

Velocidade e perda de carga em tubos PBA e DEFOFO

VELOCIDADE E PERDA DE CARGA EM TUBOS DE PVC RÍGIDO PBA EB-183 ABNT CLASSES 12, 15, 20

DE ACORDO COM AS NORMAS PNB-591 E PNB-594 DA ABNT

VAZÃO	DE 60mm				DE 75 mm				DE 85 mm				DE 110 mm				VAZÃO
	ÁREA INTERNA				ÁREA INTERNA				ÁREA INTERNA				ÁREA INTERNA				
	Classe 12 – 0,002341m ²				Classe 12 – 0,003653m ²				Classe 12 – 0,004681m ²				Classe 12 – 0,007854m ²				
	Classe 15 – 0,002240m ²				Classe 15 – 0,003484m ²				Classe 15 – 0,004489m ²				Classe 15 – 0,007512m ²				
Classe 20 – 0,002075m ²				Classe 20 – 0,003237m ²				Classe 20 – 0,004162m ²				Classe 20 – 0,006969m ²					
I/s	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	I/s
0.40	0.17	0.090	0.100	0.121													0.40
0.50	0.21	0.134	0.149	0.179													0.50
0.60	0.26	0.185	0.207	0.249	0.16	0.063	0.071	0.085									0.60
0.80	0.34	0.311	0.347	0.418	0.22	0.106	0.118	0.141									0.80
1.00	0.43	0.466	0.520	0.627	0.27	0.157	0.177	0.211	0.21	0.086	0.096	0.115					1.00
1.20	0.51	0.650	0.726	0.876	0.33	0.219	0.246	0.294	0.26	0.120	0.133	0.159					1.20
1.50	0.64	0.980	1.094	1.322	0.41	0.329	0.370	0.443	0.31	0.180	0.199	0.239					1.50
1.80	0.77	1.374	1.534	1.855	0.49	0.458	0.514	0.616	0.38	0.249	0.276	0.332					1.80
2.10	0.90	1.831	2.045	2.475	0.57	0.607	0.683	0.819	0.45	0.331	0.367	0.442					2.10
2.40	1.03	2.350	2.627	3.181	0.66	0.777	0.874	1.049	0.51	0.422	0.467	0.563					2.40
2.70	1.15	2.932	3.279	3.972	0.74	0.967	1.088	1.305	0.58	0.524	0.581	0.700					2.70
3.00	1.28	3.577	4.000	4.849	0.82	1.176	1.324	1.589	0.64	0.636	0.705	0.850					3.00
3.50	1.50	4.790	5.359	6.500	0.96	1.569	1.766	2.122	0.75	0.847	0.940	1.134					3.50
4.00	1.71	6.175	6.911	8.387	1.09	2.015	2.270	2.729	0.85	1.085	1.205	1.454	0.51	0.302	0.337	0.405	4.00
4.50	1.92	7.736	8.661	10.515	1.23	2.518	2.836	3.412	0.96	1.354	1.503	1.815	0.57	0.375	0.419	0.504	4.50
5.00	2.14	9.462	10.595	12.870	1.37	3.071	3.461	4.165	1.07	1.649	1.831	2.212	0.64	0.455	0.508	0.612	5.00
5.50	2.35	11.368	12.731	15.470	1.51	3.681	4.150	4.995	1.17	1.974	2.193	2.650	0.70	0.544	0.608	0.731	5.50
6.00	2.56	13.437	15.051	18.295	1.64	4.342	4.896	5.896	1.28	2.326	2.584	3.124	0.76	0.639	0.714	0.860	6.00

7.00	2.99				1.92	5.828	6.574	7.921	1.50	3.115	3.462	4.189	0.89	0.852	0.952	1.148	7.00
8.00	3.42				2.19	7.529	8.495	10.241	1.71	4.017	4.465	5.406	1.02	1.095	1.223	1.476	8.00
9.00	3.84								1.92	5.031	5.594	6.775	1.15	1.336	1.527	1.844	9.00
11.00	4.70								2.35	7.394	8.226	9.970	1.40	1.997	2.234	2.698	11.00
13.00	5.55												1.66	2.745	3.071	3.712	13.00
15.00	6.41												1.91	3.608	4.638	4.884	15.00
17.00	7.26												2.16	4.587	5.135	6.213	17.00
19.00	8.11												2.42	5.681	6.362	7.701	19.00
21.00	8.97												2.67	6.891	7.718	9.346	21.00

VELOCIDADE E PERDA DE CARGA EM TUBOS DE PVC RÍGIDO PBA EB-183 ABNT CLASSES 12, 15, 20

DE ACORDO COM AS NORMAS PNB-591 E PNB-594 DA ABNT

VAZÃO	DE 140 mm				DE 160 mm				DE 200 mm				DE 250 mm				VAZÃO
	ÁREA INTERNA				ÁREA INTERNA				ÁREA INTERNA				ÁREA INTERNA				
	Classe 12 – 0,012708m ²				Classe 12 – 0,016604m ²				Classe 12 – 0,025958m ²				Classe 12 – 0,040542m ²				
	Classe 15 – 0,012154m ²				Classe 15 – 0,015881m ²				Classe 15 – 0,024829m ²				Classe 15 – 0,038777m ²				
Classe 20 – 0,011310m ²				Classe 20 – 0,014784m ²				Classe 20 – 0,023073m ²				Classe 20 – 0,036035m ²					
l/s	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	Veloc. m/s	CL 12	CL 15	CL 20	l/s
6.00	0.47	0.195	0.217	0.260													6.00
7.00	0.55	0.259	0.289	0.345	0.42	0.134	0.150	0.178									7.00
8.00	0.63	0.331	0.370	0.442	0.48	0.172	0.191	0.228	0.31	0.057	0.064	0.077					8.00
10.00	0.79	0.502	0.561	0.670	0.60	0.259	0.289	0.345	0.39	0.86	0.096	0.115	0.25	0.029	0.032	0.039	10.00
12.00	0.94	0.706	0.789	0.944	0.72	0.363	0.406	0.485	0.46	0.121	0.135	0.161	0.30	0.041	0.045	0.054	12.00
14.00	1.10	0.943	1.055	1.263	0.94	0.484	0.541	0.647	0.54	0.160	0.179	0.215	0.35	0.054	0.060	0.072	14.00
16.00	1.26	1.214	1.358	1.627	0.96	0.622	0.695	0.831	0.62	0.206	0.229	0.275	0.39	0.069	0.077	0.092	16.00
18.00	1.42	1.518	1.698	2.035	1.08	0.777	0.868	1.038	0.69	0.256	0.286	0.343	0.44	0.085	0.095	0.114	18.00
20.00	1.57	1.855	2.075	2.489	1.20	0.948	1.059	1.268	0.77	0.311	0.348	0.417	0.49	0.104	0.116	0.138	20.00
22.00	1.73	2.225	2.489	2.987	1.32	1.135	1.269	1.520	0.85	0.372	0.416	0.499	0.54	0.124	0.138	0.165	22.00
24.00	1.89	2.628	2.941	3.529	1.45	1.339	1.498	1.793	0.92	0.438	0.489	0.588	0.59	0.145	0.162	0.194	24.00
27.00	2.12	3.294	3.687	4.427	1.63	1.676	1.875	2.246	1.04	0.547	0.611	0.734	0.67	0.181	0.202	0.243	27.00
30.00	2.36	4.034	4.517	5.424	1.81	2.050	2.293	2.749	1.16	0.667	0.746	0.896	0.74	0.220	0.246	0.295	30.00
33.00	2.60	4.848	5.429	6.522	1.99	2.460	2.753	3.301	1.27	0.799	0.893	1.074	0.81	0.263	0.294	0.355	33.00
36.00	2.83	5.736	6.424	7.720	2.17	2.908	3.255	3.903	1.39	0.942	1.054	1.267	0.89	0.310	0.346	0.415	36.00
39.00	3.07	6.697	7.503	9.018	2.35	3.392	3.797	4.555	1.50	1.097	1.227	1.476	0.96	0.360	0.403	0.483	39.00
42.00					2.53	3.913	4.381	5.257	1.62	1.264	1.414	1.701	1.04	0.414	0.462	0.555	42.00
46.00					2.77	4.664	5.224	6.270	1.77	1.504	1.683	2.025	1.13	0.491	0.549	0.660	46.00
50.00					3.01	5.482	6.140	7.371	1.93	1.764	1.974	2.377	1.23	0.575	0.643	0.773	50.00
55.00					3.31	6.709	7.130	8.878	2.12	2.118	2.371	2.855	1.35	0.690	0.771	0.927	55.00
60.00									2.31	2.505	2.804	3.377	1.48	0.813	0.910	1.094	60.00
65.00									2.50	2.922	3.272	3.942	1.60	0.948	1.060	1.275	65.00

70.00									2.70	3.372	3.776	4.551	1.73	1.092	1.221	1.469	70.00
80.00									3.08	4.367	4.892	5.897	1.97	1.410	1.577	1.899	80.00
90.00													2.22	1.768	1.979	2.383	90.00
100.00													2.47	2.166	2.425	2.921	100.00
120.00													2.96	3.081	3.451	4.160	120.00

*Tabelas de Velocidade e Perda de Carga em Tubos de PVC Rígido PBA e DEFOFO extraído de catálogo técnico publicado pela Vulcan Material Plástico S.A.

VELOCIDADE E PERDA DE CARGA EM TUBOS DE PVC RÍGIDO DEFOFO EB –1208

VAZÃO	DN 100		DN 150		DN 200		DN 250		DN 300		VAZÃO
	ÁREA INTERNA		ÁREA INTERNA		ÁREA INTERNA		ÁREA INTERNA		ÁREA INTERNA		
	S=0,009229		S=0,019212		S=0,032749		S=0,049876		S=0,070592		
l/s	Veloc. m/s	Perda de carga m/100m	Veloc. m/s	Perda de carga m/100m	Veloc. m/s	Perda de carga m/100m	Veloc. m/s	Perda de carga m/100m	Veloc. m/s	Perda de carga m/100m	l/s
0.50	0.05	0.005									0.50
1.00	0.11	0.017	0.05	0.003							1.00
1.50	0.16	0.035	0.08	0.006							1.50
2.00	0.22	0.058	0.10	0.010	0.06	0.003					2.00
3.00	0.33	0.120	0.16	0.020	0.09	0.006					3.00
4.00	0.43	0.203	0.21	0.034	0.12	0.009					4.00
5.00	0.54	0.306	0.26	0.051	0.16	0.015	0.10	0.005			5.00
6.00	0.65	0.429	0.31	0.071	0.18	0.019	0.12	0.007			6.00
7.00	0.76	0.571	0.36	0.094	0.21	0.026	0.14	0.010			7.00
8.00	0.87	0.732	0.42	0.120	0.24	0.033	0.16	0.012			8.00
10.00	1.08	1.113	0.52	0.181	0.31	0.049	0.20	0.018	0.14	0.008	10.00
12.00	1.30	1.571	0.62	0.253	0.37	0.068	0.24	0.025	0.17	0.011	12.00
15.00	1.63	2.400	0.78	0.384	0.46	0.103	0.30	0.037	0.21	0.017	15.00
18.00	1.95	3.401	0.94	0.540	0.55	0.144	0.36	0.052	0.25	0.023	18.00
21.00	2.28	4.572	1.09	0.722	0.64	0.192	0.42	0.068	0.30	0.029	21.00
24.00	2.60	5.914	1.25	0.929	0.73	0.246	0.48	0.087	0.34	0.037	24.00
27.00	2.93	7.427	1.41	1.161	0.82	0.307	0.54	0.108	0.38	0.046	27.00
30.00	3.25	9.109	1.56	1.419	0.92	0.374	0.60	0.132	0.42	0.056	30.00
35.00	3.79	12.292	1.82	1.905	1.07	0.500	0.70	0.176	0.50	0.075	35.00
40.00			2.08	2.461	1.22	0.643	0.80	0.226	0.57	0.096	40.00
45.00			2.34	3.086	1.37	0.804	0.90	0.281	0.64	0.119	45.00
50.00			2.60	3.782	1.53	0.982	1.00	0.343	0.71	0.145	50.00
55.00			2.86	4.547	1.68	1.178	1.10	0.411	0.78	0.173	55.00
60.00			3.12	5.382	1.83	1.392	1.20	0.484	0.85	0.204	60.00
65.00			3.38	6.287	1.98	1.623	1.30	0.563	0.92	0.237	65.00
70.00			3.64	7.262	2.14	1.871	1.40	0.648	0.99	0.272	70.00
75.00					2.29	2.135	1.50	0.740	1.06	0.310	75.00
80.00					2.44	2.419	1.60	0.836	1.13	0.350	80.00

85.00					2.60	2.720	1.70	0.939	1.20	0.393	85.00
90.00					2.75	3.038	1.80	1.048	1.27	0.438	90.00
95.00					2.90	3.373	1.90	1.162	1.35	0.485	95.00
100.00					3.05	3.725	2.00	1.282	1.42	0.535	100.00
105.00					3.21	4.095	2.11	1.460	1.49	0.587	105.00
110.00					3.36	4.482	2.21	1.540	1.56	0.642	110.00
115.00							2.31	1.680	1.63	0.698	115.00
120.00							2.41	1.821	1.70	0.758	120.00
125.00							2.51	1.973	1.77	0.819	125.00
130.00							2.61	2.126	1.84	0.883	130.00
140.00							2.81	2.453	1.98	1.018	140.00
150.00							3.01	2.804	2.12	1.162	150.00
160.00							3.21	3.178	2.27	1.316	160.00
170.00							3.41	3.575	2.41	1.479	170.00
180.00									2.55	1.652	180.00
190.00									2.69	1.834	190.00
200.00									2.83	2.025	200.00
210.00									2.97	2.226	210.00
220.00									3.12	2.436	220.00