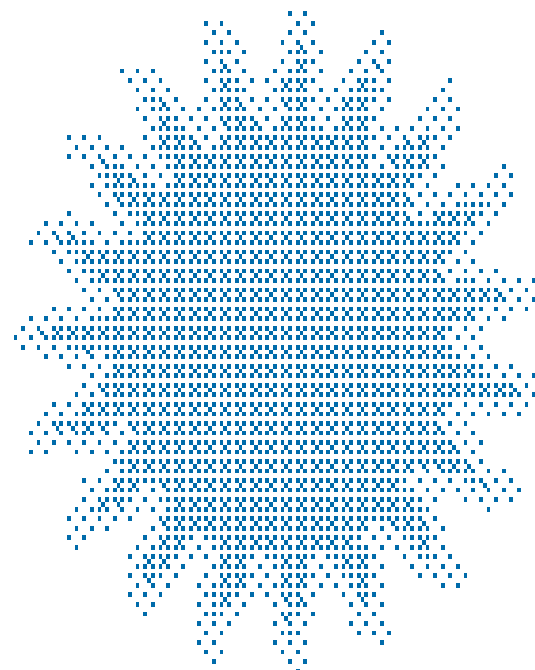
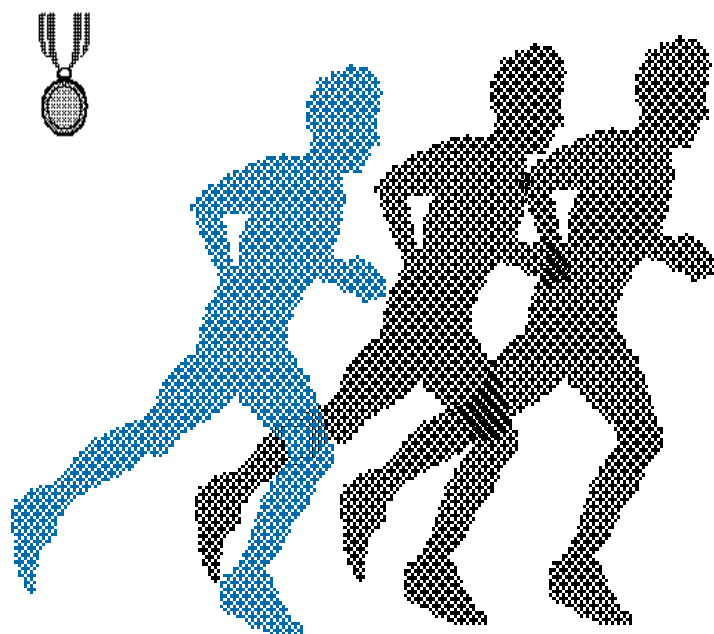


trends

published by Nordson Corporation for the nonwovens industry

July 1996 Vol. 8, No. 2



The Heat of Competition

This summer, athletes from all over the world are traveling to Atlanta to compete in the 1996 Summer Olympic Games.

These athletes have trained for years, dedicating their lives to becoming the best they can be in their particular event.

To remain competitive in a chosen field requires foresight and planning, even when the goal is so far in the future it seems out of sight or out of reach. You can be sure that none of this summer's Olympic athletes decided last week, last month or last year to compete in these Games.

And, just as no Olympic athlete would compete with 20-year-old technology, one cannot expect to consistently defeat one's competitors by using the same tools and running the same race year after year.

For example, take a look at your production machines. How many of those machines are running at the same speed as the day they were installed? How many of your machines are making the same product that they were originally designed to manufacture?

The level of competition in today's disposable products market makes it imperative that you run faster, add features and increase productivity. Reaching those goals sometimes means changing your product designs and changing the way that you make your products.

But this is old news. If you are still profitable, then you have already made many of these improvements. Now, you must have the foresight to ask: What does the future hold? What is the funda-

mental technology shift that will propel your product into the next century?

Some suspect that the next generation of disposable products will require new and different methods of combining the various components of a diaper or sanitary napkin. This is especially true as new, high-performance, absorbent-core structures are developed. These changes may involve a more pronounced move to autogenous

To remain competitive requires foresight and planning...

bonding technologies; or they may mean new types of adhesive applications.

Today, most adhesive-bonding applications in disposable products are accomplished with pressure-sensitive hot melt adhesives. However, other adhesive technologies, some still just over the horizon, may provide opportunities to create new and innovative products to operate more efficiently and to reduce product cost.

Many of these adhesive technologies have been available for years and are being used in a variety of applications in markets outside of disposable products manufacturing.

Hot melt adhesives will still play a significant role, but these hot melts

may be applied at lower temperatures and may also provide fluid transfer functionality.

Cold glues, which have been available for years, may expand into various core-integrity applications.

Two-component materials and ultra violet (UV)- and electron beam (EB)-cured adhesives each provide possibilities that may make it practical to incorporate new types of materials into disposable products.

As products become thinner and thinner, it may also become practical to use powdered adhesives for some structural applications.

Inside this issue of trends, you will find a short summary of each of these adhesive technologies, the equipment required to apply them and possible applications within the disposable products market.

Start now to consider these technologies in your product designs. Planning for the future today will help ensure that your company will still be in the race when it comes time to compete in the next Summer Olympic Games.

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Take Note of Nordson's

Global Changes



Nordson Establishes Shanghai Subsidiary

Nordson Corporation has established Nordson (China) Co., Ltd., a new wholly owned foreign enterprise subsidiary in Jin Qiao Zone, Pudong, Shanghai, China. All of Nordson's Shanghai operations have been moved to the new location. The new address is:

Nordson (China) Co., Limited
828 Xin Jin Qiao Road
Pudong New District
Shanghai, 201206
China
Tel: (86-21) 5854-2345
Fax: (86-21) 5854-9150



Nordson Opens New Bangalore Office

Nordson's office in Bangalore, India, was opened in April. Working there are Ajit Krishnan, manager, finishing business, and S. Satya Narayana, service engineer, finishing. They can be reached at:

Nordson India Private Limited
A-102 Blue Cross Chambers
11 Infantry Road Cross
Bangalore 560001
India
Tel: 91-80-559-1761
and 91-80-559-2590
Fax: 91-80-559-2601

Hot Melt Adhesives

Hot melt adhesives provide the bonding power in today's disposable diapers, sanitary napkins and adult incontinence products.

Clear or lightly colored, they are typically manufactured to produce little or no odor when applied, thus averting possible allergic reactions or interference with other scents.

Hot melt adhesives used in disposable products are often available in "environmentally friendly" packaging forms, which use the packaging film as part of the adhesive formulation.

Application equipment includes spiral spray, bead, slot coating and other types of applicators in both metered and pressure-fed configurations. These applicators are fed by various-sized melt tanks that pump the adhesive through flexible, heated hoses.

Hot melt adhesives have been used since the inception of disposable products. They require relatively simple application technologies and provide the rapid bonding required at disposable products' production-machine speeds.

Today's trend is toward adhesives with lower application temperatures that can be applied to lower-gauge substrates.

There is also some movement toward adhesives that add some functionality to the disposable product. These adhesives are typically used

in absorbent-core applications where they can enhance the fluid-transfer properties of the pad.

Technology also exists to apply foamed hot melt adhesive materials. Foaming puts an inert gas into a solution with the adhesive, potentially providing stretch and fit properties that are not available in a traditionally applied adhesive product.

The challenge for the future is to provide higher-performance adhesives at a reasonable price and to continue to provide ways to use hot melt adhesives both to bond substrates and to improve the performance of disposable products.



Cold Adhesives

Liquid adhesives, also called cold glues, have been widely used for many years in applications outside of the disposables industry.

Primary applications for cold glues are in the packaging industry, where they are used for sealing bags, cartons and boxes, and in the assembly of products like cigarettes, envelopes and business forms.

Typical cold-glue application equipment includes spray, bead and slot heads fed by pressure pots or metering devices.

There are currently only a few applications in disposable products that are well-suited to cold glues. Applications in diapers, sanitary napkins and adult incontinence products are generally limited by the high production-line speeds and the resulting need for short open times for adequate bonding.

Cold glues can perform well in disposable product applications only when long open-time

performance is not an issue, or when it actually provides an advantage.

For example, cold glue is sometimes added to the fluff pulp during or immediately after the core-forming process to provide increased pad stabilization. Cold glue has also been used to provide an end seal in the elastic channels of diapers and adult incontinence products. In this application, cold glue has the unique ability to provide substrate bonding while still allowing the elastic strands to properly retract.

Continuing innovation in liquid adhesive technology may someday expand its applicability in disposable products. Today, those applications remain limited to areas where the long open times provide designed-in functionality in the diaper, napkin or adult incontinence product.

BONDING MATERIALS

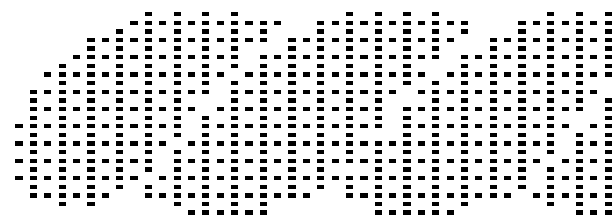
Some are tried and true while options for the future may surprise

Technologies that may appear to be far into the future are commonly used today in other applications.

Nordson Corporation, through focused business development, develops material-application solutions for a wide variety of processes.

These applications include equipment designed for cold glues, liquids, powders and two-component materials, as well as UV-curing solutions where required.

These technology summaries are intended to give you an overview of the adhesives and equipment, and to suggest possible applications. Further details are available from your Nordson representative.



Powdered Adhesives

Powdered hot melts start out as a 100-percent solid polyester, polystyrene, polyamide, nylon or EVA adhesive. These adhesives are then cryogenically ground to powders of one to 500 microns in size.

Powdered adhesives are widely used in the automotive and apparel industries to create various types of fabric laminations. These include fabric-on-foam for automotive headliners and fabric-to-nonwovens for interlinings in suits.

Although significantly more expensive than hot melts, powdered adhesives provide high heat resistance and can be applied fairly easily. Application methods include electrostatics, dot and paste. However, the scatter roll is most often used.

A scatter roll is a wire bristle positioned over the substrate and mounted under a feed hopper. The powder in the feed hopper is gravity-fed onto the bristle roll, which rotates over the web while an opposing brush roll dislodges the powder. The powder then falls to the substrate. Add-on weights are controlled by the rotational speed of the bristle roll.

A lamination is formed by heating the web on which the powder has been deposited and then laminating it to another pre-heated substrate. With lamination temperature generally above 190° F (87.8° C), the process is accomplished by passing the substrate through infrared or radiant ovens.

The lamination must then be cooled before being rewound. This step prevents curling in the final product.

The primary non-woven applications for

this technology are durable medical products. The higher melt resistance of powdered adhesives allows them to be used for medical gowns or bed covers that can be washed or autoclaved.

Traditional hot melt adhesives cannot withstand the heat of these processes.

On the other hand, traditional disposable substrates, like polyethylene film or polyester nonwovens, cannot withstand the heat necessary to remelt a powdered adhesive and create the bond.

Primarily for this reason, applications of powdered adhesives in the production of traditional diapers, sanitary napkins and adult incontinence products remain limited.

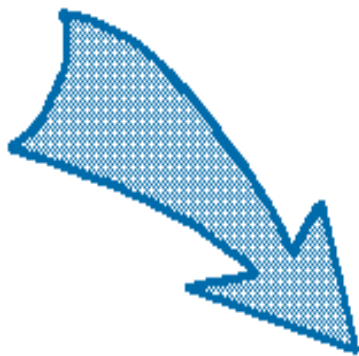
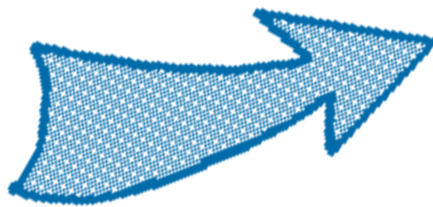
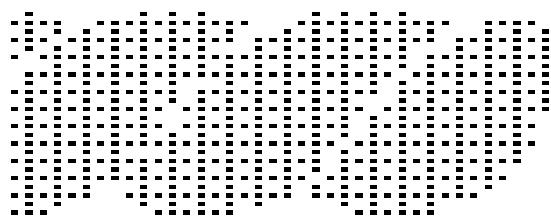
NEW METHODS

are tried-and-true options for the way surprise you

appear to be far into the future for disposables only used today in other markets. Through focused business groups, continues to develop solutions for a wide variety of manufacturing pro-

vide equipment designed to precisely apply hot melts, and two-component materials, and to provide the required.

series are intended to give only a brief overview of the product, and to suggest possible applications in disposable products available from your Nordson representative.



Two-component Adhesives

Two-component adhesives create a bond through the chemical reaction that results when a base material is combined with a catalyst. These materials are widely used in the automotive industry to assemble metal parts or to join two dissimilar materials, like glass and metal.

An application system for two-component materials requires precise metering technology to ensure that proper amounts of the base and catalyst materials are used. The two components are combined in a static or dynamic mixer just prior to the point of application. Also, changing application rates require the use of proportional-flow technology, which properly links the amount of materials being dispensed to the production speed.

Accessories include bulk unloading systems for both components, and degassing systems that remove any air that may become trapped in the system and affect the mix ratio.

Currently used for structural-strength bonding applications, two-component adhesive technology is a rapidly developing field. At some point in the future, mix and meter systems that permit the use of two-component adhesives may allow the economical addition of new features to disposable products.

UV/EB Curable Adhesives

Radiation-cured adhesives require the use of UV light, EBs or another energy source to convert the liquid adhesive to a solid. This process is typically used in the automotive, flexible packaging and laminating, medical supply, and tape and label markets.

Curable materials are used where bonding features such as high cohesive strength, high temperature resistance or solvent resistance are required.

There has been significant growth in the use of radiation-cured adhesives over the past several years, especially in those applications that

have historically been accomplished with solvent-based materials.

Radiation-cured adhesives generally provide a lower raw-material cost than solvent-based materials, and they yield the benefit of rapid curing without costly solvent evaporation and recovery equipment.

The use of radiation-cured adhesives requires the addition of a radiation source to the production machine. This is most typically either a UV or EB curing/drying system, which allow the substrate to pass through the curing section after application of the adhesive. The latter is accom-

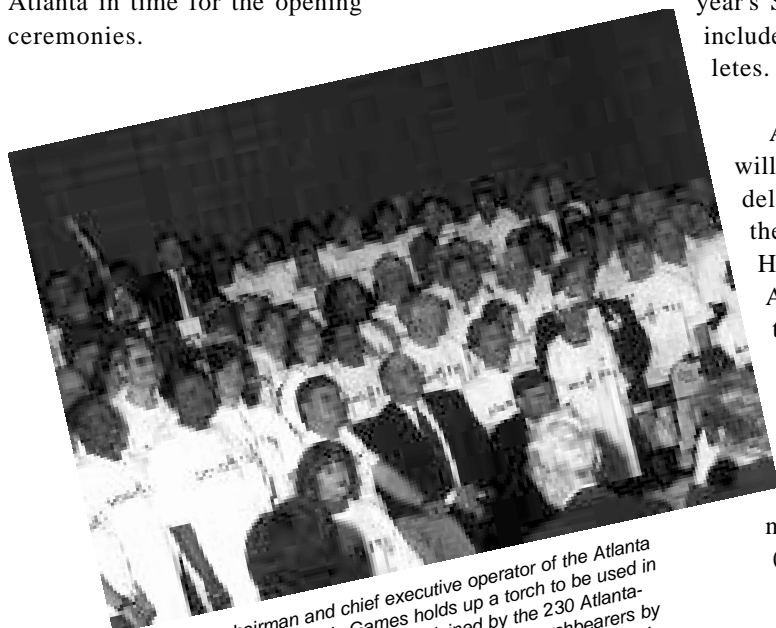
plished using traditional methods including spray, slot, bead and screen printing.

Adhesive formulations are currently evolving, as are the application and curing methods. The greatest potential today lies in the use of radiation-cured materials in the assembly of medical devices and supplies that must be sterilized.

Did You Know?

Most of you know that the 1996 Summer Olympics are coming to Atlanta, Georgia, July 19 - August 4, hometown of Nordson's Nonwovens Systems Group (NWSG), but did you know that one of our very own was instrumental in choosing 230 of the 10,000 torchbearers for the 84-day Torch Relay preceding the games?

Because of her extensive hours of volunteer community service, Jocelyne Nassar, associate market specialist, NWSG, was asked to serve as a judge on the United Way of Metropolitan Atlanta's Community Leaders Board. The Board chose 230 Community Heroes from more than 1,000 local nominations. These 230 Atlanta Community Heroes were asked to be torchbearers in the Torch Relay, which started in Greece this spring and ended in Atlanta in time for the opening ceremonies.



Billy Payne, chairman and chief executive operator of the Atlanta Committee for the Olympic Games holds up a torch to be used in the 1996 Olympic Torch Relay. He is joined by the 230 Atlanta-area Community Heroes that were chosen to be torchbearers by the United Way Community Leaders Board, on which Nordson's NWSG's Jocelyne Nassar served earlier this year.

Nassar was chosen to judge the United Way program in most part because she is a founder and the current president of the Atlanta Chapter of the National Alliance of Lebanese Americans (NALA).

Also, Nassar is an envoy for the Paralympic Games, which will be held August 15 - 25 in Atlanta. She will be working with the Jordan delegation.

"The Paralympics is the second-largest sporting event in the world," said Nassar. "We expect to receive about 3,600 athletes." By comparison, this year's Summer Olympics will include about 10,000 athletes.

As an envoy, Nassar will be with the Jordan delegation from the time they land at Atlanta's Hartsfield International Airport, throughout their stay and until their departure.

"My job is to be the Atlanta Paralympics Organizing Committee (APOC) ambassador to the team, and to be sure the Jordanian participants have a smooth and trouble-free visit," she said.



Jocelyne Nassar, associate market specialist, NWSG.

Nassar isn't Nordson's only Olympic star. Barry Yasuda, international sourcing manager, Nordson Corporation in Amherst, Ohio, was a torchbearer for the 1996 Games.

Yasuda has volunteered for 23 years in Hobby Day and Career Day at Amherst schools. He has worked on the local United Way chapter's Allocation Committee; he is active in Junior Achievement of Lorain County Inc. and Diabetes Association of Greater Cleveland's fundraiser programs; and he is a member of Nordson's Diabetes Corporate Challenge campaign team and Nordson's Time-N-Talent employee volunteer program.

Also, Ed Campbell, executive vice president and chief operating officer, Nordson Corporation in Amherst, was a torchbearer for the 1984 Los Angeles Summer Olympic Games. He carried the torch in Cleveland, Ohio.



An Olympic Aside

The Olympic torch, which was lit in Greece early this spring, first reached the United States on April 27 in Los Angeles, California. When it is all over, the torch will have traveled through 42 states by a variety of means — runners, walkers, dancers, cyclists, trains, Pony Express, a Mississippi River

steamboat and kayak — before reaching its final destination on July 19 in Atlanta's Olympic Stadium.

The 32-inch-long, three-pound torch was designed by a Georgia Tech University professor and a team of engineers such that the flame would burn steadily and never expire throughout its 84-day journey. Its dual-burner system, similar to that of a pilot light in a gas stove, makes this possible. Its light measures about 12 inches in height.

Each torchbearer lights his/her torch from the preceding one, so that each participant keeps the torch that they carried.

United Way Community Hero programs like the one that Jocelyne Nassar judged took place around the country earlier this year. Aside from these Heroes, also asked to be torchbearers were former Olympians, world-renown athletes and those who were recognized in a Coca-Cola-sponsored Personal Hero Sweepstake.



trends is published by the Nonwovens Systems Group of Nordson Corporation.

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