

# Aerovent

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## ***SOUND POWER LEVELS***

### **BCF - Backward Curved High Pressure Composite Fans**



Aerovent, A Twin City Fan Company, certifies that the fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

For air performance, refer to Catalog 745.



# Sound Calculations

The published sound power levels have been determined by laboratory tests in accordance with AMCA Standard 300-05 (Revision '08) and carry the AMCA Seal. The sound power levels shown are decibel (dB) levels referred to  $10^{-12}$  watts. We have listed sound power levels for the eight octave bands with frequency range as shown below.

| OCTAVE BAND      | 1        | 2         | 3          | 4          | 5           | 6            | 7            | 8             |
|------------------|----------|-----------|------------|------------|-------------|--------------|--------------|---------------|
| FREQUENCY CENTER | 45 to 90 | 90 to 180 | 180 to 355 | 355 to 710 | 710 to 1400 | 1400 to 2800 | 2800 to 5600 | 5600 to 11200 |
| CENTER FREQUENCY | 63       | 125       | 250        | 500        | 1000        | 2000         | 4000         | 8000          |

Sound power levels (SPL) for the fans can be easily obtained using Aerovent's Fan Selector® Program. The SPL can also be obtained using specific sound power level method described below:

**Sound Power Level of a fan =**  
**Specific Sound Power Level ( $L_{WK}$ ) + Capacity Fraction (M)**

Use of this method will be illustrated by the following example:

Calculate sound power levels for:

|                 |           |                     |        |
|-----------------|-----------|---------------------|--------|
| Model . . . . . | BCF       | Temp . . . . .      | 70°F   |
| Size . . . . .  | 330M1     | Elevation . . . . . | .0 ft. |
| CFM. . . . .    | 9191      | RPM. . . . .        | 700    |
| SP. . . . .     | 1.5" w.g. | OV. . . . .         | 1468   |

## 1. How to determine $L_{WK}$

We have published values for  $L_{WK}$  at various speeds and operating points on pages 3 through 6.

The operating point is a ratio of design CFM to the wide open volume (WOV). The WOVS equals to CFM for a given RPM at zero static pressure. WOVS can be calculated by multiplying fan RPM by the factors (Rf) shown in the table. Thus, WOVS volume for 700 RPM =  $18.758 \times 700 = 13,130$  CFM.

| SIZE  | Rf FACTOR | SIZE  | Rf FACTOR | SIZE  | Rf FACTOR | SIZE  | Rf FACTOR |
|-------|-----------|-------|-----------|-------|-----------|-------|-----------|
| 165M1 | 2.181     | 165M2 | 2.050     | 165H1 | 1.687     | 165H2 | 1.585     |
| 182M1 | 2.951     | 182M2 | 2.774     | 182H1 | 2.283     | 182H2 | 2.145     |
| 200M1 | 3.884     | 200M2 | 3.651     | 200H1 | 3.004     | 200H2 | 2.823     |
| 222M1 | 5.562     | 222M2 | 5.228     | 222H1 | 4.304     | 222H2 | 4.044     |
| 245M1 | 7.426     | 245M2 | 6.980     | 245H1 | 5.746     | 245H2 | 5.399     |
| 270M1 | 10.186    | 270M2 | 9.575     | 270H1 | 7.879     | 270H2 | 7.406     |
| 300M1 | 13.973    | 300M2 | 13.134    | 300H1 | 10.808    | 300H2 | 10.159    |
| 330M1 | 18.758    | 330M2 | 17.632    | 330H1 | 14.510    | 330H2 | 13.639    |
| 365M1 | 25.382    | 365M2 | 23.858    | 365H1 | 19.634    | 365H2 | 18.455    |
| 402M1 | 34.036    | 402M2 | 31.993    | 402H1 | 26.328    | 402H2 | 24.748    |
| 445M1 | 45.996    | 445M2 | 43.235    | 445H1 | 35.580    | 445H2 | 33.444    |
| 490M1 | 61.409    | 490M2 | 57.723    | 490H1 | 47.502    | 490H2 | 44.651    |
| 542M1 | 83.338    | 542M2 | 78.336    | 542H1 | 64.465    | 542H2 | 60.595    |
| 600M1 | 112.745   | 600M2 | 105.977   | 600H1 | 87.213    | 600H2 | 81.977    |
| 660M1 | 150.064   | 660M2 | 141.056   | 660H1 | 116.080   | 660H2 | 109.112   |
| 730M1 | 203.055   | 730M2 | 190.866   | 730H1 | 157.070   | 730H2 | 147.642   |

Therefore, operating point falls at 70% ( $9191 \div 13,130$ ) of the WOVS. Referring to the  $L_{WK}$  table for Size 330M1, the specific sound power levels can be read as follows:

$L_{WK} = \quad 36 \quad 37 \quad 33 \quad 30 \quad 30 \quad 26 \quad 19 \quad 12$

## 2. How to determine M

The value of M can be taken from the tables on page 7 once Total Pressure (TP) is calculated.

Total Pressure (TP) = Static Pressure (SP) + Velocity Pressure (VP) (All pressure at operating density.)

VP =  $(\text{Outlet Velocity} \div 4005)^2 \times \text{density factor}$ .

In our example VP =  $(1468 \div 4005)^2 \times 1.00 = 0.134$ .

Therefore, TP =  $1.5 + 0.134 = 1.634$ .

Thus, for 9191 CFM and 1.634" TP, M works out to be 44.

M can also be calculated using the formula,  $M = 10 \log \text{CFM} + 20 \log \text{TP}$ .

## 3. Combining $L_{WK}$ and M gives sound power levels.

|                   |    |    |    |    |    |    |    |    |
|-------------------|----|----|----|----|----|----|----|----|
| Thus, Octave Band | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| SPL =             | 36 | 37 | 33 | 30 | 30 | 26 | 19 | 12 |
|                   | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
|                   | 80 | 81 | 77 | 74 | 74 | 70 | 63 | 56 |

# **Inlet L<sub>wk</sub> Values (L<sub>wki</sub>) for BCF 165M1-200M1, 165M2-200M2, 165H1-200H1, 165H2-200H2**

| RPM  | % WOV | OCTAVE BAND |    |    |    |    |    |    |    | LwkiA |
|------|-------|-------------|----|----|----|----|----|----|----|-------|
|      |       | 1           | 2  | 3  | 4  | 5  | 6  | 7  | 8  |       |
| 3100 | 90    | 44          | 46 | 45 | 50 | 46 | 41 | 31 | 26 | 50    |
|      | 80    | 38          | 42 | 42 | 47 | 42 | 37 | 28 | 24 | 47    |
|      | 70    | 34          | 39 | 41 | 46 | 40 | 34 | 26 | 23 | 45    |
|      | 60    | 33          | 37 | 40 | 46 | 38 | 32 | 26 | 24 | 45    |
|      | 50    | 33          | 37 | 40 | 46 | 38 | 32 | 26 | 24 | 45    |
| 2800 | 90    | 45          | 46 | 47 | 50 | 46 | 41 | 31 | 26 | 51    |
|      | 80    | 39          | 42 | 43 | 47 | 42 | 36 | 27 | 23 | 47    |
|      | 70    | 36          | 40 | 42 | 46 | 39 | 33 | 26 | 23 | 45    |
|      | 60    | 35          | 38 | 42 | 46 | 37 | 32 | 25 | 23 | 45    |
|      | 50    | 35          | 38 | 42 | 46 | 37 | 32 | 25 | 23 | 45    |
| 2500 | 90    | 47          | 47 | 50 | 52 | 48 | 41 | 31 | 27 | 52    |
|      | 80    | 41          | 42 | 46 | 48 | 42 | 35 | 27 | 23 | 48    |
|      | 70    | 39          | 41 | 45 | 46 | 39 | 33 | 26 | 22 | 45    |
|      | 60    | 38          | 40 | 45 | 46 | 37 | 31 | 25 | 22 | 45    |
|      | 50    | 38          | 40 | 45 | 46 | 37 | 31 | 25 | 22 | 45    |
| 2200 | 90    | 48          | 47 | 52 | 53 | 49 | 40 | 32 | 27 | 53    |
|      | 80    | 43          | 43 | 48 | 48 | 43 | 34 | 27 | 22 | 48    |
|      | 70    | 41          | 41 | 47 | 46 | 39 | 32 | 25 | 21 | 46    |
|      | 60    | 41          | 41 | 47 | 45 | 37 | 30 | 24 | 20 | 45    |
|      | 50    | 41          | 41 | 47 | 45 | 37 | 30 | 24 | 20 | 45    |
| 1900 | 90    | 49          | 47 | 54 | 54 | 51 | 39 | 31 | 27 | 55    |
|      | 80    | 44          | 43 | 49 | 47 | 43 | 33 | 25 | 21 | 48    |
|      | 70    | 43          | 42 | 48 | 45 | 39 | 31 | 23 | 20 | 45    |
|      | 60    | 43          | 41 | 48 | 43 | 37 | 29 | 22 | 19 | 44    |
|      | 50    | 43          | 41 | 48 | 43 | 37 | 29 | 22 | 19 | 44    |
| 1600 | 90    | 49          | 50 | 54 | 54 | 48 | 37 | 30 | 26 | 54    |
|      | 80    | 44          | 45 | 49 | 46 | 41 | 31 | 24 | 20 | 47    |
|      | 70    | 43          | 45 | 48 | 43 | 37 | 29 | 22 | 19 | 44    |
|      | 60    | 43          | 44 | 48 | 42 | 35 | 28 | 21 | 18 | 43    |
|      | 50    | 43          | 44 | 48 | 42 | 35 | 28 | 21 | 18 | 43    |
| 1300 | 90    | 48          | 54 | 54 | 53 | 45 | 35 | 29 | 25 | 52    |
|      | 80    | 43          | 49 | 49 | 45 | 38 | 29 | 23 | 19 | 46    |
|      | 70    | 42          | 48 | 48 | 42 | 34 | 27 | 21 | 18 | 43    |
|      | 60    | 42          | 48 | 48 | 40 | 33 | 25 | 20 | 17 | 42    |
|      | 50    | 42          | 48 | 48 | 40 | 33 | 25 | 20 | 17 | 42    |
| 1000 | 90    | 47          | 54 | 54 | 52 | 40 | 32 | 28 | 24 | 51    |
|      | 80    | 43          | 49 | 48 | 43 | 34 | 26 | 22 | 18 | 44    |
|      | 70    | 42          | 48 | 45 | 40 | 31 | 24 | 20 | 16 | 41    |
|      | 60    | 41          | 48 | 44 | 38 | 30 | 23 | 19 | 15 | 40    |
|      | 50    | 41          | 48 | 44 | 38 | 30 | 23 | 19 | 15 | 40    |
| 700  | 90    | 53          | 54 | 53 | 46 | 36 | 30 | 26 | 22 | 48    |
|      | 80    | 48          | 49 | 45 | 39 | 30 | 24 | 20 | 16 | 41    |
|      | 70    | 47          | 48 | 42 | 35 | 27 | 22 | 18 | 14 | 38    |
|      | 60    | 47          | 48 | 40 | 34 | 26 | 21 | 17 | 14 | 37    |
|      | 50    | 47          | 48 | 40 | 34 | 26 | 21 | 17 | 14 | 37    |
| 400  | 90    | 54          | 54 | 48 | 37 | 30 | 26 | 23 | 19 | 43    |
|      | 80    | 49          | 46 | 41 | 31 | 24 | 20 | 16 | 12 | 36    |
|      | 70    | 48          | 43 | 37 | 29 | 22 | 19 | 15 | 11 | 33    |
|      | 60    | 48          | 42 | 35 | 28 | 21 | 18 | 14 | 11 | 32    |
|      | 50    | 48          | 42 | 35 | 28 | 21 | 18 | 14 | 11 | 32    |

1. The calculated sound power levels from these ratings are in decibels, referenced to 10<sup>-12</sup> watts calculated per AMCA Standard 301.
2. The A-weighted sound ratings obtained have been calculated per AMCA 301.
3. Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet.
4. The AMCA Certified Ratings Seal applies to LwiA ratings only.
5. Ratings do not include the effects of duct end correction.

# **Inlet L<sub>wk</sub> Values (L<sub>wki</sub>) for BCF 222M1-245M1, 222M2-245M2, 222H1-245H1, 222H2-245H2**

| RPM  | % WOV | OCTAVE BAND |    |    |    |    |    |     |     | LwkiA |
|------|-------|-------------|----|----|----|----|----|-----|-----|-------|
|      |       | 1           | 2  | 3  | 4  | 5  | 6  | 7   | 8   |       |
| 2800 | 90    | 44          | 44 | 43 | 42 | 42 | 41 | 38  | 31  | 47    |
|      | 80    | 41          | 40 | 38 | 37 | 37 | 36 | 33  | 27  | 42    |
|      | 70    | 38          | 37 | 35 | 34 | 34 | 32 | 29  | 24  | 39    |
|      | 60    | 36          | 35 | 34 | 32 | 32 | 29 | 27  | 22  | 37    |
|      | 50    | 36          | 35 | 34 | 32 | 32 | 29 | 27  | 22  | 37    |
| 2500 | 90    | 44          | 44 | 42 | 42 | 41 | 42 | 37  | 30  | 47    |
|      | 80    | 41          | 40 | 38 | 37 | 37 | 36 | 32  | 26  | 42    |
|      | 70    | 38          | 36 | 35 | 34 | 34 | 32 | 28  | 23  | 39    |
|      | 60    | 36          | 35 | 34 | 32 | 32 | 29 | 26  | 21  | 36    |
|      | 50    | 36          | 35 | 34 | 32 | 32 | 29 | 26  | 21  | 36    |
| 2200 | 90    | 44          | 44 | 42 | 42 | 40 | 42 | 35  | 29  | 47    |
|      | 80    | 41          | 39 | 38 | 37 | 36 | 36 | 31  | 25  | 42    |
|      | 70    | 38          | 36 | 35 | 34 | 33 | 31 | 28  | 22  | 38    |
|      | 60    | 36          | 34 | 34 | 32 | 31 | 29 | 26  | 20  | 36    |
|      | 50    | 36          | 34 | 34 | 32 | 31 | 29 | 26  | 20  | 36    |
| 1900 | 90    | 45          | 44 | 42 | 42 | 40 | 42 | 34  | 27  | 47    |
|      | 80    | 41          | 39 | 38 | 38 | 36 | 36 | 30  | 24  | 42    |
|      | 70    | 39          | 36 | 35 | 35 | 33 | 31 | 27  | 21  | 38    |
|      | 60    | 37          | 34 | 35 | 33 | 31 | 29 | 25  | 19  | 36    |
|      | 50    | 37          | 34 | 35 | 33 | 31 | 29 | 25  | 19  | 36    |
| 1600 | 90    | 46          | 43 | 44 | 43 | 41 | 41 | 34  | 26  | 47    |
|      | 80    | 43          | 39 | 40 | 39 | 37 | 36 | 30  | 23  | 42    |
|      | 70    | 40          | 37 | 38 | 37 | 34 | 32 | 28  | 21  | 39    |
|      | 60    | 39          | 36 | 37 | 35 | 32 | 30 | 26  | 19  | 38    |
|      | 50    | 39          | 36 | 37 | 35 | 32 | 30 | 26  | 19  | 38    |
| 1300 | 90    | 48          | 41 | 45 | 41 | 42 | 41 | 33  | 25  | 47    |
|      | 80    | 45          | 38 | 42 | 37 | 38 | 36 | 31  | 22  | 43    |
|      | 70    | 42          | 35 | 40 | 34 | 36 | 32 | 28  | 19  | 40    |
|      | 60    | 41          | 35 | 39 | 33 | 34 | 31 | 27  | 17  | 38    |
|      | 50    | 41          | 35 | 39 | 33 | 34 | 31 | 27  | 17  | 38    |
| 1000 | 90    | 46          | 43 | 45 | 41 | 42 | 38 | 30  | 21  | 46    |
|      | 80    | 43          | 40 | 42 | 37 | 38 | 34 | 27  | 18  | 42    |
|      | 70    | 40          | 38 | 41 | 34 | 35 | 31 | 25  | 15  | 39    |
|      | 60    | 39          | 38 | 40 | 33 | 33 | 30 | 24  | 14  | 38    |
|      | 50    | 39          | 38 | 40 | 33 | 33 | 30 | 24  | 14  | 38    |
| 700  | 90    | 42          | 45 | 42 | 42 | 41 | 34 | 26  | 17  | 44    |
|      | 80    | 38          | 42 | 38 | 38 | 36 | 31 | 23  | 13  | 40    |
|      | 70    | 36          | 41 | 36 | 36 | 33 | 29 | 20  | 10  | 38    |
|      | 60    | 36          | 40 | 34 | 34 | 31 | 28 | 18  | 8   | 36    |
|      | 50    | 36          | 40 | 34 | 34 | 31 | 28 | 18  | 8   | 36    |
| 400  | 90    | 45          | 44 | 42 | 41 | 36 | 27 | 18  | 10  | 41    |
|      | 80    | 42          | 41 | 38 | 37 | 32 | 24 | 15  | 6   | 37    |
|      | 70    | 41          | 39 | 35 | 34 | 30 | 22 | 12  | 2   | 35    |
|      | 60    | 40          | 38 | 33 | 32 | 28 | 20 | 10  | 0   | 33    |
|      | 50    | 40          | 38 | 33 | 32 | 28 | 20 | 10  | 0   | 33    |
| 100  | 90    | 42          | 41 | 36 | 27 | 18 | 10 | 1   | -8  | 31    |
|      | 80    | 38          | 37 | 32 | 24 | 15 | 6  | -4  | -13 | 27    |
|      | 70    | 35          | 34 | 30 | 22 | 12 | 2  | -8  | -17 | 25    |
|      | 60    | 33          | 32 | 28 | 20 | 10 | 0  | -10 | -20 | 23    |
|      | 50    | 33          | 32 | 28 | 20 | 10 | 0  | -10 | -20 | 23    |

1. The calculated sound power levels from these ratings are in decibels, referenced to 10<sup>-12</sup> watts calculated per AMCA Standard 301.
2. The A-weighted sound ratings obtained have been calculated per AMCA 301.
3. Values shown are for inlet Lw<sub>i</sub>A sound power levels for: Installation Type B: free inlet, ducted outlet.
4. The AMCA Certified Ratings Seal applies to Lw<sub>i</sub>A ratings only.
5. Ratings do not include the effects of duct end correction.

# Inlet L<sub>wk</sub> Values (L<sub>wki</sub>) for BCF 270M1-300M1, 270M2-300M2, 270H1-300H1, 270H2-300H2

| RPM  | % WOV | OCTAVE BAND |    |    |    |    |    |    |    | LwkiA |
|------|-------|-------------|----|----|----|----|----|----|----|-------|
|      |       | 1           | 2  | 3  | 4  | 5  | 6  | 7  | 8  |       |
| 1900 | 90    | 45          | 42 | 43 | 41 | 40 | 44 | 37 | 32 | 48    |
|      | 80    | 43          | 38 | 40 | 37 | 36 | 37 | 31 | 28 | 42    |
|      | 70    | 41          | 36 | 38 | 35 | 32 | 32 | 28 | 25 | 39    |
|      | 60    | 39          | 35 | 36 | 33 | 30 | 29 | 26 | 24 | 36    |
|      | 50    | 39          | 35 | 36 | 33 | 30 | 29 | 26 | 24 | 36    |
| 1700 | 90    | 45          | 41 | 43 | 40 | 40 | 45 | 35 | 32 | 48    |
|      | 80    | 43          | 37 | 40 | 36 | 36 | 37 | 30 | 28 | 42    |
|      | 70    | 41          | 35 | 38 | 33 | 33 | 32 | 27 | 25 | 38    |
|      | 60    | 39          | 35 | 36 | 31 | 31 | 29 | 25 | 24 | 36    |
|      | 50    | 39          | 35 | 36 | 31 | 31 | 29 | 25 | 24 | 36    |
| 1500 | 90    | 45          | 41 | 43 | 39 | 41 | 44 | 34 | 32 | 48    |
|      | 80    | 42          | 37 | 40 | 35 | 36 | 36 | 29 | 28 | 41    |
|      | 70    | 39          | 35 | 38 | 32 | 33 | 31 | 26 | 25 | 38    |
|      | 60    | 39          | 35 | 36 | 30 | 30 | 28 | 25 | 24 | 36    |
|      | 50    | 39          | 35 | 36 | 30 | 30 | 28 | 25 | 24 | 36    |
| 1300 | 90    | 44          | 42 | 43 | 41 | 42 | 41 | 33 | 31 | 47    |
|      | 80    | 39          | 39 | 40 | 37 | 36 | 35 | 29 | 27 | 41    |
|      | 70    | 37          | 37 | 38 | 34 | 32 | 30 | 26 | 24 | 38    |
|      | 60    | 37          | 36 | 36 | 32 | 30 | 28 | 25 | 23 | 36    |
|      | 50    | 37          | 36 | 36 | 32 | 30 | 28 | 25 | 23 | 36    |
| 1100 | 90    | 44          | 43 | 44 | 40 | 43 | 39 | 32 | 29 | 46    |
|      | 80    | 38          | 40 | 40 | 35 | 36 | 33 | 28 | 26 | 40    |
|      | 70    | 36          | 38 | 38 | 32 | 32 | 29 | 26 | 23 | 37    |
|      | 60    | 36          | 38 | 35 | 30 | 30 | 28 | 25 | 22 | 35    |
|      | 50    | 36          | 38 | 35 | 30 | 30 | 28 | 25 | 22 | 35    |
| 900  | 90    | 44          | 43 | 44 | 39 | 43 | 37 | 31 | 28 | 46    |
|      | 80    | 38          | 40 | 40 | 34 | 36 | 32 | 27 | 24 | 40    |
|      | 70    | 36          | 38 | 37 | 31 | 32 | 28 | 25 | 22 | 36    |
|      | 60    | 36          | 37 | 35 | 29 | 30 | 27 | 24 | 21 | 35    |
|      | 50    | 36          | 37 | 35 | 29 | 30 | 27 | 24 | 21 | 35    |
| 700  | 90    | 43          | 44 | 44 | 41 | 41 | 35 | 30 | 28 | 45    |
|      | 80    | 39          | 40 | 40 | 35 | 35 | 30 | 26 | 23 | 39    |
|      | 70    | 37          | 38 | 37 | 31 | 31 | 27 | 24 | 21 | 36    |
|      | 60    | 37          | 35 | 35 | 29 | 29 | 26 | 23 | 20 | 34    |
|      | 50    | 37          | 35 | 35 | 29 | 29 | 26 | 23 | 20 | 34    |
| 500  | 90    | 43          | 44 | 38 | 44 | 38 | 31 | 29 | 26 | 44    |
|      | 80    | 40          | 40 | 34 | 37 | 32 | 28 | 25 | 22 | 38    |
|      | 70    | 39          | 37 | 31 | 32 | 29 | 26 | 23 | 19 | 34    |
|      | 60    | 38          | 35 | 29 | 30 | 28 | 25 | 22 | 18 | 33    |
|      | 50    | 38          | 35 | 29 | 30 | 28 | 25 | 22 | 18 | 33    |
| 300  | 90    | 44          | 41 | 43 | 40 | 33 | 29 | 27 | 25 | 41    |
|      | 80    | 40          | 37 | 36 | 34 | 29 | 26 | 23 | 20 | 35    |
|      | 70    | 37          | 34 | 32 | 30 | 26 | 23 | 20 | 17 | 32    |
|      | 60    | 35          | 32 | 30 | 28 | 26 | 22 | 19 | 16 | 31    |
|      | 50    | 35          | 32 | 30 | 28 | 26 | 22 | 19 | 16 | 31    |
| 100  | 90    | 40          | 42 | 36 | 30 | 28 | 26 | 23 | 21 | 35    |
|      | 80    | 35          | 35 | 31 | 27 | 24 | 21 | 18 | 16 | 30    |
|      | 70    | 31          | 31 | 28 | 25 | 22 | 19 | 15 | 12 | 28    |
|      | 60    | 29          | 29 | 27 | 24 | 21 | 17 | 14 | 11 | 26    |
|      | 50    | 29          | 29 | 27 | 24 | 21 | 17 | 14 | 11 | 26    |

1. The calculated sound power levels from these ratings are in decibels, referenced to 10<sup>-12</sup> watts calculated per AMCA Standard 301.
2. The A-weighted sound ratings obtained have been calculated per AMCA 301.
3. Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet.
4. The AMCA Certified Ratings Seal applies to LwiA ratings only.
5. Ratings do not include the effects of duct end correction.

# **Inlet L<sub>wk</sub> Values (L<sub>wki</sub>) for BCF 330M1-890M1, 330M2-890M2, 330H1-890H1, 330H2-890H2**

| RPM  | % WOV | OCTAVE BAND |    |    |    |    |    |    |    | LwkiA |
|------|-------|-------------|----|----|----|----|----|----|----|-------|
|      |       | 1           | 2  | 3  | 4  | 5  | 6  | 7  | 8  |       |
| 1500 | 90    | 40          | 39 | 49 | 45 | 42 | 43 | 36 | 27 | 49    |
|      | 80    | 36          | 34 | 45 | 41 | 36 | 36 | 30 | 23 | 43    |
|      | 70    | 34          | 32 | 42 | 38 | 33 | 31 | 26 | 20 | 40    |
|      | 60    | 34          | 32 | 40 | 36 | 30 | 28 | 24 | 18 | 37    |
|      | 50    | 34          | 32 | 40 | 36 | 30 | 28 | 24 | 18 | 37    |
| 1300 | 90    | 40          | 38 | 49 | 43 | 42 | 43 | 33 | 26 | 48    |
|      | 80    | 36          | 34 | 45 | 38 | 36 | 36 | 28 | 22 | 42    |
|      | 70    | 34          | 32 | 42 | 34 | 32 | 30 | 25 | 19 | 38    |
|      | 60    | 34          | 32 | 40 | 32 | 30 | 27 | 23 | 17 | 36    |
|      | 50    | 34          | 32 | 40 | 32 | 30 | 27 | 23 | 17 | 36    |
| 1100 | 90    | 40          | 43 | 48 | 41 | 41 | 40 | 31 | 23 | 46    |
|      | 80    | 36          | 39 | 44 | 36 | 35 | 34 | 27 | 20 | 41    |
|      | 70    | 34          | 36 | 40 | 33 | 31 | 29 | 24 | 17 | 37    |
|      | 60    | 35          | 35 | 39 | 30 | 29 | 26 | 22 | 16 | 35    |
|      | 50    | 35          | 35 | 39 | 30 | 29 | 26 | 22 | 16 | 35    |
| 900  | 90    | 40          | 47 | 45 | 39 | 41 | 37 | 29 | 21 | 45    |
|      | 80    | 37          | 41 | 40 | 35 | 35 | 32 | 25 | 17 | 39    |
|      | 70    | 35          | 38 | 36 | 31 | 31 | 28 | 22 | 15 | 36    |
|      | 60    | 36          | 37 | 35 | 29 | 29 | 26 | 20 | 14 | 34    |
|      | 50    | 36          | 37 | 35 | 29 | 29 | 26 | 20 | 14 | 34    |
| 700  | 90    | 43          | 47 | 41 | 38 | 40 | 35 | 26 | 18 | 43    |
|      | 80    | 38          | 41 | 36 | 34 | 34 | 29 | 22 | 14 | 38    |
|      | 70    | 36          | 37 | 33 | 30 | 30 | 26 | 19 | 12 | 34    |
|      | 60    | 36          | 36 | 31 | 28 | 28 | 24 | 18 | 11 | 32    |
|      | 50    | 36          | 36 | 31 | 28 | 28 | 24 | 18 | 11 | 32    |
| 500  | 90    | 47          | 45 | 39 | 40 | 38 | 30 | 22 | 14 | 42    |
|      | 80    | 41          | 40 | 35 | 34 | 32 | 26 | 18 | 11 | 36    |
|      | 70    | 37          | 36 | 31 | 30 | 28 | 23 | 16 | 8  | 32    |
|      | 60    | 36          | 35 | 29 | 29 | 27 | 21 | 15 | 8  | 31    |
|      | 50    | 36          | 35 | 29 | 29 | 27 | 21 | 15 | 8  | 31    |
| 300  | 90    | 47          | 40 | 39 | 39 | 33 | 24 | 16 | 9  | 39    |
|      | 80    | 41          | 36 | 34 | 33 | 28 | 20 | 13 | 5  | 33    |
|      | 70    | 37          | 32 | 30 | 29 | 25 | 18 | 10 | 3  | 30    |
|      | 60    | 36          | 30 | 29 | 28 | 23 | 17 | 10 | 3  | 29    |
|      | 50    | 36          | 30 | 29 | 28 | 23 | 17 | 10 | 3  | 29    |
| 100  | 90    | 38          | 41 | 37 | 27 | 19 | 12 | 4  | -3 | 31    |
|      | 80    | 33          | 35 | 31 | 23 | 16 | 8  | 0  | -7 | 26    |
|      | 70    | 30          | 31 | 27 | 21 | 13 | 6  | -1 | -9 | 23    |
|      | 60    | 28          | 29 | 26 | 19 | 12 | 6  | -1 | -8 | 21    |
|      | 50    | 28          | 29 | 26 | 19 | 12 | 6  | -1 | -8 | 21    |

1. The calculated sound power levels from these ratings are in decibels, referenced to 10<sup>-12</sup> watts calculated per AMCA Standard 301.
2. The A-weighted sound ratings obtained have been calculated per AMCA 301.
3. Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet.
4. The AMCA Certified Ratings Seal applies to LwiA ratings only.
5. Ratings do not include the effects of duct end correction.

# M Capacity Fraction

| CFM    | TOTAL PRESSURE AT DENSITY |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|--------|---------------------------|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
|        | 1/4                       | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1  | 1¼ | 1½ | 2  | 2½ | 3  | 3½ | 4  | 4½ | 5  | 5½ | 6  | 6½ |  |
| 100    | 8                         | 11  | 14  | 16  | 18  | 19  | 20 | 22 | 24 | 26 | 28 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 36 |  |
| 150    | 10                        | 13  | 16  | 18  | 19  | 21  | 22 | 24 | 25 | 28 | 30 | 31 | 33 | 34 | 35 | 36 | 37 | 37 | 38 |  |
| 200    | 11                        | 14  | 17  | 19  | 21  | 22  | 23 | 25 | 27 | 29 | 31 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 39 |  |
| 300    | 13                        | 16  | 19  | 21  | 22  | 24  | 25 | 27 | 28 | 31 | 33 | 34 | 36 | 37 | 38 | 39 | 40 | 40 | 41 |  |
| 500    | 15                        | 18  | 21  | 23  | 24  | 26  | 27 | 29 | 31 | 33 | 35 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 43 |  |
| 750    | 17                        | 20  | 23  | 25  | 26  | 28  | 29 | 31 | 32 | 35 | 37 | 38 | 40 | 41 | 42 | 43 | 44 | 44 | 45 |  |
| 1000   | 18                        | 21  | 24  | 26  | 28  | 29  | 30 | 32 | 34 | 36 | 38 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 46 |  |
| 1500   | 20                        | 23  | 26  | 28  | 29  | 31  | 32 | 34 | 35 | 38 | 40 | 41 | 43 | 44 | 45 | 46 | 47 | 47 | 48 |  |
| 2000   | 21                        | 24  | 27  | 29  | 31  | 32  | 33 | 35 | 37 | 39 | 41 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 49 |  |
| 3000   | 23                        | 26  | 29  | 31  | 32  | 34  | 35 | 37 | 38 | 41 | 43 | 44 | 46 | 47 | 48 | 49 | 50 | 50 | 51 |  |
| 5000   | 25                        | 28  | 31  | 33  | 34  | 36  | 37 | 39 | 41 | 43 | 45 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 53 |  |
| 7500   | 27                        | 30  | 33  | 35  | 36  | 38  | 39 | 41 | 42 | 45 | 47 | 48 | 50 | 51 | 52 | 53 | 54 | 54 | 55 |  |
| 10000  | 28                        | 31  | 34  | 36  | 38  | 39  | 40 | 42 | 44 | 46 | 48 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 56 |  |
| 15000  | 30                        | 33  | 36  | 38  | 39  | 41  | 42 | 44 | 45 | 48 | 50 | 51 | 53 | 54 | 55 | 56 | 57 | 57 | 58 |  |
| 20000  | 31                        | 34  | 37  | 39  | 41  | 42  | 43 | 45 | 47 | 49 | 51 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 59 |  |
| 30000  | 33                        | 36  | 39  | 41  | 42  | 44  | 45 | 47 | 48 | 51 | 53 | 54 | 56 | 57 | 58 | 59 | 60 | 60 | 61 |  |
| 50000  | 35                        | 38  | 41  | 43  | 44  | 46  | 47 | 49 | 51 | 53 | 55 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 63 |  |
| 75000  | 37                        | 40  | 43  | 45  | 46  | 48  | 49 | 51 | 52 | 55 | 57 | 58 | 60 | 61 | 62 | 63 | 64 | 64 | 65 |  |
| 100000 | 38                        | 41  | 44  | 46  | 48  | 49  | 50 | 52 | 54 | 56 | 58 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 66 |  |
| 150000 | 40                        | 43  | 46  | 48  | 49  | 51  | 52 | 54 | 55 | 58 | 60 | 61 | 63 | 64 | 65 | 66 | 67 | 67 | 68 |  |
| 200000 | 41                        | 44  | 47  | 49  | 51  | 52  | 53 | 55 | 57 | 59 | 61 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 69 |  |

| CFM    | TOTAL PRESSURE AT DENSITY |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|--------|---------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
|        | 7                         | 8  | 9  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 |  |
| 100    | 37                        | 38 | 39 | 40 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 48 | 49 | 50 | 50 | 51 | 51 | 52 | 52 |  |
| 150    | 39                        | 40 | 41 | 42 | 43 | 45 | 46 | 47 | 48 | 49 | 49 | 50 | 51 | 51 | 52 | 52 | 53 | 53 | 54 |  |
| 200    | 40                        | 41 | 42 | 43 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 51 | 52 | 53 | 53 | 54 | 54 | 55 | 55 |  |
| 300    | 42                        | 43 | 44 | 45 | 46 | 48 | 49 | 50 | 51 | 52 | 52 | 53 | 54 | 54 | 55 | 55 | 56 | 56 | 57 |  |
| 500    | 44                        | 45 | 46 | 47 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 55 | 56 | 57 | 57 | 58 | 58 | 59 | 59 |  |
| 750    | 46                        | 47 | 48 | 49 | 50 | 52 | 53 | 54 | 55 | 56 | 56 | 57 | 58 | 58 | 59 | 59 | 60 | 60 | 61 |  |
| 1000   | 47                        | 48 | 49 | 50 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 58 | 59 | 60 | 60 | 61 | 61 | 62 | 62 |  |
| 1500   | 49                        | 50 | 51 | 52 | 53 | 55 | 56 | 57 | 58 | 59 | 59 | 60 | 61 | 61 | 62 | 62 | 63 | 63 | 64 |  |
| 2000   | 50                        | 51 | 52 | 53 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 61 | 62 | 63 | 63 | 64 | 64 | 65 | 65 |  |
| 3000   | 52                        | 53 | 54 | 55 | 56 | 58 | 59 | 60 | 61 | 62 | 62 | 63 | 64 | 64 | 65 | 65 | 66 | 66 | 67 |  |
| 5000   | 54                        | 55 | 56 | 57 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 65 | 66 | 67 | 67 | 68 | 68 | 69 | 69 |  |
| 7500   | 56                        | 57 | 58 | 59 | 60 | 62 | 63 | 64 | 65 | 66 | 66 | 67 | 68 | 68 | 69 | 69 | 70 | 70 | 71 |  |
| 10000  | 57                        | 58 | 59 | 60 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 68 | 69 | 70 | 70 | 71 | 71 | 72 | 72 |  |
| 15000  | 59                        | 60 | 61 | 62 | 63 | 65 | 66 | 67 | 68 | 69 | 69 | 70 | 71 | 71 | 72 | 72 | 73 | 73 | 74 |  |
| 20000  | 60                        | 61 | 62 | 63 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 71 | 72 | 73 | 73 | 74 | 74 | 75 | 75 |  |
| 30000  | 62                        | 63 | 64 | 65 | 66 | 68 | 69 | 70 | 71 | 72 | 72 | 73 | 74 | 74 | 75 | 75 | 76 | 76 | 77 |  |
| 50000  | 64                        | 65 | 66 | 67 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 75 | 76 | 77 | 77 | 78 | 78 | 79 | 79 |  |
| 75000  | 66                        | 67 | 68 | 69 | 70 | 72 | 73 | 74 | 75 | 76 | 76 | 77 | 78 | 78 | 79 | 79 | 80 | 80 | 81 |  |
| 100000 | 67                        | 68 | 69 | 70 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 78 | 79 | 80 | 80 | 81 | 81 | 82 | 82 |  |
| 150000 | 69                        | 70 | 71 | 72 | 73 | 75 | 76 | 77 | 78 | 79 | 79 | 80 | 81 | 81 | 82 | 82 | 83 | 83 | 84 |  |
| 200000 | 70                        | 71 | 72 | 73 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 81 | 82 | 83 | 83 | 84 | 84 | 85 | 85 |  |



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