Selecting the right cleaning tools for the job

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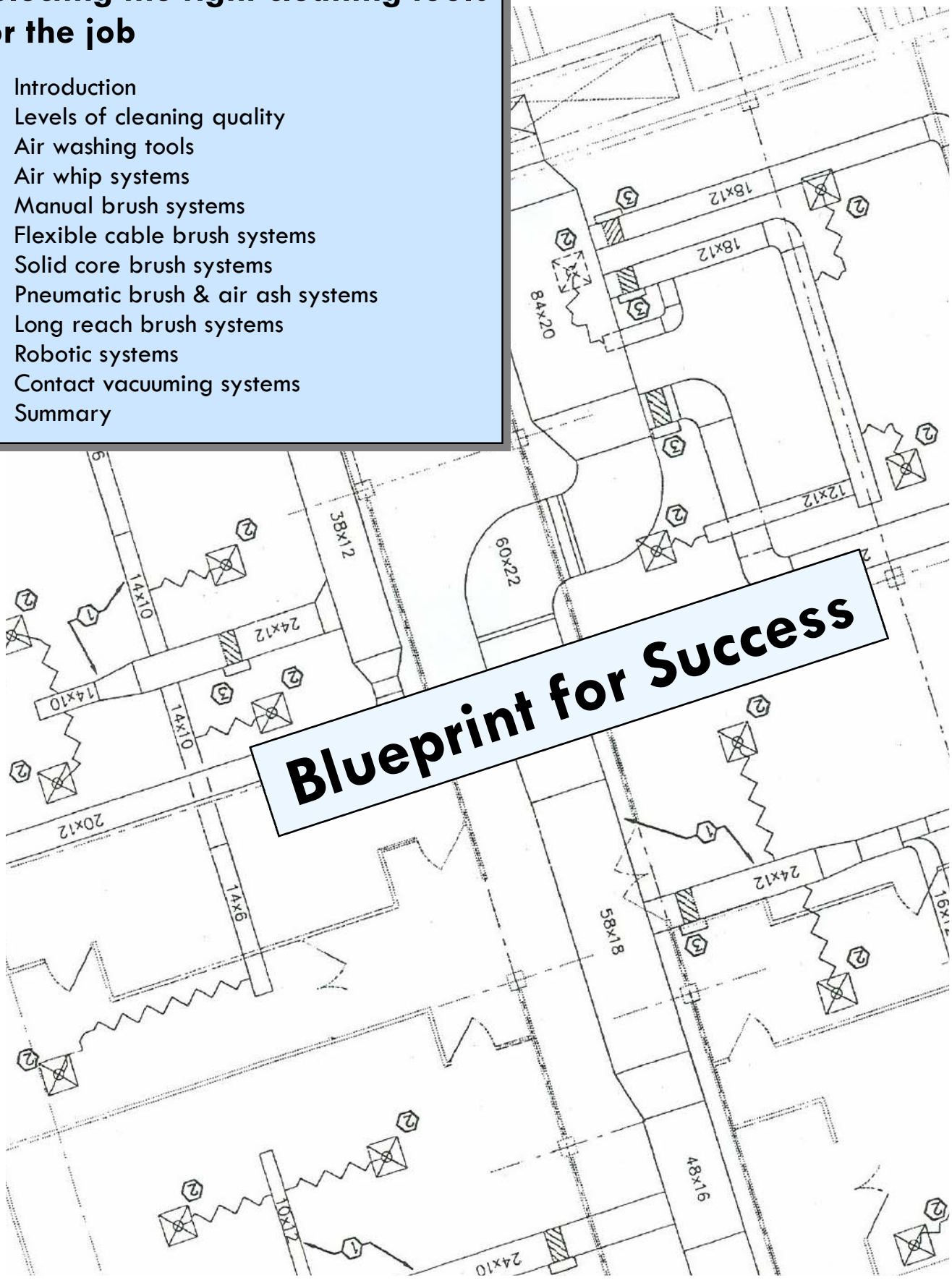

Blueprint for Success

Selecting The right tools for the job

Introduction

Air duct cleaning Contractors face the challenge of cleaning many different types of ductwork, like: small ducts, large ducts, flex duct, straight ducts, lined ducts, ducts with turns, ductboard ducts, supply ducts, return ducts, underground ducts, etc. Unfortunately with this many different types of ductwork there is no one magic cleaning tool that can clean every type and size of duct.

Since 95% of the cost of air duct cleaning is labor cost, maximizing productivity is a very important goal for every contractor.

Most Contractors end up with a tool kit of cleaning tools that lets them achieve the cleaning results they need on a wide variety of duct sizes and duct type.

This guide will review the different types of cleaning tools available in today's marketplace. We'll examine each of the following types of cleaning tools, how they work, their features and benefits, and where each tool works the best.

- Air Washing Tools
- Air Whip Systems
- Manual Brushes
- Flexible Cable Brush Systems
- Solid Core Brush Systems
- Pneumatic Brush & Air Wash Systems
- Long Reach Brush Systems
- Robotic (Air Wash, Air Whip, Brush) Systems
- Contact vacuuming

Levels of Cleaning Quality

Along with this examination of the cleaning tools we need to discuss different levels of cleaning quality these different cleaning tools achieve. There are nine types of cleaning tools and each offers a different level of cleaning effectiveness.

Each of these cleaning activities is done only after the ductwork is under negative pressure (or suction) from the vacuum collection system.

Level 3 - Air Washing: Air washing is the use of high-pressure air that comes from the air compressor through an air hose to an air nozzle. This air nozzle delivers streams of high-pressure air, which dislodges the accumulated dirt and debris found in the duct.

Level 2 – Air Whips: An air whip is the combination of air washing (high-pressure air) with some agitation from the whip(s). The high pressure of the air and whipping action dislodge the accumulated dirt and debris found in the duct. Air whips achieve a higher level of cleaning than air washing.

Level 1 – Brushing: Brushing (both manual and powered systems) makes physical contact with more of the interior surface of the duct. This brushing action effectively dislodges the accumulated dirt and debris found in the ductwork. Bushing achieves a higher level of cleaning than both air washing and air whips.

Level 1 – Contact vacuuming: Contact vacuuming makes physical contact with more of the interior surface of the duct. This contact vacuuming action effectively dislodges the accumulated dir and debris found in the ductwork. Contact vacuuming achieves a higher level of cleaning than both air washing and air whips.

All of these cleaning tools are used by air duct cleaning Contractors everyday. Based on the level of cleaning required they select the cleaning tool that will give them that level of cleaning while maximizing their productivity.

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Air Washing Tools

Description: The most common types of air washing tools are the:

- Forward skipper line (for blowing dirt/debris forward)
- Reverse skipper line (for blowing dirt and debris backward)
- Blowgun (for more precise air washing)

How they work: Air washing tools use the high-pressure air that comes from the air compressor through an on/off control, through an air hose/rod to an air nozzle. This air nozzle delivers streams of high-pressure air, which dislodges the accumulated dirt and debris. Normally the forward and reverse skipper line is 25' long but some system could be longer. The blowgun normally has an on/off control and 10"-14" copper tube which supplies a single high pressure air steam.

We recommend (at minimum) an air compressor that has up to 175 psi, 16 cfm of air and 20 gallon receiver tank. This will give you acceptable air washing productivity.

Pluses: Easy and quick to use, fits through a 1" hole, can negotiate turns and drops in the ductwork.

Minuses: Does not clean as well as air whips, brushes or contact vacuuming.

Where best to use: When you have light dust in small and medium size ductwork.

Air Whip Systems

Description: A typical basic air whip system includes:

- Three whip heads (single whip, tri whip and octopus whip heads)
- Set of (5) five foot flexible rods
- On/off control (ball valve or trigger valve)

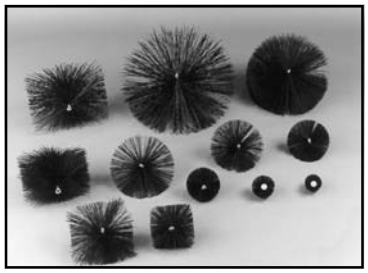
How they work: Air whips use the high-pressure air that comes from the air compressor through the on/off control, the rods and then to the whip head. The whip(s) thrashers around inside the duct making contact with some of that duct surface as it blows air forward. The single whip head gives you the most aggressive whipping action and the octopus whip head gives you the least aggressive whip action.

If you don't have enough air pressure (psi) and volume (cfm) the whip(s) will not thrash around. We recommend (at minimum) an air compressor that has up to 175 psi, 16 cfm of air and 20 gallon receiver tank. A compressor with 200 psi, 20 cfm and a 30-gallon tank would be better.

Pluses: Easy and quick to use, agitates and blows in one pass, will work in most ducts, cleans better than air washing alone, can negotiate turns and drops.

Minuses: Do not clean as well as brushes or contact vacuuming.

Where best to use: When you have light to medium dust in small and medium ductwork.



Manual Brush Systems

Description: You can generally create you own manual brush package by choosing from:

- 6" to 36" round brushes.
- 6" x 6" to 16" x 16" square brushes.
- 8" x 12" to 12" x 16" rectangular brushes.
- 4' flexible and fiberglass rods and a T handle.

How they work: You select the right size brush for the duct you want to clean. For example to clean a 6" round duct you would select the 8" round brush, attach a rod, clean the first 4' by pushing and pulling the brush, add another 4' rod to clean the next 4' of duct etc.

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Pluses: Inexpensive, simple to use, makes contact with most of the duct surface, cleans better than air washing and air whips.

Minuses: Require a lot of work to push and pull, not very productive compared to other powered brushing systems.

Where best to use: Small and medium size ductwork with short reach requirements. Not recommended for flex ducts.

Flexible Cable Brush Systems

Description: These systems normally include the following:

- 15' or 25' flexible cable
- (3) nylon brushes (8", 12" 18")
- (3) silica carbide brushes (8", 12" 18")

How they work: You select the right size brush for the duct and conditions attach it to the brush end of the cable, attached the other end of the cable to a portable drill. Insert the brush into the duct, pull the trigger on the drill and clean the duct as you push the cable/brush back and forth into the duct.
The nylon brushes can be use on most any duct surface while the silica carbide brushes are designed for aggressive cleaning on hard surfaces only.

Pluses: Easy to use, makes contact with most of the duct surface, cleans ducts with turns and drops, cleans better than air washing and air whips.
More productive than manual brushes.

Minuses: Not repairable, not recommended for ducts larger than 16" x 16".

Where best to use: All types (sheet metal, flex, ductboard, etc.) of small and medium size ductwork.

Solid Core Cable Brush Systems

Description: These systems have a stiffer cable than the flexible cable and give you more control of the brush head. These systems normally include the following:

- 20' or 33' solid core cable.
- (3) nylon brushes (8", 12" 18").
- (3) silica carbide brushes (8", 12" 18").

How they work: You select the right size brush for the duct and conditions attach it to the brush end of the cable, attached the other end of the cable to a portable drill. Insert the brush into the duct, pull the trigger on the drill and clean the duct as you push the cable/brush back and forth into the duct.

The nylon brushes can be use on most any duct surface while the silica carbide brushes are designed for aggressive cleaning on hard surfaces only.

Pluses: Easy to use, makes contact with most of the duct surface, the stiffer cables gives you better control over where the brush is going, cleans better than air washing and air whips, if inner solid core breaks it is field replaceable.

Minuses: Will not negotiate turns and drops very well.

Where best to use: All types of small and medium size ductwork and shafts that are relatively straight.

Pneumatic Brush & Air Wash Systems

Description: These systems are pneumatic (air driven) and allow you to brush and then air wash the ductwork with the same system (but not at the same time). They include:

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- 12", 24" and 32" (optional) nylon brushes
- 12", 24" and 32" (optional) silica carbide brushes
- Reversible air motor
- Guide system
- Set of extension rods (23' of reach)
- On/off control
- Forward and reverse air washing nozzles

How they work: You select the right size brush for the duct and conditions attach it to the air motor, attached the guide system with the right size legs (to center the brush in the duct) to the air motor, attach an extension rod to the guide system, attach the on/off control to the rod, connect the air hose from your compressor to the on/off control. Pull the trigger on the on/off control to rotate the brush and then push/pull the rod to clean that section of duct. Add additional rods to clean the further down the duct.

After brushing remove the brush/air motor/guide system assembly and connect the forward or reverse air washing nozzle to the rod and do a final air wash.

Pluses: Easy to use, wide brush maximize productivity, makes contact with most of the duct surface, guide system and rods give you excellent control, can brush and air wash with one system, cleans better than air washing and air whips.

Minuses: Will not negotiate turns and drops.

Where best to use: Clean both sheet metal and lined ducts and shafts from 4" to 30" high no matter what the width is.

Long Reach Brush Systems

Description: These electric or pneumatic systems gives you extra long reach from one access point to maximize your productivity. They include:

- 65' or 98' of cable
- Reel system
- Electric or pneumatic powered
- Reversible and variable speed
- Foot operated on/off control
- Select from several types of brushes from 8" to 48"
- Optional centering device

How they work: You select the right size brush for the duct and conditions attach it to the end or the cable, insert brush into duct, step on on/off control, adjust speed if needed, push and pull cable down the duct or shaft. 98' system can also air wash and spray.

Pluses: Easy to use, wide selection of brushes, excellent reach for excellent productivity, makes contact with most of the duct surface, cleans better than air washing and air whips.

Minuses: Will not negotiate more than 1 or 2 turns.

Where best to use: Commercial ducts and shafts.

Robotic Systems

Description: Most Robotic systems allow you to air wash, air whip and power brush. These systems usually include:

- Robotic vehicle with cameras and lights
- 100 cable
- Air washing package
- Air whip package
- Power brushing package
- Control module
- Color monitor
- Recording capability (optional with some systems)
- Travel cases

How they work: You determine what level of cleanliness you want and the select either the air washing, air whip or brushing option and attach it to the robotic vehicle, connect the cable and any other connections needed for set up, you then can watch your cleaning activates on the color monitor as you drive the vehicle with the cleaning tool through the ductwork.

Pluses: Excellent reach, choice of cleaning tools, great option when confined space is an issue or access is limited.

Minuses: Usually requires two people, sometimes not as productive as other tools.

Where best to use: Clean both sheet metal and lined ducts from 8" to 30" high no matter what the width is.

Contact Vacuuming

Description: Contact vacuuming is typically done with a HEPA filtered portable vac that has a set of vacuum cleaning tools (much like your home vacuum cleaner). Most systems include:

- 6, 10, or 15 gallon capacity HEPA filtered vacuum
- Set of cleaning tools
- 10', 25' or 50' length of hose.

How they work: You attach your cleaning tool (the 3" round soft bristle brush is used most often) to the hose that is connected to the vacuum, turn the unit on and vacuum the surface you are trying to clean. If its ductwork, you reach through your access opening and vacuum the duct as far as you can reach and then cut additional access openings as needed. If you are cleaning a small air handler, rooftop, furnace you typically remove the panels and vacuum all the surfaces you can reach. On large air handlers, rooftops or ductwork you may actually be able to walk or crawl inside the unit and vacuum the required surfaces.

Pluses: Gives you excellent cleaning results.

Minuses: Not very productive for cleaning small to medium size ductwork compared to other cleaning tools.

Where best to use: air handlers, rooftops and furnaces.

Summary

As you can see there is a wide choice of cleaning tools available to today's air duct cleaning Contractor. Most Contractors will need several different cleaning tools to achieve the cleaning results and productivity they desire.

Thank you for the time you spent reviewing the Blueprint for Success—Selecting the right cleaning tools for the job. We hope it has been useful. Our goal is to help you succeed. If you have any questions about this publication or any aspect of air duct cleaning please contact:

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"Blueprint for Success" is a series of articles and publications developed by Vac Systems International to help you succeed as an air duct cleaning contractor. In addition to this publication they include:

- Residential Planning Guide.
- Commercial Planning Guide.
- Introduction to Coating HVAC Systems Guide
- How to Select a Portable Vacuum Collection System for Commercial Air Duct Cleaning Guide.
- "Profit follows productivity" article.
- "The air duct cleaning opportunity for HVAC Contractors" article.