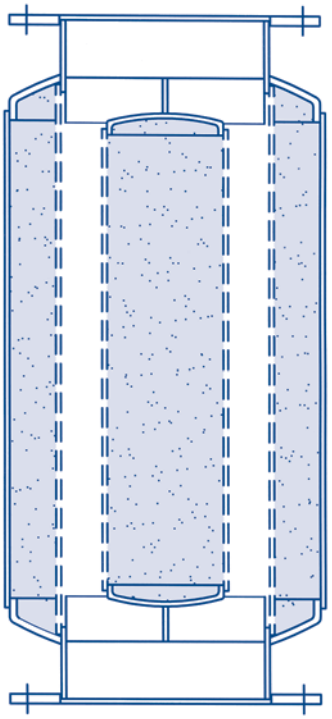
Stoddard Silencers

Specialists in Industrial Silencing

Stoddard Silencers of Canada Inc.
491 Brimley Rd. Unit 1, Scarborough, Ontario Canada M1J 1A4
Telephone (416) 291-4390 • FAX (416) 291-4791
E-Mail - info@stoddardsilencers.com
Web page - www.stoddardsilencers.com

FAN SILENCERS



Stoddard Silencers

Series "CF"

Fan Silencers

A blower fan moves large quantities of air or gas at relatively low pressures, usually measured in inches of water column gauge ("H_2O) rather than in pounds per square inch (psi). This air or gas is moved due to the dynamic action of the rotating vanes or blades which impart velocity and pressure to the air or gas.

The noise generated by the rotation of the vanes or blades is fairly balanced across the noise spectrum, with some increase in the first three octave bands. However, due to the function of the human ear the mid to high range of frequencies are perceived to be louder and will result in problems with personnel who work nearby and/or those located some distance away. Fan blowers are normally constructed of either cast iron or welded steel plate which do not remove the noise generated by the moving air/gas stream. This noise can be passed on through the piping or ducts which will radiate this noise throughout the system.

Effective treatment of the intake and discharge noise generated by the blower fan is accomplished by using a high volume, low pressure drop, absorption type silencer which can control the noise as a unit. Use of this type silencer eliminates the more costly alternative of lagging or lining the piping or duct work. Silencers can easily be retrofitted into existing blower systems and can be designed into future construction to create more effective noise control.

SILENCER SELECTION PROCEDURE

1. To avoid excessive self-noise generated by the passage of air through the silencer, select size according to the recommended cubic feet per minute (cfm) of air/gas given in the table below:

2. Refer to the pressure drop calculations on the following page. Calculate the pressure drop for the silencer selected below. Check this pressure drop against the maximum allowable pressure drop.

   If the pressure drop is too great, select the next larger size and recalculate. Where the pressure drop requirement is critical, this step may have to be repeated.

Silencer Size	Maximum cfm
8	1,900
10	2,950
12	4,250
14	5,780

Silencer Size	Maximum cfm
16	7,550
18	9,560
20	11,800
24	16,500

Silencer Size	Maximum cfm
30	25,750
36	37,120
42	51,950
48	67,850

Silencer Size	Maximum cfm
54	85,850
60	106,200
LARGER SIZES AVAILABLE ON REQUEST	

AT MAXIMUM CFM RATING AND STANDARD TEMPERATURE & PRESSURE, PRESSURE DROP IS APPROXIMATELY 1.42 INCHES OF WATER COLUMN.

INSTALLATION RECOMMENDATIONS

1. To structurally isolate the silencer from the blower fan as much as possible, Stoddard Silencers recommends the use of flexible connectors and independent supports.
2. Fan silencers may be used in tandem to achieve greater noise control.
3. To prevent high entrance/exit losses, transition pieces of the minimum length recommended (see Transition Length Calculations) should be used between the blower fan and silencer.
4. When the C24 is used as an intake silencer, there should be a spool piece with a minimum length of 1½ pipe diameters between the silencer and the fan. This will allow for proper filling of the fan wheel and lessen the possibility of decreased fan performance.

SOUND POWER LEVEL MEASUREMENTS

1. Sound power levels in dbC and dbA, plus full octave band analysis can be provided by Stoddard Silencers. Full data on the model fan being used and operating conditions including, cfm, pressure, rpm and manufacturer's published sound power levels will be required. Stoddard Silencers will provide calculations on silenced and unsilenced noise levels.
2. For installations where critical noise level requirements must be met, sales engineers are available to custom design a complete silencer package for your needs.

MINIMUM TRANSITION LENGTHS (MTL)

To minimize the amount of static pressure loss when transitioning from the fan outlet to a larger or smaller silencer inlet, Stoddard Silencers recommends the following minimum transition lengths (MTL):

ds = diameter of Silencer Inlet in inches

df = diameter of Fan Outlet in inches

MTL = (ds – df) x 5.7

Fan Silencer Pressure Drop Calculations

Intake Silencer Pressure Drop Calculations

1. Determine inlet velocity based on size from selection procedure.

   $$\text{Inlet Velocity (fpm)} = \frac{(\text{Inlet CFM}) \times 186.4}{(\text{Silencer Size})^2} = \_\_\_\_\_ \text{ Feet Per Minute}$$

   $$\text{Inlet Velocity} = \frac{(\quad\quad) \times 186.4}{(\quad)^2} = \_\_\_\_\_ \text{ Feet Per Minute}$$

2. Convert inlet velocity to velocity pressure.

   $$\text{Velocity Pressure} = \left(\frac{\text{Inlet Velocity}}{4008}\right)^2 = \_\_\_\_\_ \text{ Inches of Water}$$

   $$\text{Velocity Pressure} = \left(\frac{\quad\quad}{4008}\right)^2 = \_\_\_\_\_ \text{ Inches of Water}$$

3. Calculate pressure drop across silencer size selected.

   Pressure Drop = Velocity Pressure x Friction Factor. = _____ Inches of Water

   Pressure Drop = _____ x .75 = _____ Inches of Water

Discharge Silencer Pressure Drop Calculations

1. Determine discharge velocity based on silencer size from selection procedure. Discharge Pressure is expressed in inches of water column.

   $$\text{Discharge Velocity (fpm)} = \frac{140.8 \times (\text{ICFM}) \times \left(530 + \left(\frac{\text{Discharge Pressure}}{2}\right)\right)}{(\text{Silencer Size})^2 \times (407 + (\text{Discharge Pressure}))} = \_\_\_\_\_ \text{ Feet Per Minute}$$

   $$\text{Discharge Velocity (fpm)} = \frac{140.8 \times (\quad) \times \left(530 + \left(\frac{\quad\quad}{2}\right)\right)}{(\quad)^2 \times (407 + (\quad\quad))} = \_\_\_\_\_ \text{ Feet Per Minute}$$

2. Convert discharge velocity to velocity pressure.

   $$\text{Velocity Pressure} = \left(\frac{\text{Discharge Velocity}}{4008}\right)^2 = \left(\frac{\quad\quad}{4008}\right)^2 = \_\_\_\_\_ \text{Inches of Water}$$

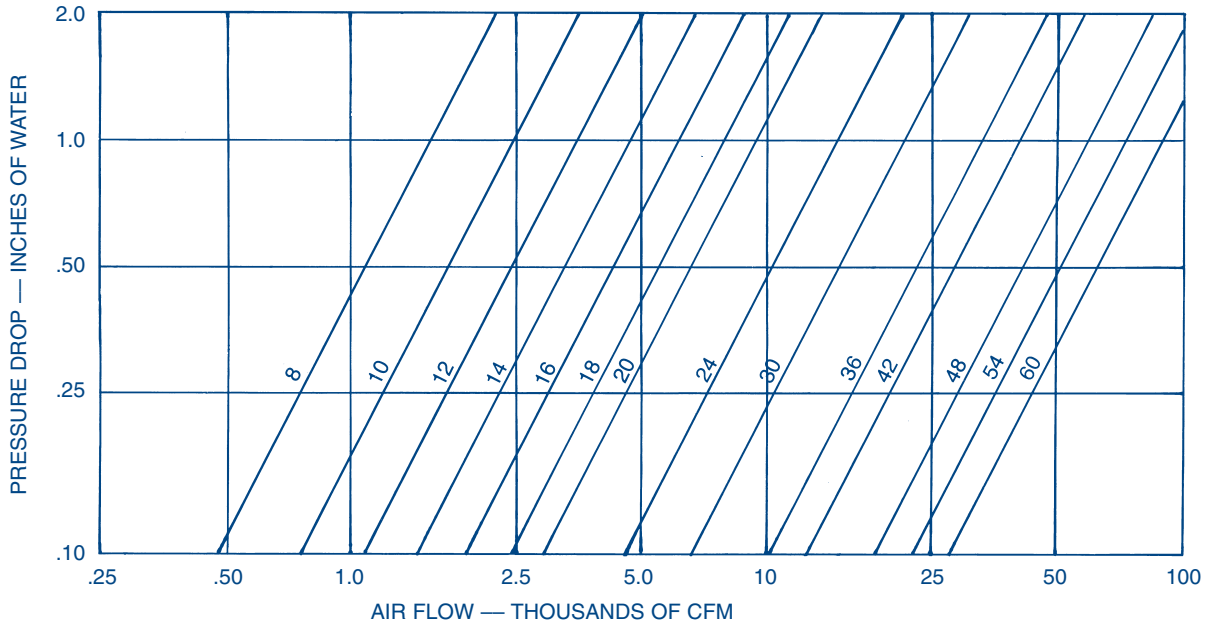
3. Calculate pressure drop across silencer selected.

   $$\text{Pressure Drop} = \frac{(\text{Velocity Pressure}) \times .97 \times (409 + (\text{Discharge Pressure}))}{\left(\frac{530 + (\text{Discharge Pressure})}{2}\right)} = \_\_\_\_\_ \text{Inches of Water}$$

   $$\text{Pressure Drop} = \frac{(\quad\quad) \times .97 \times (409 + (\quad\quad))}{\left(\frac{530 + (\quad\quad)}{2}\right)} = \_\_\_\_\_ \text{Inches of Water}$$

Note: Entrance and Exit Loss is not included in above calculations.

PRESSURE DROP FOR C24 FAN SILENCERS
(STANDARD TEMPERATURE & PRESSURE)



C24 Fan Silencers

Application

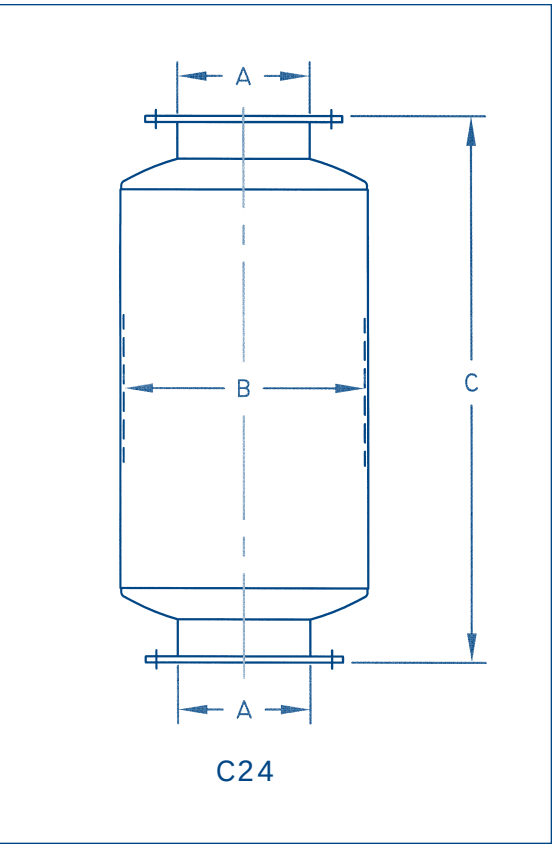
Silencing of intake and discharge of blower fans in high pressure – high velocity duct systems and material handling systems.

Design

Gas flows through aerodynamically designed passages and around central core which are filled with an appropriate acoustic absorption material to provide the noise reduction desired. Silencer can be installed horizontally or vertically on the inlet or discharge of any fan or remotely in the air system.

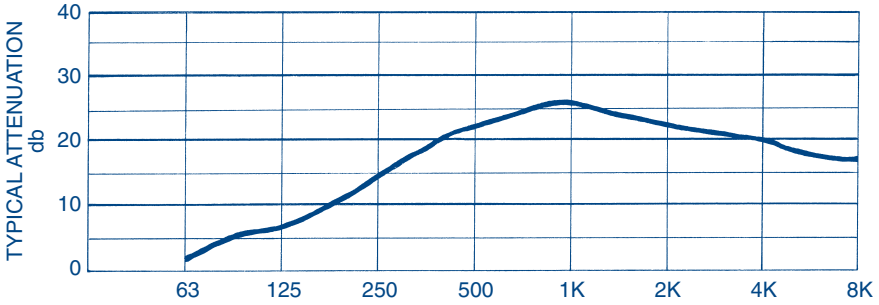
Construction

All welded sheet & plate steel construction, filled with high density acoustic absorption material. Exterior surfaces are prime coated. Units are available with plain connections, rolled angle flanges, or plate flanges to match 125 lb. American Standard Flanges. Side connections, mounting brackets, or special paint available at extra cost.



C24

Typical Attenuation Curve



OCTAVE BAND CENTER FREQUENCY (Hz)

Model	A	B	C	Weight	
				Plain Ends	Flanged Ends
C24-8	8	14	31	55	80
C24-10	10	16	35	70	100
C24-12	12	18	39	100	140
C24-14	14	20	39	115	175
C24-16	16	22	47	185	260
C24-18	18	24	47	205	280
C24-20	20	26	49 ½	245	355
C24-22	22	28	55 ½	330	445
C24-24	24	30	55 ½	385	520
C24-26	26	30	61	425	575
C24-28	28	36	63 ½	595	760
C24-30	30	36	62	600	780
C24-36	36	42	80	895	1230
C24-42	42	48	83	1435	1850
C24-48	48	54	89 ½	1815	2305
C24-54	54	60	96	2215	2920
C24-60	60	66	108 ½	2695	3525

Stoddard Silencers

Specialists in Industrial Silencing

Stoddard Silencers of Canada Inc.
491 Brimley Rd. Unit 1, Scarborough, Ontario, Canada M1J 1A4
Telephone (**416**) **291-4390** • FAX (**416**) **291-4791**
E-Mail - info@stoddardsilencers.com
Web page - www.stoddardsilencers.com