Treat Me Right

Reactive hot melt polyurethane (PUR) adhesives just need a little special attention for optimal performance

Nordson Corporation
Linda Ray
Dave Deibel
Often the move to PUR is mandatory to stay relevant and competitive, and other times it is a strategic choice to offer customers innovative products or improve the appearance of existing products. For bond strength, durability and design flexibility, PURs are one of the best adhesive options, and the unique bonding characteristics of PUR adhesives make them an ideal fit for a wide range of applications. On the other hand, as a reactive adhesive—one that will begin to cure when the adhesive comes into contact with moisture, air or heat—PURs also require a little special attention.

When an organization decides to use PUR for manufacturing processes, they often begin a love/hate relationship. Designers and marketing departments love PUR’s ability to enable innovative new products and to improve existing products. Operations and maintenance departments, however, often take a different view owing to PUR’s unique reactive characteristics, which can make the material more difficult to dispense and the equipment more difficult to maintain than traditional hot melt adhesives. But there’s no reason companies can’t take advantage of PUR’s myriad benefits without the headaches. By following a few installation, operation and maintenance tips, you can keep your PUR dispensing technology in peak condition for excellent product results, as well as consistent operation and minimal downtime.

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**The PUR experience**

PUR is here to stay: the adhesive has cemented its position during the past decade as a practical means of improving product appearance and performance and enabling new products. If you’re considering a switch to PUR, however, you might have some concerns about the adhesive’s persnickety reputation.

No doubt about it, adjusting to new operations procedures can be challenging, but the benefits of PURs far outweigh these challenges. The switch to PUR doesn’t have to be a maintenance beast, as long as you find ways to master PUR adhesive dispensing. That’s where Nordson and your adhesive supplier come in.

As a leading supplier of adhesive dispensing equipment in the world, Nordson has considerable experience with hot melt polyurethanes in paper converting and product assembly applications. Nordson’s experience includes:

- Bookbinding: spine and side gluing
- Packaging & folding carton manufacturing: clear box (plastic folding carton) production and sealing
- Woodworking: edge banding and profile wrapping (cabinets, panels, doors)
- Electronics: macro-assembly (computers, phones)
- Miscellaneous products (flooring, windows)

**Going PUR**

Before making PUR part of your operation, it’s important to be sure that PUR is the right adhesive for you. Based upon decades of experience with PUR dispensing equipment, the Nordson sales and service team identified a few key considerations when converting to or adding PUR processes to your operation.

**Is PUR the right material for the job?**

Before making the switch, it’s important to consider all your adhesive options to be certain that PURs are the best fit for your application. Your adhesive supplier(s) will recommend the type and form of the adhesive for your specific application, taking into consideration the substrates being used, bonding requirements and desired dispensing method.

While using PUR can create opportunities for cost savings, including reduced adhesive and energy usage and optimized labor, both the PUR material itself and PUR dispensing equipment are typically more expensive than traditional hot melt adhesive and equipment, influencing the payback period in your return on investment analysis. Ask your Nordson representative for a budgetary cost estimate so your internal capital request covers the amount you need for PUR dispensing equipment, keeping in mind that costs probably won’t be the same as an EVA dispensing system.
Do you have the right PUR?
All PURs are not created equal – or the same. PUR adhesives have a variety of open and cure times; a mismatch between operating procedures and PUR characteristics will result in operator frustration and material waste. If PUR is the optimal material, consult with your adhesive supplier to ensure you have the right PUR formulation for the job.

Do you have the right PUR dispensing equipment?
Just as each PUR is unique, so are the systems that apply them. Look for a scalable system that protects the integrity of your PUR, offers simplified operation and maintenance, and increases your production efficiency.

Once you have chosen to “go PUR”, identified the right PUR formulation and chosen the dispensing technology for the job, there are only two more steps standing between you and PUR success: learning how to treat your PUR and how to treat your PUR application equipment.

Getting to know your PUR
The primary and inviolable rule of PUR success: know thy adhesive.

Because so many unique PURs exist, it’s possible to find one that is the ideal match for your application. But that also means that each PUR has, in a way, its own personality.

For example, some remain stable in your application system longer while others are not as tolerant but cure faster to enable greater production rates.

To make a successful and easy PUR switch, it’s critical that you understand all of your PUR’s unique characteristics. Your adhesive supplier is your expert guide for that task.

Talk to your adhesive supplier in depth about the adhesive you will be using. A few suggested questions to ask:
- What is the ideal application temperature range for this PUR?
- How long can this PUR tolerate that heat before curing in a specified system?
- Does this PUR require purging and, if so, how often?
- What is this adhesive’s cure time?

Getting to know your application equipment
The second and equally important rule of PUR success is to master your equipment. This will require making some changes from the way you’ve handled previous non-PUR adhesive application systems, but there’s good news. No matter what distinctive set of heating or application procedures your PUR demands, Nordson offers an application technology that was created specifically not just to handle those procedures, but to make them as efficient and easy as possible.

The ideal PUR system will accommodate the optimal adhesive volume for your application as well as deliver advanced PUR application technology. Nordson provides application systems that meet the most specific manufacturing requirements, accommodating material forms from 1-kilogram slug to 55-gallon drum and utilizing applicators from non-contact bead to adjustable contact slot nozzles. Specializing in closed application technology, Nordson creates application systems that protect your PUR adhesive, minimizing its exposure to air and moisture.

There are a lot of decisions to be made to select the right PUR equipment, but having the right system, one specifically designed to handle the needs of your PUR, will make a significant difference in the success of your switch to PUR. Nordson’s team of engineers and sales staff bring years of PUR dispensing experience to help you select the ideal system for optimum adhesive performance.

You can count on that expertise long after you select your PUR system, as well. At installation, a Nordson engineer will walk you through all of these procedures, showing you how to maximize your new PUR investment. Nordson offers initial training on all new equipment, but we also understand that questions come up as you get to know your new adhesive and system. That’s why Nordson engineers are always available to answer questions and give advice on how best to use your equipment and protect your investment.
Nordson also knows that change is a constant in the manufacturing world, and inevitably, you will hire new operations and maintenance team members who need to be trained on the best way to handle PUR technology. Whether it's a whole new training for a new team or a quick brush-up on best practices, Nordson offers training packages to help you get the most out of your PUR system not just at installation, but for the life of the equipment.

**Key tips for keeping you PUR equipment happy and your investment healthy**

Get started making the most of your PUR investment by following these tips for keeping PUR dispensing equipment in peak condition for consistent operation and minimal downtime. A Nordson representative can provide detailed suggestions for specific pieces of equipment such as PUR applicators.

**Turn off the heat.**

With PUR equipment, this should be your mantra. You might be accustomed to turning on your melter at the start of the day and forgetting about it. This is a habit that works fine with many hot melt adhesives, but not PURs.

PUR degrades with exposure to heat, which can cause some PURs to cure and will at the very least diminish the adhesive's bonding capability, increasing waste and costs. Over time, as the PUR cures inside the system due to heat exposure, buildup will occur, constricting flow and eventually causing damage to the equipment as well.

The solution, however, is simple. Systems that are in continuous use can remain at optimum application temperature without damage because new adhesive is constantly moving through the system, rather than sitting in the melter waiting to be used. If your production schedule requires that your PUR system be used only a few times throughout the day, Nordson's systems offer a capability called "temperature setback," which allows you to easily lower the temperature while the system is not in use for short periods of time.

Temperature setback not only protects your adhesive and equipment; it is also a way to save energy and reduce the carbon footprint of your production process.

Regardless of your equipment's exact usage schedule, keep this rule in mind: during production hours, turn down the temperature or use equipment stand-by mode if not running for 15 minutes or more. At night, turn the melter off.

**Prevent emergencies.**

When PURs are involved, Murphy's Law works overtime. An EVA system will simply put up with more; a missed maintenance procedure most likely won't cause a shutdown. PUR systems may have huge benefits, but tolerance is not one of them.

If you let maintenance slip, whether it's daily, weekly, quarterly or annual maintenance, the damage will often show up just when you need the equipment to work most, at peak production time.

Again, the consequences can be severe, but the problem is relatively easy to avoid. Schedule and perform preventative maintenance, all of it, no matter what. For example, every three to six months, depending on use, be prepared to remove and clean applicators, replacing all seals and filters.

If you don't have the staff to perform this maintenance, look into one of Nordson's service plans. With a PUR system, planning for consistent maintenance is simply another part of the investment, and one that will pay big dividends in the end. After all, arranging for regular service by the equipment provider is always less expensive than repeated emergency service calls and associated downtime.

Whether you have the staff to perform this maintenance or not, it's critical for your system to be properly maintained. PUR systems are designed to be simple to operate and maintain, but neglecting maintenance can cause problems to occur before servicing the equipment. Certain parts of the system may require more frequent maintenance than others, so it's important to have a maintenance plan in place from the start.

**Out with the old.**

In some cases, depending on the specific PUR being used, your system will require purging. Purge material anytime PUR has been heated and not used for a period of time. A good "rule of thumb" is to purge the dispensing head after 30 minutes of sitting idle. And, do not leave PUR in the system for more than five to seven days.

Consult your adhesive provider to find out if your adhesive requires special purge material and the best method for doing so.

**A little attention goes a long way**

All adhesive dispensing systems require some level of regular preventative maintenance in order to run effectively and efficiently long-term. PUR is no different.

With just a little extra attention to procedures and maintenance schedule, switching to PUR doesn't need to be a stressful change. It can give your business a great competitive edge, and it's truly not more difficult to manage than other systems as long as you are diligent about maintenance.

Customers that proactively manage PUR dispensing systems through regular preventative maintenance have less downtime, fewer service calls and greater satisfaction than customers that wait for problems to occur before servicing the system. Greater consistency means greater success. And Nordson will be there to help.