

8000 State Road, Philadelphia, PA 19136
800-523-0856 • 215-335-4310 (Fax)
Certified to ISO 9001:2008 | AS:9100
www.cwthomas.com

About CW Thomas

Since 1946 CW Thomas has been an innovator in heavy-gauge plastic thermoforming, using both traditional vacuum forming and advanced pressure forming techniques. We focus 100% on producing products that meet our customers' unique specifications.

From *Your* Design to the Production Line

Bring us your design concept, and we'll help you transform your idea into reality. Or, if you want to reengineer a metal enclosure that's too heavy or prone to dents and damage, we'll help you turn it into a lighter weight, plastic enclosure with high-impact resistance. We can:

- Review your design and provide advice to make it easier and less costly to manufacture the product
- Design and build your tooling in house
- Create prototypes rapidly
- Manufacture and assemble your product

Our one-stop shop enables you to value-engineer your product or part, improve manufacturability, and shrink your time to market.

Quality You Can Trust

Our robust Quality Management Program assures that we meet the most stringent engineering and technical specifications. From customer-supplied design to final packaging, it incorporates procedures and standards for process control.

Our quality certifications include ISO 9001:2008 and AS:9100, which includes requirements specific to the aviation, space and defense industries. And because we work with thermoformed plastics that have UL 94V0, CSA, CE, RoHS and REACH certifications, you'll be confident that your product meets requirements.

Proven Expertise in Medical and Transportation Industries

We have a proven track record in the medical industry, working with companies such as Siemens and Draeger Medical. And, in 2009, we won a Medical Design Excellence Award (MDEA) for a microbial detection system that we had produced for BD Diagnostics.

Also, our experience in the aerospace and railcar markets includes producing seating components, interior panels and more for rolling stock manufacturers and airlines. They travel globally aboard trains for Amtrak, PATCO, Metro-North Long Island Rail Road, SEPTA and VIA Rail Railroad, along with Rail Car Builders such as Bombardier and Kinisharyo, as well as on board aircraft for Air China, Air France, British Airways, American, Lufthansa and Qatar and Delta.

Finally, we work with a variety of original equipment manufacturers from start-ups to world-class companies.

To learn more about how CW Thomas can help you with your new product or part, call **215-335-0200** or email sales@cwthomas.com. | www.cwthomas.com



AEROSPACE

Our first-class and business-class seating components including seat backs, video bezels, snack trays and more, can be found on some of the most prominent airlines around the world.



Pressure Thermoforming for Comfort, Safety and Refined Aesthetics In Aircraft Seating

Manufacturers of first-class and business-class seating often choose pressure thermoforming for impact-resistant plastic parts, including seat-backs, video bezels and snack trays because it is versatile, aesthetically pleasing, durable, economical, safe and offers quick turnaround.

Enduring Beauty

The combination of air pressure and vacuum, along with more sophisticated processing controls that better monitor tool and sheet temperatures, enable the delivery of consistent parts, precise detail and intricate undercuts. Parts can be made with great depth and functionality, and include embedded logos, reverse angles and very few seams.

By utilizing positive air pressure, we force the plastic material into the small crannies of the mold. Features such as small tight corners, selective texturization of the part, ribs, and molded-in vents can be more accurately formed. All this, without the wall thinning or additional processing is common in more customary types of thermoforming.

Maximum Value at Minimum Cost

Pressure forming is economical if you need a prototype or need to produce less than 5,000 pieces a year. Because of lower, up-front tooling costs, we produce parts at a fraction of the total-project cost for injection or structural-foam molding. And, since you can produce several small parts from one tool, you'll save even more on a multi-part assembly.

Shrink Your Time to Market

Because tooling manufacture time for thermoforming is about half as long as for injection molding, you can expedite your design process and time to market.

Quality and Safety You Can Count On

Our quality certifications include ISO 9001:2008 and AS:9100.

The materials we use are compliant with FAR 25.853(a) and FAR 25.853(d) as well as ABD0031 and D6-51377. Thus, we are in compliance for the Boeing and Airbus flame, smoke and toxicity requirements and provide the required physical, chemical and aesthetic properties for aircraft interiors' durability and appearance.

Our Seating Components Fly High

Our seating components travel the world on Air China, Air France, British Airways, Continental, Lufthansa and Qatar. We leverage the knowledge we've built by working with airline-industry seating-integrators to review your design and provide advice to value-engineer your part, increase manufacturability, and speed up part production.

Weight Savings

Pressure formed materials are lighter in weight thus saving energy for the aerospace industry.

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Aerospace Projects

We make seating components for First Class and Business Class seating.





MEDICAL

Plastic covers, enclosures and components for in vitro diagnostic units
for a wide range of medical and veterinary laboratory tests



Pressure Thermoforming for Plastic Components In Medical Diagnostics Equipment

There are sound reasons why manufacturers of medical diagnostics equipment choose pressure thermoforming to create plastic parts and products:

- The whirlwind of change in medical technology necessitates faster new product design-cycles. Plastic thermoforming, which enables rapid prototyping and speeds product development, rises to the challenge.
- Pressure thermoformed plastic parts are ideal for high-quality, large, multi-part enclosures such as housings or covers for mechanical and electronic components in medical equipment.

An Attractive, Time and Money-Saving Alternative

Tooling production time for pressure thermoforming is about half as long as for injection molding and far less costly for volumes between 10 and 5,000 a year. Thus, for short and medium run projects, pressure thermoforming expedites your design process and time to market at a fraction of the total project cost.

And, you don't have to give up design flexibility or quality. Thermoforming allows for sharp details, crisp lines, tight corners, embossed logos, selective texturizing and an endless palette of colors. Also, you can use lips (undercuts) to mate parts seamlessly. Finally, because thermoformed plastic provides high impact strength, it stands the test of time.

Custom Medical Products

We can make covers / enclosures for any of the following medical diagnostics equipment for you ... and much more:

- Flow Cytometry diagnostic equipment
- Imaging equipment
- Cell preparation systems
- Blood analysis equipment
- Cell imaging systems
- Products for tissue culture and fluid handling such as centrifuges, shakers and incubators
- In vitro diagnostic equipment
- Neo-natal baby-care stations

Materials Comply with Global Standards

Our pressure thermoforming materials and processes comply with stringent global safety standards for medical equipment. We use plastic materials that meet UL94-V0 flammability specifications, and brominates void of PVC content as required to meet European standards such as REACH and RoHS.

Recognized for Design in Medical Diagnostics

CW Thomas supplies plastic parts and products to laboratory equipment companies and leading original equipment manufacturers (OEMs) such as Siemens and Draeger Medical. In 2009, we won a Medical Design Excellence Award (MDEA) for a microbial detection system that we had produced for Becton, Dickinson and Company.

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Medical Projects

These are all medical devices. We make components and enclosures for this market.





RAIL TRANSPORTATION

Pressure and vacuum formed parts for items such as interior ceiling
and wall panels, window masks and baggage racks

Our products can be found in trains all over North America.



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Thermoformed Interior Parts for Transit Authorities and Railcar Manufacturers

There are plenty of good reasons why transit authorities and railcar manufacturers use heavy-gauge vacuum and pressure thermoforming extensively. It's cost effective for producing large parts, such as ceiling and wall panels, window masks and those components with multiple pieces, such as baggage racks. In addition, tooling lead times that are substantially shorter than for injection molding tools put your project on the fast track. Finally, thermoforming comes with a full spectrum of color options along with a full range of value-added assembly services.

Our Role in Rail Car Interiors

If you need parts for rail car interiors, we'll assist you with design reviews, tooling, production and assembly. Products created to your design specifications include window masks, ceiling and wall panels, seat backs, armrests, door pockets, baggage racks, vents, ducts and more. Also, we offer graffiti-resistant films for use on side-wall panels and seat shrouds, facilitating design options that are long lasting and aesthetically pleasing.

Our exacting standards have resulted in us being approved as a plastics parts supplier to organizations such as Amtrak, PATCO, Metro-North Railroad, Bombardier and Kinkisharyo.

Quality and Compliance You Can Count On

The materials we supply comply with the flammability and smoke emission requirements for transit materials with products that meet the rigorous requirements of both the SMP 800C and Boeing BSS 7239. Our quality certifications include ISO 9001:2008 and AS:9100.

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Rail Transportation Projects



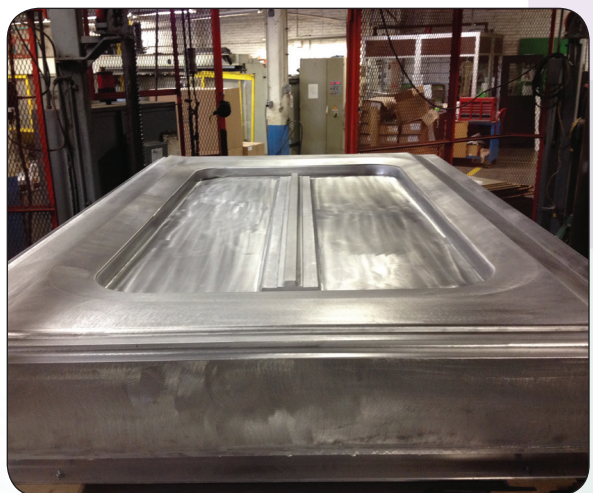
Prototype Window mask mold



Railcar interior seating



Railcar Window masks



A window mask mold



Whether you are an entrepreneur or working for a world-class organization,
if you need a heavy-gauge plastic cover, enclosure tray or guard,
we'll take your design to the production line.



Thermoformed Heavy-Gauge Plastic Parts for Original Equipment Manufacturers and Industrial Applications

If your new product needs a heavy-gauge plastic cover or enclosure, it's easier than ever for you to launch it. Whether you work for a start-up or world-class organization, we'll help you take it from your design to the production line.

Original Equipment Manufacturer (OEM) and Industrial Applications

A few examples of our wide range of applications include:

- **Aircraft** seating components
- **Enclosures** for medical devices, dispensers, tail lights, electrical boxes and others
- **Inserts** for refrigerators, laboratory shakers and in vitro diagnostic equipment
- **Covers** for dispensers, exhausts and cab fronts
- **Guards** for motors, gears and fan belts
- **Dashboards** for construction equipment and forklifts
- **ATM** machine covers
- **Bread-proofing** trays
- **Rail transit window masks**, ceiling and side panels and other interior parts

The list is endless. The bottom line is that if heavy-gauge plastic is required in your product, bring us your initial design on anything from a napkin to computer-aided design (CAD) drawings, and we'll turn it into reality.

From Your Design to the Production Line

Our first step is to review your design with you to assure we've explored all options to improve manufacturability, cost-effectiveness and time to market. Then, we'll design and build your tooling in-house, rapidly create prototypes, and once you approve the final design, we'll manufacture and assemble your product. Think of us as an extension of your company – your custom manufacturing department.

Vacuum and Pressure Thermoforming

Our specialties are vacuum and pressure thermoforming. Use vacuum thermoforming for the most economical solution when parts don't require aesthetic elements. And, put pressure thermoforming to work when you need sharp details, crisp lines, tight corners, embossed logos and selective texturizing.

Impeccable Quality

Our robust Quality Management Program assures that we meet the most stringent engineering and technical specifications. From your design to final packaging, it incorporates procedures and standards for process control.

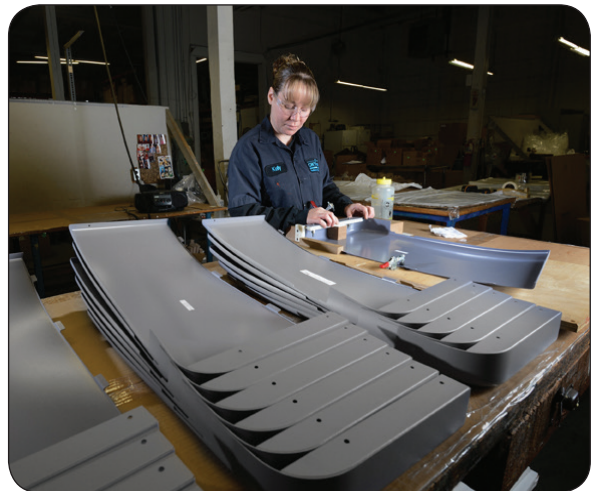
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OEM Projects



Properly designed molds and trim fixtures made from the correct choice of materials will transfer into a consistent quality finished part for the life of your program.



Parts can be assembled for fast installation.



Our state of the art equipment can take on any project large or small.



Medical Device enclosures awaiting the trimming and fabrication phase of our process.

Pressure Thermoforming For Refined Aesthetics in Heavy-Gauge Plastic

During our pressure forming process, we heat a sheet of plastic, drape it over a mold and evacuate the air from between the plastic sheet and the mold as we apply air pressure from the opposite side of the sheet, bringing definition to design details.

When to Use Pressure Thermoforming

Use pressure thermoforming to produce injection-mold quality, attractive plastic component parts, housings and containers. Its advantages include:

- **Enduring Beauty**

You can produce sharp details, crisp lines, tight corners and embossed logos. Plus, you can selectively texturize pieces. And, because thermoformed plastic has higher impact resistance than injection-molded parts, it'll stand the test of time.

- **Low-Cost Tooling**

Tooling costs for pressure forming are substantially lower than for injection molding, making it the natural choice for short (from 10 pieces/year) to medium runs (up to 5,000 pieces/year). It's perfect for prototyping, market trials and short life-cycle products. And, since you can produce several small parts from one tool, you'll save even more on a multi-part assembly.

- **Quick Turnaround**

Compared to injection molding, pressure thermoforming cuts tooling lead times virtually in half, enabling you to meet your tight deadlines.

- **Design Flexibility in a Rainbow of Colors**

Pressure forming gives you the options of creating unique shapes and model geometry that you could not do with traditional vacuum forming methods. This modeling, coupled with advanced CNC machining, allows you to include features such as vents, lips, or undercuts to mate parts seamlessly. You can also create "deep drafts" (a hollowed-out area in the plastic). Deep drafts provide design flexibility for ergonomic features and more. With the advent of custom colors and painting technology, an endless palette of colors adds to your design options.

Design Guidance Improves Products, Processes and Price

We'll review your design and advise you on how to make it easier and less costly to manufacture. Perhaps there's a way to transform two pieces into one, or snap them together instead of gluing them (in order to cut) assembly costs. Or, if your product includes powder-coated or painted sheet-metal, we may be able to transform it into high-impact plastic that resists dents and scratches and takes less time to produce. We have many more out-of-the-box solutions we can use to optimize your product.

Vacuum Thermoforming For Cost Effective Heavy-Gauge Plastic Parts and Products

Vacuum thermoforming is simpler and even more economical than pressure thermoforming for producing plastic parts and products. We heat a sheet of plastic, drape it over a mold and extract the air from between the plastic and the mold. That's it. Unlike pressure thermoforming, no pressure is added to bring definition to design details.

When to Use Vacuum Thermoforming

We recommend vacuum thermoforming for producing plastic items that don't need aesthetic refinement such as components, that may be hidden inside equipment. When you use vacuum thermoforming, you'll benefit from:

- **Lowest-Cost Tooling**

Tooling costs for vacuum thermoforming are substantially lower than those for injection molding, and also lower than tooling for pressure thermoforming. So, if you don't need refined details, such as sharp edges and embossed logos, and, you only require short (from 250 pieces/year) to medium runs (up to 5,000 pieces/year), vacuum thermoforming is a good choice. It's perfect for prototyping, market trials and short life-cycle products. And, since you can produce several small parts from one tool, you'll save even more on a multi-part assembly.

- **Quickest Project Turnaround**

When compared to injection molding and pressure thermoforming, vacuum thermoforming offers the quickest turnaround time. It enables you to meet the tight deadlines required in competitive, ever-changing markets.

- **Ability to Make Large Parts**

We can create parts up to 60" x 104".

- **A Wide Array of Colors**

Design Advice Results in Better, Less Costly Products

We'll review your design and advise you on how to make it easier and less costly to manufacture. Perhaps we can help you cut assembly costs by changing two pieces into one. Or, maybe we can make your powder-coated or painted sheet-metal enclosure more durable by using high-impact plastic instead. You'll not only say goodbye to dents and scratches, you'll also save on production time. Whatever the challenge, we'll put on our creative thinking caps to generate creative solutions to optimize your product.