



PDAA



Tools & Equipment for Installers

In 2014, PDAA provided the fifth edition of the Vinyl Installation Proficiency Guide as a printed guidebook for the first time. This guide, which provides in-depth information critical to correct vinyl installation techniques, is key to PDAA members who are interested in becoming Master Certified. Here's an excerpt from this unparalleled book, detailing "Tools, Cleaning Supplies & Equipment" commonly used by PDAA members. You'll find most, if not all, of these items helpful at some point in your installation career. If you are unsure where to purchase an item, try contacting PDAA members in your area (check out Find an Installer online at SGIA.org). You may find the answer to your question and make a new contact, as well.

Tools Squeegees

There are many types of squeegees available: plastic, nylon, Teflon and felt. They come in several different sizes: 4 inches, 6 inches and 12 inches. Felt squeegees can be rectangular or half rounds. Covered squeegees also are quite common today. They can be purchased with a felt or velour-type cover on one edge, a Velcro-type cover on one edge or you can add your own covering. We have seen installers add denim, suede, Teflon tape, nylon fabric and various iron-on patch materials. Covers are added to squeegees to prevent or minimize scratching of graphics that have no premask, or specialty films not requiring lamination.

Each and every one of these different squeegees may come in handy from time to time. With the wide variety of graphic installations that require professional installer, one cannot own too

many varieties. It might be wise to get at least one of each type and try them on different installations to determine which squeegees work best in each situation.

Keeping in mind the purpose of the squeegee, which is to push out all of the air, conform the vinyl to the substrate and apply adequate pressure to adhere the vinyl to the substrate. Some general recommendations have been included:

- For all graphics that have premask, try using a 4-inch nylon squeegee (e.g. 3M Gold or Lidco Silver). Note: If applying to mildly textured surfaces like painted sheet-rock walls or painted wood (barricades) graphics, you need the pressure you can get from a firm nylon squeegee due to the premask. However, the graphic will only be adhered to the high points of the texture, so once the premask is carefully removed, you will need to use a tool that will push the vinyl down into the texture for better adhesion. For this step, try using a felt squeegee or one with a Velcro cover. Other new techniques involve using some heat followed by a foam roller tool. Many of us have also used a rivet brush to mash the vinyl onto the texture. Be careful when using heat on sheetrock and wood — the surface and the vinyl can burn easily.
- For vinyl laminated graphics without premask (on completely flat, smooth, rigid surfaces), use a covered, felt or Teflon squeegee.
- For vinyl laminated graphics without premask (on flat aluminum with rivets or screws), use a covered or felt squeegee.



- For vinyl laminated graphics without premask (on complex curve vehicle shapes) use a covered squeegee. Thinner coverings work better on these difficult shapes, allowing you to better direct the flow of the vinyl.
- For vinyl laminated graphics without premask (on textured surfaces like sheetrock, painted wood or barricades) use a covered or felt squeegee.

NOTE: PDAA does not recommend installing graphics less than 3 millimeters in thickness, unless they have a vinyl laminate, pre-mask, or both.

Rivet Brushes

A rivet brush is designed to conform vinyl to the shape of a rivet or screw head — with the use of heat — after the vinyl has been applied with a squeegee. If the graphic has premask, remove it after applying the vinyl and poke at least one small hole with a fine needle-like device before using the rivet brush and heat.

NOTE: PDAA recommends using a rivet brush and a propane torch to finish vinyl applied over rivets and screws. We do not recommend using a squeegee!

Rivet brushes also come in handy when applying graphics to corrugated and textured surfaces like banners, flex face, drywall or sheetrock.

A rivet brush is used to make vinyl tight around rivets.

Foam Roller

Foam roller tools have become increasingly common among installers, particularly for installation to either riveted or rough surfaces. The compressibility of the foam surface of the roller allows heated vinyl to stretch into or around small, three-dimensional features.

Knife

PDAA recommends sturdy, stainless steel knives with break-off blades. They tend to have less “wobble” than most plastic knives, which helps ensure a better, straighter cut. The blade tip used for cutting should be very sharp, so it is wise to break off the used ones frequently. The blades come in two different angles, 45-degree (shown in photo) and a 30-degree blade that is longer and thinner at the tip. This blade is best suited for critical cuts on round and curved objects like keyholes on a vehicle door.

The 45-degree blade is used primarily for less-detailed or straighter trims.

Air Release Tools

Always use a fine needle tip for poking holes in vinyl to release air from bubbles and around rivets and screws. PDAA does NOT approve of using any kind of knife to puncture holes in vinyl.

The two most common PDAA approved tools used today are the Griffhold Stylus Burnisher (a pencil-size, wooden dowel with

a needle tip) or an Air Release tool (a metal tool with a retractable fine-needle tip).

An Olfa knife is a cutting tool common to many installers. An air-release tool is used to eliminate air bubbles. A seam ripper is a common slitting tool.

These tools, whether made specifically for graphics installation or for other purposes, are essential for allowing installers to cut away liner paper without fear of cutting the graphic.

Vinyl Removal Scrapers/Plastic Razor Blades

Small, plastic devices that work well for lifting the edge of applied vinyl for removal, taking off smaller emblems on vehicles, and for taking off small text and graphics (used for scraping when a razor might scratch the surface).

Letter Opener

Small plastic letter openers with recessed cutting edges can be great for cutting away backing paper.

Stabilo Pencils

The best all-purpose marking device used today is called a Stabilo and is available in many different colors. Mark along the edge of the graphics, but do not apply vinyl on top of the Stabilo mark — it will not stick well.

Tape Measure

Use a 25-foot or 30-foot one, with a 1-inch-wide blade. On big graphics, it pays to have a big tape measure.

PRO TIP: CenterPoint Tape measures feature a “half-size” scale on the bottom edge, instead of the usual metric that is rarely used in the US. It allows you to find the “center point” of any measurement quickly and easily, and is available at most hardware stores. A Lil’ Chizler is used to remove applied vinyl and vehicle emblems. The Stabilo marker is used to mark vinyl.

Six-Inch Ruler

A six-inch ruler fits easily in any tool pouch and they are extremely handy.

Chalk Line/Laser Level

A chalk line is also a good thing to include in your tool kit. However, you must never apply vinyl to the chalk dust — it will not stick.

A laser level can also provide a useful straight line whether used on horizontal or vertical surfaces. It can easily be used by one person.

PRO TIP: When you need a long straight line, pop the line away from the surface first to shake out excess chalk, and then pop the regular line. Use a Stabilo to make periodic marks along the line, instead of measuring multiple times, then simply wipe off the chalk and install the graphics (see note under “Stabilo”).



Squeeze Clamps

Squeeze clamps are great for clamping substrates, banners and signs to a table in order to hold them while applying vinyl. They also work well for clamping a ruler to something being cut so that the rules does not slip. They also can be used to help graphics from blowing away in the wind!

Masking Tape

Masking tape is a must for every installer laying out and installing graphics, especially on non-magnetic surfaces. A high-quality, 2-inch masking tape may be expensive, but well worth it.

Magnets

Many installers are beginning to use magnets for positioning vinyl on magnetic vehicle surfaces.

Razor Scrapers

Razor scrapers (with a new razor blade) are used in conjunction with 70-percent isopropyl rubbing alcohol (IPA), primarily to clean glass or remove vinyl graphics or adhesive from glass.

Note: Please do not use razor blades to scrape vinyl and adhesive off vehicle surfaces unless you are extremely proficient.

Small Tools

It's always a good idea to have a selection of common tools. Screwdrivers, a hammer, pliers, wrenches, sockets, Allen wrenches and torque bits are a good place to start. Compact, powered screwdrivers come in handy, too.

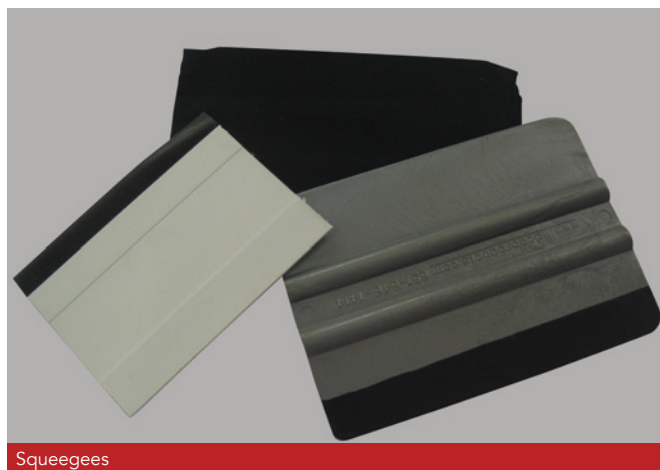
Propane Torches

Propane torches can be used to seal edges and to remove small graphics. They also are recommended for sealing rivets. Most installers use them when a small amount of heat is needed to warm up vinyl, to remove wrinkles, or to relax the film.

PRO TIP: PDAA recommends BernzOmatic Self-Igniting Torches, which can be found at most hardware stores.

Understanding Propane Gas and MAPP Gas

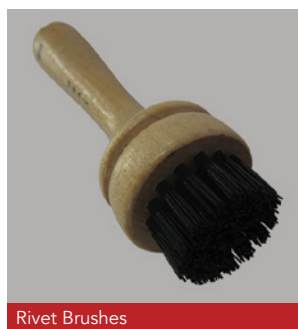
Propane and MAPP gas are both sold in 14.1-ounce bottles (cans). Propane and MAPP gas will both attach to and work with the torches listed above. It is important to understand the relation between the two. Both have a similar flame temperature in air — propane has a maximum temperature of 3,450 degrees Fahrenheit and MAPP has a maximum temperature of 3,650 degrees Fahrenheit. These temperatures, however, do not provide an accurate reflection of how the use of these different gases varies when used for heating vinyl. With regard to heating vinyl, two other factors more accurately reflect the behavior of these two gases: primary and secondary combustion heating values. The primary combustion heating value of propane is 255 (BTU/CuFt) compared with the MAPP value of 517. The secondary combustion heating value of propane is 2,243 (BTU/CuFt) compared with the MAPP value of



Squeegees



Heat Gun



Rivet Brushes



Air Release tool



Propane Torches

1,889. Note that propane's primary value is less than half that of MAPP. Practically speaking, if you hold a MAPP gas flame close to the vinyl, such that the "cone" (the hottest part of the flame) touches the vinyl, it will burn the vinyl twice as fast that propane would. That is the primary effect. If you hold the MAPP gas further away from the surface, the secondary combustion heating value will take precedence. Propane will actually burn the same vinyl a little sooner than MAPP would.

What Does This All Mean?

How close you hold the flame and how fast you move the torch can produce two totally different reactions depending on which gas is used. You should pick one and stick with it. PDAA recommends using propane gas, which is more readily available in stores and is less likely to burn the vinyl if you get too close.

Heat Guns

In the late seventies and early eighties, most installers used heat guns to warm or remove vinyl, but mainly to seal rivets. There were no vehicle wraps and installers never applied vinyl to complex curves. In the mid- to late eighties, most installers retired their heat guns and replaced them with propane torches. There were many

advantages, including no extension cords, no need for an outlet nearby and no waiting for a heat gun to warm up. Today, no one is getting rid of their torches, but many are purchasing high-quality heat guns with digital temperature readouts and extensive variable temperature ranges (120–1200 degrees Fahrenheit). The reason for this is a technique called "post-heating." If you install vehicle wraps, you need a professional grade heat gun.

PRO TIP: PDAA recommends Steinel Heat Guns (www.steineln.net) with the features previously listed. There are several to choose from, and they change from time to time. Expect to pay \$150–200.

Cleaning Supplies & Solutions

Buckets

One-gallon, plastic buckets with a handle work well. Having at least one bucket for each type of cleaning solution being used for a given job is a smart choice.

Cleaning and Drying Towels

White cotton shop towels (thin, not terrycloth and about the size of a common wash rag) work well for the wet part of the cleaning process. White cotton terrycloth towels (about the size of common hand towels) work well for drying.



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Neoprene Gloves

These gloves are chemical resistant and should be used when cleaning with strong solvents. Although they make holding on to a wet rag difficult, safety and health concerns must take priority.

Cleaning Solutions

Below is a list of cleaning agents that are commonly used in our industry for surface preparation and adhesive removal:

- Detergent and water
- Xylol, Naphtha, PrepSol
- Isopropyl (70 percent) rubbing alcohol
- ZEP's Orange Gel degreaser

NOTE: Material safety data sheets (MSDS) for these agents may be downloaded at www.msds.com. Below is a more detailed explanation of these agents and their usage:

Detergent & Water

This is for surfaces that are heavily contaminated with dirt, dust and mud. For detergent, PDAA recommends using "Joy" brand (mix one teaspoon per quart of water).

Do not use any detergents that contain hand cream, lotion or fragrance. The use of an inappropriate detergent may result in application problems and may interfere with the bond of the

adhesive. Other options are purchasing a high-pressure washer, having the client provide a reasonably clean vehicle to start with, or taking it to a car wash yourself. Regardless of who washes the vehicle (if it is really dirty), you're better off if it has plenty of time to dry. Water and moisture take a long time to evaporate in and around trim pieces, windows, handles, etc. If possible, have it washed one day and let it dry overnight before proceeding to the next cleaning steps and installing the graphics.

ZEP Orange Gel Degreaser Aerosol

This organic, petroleum-free cleaner/degreaser/deodorizer effectively emulsifies tar and asphalt and removes many adhesives and industrial coatings. Thickened for use on vertical surfaces to promote longer contact time with grease and soil, it is ideal as a graffiti remover. Its detergents are completely biodegradable, environmentally safe and water-soluble. It also contains no caustics, acids, petroleum distillates, chlorinated hydrocarbons or chlorinated solvents.

PDAA recommends the use of this product for grease, tar and adhesive removal. Using it for tar and grease removal will make a bigger mess than a petroleum-based solvent, but it rinses off with water, is less toxic and will not damage the paint. Wear safety



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glasses when spraying to prevent eye contact. Rubber or neoprene gloves also are recommended.

PRO TIP: If you plan to use it on a vehicle and the vehicle needs to be washed with detergent and water as well, use the Orange Gel Degreaser first to remove tar, grease and adhesives, then wash the vehicle and finally use Isopropyl Alcohol as your final rinse.

Naptha

Naptha is used to remove tar, wax, grease and diesel soot. Naptha is another petroleum-based solvent with the same properties as Xylol, just not as strong. It's not very effective for adhesive removal. Use the same cautions as Xylol.

Petroleum-Based Solvents

Always wear safety glasses and neoprene gloves when working with solvents to prevent eye and skin contact. Petroleum-based solvents should only be used in a well-ventilated area (outdoors is preferable). Use as little as is needed to do the job.

Xylol

Use to remove tar, wax, grease and diesel soot. Xylol, also called Xylene, is a petroleum-based solvent. If dirt and mud are present, use detergent and water to wash the vehicle first, then use the Xylol. Xylol can also be used for removing most adhesives. As with most solvents, it may damage some painted surfaces and therefore must be tested on a small section first. Generally, if the surface has OEM paint and you are using it on tar, wax, grease and diesel soot, you will not get the surface wet enough, nor will it be left wet long enough to cause paint damage. If you are trying to take off large amounts of adhesive, it will require many applications of the solvent and you'll have to leave it on for a long time period. Do not use Xylol under these conditions because it will damage even a good OEM paint job. If the vehicle has been repainted, you should definitely test Xylol on a very small area, in the least conspicuous spot. Use extreme caution with this chemical and always wear neoprene gloves!

PrepSol

PrepSol is used to remove tar, wax, grease and diesel soot. DuPont's PrepSol brand solvent is another petroleum-based solvent. It is weaker than Naptha and not very effective for adhesive removal. The strength of these solvents is diluted by adding an oily substance, because oil and water do not mix. This product will leave an oily film that is difficult to remove. Consequently, most installers do not like using it. It does, however, have one important use — it can be used to remove tar and grease on paint that would be damaged by Xylol (and maybe Naptha). It is probably not possible to put on too much PrepSol or leave it on too long to damage vehicle paint, whether OEM or repainted, but it can harm latex

paint. If you use PrepSol, make sure you use several drying rags to help remove the oiliness and use a lot of Isopropyl Alcohol as a final rinse.

Isopropyl 70-Percent Rubbing Alcohol

Use as a final rinse to ensure oily films and residues are removed from the surface. Isopropyl will remove some dirt and oxidation but will not remove wax, tar or grease. Chemically, Isopropyl 70-percent rubbing alcohol is 70-percent Isopropanol and 30-percent water.

Equipment

Weed Burners

Weed burners are large propane devices used to remove large graphics. If you do not have one, get one. However, before you use it, have an experienced PDAA professional teach you how to use it safely and efficiently.

PRO TIP: PDAA recommends the Bertha 500 Model 163 from LB White (www.lbwhite.com).

Scaffolds

Scaffolds are available in several types and configurations. The main types are aluminum and steel — both are acceptable. Aluminum scaffolds are more expensive but easier to transport and the collapsible "V-X" models, sold by Genie and Upright, can be set up by one person for trailer-height installations. They are designed for people who want to install large graphics quickly and easily.

Ladders

One of the keys to applying graphics well is having a solid stance in front of the graphic and being able to reach it comfortably without reaching too far in any direction. While ladders are designed to help you reach things, they can be very dangerous and do not provide a good solid platform to install large graphics. The use of ladders is quite common as they are easy to find, relatively inexpensive to purchase and easily transported. In some instances, a ladder can be the tool of choice. As far as graphic installation is concerned, you would be safer, save money (in the long run) and generally be more productive if you invest in a good aluminum modular scaffold.

NOTE: If you place a walk board between two ladders, more than four feet off the ground without guardrails, you are in violation of Federal law and OSHA can shut your installation down and fine your company.

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