Sound Power Level Technical Calculation

Customer	MORICA INC.	Date	July 22, 2021
Project		Prepared by	H.S. Moon
Equipment		Checked by	C.H. Lee
Quantity	1 PC	Approved by	C.H. Lee

1. Specification

A) Model		SB-30T1 (60Hz)	
B) Capacity	2,296.7 (CMH)	38.3 (CMM)	1,351.8 (CFM)
C) St' Pressure	45 (mmAq)	1.8 (Inch)	
D) Motor Power		828.8 (kW)	
E) Fan Speed		1,751 (RPM)	

2. Calculation of Expected Sound Power Level

Lw = kW + 10 log Q + 20 log Ps + C + BFI

Lw = Estimated Sound Power Level of Fan [dB]
kW = Specific Sound Power Level
Q = Flow Rate CFM (CMH * 0.58861)
Ps = Pressure Drop inch of Water inch (mm ÷ 25.4)
C = Correction Factor in dB, for Point of Operation

Static Efficiency	C
90% to 100%	0 dB(A)
85% to 89%	3 dB(A)
75% to 84%	6 dB(A)
65% to 74%	9 dB(A)
55% to 64%	12 dB(A)
50% to 54%	15 dB(A)

Band	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**SPL**
Frequency	63	125	250	500	1,000	2,000	4,000	
kW dB	47	43	39	33	28	25	23	
Lw dB	88.4	84.4	80.4	74.4	69.4	66.4	64.4	
Lw dB(A)	62.4	68.4	71.4	71.4	69.4	67.4	65.4	77
Level Weighting (A type)	-26	-16	-9	-3	0	1	1	

A) Fan Natural Frequency

F(Hz) = N * Z / 60 = 1751 * 54 / 60 = 1575.9

N = Fan Speed (RPM) = 1751

Z = Wheel Blade Number = 54

B) Estimated SPL

Lw(A) = 77 dB(A)

C) Actual SPL

Lw(A) = 74 dB(A)

Specific Sound Power Levels (KW), Blades Frequency (BFI) and BFI Occurs

Fan Type	Forward Curved					Octave Band Center Frequency, Hz		
Wheel Size	63	125	250	500	1,000	2,000	4,000	BFI
All	47	43	39	33	28	25	23	2

* Standard : ASHRAE Data