



Main Exhaust Fan System - ** Fan System Sound Performance - (Calculation of Noise Propagation according ISO 9613-2)														
Octave Band Frequencies [Hz]				Frequency Hz										total
				31.5	63	125	250	500	1000	2000	4000	8000	16000	
	Onsite Sound Contributors													
	Noise Contributor 1 - Main Fan Discharge Noise													
1	Fan Sound Power linear at Fan Stator vane outlet	Lw	dB	119	122.0	125.0	124.0	119.0	115.0	109.0	103.0	94.0	83	129.7
2	Fan sound power fan inlet A-Rated	LwA	dB(A)	79.5	95.8	108.8	115.3	115.8	115.0	110.2	104.0	92.9		121.0
3	Silencer (Resonance Type)	De	dB											
4	Sound Level behind Silencer	LpA	dB(A)	79.5	95.8	108.8	115.3	115.8	115.0	110.2	104.0	92.9		121.0
5	Outlet Reflection	LpA	dB(A)	0.00	0.40	0.20	0.10	0.10	0.10	0.10	0.20	0.20		
6	Directivity Correction 1.8m Ground Level to Outlet (Deflector angle)		dB	0.00	-5.00	-6.50	-10.00	-13.50	-16.50	-20.00	-24.00	-28.50		
7	Attenuation of sound due to geometric propagation - Height from Discharge to 1.8m AG	Adiv (in meters)	8.26	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3		
	Attenuation due to atmospheric absorption	Aatm		0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.0		
	Attenuation due to ground effects	Agr		0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Lp in 1m distance	LpA	dB(A)	50.1	64.9	73.1	76.1	73.0	69.2	60.8	50.2	35.3		79.7
	Sound pressure level with 2 operating Fans (Directivity index - deflection)	LpA	2	53.2	67.9	76.1	79.1	76.0	72.2	63.8	53.2	38.3		82.7
	Noise Contributor 3 - Motors													
12	Linear Sound Power level of motors	Lw	dB	38.0	51.8	68.3	64.6	67.9	68.8	67.6	64.5	55.5	38.4	
13	Motor sound power level A-Rated	LwA	dB(A)	-1.0	25.6	52.1	55.9	64.7	68.8	68.8	65.5	54.4	37.3	
14	Sound Power Level of 2 motors operating	LwA	2	2.0	28.6	55.1	58.9	67.7	71.8	71.8	68.5	57.4	40.3	76.5
	Noise Contributor 4 - Fan Casing													
15	Linear Sound Power in 1m distance without insulation	Lw	dB	119.0	122.0	125.0	124.0	119.0	115.0	109.0	103.0	94.0		129.7
16	Insertion loss Fan casing	De	dB	-17.0	-22.0	-21.0	-24.0	-29.0	-34.0	-32.0	-31.0	-27.0		
	Acoustic and Thermal Enclosure													
17	A Rating	LwA	dB(A)	-39.0	-26.0	-16.0	-9.0	-3.0	0.0	1.0	1.0	-1.0		
	Attenuation of sound due to geometric propagation - Height from Discharge to 1.8m AG	Adiv (in meters)	1.00	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		
	Attenuation due to atmospheric absorption	Aatm		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
	Attenuation due to ground effects	Agr		0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
18	Lp in 1m distance	LpA	dB(A)	52.0	66.0	77.0	80.0	76.0	70.0	67.0	62.0	54.9		83.2
	Sound pressure level with 2 Parallel Ducts	LpA	2	55.0	69.0	80.0	83.0	79.0	73.0	70.0	65.0	57.9		86.2
	Noise Contributor 4 - Fan Inlet Ducting (Head Bend, Bifurcation, Inlet Ducts, Fan Casing)													
19	Linear Sound Power in 1m distance without insulation	Lw	dB	118.0	121.0	124.0	123.0	118.0	114.0	108.0	102.0	93.0		
20	Sound insulation by ducting Shell surfaces		dB	-7.0	-8.0	-11.0	-13.0	-11.0	-10.0	-8.0	-12.0	-12.0		
21	Measuring surface Fan Inlet		dB	-21.6	-21.6	-21.6	-21.6	-21.6	-21.6	-21.6	-21.6	-21.6		
22	Linear Sound Pressure (1 meter from head bend)	Lp (lin)		89.4	91.4	91.4	88.4	85.4	82.4	78.4	68.4	59.4		96.9
23	Acoustic and Thermal Enclosure													
24	A Rating	LpA	dB(A)	-39.0	-26.0	-16.0	-9.0	-3.0	0.0	1.0	1.0	-1.0		
	Attenuation of sound due to geometric propagation - Height from Discharge to 1.8m AG	Adiv (in meters)	dB	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		
	Attenuation due to atmospheric absorption	Aatm	dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
	Attenuation due to ground effects	Agr	dB	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
25	Lp in 1m distance	LpA	dB(A)	39.4	57.4	64.4	68.4	71.4	71.4	68.4	58.4	47.3		76.6
	Sound pressure level with 2 Parallel Ducts	LpA	2	42.4	60.4	67.4	71.4	74.4	74.4	71.4	61.4	50.3		79.6
	Noise Contributor 5 - Body Borne Noise Outlet Ducting (Fan Diffuser)													
26	Linear Sound Power in without insulation (2 fans operating)	Lw	dB	119	122	130	136	135	132	126	121	115		
27	Sound insulation by Diffuser Shell surfaces		dB	-3.0	-8.0	-8.0	-11.0	-15.0	-21.0	-19.0	-18.0	-13.0		
28	Measuring surface Diffuser		dB	-20.6	-20.6	-20.6	-20.6	-20.6	-20.6	-20.6	-20.6	-20.6		
29	Linear Sound Pressure (1 meter from Diffuser)	Lp (lin)		95.4	93.5	101.0	104.8	99.4	89.9	86.5	82.8	81.3		107.7
30	Acoustic and Thermal Enclosure													
31	A Rating	LpA	dB(A)	-39.0	-26.0	-16.0	-9.0	-3.0	0.0	1.0	1.0	-1.0		
	Attenuation of sound due to geometric propagation - Height from Discharge to 1.8m AG	Adiv (in meters)	8.76	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9	29.9		
	Attenuation due to atmospheric absorption	Aatm	dB	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.7		
	Attenuation due to ground effects	Agr	dB	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
32	Lp in 1m distance	LpA	dB(A)	26.6	40.7	55.1	65.9	66.5	60.0	57.6	53.8	49.8		70.3
	Sound pressure level with 2 Parallel Ducts	LpA	2	29.6	43.7	58.1	69.0	69.5	63.0	60.6	56.8	52.8		73.3
	Total Site Noise Level - Sum of all contributors onsite (fan Discharge Noise, Body Borne Noise +HVAC units)													
				57.3	71.8	81.7	84.8	82.1	79.1	76.3	70.9	61.7	40.3	88.8
33														
	Total Site Noise Level - Sum of all contributors onsite (fan Discharge Noise, Body Borne Noise +HVAC units) at Distance 3 m:													
				53.50	67.50	76.50	80.00	77.30	73.30	67.70	60.60	54.10		83.7
	Total Site Noise Level - Sum of all contributors onsite (fan Discharge Noise, Body Borne Noise +HVAC units) at Distance 15 m:													
				47.0	61.9	69.7	74.3	71.5	66.6	59.5	51.2	44.2		77.6

Please note, that the bund and specific topography has not yet been included in our evaluation - Levels above are free field levels.
It is expected, that bund and additional obstacles in topography will further lower the Immission noise level caused by the fans
Level of measuring areas acc. to DIN EN ISO 3744
All level values in the print-out are rounded to whole numbers.

Tolerance:

Overall level +/- 4 dB
Octave band level +/- 6 dB
Fan data:

Description operation point	Selection
Volume flow	151 m³/s
Total pressure increase	4461 Pa
Temperature	25°C
Density	1,2 kg/m³
Rotational speed (max)	567 RPM
Speed of Sound	328m/s
Barometer Lvl	Lv 96609 Pa
Outer diameter	3136 mm
Tip speed	93,1 m/s
No. of blades	11
Blade pass frequency	104 Hz