

Pipe Organ Blower Calculator

Notes for Spreadsheet

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Introduction

The spreadsheet has two columns for calculations, labeled “1st Trial” and “2nd Trial.” They use identical formulas, and are included for convenience in comparing two blowers.

This spreadsheet is based on formulas published by Al Sefl. It was originally written by Kurt Schlieter. It has been edited, revised and documented by me. It is in Excel 95 format, and has been tested with both Excel 95 and Excel 97.

This spreadsheet has been locked, so that the user cannot inadvertently overwrite the formulas and critical constants. The the locked cells containing these formulas and constants are in **bold** type. The cells that the user can enter data into are in regular (medium weight) type. If the user wishes to revise the formulas or otherwise edit the spreadsheet, use the “Tools” menu, and look for the “Protection” item. There is no password required.

Some of the constants used in the formulas have been made visible as separate spreadsheet cells.

Notes

The following notes refer to the line numbers in the leftmost column in the spreadsheet.

Calculate Blower Output

1. Enter motor pulley diameter.
2. Enter blower pulley diameter. These two items must be entered. If the motor directly drives the blower, enter “1” into both pulley diameter cells.
3. Enter theoretical motor speed. Probably, 1200 and 1800 RPM are the only two numbers you are going to use here.
4. Calculated actual motor speed, based on the “Motor speed Factor” constant.
5. Calculated actual blower shaft speed, based on the motor speed and the ratio of the pulley diameters.
6. Enter number of fans.

7. Enter the blade width (depth) of the fan.
8. Enter the fan diameter.
9. Calculated theoretical pressure per fan, in inches of water column.
10. Calculated actual pressure per fan, taking into account the fan efficiency, in inches of water column.
11. Calculated total blower output pressure, in inches of water column.
12. Calculated fan blast area, square inches.
13. Calculated fan blast area, square feet.
14. Calculated air velocity per second.
15. Calculated air velocity per minute
16. Calculated air flow in cubic feet per minute.
17. Calculated air flow in cubic feet per second.
18. Calculated minimum motor horsepower required.

Calculations for changes in motor speeds and pulley diameters:

19. Enter old output capacity in cubic feet per minute.
20. Enter old motor horsepower.
21. Enter old static output pressure, in inches of water column.
22. Enter desired static output pressure, in inches of water column.
23. Enter old blower speed in RPM.
24. Calculated new blower speed required.
25. Calculated new motor horsepower required.
26. Calculated new output capacity in cubic feet per minute.
27. Enter the available new motor speed in RPM.
28. Enter motor pulley diameter, in inches.
29. Calculated required blower pulley diameter, in inches.