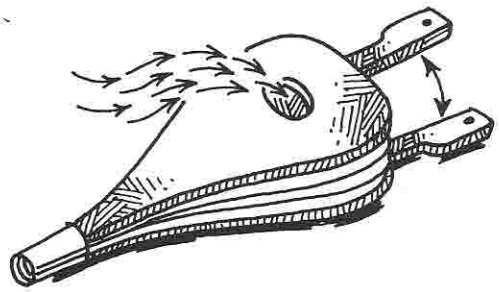
HOMELITE®

BLOWER BASICS

A little history

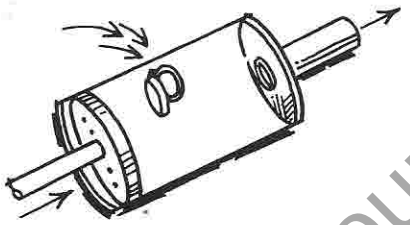
Earliest man experienced the need for ventilation. As he sought protection from the weather and his enemies, he moved into caves. He soon found that the smoke and fumes from the fires he used for cooking and warmth soon drove him back outside coughing and gasping for fresh clean air. It was only when he discovered that a cave with two openings provided natural ventilation with its resulting circulation of air was he able to remain inside for long periods of time.

As he became more knowledgeable, he began to forge weapons and utensils from raw metals. And he soon learned the value

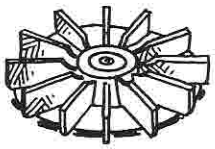


of the bellows—a form of mechanical blowing machine which permitted him to undertake the first smithing operations.

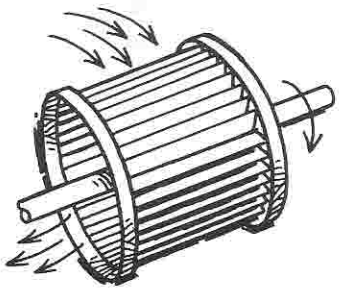
The earliest forms of mechanical blowers consisted of simple bags made of animal skins equipped with a valve and nozzle. More advanced types of these bellows are still found today in blacksmith shops in primitive areas.



Later, piston blowers were introduced, and in their simplest form consisted of a square wooden chamber with a close-fitting piston working within it. When the piston was drawn backward, air was sucked into the chamber through a flap valve. When the piston was pushed forward, the air was compressed and forced out through the nozzle. Blowing engines, the modern version of piston blowers, are now more commonly called air compressors.



Later developments produced rotary blowers. This type of machine included various forms of disc blowers or fans with slightly bent or curved blades, which were generally used for ventilating purposes.



As development continued, squirrel cage rotary blowers were found to be more efficient and could be driven by small gasoline engines or electric motors to provide a high volume of air with little fan noise.

Today, highly developed rotary ventilation blowers are used on job sites for a wide variety of applications, all intended to provide safe, comfortable conditions for workmen who are required to install or repair equipment in confined work areas.

What is ventilation?

Ventilation is the application of natural or mechanical means to create the circulation of fresh air in underground, above-ground and confined work areas.

What is the result?

Through ventilation, the circulation of fresh air in confined areas provides comfortable, safe, breathable air.

Why ventilate?

Ventilation is necessary to insure a constant supply of fresh, breathable air and to reduce the danger to personnel from a potentially explosive atmosphere or oxygen deficiency. Workers who must work in underground manholes, cable vaults and other confined areas must be provided with a comfortable work-environment in order to be more efficient. Furthermore, the work area must be considered safe for the workers in order to comply with OSHA regulations.

This need cannot always be satisfied through natural ventilation. In those circumstances, the ventilation must be provided by mechanical means. And the machine that does it is called a blower.

Types of applications

The primary function of a blower is (a) to supply fresh air to an enclosed area, or (b) to exhaust stale air for a more comfortable working environment. Compact portable ventilating blowers with flexible ducts can be used for a number of jobs. They can supply continuous fresh air around the construction site or in enclosed work areas. They can also be used for removing toxic and noxious gases from sewers and manholes, or used as a leak detector for testing sewer lines and pipes. Blowers are also used by tank-cleaning crews and for cooling laser beam equipment in trenches. Utilities and telephone company repairmen use them to expel hazardous gases and to supply fresh clean air into cable vaults and into manholes.

Another application is for controlled, forced-draft burning of trash, debris and brush. Fire fighters many times use the suction side to remove smoke from burning buildings to more efficiently fight fires.

Blowers are easily converted from air supply equipment to exhaust equipment. Simply affix the flexible hose to the air intake rather than the output side of the blower, and the unit is converted.

Blower equipment and accessories

Ventilating blowers are available in both engine-driven and electric motor-driven types. The engine-driven units are gasoline fueled but are available with L.P. and natural gas carburetion kits. Blowers are constructed of top-quality materials for long life, low maintenance and light weight to meet the needs of the marketplace for both durability and safety.

Convenient carrying handles make portable blowers easy to move about the job site. The blower housing intake and output openings are equipped with screens to protect the internal fan from damage from external debris and to protect hands of operator. The blower fan impeller is made from heavy-duty cast aluminum and is of the squirrel cage design for efficient and quiet operation. Portable gas-driven units are also normally supplied with vibration isolators to keep the unit from "walking" while in operation. Engine-driven units should be supplied with a variable speed control for supplying large volumes of air for purging or for smaller amounts of air during normal ventilation.

Electric-driven blowers are used when electricity is readily available from a utility line supply or from a portable electric generator.

Flexible ducts are normally 8" in diameter and usually supplied in 15 or 25-foot lengths. Multiple lengths may be connected together for longer runs. A helical spring is used to connect the duct to the blower. Flexible ducts are generally furnished in a highly visible yellow color and are made from heavy-duty vinyl plastic. These ducts are sometimes referred to as collapsible tubes. They are ideally used to vent air away from or into a specific area and are collapsible for easy storage. Other types of ducts are constructed of canvas or heavy-duty, mildew-resistant polyethelene-coated polyester. They, too, may be collapsed and folded for storage.

Welded steel frames or carriers are available to hold flexible ducts firmly in place in a collapsed position for easy storage and transport. The ducts may be used on the suction or discharge side of the blower. Use collapsible canvas or polyester duct on discharge side only.

Specification testing and certification

Blower air flow certification. What it is—and why we have it.

Prior to establishing procedures, methods and test requirements for blowers, there was no standard used to compare one blower's rating to another. A manufacturer could rate his blower at almost any CFM he wanted; also, most blowers were rated at

the blower outlet (free air). No consideration was given to the amount of air volume lost due to the resistance of the flexible air duct and the number of 90 degree bends in the duct when in use. Sometimes two 90 degree bends are used.

A very good solution then was to have the manufacturers of ventilating blowers submit their blowers to an independent testing laboratory, test them in a chamber built to specific standards and test the blowers with free air as well as with an 8" diameter and 15' long flexible duct with one 90 degree bend and two 90 degree bends. The test procedures would be standardized using a recognized standard.

That is why and how air flow certification came into being. Most reputable suppliers submit their blowers to the independent testing laboratory, Colorado Engineering Experimental Station, Inc. (CEESI), which certifies the test. The test chamber is built in accordance with Standard #210-67 of the Air Moving and Conditioning Association (AMCA) and test procedures are in accordance with Standard E.L. 2723/P.L. 2709 of American Telephone and Telegraph (AT&T). All Homelite blowers have been certified by CEESI under the above procedures and the certified air flow in CFM is printed on Homelite's specification sheets. A decal with the results is placed on each blower.

Guidelines for complete ventilation of cable vaults, manholes or other confined areas

In the interest of helping you obtain the most satisfactory results with your ventilation blower and its accessories, the following guidelines are listed. Where local conditions warrant, you may wish to follow an even more rigorous procedure than described herein. Determine by careful analysis all factors present at your particular jobsite.

1. Always assume that a cable vault, manhole or other confined work area is unsafe until you have proven to your complete satisfaction that it is safe.

2. Never enter a manhole or confined space until it has been thoroughly tested with a gas detector and then power-ventilated with a blower for a minimum of five minutes with the blower set at maximum speed. Power ventilation should never be used only by itself. Safety can only be assured after making thorough gas detection tests, combined with proper power ventilation.

3. Always purge the blower duct at the street level for at least one minute before placing it into the manhole. Be certain the blower intake is positioned away from any sources of potentially harmful or hazardous fumes or gases such as engine exhaust on gasoline-powered blowers.

4. The most effective position for the blower output end is to tie the duct to a support or cable rack midway up the wall with the duct opening directed at one wall. As can be seen in Figure 1, this position provides an even air distribution and will tend to eliminate dead air spaces where harmful or hazardous gases may accumulate (see Figure 2.)

5. Periodic gas test should be continued while working and after taking work breaks. Harmful gases can be produced due to many factors and in many places where gases were not found before. Continue gas testing!

6. Test—ventilate—test—continue to ventilate—retest at least every two hours.

Maintenance

Conscientious, periodic maintenance will insure long service life from your equipment. The manufacturer's instructions for the blower and its prime mover should be read before operation.

With engine-driven blowers, run the engine at reasonable speed to prevent damage and excessive wear. Every 50 hours of operation, replace the crankcase oil with high grade engine oil or in accordance with the manufacturer's specifications. Check for noise or excessive vibration; determine if any adjustment to the carburetor is needed. Engine tune-up and sparkplug replacement should be done as required.

Remove all debris from air intake screen before each use. Check flexible ducts for tears or leaks and repair or replace.

Always refer to the Owner's manual for proper servicing instructions.

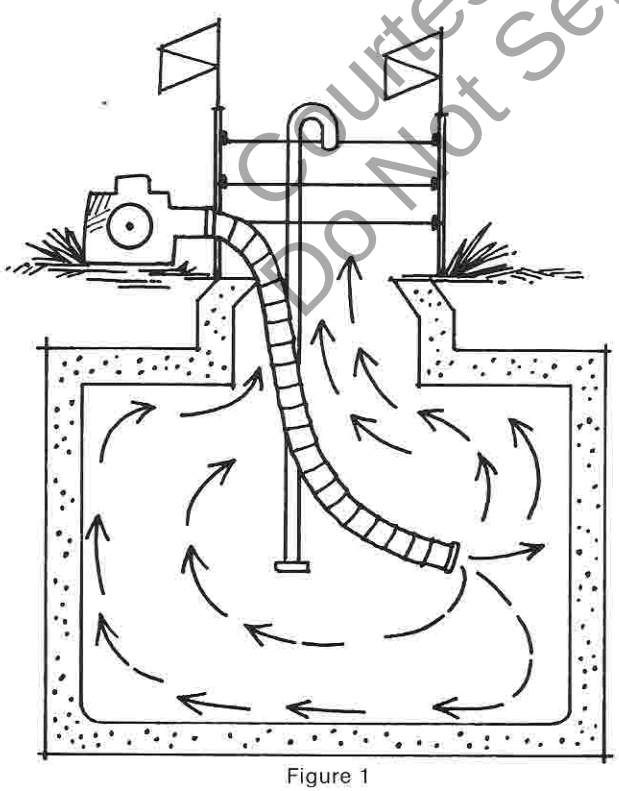


Figure 1

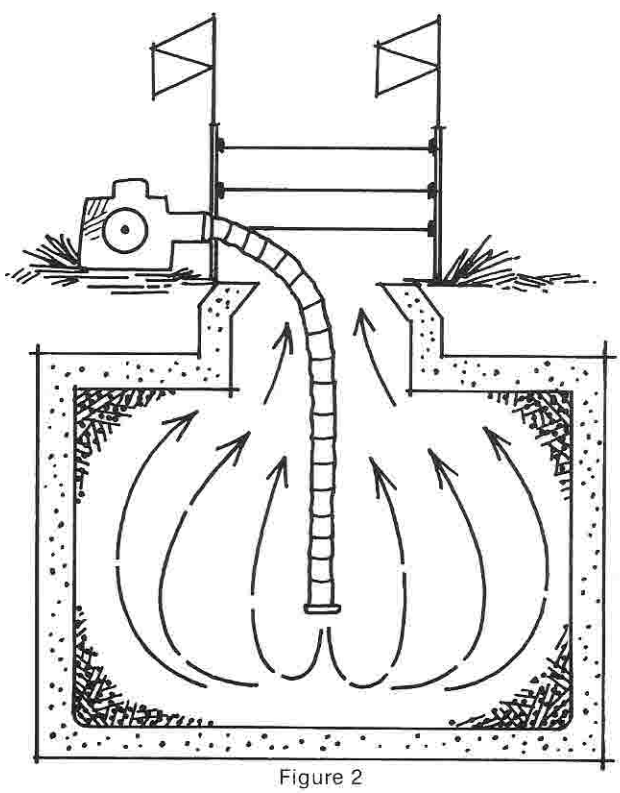


Figure 2

Glossary

AMCA—Air Moving and Conditioning Association

AT&T—American Telephone and Telegraph Company

BLOWER—An electric or engine-driven device to stir, move or force air into, through or onto by means of revolving blades.

CABLE VAULT—An underground chamber used by electric utilities and telephone companies for running and splicing cables.

CAISSON—A water-tight box or tube inside which men can do construction work under water.

CAPACITY—The total volume of air a blower can move in a given amount of time. Usually measured in cubic feet per minute.

CARRIER—A welded steel frame which will hold collapsible tube firmly in place in collapsed position for easy storage or transport.

CEESI—Colorado Engineering Experiment Station, Inc.

CFM/CFH—A unit of measurement used to determine the air handling capability of a blower. Blower capacity can be expressed in either cubic feet per minuute (CFM) or cubic feet per hour (CFH).

COLLAPSIBLE TUBE—Heavy-duty vinyl plastic duct held in place with helical spring; has highly visible yellow color. Used to place vented air away from or into a specific area. Collapsible for easy storage.

CONFINED AREA—A work space that is restricted or which has a limited supply of fresh air available, or where noxious or flammable gases may be present.

DISCHARGE TUBE—A duct or hose used to carry air from the discharge side of the blower (See Collapsible Tube).

DUCT—A tube or channel through which air can be moved.

FAN—A device used to set up a current of air for ventilating or cooling. Usually motor or engine-driven with revolving blades.

FUME—A gas, smoke or vapor which is offensive and/or suffocating.

GAS—One of three basic forms of matter (solid, gas, liquid); an expanded fluid.

GAS DETECTOR—A device for detecting combustible gas in a manhole, cable vault or other enclosed space prior to entry.

HAZARDOUS—Risky, dangerous, unsafe.

INTAKE—The place on the blower where the air is taken in.

MANHOLE—A hole through which a man can get into a sewer, pip conduit, cable vault, etc., for repair or inspection.

NOXIOUS—Harmful, injurious or unwholesome gases or fumes.

OSHA—The Occupation, Safety and Health Act, administered by the United States Department of Labor.

POWER VENTILATION—A means of ventilating a manhole or confined space by the use of an electric-powered or engine-driven blower.

PURGE—To cleanse or clear an air duct of impurities or foreign matter.

SUCTION—The air intake side of the blower can be used with a duct or tube to draw or suck air, gases, smoke or fumes from a confined area.

SUCTION TUBE—A flexible duct or channel connected to the suction side (intake) of the blower. Usually made of heavy-duty vinyl plastic. Used to suck or draw air or gases from a confined area.

VENTILATE—To circulate fresh air into a cable vault, manhole or other confined area. To purge an area of foul air, gases or noxious fumes.

HOMELITE TEXTRON

Homelite Division of Textron inc.