Mastering Mounting

Hot Spots

by
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So how can hot spots, a term often used in relation to dry mounting equipment, possibly relate at all to the August issue theme of gilding? Perhaps a stretch but when dealing with metallic golds, the color shades and finishes can run the range from a cold blue-based gold to a hot red-based gold, with numerous cooler to warmer variables of green- to yellow-based golds in between. Dry mounting is designed to use heat to bond materials together, so a "hot" press is the desired temperature. But just like Goldilocks (yes, another take on "gold") it can neither be too hot nor too cold, but must be just right to bond all the layers together.

What Are Hot Spots?

Hot spots are areas in a heat press where the temperature is inconsistent with the rest of the heated surface. They could also be called cold spots, but somehow that term does not instill fear in the heart of framers who use mounting presses. There is something fearful about heat (perhaps simply a healthy respect for the possibility that heat can damage art) that makes "hot spots" an awful term. These spots can have numerous causes from thermostats, to pressure, to pads, which I will explore this month, as well as possible tests and solutions for this dreaded ailment.

Needing The Temperature "Just Right"

When considering mounting equipment, it is the selected temperature of the heated press surface that helps to achieve a successful mounting. Regardless of mechanical press or hot vacuum press; metal platen or glass top; the heated surface of a dry mounting system must be consistent throughout in order to evenly activate and bond all the layers involved. Adhesives generally have a minimum and maximum activation temperature, much like a bell curve, with the recommended temperature at the very top of the curve. They will melt at both edges too, but will not when outside that range (see Diagram 1).

The interesting thing about adhesives and dry mounting is the thought process that many people have when an adhesive is not bonding properly. I have stressed TTPM: Time, Temperature, Pressure, Moisture (the four elements of mounting) for years, with temperature being that second "T." Often the natural reaction to a failed mounting is to first turn the temperature up and try mounting it again. When viewing Diagram 1, it needs to be

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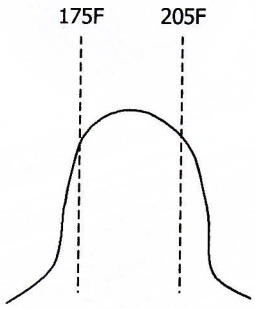
stressed that if the temperature goes too high or drops too low, the adhesive will not bond. Simply turning the temperature up might not help. In fact, it could be time or pressure causing the problem in the first place, not temperature. The important issue is to narrow down what the problem could be, then attempt to rectify it.

Diagram 1

Adhesives will bond at a minimum temperature and a maximum temperature, with the recommended bonding temperature somewhere between them.



Press Types

The three basic press types—mechanical, hot platen vacuum, and hot glass top vacuum—are the ones on which I have concentrated. This is an overview of these general types of equipment and how to routinely check them (part of any complete maintenance program). Let's examine each first.

Mechanical Press

Mechanical presses, both the 210 and 500 series, are the same, just different in overall size. When a new press arrives at any location, the first order of business is to set it up, make certain it is level, adjust pressure, and check the temperature for accuracy. Though we expect all new equipment to be perfect and accurate, sometimes things can unintentionally self-adjust during transport.

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When a mechanical press dial is set to 200°F, it should also read 200°F on the exterior thermometer, and should actually be 200°F inside on all portions of the platen. If the regulator is set at 200°F and the thermometer reads 210°F, for example, simply twist the black adjustment regulator knob to the full maximum and then slightly beyond to slip the knob on its metal post to reset and match the thermometer reading. A slight clockwise adjustment of the black knob will lower the thermometer reading and platen temperature; a slight counterclockwise tweaking will raise the thermometer reading and platen temperature. Once adjusted it will take a few minutes to correct on the thermometer.

On an older or used machine, it is possible that the thermostat needs to be replaced. These can be ordered through the manufacturer's technical service and can be manually installed by following their directions. Remember, once they're installed, thermostats need to be fine-tuned or calibrated to match the thermometer by testing the temperatures and making adjustments with a small screwdriver after installation.

Hot Vacuum Platen

Since I have not had the opportunity to dismantle and examine the interior of all platen vacuum systems, I will concentrate only on the VacuSeal units I am most familiar with. These presses are heated by pads with coils surrounding the outer edges with a central sensor wire. The smaller units have a single pad while the larger units have two pads side by side. These are generally held in place by a silicone type of adhesive at various points to prevent them from shifting or slipping during transit. Both the outer coils and the inner sensors heat up to control and regulate the temperature as directed by the outer dial regulator or digital electronics.

Since vacuum presses automatically adjust for pressure, it is not possible for uneven pressure application to be a cause for hot spots. When an inconsistency in the

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temperature is indicated during area testing, it could be the outer coils, sensor, thermostat, or relay causing the problem. Most often, new thermostats or heating pads are quite easy to replace and soon enough the press is back to its dependable self. Contact your affiliated technical service department for help in resolving any of these problems.

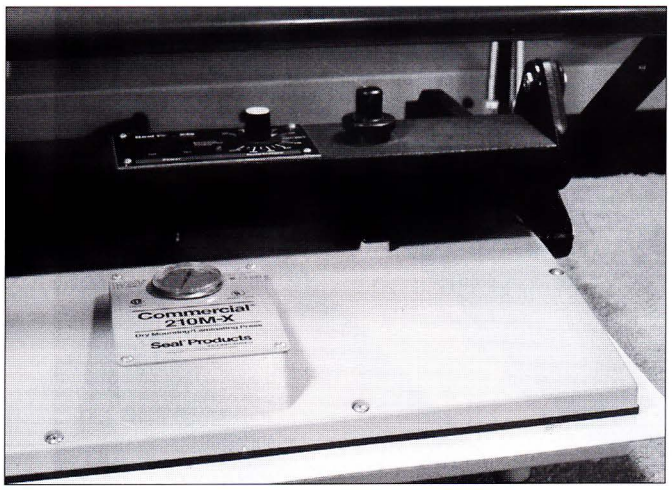

Photo 1: The regulator knob on this press is located on the control panel center top of the black cross bar. The taller adjustment/locking knobs at the right and left of the control panel are for pressure control. The thermometer is located on the lower front of the press.

Hot Vacuum Glass Top

Glass top presses use a totally different method to transport and regulate heat across the mounting area. This is a highly tested and patented system. There are two sheets of glass with the inner surface of the lower sheet, having a heat conductive film embedded into, or coated onto, it. This sheet controls the electrical current that is passed through the film to evenly disperse and monitor the heat levels. As with the above presses, there is also a sensor to monitor this temperature, which in turn is controlled through a digital thermostat.

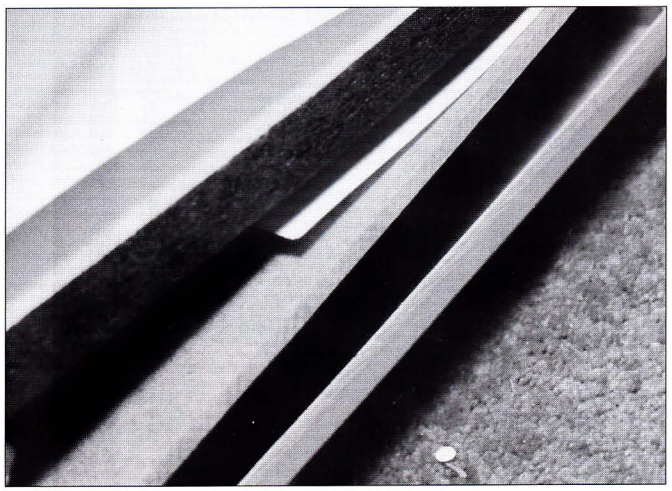

Photo 2: The 1" thick sponge pad and ¼" masonite board shown here are integral parts of the mechanical press and are required for the press to function properly. Though release paper is required to protect the sponge pad, wrapping it around the pad is only a preference.

In all cases, new equipment should not be the issue here; I am most concerned with monitoring and testing existing and heavily used machines. Conducting routine checks will help detect potential problems before they become serious issues and cause damage to a customer's project. Quite simply, any electrical unit can fry, burn out, or short circuit due to power surges and long term use.

What Could Be The Problem?

Uneven temperatures can indeed be the result of a heater pad or thermostat going bad, but it can also be caused by inconsistent pressure. Since a mechanical press requires manual control of pressure and moisture, it is the operator's responsibility to routinely check for proper adjustments.

Uneven pressure adjustment from side to side, controlled by the adjustment knobs right and left of the control panel on top of the press bar, can vary the interior temperature (see Photo 1). When the pressure is greater in one area than another, the heat will be increased. A crusty, stiff, or lumpy sponge pad, or one contaminated with residue from adhesive, can also be responsible for hot spots. The sponge pad is required to

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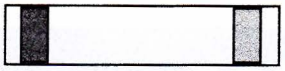
assist in providing equal and even pressure against the top platen (the heat source). It stands to reason that if the sponge pad is unable to press evenly against the platen that the heat will not be evenly distributed either (see Photo 2). The bottom line is that it might not be the thermostat at all, but just an old or contaminated sponge pad.

Diagram 2



The indicator strip is a small ½"x3" strip with wax-coated ends that will melt at 200F and 210F

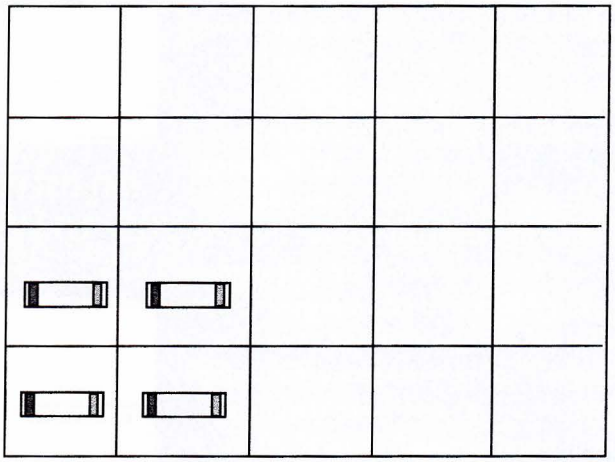
Routine Maintenance

Sound maintenance programs should be routinely practiced to verify accuracy and proper function of all equipment. You wouldn't consider driving your car without occasionally having things checked under the hood, would you? The same goes for your heat press. It's a good idea to test all the heating mechanics at least twice a year to make certain the temperatures are accurate. (See Test Strip Procedure discussed in the next section).

Diagram 3

Divide the scuff board into 4" squares and place an indicator strip in each box.

These will work as both control and verification of temperature accuracy.



If the adhesive selected for routine mounting melts and bonds within the press as all layers heat up to 185°F, then when the press temperature is set to 185°F, it should indeed be that temperature inside. It is often easy to forget to check the little things. Simply verifying the temperature gauge matches the selected set temperature is a start.

That should be verified daily when the press is first turned on and reaches its initial warm up temperature. Just prior to running the press through its first full cycle of the day with all mounting release layers, yet with no project, check that the temperature reading matches the setting. Sometimes the temperature gauge may show a temperature that is not a true indicator of the inside heat. In this case, the thermometer could be broken.

Test Strip Procedure

There is an easy way to test any press for accuracy. Seal Temperature Indicator Strips are ½" x 3" strips of paper with two wax-coated areas, one on each end of the strip. One end melts at 200°F, the other end at 210°F, and the strip is backed with a low tack adhesive for holding in place during testing (see Diagram 2).

Begin with a piece of scuff board that is the full platen size of your press. Divide the surface of this test board into 4" squares and place an indicator strip in every box (see Diagram 3). Then set the press at 190°F and lock closed for two minutes. Open and check test strips for melting. Make a notation on the test board as

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wax ends melt. Increase press to 195°F and lock for another two minutes; then open and check for melting. Continue this at five degree intervals until all strip ends have melted and notations have been made.

Obviously all of the 200°F ends should melt, covering the entire test board when the press is set at 200°F, but none of the 210°F ends should be melted. The 210°F ends should not melt until the press is set for that higher temperature. An overview of the board at the end of the test, complete with all notations will give you a clear indication of hot and/or cool spots that need your attention.

Maintenance Review

Mechanical Presses: In order to reduce the particles in your press, develop a daily routine of wiping down the inside of your mounting equipment. In addition, keep presses closed when not in use to avoid dust and particle buildup; check for adhesive residue and scratches; regularly wipe release materials with a clean, soft, lint-free rag to remove bits of unwanted adhesive and dust particles; and test for temperature accuracy and sponge flexibility at least twice a year.

Vacuum Presses: In moist or high humidity areas, hoses may become blackened with residue from excessive moisture from mounting. Run an empty press first thing each morning through one full heated cycle to blow out the hoses and draw any accumulated moisture from within the unit. At the end of each day, run the press empty with the press lid open to blow plain air through the vacuum hoses, and check for hot spots bi-annually.

When Is A Hot Spot Not A Problem?

Hot spots in any mounting press are always a problem, and one that needs immediate attention. Uneven heating can create trapped air, insufficient adhesive bonding, and inadequate pressure. As is always stressed with mat cutters, framers are only as good as their equipment allows. Regular maintenance and spot checking (no pun intended) will help minimize revenue loss from hot spots.

So in closing the only time hot spots are allowed would be on a beautiful day without a cloud in the sky on a sunny beach. Happy summertime! ■

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