Three cooperating companies — Sekisui Voltek, Stik-2 and Rohm and Haas — merge their development efforts and coalesce their expertise.

If you could sneak a peek into literally thousands of innovative, new industrial and consumer products, you’d witness one very surprising finding. It’s this: these goods owe their slimmer profile, lighter weight and lasting performance to pressure sensitive tapes that tightly bond together their inner workings.

Secured in the past by rivets or welds, components often meet today with a mere press of a foam tape that is coated on both sides with a pressure sensitive adhesive (PSA). Foams may look insubstantial, but they’re increasingly sophisticated and important components in the appliances, building structures and retail environments all around us. End users continually demand more of these materials as they assemble smaller, lighter, stronger, better
Manufacturers of building products bond windows and doors, plus a growing array of door trim and molding with them. White goods manufacturers use them to secure cladding, stainless steel, display panels, glass and accessories to their latest models of powder-coated stoves, washing machines and refrigerators. Retailers rely on them to adhere security devices, RFID tags, point-of-purchase displays and more. Even the automotive industry mounts emblems and interior trim with these newly capable materials. If it seems that water-based pressure sensitive adhesive foam materials are beginning to show up just about everywhere, it’s because they are.

Now, adhesive supplier Rohm and Haas, foam supplier Sekisui Voltek and tape manufacturer Stik-2 have teamed up to unequivocally answer, “yes.” The collaboration has spawned an array of precision solutions for pressure sensitive tape converters and end users grappling with challenging assembly applications. The three firms planted the seeds of the partnership by innovating in their own areas of expertise. Success really blossomed, though, when they decided to unite and approach the marketplace together.

New Process Controls Yield Precision Foam Products

A North American market leader in manufactured foam products, Sekisui Voltek boasts 35 years of experience, an expertise that has sparked double-digit growth over the last several years and a hunger for continuous improvement. Customers turn to Sekisui Voltek for crosslinked, closed-cell foams that trump more traditional materials like fabric, rubber foam and solid plastics for use in a host of diverse and unique applications. Their brands include Volara®, Volextra® and Minicel®.

Headquartered in Lawrence, Mass., with production facilities in Massachusetts and Michigan, Sekisui Voltek recently installed state-of-the-art process control systems that honed its already top-notch foam production to an exacting art. “Two attributes define the quality of a foam product: density and thickness,” says Mark Hatch, Voltek director of market development. “We implemented a
proprietary, in-line system that precisely scans and verifies density and thickness throughout the roll.”

This ability to control and measure density and thickness is indispensable for customers, who rely on consistency throughout the foam to meet exacting specifications and challenging conditions in use. Anthony Filip, Sekisui Voltek’s technical service engineer, explains, “Customer data on shear strength, for instance, is more reliable when thickness and density are less varying.” Such systems are particularly critical, since the company produces customized products like foams as thin as ten thousandths of an inch.

Its foams present adhesive challenges, however. Low surface energy polyolefins complicate adhesive anchorage and, if not properly anchored, may allow adhesive transfer (bond failure that occurs when adhesive delaminates from its foam substrate and remains on the bonding surface) in use. Sekisui Voltek saw a chance to not only conclusively solve the conundrum but to reach farther and introduce integrated, high-performance, environmentally advanced solutions to customers. “We choose to associate with market leaders and high achievers,” Hatch notes. Rohm and Haas, with its groundbreaking technology, was the natural choice.

Emulsion Acrylic PSA Bonds Tightly to Polyolefin

Rohm and Haas, the world’s emulsion adhesive expert, had just introduced a cost-effective, high-performance, water-based acrylic PSA that anchors tightly to polyolefin foams and was touted as outperforming every other emulsion acrylic PSA by a substantial margin.

The product, ROBOND™ Prohesion, displays a number of attributes of keen interest to converters and end users faced with challenging assembly applications. With excellent initial tack and quick peel build, ROBOND Prohesion demonstrates a cohesive strength that many thought unattainable for an emulsion PSA.

“Its resistance properties are revolutionary. No other emulsion acrylic PSA has come close to its outstanding heat resistance capabilities while retaining this level of excellent adhesion – a stunning property balance achievement for any water-based acrylic PSA,” says Sekhar Sundaram, Rohm and Haas project team leader. Its humidity resistance is outstanding, overcoming a serious shortfall for most aqueous adhesives, while its heat resistance exceeds that of some solvent-based acrylic choices.

ROBOND Prohesion is the first emulsion acrylic PSA to exhibit such impressive performance values in combination with high adhesion to multiple substrates – a critical advantage for Sekisui Voltek’s diverse customer base. “The adhesive exhibits superior anchorage to substrates ranging from those with high surface energy like stainless steel to equally challenging low surface energy materials like Sekisui Voltek’s polyolefin foams,” adds Sundaram.

Full-Scale Tests Show Emulsion System Trumps Solvent-Based Systems

To take the project further, the two companies turned to Stik-2, a major mounting, bonding, gasketing and sealing tape manufacturer for 35 years. An industry leader, Stik-2 specializes in polyethylene foam tapes, and in a relatively unusual move for a tape manufacturer, runs a dedicated coating line for waterborne adhesive tapes. “Water-borne coating is a growing business for us,” remarks Mike Barrett, national sales manager, who says the company also offers solvent-based and hot melt coating. “We recently started 12-hour shifts on our water-borne line to accommodate increasing customer orders.”
With Stik-2’s expertise and toll coating capabilities, the company was the perfect choice to run production trials pairing the foam substrates and the new adhesive. “The coating trial was a big success both in terms of coatability and performance,” says Chris Urheim, Rohm and Haas’s North America market manager for pressure sensitive adhesives, who says the new adhesive anchored superbly and the system bonded tightly to diverse substrates under very challenging conditions. “The data clearly indicates that this system can outperform some of the solvent-based PSA foam materials currently on the market.” Urheim adds that Rohm and Haas will continue working closely with Sekisui Voltek and Stik-2 to tailor the system for those customers requiring more specialized products.

The good news pleased Sekisui Voltek and Stik-2 for reasons beyond peel and shear values. “We sell high-performance products, but we understand customer cost pressures. This adhesive combined with precision polyolefin foams offers a cost solution benefit,” Hatch comments. “Further, we like to lead the market toward environmentally advanced choices that don’t compromise on performance. This emulsion makes doing the right thing simple.”

**Two Advances = One Synergistic Leap Ahead**

The three companies also are demonstrating that, while individual advances are important steps, partnering for innovations can yield a synergistic leap ahead. By choosing to stick together, the co-suppliers now offer state-of-the-art foam and adhesives systems that can address a broad array of assembly applications.

Company representatives report that eager customers are lining up accordingly. Would-be buyers may have begun by asking about the capabilities of these PSA foam materials, but they now say, “That’s exactly what we had in mind. In fact, we believe we have some other applications for these materials.”

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**Benefits Stack Up**

It’s easy to see why assembly operations stick with PSA foam materials. These lightweight, easy-to-apply fastening systems can be molded of very thin foam that is precision cut to fit even tiny areas, or formed into thick strips that fill gaps. They conform to surface irregularities, increasing the bonding surface area and improving the overall bond. Their sealing abilities repel dirt, cleaning solutions and more. They readily absorb thermal expansion and contraction, distribute stress uniformly across the bond, absorb shock and offer dynamic compression. Seemingly light and insubstantial, they possess astonishing strength-to-weight ratios. Appearing deceptively simple, foam tapes are nonetheless vital high-performance fastening systems components that offer huge advantages with a quick press.

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