



PERSICO PIZZAMIGLIO S/A

TUBOS ESTRUTURAIS

EDIÇÃO AGOSTO 2007



tubos de aço

PERSICO

Você não vê, mas nós estamos aí

ASTM A 500 | NBR 8261

CONDIÇÕES DE FORNECIMENTO

1 - APLICAÇÃO

Construção civil, máquinas agrícolas, serralherias, indústria de móveis e outros usos estruturais, em seções circulares, quadradas e retangulares.

2 - AÇO

Teor de carbono, 0,26% máx. C

3 - PROPRIEDADES MECÂNICAS

		GRAU A	GRAU B
LIMITE DE ESCOAMENTO (kgf/mm ²) / MPa	∅	23,2 / 228	29,5 / 290
	∩	27,4 / 269	32,3 / 317
RESISTÊNCIA À TRAÇÃO (kgf/mm ²) / MPa		31,6 / 310	40,8 / 400
ALONGAMENTO EM 50,8 mm		25% (*)	23% (**)

(*) APLICÁVEL PARA ESPESSURAS DE PAREDE MAIOR OU IGUAL (≥) 3,00 mm. PARA ESPESSURA MENOR, O ALONGAMENTO DEVE SER CALCULADO DE ACORDO COM A EQUAÇÃO: $A = 2,2e + 17,50$

(**) APLICÁVEL PARA ESPESSURAS DE PAREDE ≥ 4,60 mm. PARA ESPESSURA MENOR, O ALONGAMENTO DEVE SER CALCULADO DE ACORDO COM A EQUAÇÃO: $A = 2,40e + 12,0$

e = espessura A = alongamento

4 - ENSAIOS MECÂNICOS

Os tubos são submetidos a ensaios de achatamento.

5 - ACABAMENTO

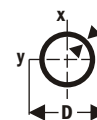
- Os tubos podem ser fornecidos sem revestimento ou galvanizados.
- Quaisquer dimensões intermediárias mediante consulta.

ESCRITÓRIO DE VENDAS

PERSICO PIZZAMIGLIO S/A
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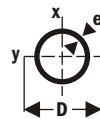


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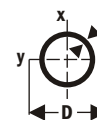
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
9,52	1,00	0,210	0,268	0,025	0,052	0,303
	1,20	0,246	0,314	0,028	0,058	0,297
12,70	1,00	0,288	0,368	0,063	0,100	0,415
	1,20	0,340	0,434	0,072	0,114	0,409
	1,50	0,414	0,528	0,084	0,133	0,400
15,87	0,90	0,332	0,423	0,119	0,150	0,530
	1,00	0,367	0,467	0,130	0,163	0,527
	1,20	0,434	0,553	0,150	0,189	0,520
	1,50	0,532	0,677	0,177	0,223	0,511
19,05	0,90	0,403	0,513	0,212	0,222	0,642
	1,00	0,445	0,567	0,232	0,243	0,639
	1,20	0,528	0,673	0,269	0,283	0,633
	1,50	0,649	0,827	0,321	0,337	0,623
	1,90	0,804	1,024	0,381	0,400	0,610
	2,25	0,932	1,188	0,427	0,448	0,599
20,70	1,00	0,486	0,619	0,301	0,291	0,697
	1,20	0,577	0,735	0,351	0,339	0,691
	1,50	0,710	0,905	0,420	0,405	0,681
	1,90	0,881	1,122	0,501	0,484	0,668
	2,25	1,024	1,304	0,563	0,544	0,657
	2,65	1,180	1,503	0,625	0,604	0,645
21,20	1,90	0,904	1,152	0,542	0,511	0,686
	2,25	1,051	1,339	0,610	0,575	0,675
22,22	0,90	0,473	0,603	0,343	0,309	0,754
	1,00	0,523	0,667	0,376	0,339	0,751
	1,20	0,622	0,792	0,439	0,395	0,744
	1,50	0,766	0,976	0,527	0,474	0,734
	1,90	0,952	1,213	0,632	0,569	0,722
	2,25	1,108	1,412	0,713	0,642	0,711
25,40	0,90	0,544	0,693	0,521	0,410	0,867
	1,00	0,602	0,767	0,572	0,450	0,863
	1,20	0,716	0,912	0,670	0,527	0,857
	1,50	0,884	1,126	0,808	0,636	0,847
	1,90	1,101	1,403	0,975	0,768	0,834
	2,25	1,284	1,636	1,107	0,872	0,822
	2,65	1,487	1,894	1,242	0,978	0,810
28,60	1,00	0,681	0,867	0,827	0,578	0,976
	1,20	0,811	1,033	0,971	0,679	0,970
	1,50	1,002	1,277	1,176	0,823	0,960
	1,90	1,251	1,594	1,428	0,998	0,946
31,75	0,90	0,685	0,872	1,039	0,654	1,091
	1,00	0,758	0,966	1,143	0,720	1,088
	1,20	0,904	1,152	1,346	0,848	1,081
	1,50	1,119	1,426	1,635	1,030	1,071
	1,90	1,399	1,782	1,993	1,255	1,057
	2,25	1,637	2,085	2,282	1,438	1,046
	2,65	1,902	2,423	2,586	1,629	1,033
	3,00	2,117	2,710	2,831	1,783	1,022
33,50	2,25	1,734	2,209	2,711	1,619	1,108
	2,65	2,016	2,568	3,079	1,838	1,095
	3,00	2,256	2,875	3,376	2,015	1,084
	3,35	2,491	3,173	3,651	2,180	1,073
	3,75	2,751	3,505	3,940	2,352	1,060

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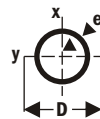
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
34,92	1,00	0,836	1,066	1,534	0,879	1,200
	1,20	0,998	1,271	1,810	1,036	1,193
	1,50	1,236	1,575	2,204	1,262	1,183
	1,90	1,547	1,971	2,969	1,544	1,169
	2,25	1,813	2,309	3,096	1,773	1,158
	2,65	2,109	2,687	3,522	2,017	1,145
	3,00	2,362	3,008	3,866	2,214	1,134
38,10	1,00	0,915	1,166	2,007	1,054	1,312
	1,20	1,092	1,391	2,371	1,245	1,305
	1,50	1,354	1,725	2,894	1,519	1,295
	1,90	1,696	2,161	3,550	1,864	1,282
	2,25	1,989	2,534	4,088	2,146	1,270
	2,65	2,317	2,951	4,663	2,446	1,257
	3,00	2,597	3,308	5,133	2,695	1,245
	3,35	2,871	3,657	5,573	2,926	1,234
3,75	3,177	4,047	6,041	3,171	1,222	
41,27	1,00	0,993	1,265	2,567	1,244	1,424
	1,20	1,186	1,511	3,035	1,471	1,417
	1,50	1,471	1,874	3,711	1,799	1,407
	1,90	1,845	2,350	4,565	2,212	1,394
	2,25	2,165	2,758	5,268	2,553	1,382
	2,65	2,524	3,215	6,024	2,919	1,369
	3,00	2,831	3,607	6,646	3,221	1,357
	3,35	3,133	3,991	7,231	3,504	1,346
	3,75	3,470	4,420	7,858	3,808	1,333
	4,25	3,880	4,943	8,581	4,159	1,317
42,20	2,25	2,217	2,824	5,653	2,679	1,415
	2,65	2,585	3,293	6,468	3,066	1,401
	3,00	2,900	3,695	7,140	3,384	1,390
	3,35	3,210	4,089	7,773	3,684	1,379
	3,75	3,556	4,530	8,453	4,006	1,366
	4,25	3,978	5,067	9,239	4,379	1,350
44,45	1,00	1,072	1,365	3,224	1,451	1,537
	1,20	1,280	1,630	3,816	1,717	1,530
	1,50	1,589	2,024	4,674	2,103	1,519
	1,90	1,994	2,540	5,761	2,592	1,506
	2,25	2,342	2,983	6,661	2,997	1,494
	2,65	2,732	3,480	7,633	3,434	1,481
	3,00	3,067	3,907	8,436	3,796	1,469
	3,35	3,396	4,326	9,196	4,138	1,458
	3,75	3,764	4,795	10,015	4,506	1,445
	4,25	4,213	5,367	10,966	4,934	1,429
47,60	1,00	1,149	1,464	3,977	1,671	1,648
	1,20	1,373	1,749	4,712	1,980	1,641
	1,50	1,705	2,172	5,779	2,428	1,631
	1,90	2,141	2,728	7,135	2,998	1,617
	2,25	2,516	3,206	8,263	3,472	1,605
	2,65	2,938	3,742	9,487	3,986	1,592
	3,00	3,300	4,203	10,502	4,412	1,580
	3,35	3,656	4,657	11,467	4,818	1,569
	3,75	4,055	5,166	12,511	5,257	1,556
	4,25	4,544	5,788	13,730	5,769	1,540

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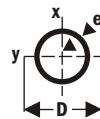
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
48,25	2,25	2,552	3,252	8,623	3,574	1,628
	2,65	2,980	3,796	9,903	4,105	1,615
	3,00	3,348	4,265	10,966	4,546	1,603
	3,35	3,709	4,725	11,978	4,965	1,592
	3,75	4,115	5,243	13,072	5,419	1,579
	4,25	4,612	5,875	14,353	5,950	1,563
50,80	1,00	1,228	1,565	4,853	1,911	1,761
	1,20	1,468	1,870	5,755	2,266	1,754
	1,50	1,824	2,323	7,067	2,782	1,744
	1,90	2,291	2,919	8,740	3,441	1,730
	2,25	2,694	3,432	10,136	3,990	1,718
	2,65	3,147	4,009	11,655	4,589	1,705
	3,00	3,536	4,505	12,921	5,087	1,693
	3,35	3,920	4,994	14,128	5,562	1,682
	3,75	4,351	5,543	15,439	6,079	1,669
	4,25	4,879	6,215	16,979	6,685	1,653
57,15	1,00	1,385	1,764	6,956	2,434	1,986
	1,20	1,656	2,109	8,259	2,890	1,979
	1,50	2,059	2,622	10,162	3,556	1,968
	1,90	2,589	3,298	12,602	4,410	1,955
	2,25	3,046	3,881	14,649	5,126	1,943
	2,65	3,562	4,537	16,890	5,911	1,929
	3,00	4,006	5,104	18,768	6,568	1,917
	3,35	4,445	5,662	20,570	7,199	1,906
	3,75	4,938	6,291	22,540	7,888	1,893
	4,25	5,545	7,063	24,873	8,704	1,876
60,32	1,20	1,750	2,229	9,744	3,231	2,091
	1,50	2,176	2,772	11,998	3,978	2,080
	1,90	2,737	3,487	14,896	4,939	2,067
	2,25	3,222	4,105	17,332	5,747	2,055
	2,65	3,769	4,801	20,007	6,634	2,041
	3,00	4,241	5,402	22,254	7,378	2,029
	3,35	4,707	5,996	24,415	8,095	2,018
	3,75	5,232	6,665	26,783	8,880	2,004
	4,25	5,877	7,486	29,596	9,813	1,988
	4,75	6,510	8,292	32,251	10,693	1,972
	5,00	6,821	8,690	33,521	11,115	1,964
63,50	1,20	1,844	2,349	11,402	3,591	2,203
	1,50	2,293	2,922	14,051	4,425	2,193
	1,90	2,886	3,677	17,461	5,500	2,179
	2,25	3,399	4,330	20,336	6,405	2,167
	2,65	3,977	5,066	23,498	7,401	2,153
	3,00	4,476	5,702	26,159	8,239	2,142
	3,35	4,969	6,330	28,762	9,047	2,130
	3,75	5,526	7,039	31,545	9,935	2,117
	4,25	6,210	7,911	34,902	10,993	2,100
	4,75	6,882	8,767	38,082	11,994	2,084

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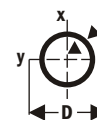
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
69,85	1,20	2,032	2,588	15,255	4,368	2,428
	1,50	2,528	3,221	18,823	5,390	2,417
	1,90	3,184	4,056	23,433	6,710	2,403
	2,25	3,751	4,778	27,332	7,826	2,391
	2,65	4,392	5,595	31,637	9,059	2,378
	3,00	4,946	6,300	35,275	10,100	2,366
	3,35	5,494	6,999	38,796	11,108	2,354
	3,75	6,113	7,787	42,678	12,220	2,341
	4,25	6,876	8,759	47,325	13,550	2,324
	4,75	7,626	9,715	51,750	14,818	2,308
	5,00	7,996	10,187	53,882	15,428	2,300
	5,60	8,873	11,303	58,785	16,832	2,280
76,20	1,20	2,220	2,827	19,891	5,221	2,652
	1,50	2,763	3,520	24,570	6,449	2,642
	1,90	3,481	4,435	30,632	8,040	2,628
	2,25	4,103	5,227	35,774	9,309	2,616
	2,65	4,807	6,123	41,470	10,884	2,602
	3,00	5,416	6,899	46,297	12,151	2,590
	3,35	6,019	7,667	50,983	13,381	2,578
	3,75	6,700	8,535	56,167	14,742	2,565
	4,25	7,541	9,607	62,397	16,377	2,548
	4,75	8,370	10,662	68,358	17,942	2,532
88,90	1,50	3,233	4,119	39,348	8,852	3,091
	1,90	4,077	5,193	49,169	11,062	3,077
	2,25	4,808	6,125	57,538	12,944	3,065
	2,65	5,637	7,181	66,850	15,039	3,051
	3,00	6,355	8,096	74,783	16,824	3,039
	3,35	7,068	9,004	82,517	18,564	3,027
	3,75	7,875	10,032	91,117	20,499	3,013
	4,25	8,872	11,302	101,516	22,838	2,997
	4,75	9,857	12,557	111,534	25,092	2,980
	5,00	10,346	13,179	116,404	26,188	2,972
	5,60	11,504	14,655	127,718	28,733	2,952
	6,30	12,833	16,348	140,272	31,557	2,929
	7,11	14,341	18,269	153,961	34,637	2,903
101,60	1,50	3,703	4,717	59,110	11,636	3,539
	1,90	4,672	5,951	73,989	14,565	3,526
	2,25	5,513	7,023	86,712	17,069	3,513
	2,65	6,467	8,238	100,920	19,866	3,500
	3,00	7,295	9,293	113,064	22,257	3,488
	3,35	8,117	10,340	124,945	24,595	3,476
	3,75	9,049	11,528	138,205	27,206	3,462
	4,25	10,203	12,998	154,310	30,376	3,445
	4,75	11,345	14,453	169,905	33,446	3,428
	5,00	11,912	15,174	177,515	34,944	3,420
	5,60	13,258	16,174	195,276	38,440	3,400
	6,30	14,807	18,862	215,122	42,347	3,377
	7,11	16,568	21,106	236,947	46,643	3,350

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DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
114,30	2,65	7,297	9,295	144,957	25,364	3,949
	3,00	8,234	10,490	162,590	28,450	3,936
	3,35	9,166	11,677	179,885	31,476	3,924
	3,75	10,224	13,024	199,241	34,863	3,911
	4,25	11,534	14,694	222,832	38,991	3,894
	4,50	12,185	15,523	234,380	41,011	3,885
	4,75	12,833	16,348	245,764	43,003	3,877
	5,00	13,478	17,169	256,986	44,967	3,868
	5,60	15,012	19,124	283,269	49,566	3,848
	6,30	16,780	21,375	312,794	54,732	3,825
	7,11	18,795	23,943	345,470	60,450	3,798
127,00	2,65	8,127	10,352	200,240	31,534	1,397
	3,00	9,174	11,687	224,808	35,403	4,385
	3,35	10,215	13,013	248,953	39,205	4,373
	3,75	11,398	14,520	276,036	43,470	4,360
	4,25	12,866	16,389	309,133	48,682	4,342
	4,50	13,595	17,318	325,370	51,239	4,334
	4,75	14,321	18,243	341,403	53,764	4,325
	5,00	15,044	19,164	357,232	56,257	4,317
	5,60	16,766	21,358	394,402	62,110	4,297
	6,30	18,753	23,889	436,330	68,713	4,273
	7,11	21,022	26,780	482,964	76,057	4,246
139,70	2,65	8,957	11,410	268,051	38,375	4,846
	3,00	10,114	12,884	301,167	43,116	4,834
	3,35	11,265	14,350	333,767	47,783	4,822
	3,75	12,573	16,016	370,400	53,028	4,808
	4,25	14,197	18,058	415,264	59,451	4,791
	4,50	15,004	19,113	437,316	62,608	4,783
	4,75	15,808	20,138	459,115	65,729	4,774
	5,00	16,610	21,159	480,665	68,814	4,766
	5,60	18,520	23,592	531,377	76,074	4,745
	6,30	20,726	26,403	588,772	84,291	4,722
	7,11	23,249	29,616	652,861	93,466	4,695
141,30	2,65	9,061	11,543	277,546	39,285	4,903
	3,00	10,232	13,034	311,863	44,142	4,891
	3,35	11,397	14,518	345,651	48,924	4,879
	3,75	12,721	16,205	383,625	54,299	4,865
	4,25	14,364	18,299	430,145	60,884	4,848
	4,50	15,182	19,340	453,014	64,121	4,839
	4,75	15,996	20,377	475,626	67,321	4,831
	5,00	16,807	21,410	497,981	70,486	4,822
	5,60	18,741	23,874	550,602	77,934	4,802
	6,30	20,975	26,719	610,180	86,367	4,778
	7,11	23,529	29,974	676,736	95,787	4,751

TUBOS ESTRUTURAIS



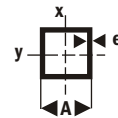
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
152,40	2,65	9,787	12,467	349,666	45,888	5,295
	3,00	11,053	14,081	393,115	51,590	5,283
	3,35	12,314	15,687	435,945	57,211	5,271
	3,75	13,747	17,512	484,143	63,536	5,257
	4,25	15,528	19,781	543,279	71,296	5,240
	4,50	16,413	20,909	572,388	75,117	5,231
	4,75	17,296	22,033	601,194	78,897	5,223
	5,00	18,175	23,154	629,700	82,638	5,214
	5,60	20,274	25,826	696,898	91,456	5,194
	6,30	22,699	28,916	773,160	101,465	5,170
	7,11	25,476	32,453	858,592	112,676	5,143
165,10	2,65	10,617	13,524	446,367	54,072	5,744
	3,00	11,993	15,278	502,100	60,824	5,732
	3,35	13,363	17,023	557,103	67,487	5,720
	3,75	14,922	19,009	619,076	74,994	5,706
	4,25	16,859	21,476	695,227	84,219	5,689
	4,50	17,823	22,470	732,759	88,766	5,680
	4,75	18,784	23,928	769,933	93,269	5,672
	5,00	19,742	25,149	806,750	97,729	5,663
	5,60	22,028	28,061	893,669	108,258	5,643
	6,30	24,672	31,430	992,537	120,235	5,619
	7,11	27,702	35,290	1.103,592	133,688	5,591
168,30	2,65	10,826	13,791	473,263	56,240	5,857
	3,00	12,230	15,579	532,420	63,270	5,845
	3,35	13,628	17,360	590,816	70,210	5,833
	3,75	15,218	19,386	656,632	78,031	5,819
	4,25	17,194	21,904	737,531	87,645	5,802
	4,50	18,176	23,157	777,416	92,385	5,793
	4,75	19,159	24,406	816,926	97,080	5,785
	5,00	20,136	25,651	856,065	101,731	5,776
	5,60	22,470	28,624	948,498	112,715	5,756
	6,30	25,170	32,063	1.053,691	125,216	5,732
	7,11	28,264	36,005	1.171,924	139,266	5,704
177,80	3,35	14,412	18,360	698,859	78,612	6,169
	3,75	16,096	20,505	777,010	87,403	6,155
	4,25	18,190	23,172	873,162	98,218	6,138
	4,50	19,232	24,500	920,603	103,555	6,129
	4,75	20,271	25,824	967,625	108,844	6,121
	5,00	21,308	27,143	1.014,229	114,087	6,112
	5,60	23,782	30,259	1.124,229	126,478	6,091
	6,30	26,646	33,943	1.249,943	140,601	6,068
		29,929	38,127	1.391,292	156,501	6,040

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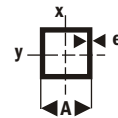


TUBOS ESTRUTURAIS



DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
16,00	1,00	0,471	0,600	0,226	0,283	0,614
	1,20	0,558	0,710	0,261	0,326	0,606
	1,50	0,683	0,870	0,308	0,385	0,595
20,00	1,00	0,597	0,760	0,459	0,459	0,777
	1,20	0,708	0,902	0,534	0,534	0,769
	1,50	0,871	1,110	0,637	0,637	0,758
	1,90	1,080	1,376	0,759	0,759	0,743
22,00	1,00	0,659	0,840	0,619	0,563	0,858
	1,20	0,784	0,998	0,722	0,657	0,851
	1,50	0,966	1,230	0,866	0,787	0,839
	1,90	1,199	1,528	1,038	0,943	0,824
25,00	1,00	0,754	0,960	0,923	0,739	0,981
	1,20	0,895	1,142	1,081	0,865	0,973
	1,50	1,107	1,410	1,301	1,042	0,961
	1,90	1,378	1,756	1,572	1,258	0,946
30,00	1,00	0,911	1,160	1,628	1,085	1,185
	1,20	1,085	1,382	1,914	1,276	1,177
	1,50	1,342	1,710	2,321	1,548	1,165
	1,90	1,676	2,136	2,823	1,882	1,150
	3,00	2,543	3,240	3,985	2,657	1,109
35,00	1,00	1,068	1,360	2,623	1,499	1,389
	1,20	1,274	1,622	3,093	1,767	1,381
	1,50	1,578	2,010	3,767	2,153	1,369
	1,90	1,975	2,516	4,609	2,634	1,354
	3,00	3,014	3,840	6,611	3,778	1,312
40,00	1,00	1,225	1,560	3,957	1,979	1,593
	1,20	1,462	1,862	4,677	2,339	1,585
	1,50	1,831	2,310	5,715	2,858	1,573
	1,90	2,273	2,896	7,023	3,511	1,557
	3,00	3,485	4,440	10,197	5,099	1,515
50,00	1,20	1,839	2,342	9,303	3,721	1,993
	1,50	2,284	2,910	11,419	4,568	1,981
	1,90	2,870	3,656	14,118	5,647	1,965
	3,00	4,427	5,640	20,849	8,340	1,923
55,00	1,20	2,027	2,582	12,464	4,532	2,197
	1,50	2,520	3,210	15,325	5,573	2,185
	1,90	3,168	4,046	18,989	6,905	2,169
	3,00	4,898	6,240	28,215	10,260	2,126
60,00	1,50	2,755	3,510	20,033	6,678	2,389
	1,90	3,466	4,416	24,869	8,290	2,373
	3,00	5,369	6,840	37,141	12,380	2,330
	5,00	8,635	11,000	55,917	18,639	2,255
63,50	1,50	2,920	3,720	23,847	7,511	2,532
	1,90	3,675	4,682	29,636	9,334	2,516
	3,00	5,699	7,260	44,398	13,984	2,473
	5,00	9,185	11,700	67,221	21,172	2,397
	5,60	10,180	12,960	73,140	23,037	2,379

TUBOS ESTRUTURAIS



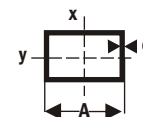
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
D	E	kg/m	cm ²	cm ²	cm ²	cm
70,00	1,50	3,226	4,110	32,157	9,188	2,797
	1,90	4,063	5,176	40,035	11,439	2,781
	3,00	6,311	8,040	60,273	17,221	2,738
	5,00	10,205	13,000	92,083	26,310	2,661
	5,60	11,320	14,430	100,470	28,705	2,600
80,00	1,50	3,697	4,710	48,391	12,098	3,205
	1,90	4,659	5,936	60,377	15,094	3,189
	3,00	7,253	9,240	91,445	22,861	3,146
	5,60	13,082	16,666	154,621	38,655	3,046
100,00	2,65	8,100	10,319	163,111	32,622	3,976
	3,00	9,037	11,540	182,709	36,542	3,962
	3,35	10,167	12,951	201,874	40,375	3,948
	3,75	11,333	14,438	223,255	44,651	3,932
	4,25	12,778	16,276	249,212	49,842	3,913
	4,75	14,207	18,098	274,332	54,866	3,893
	5,00	14,915	19,000	286,583	57,317	3,884
	5,60	16,599	21,146	315,165	63,033	3,861
	6,30	18,536	23,612	347,078	69,416	3,834
115,00	2,65	9,349	11,909	250,678	43,596	4,588
	3,00	10,550	13,440	281,187	48,902	4,574
	3,35	11,744	14,961	311,115	54,107	4,560
	3,75	13,100	16,688	344,614	59,933	4,544
	4,25	14,780	18,828	385,450	67,035	4,525
	4,75	16,444	20,948	425,151	73,939	4,505
	5,00	17,270	22,000	444,583	77,319	4,495
	5,60	19,237	24,506	490,101	85,235	4,472
	6,30	21,503	27,392	541,246	94,130	4,445
125,00	2,65	10,181	12,969	323,721	51,795	4,996
	3,00	11,492	14,640	363,389	58,142	4,982
	3,35	12,796	16,301	402,364	64,378	4,968
	3,75	14,277	18,188	446,067	71,371	4,952
	4,25	16,114	20,528	499,455	79,913	4,933
	4,75	17,935	22,848	551,486	88,238	4,913
	5,00	18,840	24,000	577,000	92,320	4,903
	5,60	20,995	26,746	636,889	101,902	4,880
	6,30	23,481	29,912	704,406	112,705	4,853
140,00	2,65	11,429	14,559	457,933	65,025	5,608
	3,00	12,905	16,440	514,517	73,502	5,594
	3,35	14,374	18,311	570,221	81,460	5,580
	3,75	16,043	20,438	632,817	90,402	5,564
	4,25	18,116	23,078	709,484	101,355	5,545
	4,75	20,173	25,698	784,422	112,060	5,525
	5,00	21,195	27,000	821,250	117,321	5,515
	5,60	23,633	30,106	907,921	129,703	5,492
	6,30	26,449	33,692	1.006,020	143,717	5,464

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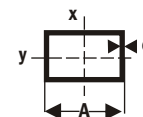


TUBOS ESTRUTURAIS



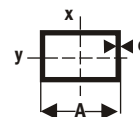
DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
AxB	e	kg/m	cm ²	cm ⁴	cm ³	cm	cm ⁴	cm ³	cm
30,00X20,00	1,00	0,754	0,960	1,207	0,805	1,121	0,639	0,639	0,816
	1,20	0,897	1,142	1,416	0,944	1,113	0,746	0,746	0,808
	1,50	1,107	1,410	1,712	1,141	1,102	0,895	0,895	0,797
	1,90	1,378	1,756	2,072	1,381	1,086	1,072	1,072	0,781
32,00X19,00	1,00	0,769	0,980	1,363	0,852	1,179	0,601	0,632	0,783
	1,20	0,916	1,166	1,601	1,000	1,171	0,701	0,738	0,775
	1,50	1,130	1,440	1,936	1,210	1,160	0,393	0,883	0,763
	1,90	1,408	1,794	2,348	1,467	1,144	1,004	1,057	0,748
35,00X15,00	1,00	0,754	0,960	1,466	0,838	1,236	0,380	0,507	0,629
	1,20	0,897	1,142	1,722	0,984	1,228	0,441	0,588	0,621
	1,50	1,107	1,410	2,083	1,190	1,215	0,524	0,698	0,609
	1,90	1,378	1,756	2,525	1,443	1,199	0,619	0,825	0,594
35,00X20,00	1,00	0,832	1,060	1,755	1,003	1,287	0,730	0,730	0,830
	1,20	0,991	1,262	2,064	1,180	1,279	0,852	0,852	0,822
	1,50	1,225	1,560	2,504	1,431	1,267	1,023	1,023	0,810
	1,90	1,527	1,946	3,046	1,740	1,251	1,228	1,228	0,794
35,00X25,00	1,00	0,911	1,160	2,044	1,168	1,328	1,211	0,969	1,022
	1,20	1,085	1,382	2,407	1,376	1,320	1,421	1,137	1,014
	1,50	1,342	1,710	2,925	1,671	1,308	1,718	1,374	1,002
	1,90	1,676	2,136	3,567	2,038	1,292	2,080	1,664	0,987
40,00X20,00	1,00	0,911	1,160	2,436	1,218	1,449	0,820	0,820	0,841
	1,20	1,085	1,382	2,870	1,435	1,441	0,958	0,958	0,833
	1,50	1,342	1,710	3,491	1,745	1,429	1,152	1,152	0,821
	1,90	1,676	2,136	4,263	2,131	1,413	1,384	1,384	0,805
40,00X30,00	1,00	1,068	1,360	3,197	1,598	1,533	2,049	1,366	1,227
	1,20	1,274	1,622	3,774	1,887	1,525	2,412	1,608	1,219
	1,50	1,578	2,010	4,603	2,302	1,513	2,931	1,954	1,208
	1,90	1,975	2,516	5,643	2,821	1,498	3,575	2,383	1,192
	2,25	2,314	2,948	6,493	3,246	1,484	4,095	2,730	1,179
	3,00	3,014	3,840	8,139	4,070	1,456	5,083	3,389	1,151
50,00X20,00	1,00	1,068	1,360	4,245	1,698	1,767	1,001	1,001	0,858
	1,20	1,274	1,622	5,015	2,006	1,758	1,171	1,171	0,849
	1,50	1,578	2,010	6,125	2,450	1,746	1,409	1,409	0,837
	1,90	1,975	2,516	7,521	3,008	1,729	1,696	1,696	0,821
	2,25	2,314	2,948	8,666	3,467	1,715	1,921	1,921	0,807
	3,00	3,014	3,840	10,895	4,358	1,684	2,327	2,327	0,778
50,00X30,00	1,00	1,225	1,560	5,445	2,178	1,868	2,469	1,646	1,258
	1,20	1,462	1,862	6,444	2,578	1,860	2,910	1,940	1,250
	1,50	1,813	2,310	7,890	3,156	1,848	3,541	2,361	1,238
	1,90	2,273	2,896	9,720	3,888	1,832	4,326	2,884	1,222
	3,00	3,485	4,440	14,213	5,685	1,789	6,181	4,121	1,180
50,00X40,00	1,20	1,650	2,102	7,874	3,149	1,935	5,581	2,790	1,629
	1,50	2,049	2,610	9,655	3,862	1,923	6,828	3,414	1,617
	1,90	2,571	3,276	11,919	4,768	1,908	8,403	4,202	1,602
	3,00	3,956	5,040	17,531	7,012	1,865	12,255	6,128	1,559

TUBOS ESTRUTURAIS



DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
AxB	e	kg/m	cm ²	cm ⁴	cm ³	cm	cm ⁴	cm ³	cm
60,00X33,00	1,20	1,707	2,174	10,669	3,556	2,215	4,215	2,555	1,392
	1,50	2,120	2,700	13,102	4,367	2,203	5,144	3,117	1,380
	1,90	2,661	3,390	16,207	5,402	2,187	6,308	3,823	1,364
	3,00	4,098	5,220	23,971	7,990	2,143	9,111	5,522	1,321
60,00X40,00	1,50	2,284	2,910	14,899	4,966	2,263	7,940	3,970	1,652
	1,90	2,870	3,656	18,453	6,151	2,247	9,783	4,892	1,636
	3,00	4,427	5,640	27,385	9,128	2,204	14,313	7,157	1,593
70,00X25,00	1,20	1,745	2,222	13,279	3,794	2,444	2,612	2,090	1,084
	1,50	2,167	2,760	16,318	4,662	2,432	3,169	2,536	1,072
	1,90	2,720	3,466	20,204	5,773	2,415	3,858	3,087	1,055
	3,00	4,192	5,340	29,952	8,558	2,368	5,456	4,365	1,011
70,00X50,00	1,20	2,216	2,822	20,380	5,823	2,687	12,161	4,864	2,076
	1,50	2,755	3,510	25,118	7,177	2,675	14,949	5,980	2,064
	1,90	3,466	4,416	31,221	8,920	2,659	18,516	7,406	2,048
	3,00	5,369	6,840	46,797	13,371	2,616	27,485	10,994	2,005
	5,00	8,635	11,000	70,917	20,262	2,539	40,917	16,367	1,929
80,00X40,00	1,50	2,755	3,510	29,902	7,476	2,919	10,164	5,082	1,702
	1,90	3,466	4,416	37,194	9,299	2,902	12,544	6,272	1,685
	3,00	5,369	6,840	55,853	13,963	2,858	18,429	9,215	1,641
90,00X30,00	1,50	2,755	3,510	34,087	7,575	3,116	5,980	3,987	1,305
	1,90	3,466	4,416	42,407	9,424	3,099	7,331	4,887	1,289
	3,00	5,369	6,840	63,926	14,158	3,052	10,573	7,049	1,243
100,00X40,00	1,50	3,226	4,110	51,926	10,385	3,554	12,389	6,194	1,736
	1,90	4,063	5,176	64,766	12,953	3,537	15,304	7,652	1,720
	3,00	6,311	8,040	98,001	19,600	3,491	22,545	11,273	1,675
100,00X50,00	2,25	5,140	6,548	86,419	17,284	3,633	29,202	11,681	2,112
	2,65	6,020	7,669	100,311	20,062	3,617	33,683	13,473	2,096
	3,00	6,782	8,640	112,119	22,424	3,602	37,439	14,976	2,082
	3,35	7,537	9,601	123,610	24,722	3,588	41,047	16,419	2,068
	3,75	8,390	10,688	136,360	27,272	3,572	44,993	17,997	2,052
	4,25	9,442	12,028	151,737	30,347	3,552	49,668	19,867	2,032
	4,75	10,478	13,348	166,506	33,301	3,532	54,067	21,627	2,013
	5,00	10,990	14,000	173,669	34,733	3,522	56,167	22,467	2,003
	5,60	12,203	15,546	190,260	38,052	3,498	60,942	24,377	1,980
	6,30	13,590	17,312	208,589	41,718	3,471	66,065	26,426	1,953
	100,00X75,00	2,25	6,023	7,673	113,297	22,659	3,843	72,700	19,387
2,65		7,060	8,994	131,297	26,659	3,827	84,344	22,492	3,062
3,00		7,960	10,140	147,414	29,483	3,813	94,230	25,128	3,048
3,35		8,852	11,276	162,742	32,548	3,799	103,842	27,691	3,035
3,75		9,862	12,563	179,808	35,962	3,783	114,945	30,532	3,019
4,25		11,110	14,153	200,475	40,095	3,764	127,327	33,954	2,999
4,75		12,342	15,723	220,419	44,084	3,744	139,633	37,235	2,980
5,00		12,953	16,500	230,125	46,025	3,735	145,594	38,825	2,970
5,60		14,401	18,346	252,713	50,543	3,711	159,389	42,504	2,948
6,30		16,063	20,462	277,834	55,567	3,685	174,599	46,560	2,921

TUBOS ESTRUTURAIS



DIMENSÃO mm	ESPESSURA mm	PESO	ÁREA DA SEÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO	MOMENTO DE INÉRCIA	MOMENTO RESISTENTE	RAIO DE GIRAÇÃO
AxB	e	kg/m	cm ²	cm ⁴	cm ³	cm	cm ⁴	cm ³	cm
115,00X75,00	2,25	6,553	8,348	157,873	27,465	4,349	81,634	21,769	3,127
	2,65	7,684	9,789	183,766	31,959	4,333	94,752	25,267	3,111
	3,00	8,666	11,040	205,905	35,810	4,319	105,901	28,240	3,097
	3,35	9,641	12,281	227,569	39,577	4,305	116,750	31,133	3,083
	3,75	10,745	13,688	251,755	43,783	4,289	128,786	34,343	3,067
	4,25	12,111	15,428	281,141	48,894	4,269	143,301	38,214	3,048
	4,75	13,461	17,148	309,607	53,845	4,249	157,241	41,931	3,028
	5,00	14,130	18,000	323,500	56,261	4,239	164,000	43,733	3,018
	5,60	15,720	20,026	355,938	61,902	4,216	179,662	47,910	2,995
	6,30	17,547	22,352	392,201	68,209	4,189	196,962	52,523	2,968
120,00X40,00	3,00	7,253	9,240	156,229	26,038	4,112	26,661	13,331	1,699
125,00X35,00	3,00	7,253	9,240	162,415	25,986	4,193	20,476	11,700	1,489
130,00X30,00	3,00	7,253	9,240	167,925	25,835	4,263	14,965	9,977	1,273
150,00X100,00	2,65	10,180	12,969	421,529	56,204	5,701	225,912	45,182	4,174
	3,00	11,492	14,640	473,479	63,131	5,687	252,299	50,660	4,160
	3,35	12,796	16,301	524,590	69,945	5,673	280,138	56,028	4,146
	3,75	14,277	18,188	581,985	77,598	5,657	310,149	62,030	4,130
	4,25	16,114	20,528	652,224	86,963	5,637	346,687	69,337	4,110
	4,75	17,935	22,848	720,815	96,109	5,617	382,158	76,432	4,090
	5,00	18,840	24,000	754,500	100,600	5,607	399,500	79,900	4,080
	5,60	20,995	26,746	833,708	111,161	5,583	440,071	88,014	4,056
	6,30	23,481	29,912	923,246	123,099	5,556	485,566	97,113	4,029
200,00X75,00	2,65	11,221	14,294	713,040	71,304	7,063	153,732	40,995	3,279
	3,00	12,670	16,140	801,704	80,170	7,048	172,035	45,876	3,265
	3,35	14,111	17,976	889,118	88,912	7,033	189,894	50,638	3,250
	3,75	15,749	20,063	987,503	98,750	7,016	209,769	55,938	3,234
	4,25	17,782	22,653	1108,234	110,823	6,995	233,823	62,353	3,213
	4,75	19,800	25,223	1226,494	122,649	6,973	257,019	68,539	3,192
	5,00	20,803	26,500	1284,708	128,471	6,963	268,302	71,547	3,182
	5,60	23,193	29,546	1421,958	142,196	6,937	294,540	78,544	3,157
	6,30	25,954	33,062	1577,747	157,775	6,908	323,686	86,316	3,129

OUTRAS CONJUGAÇÕES SOB CONSULTA.

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