Conversion Table

Transmittance ⟸⟹ Extinction*)

Transmittance T (%) and extinction (E) can be interconverted (see p. 19):

$$E = \log \frac{1}{T}$$

$$-\log T = E.$$

To facilitate the calculations the measured transmittance is expressed as a decimal and not as a percentage: *e.g.* 0.05 instead of 5%.

Example: The measured transmittance T was 12.7% or T = 0.127. Therefore E = −log 0.127 = −($\bar{1}$.1038) = 0.8962. This value for T = 12.7% can also be obtained from the Table.

The Table does not contain values for E corresponding to T values of under 10% (less than 0.1).

The calculations in this case are as follows:

Example: The measured transmittance T was 4.5% or T = 0.045. Therefore E = −log 0.045 = −($\bar{2}$.6532) = 1.3468.

To obtain this value from the Table the T value which is ten times larger is found (10 T = 45%), 100000 is added to the E value (0.34579) and the required E value of 1.34679 is obtained.

*) optical density

T%	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
10	1.0000	*957	*914	*872	*830	*788	*747	*706	*666	*626
11	0.9586	547	508	469	431	393	355	318	281	245
12	.9208	172	136	101	066	031	*996	*962	*928	*894
13	.8861	827	794	761	729	697	665	633	601	570
14	.8539	508	477	447	416	386	356	327	297	268
15	0.8239	210	182	153	125	097	069	041	013	*986
16	.7959	932	905	878	852	825	799	773	747	721
17	.7696	670	645	620	595	570	545	520	496	471
18	.7447	423	399	375	352	328	305	282	258	235
19	.7212	190	167	144	122	100	077	055	033	011
20	.6990	968	946	925	904	882	861	840	819	799
21	.6778	757	737	716	696	676	655	635	615	596
22	.6576	556	536	517	498	478	459	440	421	402
23	.6383	364	345	326	308	289	271	253	234	216
24	.6198	180	162	144	126	108	091	073	055	038
25	0.6021	003	*986	*969	*952	*935	*918	*901	*884	*867
26	.5850	834	817	800	784	768	751	735	719	702
27	.5686	670	654	638	622	607	591	575	560	544
28	.5528	513	498	482	467	452	436	421	406	391
29	.5376	361	346	331	317	302	287	272	258	243
30	0.5229	214	200	186	171	157	143	129	114	100
31	.5086	072	058	045	031	017	003	*989	*976	*962
32	.4949	935	921	908	895	881	868	855	841	828
33	.4815	802	789	776	763	750	737	724	711	698
34	.4685	672	660	647	634	622	609	597	584	572
35	0.4559	547	535	522	510	498	486	473	461	449
36	.4437	425	413	401	389	377	365	353	342	330
37	.4318	306	295	283	271	260	248	237	225	214
38	.4202	191	179	168	157	145	134	123	112	101
39	.4089	078	067	056	045	034	023	012	001	*990

T%	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
40	0.39794	685	577	469	362	254	147	040	*934	*828
41	.38722	616	510	405	300	195	091	*986	*882	*779
42	.37675	572	469	366	263	161	059	*957	*856	*754
43	.36653	552	452	351	251	151	051	*952	*853	*754
44	.35655	556	458	360	262	164	067	*969	*872	*775
45	0.34679	582	486	390	294	199	103	008	*913	*819
46	.33724	630	536	442	348	255	161	068	*975	*883
47	.32790	698	606	514	422	331	239	148	057	*966
48	.31876	785	695	605	515	426	336	247	158	069
49	.30980	892	803	715	627	539	452	364	277	190
50	0.30103	016	*930	*843	*757	*671	*585	*499	*414	*328
51	.29243	158	073	*988	*904	*819	*735	*651	*567	*483
52	.28400	316	233	150	067	*984	*901	*819	*737	*654
53	.27572	490	409	327	246	165	084	003	*922	*841
54	.26761	680	600	520	440	360	281	201	122	043
55	.25964	885	806	727	649	571	493	415	337	259
56	.25181	104	026	*949	*872	*795	*718	*642	*565	*489
57	.24412	336	260	184	109	033	*958	*882	*807	*732
58	.23657	582	508	433	359	284	210	136	062	*988
59	.22915	841	768	695	621	548	475	403	330	257
60	0.22185	113	040	*968	*896	*824	*753	*681	*610	*538
61	.21467	396	325	254	183	112	042	*971	*901	*831
62	.20761	691	621	551	482	412	343	273	204	135
63	.20066	*997	*928	*860	*791	*723	*654	*586	*518	*450
64	.19382	314	246	179	111	044	*977	*910	*843	*776
65	0.18709	642	575	509	442	376	310	243	177	111
66	.18046	*980	*914	*849	*783	*718	*653	*587	*522	*457
67	.17393	328	263	198	134	070	005	*941	*877	*813
68	.16749	685	622	558	494	431	368	304	241	178
69	.16115	052	*989	*927	*864	*802	*739	*677	*614	*552

T%	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
70	0.15490	428	366	304	243	181	120	058	*997	*935
71	.14874	813	752	691	630	569	509	448	388	327
72	.14267	206	146	086	026	*966	*906	*847	*787	*727
73	.13668	608	549	490	430	371	312	253	194	136
74	.13077	018	*960	*901	*843	*784	*726	*668	*610	*552
75	0.12494	436	378	321	263	205	148	090	033	*976
76	.11919	862	805	748	691	634	577	520	464	407
77	.11351	295	238	182	126	070	014	*958	*902	*846
78	.10791	735	679	624	568	513	458	403	347	292
79	.10237	182	127	073	018	*963	*909	*854	*800	*745
80	0.09691	637	583	528	474	420	366	313	259	205
81	.09151	098	044	*991	*938	*884	*831	*778	*725	*672
82	.08619	566	513	460	407	355	302	249	197	145
83	.08092	040	*988	*935	*883	*831	*779	*727	*676	*624
84	.07572	520	469	417	366	314	263	212	160	109
85	0.07058	007	*956	*905	*854	*803	*753	*702	*651	*601
86	.06550	500	449	399	349	298	248	198	148	098
87	.06048	*998	*948	*899	*849	*799	*750	*700	*651	*601
88	.05552	502	453	404	355	306	257	208	159	110
89	.05061	012	*964	*915	*866	*818	*769	*721	*672	*624
90	0.04576	528	479	431	383	335	287	239	191	144
91	.04096	048	001	*953	*905	*858	*810	*763	*716	*668
92	.03621	574	527	480	433	386	339	292	245	198
93	.03152	105	058	012	*965	*919	*872	*826	*780	*733
94	.02687	641	595	549	503	457	411	365	319	273
95	0.02228	182	136	091	045	000	*954	*909	*863	*818
96	.01773	728	682	637	592	547	502	457	412	368
97	.01323	278	233	189	144	100	055	011	*966	*922
98	.00877	833	789	745	700	656	612	568	524	480
99	.00436	393	349	305	261	218	174	130	087	043
100	0.00000									