



SMS group

AEROSPACE/INDUSTRIAL CUSTOM INJECTION & COMPRESSION MOLDING

HyComp Inc. is a fully integrated manufacturing facility located in Cleveland, Ohio. We specialize in the manufacturing of composite and plastic aerospace and industrial parts either compression or injection molded in a vast array of materials. With a full staff of engineers, chemists, and manufacturing specialists, HyComp is able to provide complete services including:

- [Injection molding](#)
- [Compression molding](#)
- [Materials selection](#)
- [Part design](#)
- [Machining](#)
- [Quality](#)
- [Tool design](#)

HyComp Inc. Background

HyComp opened for business in 1986 dedicated to providing stronger polymer components for high temperature applications that would provide savings in both weight and cost. Skilled engineers and chemists were collected with expertise in resins and fiber reinforcements to develop and process elegant solutions for aerospace and industrial applications. One of those developments is the range of proprietary high-temperature, high PV resistant bearing materials, now being used in a vast array of industries to reduce maintenance headaches and costly failures.

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INJECTION MOLDING

HyComp manufactures custom injection molded thermoplastic parts for structural Aerospace and Industrial products. Our state of the art equipment allows us to process the most advanced materials:

- **PEEK (PolyEtherEtherKetone)** – Is a high performance thermoplastic that can operate continuously at 480°F. It has excellent chemical resistance with very low moisture absorption. PEEK also carries V-O flammability rating, exhibiting very low smoke and gas emission when exposed to fire.
- **Torlon® (Polyamide-imide)** – Is capable of performing under harsh stress conditions at continuous temperatures of 500°F. It is the highest performing melt processable plastic while providing greater compressive strength and higher impact resistance than most other plastics.
- **Ultem® (PolyEtherimide)** – Is a high performance polymer combining strength and rigidity at elevated temperatures with long-term heat resistance. It also offers tremendous dimensional stability combined with broad chemical resistance.
- **Ryton® (PolyPhenylene Sulfide)** – PPS is inert to steam, strong bases, fuels and acids. Minimal moisture absorption and a low coefficient of linear thermal expansion make it ideal for precise tolerance machined components.
- **PVDF (PolyVinylidene Fluoride)** - Has excellent corrosion and chemical resistance while performing in many applications up to 300°F. It is tough, durable, and easily fabricated into finished parts.
- **PC (Polycarbonate)** - A strong, tough, rigid material that has the ductility of softer, lower-modulus thermoplastics and excellent electrical insulating characteristics. Applications are glazing, appliances, water bottles, and electrical uses.
- **Nylon** - Is a generic name for a family of long-chain polyamide engineering thermoplastics. Nylons are synthesized from intermediates such as dicarboxylic acids, diamines, amino acids and lactams. Typically used in automotive parts, electrical uses, and packaging.

HyComp processes these materials unreinforced or reinforced with carbon fiber, aramid fiber, or glass. Capabilities include molding 20-400 tons, material drying, postcuring to 800°F, and extensive machining.

RYTON is a registered trademark of Chevron Phillips Chemical Company / Torlon is a registered trademark of BP Amoco/ Ultem is a registered trademark of GE Plastics

COMPRESSION MOLDING



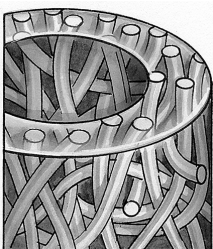
HyComp manufactures custom compression molded Thermoset parts for various industries. Our advanced equipment in this area allows us to make stock plates, custom bushings, and a variety of custom shapes. Materials used when compression molding are WearComp®, FibreComp®, GlasComp®320, Phenolics, epoxy, and the newest addition FibreComp® 500. Capabilities include molding from 25-500 tons, material drying, postcuring to 800°F, and extensive machining.

PROPRIETARY COMPOSITES

Self-Lubricating Bearings, Insulators, Wear Items

WearComp®, **WearComp®200**, and **FibreComp®** are the proprietary composite self-lubricating bearings produced by HyComp. These materials have been developed using sophisticated resin chemistry and fiber know how, utilizing years of experience in the processing of high performance resins. The manufacturing process for these products is truly integrated and starts with the manufacturing of the base resin and finishes with the final machining of the bearing in both flat and round shapes. WearComp® and FibreComp® are marketed towards industrial markets where equipment bearing life is important. HyComp strives to reduce downtime and reduce or eliminate lubrication where it is essential for product quality or environmental concerns. Materials are available in stock shapes including; plates, bushing blanks, rod stock, and as finished machined parts.

WearComp® - Ideal for low speed, high load, high impact applications



FibreComp® - Ideal for high speed, medium load, low impact applications

WearComp®200 - Ideal for medium speed, high load, high impact applications

SECONDARY MACHINING

Our extensive machining operations finish molded parts to exact tolerances, providing customers with parts complete to their specifications. Our machines include:



- CNC vertical machining centers
 - 20 x 40 x 20 capabilities
 - 4th axis capabilities
- CNC turning centers
 - 4th axis capabilities
 - Live tooling capable
- Surface grinding
 - Up to 48 x 60
- Honing ID and OD grinding
- Multiple milling and turning machines
- Full welding capabilities for all materials

TOOL DESIGN

HyComp's capabilities in this area include extensive knowledge of injection and compression molding tool design. Using AutoCAD 14, IGES, & Step Files to aid in the design and a full in-house machine shop for manufacturing, HyComp is capable of producing all different types of tools including; hot runners, slides, multi-cavity, prototypes, and insert molds.



PART DESIGN

HyComp's staff is composed of mechanical engineers, chemists, certified tool and die makers, and degreed applications engineers. Their collective expertise is at our customers' service:

- CAD/CAM for component and tooling design.
- Tribological Wear Testing.
- Engineering consultation backed by an archive of thousands of actual applications in numerous industries.

PART DESIGN (cont.)

- Advice on techniques for machining and grinding of various grades of metals, plastics, and composites.
- Quality Control program that meets the strictest aerospace requirements.
- Trained manufacturer's agents located around the US and Canada who can visit customers and help assess potential applications on site.
- Materials selection
- Part Qualification

QUALITY

Full service inspection capabilities

- In process verification to control variation including both SPC (statistical process control), and CMM (coordinate measurement machine) capabilities to ensure final product inspection meets customer specifications as well as verifying our tooling and ability to reverse engineer. Instron
- This machine lets us physically test materials to ensure they meet all customer requirements.

Certification

- SAE AS 9100B and ISO 9002 Registered

HyComp Inc. CUSTOMERS

Aerospace Customers

G.E. Aircraft Engines
Pratt & Whitney Canada
Rolls-Royce
Hamilton Sundstrand
Honeywell
Goodrich
Moog

Industrial Customers

Emerson Electric
Goodyear
Alcoa
US Steel
Micro Precision Textron

HyComp Inc. Applications

Bushings
Wear Pads
Seals
Wear Rings
Coil Bobbins
Valve Components & Covers
Shrouds
Vanes
Inlet Guide Vanes
Gear Segments
Pistons
Poppets



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