

## Anhang 17: Berechnungstabellen

### Abhang 17 - Tabelle 1 – Berechnungstabelle für natürliche Rauch- und Wärmeabzugsanlagen

			keine Brandmeldeanlage, keine Sprinkleranlage						Brandmeldeanlage						Sprinkleranlage					
H	y	y <sub>r</sub>	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N
[m]	[m]	[m]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]
3,0	2,0	1,0													7,128	60	4,9	7,126	1,529	6
3,0	2,5	0,5													9,961	60	9,6	9,959	0,270	38
3,5	2,0	1,5													7,128	60	4,0	7,126	4,214	3
3,5	2,5	1,0													9,961	60	6,8	9,959	1,529	8
3,5	3,0	0,5							19,641	102	15,8	21,965	0,352	63	13,094	60	12,5	13,092	0,270	50
4,0	2,5	1,5													9,961	60	5,5	9,959	4,214	4
4,0	3,0	1,0							19,641	102	11,2	21,965	1,992	12	13,094	60	8,9	13,092	1,529	10
4,0	3,5	0,5	34,376	116	26,5	39,858	0,376	106	24,751	81	21,3	26,205	0,314	84	16,501	60	15,8	16,498	0,270	63
4,5	2,5	2,0													9,961	60	4,8	9,959	8,651	3
4,5	3,0	1,5							19,641	102	9,1	21,965	5,490	5	13,094	60	7,3	13,092	4,214	5
4,5	3,5	1,0	34,376	116	18,8	39,858	2,130	19	24,751	81	15,1	26,205	1,775	15	16,501	60	11,2	16,498	1,529	12
4,5	4,0	0,5	42,000	95	34,3	46,184	0,341	136	30,240	66	27,9	30,760	0,284	109	20,160	50	20,7	19,563	0,246	81
5,0	2,5	2,5													9,961	60	4,3	9,959	15,113	2
5,0	3,0	2,0							19,641	102	7,9	21,965	11,270	2	13,094	60	6,3	13,092	8,651	3
5,0	3,5	1,5	34,376	116	15,3	39,858	5,869	7	24,751	81	12,3	26,205	4,891	6	16,501	60	9,1	16,498	4,214	5
5,0	4,0	1,0	42,000	95	24,3	46,184	1,927	24	30,240	66	19,7	30,760	1,606	20	20,160	50	14,7	19,563	1,391	16
5,0	4,5	0,5	50,116	80	43,3	52,920	0,312	170	36,084	55	35,5	35,610	0,260	138	24,056	42	26,5	22,796	0,225	103
5,5	2,5	3,0													9,961	60	3,9	9,959	23,841	2
5,5	3,0	2,5							19,641	102	7,1	21,965	19,689	2	13,094	60	5,6	13,092	15,113	2
5,5	3,5	2,0	34,376	116	13,3	39,858	12,048	4	24,751	81	10,7	26,205	10,040	3	16,501	60	7,9	16,498	8,651	3
5,5	4,0	1,5	42,000	95	19,8	46,184	5,310	9	30,240	66	16,1	30,760	4,425	7	20,160	50	12,0	19,563	3,832	7
5,5	4,5	1,0	50,116	80	30,6	52,920	1,764	31	36,084	55	25,1	35,610	1,470	25	24,056	42	18,8	22,796	1,273	19
5,5	5,0	0,5	58,697	68	53,5	60,040	0,288	209	42,262	47	44,2	40,737	0,240	170	28,174	35	33,1	26,214	0,208	128
6,0	3,0	3,0							19,641	102	6,5	21,965	31,058	1	13,094	60	5,2	13,092	23,841	2
6,0	4,0	2,0	42,000	95	17,2	46,184	10,900	5	30,240	66	14,0	30,760	9,083	4	20,160	50	10,4	19,563	7,866	4
6,0	5,0	1,0	58,697	68	37,9	60,040	1,630	37	42,262	47	31,3	40,737	1,358	30	28,174	35	23,4	26,214	1,176	24
7,0	3,0	4,0							19,641	102	5,6	21,965	63,755	1	13,094	60	4,5	13,092	48,940	2
7,0	4,0	3,0	42,000	95	14,0	46,184	30,036	2	30,240	66	11,4	30,760	25,030	2	20,160	50	8,5	19,563	21,677	2
7,0	5,0	2,0	58,697	68	26,8	60,040	9,220	7	42,262	47	22,1	40,737	7,683	6	28,174	35	16,6	26,214	6,654	5
7,0	6,0	1,0	77,159	52	55,1	75,362	1,422	54	55,554	36	45,9	51,768	1,185	44	37,036	27	34,6	33,568	1,026	34

			keine Brandmeldeanlage, keine Sprinkleranlage						Brandmeldeanlage						Sprinkleranlage					
H	y	y <sub>r</sub>	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N	M	Θ	A <sub>WA</sub>	V	V <sub>krit</sub>	N
[m]	[m]	[m]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]	[kg/s]	[°C]	[m <sup>2</sup> ]	[m <sup>3</sup> /s]	[m <sup>3</sup> /s]	[1]
8,0	3,0	5,0							19,641	102	5,0	21,965	111,376	1	13,094	60	4,0	13,092	85,494	2
8,0	4,0	4,0	42,000	95	12,2	46,184	61,658	1	30,240	66	9,9	30,760	51,382	1	20,160	50	7,4	19,563	44,498	2
8,0	5,0	3,0	58,697	68	21,9	60,040	25,408	3	42,262	47	18,1	40,737	21,173	2	28,174	35	13,6	26,214	18,336	3
8,0	6,0	2,0	77,159	52	38,9	75,362	8,042	10	55,554	36	32,5	51,768	6,701	8	37,036	27	24,5	33,568	5,804	7
8,0	7,0	1,0	97,231	41	76,0	92,019	1,266	73	70,007	29	63,8	63,761	1,055	61	46,671	21	48,3	41,564	0,914	47
9,0	3,0	6,0							19,641	102	4,6	21,965	175,688	1	13,094	60	3,7	13,092	134,862	2
9,0	4,0	5,0	42,000	95	10,9	46,184	107,713	1	30,240	66	8,9	30,760	89,761	1	20,160	50	6,6	19,563	77,735	2
9,0	5,0	4,0	58,697	68	19,0	60,040	52,157	2	42,262	47	15,7	40,737	43,464	1	28,174	35	11,7	26,214	37,641	2
9,0	6,0	3,0	77,159	52	31,8	75,362	22,160	4	55,554	36	26,5	51,768	18,467	3	37,036	27	20,0	33,568	15,993	4
9,0	7,0	2,0	97,231	41	53,8	92,019	7,164	13	70,007	29	45,1	63,761	5,970	11	46,671	21	34,2	41,564	5,170	10
9,0	8,0	1,0	118,794	34	100,9	109,914	1,146	96	85,532	23	85,1	76,645	0,955	81	57,021	18	64,6	50,153	0,827	62
10,0	3,0	7,0							19,641	102	4,2	21,965	258,292	1	13,094	60	3,4	13,092	198,270	2
10,0	4,0	6,0	42,000	95	9,9	46,184	169,911	1	30,240	66	8,1	30,760	141,592	1	20,160	50	6,0	19,563	122,622	2
10,0	5,0	5,0	58,697	68	17,0	60,040	91,114	1	42,262	47	14,0	40,737	75,928	1	28,174	35	10,5	26,214	65,756	2
10,0	6,0	4,0	77,159	52	27,6	75,362	45,491	2	55,554	36	23,0	51,768	37,909	2	37,036	27	17,3	33,568	32,830	3
10,0	7,0	3,0	97,231	41	43,9	92,019	19,741	5	70,007	29	36,8	63,761	16,451	4	46,671	21	27,9	41,564	14,247	4
10,0	8,0	2,0	118,794	34	71,3	109,914	6,481	17	85,532	23	60,2	76,645	5,401	15	57,021	18	45,7	50,153	4,677	12
10,0	9,0	1,0	141,750	28	129,8	128,964	1,049	123	102,060	20	109,8	90,362	0,874	104	68,040	15	83,6	59,297	0,757	80
12,0	4,0	8,0	42,000	95	8,6	46,184	348,793	1	30,240	66	7,0	30,760	290,661	1	20,160	50	5,2	19,563	251,719	2
12,0	6,0	6,0	77,159	52	22,5	75,362	125,358	1	55,554	36	18,8	51,768	104,465	1	37,036	27	14,2	33,568	90,469	2
12,0	8,0	4,0	118,794	34	50,5	109,914	36,662	3	85,532	23	42,6	76,645	30,552	3	57,021	18	32,3	50,153	26,459	3
12,0	10,0	2,0	166,020	24	115,2	149,105	5,482	28	119,534	17	97,8	104,863	4,569	23	72,100	14	64,3	62,666	4,160	17
14,0	4,0	10,0	42,000	95	7,7	46,184	609,316	1	30,240	66	6,3	30,760	507,763	1	20,160	50	4,7	19,563	439,736	2
14,0	6,0	8,0	77,159	52	19,5	75,362	257,335	1	55,554	36	16,3	51,768	214,446	1	37,036	27	12,3	33,568	185,716	2
14,0	8,0	6,0	118,794	34	41,2	109,914	101,029	2	85,532	23	34,8	76,645	84,191	1	57,021	18	26,4	50,153	72,912	2
14,0	10,0	4,0	166,020	24	81,5	149,105	31,013	5	119,534	17	69,2	104,863	25,844	5	72,100	14	45,5	62,666	23,530	4
16,0	4,0	12,0	42,000	95	7,0	46,184	961,159	1	30,240	66	5,7	30,760	800,966	1	20,160	50	4,3	19,563	693,657	2
16,0	6,0	10,0	77,159	52	17,4	75,362	449,546	1	55,554	36	14,5	51,768	374,621	1	37,036	27	11,0	33,568	324,432	2
16,0	8,0	8,0	118,794	34	35,7	109,914	207,393	1	85,532	23	30,1	76,645	172,828	1	57,021	18	22,9	50,153	149,673	2
16,0	10,0	6,0	166,020	24	66,5	149,105	85,461	2	119,534	17	56,5	104,863	71,217	2	72,100	14	37,2	62,666	64,841	2

**Anhang 17 - Tabelle 2 – Berechnungstabelle für mechanische Rauch- und Wärmeabzugsanlagen**

			keine Brandmeldeanlage, keine Sprinkleranlage					Brandmeldeanlage					Sprinkleranlage				
H	y	y <sub>r</sub>	M	Θ	V	V <sub>krit</sub>	N	M	Θ	V	V <sub>krit</sub>	N	M	Θ	V	V <sub>krit</sub>	N
[m]	[m]	[m]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]
3,0	2,0	1,0											7,128	160	9,145	2,497	5
3,0	2,5	0,5											9,961	160	12,781	0,441	30
3,5	2,0	1,5											7,128	160	9,145	6,882	3
3,5	2,5	1,0											9,961	160	12,781	2,497	7
3,5	3,0	0,5						19,641	509	44,623	0,788	57	13,094	160	16,801	0,441	40
4,0	2,5	1,5											9,961	160	12,781	6,882	3
4,0	3,0	1,0						19,641	509	44,623	4,455	11	13,094	160	16,801	2,497	8
4,0	3,5	0,5	34,376	582	85,175	0,842	102	24,751	404	48,864	0,702	70	16,501	160	21,171	0,441	49
4,5	2,5	2,0											9,961	160	12,781	14,128	2
4,5	3,0	1,5						19,641	509	44,623	12,277	4	13,094	160	16,801	6,882	4
4,5	3,5	1,0	34,376	582	85,175	4,762	18	24,751	404	48,864	3,969	13	16,501	160	21,171	2,497	10
4,5	4,0	0,5	42,000	476	91,502	0,762	121	30,240	331	53,419	0,635	85	20,160	160	25,866	0,441	60
5,0	2,5	2,5											9,961	160	12,781	24,680	2
5,0	3,0	2,0						19,641	509	44,623	25,201	2	13,094	160	16,801	14,128	3
5,0	3,5	1,5	34,376	582	85,175	13,123	7	24,751	404	48,864	10,936	5	16,501	160	21,171	6,882	5
5,0	4,0	1,0	42,000	476	91,502	4,309	22	30,240	331	53,419	3,590	15	20,160	160	25,866	2,497	12
5,0	4,5	0,5	50,116	399	98,237	0,697	141	36,084	277	58,268	0,581	101	24,056	160	30,865	0,441	71
5,5	2,5	3,0											9,961	160	12,781	38,931	2
5,5	3,0	2,5						19,641	509	44,623	44,025	2	13,094	160	16,801	24,680	2
5,5	3,5	2,0	34,376	582	85,175	26,940	4	24,751	404	48,864	22,450	3	16,501	160	21,171	14,128	3
5,5	4,0	1,5	42,000	476	91,502	11,873	8	30,240	331	53,419	9,894	6	20,160	160	25,866	6,882	5
5,5	4,5	1,0	50,116	399	98,237	3,944	25	36,084	277	58,268	3,287	18	24,056	160	30,865	2,497	14
5,5	5,0	0,5	58,697	341	105,358	0,644	164	42,262	237	63,395	0,537	119	28,174	149	35,250	0,426	84
6,0	3,0	3,0						19,641	509	44,623	69,447	1	13,094	160	16,801	38,931	2
6,0	4,0	2,0	42,000	476	91,502	24,373	4	30,240	331	53,419	20,311	3	20,160	160	25,866	14,128	3
6,0	5,0	1,0	58,697	341	105,358	3,645	29	42,262	237	63,395	3,037	21	28,174	149	35,250	2,408	16
7,0	3,0	4,0						19,641	509	44,623	142,561	1	13,094	160	16,801	79,918	2
7,0	4,0	3,0	42,000	476	91,502	67,163	2	30,240	331	53,419	55,969	1	20,160	160	25,866	38,931	2
7,0	5,0	2,0	58,697	341	105,358	20,617	6	42,262	237	63,395	17,181	4	28,174	149	35,250	13,621	4
7,0	6,0	1,0	77,159	259	120,679	3,179	38	55,554	180	74,427	2,649	29	37,036	128	44,110	2,229	21

			keine Brandmeldeanlage, keine Sprinkleranlage					Brandmeldeanlage					Sprinkleranlage				
H	y	y <sub>r</sub>	M	Θ	V	V <sub>krit</sub>	N	M	Θ	V	V <sub>krit</sub>	N	M	Θ	V	V <sub>krit</sub>	N
[m]	[m]	[m]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]	[kg/s]	[°C]	[m³/s]	[m³/s]	[1]
8,0	3,0	5,0						19,641	509	44,623	249,043	1	13,094	160	16,801	139,612	2
8,0	4,0	4,0	42.000	476	91.502	137.872	1	30.240	331	53.419	114.894	1	20.160	160	25.866	79.918	2
8,0	5,0	3,0	58.697	341	105.358	56.813	2	42.262	237	63.395	47.344	2	28.174	149	35.250	37.536	2
8,0	6,0	2,0	77.159	259	120.679	17.982	7	55.554	180	74.427	14.985	5	37.036	128	44.110	12.612	5
8,0	7,0	1,0	97.231	206	137.337	2.832	49	70.007	143	86.420	2.360	37	46.671	107	52.893	2.044	27
9,0	3,0	6,0						19,641	509	44,623	392,851	1	13,094	160	16,801	220,229	2
9,0	4,0	5,0	42.000	476	91.502	240.853	1	30.240	331	53.419	200.711	1	20.160	160	25.866	139.612	2
9,0	5,0	4,0	58.697	341	105.358	116.626	1	42.262	237	63.395	97.188	1	28.174	149	35.250	77.053	2
9,0	6,0	3,0	77.159	259	120.679	49.552	3	55.554	180	74.427	41.293	2	37.036	128	44.110	34.753	3
9,0	7,0	2,0	97.231	206	137.337	16.019	9	70.007	143	86.420	13.349	7	46.671	107	52.893	11.560	6
9,0	8,0	1,0	118.794	168	155.231	2.562	61	85.532	117	99.304	2.135	47	57.021	88	61.482	1.849	35
10,0	3,0	7,0						19,641	509	44,623	577,557	1	13,094	160	16,801	323,774	2
10,0	4,0	6,0	42.000	476	91.502	379.932	1	30.240	331	53.419	316.610	1	20.160	160	25.866	220,229	2
10,0	5,0	5,0	58.697	341	105.358	203.737	1	42.262	237	63.395	169.781	1	28.174	149	35.250	134,606	2
10,0	6,0	4,0	77.159	259	120.679	101.721	2	55.554	180	74.427	84.767	1	37.036	128	44.110	71,342	2
10,0	7,0	3,0	97.231	206	137.337	44.142	4	70.007	143	86.420	36.785	3	46.671	107	52.893	31,857	3
10,0	8,0	2,0	118.794	168	155.231	14.492	11	85.532	117	99.304	12.077	9	57.021	88	61.482	10,459	7
10,0	9,0	1,0	141.750	141	174.282	2.345	75	102.060	98	113.020	1.954	58	68.040	73	70.626	1.693	43
12,0	4,0	8,0	42.000	476	91.502	779.924	1	30.240	331	53.419	649.937	1	20.160	160	25.866	452,087	2
12,0	6,0	6,0	77.159	259	120.679	280.309	1	55.554	180	74.427	233.591	1	37.036	128	44.110	196,595	2
12,0	8,0	4,0	118.794	168	155.231	81.979	2	85.532	117	99.304	68.316	2	57.021	88	61.482	59,164	3
12,0	10,0	2,0	166.020	120	194.422	12.259	16	119.534	84	127.522	10.216	13	72.100	69	73.996	9.301	9
14,0	4,0	10,0	42.000	476	91.502	1362,471	1	30.240	331	53.419	1135,393	1	20.160	160	25.866	789,763	2
14,0	6,0	8,0	77.159	259	120.679	575.419	1	55.554	180	74.427	479.515	1	37.036	128	44.110	403.570	2
14,0	8,0	6,0	118.794	168	155.231	225.909	1	85.532	117	99.304	188.257	1	57.021	88	61.482	163.036	2
14,0	10,0	4,0	166.020	120	194.422	69.346	3	119.534	84	127.522	57.788	3	72.100	69	73.996	52.614	3
16,0	4,0	12,0	42.000	476	91.502	2149.218	1	30.240	331	53.419	1791.015	1	20.160	160	25.866	1245.805	2
16,0	6,0	10,0	77.159	259	120.679	1005,215	1	55.554	180	74.427	837,679	1	37.036	128	44.110	705,009	2
16,0	8,0	8,0	118.794	168	155.231	463.746	1	85.532	117	99.304	386.455	1	57.021	88	61.482	334,680	2
16,0	10,0	6,0	166.020	120	194.422	191.095	2	119.534	84	127.522	159.246	1	72.100	69	73.996	144.988	2