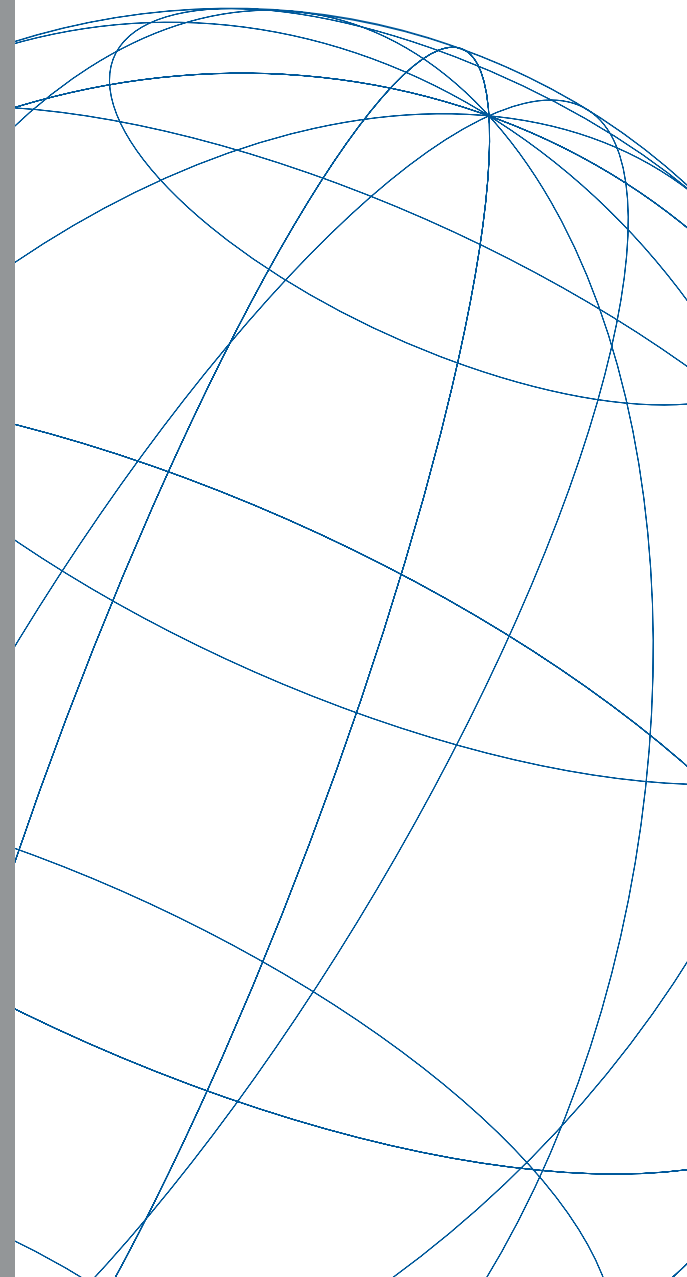
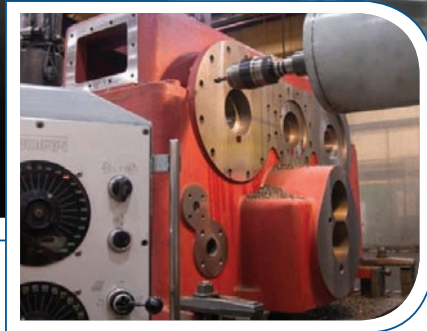
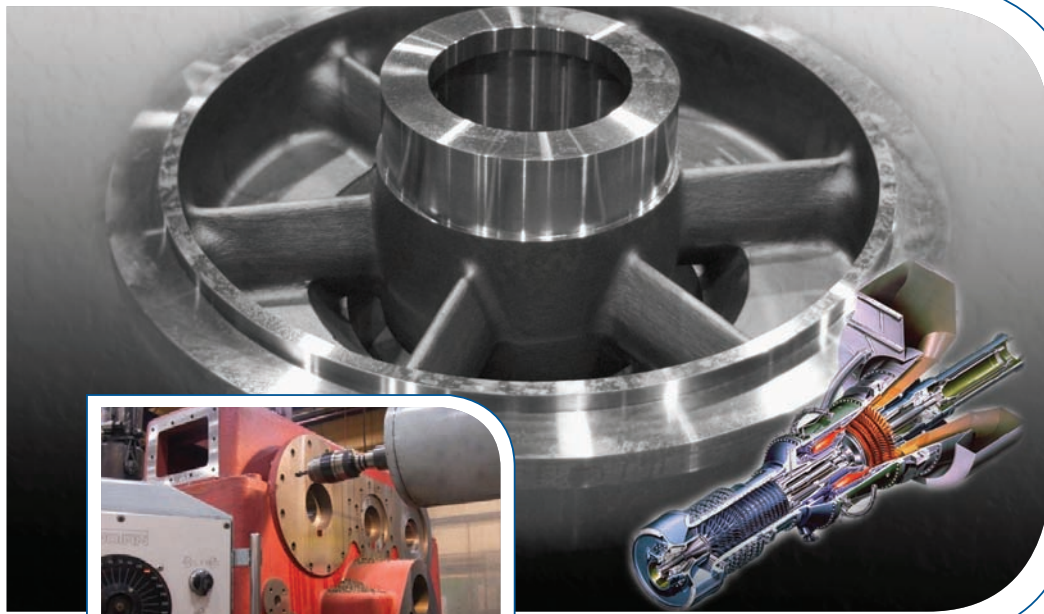


# London Products



Our Innovation. Your Advantage.



**Bradken's Engineered Products Division is a full service iron and steel foundry and machining organization. We cover a wide range of materials and configurations including the production of carbon, low alloy, stainless steel and specialty alloy castings weighing up to 55,000 lbs/25,000 kg.**

From engineered concept to finished product, Bradken provides value to its customers by making high quality, complex, engineered castings. In order to support that claim, Bradken Engineered Products employs leading edge technology, coupled with extensive industry experience and value added offerings including:

- Assisted engineering (converting expensive fabrications to cast products; improving castability)
- Patterns and tooling
- Carbon/stainless and specialty steel castings
- Linatron x-ray capabilities for wall thicknesses beyond 6.5"
- Nuclear certified
- Machining and value added services such as sub-assembly
- Global sourcing

Certified by the military to produce specially qualified steel castings, the Engineered Products Division has special qualifications for military and naval applications. Our organization is certified by US/Canadian government agencies and maintains a wide variety of specialty customer certifications.

Bradken is a true global supplier. Our value added casting, machining, fabrication, and assembly capabilities provide "turn-key" supply and domestic content opportunities in many of our supply solutions.



**Our Innovation. Your Advantage.**

**London Products is a single source, single responsibility business of the Engineered Products Division. London Products remains true to its mission, "To provide value for our customers by making high quality, complex, engineered castings on time and sell that value" and will continue to do so while enhancing systems and processes that are advantageous to our customers.**

London Products is a leader in the industry providing:

- Pattern/tooling design and construction
- Steel, stainless steel, NiResist, NiHard, ductile iron and specialty steel casting materials
- Finish machining & testing



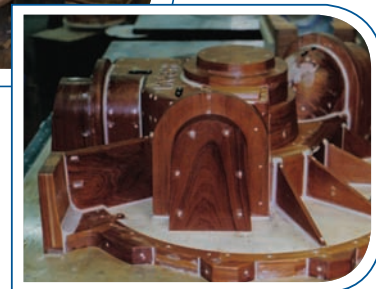
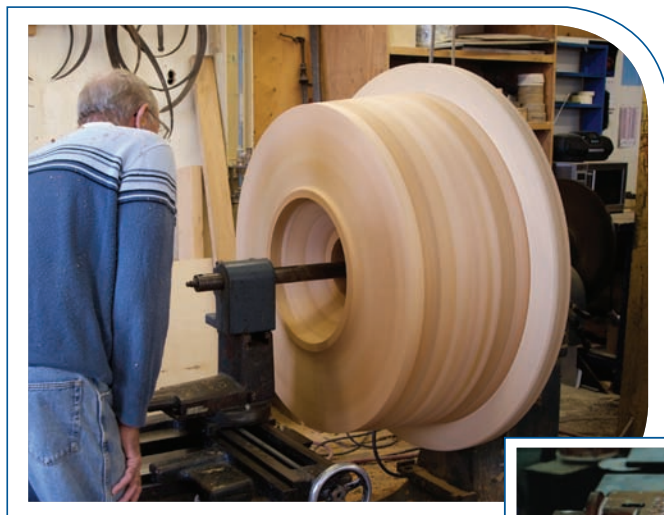
London Products casting facility has positioned itself as the preferred supplier for patterns, high integrity ferrous castings and machined components. Continuously assessing and improving all aspects of our business to ensure we exceed customers' expectations, we pride ourselves in delivering reliable components on time, with superior service, while maintaining exceptional value for our customers.



**Certifications:** In addition to our numerous customer certifications, London Products holds the following certifications

- ISO9001: 2000
- CGP – Canadian government control goods program
- ABS – American bureau of ship building
- ASME – Section III, NCA 3800 2001





## Pattern and Tooling Capabilities

Since 1948, the London Products facility has been supplying patterns and tooling. Initially producing wood patterns, we have evolved into a leading, state-of-the-art supplier of foundry tooling.

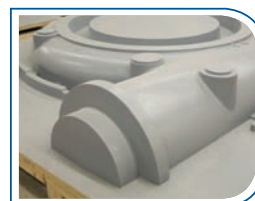
**“The quality of any castings is in part determined by the quality of its pattern. Patternmaking requires the skill of an artisan and an intimate knowledge of the casting process.”**

In 1980 we became the first pattern shop in North America to utilize CAD/CAM for the design and manufacture of metal tooling. Today we can make your tooling in wood, metal, plastic and styrofoam by either CNC or conventional methods. Value added supply of jigs, fixtures, models and templates complete the service.

### Differentiated Offerings:

- **Technology:** The CAD/CAM Connection - Our pattern shop can use the CAD data to write CNC programs that will cut your patterns ensuring accuracy, performance and uniform wall thickness.
- **Experience:** Journeymen pattern makers - Artisans with an intimate knowledge of the casting process and a practical understanding of function and application.
- **Comprehensive supply:** Wood, metal, plastic, styrofoam, checking fixtures and proto-types. Size and configuration are not a problem for London Products as we manufacture a full range of tooling from small investment and production tooling to large wooden and foam patterns for jobbing environments.

London Products leads in areas of cost and reduced lead-times. Using fiberglass and styrofoam as alternatives to wooden patterns can provide a number of benefits. Alloy selections and the casting surface finish are unaffected when switching from wood to styrofoam patterns. Although a styrofoam pattern is only used once, it can be practical in low volume, low frequency applications for obsolete parts, prototyping or breakdown situations.

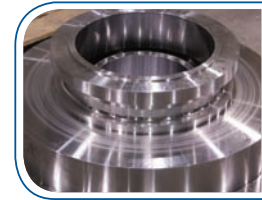


# Casting Capabilities

London Products casting facility has positioned itself as the preferred supplier of high integrity ferrous castings to over 10,000 lbs/4,500 kg. We continuously assess and improve all aspects of our business to ensure we exceed our customers' expectations. The essence of our success is delivering reliable components on time, with superior service and exceptional value. Our London casting facility offers a full range of ferrous alloys from stainless steels through to engineered irons. We also offer comprehensive heat-treatment and non-destructive testing capabilities.

**“Different alloys for different applications. This is what our customers expect – a broad range of application competence and flexibility in manufacturing.”**

- **Technology:** Foundry engineering uses your CAD data in Magmasoft solidification software to optimize the casting process before the pattern is built or any metal has been poured.
- **Experience:** With over 60 years in the foundry business and countless differentiated, complex configurations cast, London Products has been and continues to be a solution provider.
- **Comprehensive supply:** Our customers see us as a jobbing foundry resource providing expertise in casting engineered products with difficult geometries and varying alloys. We offer a full range of ferrous alloys, from stainless steels through to the engineered irons to diverse materials such as heat and corrosion resistant stainless, carbon steel, NiHard, NiResist and ductile iron.



London Products is a solution provider. We are interested in castings that present a challenge to your business. If it's a difficult casting or if you are having trouble with quality; we want to facilitate a resolution. Achieving higher quality results means lower total cost of supply and delivery of satisfaction to the customer.





## Machining Capabilities

Our customers are ultimately interested in finished components. London Products provides added value and differentiation by providing machining and assembly services. We machine the castings we make or provide contracted machining for a variety of applications and materials. London Products has the machine tools, support equipment, people, and skills necessary to finish machine and assemble products. With a history of serving the Rail and Industrial markets, continuous investment in machine tools is now providing growth in the areas of Energy, Mining and Construction.

**“We are a single source provider of quality machined and machined cast components”**

- **Technology:** Our London machining operations utilize CNC machines, CAD for programming and CMM to perform layouts and check dimensional accuracy. Bradken's commitment to process improvement, product quality and industry leadership; ensures reinvestment in technology.
- **Experience:** London Products employs experienced machinists; many with extensive tenures and continuity with our organization. Over 34 years of machining, material handling and sub-assembly knowledge at your disposal. This leads to a thorough understanding of the customers' needs and reduced learning curve.
- **Comprehensive supply:** London Products offers skilled machining for a variety of applications. Manual machining for jobbing, special components. We offer CNC for semi-production and precision engineered components. Large horizontal, vertical and turning capabilities for a variety of markets and materials. To round out our supply, London Products supplies: CMM

layout, blasting, painting, welding and sub-assembly. London Products offers complete machined and value added supply. If you are looking for a single source solution, we will work with you and deliver technology, experience and comprehensive supply.

Differentiation within the industry is what we can supply to help reduce your total cost, improve delivery and reduce your supply base. We want to simplify your component acquisition process. Patterns/Tooling – Engineered Castings – Fully Machined Components from Bradken.



# London Products Capabilities Summary

## Patterns/Tooling

### Personnel

- Experienced pattern makers

### Materials of Construction

- Wood, metal, plastic, styrofoam, aluminum, Nicrosil (for hot sizing dies)

### Technology

- CAD/CAM capable, CNC pattern cutting

### Size

- From small production tooling and specialty checking fixtures to very large jobbing patterns for a variety of applications

### Equipment

- Various sanders, jointers, shapers, table saws, crosscut saws, band saws, planers, pattern mills and lathes. An overhead router, CNC turret mill, drill press, vacuum chamber, styrofoam router and layout tables round out our offering

### Specialty

- Diverse foundry tooling
- Styrofoam patterns
- Checking fixtures
- Prototypes



## Machining

### Personnel

- Experienced, skilled machinists, programmers and operators

### Materials and Components Machined

- Steel castings, Iron castings, aluminum, fabrications, forgings

### Technology

- CNC programming and tooling
- CMM layout

### Size

- From small production tooling and specialty checking fixtures to very large jobbing patterns for a variety of applications

### Equipment

- CNC Vertical/Horizontal
- Manual Vertical/Horizontal
- Milling, grinding, honing, tapping
- Turning OD 213"/5,410 mm max
- Max travel 384"/9,754 mm and 117"/2,972 mm under the rail
- Minimum 36" x 36" x 36" or 1m x 1m x 1m
- Lifting 80,000 lbs/36,000 kg max

### Specialty

- Semi-production and jobbing
- Large CNC
- Complex engineered components
- Turnkey, single source supply

## Castings

### Personnel

- Experienced and skilled metallurgical engineers, foundry technicians, and qualified, highly skilled mold/melt crews

### Materials

- Heat and corrosion resistant stainless, carbon steel, NiHard, NiResist and ductile iron. In addition we pour many specialty alloys - over 280 in total

### Technology & Testing

- Magmasoft solidification modelling
- Visual, radiography, ultrasonic, liquid penetrant, magnetic particle
- Metallurgical and sand testing

### Size, Weight and Mold Process

- From 20 lbs/10 kg to 10,000 lbs/4,500 kg
- Flask-less and flasked
- Furan (air set)
- Ceramic up to 24"/610 mm square

### Equipment and Furnaces

- Coreless induction melting furnaces. Charge materials made from virgin metals wherever practical
- Heat treatment – Normalizing, stress relieving and annealing

### Specialty

- Complex highly engineered castings
- Value added supply (patterns, casting and machining)
- Alloy selection

# North American Facilities

## Industrial Products

### Atchison

400 South Fourth Street  
Atchison, KS 66002  
USA

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F +1 913 367 2130

### St. Joseph (Machine Shop)

3811 South 48th Terrace  
St. Joseph, MO 64503

T +1 816 232 8856  
F +1 816 279 8246

### Amite

13040 Foulks Lane  
Amite, LA 70422-9209  
USA

T +1 985 748 5342  
F +1 985 748 7396

### Tacoma (Global Services)

1702 Center Street  
Tacoma, WA 98409-7808

T +1 253 471 7021  
F +1 253 471 7029

## London Products

### London (Foundry)

3040 Osler Street, P.O. Box 7006  
London, Ontario N5Y 5R7  
Canada

T +1 519 455 5420  
F +1 519 455 0621

### London (Machine Shop)

45 Enterprise Drive  
London, Ontario N6N 1C1  
Canada

T +1 519 685 3000  
F +1 519 685 6448

## Atlas Products

### Tacoma

3021 South Wilkeson Street  
Tacoma, WA 98409  
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T +1 253 475 4600  
F +1 253 473 8710

### Chehalis

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Chehalis, WA 98532  
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F +1 253 473 8710

### Tacoma (Fabrication and Machining)

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