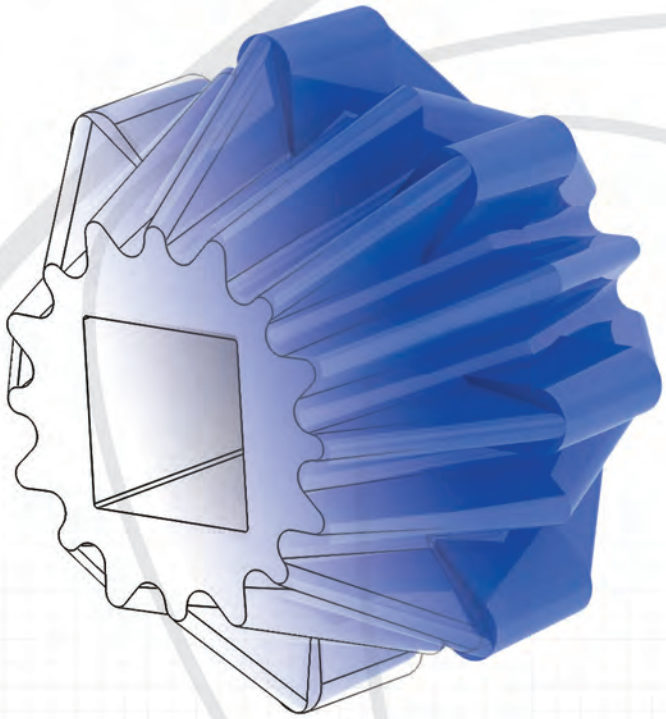
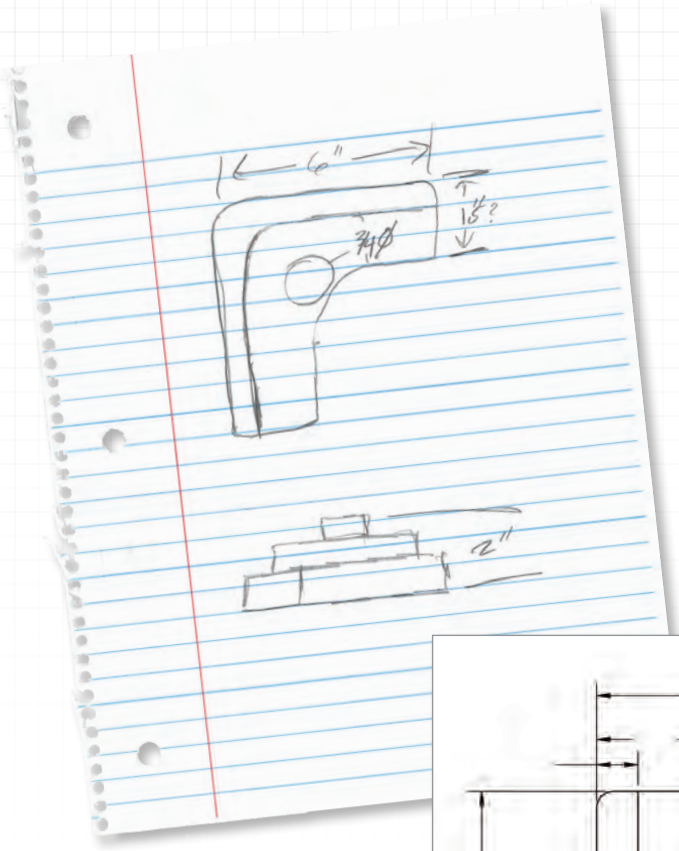
ARGONICS
ENGINEERED POLYURETHANE

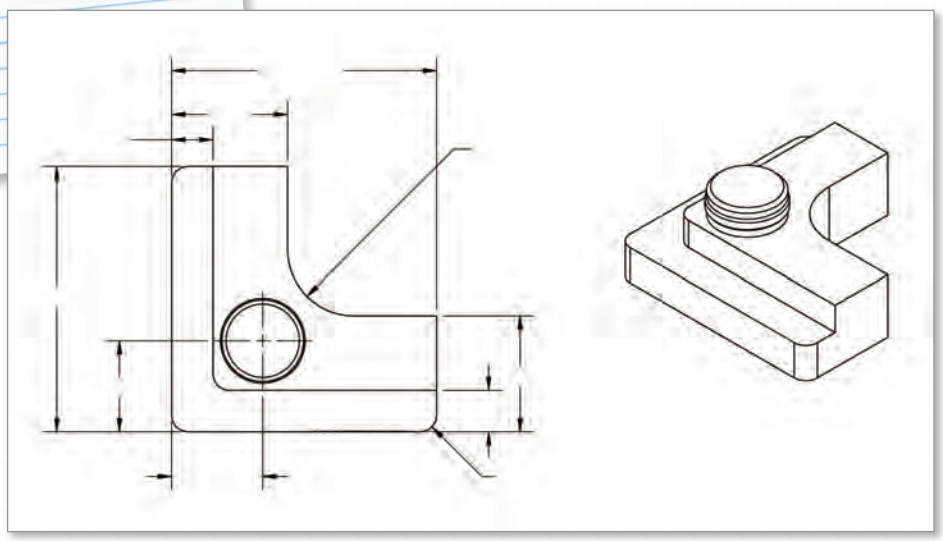
# CUSTOM PART DESIGN



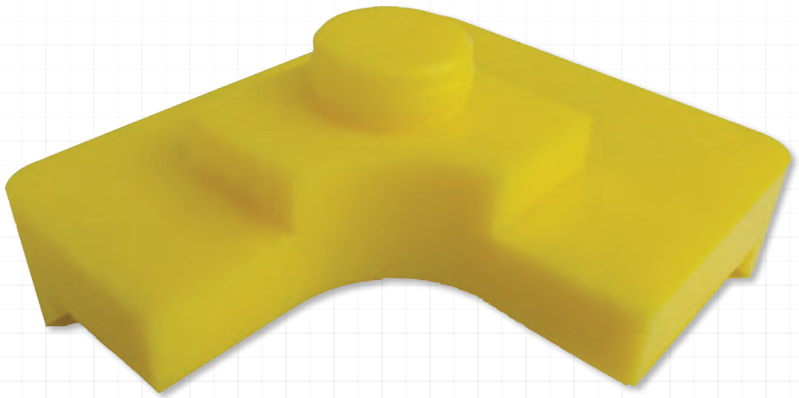
Commitment to
**engineering your success**
is in our name




# FROM IDEA...



# ...TO PRODUCT



**GIVE US A CALL TO GET STARTED:**

**906.226.9747**

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CUSTOM PART DESIGN

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# ABOUT ARGONICS

Argonics was started in mid-1993 after Kryptonics, Inc. of Boulder, CO decided to spin off its Industrial Division and focus primarily on the consumer markets using polyurethane. In the purchase agreement with Kryptonics, Argonics obtained the right to use the Kryptane trademark on all products sold which contain prepolymers purchased from Kryptonics. In 1997, Kryptonics split again, retaining its skateboard wheels and creating Kryptane Systems, which continued to produce commercial products. In 2006, Argonics purchased Kryptane Systems, giving the company ownership of the Kryptane formulas and trademark.

Argonics currently employs 82 people in its Michigan plant. This seasoned team of engineers, technicians, tooling machinists, fabricators and production staff produce products that vary in weight from 1 gram to more than 1,000 pounds.

Argonics has become a leader in abrasion-resistant performance polyurethane markets. Applications include liners for concrete batch plants, grain industry chutes, hopper liners, and equipment in the mining and aggregate industries. Additionally, Argonics produces a line of Public Works Products, focused on municipal waterworks and snow removal products. The acquisition of Kryptane Systems also brings in industrial rollers, shocks and springs, and precision parts.

# WHY ARGONICS?

We are **one of the country's largest producers of hot cast polyurethane products**, which are manufactured in-house at our location in Gwinn, Michigan. Our state-of-the-art facilities contain multiple high-tech urethane dispensers, allowing for endless product possibilities.

We currently create products for a variety of industries such as mining, agriculture, military, concrete, marine, snow removal, and public works. **If you have a hard-to-solve wear problem, Argonics will find a solution.** We have built our reputation on the achievement of providing cost-effective results for the most demanding applications for companies around the world.

We understand the importance of concept and product development, as well as product implementation. These aspects, plus quick turnaround time, are all part of our day-to-day commitments to our customers. **We promise to give you an invaluable advantage for your next urethane application.**

> "With their [Argonics'] expertise, along with CAD, Solidworks, and prototyping capabilities, they [Argonics] can design a part in urethane to match any substance or requirement … with urethane, you can combine strength, resilience, and lifetime durability in one product."
>
> – LARS MULLER, *Muller-Beltex*

## OUR EXPERTISE

Our expertise in urethane formulations can cut the time and expense of bringing a product to market. With **more than three decades of experience**, we offer extensive knowledge of urethane chemistry and the ability to adapt that chemistry to your specific needs. Argonics formulates its own polymers and can therefore customize that material to meet very stringent requirements. In the case of less demanding applications, that chemical knowledge can save you money.

We maintain a complete prototyping department to produce the "one off" prototypes and proof of concept parts essential to our customers. High volume and hand cast production parts are the core of our engineer-to-order operation.

# WHY URETHANE?

Urethane (short for polyurethane) is a family of *elastomers* – rubber-like polymers that stretch and return to shape when force is removed.

Products made using cast polyurethane are found everywhere. They are prevalent in all phases of mining, agricultural equipment, and material handling, as well as the oil and gas industry. Even in recreation, cast polyurethane is the leading product of choice for the manufacturing of roller-skate wheels, golf ball covers, bowling balls, scuba fins, and more.

Why is urethane a top product choice for these industries? Unlike plastic, **polyurethane is non-brittle**, making it a good material choice that will not crack or break under impact or shock loading. **Polyurethanes are often chosen where resistance to the effects of sliding, stretching, cutting, tearing, compression, torsional forces, and ageing are involved.**

## OTHER BENEFITS OF CAST POLYURETHANES:

- Load-bearing capacity
- Abrasion resistant
- Excellent resistance to oil and grease
- Can be bonded to substrates such as steel, aluminum, fiberglass, and plastic
- Can be formulated to specific chemical and temperature resistance
- Can be molded in various durometers (hardness)
- Shorter lead times and more economical tooling costs
- Ideal for vibration control and noise minimization
- Can be formulated to work in both wet or dry conditions

# OUR CAPABILITIES

## URETHANE PROCESSING CAPABILITIES

- Proprietary chemistry, formulated precisely to our specifications
- High rebound formulations 52A-95A
- Low rebound formulations 65A-93A
- Capability of processing formulations up to 70D
- Flame retardant anti-static formulation
- Centrifugal casting
- Part weights from 1 gram to 1200 pounds
- Urethane bonding technology to adhere to various substrate
- Precision calibrations ensure our urethane processing is holding to a tightly controlled stoichiometry, which translates into more consistent product physical properties
- CNC Grinding – Used in the finish machining of precision rollers. These machines can grind parts with a repeatability of +/-.002" on compliant urethane rollers
- CNC Lathes – Used to machine various metals and urethanes. Capable of producing machined parts with tolerances of +/-.0005 inches, used in secondary operations of our urethane products
- 3D printers for fast turnaround on prototyping

"The urethane parts we use range from soft and pliable for gently handling potatoes to very hard load bearing components … instead of choosing to make parts via injection molding, I will often choose the method of poured urethane parts from Argonics because I do not want to pay the high cost of injection molded tooling. Urethane is usually much more cost effective for us, whether for one-off or higher volume parts."

– ROY WITHERS, *Double L Global*

# PROCESS EQUIPMENT

## PROTOTYPING

- Test conveyor
- StateMix Vortex Mixer for hand batching
- 3-D printers (2)
- Complete fabrication and mold making

## PREPARATORY

- 14 ovens
- Walk-in sandblast booth
- Walk-in wash booth
- Walk-in paint booth
- Vapor degreaser
- Parts washer

## PRODUCTION

- 4 mobile and stationary urethane dispensers
- PLC ratio controls with pour rates up to 50 lbs./minute
- Self-heated molds that maintain precise temperatures
- Processing table with ability to create parts 96 ft. long
- Robotic pouring table
- Overhead dual bridge gantry hoist
- Chain table conveyor for casting high volume runs
- Centrifical casting capability
- Adjustable indexing system
- Modular automated machines to increase productivity
- Custom-built product and process equipment for efficient manufacturing

## POST OPERATORY

- Dual head waterjet cutter
- 3 CNC machining centers
- Variety of horizontal and vertical band saws
- Horizontal stretch wrapping
- Pad printer
- Project specific notching machines
- Die cutting clicker press
- Hydraulic press

## QUALITY

- Qualitest DIN abrasion tester
- MTS tensile tester
- Megahom meter
- Oxygen index flame tester
- Thermal chamber for hot and cold testing
- Wet chemistry and physical testing laboratory that meets ASTM testing requirements
- Various precision measuring and QA devices

# THE DESIGN PROCESS CHECKLIST

When creating a custom urethane part, here is a helpful list of things to consider:

1. Do you have a **specific part** or **part design problem to resolve?**
2. Describe the **overall weight and dimensions.**
3. **What does the part do,** and are there **performance requirements?**
4. What is the **operating environment?**
   - Temperature
   - Humidity
   - Water
   - Petroleum Products
   - Solvents
   - pH
5. What is the **cycle rate?**
6. What is the **failure mode?**
7. How often is it **in use?** (Minutes per hour, hours per day, days per week)
8. What is the **life expectancy?**
9. Does it **require an insert,** and if so, **what is it made of?** Is it over molded or bonded?
10. **Anticipated order quantities** and **annual volumes?**
11. If the part is being tested, **how close is the test to the actual running process?**
12. Is it a **new part or replacing an OEM part?** If existing, **what is it made of** and **why replace it?**
13. What are the **most important physical properties?** Why urethane?
14. Have **other solutions been attempted?** What were they?
15. What are the **overall tolerances?** Any tight tolerances to consider?
16. What is the **desired durometer?**
17. What is the **desired color?**
18. Is there a **drawing?**
19. Are there **lead-time considerations?**

**NOT SURE? GIVE US A CALL: 906.226.9747**

# LIMITATIONS TO CONSIDER

While the benefits of urethane are many, there are some situations where it may not perform to the best of its ability. To ensure the highest performance possible from urethane, we want to explain the risk factors that could damage or shorten the life of the product.

## High Temperature Service

Due to its plastic/rubberlike nature, certain polyurethane physical properties tend to fall off at elevated temperatures. Generally speaking, urethanes are not useful materials under heavy service loads at temperatures above approximately 220-225°F (105-107 °C). We have the capability of manufacturing small parts that can withstand elevated temperatures of 300°F (150°C).

## Moist, Hot Environments

Ester polyurethanes are subject to hydrolysis when in the presence of moisture, humidity, and elevated temperatures. The combination of these factors will create a major problem for ester polyurethanes. Ether formulations are designed to withstand hydrolytic attack. Below 125°F, most polyurethane can withstand continual contact with water for many years. Between these two extremes, there is a wide range of temperature and moisture conditions under which polyurethanes may or may not be suitable for use. It is best to contact your Argonics, Inc. representative to help with the proper material selection.

## Chemical Environments

There are certain chemical environments unsuitable for polyurethanes. Powerful acids and bases are generally detrimental, as are certain solvents – specifically, aromatic solvents such as toluene or ketones, MEK, or acetone, and esters like ethyl acetate. There are many chemicals, on the other hand, which urethanes resist well and are suited for in-contact service. These include many oils and petroleum-based materials.

# MEET OUR ENGINEERS

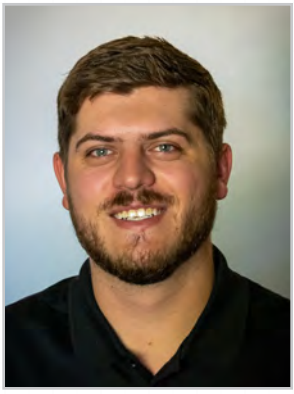
**JACOB BOSSERT**
*Product Engineer*

**FRED BOYLE**
*Senior Process Engineer*

**LEVI JEZEK**
*Product Engineer*

**RYAN KANGAS**
*Engineering Manager*

**JOE ROELL**
*Senior Product Engineer*



**BEN SCHWEIKART**
*Product Engineer*

## WE'RE HERE FOR YOU

Our engineers are ready to help you solve your design issues.
Contact us today to get started.

ARGONICS
ENGINEERED POLYURETHANE

**520 9th Street • Gwinn, Michigan 49841**
**906.226.9747 | www.argonics.com | information@argonics.com**

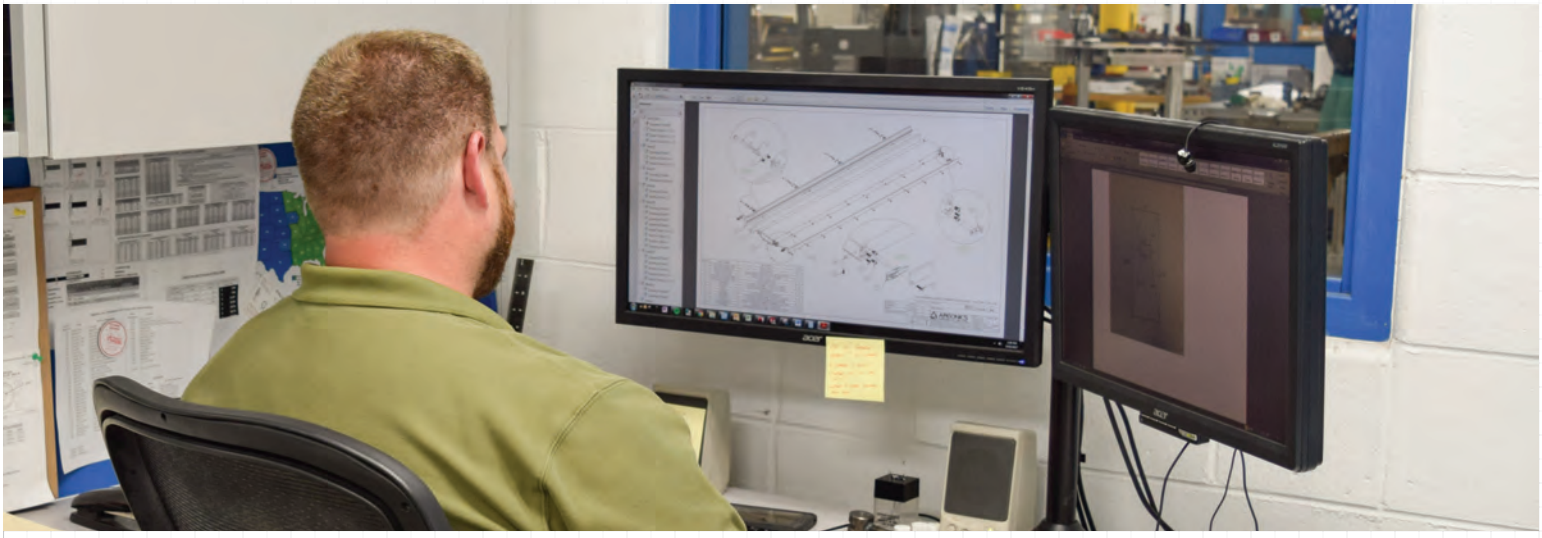
# SUCCESS STORIES

An automotive company specializing in aftermarket suspension solutions wanted urethane bushing to replace a rubber bushing application. We provided the company with urethane samples in various durometers to test. They chose a specialized urethane product and began installing the chosen urethane bushings in their application. The automotive company continues to look to us as its urethane specialist, due to the quality and dependability of the urethane solutions.

SPECIALTY PRODUCTS COMPANY (SPC), *Longmont, Colorado, USA*
CUSTOM URETHANE PRODUCT

A manufacturer of produce chiller tubes (used to chill produce) needed to replace rollers in its loading system. In the existing tubes, produce was stacked on thick steel beds with steel/cast iron rollers. Because the steel beds were not perfectly flat, the rollers continuously failed, due to heavy loading (40,000 pounds) and uneven load distribution. This high failure rate lead to constant maintenance and repair; after testing large quantities of caster wheels with the same outcome, the manufacturer asked our Colorado division to devise a custom solution. They developed compressed rollers to focus the load on surrounding rollers. The new rollers also had stainless steels hubs and components to combat rust. The manufacturer now retrofits their chillers with our Kryptane urethane rollers, saving time and money with less repairs and hassle.

WESTERN PRECOOLING, *Fremont, California*
CUSTOM POLYURETHANE ROLLERS



A supplier of precision Original Equipment Manufacturer (OEM) components for computer hardware sought a solution for sensitive robotic components in a data center environment. They needed ¾ inch diameter rollers to carry a 25-pound load over 10 million linear inches without failure. Previous rollers had a 10-15% failure rate in pre-installation testing. In the field, previous rollers failed 5% of the time, which this manufacturer deemed unacceptable.

The manufacturer demanded a zero defect roller and turned to our Colorado division to solve this problem. We developed a roller that maintains a zero failure rate in the field and a less than 1% failure rate in pre-installation testing. Over 400,000 zero failure rollers have been produced and delivered. This has restored the manufacturer's confidence, and given them significant cost savings.

KILLIAN MANUFACTURING, *Syracuse, New York*
PRECISION ROLLERS

# OUR GLOBAL FOOTPRINT

**Algeria Argentia Australia Austria Bahamas Brazil Burkina Faso Canada Chile China England Ecuador Germany Ireland Israel Italy Malaysia**

Mexico Netherlands New Zealand Niger Peru Philippines Qatar
South Korea Spain Sweden Taiwan Thailand Trinidad Turkey USA Vietnam

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