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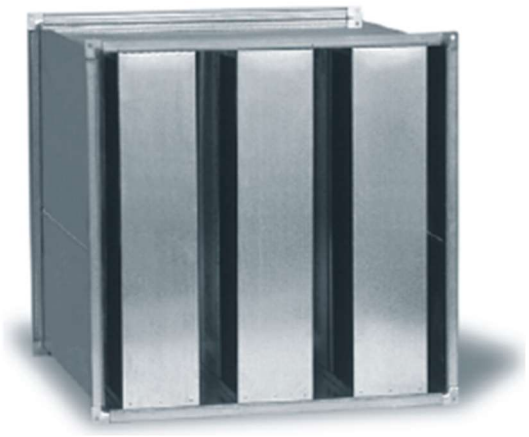
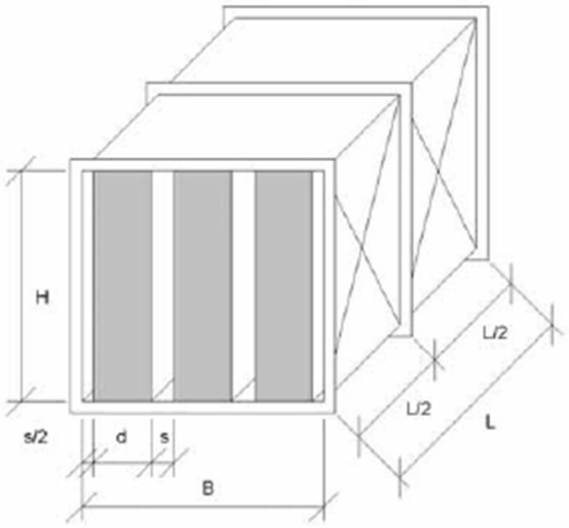
DZ2-DZ3 – ATTENUATORS RECTANGULAR





Application:
Sound attenuators are designed to attenuate noises of fans and air-conditioning devices in ventilation and air-conditioning installations. Noise has a strong negative impact on working efficiency and general feeling of occupants. Damages to the central nervous system, deafness and other ailments are threats to persons working in noisy environments.

Application of DZ-2:
DZ-2 sound attenuators are designed to attenuate fan noises in ventilation and air-conditioning systems. Based on numerous practical calculations it has been established that the said systems require maximum sound attenuation in the 250 Hz octave band. The sound attenuation performances of the DZ-2 sound attenuators with built-in K-2 attenuation splitters are far superior to those of classical absorption attenuators with equal length and width of splitters and equal splitter pattern pitch. In other frequency bands, attenuation performances of the DZ-2 attenuators are also well adapted to ventilation and air-conditioning systems acoustic requirements.

Application of DZ-3:
DZ-3 sound attenuators are suitable to attenuate industrial machinery noises and for special applications in the air-conditioning engineering. DZ-3 sound attenuators provide very efficient attenuation in the 500 to 4000 Hz frequency range.

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Description:

The attenuator housing is made of galvanised sheet steel. The housing connecting flanges are made of galvanised rolled steel quick-coupling elements with 30 mm edges, joined by means of angle pieces. Splitters with frames of galvanised sheet steel and filling of highly efficient absorption material are built into the housing. Filling exposed surface is protected with cellulose foil. They are designed to be incombustible. Contrary to K-3 splitters, the filling of K-2 attenuation splitters is partly covered with galvanised sheet steel strips. Strips of galvanised sheet steel or cellulose foil run along the splitter length L. Hence, the K-2 attenuator splitter height H and length L are not interchangeable. The splitter L dimension shall always run in the direction of propagation of sound.

Determination of adequate attenuator:

Splitter thickness d=100 mm is suitable for smaller air flow rates as well as in the cases where high degree attenuation is required in the high frequency range. Splitter thickness d=200 mm is suitable for large air flow rates as well as in the cases where high degree attenuation is required in the low frequency range. The computer program automatically calculates the required distance (s) between splitters. In comparison with standard cellulose foil lining design, the noise attenuation capacity of splitters with polyethylene foil lining is inferior. The differences are observed in the frequency range from 500 Hz up. Attenuation capacities are reduced as follows:

	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ΔD	14%	36%	50%	50%	50%

Permissible air velocities across splitters:

With the standard version-outer filling surface protected with cellulose foil or sheet steel plates - air velocities of up to 20 m/s are permissible. By installing a perforated galvanised steel sheet in front of the cellulose foil, this upper limit can be increased to 30 m/s. In conditions of dusty or damp air, cellulose foil lining shall be supplemented by polyethylene protection foil and a protection screen. This latter design can sustain air velocities of up to 30 m/s.

Temperature range:

- standard version: up to 100°C,
- when protected with polyethylene foil and screen: up to 80°C.

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Attenuation capacities

Attenuation capacities are measured in our in-house laboratory.
In cases where the required attenuation rates exceed the capacities achievable with attenuators of sizes limited by installation constraints, several attenuators may be installed in series. However, because of lateral sound propagation (through the attenuator housing and splitter frame), attenuation rates exceeding 40 dB, across the entire frequency spectrum, can not be achieved by means of a single attenuator. Higher attenuation rates can only be achieved by adding another attenuator - located as far away as possible from the first one.

Caution:

When installing attenuator splitters in different ducts, ensure that the duct height does not exceed the height of splitters. Any gap between the duct walls and splitters shall be packed, otherwise noise can freely bypass the silencer without attenuation.

Sound attenuation capacity D (dB) determination table

Type: DZ-2; d=100mm

Attenuator length **L=500**

Frequency	Distance between attenuation splitters s (mm)							
(Hz)	30	40	50	60	70	80	90	100
63	6	5	3	3	3	2	2	2
125	10	9	7	5	5	5	5	5
250	14	12	10	9	8	7	7	7
500	20	18	16	15	12	12	12	11
1000	25	22	20	18	16	14	13	12
2000	29	25	21	19	16	12	11	10
4000	20	18	17	16	13	10	9	8
8000	15	13	11	10	9	8	8	7

Attenuator length **L=1000**

Frequency	Distance between attenuation splitters s (mm)							
(Hz)	30	40	50	60	70	80	90	100
63	6	5	5	5	5	3	3	3
125	13	12	10	9	9	8	7	7
250	25	23	19	16	13	13	13	13
500	35	32	28	25	22	21	21	20
1000	41	37	34	31	28	26	24	23
2000	41	37	33	30	27	18	17	16
4000	28	25	23	22	19	16	15	14
8000	20	18	17	16	14	13	11	10

Attenuator length **L=2000**

Frequency	Distance between attenuation splitters s (mm)							
(Hz)	30	40	50	60	70	80	90	100
63	13	12	9	9	9	8	5	5
125	23	21	18	16	15	12	11	11
250	47	42	35	30	27	27	26	25
500	50	50	50	44	43	43	42	42
1000	50	50	50	50	49	49	46	44
2000	50	50	50	50	47	35	29	27
4000	46	41	37	35	33	28	26	24
8000	34	30	27	24	21	18	17	16

Attenuator length **L=2500**

Frequency	Distance between attenuation splitters s (mm)							
(Hz)	30	40	50	60	70	80	90	100
63	13	12	11	11	11	9	8	8
125	24	22	19	18	16	14	14	13
250	50	50	42	38	34	34	34	30
500	50	50	50	50	48	47	45	44
1000	50	50	50	50	50	50	50	50
2000	50	50	50	50	50	37	35	33
4000	50	50	48	43	40	34	31	27
8000	35	32	28	28	25	25	21	18

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Attenuator length **L=1500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	8	7	7	7	7	5	3	4
125	19	17	14	12	12	11	10	9
250	36	32	27	23	20	20	20	19
500	50	47	40	35	32	31	31	30
1000	50	50	49	45	43	37	35	33
2000	50	50	45	41	38	24	22	21
4000	38	33	30	28	26	21	20	18
8000	27	24	22	20	18	17	15	13

Attenuator length **L=3000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	13	12	11	11	11	12	12	12
125	23	22	20	19	18	15	15	14
250	50	50	50	45	39	38	37	36
500	50	50	50	50	50	50	50	50
1000	50	50	50	50	50	50	50	50
2000	50	50	50	50	50	50	39	38
4000	50	50	50	50	46	39	35	30
8000	35	33	31	30	29	28	25	20

Sound attenuation capacity D (dB) determination table

Type: DZ-2; d=200mm

Attenuator length **L=500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	4	3	3	3	3	2	2	2
125	8	7	7	4	3	3	3	3
250	16	13	11	9	8	7	7	6
500	18	15	13	11	8	7	7	6
1000	18	15	14	10	9	8	8	7
2000	15	12	10	9	8	7	6	6
4000	16	13	8	9	8	8	7	7
8000	13	11	7	8	7	7	6	6

Attenuator length **L=2000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	10	9	9	7	5	5	5	5
125	24	21	20	18	16	15	14	13
250	47	42	39	34	30	27	25	23
500	50	46	41	35	31	28	25	23
1000	49	43	40	30	25	21	18	16
2000	38	34	26	22	19	17	15	14
4000	30	27	22	19	16	15	14	13
8000	26	23	20	15	13	12	11	9

Attenuator length **L=1000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	6	5	5	3	3	3	2	2
125	14	12	11	9	8	7	7	6
250	25	22	21	17	15	14	13	12
500	30	26	22	18	16	15	13	12
1000	28	24	22	17	15	13	11	10
2000	23	20	16	13	11	10	9	8
4000	19	17	13	12	10	9	9	8
8000	16	14	11	9	8	8	7	7

Attenuator length **L=2500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	11	10	10	8	7	7	5	5
125	29	25	24	21	19	18	17	16
250	50	49	48	41	37	33	31	28
500	50	50	50	43	38	34	30	28
1000	49	43	43	37	30	25	21	18
2000	45	39	30	25	23	20	17	17
4000	36	31	24	21	19	17	16	15
8000	30	26	22	18	15	14	13	12

Attenuator length **L=1500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	8	7	7	5	5	5	3	3
125	19	17	16	14	13	12	11	9
250	38	33	30	26	22	20	18	17
500	42	37	31	27	24	21	18	17
1000	39	34	31	24	20	17	15	13
2000	31	27	21	17	16	13	12	11
4000	25	22	18	15	14	13	12	10
8000	22	19	16	13	11	11	9	8

Attenuator length **L=3000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	13	12	10	8	8	7	7	5
125	33	29	28	24	21	20	19	18
250	50	50	50	48	43	39	36	33
500	50	50	50	50	44	40	35	32
1000	50	44	43	43	34	29	23	20
2000	50	44	34	29	25	23	20	18
4000	40	35	27	23	21	20	19	17
8000	33	29	24	20	18	15	14	13

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Sound attenuation capacity D (dB) determination table

Type: DZ-3; d=100mm

Attenuator length **L=500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	2	2	2	2	1	1	1	1
125	5	4	4	4	3	3	2	2
250	9	8	7	7	6	6	5	5
500	18	15	13	12	11	11	10	10
1000	35	30	26	25	24	22	21	20
2000	46	42	32	30	28	26	23	20
4000	41	36	26	24	21	18	15	13
8000	30	26	17	15	14	12	10	8

Attenuator length **L=1000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	6	5	4	3	3	2	2	2
125	10	8	6	5	4	4	3	3
250	22	17	13	12	12	10	8	7
500	34	29	23	22	21	20	19	18
1000	41	39	37	35	34	33	31	30
2000	50	46	44	42	39	36	34	32
4000	45	37	35	32	29	27	24	23
8000	36	29	24	21	18	16	14	13

Attenuator length **L=1500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	8	7	6	6	5	4	3	3
125	10	9	7	6	5	5	4	4
250	28	24	20	18	16	14	12	10
500	46	39	33	32	30	28	26	25
1000	50	48	47	46	44	43	42	40
2000	50	50	50	50	50	47	46	44
4000	50	47	45	43	41	39	35	33
8000	36	33	31	30	29	24	20	18

Attenuator length **L=2000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	10	9	8	7	6	5	4	4
125	14	11	9	9	8	8	5	5
250	33	30	27	25	23	20	17	14
500	50	48	43	40	39	37	35	34
1000	50	50	50	50	50	50	50	50
2000	50	50	50	50	50	50	50	50
4000	50	50	50	50	50	50	47	42
8000	45	40	38	36	33	30	27	23

Attenuator length **L=2500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	11	10	9	8	7	6	6	5
125	18	14	11	11	10	8	7	6
250	41	38	33	29	26	22	20	18
500	50	49	47	40	32	29	26	21
1000	50	50	50	50	50	46	40	36
2000	50	50	50	50	50	50	50	50
4000	50	50	50	50	50	50	50	48
8000	50	46	42	40	38	36	33	28

Attenuator length **L=3000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
63	12	12	10	9	9	7	7	6
125	20	20	19	18	15	13	9	8
250	48	44	39	32	28	23	18	10
500	50	50	50	43	39	33	26	18
1000	50	50	50	50	48	45	42	36
2000	50	50	50	50	50	50	50	50
4000	50	50	50	50	50	50	50	50
8000	48	46	44	42	40	39	36	33

Sound attenuation capacity D (dB) determination table

Type: DZ-3; d=200mm

Attenuator length **L=500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	3	2	2	2	2	1	1	1
125	5	5	5	4	4	3	2	2
250	11	10	9	8	7	6	6	6
500	20	17	16	14	13	11	10	9
1000	27	25	23	19	17	13	13	12
2000	26	24	20	18	15	12	11	10
4000	18	16	14	12	10	8	7	6
8000	12	11	10	8	7	6	5	5

Attenuator length **L=2000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	9	8	8	7	6	4	4	3
125	15	14	13	13	12	11	10	10
250	38	34	30	27	24	21	20	18
500	50	50	50	47	45	42	40	39
1000	50	50	50	50	50	47	46	45
2000	50	50	50	47	43	37	35	34
4000	38	37	36	32	28	24	22	19
8000	26	24	22	20	17	13	12	11

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Attenuator length **L=1000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	4	4	4	3	3	2	2	2
125	10	9	8	8	7	6	6	5
250	19	18	17	15	14	13	12	11
500	31	30	29	26	25	22	20	18
1000	38	36	34	32	30	27	25	24
2000	37	35	32	27	24	20	18	16
4000	28	26	23	18	17	14	13	12
8000	18	16	14	13	12	9	8	7

Attenuator length **L=2500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	10	9	8	8	7	5	5	4
125	19	17	15	14	13	12	11	11
250	42	40	37	33	30	25	23	22
500	50	50	50	50	50	48	47	46
1000	50	50	50	50	50	49	48	47
2000	50	50	50	50	48	45	42	40
4000	45	43	38	34	33	27	24	22
8000	30	27	23	21	19	16	14	12

Attenuator length **L=1500**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	7	6	6	5	4	3	2	2
125	13	12	11	10	9	8	7	6
250	27	26	23	22	19	17	17	16
500	44	41	38	36	34	31	29	28
1000	48	47	44	42	40	36	34	33
2000	49	48	42	37	33	27	26	24
4000	35	33	28	26	23	17	15	13
8000	22	19	18	16	14	12	10	9

Attenuator length **L=3000**

Frequency (Hz)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
63	12	11	10	10	8	6	5	4
125	21	19	17	16	15	13	12	11
250	48	45	42	38	35	30	27	26
500	50	50	50	50	50	50	50	49
1000	50	50	50	50	50	50	50	50
2000	50	50	50	50	50	50	49	46
4000	50	50	43	40	38	29	26	23
8000	34	28	25	22	20	15	14	13

Pressure drop Δp (Pa) determination table
Type: DZ-2; d=100mm

Attenuator length **L=500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	3	3	3	2	2	2	2	2
4	10	9	8	7	7	6	6	5
6	26	24	23	21	19	17	16	15
8	45	41	38	34	31	28	26	24
10	69	62	57	50	46	42	39	36
12	99	89	81	72	65	60	56	51
14	134	120	108	96	86	80	74	69
16	174	156	141	125	112	104	97	89
18	218	196	177	157	141	130	121	112
20	270	242	218	193	173	161	149	138

Attenuator length **L=2000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	7	6	5	4	4	3	3	3
4	22	19	16	13	11	10	9	8
6	53	45	39	33	28	25	22	20
8	90	77	67	55	47	42	38	33
10	140	119	102	84	71	63	57	51
12	201	171	146	120	101	91	82	73
14	272	231	197	162	136	123	110	97
16	354	301	257	211	177	160	143	127
18	447	380	323	266	223	201	180	159
20	552	469	399	328	275	248	222	196

Attenuator length **L=1000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	5	4	3	3	3	2	2	2
4	14	12	10	9	8	7	6	6
6	34	30	27	24	21	19	18	16
8	58	51	45	39	34	31	29	27
10	89	78	69	59	51	47	44	40
12	128	112	98	84	73	67	62	58
14	173	151	132	112	98	90	84	77
16	224	196	172	146	127	118	109	100
18	283	247	216	184	160	148	137	126
20	349	305	266	226	197	182	168	155

Attenuator length **L=2500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	8	6	5	4	4	3	3	2
4	25	21	18	14	12	11	9	8
6	59	50	44	36	30	27	24	22
8	103	87	74	61	51	45	41	36
10	159	134	114	93	77	69	62	55
12	229	193	164	133	110	99	89	79
14	311	262	221	179	148	134	120	106
16	406	342	288	233	193	174	156	139
18	511	431	363	294	243	219	197	174
20	631	532	447	362	300	271	243	215

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Attenuator length **L=1500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	6	5	4	4	3	3	3	2
4	17	15	13	11	9	8	8	7
6	43	37	33	28	25	22	20	18
8	74	64	56	47	41	36	33	30
10	114	98	85	71	61	55	50	45
12	164	141	122	102	87	79	72	65
14	223	191	164	137	117	106	97	87
16	290	249	214	179	152	139	126	114
18	366	314	270	225	191	174	158	142
20	451	387	332	277	236	215	195	176

Attenuator length **L=3000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	9	8	6	5	4	3	3	3
4	29	24	20	16	13	11	10	9
6	66	56	48	39	33	29	26	23
8	116	97	82	66	55	49	44	39
10	179	150	126	101	83	75	67	60
12	258	216	181	145	119	107	97	86
14	350	293	245	196	160	145	130	115
16	457	382	319	255	209	189	170	150
18	577	482	402	321	263	238	213	189
20	713	595	496	396	324	293	263	233

Pressure drop Δp (Pa) determination table
Type: DZ-2; d=200mm

Attenuator length **L=500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	3	3	2	2	2	2	2	1
4	9	9	8	7	7	6	6	5
6	26	24	21	20	19	17	16	15
8	43	40	34	33	31	28	26	24
10	67	61	52	49	46	42	39	36
12	97	87	74	69	65	60	56	51
14	130	117	98	93	87	80	74	69
16	169	152	128	120	113	104	97	89
18	212	192	160	151	141	131	121	112
20	263	236	197	186	174	161	149	138

Attenuator length **L=2000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	5	4	3	3	3	2	2	2
4	15	14	10	9	9	8	7	6
6	38	34	27	25	23	21	19	17
8	65	58	45	42	39	34	31	28
10	100	89	68	63	58	52	47	42
12	144	129	97	90	83	75	67	60
14	195	174	131	121	111	100	90	81
16	254	226	170	157	144	131	118	105
18	320	285	214	197	181	164	148	131
20	395	352	263	243	223	202	182	162

Attenuator length **L=1000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	4	3	3	2	2	2	2	2
4	12	11	9	8	7	7	6	6
6	30	27	24	22	21	18	17	16
8	52	46	39	36	34	30	28	25
10	80	70	58	54	50	46	42	38
12	114	101	83	78	72	65	60	54
14	155	136	111	104	96	87	80	72
16	202	178	145	135	125	114	104	94
18	255	224	182	169	157	143	130	118
20	314	276	224	209	193	176	161	145

Attenuator length **L=2500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	5	4	3	3	3	2	2	2
4	17	15	11	10	9	8	7	7
6	42	36	29	27	25	22	20	18
8	72	61	48	45	41	36	33	29
10	111	94	73	67	62	55	49	44
12	159	135	104	96	88	79	71	63
14	216	182	140	129	118	106	95	84
16	281	238	182	168	154	138	124	110
18	354	299	229	211	193	174	156	137
20	437	370	283	260	238	214	192	169

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Attenuator length **L=1500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	4	4	3	3	2	2	2	2
4	13	12	10	9	8	7	7	6
6	35	30	26	24	22	20	18	16
8	59	50	42	39	36	33	30	27
10	90	77	64	59	55	49	45	40
12	130	110	91	85	78	71	64	58
14	175	149	122	113	104	95	86	77
16	228	194	159	147	136	123	112	100
18	286	245	200	185	170	155	140	126
20	354	302	246	228	210	191	173	155

Attenuator length **L=3000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	5	5	3	3	3	3	2	2
4	19	16	12	11	10	9	8	7
6	46	39	32	30	27	24	21	19
8	80	66	54	49	45	40	36	31
10	122	102	81	75	68	61	54	48
12	175	146	117	107	98	87	78	68
14	238	198	157	144	131	117	104	91
16	311	258	204	187	171	153	136	119
18	391	326	257	236	214	192	171	149
20	483	402	317	291	264	237	210	184

By means of pressure drop reducing guides, the pressure drops listed in the table are reduced by 20%.

Pressure drop Δp (Pa) determination table
Type: DZ-3; d=100mm

Attenuator length **L=500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	3	3	2	2	2	2	2	1
4	10	9	8	7	7	6	6	5
6	25	24	24	23	20	17	16	15
8	43	41	40	35	32	29	27	25
10	65	61	58	51	47	42	39	38
12	97	89	83	75	67	62	58	53
14	130	120	112	100	89	83	77	71
16	169	156	145	130	116	108	100	92
18	208	195	184	162	146	134	126	116
20	259	242	227	199	179	167	155	143

Attenuator length **L=2000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	8	6	6	5	4	3	3	3
4	23	19	18	14	11	10	10	9
6	53	46	41	34	31	26	23	21
8	88	78	70	58	49	46	40	35
10	140	122	107	88	75	67	62	56
12	193	172	154	127	107	97	89	79
14	267	234	206	170	143	132	119	105
16	347	305	269	222	188	170	154	138
18	441	385	337	281	237	215	193	174
20	540	474	417	346	291	265	239	214

Attenuator length **L=1000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	4	4	3	3	3	2	2	2
4	14	12	10	9	9	7	7	6
6	35	30	27	25	22	20	19	17
8	58	51	46	41	35	33	31	30
10	87	78	71	62	54	50	47	43
12	124	112	102	87	77	72	66	63
14	168	151	137	116	103	96	90	85
16	215	195	178	151	134	125	117	110
18	273	246	223	192	168	157	149	139
20	339	304	274	235	207	194	182	171

Attenuator length **L=2500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	9	7	7	5	4	4	3	3
4	25	21	20	15	13	12	10	8
6	64	53	46	37	31	28	26	23
8	114	93	77	64	55	49	45	40
10	172	143	120	99	82	74	68	60
12	241	204	174	141	118	107	98	87
14	335	278	232	190	158	144	133	117
16	433	362	304	247	206	188	172	153
18	551	458	382	312	259	235	217	193
20	680	564	469	384	320	293	268	239

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Attenuator length **L=1500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	5	5	4	3	3	3	2	2
4	17	15	13	11	10	9	8	7
6	45	38	33	29	26	23	21	20
8	83	68	57	49	43	37	35	32
10	120	102	88	73	63	58	53	50
12	178	149	126	106	91	83	76	70
14	238	200	169	143	123	112	104	95
16	310	261	221	186	159	147	135	124
18	389	328	278	234	200	184	169	153
20	481	405	342	288	247	249	206	191

Attenuator length **L=3000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	30	40	50	60	70	80	90	100
2	10	8	6	5	5	4	4	3
4	30	25	20	17	14	12	11	10
6	74	59	48	39	34	30	29	24
8	130	103	82	67	56	50	46	43
10	199	159	128	102	85	77	71	64
12	297	231	181	148	121	112	102	92
14	396	312	247	199	165	151	138	124
16	516	407	322	261	214	196	180	161
18	652	513	405	326	270	248	225	204
20	808	634	499	401	333	305	279	252

Pressure drop Δp (Pa) determination table
Type: DZ-3; d=200mm

Attenuator length **L=500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	3	3	2	2	2	2	2	1
4	10	9	8	7	7	6	6	5
6	27	24	22	21	20	17	16	15
8	46	40	36	34	32	29	27	25
10	69	60	53	50	47	43	39	37
12	100	87	76	72	67	62	58	53
14	135	117	102	96	90	83	77	71
16	175	152	132	125	117	108	100	92
18	220	191	166	156	146	135	126	116
20	272	236	205	192	180	167	155	143

Attenuator length **L=2000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	6	4	3	3	3	3	3	2
4	18	14	11	10	9	8	8	7
6	44	35	28	26	25	22	20	18
8	76	59	47	44	41	37	33	30
10	117	91	71	66	61	55	51	46
12	168	130	102	95	88	80	73	65
14	228	176	137	127	117	107	97	88
16	297	229	178	165	153	139	127	114
18	375	289	223	208	192	175	159	143
20	462	356	275	256	236	216	196	177

Attenuator length **L=1000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	4	3	3	3	3	2	2	2
4	13	11	9	8	8	7	7	6
6	32	27	24	23	22	19	18	17
8	54	46	40	38	35	32	30	28
10	83	70	60	57	53	49	45	41
12	120	101	86	81	76	70	64	59
14	162	136	115	108	101	93	86	79
16	211	177	150	141	132	121	112	103
18	266	223	188	176	165	152	141	130
20	329	275	231	217	203	188	174	160

Attenuator length **L=2500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	6	5	4	3	3	3	2	2
4	19	15	12	11	10	9	8	7
6	49	38	30	28	26	23	22	19
8	85	65	50	47	44	39	36	32
10	131	100	77	71	66	59	54	48
12	188	143	110	102	94	85	78	69
14	254	193	147	137	126	114	105	93
16	332	252	192	178	164	149	137	121
18	419	318	241	224	206	187	172	152
20	517	392	297	276	254	231	212	188

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Attenuator length **L=1500**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	4	3	3	3	3	2	2	2
4	15	12	10	9	9	8	7	6
6	38	31	26	25	23	21	19	18
8	65	53	43	41	38	34	32	29
10	99	80	66	61	57	52	48	44
12	144	116	94	88	82	75	68	62
14	194	156	126	118	109	100	92	84
16	253	203	164	153	142	130	120	109
18	319	256	206	192	178	164	150	136
20	394	316	253	237	220	202	185	168

Attenuator length **L=3000**

Air velocity between splitters V_s(m/s)	Distance between attenuation splitters s (mm)							
	60	80	100	120	140	160	180	200
2	7	5	4	4	4	3	3	3
4	23	17	12	12	11	10	9	8
6	54	41	32	30	28	25	23	20
8	94	70	54	50	46	41	38	34
10	145	108	82	76	70	63	57	51
12	210	156	117	109	100	91	82	73
14	285	211	158	146	135	122	110	98
16	371	275	206	191	175	159	144	128
18	469	347	259	240	220	200	181	161
20	579	428	319	295	271	247	223	199

By means of pressure drop reducing guides, the pressure drops listed in the table are reduced by 20%