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Bar Coding for Electronic Manufacturing

Manufacturers know that time to market, customer satisfaction, and cost control is critical to competing in a global economy. Maximizing productivity, efficiency, tracking and process improvements are key to success.

Labeling and bar code systems are widely employed to automate accurate and versatile identification systems.

Bar coding provides accurate and productive ways to:

- Track inventory, production, work -in-process and customer orders in real-time.
- Track warehouse and stock-room operations and cut the time needed for cycle counting and inventory validation.
- Prevent employee mistakes such as picking the wrong materials.
- Automate data capture in shipping and receiving.
- Collect tracking and traceability records to meet customer, industry standard and US Government mandates.
- Increase responsiveness, improve customer service, and enhance productivity.

Bar coding was adopted throughout the electronic manufacturing and assembly industry as part of an effort to capture data before, during and after production.

This data stays with the components or units and becomes an important link in the production and supply chain process.

Labels designed for electronic assembly and PC Board identification must last the life of the product and keep the data intact. This requires durable labels designed to withstand harsh environment processing including contact with chemicals, aqueous washes, extreme high temperatures, wave flow soldering, or reducing ESD.



Lean Manufacturing

Lean manufacturing requires manufacturers to do more with less. This makes it imperative to keep a close watch on critical inventory levels to avoid delays in production or deliverables. With mobile computing, RFID and wireless equipment, companies are doing more at the point of activity to empower employees to be more productive and provide real-time information for better business decisions.



High Density Bar Codes For Electronics

Because of shrinking real estate on the electronic components, two-dimensional (2D) symbologies have gained popularity. 2D bar codes offer greater data storage capacity using high-density identification and error correction features, 2D symbologies are commonly used to store data needed to track parts, WIP, provide traceability and more.

What Is The Data Matrix Code?

The Data Matrix code is a two-dimensional matrix symbology containing dark and light square data modules making up a larger square or rectangular shaped symbol. It has a finder pattern of two solid lines and two alternating dark and light lines on the perimeter of the symbol.

A two dimensional imaging device is necessary to scan the symbology - this is different from linear bar code scanners used today. Data Matrix is designed with a fixed level of error correction capability. Data Matrix is used for item marking applications using a wide variety of printing and marking technologies. The Data Matrix symbol looks like this:



The Data Matrix code was designed to withstand a fair amount of destruction and have the encoded data remain readable. Meaning a whole section of the code can be scratched or completely gone and the mark will still read.

The other feature of the Data Matrix code is the ability to be read from different angles. This makes it easier and far more efficient to scan marked objects without the worry or effort to align them in one direction.



Scalable and Small Data Matrix

Typically 1/10th to 2/10th of an inch, 2D symbologies contain a substantial amount of data and powerful error correction characteristics making it easier to mark parts, accurately and process quickly. (not shown to actual size.)

Are your labels in compliance with your drawings?

Do they meet strict requirements?

Need a specific label size and shape to match a drawing?

Want one approved vendor to help with all your labeling projects?



Be sure your thermal transfer ribbon is matched to the label material, topcoat, and is rated to withstand the labels environment to ensure that the printing on the label remains readable throughout the life of the product.

Always keep in mind, that nothing replaces testing in the actual production environment. Ask your vendor for testing samples when you have a new product to be labeled, need a different label or something in your production cycle changes.

Labels Designed To Your Specifications

Electronic manufacturers are no strangers to label specifications that call for the smallest sizes to fit electronic components and subassemblies, specific corner radius, durable labels to withstand exposure to harsh chemicals, and aggressive adhesives that last the life of the product...without fail.

The size and shape of the label is made from cutting dies. Some label manufacturers have more standard dies on hand to provide a wide selection of "standard" size labels. Some of the most demanding specifications and unique labeling applications may require a cutting die be created to produce a specific label. This may add to the cost and delivery time of a label.

A knowledgeable label manufacturer can be a great help when involved early in the design and specification process. You may know all too well once specs are submitted, it is harder and more costly to change when labels fail. Consider choosing a label manufacturer to be sure the labels you spec out will perform before you lose valuable product data or have a dissatisfied customer.

What is considered when you order your label:

- **Material:** Kapton® and Polyester materials are proven to withstand harsh environments. Specific types of materials are chosen based on extremes the label will be exposed to.
- **Adhesives:** Aggressive, temporary, or removable adhesives are defined according to the application.
- **Top Coating:** To protect your printing information and bar codes, a top coating may be applied during manufacturing.
- **Exact size, substrates, corner radius, label gap, size, mil-thickness.**
- **Color to your specifications for strong visual or brand recognition.**

Shown here are the effects of time and temperature 315°/600° F for 50 minutes) on a standard polyimide labels compared to a new generation lead free polyimide labels. This new polyimide material is designed for the higher temperatures required for the lead free soldering processes.



After Testing Results: New generation Polyimide Label (left) vs Standard Polyimide (right)

Durable Labels For Harsh Environments

Electronic assembly labels are designed to withstand the high IR & vapor phase of solder re-flow and for surface mount on either top or bottom side of the board without burning, curling, or damage to the printed output.

Kapton® Labels - The most common type of Kapton® label is available in high gloss with superior bar code contrast, super permanent adhesives to withstand high heat processing up to 480°, chemical exposure and abrasion of PCB processing.

Variations of this material are available for printing small, high resolution (600 dpi) bar codes commonly found on PCB labels. Be sure to mention this specific printing need when you order your labels.

Other variations in colors are available, including black, for specific product identification and tracking purposes.

Applications:

- Surface mount process tracking (SMT)
- Wave solder (through hole) applications
- Product identification of electronic components

Polyester Labels - This class of labeling materials have come a long way in durability and availability. Choose from high gloss to matte, silver, white and colors, and flexible to be die cut to various shapes and sizes. With the higher temperature ratings of today's polyester labeling materials, a polyester can often be used to lower your cost of labeling in place of some Polyimide material labels.

Features:

- High gloss, excellent print quality, good tear, smear and abrasion resistance.
- Popular uses include product marking, hazardous material labeling, and component tracking and traceability through the assembly process and supply chain.



New, high performance black polyimide labels that match a dark or black background to enhance aesthetic appeal, can also be a solution when reflected light from white labels cause problems in your electronic product.

This matte black polyimide label material features a 1.0 mil black film capable of withstanding temperatures as high as 900F°/500C°, which makes it an excellent choice for electronics assembly or durable product applications. The permanent acrylic adhesive offers excellent bond strength to a wide range of surfaces required for industrial applications and can be die cut to your specifications.

Used with white resin ribbons, this material can be printed with thermal transfer printers to create high quality bar codes and images that are very durable against abrasion and chemicals.

Dataplates: Made of sturdy materials including plastic, aluminum, custom steel, and stainless steel, these dataplates are most commonly used on larger machinery, aircraft, tanks, and when exposure to the elements is expected. Ordering dataplates preprinted using a label printing service can provide quick, easy and economical delivery.



ESD Protection Includes Your Label

A possible reason for electronic device failure is an electrostatic discharge (ESD) event at the board level. The damage may be so minor that the chip will appear to function normally in some cases but not others.

ESD damage affects production yield, product reliability and profitability in the electronics market.

Need ESD Protection? – Don't Overlook the Label

As electronic devices become smaller and more complex the more sensitive to ESD they become.

It's increasingly more important to use label materials designed to address two major ESD concerns that standard labels can present.

1. First, they eliminate the charge generated when the label is removed from the liner that can discharge and destroy sensitive components during application.
2. Second, after the label has been applied and during the label life, the label has been designed to prevent significant charge build-up on the label surface which can result in a static discharge event.

Every level of labeling products specifically for the electronic industry can play a role in offering anti-static protection:

- * Electrostatic dissipative, RoHS compliant materials
- * Humidity and temperature indicating inks
- * Anti-static adhesives

Durable label materials are designed to withstand PC board manufacturing processes and conform to REACH, RoHS, and HALOGEN FREE requirements of the electronics industry.



Moisture, temperature, materials and movement combine to create static charges which can damage printed circuit boards (PCB) and other sensitive equipment.

New Generation of Barcode Labels

A new generation of barcode labels with enhanced antistatic technologies, not only enables you real-time information for WIP tracking, but also provides you with antistatic features to protect boards and their components from ESD events during label application or during label life.

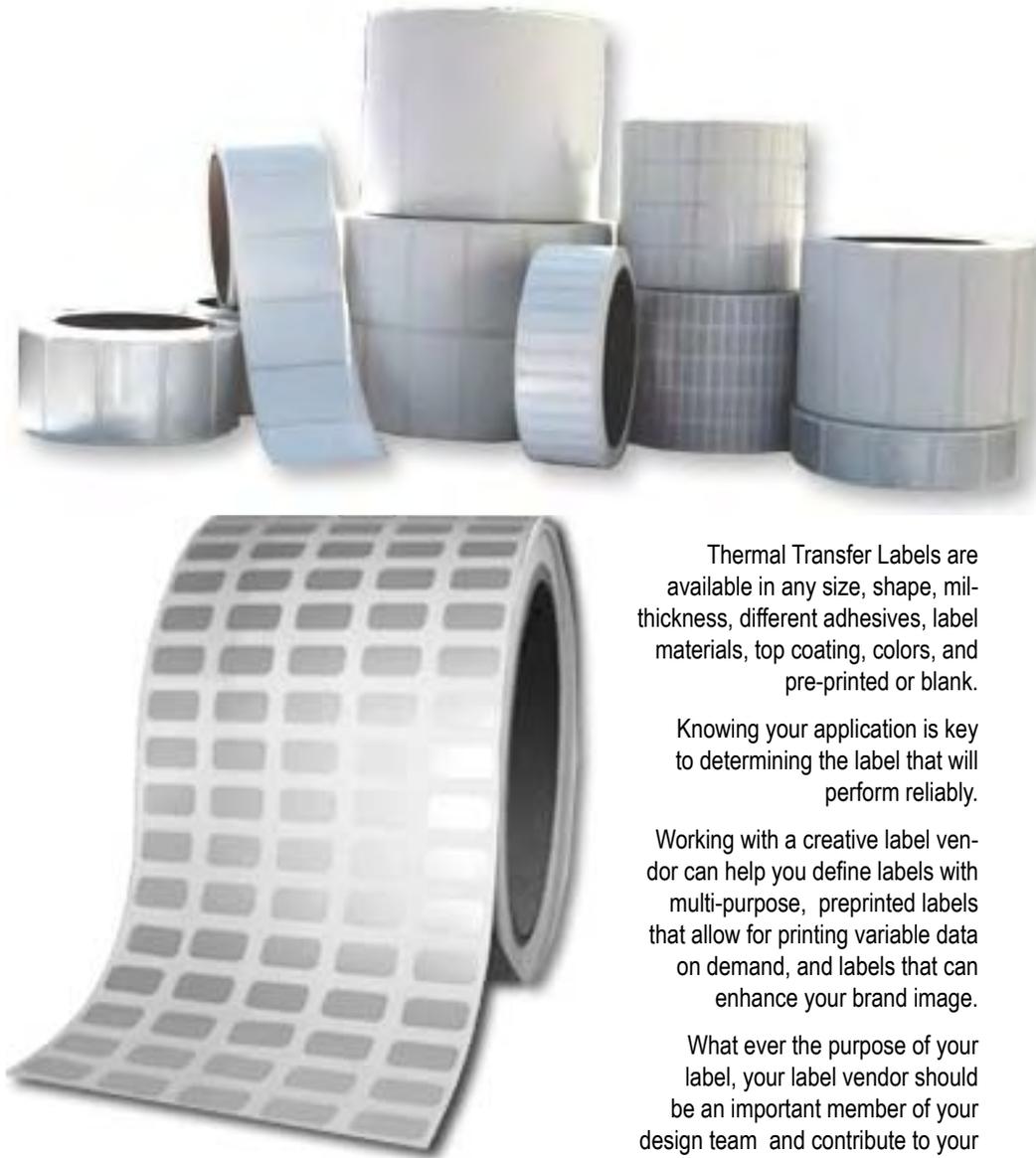
Ordering Your Thermal Transfer Labels

When purchasing your Thermal Transfer labels, you will want to consider a label vendor who:

- Can offer a wide selection of standard sizes.
- Offers short runs as well as the ability to handle large volume label orders.
- Helps you select the right labeling material to perform in your application even in the harshest environments such as chemical exposure, outdoor elements, moisture, freezing and high temperature and more.
- Has a proven track record for providing creative labeling solutions to align with your budget in mind.
- Unique die cuts and shapes, roll, fanfold, sheet fed labels.
- Labels made in USA.
- Turn around time to meet your needs.

Direct From The Manufacturer For Quality Labels and Faster Turnaround

There are several benefits of dealing directly with a label manufacturer. One of the most important things to look for is the experience in making and specifying labels. Your label vendor should understand your application as well as the anatomy of the label. Each layer of the label should be considered when matching the label to your application. A label converter has control over the entire label process to ensure quality controls or help you meet strict deadlines.



Thermal Transfer Labels are available in any size, shape, mil-thickness, different adhesives, label materials, top coating, colors, and pre-printed or blank.

Knowing your application is key to determining the label that will perform reliably.

Working with a creative label vendor can help you define labels with multi-purpose, preprinted labels that allow for printing variable data on demand, and labels that can enhance your brand image.

What ever the purpose of your label, your label vendor should be an important member of your design team and contribute to your success.



Case Study

Preprinted Labels with Preprinted Variable Data

This supplier is mandated by the Department of Defense under MIL-STD-130 mandate to provide unit-level labels. Each label requires a unique data string. This particular label would be costly for the supplier to print themselves because 1) it uses reverse print black on silver matte polyester label stock 2) has an overlam for protecting the print and 3) must last the entire life-cycle of the product. By pre-printing the part of the label which does not contain variable data (what you see here) the cost per label is reduced while still allowing for variable data.

The bottom section of the label is blank where variable data, in this case the Unique Identification string of data containing the serial number in a Data Matrix 2-D barcode, will be printed in batches when needed.

The customer saves money, keeps less inventory and is in compliance with MIL-STD-130.



Preprinted, Two Color Labels for Printing On Demand

Printed on a glossy, silver polyester label material, this label can be used in two ways. One application is to use it as is. The durable material lasts, and the two color graphical layout enhances the corporate image. This same label can also be printed on demand. When variable data is required in a labeling job, the customer uses their existing thermal transfer printers and prints in the blank area at the bottom. The customer has consistent, high quality image that 1) saves time because they don't have to change rolls of labels in printers 2) cuts costs with efficient ordering, and 3) reduces waste by using one label for two applications.

Using Preprinted Labels To Save

In addition to offering bright, colorful graphics, preprinted labels can be used in many different ways. Whether your application calls for graphics, multiple colors, paper or durable labels as printed or combined with printing on demand, your labeling jobs can become more efficient and economical by:

- Ordering in larger quantities when applications are combined
- Save time changing rolls of labels in your printers
- Save on managing different label inventories
- Provide a consistent look for your business
- Save time ordering and maintaining art for several labels
- Reduce waste

Variable Data on Preprinted Labels

When serial numbers, lot numbers, expiration dates, and other variable data is required for your labeling jobs, preprinted labels may be an economical and efficient way to go and still offer you the flexibility to print variable information on demand.

You can still have labels with top coats, overlaminates, and other finishes by specifying this at the time of your order. Specific areas will be allowed in the design for Thermal Transfer printing later on.

Preprinted labels are just one example of how you can improve your labeling process and business operations. When was the last time you took a close look at your labeling? Are you experiencing slow downs in production? Do you need to improve your ability to track work-in-process or provide traceability throughout your supply chain?

Labeling Solutions For Electronic Manufacturing

Printed Circuit Board Labels - Bar code or alphanumeric identification of printed circuit boards are used for tracking production lots, warranty information, product authentication, and registration applications.



Compliance Labels - Labels to comply with the RoHS directive for lead-free manufacturing processes, EIA-standard marking and UL-listed and CSA-certified labels.

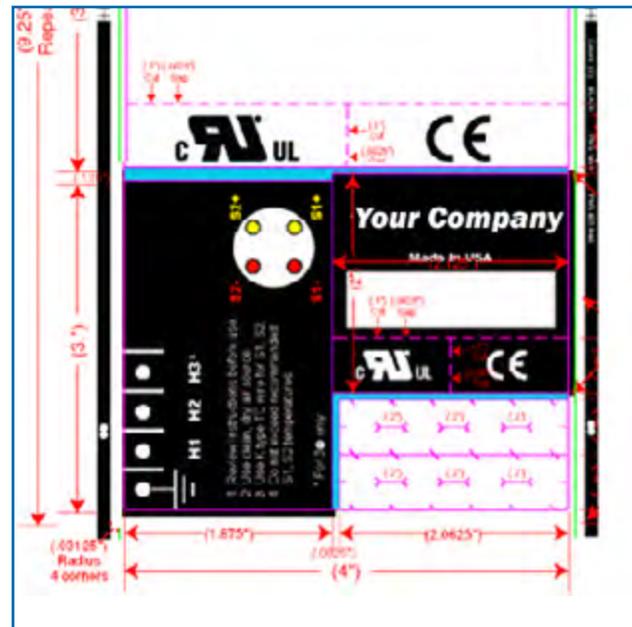


Cable and Wire Identification - Wrap around, ties and specialty labels for cables, wire harnesses and assemblies.

DoD Military Compliance Labels for MIL-STD-129 including RFID for shipping cartons, pallets, and containers as well as MIL-STD-130 Unit Labels including UID. Preprinted labels are available for quick turnaround and 100% compliance.



Kitted Labels are used to speed production labeling, increases the accuracy of complete parts labeling, and drives down label costs.



Preprinted Labels - with eye-catching warnings, graphics, logos, with room to print lot number and other variable information on demand.

Label Printing Systems



Choose from the most prestigious line of manufacturers of Thermal Transfer Printers for reliability and performance in industrial environments. With choices in stationary, mobile, or RFID printers, make sure you take in to account your immediate needs and what you may need in the foreseeable future.

Often times, newer printers will offer upgrade features to handle your future growth needs without the immediate expense as in the case of field-installable RFID encoders.

How do you know when it's time to buy a new printer? Here are some situations that may help you decide:

- With printer pricing coming down, and choices for smaller desktop or mobile printers rising, you may find choosing smaller, centrally located printers— each strategically located where the labeling will take place, will help speed production and lower costs.
- Modern label printers with more computing power can use applications written to simplify things your operators need to replace repetitive jobs and enhance productivity. This is called Smart Printing.
- When you update your ERP system, you find newer models can take XML data streams directly from your ERP software, making the labeling process more efficient.
- With upgrades to your IT Infrastructure, you'll want to make sure that your printers can be network devices, rather than being tethered to individual PCs. Most new label printers come with Ethernet connectivity and many can work with wireless networks, too.
- Great financing and trade in deals.



On-demand printing at the point of activity will save time and operator error when labeling. New, low cost thermal transfer printer models make this possible.

Fast and Easy Ways to Enhance Your Label Printing

By taking a strong look at how your labeling process operates, what equipment you have (or don't have) for which job, and where your equipment is located in relation to the labeling task, can be a great place to look to save money, limit waste, increase employee productivity, and labeling accuracy.



Distributed Printing. Distributed printing is a simple concept: electronically forward the label print job to the point where you need to use it. Instead of sending a label print job to a centralized, high-speed printer, add a few smaller printers in areas where your labeling is needed. In this scenario, you eliminate physical distribution of your labels from a central location to other sites. Think of the savings in time and labor, especially if you use your labels far from where they are printed.

Mobile Printing. Mobile computers have the ability to print, scan and access database information when you need it. So instead of doing your labeling at a PC connected to the scanning and printing equipment, employees can move to where they need to label. With the variety of mobility options available, users can take the computer and printer with them, either on a shoulder belt, on a fork life, or on a cart. Again, the savings in time and labor can reduce the costs of printing labels and improve labeling accuracy.

Smart printing. By using the computing power that is built into modern label printers, you can create some simple apps to enhance productivity. These printers integrate the memory and processing power of a personal computer so that you can run print operations without a PC or a network connection to a host computer. With smart printers, you add scalability and flexibility, letting you add devices or upgrade existing ones as your needs change, all without stressing your IT support structure.

Printer and Scanner Repair and Maintenance. Labeling might not seem to be a key factor in operating your business, but once your labeling equipment fails, it suddenly is very important. Keeping your equipment in proper working order is essential for proper labeling. With proper maintenance, you stop problems from occurring in the first place and keep your labeling up and running. In the long run, service plans offer some cost savings and give you one less thing to worry about.

Pre Printed Labels. It might be more efficient and less costly to outsource your label printing. You can have the entire label printed in one or many colors, or have sections of the label left blank for you to print variable information on demand and as needed. This gives you the most economical way to use your labels by reducing waste when information or graphics change.

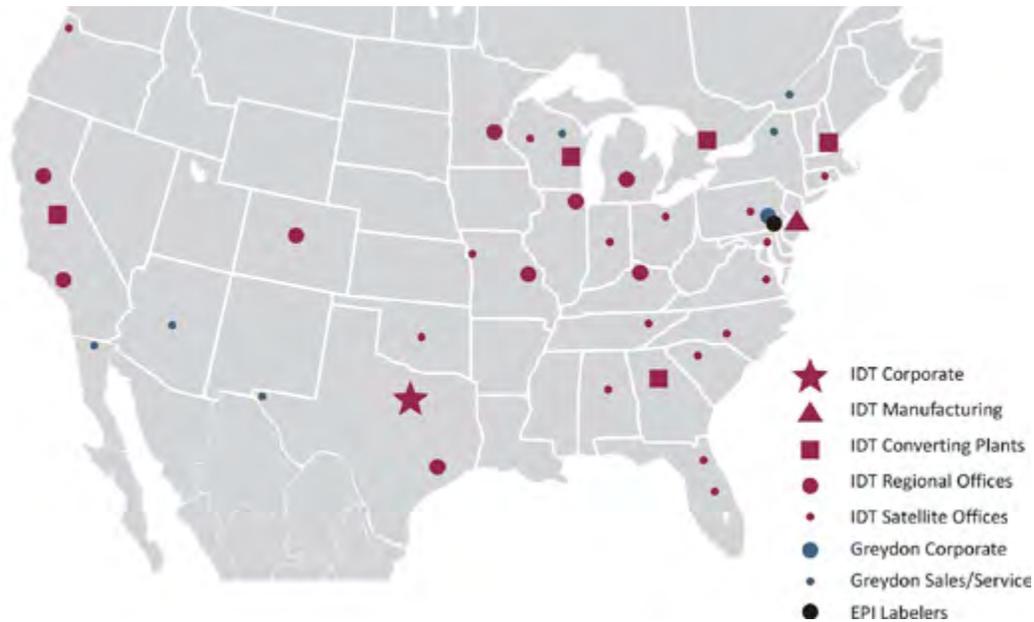
Mobile Workstations makes it easy to bring on-demand printing to where you need it, when you need it. These self-powered carts allow you to maximize the use of your printers and labeling supplies for new levels of control and flexibility.

The Complete Solution with ID Technology

ID Technology delivers innovative and reliable bar code and specialty label printing solutions, designed to meet your specific business application. We can assist you in selecting the right product, the proper ribbon, the correct labeling materials, exact sizes, and even distinctive shapes - all backed by our after-the-sale field service to simplify your label and bar coding experience. What makes ID Technology different?

- ID Technology manufactures labels and understands how every aspect of the label must be designed to meet and exceed longevity, performance and formatting requirements of your application.
- We have been designing bar code and labeling systems for decades in many different industries. We understand the challenges of the most demanding client applications.
- There are label converting and printing operations across the US to deliver the kind of service to ensure your labeling success.





ID Technology, with six full service converting facilities, is ready for your label challenge. Whether you need simple 1-color labels or complex, high quality decorative labels, ID Technology has the expertise and capacity to fulfill your barcode and labeling needs.

Plants in Fort Worth, TX, Pewaukee, WI, Fresno, CA, Marietta, GA, Nashua, NH and Mississauga, Canada produce blank and shell labels for use in thermal transfer printers, multi-color flexographic labels for prime labeling and digitally printed short run labels. Locations around the country mean easier scheduling, redundant capacity and reduced shipping costs.

Our label specialists know the importance of correctly matching inks, coatings, substrates and adhesives for each application. This expertise along with our in-house design, art re-origination and plate making ensures the highest possible label performance.

ID Technology, along with Greydon and EPI Labelers, is part of Pro Mach Labeling & Coding.



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Identification Labeling

Durable Labels for Harsh Environments
Unique Sizes, Shapes, Color or Black/White
Barcode or Text, Preprinted or Blank
RFID SmartTags
Sequential Numbering
Asset Tracking Labels
Tamper Resistant

Bar Code Solutions

Print and Apply Labeling Systems

Thermal Transfer Overprinters

Inkjet and Laser Coders

Service and Support

