551	3,052	3,550	4,044	4,536	5,025	5,510	5,993	6,948	7,892	8,823	9,741	10,648	11,542	12,423	13,293	14,994	16,647	18,250
86	2,096	2,613	3,126	3,636	4,143	4,647	5,148	5,646	6,141	7,121	8,089	9,045	9,988	10,919	11,838	12,744	13,638	15,389	17,090	18,743
88</																				

Ø mm	Espessura da Parede em mm																		
	2,00	2,50	3,00	3,50	4,00	4,50	5,00	5,50	6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00
102	4,932	6,135	7,324	8,502	9,667	10,820	11,961	13,089	14,205	16,400	18,545	20,642	22,689	24,686	26,634	28,533	30,383	32,183	33,934
104	5,031	6,258	7,472	8,675	9,865	11,042	12,207	13,360	14,501	16,745	18,940	21,086	23,182	25,229	27,226	29,175	31,073	32,923	34,723
106	5,130	6,381	7,620	8,847	10,062	11,264	12,454	13,632	14,797	17,090	19,335	21,529	23,675	25,771	27,818	29,816	31,764	33,663	35,513
108	5,228	6,504	7,768	9,020	10,259	11,486	12,701	13,903	15,093	17,436	19,729	21,973	24,168	26,314	28,410	30,457	32,455	34,403	36,302
110	5,327	6,628	7,916	9,193	10,456	11,708	12,947	14,174	15,389	17,781	20,124	22,417	24,662	26,856	29,002	31,098	33,145	35,143	37,091
112	5,426	6,751	8,064	9,365	10,654	11,930	13,194	14,445	15,685	18,26	20,518	22,861	25,155	27,399	29,594	31,739	33,836	35,882	37,880
114	5,524	6,874	8,212	9,538	10,851	12,152	13,441	14,717	15,981	18,471	20,913	23,305	25,648	27,941	30,186	32,381	34,526	36,622	38,669
116	5,623	6,998	8,360	9,710	11,048	12,374	13,687	14,988	16,277	18,817	21,308	23,749	26,141	28,484	30,778	33,022	35,217	37,362	39,458
118	5,721	7,121	8,508	9,883	11,246	12,596	13,934	15,259	16,573	19,162	21,702	24,193	26,634	29,027	31,369	33,663	35,907	38,102	40,248
120	5,820	7,244	8,656	10,056	11,443	12,818	14,180	15,531	16,868	19,507	22,097	24,637	27,128	29,569	31,961	34,304	36,598	38,842	41,037
122	5,919	7,368	8,804	10,228	11,640	13,040	14,427	15,802	17,164	19,853	22,491	25,081	27,621	30,112	32,553	34,945	37,288	39,582	41,826
124	6,017	7,491	8,952	10,401	11,838	13,262	14,674	16,073	17,460	20,198	22,886	25,525	28,114	30,654	33,145	35,587	37,979	40,322	42,615
126	6,116	7,614	9,100	10,574	12,035	13,484	14,920	16,344	17,756	20,543	23,280	25,969	28,607	31,197	33,737	36,228	38,669	41,061	43,404
128	6,215	7,738	9,248	10,746	12,232	13,706	15,167	16,616	18,052	20,888	23,675	26,412	29,101	31,739	34,329	36,869	39,360	41,801	44,193
130	6,313	7,861	9,396	10,919	12,429	13,928	15,413	16,887	18,348	21,234	24,070	26,856	29,594	32,282	34,921	37,510	40,050	42,541	44,983
132	6,412	7,984	9,544	11,092	12,627	14,150	15,660	17,158	18,664	21,579	24,464	27,300	30,087	32,824	35,513	38,151	40,741	43,281	45,772
134	6,511	8,107	9,692	11,264	12,824	14,371	15,907	17,430	18,940	21,924	24,859	27,744	30,580	33,367	36,104	38,793	41,431	44,021	46,561
136	6,609	8,231	9,840	11,437	13,021	14,593	16,153	17,701	19,236	22,269	25,253	28,188	31,073	33,910	36,696	39,434	42,122	44,761	47,350
138	6,708	8,354	9,988	11,609	13,219	14,815	16,400	17,972	19,532	22,615	25,648	28,632	31,567	34,452	37,288	40,075	42,812	45,500	48,139
140	6,807	8,477	10,136	11,782	13,416	15,037	16,647	18,243	19,828	22,960	26,043	29,076	32,060	34,995	37,880	40,716	43,503	46,240	48,928
142	6,905	8,61	10,284	11,955	13,613	15,259	16,893	18,515	20,124	23,305	26,437	29,520	32,553	35,537	38,472	41,357	44,193	46,980	49,718
144	7,004	8,724	10,432	12,127	13,810	15,481	17,170	18,786	20,420	23,650	26,832	29,964	33,046	36,080	39,064	41,999	44,884	47,720	50,507
146	7,103	8,847	10,580	12,300	14,008	15,703	17,386	19,057	20,716	23,996	27,226	30,408	33,540	36,662	39,656	42,640	45,574	48,460	51,296
148	7,201	8,901	10,728	12,473	14,205	15,925	17,633	19,328	21,012	24,341	27,621	30,852	34,033	37,165	40,248	43,281	46,265	49,200	52,085
150	7,300	9,094	10,876	12,645	14,402	16,147	17,880	19,600	21,308	24,686	28,015	31,295	34,526	37,707	40,439	43,922	46,955	49,940	52,874
152	7,398	9,217	11,024	12,818	14,600	16,396	18,126	19,871	21,603	25,031	28,410	31,739	35,019	38,250	41,431	44,563	47,646	50,679	53,663
154	7,497	9,341	11,172	12,990	14,797	16,591	18,373	20,142	21,899	25,377	28,805	32,183	35,513	38,793	42,023	45,205	48,337	51,419	54,453
156	7,596	9,464	11,320	13,163	14,994	16,813	18,619	20,414	22,195	25,195	29,199	32,627	36,006	39,335	42,615	46,487	49,027	52,899	56,242
158	7,694	9,587	11,468	13,336	15,191	17,035	18,866	20,685	22,491	26,067	29,594	33,071	36,499	39,878	43,207	46,846	49,718	52,899	56,031
160	7,793	9,710	11,616	13,508	15,389	17,257	19,113	20,956	22,787	26,412	29,988	33,515	36,992	40,420	43,799	47,128	50,408	53,639	56,820
162	7,892	9,834	11,764	13,681	15,586	17,479	19,359	21,227	23,083	26,578	30,383	33,959	37,485	40,963	44,391	47,769	51,099	54,379	57,609
164	7,990	9,957	11,912	13,854	15,783	17,701	19,606	21,499	23,379	27,103	30,778	34,409	37,979	41,505	44,983	48,411	51,789	55,118	58,398
166	8,089	10,080	12,059	14,026	15,981	17,923	19,853	21,770	23,675	27,448	31,172	34,847	38,472	42,048	45,574	49,052	52,480	55,858	59,188
168	8,188	10,204	12,207	14,199	16,178	18,145	20,099	22,041	23,971	27,794	31,567	35,291	38,965	42,590	46,166	49,693	53,170	56,598	59,977
170	8,286	10,327	12,355	14,371	16,375	18,367	20,346	22,312	24,267	28,139	31,961	35,735	39,458	43,133	46,758	50,334	53,861	57,338	60,776
172	8,385	10,450	12,503	14,544	16,573	18,589	20,522	22,584	24,563	28,484	32,365	36,178	39,352	43,676	47,350	50,975	54,551	58,078	61,555
174	8,484	10,574	12,651	14,717	16,770	18,811	20,839	22,855	24,859	28,829	32,750	36,622	40,445	44,218	47,942	51,617	55,242	58,818	62,344
176	8,582	10,697	12,779	14,889	16,967	19,033	21,086	23,126	25,155	29,175	33,145	37,066	40,938	44,534	48,534	52,258	55,932	59,558	63,133
178	8,681	10,820	12,947	15,062	17,164	19,254	21,332	23,398	25,451	29,520	33,540	37,510	41,431	45,303	49,126	52,899	56,623	60,297	63,923
180	8,779	10,944	13,095	15,235	17,362	19,476	21,579	23,669	25,747	29,865	33,934	37,954	41,925	45,846	49,718	53,540	57,313	61,037	64,712
182	8,878	11,067	13,243	15,407	17,559	19,668	21,855	23,940	26,043	30,210	34,329	38,398	42,418	46,388	50,309	54,181	58,004	61,777	65,501
184	8,977	11,190	13,391	15,580	17,756	19,920	22,072	24,211	26,338	30,556	34,723	38,842	42,911	46,931	50,901	54,823	58,694	62,517	66,290
186	9,075	11,313	13,539	15,753	17,954	20,142	22,319	24,483	26,634	30,901	35,118	39,268	43,404	47,473	51,493	55,654	59,385	63,257	67,079
188	9,174	11,437	13,687	15,925	18,151	20,364	22,565	24,754	26,930	31,246	35,513	39,730	43,897	48,016	52,085	56,105	60,075	63,997	67,868
190	9,273	11,560	13,835	16,098	18,348	20,586	22,812	25,025	27,226	31,591	35,907	40,174	44,391	48,558	52,677	56,746	60,766	64,763	68,658
192	9,371	11,683	13,983	16,270	18,545	20,808	23,059	25,297	27,522	31,937	36,300	40,617	44,884	49,101	53,269	57,387	61,456	65,476	69,447
194	9,470	11,807	14,131	16,443	18,743	21,030	23,305	25,568	27,818	32,282	36,696	41,061	45,377	49,644	53,861	58,029	62,147	66,216	70,236
196	9,569	11,930	14,279	16,616	18,940	21,252	23,552	25,839	28,114	32,627	37,091	41,505	45,870	50,186	54,453	58,670	62,834	66,956	71,025
198	9,667	12,053	14,427	16,788	19,137	21,474	23,798	26,110	28,410	32,972	37,485	41,949	46,364	50,729	55,044	59,311	63,582	67,696	71,814
200	9,766	12,177	14,575	16,961	19,355	21,696	24,045	26,382	28,706	33,318	37,880	42,393	46,857	51,271	55,636	59,952	64,219	68,436	72,603
202	9,865	12,300	14,723	17,134	19,532	21,918	24,299	26,653	29,002	33,663	38,275	42,837	47,350	51,814	56,228	60,593	64,909	69,176	73,393
204	9,963	12,423	14,871	17,306	19,729	22,140	24,538	26,924	29,298	34,008	38,669	43,281	47,843	52,356	56,820	61,235	65,600	69,915	74,182
206	10,062	12,547	15,019	17,479	19,926	22,362	24,798	27,195	29,594	34,353	39,064	43,725	48,337	52,899	57,412	61,876	66,290	70,655	74,971
208	10,161	12,670	15,167	17,651	20,124	22,584	25,031	27,467	29,890	34,699	39,458	44,169	48,830	53,441	58,004	62,517	66,981	71,395	75,760
210	10,259	12,793	15,315	17,824	20,321	22,806	25,278	2											