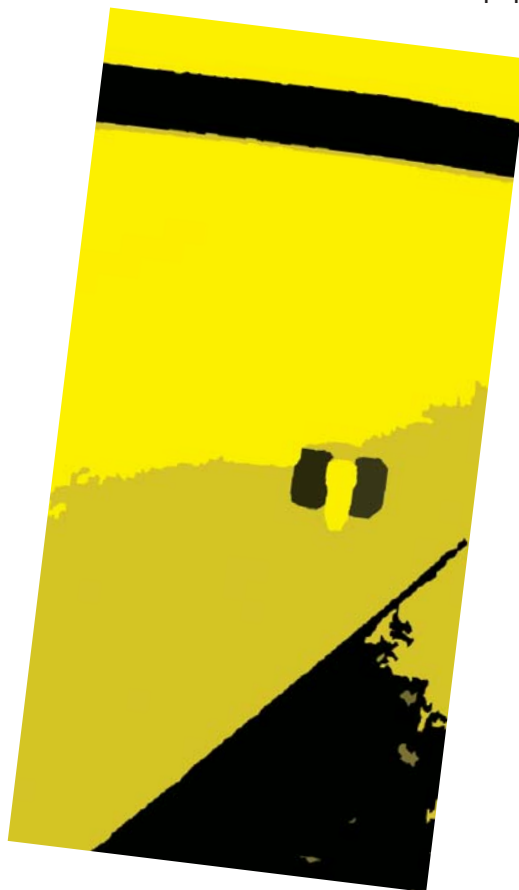


Speed up Your Production with a Registration System



■ Using a registration system improves accuracy and consistency, but its greatest benefit may be its ability to increase production, and consequently, profitability.

If you find your shop is sacrificing speed for quality, or vice-versa, and it's impacting profits, maybe you should take a good look at how your printing lines up. (Figure 1, page 15) The right registration system can boost quality and consistency while decreasing set-up time dramatically. The resulting increases in customer satisfaction and production capabilities can more than justify the investment.

Whether you're screen printing one color or 16, the need for registration is a given. The artwork that is imaged on individual screens must be aligned so that the elements come together properly in the finished print.

"Even if you're dealing with a single screen, the print has to be in the right place on the garment," notes Geoff Baxter, President, Atlantic Screen Supply. "A pre-registration system is used to align the entire job before it goes on the press. It makes registration a pre-press, rather than an on-press process. That avoids press downtime."

"Ideally, a registration system allows you to pre-align artwork, from its electronic creation all the way through the

Whether you're screen printing **one color** or **16**, the need for **registration** is a given.

process, including the artboard, canvas, film output, screens and, finally, the press," says master printer and consultant Mark Coudray, Serigraphic Designs, San Luis Obispo, California. "It creates standardized layouts and positioning to avoid on-press tweaking and minimize set-up times." (Figure 2, page 15)

In practice, registration systems run the gamut from old-fashioned pre- and/or on-press "eye-balling" and grid setups to elaborate, digitally aligned pin-registration systems capable of 24/100-of-an-inch or higher print resolution. One basic approach to pre-registration, for example, employs a light table covered with filtering media with a registration template/setup affixed or imprinted on top of it. You put the frame (print-side up) on the table, and then put the film positive on the screen and line it up to the marks on the grid. There is a fixture on the press that matches the one on the light table so that when you slide the frame

into the printer, the image should be in the same position as it was during setup.

Printers also have been known to measure and mark their screens with tape, or use a T-square to roughly align positives, and then fine-tune registration on-press by moving the screen and/or using micro-registration.

Not a Cure-all

Variables at each stage in the screen printing process can impact how well a registration system works. For example, in the grid approach, if the stops on the press don't match those on the pre-press fixture, or the frame isn't square, the screen won't be properly aligned.

A pin-registration system cuts down on some of these variables by creating set standard placements that carry through each step in the process.



By **Deborah Sexton**, Owner, Saracen Communications

If you're willing to **make the commitment** to integrate pin registration into your shop and **use it properly**, it's likely to increase your productivity by **20 to 40** percent."

"This eliminates the need to re-register after the initial setup," notes Douglas Grigar, a consultant based in Hearne, Texas.

In a pin-registration system, film positives are aligned, and a special punch puts holes through them in exactly the same spots. (See Figure 3) Then the artwork and screens each can be attached to a set of pins that are precisely referenced to each other for exposure. The same concept can be applied in press setup, making it possible to achieve and maintain accurate, consistent positioning of images from positives through printing.

"In a true pin-registration system, you can follow the pins from art to screen exposure to the press," asserts James Ortolani, National Sales Manager, Hix Corp. in Pittsburg, Kansas. "Whereas in other types of pre-registration systems, you might align your positives and pin them on a carrier sheet; in pin registration, the pins actually fit into the machine. The press is pre-registered to allow for pin-registration, and all you have to do is slide in the screen."

Speeding up the Process

The primary advantage of pin registration is speed. First, it allows for quick press setup.

"If a job isn't pin registered, you easily can spend 45 minutes registering it on press, even with a top-of-the-line micro-registration system," says Ortolani. "You typically can cut a good 30 minutes off that using pin registration."

"On average, we were spending 60 to 90 minutes setting up a typical high-tolerance, 10-color job," affirms Coudray. "With pin registration, we've reduced that to five minutes. If you're careful and use pin registration properly, it's not uncommon to be able to do a press setup in 15 seconds. You put in the screen, put in the squeegee and you're ready to print."

"The average shop prints only about 40 percent of the time," notes Baxter, "the other 60 percent, they're doing something else, and very often that is setting up a press. An average job takes about an hour to set up conventionally. If the run is 1,500 shirts, it might take 15 or 20 minutes to print. Thus, you're spending far longer setting up than producing and making money. If you're willing to make the commitment to integrate pin registration into your shop and use it properly, it's likely to increase your productivity by 20 to 40 percent."

"Not having to re-register at several points in the process also saves time," Grigar points out. "With pin registration, art, screen and press registration are addressed at once."

Pin registration can boost quality, consistency and repeatability as well. A number of systems are capable of 1/32-of-an-inch tolerances, and a few can print dot-on-dot halftones, according to Coudray.

"There have been halftone simulated-process jobs where alignment was critical, and there was so much detail in the image that we wouldn't have been able to print it without pin registration," he says. "We wouldn't have been able to make adjustments that fine manually."

It's also possible for printers to pin register a job, run a sample on a manual press and if the customer is happy, use the same screen for production on an automatic, according to Ortolani.

Controlling Other Variables

There are variables that impact how well a pin-registration system performs. For instance, says Coudray, it is critical that screens be flat to avoid problems in imaging or registration. Films likewise must be flat, without bowing or bubbles. And pallets also must be flat and parallel.

"As with many devices capable of producing high-quality results, pin registration is subject to the 'weakest-link-in-the-chain' law," notes Baxter. "The film has to be punched in at exactly the right place and pre-registered. The screens have to be shot in exactly the same position. The pallets and the screen holders must be level. The press has to be set up correctly. If there's a flaw in any of the links of the chain, the system is not going to work. Everything has to be carried through, and a lot of people just aren't willing or able to put in the time and establish the controls to make it work."

"I would say of the 30 to 40 percent of the printers who have pin-registration systems, 25 percent use them, and 5 percent use them well," he adds.

"You should determine going in if a pin-registration system is even feasible for your shop," advises Coudray. "If your screens and frames are in poor condition, no pre-registration system is going to work to its full advantage. Your fundamental mechanics have to be good. You need to review your entire pre-press process and get it functioning optimally. There are many pin-registration systems available that can produce great results if you're following good practices."

Pin-registration systems range in price from about \$1,500 to \$15,000, but, says Baxter, "The return on investment typically

more than justifies the initial investment.”

“Pin registration is not particularly complicated, and all manufacturers offer assistance,” he adds. “The key is being motivated. If you don’t want to put in the effort to make it work, it is not going to. There has to be a commitment.”

The following guide is intended to make you aware of the manufacturers who offer pre-registration systems and to help you compare one to another as you decide which system will work best for your shop. Some systems are designed to work with any make or model of frame or equipment and others are frame or press specific. Some manufacturers offer videos demonstrating their systems on their Web sites. Be sure to visit for more information.

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Figure 1: Many printers use the eyeball method when registering film positives on their screens. While this method works fine in many cases, using a registration system offers greater accuracy, consistency and can significantly speed up the process.

Product Name:

Registrite Pin Registration Table

Description:

This is a universal pre-registration system that will work with any frame. It consists of a vacuum art table, pins, and bushings. The artwork table has three registration pins to register artwork and an aluminum vacuum table to hold artwork in place after it is registered. Bushings are attached to your existing press frame holder. The artwork is registered to the vacuum table with pins and then the frame is lined up with the pins on the press on each print head.

Step by Step:

1. Put three or four pieces of double-sided tape on your film positive

facing upward. Register your artwork on the table using the grid with tape, sticky side up. Turn on the vacuum to hold the positive in place.

2. Place your frame over the fixed registration pin on one side of the frame. Adjust the second “sliding pin” to the second fixed bushing in your frame. Tighten it and push the frame down on top of the film positive, which will adhere to the mesh by the four pieces of adhesive tape.
3. Release the vacuum and pull the frame off the vacuum table. The film is in place. Expose it.
4. Slide the frames into your press. You have two plunger pins fixed in your frame holders. Push the plungers down into the brass frame inserts thus registering the frames on the press.

Compatibility:

This system works with any type of frame because you attach the pins to your existing frames. Pins also can be installed on any model of press.



Figure 2: Some printers mount a pin bar on their exposure unit to speed up registration and ensure greater accuracy. According to Mark Coudray, Coudray Graphic Technologies, “It can be done on the exposure unit or off depending on whose system you are using.”

Price:

Depending on the size, the price of the art table is approximately \$5,000, and it includes a vacuum. If you already have a vacuum table, it can be retrofitted with an assembly kit that A.W.T offers. In addition to the art/vacuum table, two bushings are needed for each frame, which comes to \$40 a set. You also need two bushings per frame, which cost \$18 per set. There also is a one-time cost for a machine frame holder insert, which costs \$160 per set of two.

R Jennings Mfg. Co.
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If you don’t **want** to put in the **effort** to make it work, it is not going to. There has to be a **commitment.**”



Figure 3: A pin registration system uses pins to keep artwork aligned through the screen printing process. This photo shows a pin bar attached to the mesh side of a Newman Roller Frame. Photo courtesy of Stretch Devices.



Figure 4: For the budget-minded, R Jennings offers free instructions on how to construct your own pin registration system. It supplies the pins, a drill fixture and special clamps. The company also will install the pins on your clamps if you want to ship them to the facility. Photo courtesy of R Jennings.



Figure 5: Position your positive on the vacuum alignment board. Put double-sided tape on the positive and turn on the vacuum to hold it in place. Photo courtesy of Lawson Screen Products.



Figure 6: Place your screen in position resting it at the bottom of the alignment board on pins. Press the screen against the tape. Photo courtesy of Lawson Screen Products.



Figure 7: The screen is ready to be exposed. Photo courtesy of Lawson Screen Products.



Figure 8: For instant positioning without pins, use the speed registration attachment that provides three points for your screens while you clamp them in place. It works on manual or automatic presses. Photo courtesy of Lawson Screen Products.



Figure 9: M&R's rapid registration system consists of a master registration frame, a registration pallet, one pin bar, stop blocks for accurate positioning of the Tri-Loc pallets and pre-punched carrier sheets. This photo shows the single frame Tri-Loc, a double-frame version also is available. Photo courtesy of M&R.

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www.rjennings.com

Product name:

Quick Clamp Pin Registration

Description:

This is a plan for a screen registration guide that you make yourself. (Figure 4, page 15) You can simply e-mail the company and request your free copy of the instructions. The system consists of a layout board with two stops against which you push your screen into position. The board is covered with a piece of graph or otherwise lined paper on which a large cross is drawn. Then it is covered with a piece of clear plastic. According to Roger Jennings, it can be constructed in less than 15 minutes.

If you want to take it a step further and make it a pin system, you can purchase a drill fixture from R Jennings that aids you in drilling holes in opposite ends of the screen so it can be registered from either end. You put the screens on the pins, which are mounted on the side or rear clamps, clamp it, and you're done. Jennings also offers the pins. If you want to send the company your clamps, it will install the pins for you.

Step by Step:

1. Lay the positive down on the plastic-covered layout board and scotch tape it down.
2. On top of the positive, put a 1-inch strip of double-sided tape in each corner. Butt the screen up against the stops, and press the screen down on the pieces of tape. Repeat for each color.
3. You can go a step further and install pins on your clamps and drill holes in your screens. In this case, you then insert the prepared screen onto the pins on your press.

Compatibility:

The non-pin system can be used with any type of equipment or frames. For the pin system, the pins can be installed in many models of presses but not all.

Price:

- The plans are free of charge. The estimated cost to build the non-pin system is approximately \$5 in materials. Prices for the parts needed for the pin system are:
- To install two pins in a side or rear clamp is \$50 plus shipping.
- Drill fixture to drill holes in screens is \$150 plus shipping.

- Two pins and two quick clamps installed on the side and rear clamps cost \$120 plus shipping.

Lawson Screen Products

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www.lawsonsp.com

Product name:

Lawson Super Simple Registration System(SSR)

Description:

This is a pre-registration method that integrates pre-press, screen exposure and on-press registration. It requires no special tools, carrier sheets or frames. Standard features include a master grid registration/alignment board, floor stand, vacuum system, press registration film, aluminum registration/alignment press plate and film grid sheet. Optional features include press registration film, a no-noise vacuum, locking casters, pin bars and speed pin register device. Most systems use a table type alignment board; the SSP has a vertical (like an easel) alignment board so that the user does not have to bend over. This system is available with pin bars that are screwed into your existing frames and press or a three-point registration system where you attach an alignment fixture that allows you to slide your screen into place on the pallet. The pin system is the more accurate of the two.

Step by Step:

1. Position your positive on the vacuum alignment board. Put double-sided tape on the positive and turn on the vacuum to hold it in place. (Figure 5, page 15)
2. Place your screen in position resting it at the bottom of the alignment board on pins. Press the screen against the tape. (Figure 6)
3. Expose the screen. (Figure 7)
4. If you are using the SSP's pin system, you will slide your screen into the pin bar affixed to your press. If you are using the non-pin three-point registration system, you will slide your screen up against the three stops. (Figure 8)

Compatibility:

This system can be used on almost any size, style or brand of frame. It also works on any brand of manual or automatic press.

Price:

\$995 plus \$95 packing

M&R

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Fax: 630.858.6134

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www.mrprint.com

Product Names:

Tri-Loc and Double Tri-Loc

Description:

Tri-Loc is a rapid registration system that uses precision-milled stop points to ensure that the operator can precisely match the registration on the exposure unit with the registration on the press. It includes a master reg-



Figure 10: The Tri-Loc master registration frame is mounted directly into the exposure unit. Film positives are mounted on a carrier sheet, then placed on a pin bar positioned on the master registration frame. Photo courtesy of M&R.

istration frame, an on-press registration pallet available in two sizes, stop blocks for accurate positioning of Tri-Loc pallets, and a start-up kit with one pin bar and 100 pre-punched carrier sheets. (Figure 9) The Double Tri-Loc allows you to do two screens at once.

Step by Step:

1. Mount the Tri-Loc master registration frame directly on the exposure unit. Film positives are mounted on carrier sheets, then placed on a pin bar positioned on the master registration frame. (Figure 10)
2. The screen is aligned on the Tri-Loc master registration frame. Three stop points assure that the screen and film are precisely and tightly locked into the desired position during vacuum pull-down. (Figure 11)

3. The lightweight on-press registration pallet is placed on an M&R press. The registration pallet's three stop points precisely duplicate the registration from the master registration frame. (Figure 12)
4. The operator simply raises the press carousel, pulls the screen into contact with the pallet's three stop points, and locks the screen into place. (Figure 13)

Compatibility:

Tri-Loc is compatible with any M&R textile automatic and with the Chameleon manual press. It can be used with wood frames, aluminum static frames, and roller frames. The Master Registration Frame comes in a number of format sizes to fit most popular screen frame sizes. Custom sizes are available.

Price:

The base price of a single Tri-Loc is \$1,995.

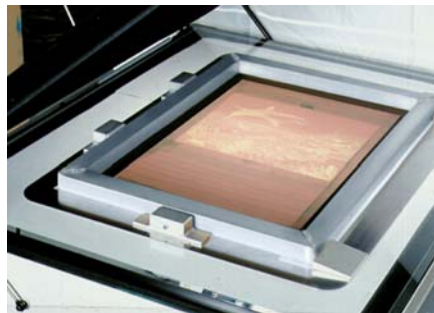


Figure 11: The screen is aligned on the Tri-Loc master registration frame. Three stop points assure that the screen and the film are precisely and tightly locked into the desired position during vacuum pull-down. Photo courtesy of M&R.

Stretch Devices

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Product Name:

Newman Pinlock™ Registration System

Description:

This system is a complete full pin registration system for automatic or manual textile printing. Specifically designed for use with Newman Roller Frames®, the system consists of three steps: art preparation, screen exposure and on-press alignment. The components of the system include full-size carrier sheets or pre-

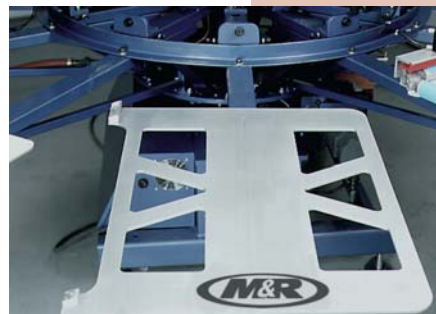


Figure 12: The lightweight on-press registration pallet is placed on an M&R press. The registration pallet's three stop points precisely duplicate the registration from the master registration frame. Photo courtesy of M&R.

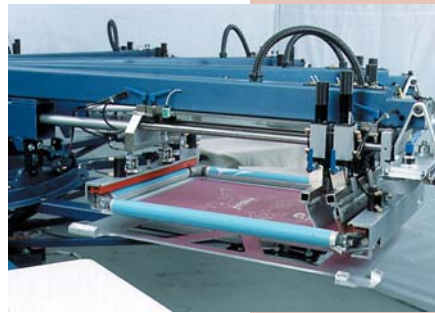


Figure 13: The operator raises the press carousel, pulls the screen into contact with the pallet's three stop points, and locks the screen into place. Photo courtesy of M&R.

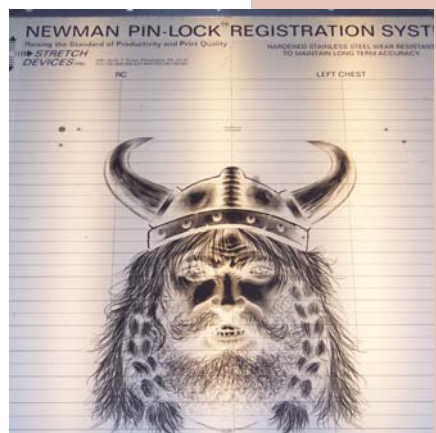


Figure 14: The Newman PinLock™ Registration System uses pre-punched carrier sheets that are set on pins attached to a grid layout board. Photo courtesy of Stretch Devices.

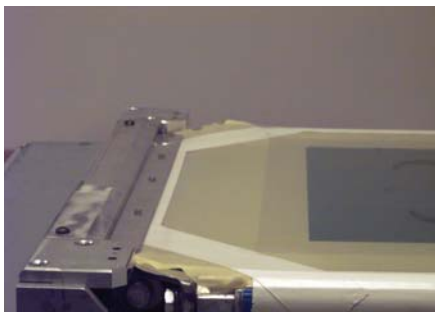


Figure 15: The film positive is positioned onto the carrier sheet, which is transferred to a pin bar that is attached to the mesh side of the Newman Roller Frame®.



Figure 16: A swing-out pallet is directly attached to the underside of the printing pallet. The arms swing out and the spring-loaded pins extend upward to the screen's printing elevation allowing the frame to be set in place on the pins.



Figure 17: Figure 17: The EZY REG system offered by TAS America includes a light box with a layout grid, an oversized pallet, a pin or a non-pin alignment fixture, and carrier sheets. It works on only specific TAS models and is compatible with rigid and retensionable frames. Photo courtesy of Tas America.



Figure 18: This specialized jig designed as part of Vastex's pin registration system, fits any Vastex standard 15-by-17 inch pallet. It can be customized for any size pallet.

punched header sheets, a grid layout board, a frame and film pin bar that is attached to the mesh side of the Newman Roller Frame®, and a swing-out pallet fixture (automatic textile printing) or swing-down pallet fixture (manual textile printing).

Step by Step:

1. Artwork is aligned on a pre-punched optically clear; stable based polyester carrier sheet or header sheet while connected to the grid layout board. (Figure 14, page 17) The grid layout board has a five-hole pin bar that corresponds to the five pre-punched holes in the carrier sheets or header sheets. Each succeeding color is positioned and aligned on a new carrier sheet or header on the grid board until the design is complete.
2. The art separations, correctly attached to the carrier sheets or header sheets, are placed on an accurate pin bar that is attached to the mesh side of a Newman Roller Frame®. (Figure 15) The pin bar has pins that exactly mate to the PinLock™ castings on the Newman Roller Frame®. This is done on a standard work table before the frames go into the vacuum exposure unit.
3. The film positive is transferred from the pin bar to the screen mesh with five or six pieces of thin tape. This step takes about 5 to 20 seconds. After the film is transferred to the frame (with dried emulsion on it), the Newman Roller Frame® is placed into the vacuum exposure unit and exposed. You can expose as many frames as the unit will allow. All sizes of frames or combination of frame sizes can be placed into the vacuum exposure unit at the same time.
4. The swing-out pallet fixture (automatic), which is attached to the underside of the printing pallet on the press, is pulled outward and rotated to 90 degrees and locked into position. It is now ready to register a Newman Roller Frame® into the press. The swing-down pallet fixture (manual) also attached to the underside of the printing pallet on the press, is pulled down and locks into position. (Figure 16)
5. The Newman Roller Frame® is set onto the pins of the swing pallet fixture and clamped into position. The machine is indexed to the next station and the process is repeated.

Compatibility:

This system works with only Newman Roller Frames; however, the swing pallet fixtures will adapt to virtually any automated or manual press on the market.

Price:

Automatic for M3 Newman Roller Frames® is \$2,400.

Manual for MZX Newman Roller Frames® is \$1,385.

PinLocks™ (Automatic-M3) are \$15.97 (set of 2).

PinLocks™ (Manual-MZX) are \$9.95 (set of 2).

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Product name:

EZY REG Preregistration System

Description:

The EZY REG system includes a light box with a layout grid, an oversized pallet that has holes precisely drilled into it that fit all pinned standard screen widths, a pin or a non-pin alignment fixture, and carrier sheets. This pallet fits on the TAS 200RA, RAL, ROC and the Hawk series models.

For screens without pins, the specially designed alignment fixture has three stops that press against two of the screen frame sides. This is used to get the screen in close registration on the press, however, some micro-registration adjusting may need to be done. With the pin alignment fixture, no further adjustments are needed on press. The TAS EZY REG system also works with complete accuracy when using digital-to-screen or computer-to-screen output devices. (Figure 17)

Step by Step:

1. When the film is not punched, the master positive is fixed to light table layout grid with single-sided tape. Double-sided tape is used on the next film positive. The registration marks bring the images into perfect alignment. After aligning the film, the screen is held over the pre-registration light box and slowly lowered onto the pins.

Tighter registration is achieved by taping the film to a header sheet or carrier sheet. Manufacturers of those

sheets provide an on-glass pin registration bar (which is taped to the light table). With single-sided tape (sticky side up), align the holes and press the film onto the pin bar, and the film is now in position.

When the film is punched, press the film onto the off glass pin registration bar alignment fixture. With single-sided tape (sticky side up), press the film onto the pin bar, the film is now in position.

2. The screen is pressed down on the double-sided tape so that the image sticks to the screen. This process is followed for each successive color. The film positives are now all accurately positioned and firmly held in place ready for exposing. Expose the film.
3. Remove one pallet off the press and replace it with the EZY REG oversized pallet.

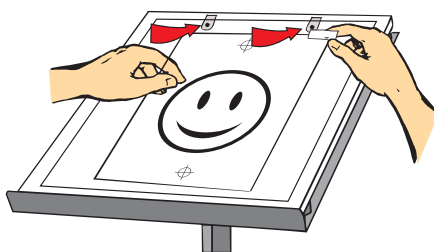


Figure 19: Attach a setup to the pins. Position the positive and tape it to the set-up sheet. Repeat this step for all positives.

4. Manually index the pallet into printing position #1.
5. Slide the screen into head #1 beyond the pins, raise the pallets into print position, move the screen receptacles directly over the pallet pins, and the screen drops into position.
6. Lock down the screen with air clamps, lower the pallets, and repeat at each screen location.

Compatibility:

The EZY REG system works on only TAS machines, and it is compatible with rigid and retensionable frames.

Price:

EZY REG complete system costs \$2,086.

The specially designed EZY REG oversized registration pallet alone is \$1,000.

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www.vastex.com

Product Name:

Vastex Universal Registration System (VRS)

Description:

First designed more than 20 years ago, VRS is a pin registration system designed to move multicolor setup from the production floor to the art department. The system includes a 20" x 24" graph layout board with mounted Stousser registration pins, 24 punched set-up sheets, screen location stops with a set of registration pins mounted to the exposing unit glass and a printer pallet locator jig with corresponding screen stops. Images are located in register onto each screen using the pin board and exposing unit. (Figure 18)

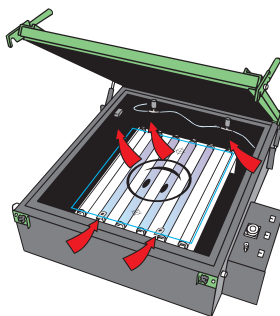


Figure 20: Insert the first sheet with the positive onto the pins of the Exposit screen exposure unit. Note the screen stops register pins.

After the screens are prepared, a special pallet jig is mounted onto the Vastex V-2000 printer. Each screen is clamped while located against the jig's stops. Multicolor screens are set up and in register within minutes.

Step by Step:

1. Using the registration pins, attach a blank clear Mylar set-up sheet to the pin board. (See Figure 19) This is also called a carrier sheet.
2. Take the first positive, which will have the outline or the largest portion of the design and locate that on the carrier sheet by using the grid on the pin board and tape it down.
3. Take another clear carrier sheet and snap it on the pins right over the first one.
4. Take the second positive and locate it in register to the first positive, tape it to the second carrier sheet. Repeat

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with the third and the fourth positive. Now what you have is a stack of carrier sheets with the positives attached all in perfect registration and located to the pins.

Here the system takes one of two paths:

5. If you have a Vastex exposing unit, take one of the carrier sheets with its positive and snap it onto a matching set of pins on the exposing unit. There are three stops built into the glass of the exposing unit for locating the screen. (Figure 20, page 19)
6. Take the first coated screen, bump it against the stops, and sit it on top of the positive that is located on the pins of the glass and shoot that screen. (Figure 21)

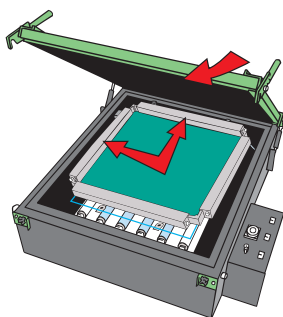


Figure 21: Put your coated screen against the Exposit screen exposure unit. Repeat for all screens.

7. Now the first image is in register to those pins. Then we take our second carrier sheet and snap it onto the pins, then take your next screen and bump it against the same three stops and shoot that one. After we've done all the screens, all the screens will be in register to each other.

If the printer does not have a Vastex exposure unit, then for steps 5-7:

A universal pin board is used to align all your positives to the carrier sheet. The universal pin board has three stops, which are the same as the Vastex exposure unit. The operator puts double-sided adhesive tape on top of the positive and takes a screen and bumps it right against the stops and attaches the positive to the screen right on the board.

8. The next part of the system uses a pallet jig. This is snapped on top of the standard pallet. It provides the same three stops that were on the glass of the exposing unit or the universal pin board. (Figure 22)
9. Put the screen against the stops and clamp it. Repeat this for each color and you're ready to print. (Figure 23)

Compatibility:

Custom pallet jigs can be made for other brands of printers.

Price:

The total VRS package, including a floor stand for the pin board, is priced at under \$600.

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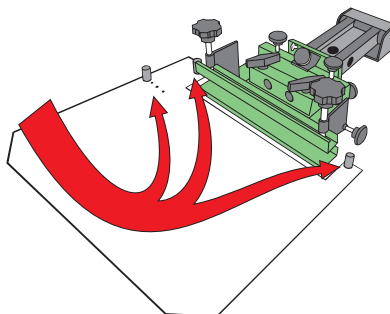


Figure 22: Install the pallet jig onto your press. Note the jig has screen stops that match the stops on the Exposit exposure unit.

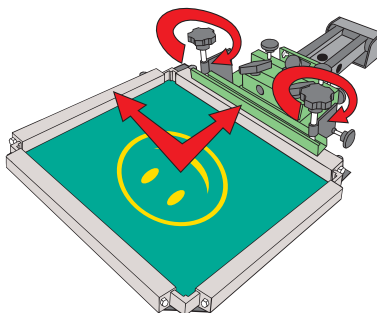


Figure 23: Put your screen against the stops clamp. Repeat this for all colors.