Total production control from concept through manufacturing . . . all under one roof
Dynatect’s Ro-Lab Division is a custom-molding manufacturer that specializes in the design and production of specialty or wear components.

Dynatect helps both OEMs and end-users with part performance challenges such as abrasion, corrosion, and heat. Dynatect’s polyurethane and rubber offer the broadest range of solutions for any challenge.

Dynatect solves customer problems with expertise in the following areas:

- Combining two elastomers with different hardness into one molded product
- Formulating elastomer for abrasion, cut, tear, fatigue, or rebound
- Supporting a full variety of hardness span from sacrificial material to low-wear
- Coloring any elastomer
- Drawing from a reference library of 300 recipes for custom material formulation
- Strictly controlling material composition and purity
- Molding of exceptional sizes: thin or intricate parts, thick parts, long-length parts
- Insert molding of metals, textiles or ceramics into rubber or polyurethane
- Using engineered elastomers to replace wood, metal, or plastic
- Meeting high aesthetics (including RMA-F1 standard*)
- Close tolerance molding (including RMA-A1 standard*)

* When specified, Dynatect meets quality standards developed by the Rubber Manufacturers Association (RMA).

Our Process

Dynatect provides full support through every step of the component life cycle: part design, material selection, process selection, prototyping, and production. It begins with the design collaboration and continues with first article inspections, dimensional validation and part traceability.

1. You describe your application
   - Example: The product is used under 5000 lb. load and the wheels move at 6 miles/hour
   - Example: My product fails prematurely and it is used in a hot caustic bath

2. We propose an initial design and describe critical properties for success (such as abrasion, oil-resistance, etc.)
   - 3D Printing and Soft Tooling
   - Prototypes
   - FEA & Closed Solutions
   - D.F.M. (Designed for Manufacturability)

3. We recommend an elastomer formulation
   - Polyurethane:
     - Polyether
     - Polyester
     - Specialty
   - Rubber:
     - Natural
     - Nitrile
     - SBR
     - Silicone
   - Plastics

4. We choose a molding process
   - Hot Cast and Ambient Cast Polyurethane
   - Injection Molding for Plastic, Rubber and Urethane
   - Compression Rubber Molding
   - Transfer Molding
   - RIM (polyurethane)
Many custom molders are adept at meeting the basic operational and quality requirements of components. Dynatect moves beyond the status quo and provides game-changing benefits that improve customers’ products or processes. Dynatect’s success is founded on listening and delivering the benefits that customers value.

**Reduce Downtime with Superior Chemistry and Design**
- Increase product lifetime with improved durability (Abrasion/cut/tear/flex-fatigue)
- Improve the slip or grip of components with targeted polymer formulas for ideal friction characteristics
- Mix performance needs with dual material molding (replace a single material which can’t meet multiple attributes like core rigidity and surface friction)
- Minimize interference with interdependent parts
- Reduce cleaning with improved resistance to chemicals, corrosion, or microbes
- Reduce costs of automation and shipping by reducing weight

**Support Brand with Superior Cosmetics**
- Support brand quality with high-quality finish components
- Support brand recognition with custom component colors
- Reduce after-sale quality claims by minimizing the potential for cracking, staining, or skid marks

**Manage End-Of-Life Repair vs. Replacement**
- Increase end-user demand for repair or replacement components with polymer wear indicators
- Re-use expensive core materials by coating with a sacrificial polymer and recoating as needed
- Lower MRO costs by recoating rather than replacing components used for intentional abrasion, chipping, pitting, etc.

**DYNATECT RO-LAB QUICK FACTS**
- Founded in 1906
- Over 110 yrs. experience in custom engineering
- Industry experience: medical, mining, military, commercial, construction, food processing, agriculture, oilfield, energy
- 100 presses (25 to 50 in. wide)
- Press tonnage up to 2500 tons
- Rubber platens up to 20 ft. long
- Oven capacities up to 2800 cubic ft. (20’x12’x12’)

**POLYURETHANE ADVANTAGES**

**Consider Polyurethane Over Plastic/Metal/Rubber to Improve Your Design.**
Polyurethane is a surprisingly versatile material that can bring a solution to your most challenging design applications. It offers load bearing capabilities, abrasion resistance and impact absorption in a single material, which may be preferable compared to using plastic, metal or rubber (see below). In many instances, it can produce significant cost savings by eliminating coating or painting, expensive tooling or machining operations. Some tooling is required, but is often much easier to produce than the tooling required for the other materials.

**Polyurethane Advantages Over...**

**Plastic:**
- Lower Tooling Costs
- Faster and Better Prototype Accuracy
- Higher Wear Resistance
- Higher Durability

**Metal:**
- More Cost-Effective
- Lighter Weight
- Faster Lead Time
- Elevated Corrosion Resistance

**Rubber:**
- More Cost-Effective
- Low-Pressure Tooling
- Higher Load-Bearing Capacity
- Higher Wear Resistance
DYNATECT RO-LAB PRODUCT EXAMPLES

- **Material:** Open Cast Polyurethane  
  - **Industry:** Test & Measurement  
  - **Function:** Non-conductive material required for testing of consumer products

- **Material:** Compression Molded Polyurethane  
  - **Industry:** Medical Equipment  
  - **Function:** Lower cost tooling than plastic, cost-effectively produced at low volumes

- **Material:** Compression Molded Neoprene  
  - **Industry:** Laboratory  
  - **Function:** Conductive carbon rubber bottle tops for lab use

- **Material:** Compression Molded Polyurethane  
  - **Industry:** Commercial - Entertainment  
  - **Function:** Audio speaker cones  
  - **Function:** Meets zero-defect requirement for superior sound quality

- **Material:** Compression Molded Polyurethane  
  - **Industry:** Commercial  
  - **Function:** Seal for artificial diamond-manufacturing machine  
  - **Function:** Complex molding process to meet required size, shape, and consistent thickness

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  - **Industry:** Commercial - Sports Equipment  
  - **Function:** Ball throwing wheel  
  - **Function:** Dual durometer molding to achieve superior balance and ideal surface friction characteristics

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  - **Function:** Cost-effectively produced at low volumes

- **Material:** Compression Molded (yellow); Open Cast (black) Polyurethane  
  - **Industry:** Material Handling  
  - **Function:** Caster wheels  
  - **Function:** Excellent load-bearing characteristics with minimal heat build-up

- **Material:** Injection Molded SBR Rubber  
  - **Industry:** Construction  
  - **Function:** Shower pan gasket  
  - **Function:** Cost-effectively produced at low volumes

- **Material:** Compression Molded Polyurethane  
  - **Industry:** Construction/Utility  
  - **Function:** Seal used on utility truck  
  - **Function:** Meets low temperature requirements  
  - **Function:** Cost-effectively produced at low volumes
- **Material:** Natural Rubber
- **Industry:** Construction
- **Function:** Drill rod wiper used on HDD machines to clean water, mud, and soil from external rod surfaces
- Developed to ensure repeatable, long-life part performance

- **Material:** Polyurethane
- **Industry:** Construction & Paving
- **Function:** Track pads for track-driven construction vehicles, protects pavement from damage.
- Superior abrasion, developed for high utilization and dry traction areas

- **Material:** Polyurethane
- **Industry:** Construction
- **Function:** Pipe guides, guides and supports HDD drill pipes
- Must resist outdoor temperatures and heat build-up
- Developed for rugged conditions

- **Material:** Compression Molded Polyurethane
- **Industry:** Agricultural/Food Processing
- **Function:** Seal for fruit peeling and coring
- Designed to resist acidic juices and cleaning agents

- **Material:** Compression Molded Nitrile
- **Industry:** Agriculture/Food Processing
- **Function:** Fruit slicing chuck
- Cost-effectively produced at low volumes

- **Material:** Injection Molded Natural Rubber
- **Industry:** Agriculture/Food Processing
- **Function:** Fruit Pitter
- Durometer is critical in this application (too hard and part damages fruit; too soft and the fruit pushes through)
- Cost-effectively produced at low volumes

- **Material:** Compression Molded Polyurethane
- **Industry:** Paper Converting
- **Function:** Mixing paddle for sauce
- FDA material, designed to withstand heat and vegetable oils

- **Material:** Compression Molded Polyurethane
- **Industry:** Paper Converting
- **Function:** Abrasion-resistant laminator wheel used in cardboard production

- **Material:** Open Cast Polyurethane (shaped on lathe)
- **Industry:** Material Handling
- **Function:** Conveyor belt to move material
- Excellent abrasion-resistance

- **Material:** Compression Molded Nitrile Rubber
- **Industry:** Oil and Gas
- **Function:** Oil-Resistant bellows for offshore rig to seal out elements from a brake cylinder

- **Material:** Low Pressure Injection Polyurethane
- **Industry:** Transportation
- **Function:** Corner unit of bus bumper
- Special RMA-A1 finish applied
- Unusual size adds complexity to molding process

- **Material:** Compression Molded Nitrile Rubber
- **Industry:** Military
- **Function:** Sheet rubber (industrial use)
- Can be made from 1/2" to 3" thick and up to 30 ft. long
- Can be molded to close tolerances

- **Material:** Polyurethane
- **Industry:** Construction
- **Function:** Pipe guides, guides and supports HDD drill pipes
- Must resist outdoor temperatures and heat build-up
- Developed for rugged conditions
HOT CAST URETHANE MOLDING CAPABILITIES

Compression Molding
Liquid polyurethane is poured into a mold and cured in a compression press with capacities up to 250 tons. This technique is most suitable for components that must maintain dimensional accuracy and repeatability.

- Dynatect Ro-Lab’s 1,400 ton compression press is ideal for large molds or thin sheets with close tolerances
- Multi-cavity molds can produce parts down to two grams
- Continuous curing for long, uninterrupted items
- A preferred process for gaskets, seals and O-rings

Liquid Injection Molding
Injection of polyurethane into a closed mold under low pressure. Ideal for projects in which a component size, shape, or tooling configuration would make compression molding impractical.

- Effective in forming extremely large products with very light weights
- Able to improve or eliminate secondary operations
- Workable for flexible or rigid products in foams or solids
- Delivers reliable control of components with varying wall thickness

Open Cast Molding
The pouring of polyurethane into an open mold, which is then cured in an oven or on a heated table.

- Usable on part sizes from less than an ounce to more than 500 lbs.
- Excellent for projects where conventional tooling would be expensive or impractical

Spin Cast Molding
Dynatect’s innovative spin casting technique results in dual durometer wheels with excellent balance and high cosmetic appeal. Centrifugal force is used to uniformly distribute material in the mold.

RUBBER MOLDING CAPABILITIES

Compression Molding
A straightforward elastomeric molding method involving placement of raw rubber into a two-part heated mold, followed by compression of the rubber in the mold to form and cure the thermoset material under heat and pressure.

- Dynatect Ro-Lab’s 1,400 ton compression press is ideal for large molds or thin sheets with close tolerances
- Multi-cavity molds can produce parts down to two grams
- Continuous curing for long, uninterrupted items
- A preferred process for gaskets, seals and O-rings

Injection Molding
A more complex process that injects preheated material into the cavities of a closed mold.

- Delivers faster curing times than compression or transfer molding
- Shortens cycle times
- Ideal for high volume component production

Transfer Molding
A process that combines compression and injection techniques, a piston forces preheated material from a transfer pot into a closed mold.

- Creates finished components with intricate shapes
- Compatible with the use of delicate inserts
- Delivers tight dimensions and tolerances
- Usable for all rubber durometers

Injection Molding
A more complex process that injects a preheated material into the cavities of a closed mold under low pressure. Ideal for projects in which a component size, shape, or tooling configuration would make compression molding impractical.

- Delivers faster curing times than compression or transfer molding
- Shortens cycle times
- Ideal for high volume component production

Open Cast Molding
The pouring of rubber into an open mold, which is then cured in an oven or on a heated table.

- Usable on part sizes from less than an ounce to more than 500 lbs.
- Excellent for projects where conventional tooling would be expensive or impractical

Spin Cast Molding
Dynatect’s innovative spin casting technique results in dual durometer wheels with excellent balance and high cosmetic appeal. Centrifugal force is used to uniformly distribute material in the mold.

FOAM RIM (Reaction Injection Molding) CAPABILITIES

Injection of polyols and isocyanates into a closed mold, triggering a chemical reaction that causes the material to expand and form the finished product.

- Effective in forming extremely large products with very light weights
- Able to improve or eliminate secondary operations
- Workable for flexible or rigid products in foams or solids
- Delivers reliable control of components with varying wall thickness
## Properties of Polyurethane and Rubber

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>POLYURETHANE</th>
<th>RUBBER</th>
<th>NITRILE</th>
<th>NEOPRENE</th>
<th>NATURAL</th>
<th>SBR</th>
<th>BUTYL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength (MPa)</td>
<td>20.7 to 65.5</td>
<td>13.8+/-</td>
<td>20.7+/-</td>
<td>20.7+/-</td>
<td>18.8+/-</td>
<td>18.8+/-</td>
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<tr>
<td>Durometer (Hardness)</td>
<td>5A to 85D</td>
<td>40 to 95A</td>
<td>40 to 95A</td>
<td>30 to 90A</td>
<td>40 to 90A</td>
<td>40 to 75A</td>
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<tr>
<td>Specific Gravity</td>
<td>1.10 to 1.24</td>
<td>1.0</td>
<td>1.23</td>
<td>0.93</td>
<td>0.94</td>
<td>0.92</td>
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<tr>
<td>Tear Resistance</td>
<td>Outstanding</td>
<td>Fair</td>
<td>Good</td>
<td>Good</td>
<td>Fair</td>
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<tr>
<td>Abrasion Resistance</td>
<td>Outstanding</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good-Excellent</td>
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<tr>
<td>Compression Set</td>
<td>Good</td>
<td>Good</td>
<td>Fair-Good</td>
<td>Good</td>
<td>Fair</td>
<td>Good</td>
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<tr>
<td>Rebound</td>
<td>Very High to Very Low</td>
<td>Medium</td>
<td>High</td>
<td>Very High</td>
<td>Medium</td>
<td>Very Low</td>
<td></td>
</tr>
<tr>
<td>Gas Permeability</td>
<td>Fair-Good</td>
<td>Fair</td>
<td>Low</td>
<td>Fair</td>
<td>Fair</td>
<td>Very Low</td>
<td></td>
</tr>
<tr>
<td>Acid Resistance</td>
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<td>Excellent</td>
<td>Fair-Good</td>
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<tr>
<td>Aliphatic Hydrocarbons</td>
<td>Excellent</td>
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<td>Poor</td>
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<tr>
<td>Aromatic Hydrocarbons</td>
<td>Fair-Good</td>
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<td>Fair</td>
<td>Poor</td>
<td>Poor</td>
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<tr>
<td>Oil and Gas Resistance</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>Poor</td>
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<tr>
<td>Oxidation Resistance</td>
<td>Outstanding</td>
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<td>Excellent</td>
<td>Good</td>
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<tr>
<td>Ozone Resistance</td>
<td>Outstanding</td>
<td>Fair</td>
<td>Excellent</td>
<td>Fair</td>
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</tr>
<tr>
<td>Low Temperature Resistance</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td></td>
</tr>
</tbody>
</table>

### Hardness Scales

<table>
<thead>
<tr>
<th>POLYURETHANE</th>
<th>HARDNESS SCALES</th>
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</thead>
<tbody>
<tr>
<td>Bowling Balls</td>
<td>95 – 80 – 70 – 60 – 50 – 40 –</td>
</tr>
<tr>
<td>Metal-Forming Wiper Dies</td>
<td>90 – 80 – 70 – 60 – 50 – 40 –</td>
</tr>
<tr>
<td>Nonspark Hammers</td>
<td>95 – 90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Solid Truck Tires</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Metal-Forming Die Pads</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Idler Rolls</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Abrasive-Handling Pads</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Silk Screen Wiper Blades</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Door Seals</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Can Tester Rolls</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
<tr>
<td>Printing Rolls</td>
<td>90 – 80 – 70 – 60 – 50 –</td>
</tr>
</tbody>
</table>

### Plastic
- Phenolics (Billiard Ball)
- Acrylics (Car Headlight Cover)
- Polycarbonate (Bullet-Proof Glass)
- Nylon (Caster Wheel)
- Polystyrene (Food Service Take-Out Container)
- Polypropylene (Reusable Food Container)

### Rubber
- Auto Tire Treads
- Inner Tubes
- Rubber Bands
Dynatect Manufacturing, formerly known as A&A Manufacturing, has over 70 years of experience in dynamic equipment protection manufacturing. Headquartered in New Berlin, Wisconsin, Dynatect designs and manufactures a complete line of components to protect equipment and people. Dynatect products include protective covers, cable and hose carriers, elastomer components, and mechanical motion control. With tens of thousands of worldwide clients, and a library of more than 500,000 customized products, Dynatect has the broadest product offering to solve applications.

Why Choose Dynatect As Your Preferred Partner?

- 70 years of experience in custom engineering
- 25 years of experience producing custom industrial door solutions
- Certified ISO 9001:2008 conformance facilities
- Manufactured and supported in the USA
- Single source for a broad range of complementary products
- Vertically integrated for consistent supply and quality
- Value-added design and fabrication
- Fast delivery of customized products
- Over 30 full-time engineers on staff
- 4,400 sq. ft. R & D test area including computer controlled test stations supporting multi-axis testing
- Industry leader in support with over 60 technical field sales representatives