

Value Added Toll Coating

About 3 Sigma

Established in 1980, 3 Sigma is a fast-growing innovator of pressure sensitive adhesive coated products. 3 Sigma uses its solvent, emulsion and hot melt technology expertise to produce specialty or complex adhesive constructions at our facility in Troy, Ohio. Our flexibility, creativity, market experience and unique product commercialization approach enables us to create higher margin, innovative products for our customers, helping them to capture market opportunities, reduce waste and production costs, and increase output.



A Proven Approach

Research and Development of custom adhesives and top coats for highly specialized pressure sensitive products is our specialty. Our solvent, emulsion and hot melt chemistry and manufacturing capabilities are utilized every day to create unique, value-added products for our customers that add directly to their bottom line. 3 Sigma's research and development personnel have worked in large multi-national corporations and follow a unique, collaborative approach when working with customers and strategic partners, ensuring alignment and a superior customer experience.

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"We were able to capture new business due to the unique capabilities that 3 Sigma provides"

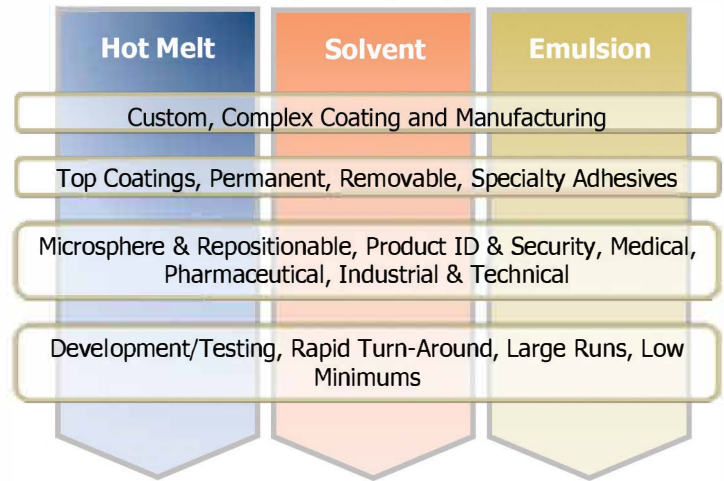
- From 2008 ISO Customer Survey

Value Added Relationships

3 Sigma develops value added relationships and collaborates with market leaders who are seeking partners to co-develop and validate new, innovative products for existing or new market segments.

Our technical flexibility, creativity, market intimacy and experience is a perfect fit for companies looking for ways to reduce scale up and product commercialization time and cost.

Broad Specialty Capabilities



Technologies and Capabilities

3 Sigma brings more to Value Added Toll Coating scenarios through:

- **Chemistry:** We have expertise in Hot Melt, Emulsion and Solvent chemistries and are continuing to invest in new chemistries such as top coats.
- **Manufacturing Process:** Our manufacturing process capabilities include Slot Die, Mayer Rod, Precision Roll and Gravure.
- **Functional Expertise:** We have a legacy of creating diverse products that are Permanent, Removable and Repositionable for use across a number of industries.
- **Equipment Capabilities:** We have a wide variety of coating and slitting capabilities and are continuing to invest and expand in these areas.
- **Relationship Approach:** Through our unique stage gate process and relationship approach we help customers and partners accelerate the capture of market opportunities. We can help overcome human capital or financial constraints that would slow the commercialization of new products.



Specialty Adhesive Coatings

Our product development team are experts in adhesive chemistry. We are one of the few companies that provide solvent, emulsion/aqueous, and hot-melt chemistry from a single facility.

3 Sigma adhesives are:

- Permanent: For general purpose, long-term adhesion
- Removable: For various degrees of removability from a wide variety of substrates
- Repositionable: For either frequent peel and re-stick requirements or for application to delicate or sensitive substrates.

Capabilities	Applications & Benefits
Pattern Adhesives	<p><u>Applications:</u> Jewelry tags, hang tags, price marking labels, inventory tracking labels, inexpensive coupons, lift tabs for hand-applied labels</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Provides specific stripes or lanes of adhesives, allow for dry lift areas •Available for all three adhesive technologies - solvent, emulsion, or hot-melt •Greater flexibility in graphic and construction design
Dual Adhesives	<p><u>Applications:</u> Coupons, package re-closures, pharmaceutical and medical products, inventory labels, tracking devices</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Provides greater construction design options and flexibility •Enables permanent and removable functions in a single label
Transfer Adhesives	<p><u>Applications:</u> Two sided coupons, single or double coated tapes, foam and metal fabrications, plates, tags, security labels, inside window labels, back printed labels on see-through bottles, adhesive for point-of-purchase displays</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Allows converter to print 2 sided products, then create their own pressure sensitive product •Allows for multiple custom designed adhesive properties •Can be supplied as tape product down to 1/4" widths
Ultra Removable Microsphere Adhesives	<p><u>Applications:</u> Newspaper advertising, direct mail (inside & outside envelope), sunglasses, fine quality crystal and glassware, china, collectibles, retail books, calendars, wall decorations, wallpaper borders, label on a label</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Will not build in adhesion over a long period of time •Easy to remove without leaving residue or damaging surface (paper and glass) •Allows a label to be repositioned multiple times on most surfaces while retaining the adhesive bond •Adheres to rigid product standards for the labeling requirements in numerous applications including: <ul style="list-style-type: none"> - US Postal Service - FDA (Direct Food Contact) - CONEG (Heavy Metals) - American Society of Toy Manufacturers

Pressure Sensitive Roll Label Capabilities

In value added toll coating scenarios our chemistry and flexible manufacturing capabilities can be adapted to streamline the design, development and commercialization of new products for a wide variety of end markets and applications.

By adapting our equipment and processes to meet the needs of our customers, we are able to accommodate minimum or high volume requirements, rapid delivery, and unique, difficult product constructions that fit end user requirements.

Capabilities	Applications & Benefits
Solvent Based Adhesive Constructions	<p><u>Applications:</u> Durable labels, industrial labels, health & beauty labels, medical labels</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Moisture resistance •Resistant to oil, grease or solvents •Withstands harsh environments yet remains removable •Provides higher degree of tack and longer life where required •Operates within wider temperature ranges
Pattern Coated Constructions	<p><u>Applications:</u> Jewelry tags, hang tags, price marking labels, inventory tracking labels, inexpensive coupons, lift tabs for hand-applied labels</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Provides specific stripes or lanes of adhesive •Allows for dry lift areas •Available for all three adhesive technologies - solvent, emulsion, or hot-melt •Greater flexibility in graphic and construction design
Multi-Ply Constructions	<p><u>Applications:</u> Piggy-back labels, re-closure products, double coated tapes, direct mail products, inventory tracking</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Increases label functionality for end user •Improves label production efficiency by enabling multiple purposes in a single product construction •Provides a wide variety of material combination options
Coated Film Stock	<p><u>Applications:</u> Durable labels, drum labels, jewelry labels, outdoor signage, superior print definition and high color resolution labels</p> <p><u>Benefits:</u></p> <ul style="list-style-type: none"> •Improves print receptivity •Protects surface from yellowing due to exposure to UV rays •Customized to your printing technology including flexographic, offset, gravure, thermal transfer, screen printing

Facestocks & Top Coatings

During our design and testing stages we make sure to specify the right facestock material as it is crucial to the converting process to ensure successful fitness-for-use of the construction. We stock a wide variety of papers and films to support value added toll coating partner needs. For items not in our inventory, we have a strong relationship with many suppliers who understand our value proposition and respond quickly in delivering materials.

In addition to offering many standard papers and films, we utilize a significant amount of specialized materials such as:

- Foils and metallized films
- Satin cloth
- Magnet
- Security products and destructible materials
- Holographics

As well as having expertise in material stocks, we also can provide a number of options for treatment or enhancement of the facestock.

Capabilities	Applications & Benefits
Corona Treating	This process increases surface energy for improved ink adhesion without adding additional materials to the film facestock.
Print Enhancement	Top coating improves ink adhesion for flexographic, gravure, offset or thermal transfer. 3 Sigma can also provide a matte top coating for vinyl stocks suitable for laser printing.
Color Additives	Blockout or pigmented coatings can be applied to facestocks to increase opacity.
Overlaminations	Thin matte or clear films applied to a product provide additional protection for material surfaces used in harsh application conditions.
Dual Facestocks	Two facestocks provided on the same web give you a wide range of design options for complicated constructions.

Release Liners

We are experts in specifying and incorporating the proper liner release level, even in the most difficult constructions. The liner is a critical component in providing support, protection, and a cutting surface throughout the converting process. We carefully select materials based on the construction's intended end-use and the dispensing process to provide precise performance of the liner.

Proper preparation and handling of liners and release coatings will minimize problems during the converting process. Our liners and capabilities include:

- Precision die-cutting
- Trouble-free matrix stripping
- Efficient label dispensing & application

Liners are available in a wide array of calipers and release levels to accommodate various applications and converting methods. Some of the various types include:

- SCK (Super Calendered Kraft, bleached or unbleached)
- Machine grade/Machine finished
- Clay coated
- Polycoated (PK)
- Layflat liners
- Clear polyester
- Clear polypropylene



Materials Capabilities

3 Sigma's success in developing specialty pressure sensitive adhesive products is a result of our skill in producing a product that performs to specifications.

Constructing stock for effective converting is based on understanding the converting process, applying appropriate coating technology and utilizing the right manufacturing process and materials.

Our materials capabilities include:

Facestock:

- Paper stocks
- Polyester printable films
- Premium synthetics including Tyvek®
- Kimdura® and magnetic
- Laminated foils
- Fluorescent colors
- Thermal printable stock
- Polypropylenes
- Vinyls

Release liners:

- Super calendered papers
- Clay coated kraft papers
- Polyethylene coated papers
- Polyesters
- Polypropylenes

Tamper-evident components:

- Destructible acetate films
- Destructible vinyl film
- Ink transfer tapes and stocks
- Taggant-modified adhesives

Technology & Equipment Capabilities

3 Sigma's coaters and manufacturing technologies are able to produce pressure sensitive products that meet precise specifications for end-use label and tape applications.

Our equipment capabilities combined with our careful selection of the right materials and production processes help to make converting easy and accurate.

Coating Capabilities

- Multiple coaters manufactured by Ross Waldron and Egan provide a consistent, high quality label stock
- Emulsion and hot melt adhesive coatings range from 60" to 3" web width, and solvent based adhesive coatings to 54" to 10" web width
- Emulsion adhesive coatings offer both direct and transfer applications
- Emulsion and hot melt adhesive patterns offer coatings as narrow as 1/16" for either gummed or dry stripes, holding tolerances to 1/16" for hot melt and 1/8" for emulsion
- Solvent-based adhesive patterns offer coatings as narrow as 1/4" for either gummed or dry stripes, holding tolerances to 1/16"
- Unique dual-adhesive coatings on the same web create facestocks with 2 different adhesives
- Specialty formulations produce adhesives suitable for direct food contact, as well as repositionable and re-sealable applications
- Silicone coating pattern tolerances range to +1/8"
- Pressure sensitive block-out coatings provide protection for proprietary information
- Film top coating offers superior flexographic printing, adds a protective layer and, in general, enhances the appearance of the label
- Gravure system can produce intricate patterns for either self-wound constructions or non-laminated coatings
- Self-wound pressure sensitive linerless constructions range from 3" to 60" web width
- Toll coating in full adhesive or pattern adhesive configurations is available in 3" to 60" web widths
- Roll label stock is available on 3" or 6" cores with maximum 40" O.D.
- Sheeting, guillotining and slitting (as narrow as 1/2" widths) capabilities

Note: capabilities may vary based on materials and constructions.

Please contact us with any questions on our Value Added Toll Coating capabilities.

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