

# TABULKY FYZIKÁLNÍCH KONSTANT

**TABULKA 1**

**Teplotní závislost hustoty destilované vody [ kg.m<sup>-3</sup> ]**

<b>t [°C]</b>	<b>0.0</b>	<b>0.2</b>	<b>0.4</b>	<b>0.6</b>	<b>0.8</b>
<b>0</b>	999.8426	999.8558	999.8683	999.8801	999.8912
<b>1</b>	999.9015	999.9112	999.9202	999.9284	999.9360
<b>2</b>	999.9429	999.9491	999.9546	999.9595	999.9636
<b>3</b>	999.9672	999.9700	999.9722	999.9738	999.9747
<b>4</b>	999.9750	999.9746	999.9736	999.9719	999.9696
<b>5</b>	999.9668	999.9632	999.9591	999.9544	999.9400
<b>6</b>	999.9430	999.9365	999.9293	999.9216	999.9132
<b>7</b>	999.9043	999.8948	999.8847	999.8740	999.8627
<b>8</b>	999.8500	999.8385	999.8256	999.8121	999.7980
<b>9</b>	999.7834	999.7682	999.7525	999.7362	999.7194
<b>10</b>	999.7021	999.6842	999.6658	999.9468	999.6274
<b>11</b>	999.6074	999.5869	999.5658	999.5443	999.5222
<b>12</b>	999.4996	999.4766	999.4530	999.4289	999.4043
<b>13</b>	999.3792	999.3536	999.3276	999.3010	999.2740
<b>14</b>	999.2464	999.2184	999.1899	999.1609	999.1315
<b>15</b>	999.1016	999.0712	999.0403	999.0090	998.9772
<b>16</b>	998.9450	998.9123	998.8791	998.8455	998.8114
<b>17</b>	998.7769	998.7419	998.7065	998.6706	998.6343
<b>18</b>	998.5976	998.5604	998.5228	998.4847	998.4462
<b>19</b>	998.4073	998.3680	998.3282	998.2880	998.2474
<b>20</b>	998.2063	998.1649	998.1230	998.807	998.0380
<b>21</b>	997.9948	997.9513	997.9073	997.8630	997.8182
<b>22</b>	997.7730	997.7275	997.6815	997.6351	997.5883
<b>23</b>	997.5412	997.4936	997.4456	997.3973	997.3485
<b>24</b>	997.2994	997.2499	997.2000	997.1487	997.0090
<b>25</b>	997.0480	996.9965	996.9447	996.8925	996.8399
<b>26</b>	996.7870	996.7337	996.6800	996.6259	996.5714
<b>27</b>	996.5166	996.4615	996.4059	996.3500	996.2938
<b>28</b>	996.2371	996.1801	996.1228	996.0651	996.0070
<b>29</b>	995.9486	995.8898	995.8306	995.7712	995.7113
<b>30</b>	995.6511	995.5906	995.5297	995.4685	995.4069
<b>31</b>	995.3450	995.2827	995.2201	995.1572	995.0939
<b>32</b>	995.0302	994.9663	994.9020	994.8373	994.7724
<b>33</b>	994.7071	994.6414	994.5755	994.5092	994.4425
<b>34</b>	994.3756	994.3083	994.2407	994.1728	994.1045
<b>35</b>	994.0359	993.9671	993.8978	993.8283	993.7585

**TABULKA 2**  
Závislost hustoty vzduchu na tlaku a teplotě [kg.m<sup>-3</sup>]

t[°C]	p[kPa]											
	93	94	95	96	97	98	99	100	101	101.325	102	103
0	1.187	1.200	1.213	1.225	1.238	1.251	1.264	1.276	1.289	1.293	1.302	1.315
5	1.166	1.178	1.191	1.203	1.216	1.228	1.241	1.253	1.266	1.270	1.278	1.291
10	1.145	1.157	1.170	1.182	1.194	1.206	1.219	1.231	1.243	1.247	1.256	1.268
11	1.141	1.153	1.165	1.178	1.190	1.202	1.214	1.227	1.239	1.243	1.251	1.264
12	1.137	1.149	1.161	1.174	1.186	1.198	1.210	1.222	1.235	1.239	1.247	1.259
13	1.133	1.145	1.157	1.169	1.182	1.194	1.206	1.218	1.230	1.234	1.243	1.255
14	1.129	1.141	1.153	1.165	1.177	1.190	1.202	1.214	1.226	1.230	1.238	1.250
15	1.125	1.137	1.149	1.161	1.173	1.185	1.198	1.210	1.222	1.226	1.234	1.246
16	1.121	1.133	1.145	1.157	1.169	1.181	1.193	1.205	1.218	1.221	1.230	1.242
17	1.117	1.129	1.141	1.153	1.165	1.177	1.189	1.201	1.213	1.217	1.225	1.237
18	1.113	1.125	1.137	1.149	1.161	1.173	1.185	1.197	1.209	1.231	1.221	1.233
19	1.110	1.121	1.133	1.145	1.157	1.169	1.181	1.193	1.205	1.209	1.217	1.229
20	1.106	1.118	1.130	1.141	1.153	1.165	1.177	1.189	1.201	1.205	1.213	1.225
21	1.102	1.114	1.126	1.138	1.149	1.161	1.173	1.185	1.197	1.201	1.209	1.220
22	1.098	1.110	1.122	1.134	1.145	1.157	1.169	1.181	1.193	1.197	1.205	1.216
23	1.095	1.106	1.118	1.130	1.142	1.153	1.165	1.177	1.189	1.193	1.200	1.212
24	1.091	1.103	1.114	1.126	1.138	1.149	1.161	1.173	1.185	1.189	1.196	1.208
25	1.087	1.099	1.111	1.122	1.134	1.146	1.157	1.169	1.181	1.185	1.192	1.204
26	1.084	1.095	1.107	1.119	1.130	1.142	1.153	1.165	1.177	1.181	1.188	1.200
27	1.080	1.092	1.103	1.115	1.126	1.138	1.150	1.161	1.173	1.177	1.184	1.196
28	1.076	1.088	1.099	1.111	1.123	1.134	1.146	1.157	1.169	1.173	1.181	1.192
29	1.073	1.084	1.096	1.107	1.119	1.130	1.142	1.154	1.165	1.169	1.177	1.188
30	1.069	1.081	1.092	1.104	1.115	1.127	1.138	1.150	1.161	1.165	1.173	1.184

**TABULKA 3**  
Závislost dynamické viskozity vody na teplotě

t	η	t	η	t	η	t	η	T	η
[°C]	[10 <sup>-3</sup> Pa.s]	[°C]	[10 <sup>-3</sup> Pa.s]	[°C]	[10 <sup>-3</sup> Pa.s]	[°C]	[10 <sup>-3</sup> Pa.s]	[°C]	[10 <sup>-3</sup> Pa.s]
1	1.728	11	1.271	21	0.978	31	0.781	41	0.641
2	1.671	12	1.235	22	0.955	32	0.765	42	0.629
3	1.618	13	1.202	23	0.933	33	0.749	43	0.618
4	1.567	14	1.169	24	0.911	34	0.734	44	0.607
5	1.519	15	1.139	25	0.890	35	0.719	45	0.596
6	1.472	16	1.109	26	0.871	36	0.705	46	0.586
7	1.428	17	1.081	27	0.851	37	0.692	47	0.576
8	1.386	18	1.053	28	0.833	38	0.678	48	0.565
9	1.346	19	1.027	29	0.815	39	0.665	49	0.556
10	1.307	20	1.002	30	0.798	40	0.653	50	0.547

**TABULKA 4**

Teplotní závislost povrchového napětí  $\sigma$  a dynamické viskozity  $\eta$  destilované vody při tlaku  $10^5$  Pa

t [°C]	$\eta$ [ $10^{-3}$ Pa.s]	$\sigma$ [ $10^{-3}$ N.m <sup>-1</sup> ]	t [°C]	$\eta$ [ $10^{-3}$ Pa.s]	$\sigma$ [ $10^{-3}$ N.m <sup>-1</sup> ]
0	1.7865	75.6	40	0.6540	69.6
5	1.5138	74.9	50	0.5477	67.9
10	1.3037	74.2	60	0.4674	66.2
15	1.1369	73.5	70	0.4048	64.4
20	1.0019	72.8	80	0.3554	62.6
25	0.8909	72.0	90	0.3155	60.7
30	0.7982	71.2	100	0.2829	58.8

**TABULKA 5**

Dynamická viskozita  $\eta$  a povrchové napětí  $\sigma$  vybraných kapalin při teplotě 20 °C

kapalina	$\eta$ [ $10^{-3}$ Pa.s]	$\sigma$ [ $10^{-3}$ N.m <sup>-1</sup> ]		$\eta$ [ $10^{-3}$ Pa.s]	$\sigma$ [ $10^{-3}$ N.m <sup>-1</sup> ]
Aceton	0.324	23.3	Nitrobenzen	2.01	43.3
Anilin	4.39	43.3	Olivový olej	84.0	33.0
Benzen	0.647	28.88	Ricinový olej	986	36.4-
Ethanol	1.197	22.3	Fenol	11.6	40.9
Glycerol	1 480	65.7	Destilovaná voda	1.002	72.75
Methylalcohol	0.594	22.6			

**TABULKA 6**

Bod varu vody v závislosti na tlaku

p [ $10^5$ Pa]	t [°C]	p [ $10^5$ Pa]	t [°C]	p [ $10^5$ Pa]	t [°C]
0.900	96.71	0.960	98.49	1.020	100.19
0.905	96.86	0.965	98.63	1.025	100.32
0.910	97.02	0.970	98.78	1.030	100.46
0.915	97.16	0.975	98.93	1.035	100.60
0.920	97.32	0.980	99.07	1.040	100.73
0.925	97.46	0.985	99.21	1.045	100.86
0.930	97.61	0.990	99.35	1.050	101.00
0.935	97.76	0.995	99.49	1.055	101.13
0.940	97.98	1.000	99.63	1.060	101.27
0.945	98.06	1.005	99.77	1.065	101.40
0.950	98.20	1.010	99.91	1.070	101.53
0.955	98.35	1.015	100.05	1.075	101.66

**TABULKA 7**Dynamická viskozita  $\eta$  roztoku glycerolu při teplotách 20, 25 a 30 °C

Roztok glycerolu (%)	$\eta$ [10 <sup>-3</sup> Pa.s]		
	20 °C	25 °C	30 °C
-			
5	1.143	1.010	0.900
10	1.311	1.153	1.024
20	1.769	1.542	1.360
30	2.501	2.157	1.186
40	3.750	3.181	2.731
50	6.050	5.041	4.247
60	10.960	8.823	7.312
70	22.94	17.96	14.32
72	27.56	21.29	16.88
74	33.04	25.46	19.93
76	40.19	30.56	23.60
78	49.57	37.18	28.68
80	62.0	45.86	34.92
82	77.9	56.90	42.95
84	99.6	72.2	53.63
85	112.9	81.5	60.05
86	129.6	92.6	68.1
87	150.4	106.1	77.5
88	174.5	122.6	88.8
89	201.4	141.8	101.1
90	234.6	163.6	115.3
91	278.4	189.3	134.4
92	328.4	221.8	156.5
93	387.7	262.9	182.8
94	457.7	308.7	212.0
95	545.0	366.0	248.8
100	1480	-	-

**TABULKA 8**  
**Teplotní závislost tlaku nasycené vodní páry**

t [°C]	p [Pa]	t [°C]	p [Pa]	t [°C]	p [Pa]	t [°C]	p [Pa]
-30	38.1	5	872.3	25	3167.7	62	21838.1
-25	63.5	6	935.0	26	3361.0	64	23904.6
-20	103.5	7	1001.6	27	3565.0	66	26144.4
-15	165.5	8	1072.6	28	3779.7	68	28557.6
-12	217.6	9	1147.8	30	4242.3	70	31157.4
-10	286.5	10	1337.8	32	14754.3	72	33943.8
-9	310.1	11	1311.9	34	5319.5	74	36956.4
-8	335.2	12	1402.5	36	5940.8	76	40183.2
-7	362.0	13	1497.2	38	6624.8	78	43636.3
-6	390.8	14	1598.5	40	7375.4	80	47342.6
-5	421.7	15	1705.2	42	8199.3	82	51315.6
-4	454.6	16	1817.2	44	9100.6	84	55568.6
-3	489.7	17	1937.2	46	10085.8	86	60114.9
-2	527.4	18	2063.8	48	11160.4	88	64.941.1
-1	567.7	19	2197.1	50	12333.6	90	70095.4
0	610.5	20	2338.5	52	13612.2	92	75592.2
1	659.7	21	2486.5	54	14998.7	94	81446.4
2	705.8	22	2643.8	56	16505.3	96	87675.2
3	758.0	23	2809.1	58	18145.1	98	94294.6
4	813.4	24	2983.7	60	19918.3		

**TABULKA 9**  
**Hustota  $\rho$  vybraných pevných látek**

Látka	$\rho$ [kg.m <sup>-3</sup> ]	Látka	$\rho$ [kg.m <sup>-3</sup> ]
<b>Hliník</b>	2700	<b>Grafit</b>	2100
<b>Azbest</b>	2100-2800	<b>Sádra</b>	800-1200
<b>Asfalt</b>	1300	<b>Ebonit</b>	1200
<b>Bakelit</b>	1300-1500	<b>Sklo</b>	2400-4700
<b>Mosaz</b>	8600	<b>Papír</b>	700-1100
<b>Bronz</b>	8400-8700	<b>Plexisklo</b>	1180
<b>Celuloid</b>	1400	<b>Polystyren</b>	1050
<b>Uhlí</b>	1200-1500	<b>Polyst.pěnový</b>	120-250
<b>Beton</b>	1800-2200	<b>Porcelán</b>	2100-2400
<b>Měď</b>	8930	<b>Křemen</b>	2600
<b>Žula</b>	2600-2900	<b>Guma</b>	2700
<b>Diamant</b>	3500	<b>Ocel</b>	7400-8000
<b>Dural (Al-Mg)</b>	2800	<b>Dubové dřevo</b>	600-1000

**TABULKA 10**  
**Mechanické a tepelné vlastnosti vybraných látek**

Látka	Modul pružnosti E [10 <sup>9</sup> Pa]	Modul pružnosti ve smyku G [10 <sup>9</sup> Pa]	Měrná tepelná kapacita c [kJ.kg <sup>-1</sup> .K <sup>-1</sup> ]	Tepelná vodivost λ [W.m <sup>-1</sup> .K <sup>-1</sup> ]	Teplotní roztažnost α [10 <sup>-6</sup> K <sup>-1</sup> ]
<b>Hliník</b>	66-68	26-28	0.89	229	24
<b>Bakelit</b>	9-15	1-3	1.3-1.5	0.23	6-8
<b>Mosaz</b>	100-110	43	0.42	106	22
<b>Cihly</b>	20-40	8-16	1.0-1.5	0.3-0.8	2-4
<b>Beton</b>	40-80	16-33	0.7-1.1	0.5-0.8	5-10
<b>Měď</b>	120-130	42-47	0.38	395	17
<b>Sklo</b>	60-80	20-30	0.7-0.9	-	3-6
<b>Žula</b>	30-60	10-15	0.6-0.8	2.9-4.0	4-5
<b>Olovo</b>	15-17	7	0.13	35	29
<b>Ocel</b>	190-220	60-90	0.4-0.5	80-90	10-12
<b>Dřevo –dub</b>	13-15	0.6-1.0	1.0-1.5	0.9-1.6	7-9
<b>Dřevo –borovice</b>	10-12	0.3-0.5	0.9-1.3	0.7-1.4	6-9