

# BRADKEN

## MANUFACTURING FACILITIES



Large steel turbine housing



Highly Engineered Energy Component



Molding/core making  
(complex pump housing)

### Bradken - Atlas

One of the premier foundries in North America, Atlas has been producing high integrity steel castings for customers around the world for more than a century. Bradken - Atlas has a rich history in the Energy market possessing the technical tools and infrastructure to manufacture the most challenging steel and stainless steel castings under the most intense specifications. Bradken - Atlas is one of only a few foundries left in North America that is qualified to make castings for Nuclear applications. State-of-the-art technology is employed to produce complicated components with stringent metallurgical and quality requirements. Our Washington facilities are not just foundries; we have evolved into a manufacturer of major metal components and value added offerings.

### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs utilizing lean manufacturing and six sigma and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
  - Off-shore oil & gas certified by numerous OEM's and countries with material qualified to EN 10225 and API RP2Z
  - Nuclear certified by ASME as a certified material manufacturer QSC certificate No. 204
  - In house ASTN level III non-destructive testing specialists in Ultrasonic, Magnetic particle, Visual, Dye penetrant, Radiography and Linatron X-Ray capabilities for wall thicknesses beyond 6.5"
  - Navy nuclear qualified to NAVSEA 250-1500
  - ISO 9001 certified world-class foundry
  - DNV approved manufacturer of steel castings
  - Casting weight range: 200 to 45,000 lbs in a variety of steels and specialty stainless steels
  - Approved manufacturer of HY-80 and HY-100 castings by the department of the navy
  - Two electric arc furnaces and two 10 ton AOD systems can be operated individually or in concert to produce heat sizes from 1,500 to 95,000 pounds
  - Captive machining and heavy fabrication facility (formerly Ideal Machine & Manufacturing) provides: machining, fabrication, horizontal milling, vertical boring, drilling and tapping
- ### Key Differentiators:
- Highly engineered complex steel and stainless steel castings with intensive specifications
  - AOD Capable: Full range of 130 high, low alloy & duplex/stainless steel casting alloys
  - Linatron X-Ray capabilities to 20" section thickness
  - Pro/ENGINEER and CAD/CAM Software Tools
  - Solidification Modelling/Assisted Engineering
  - Fabrication, cast/fabrication and hydro testing
  - Rough machining, final machining/assembly

# BRADKEN

## MANUFACTURING FACILITIES



Linatron Radiography for Heavy Sectioned Castings



Turning/Machining  
(Off-shore Oil Platform Riser Basket)



Heavy fabrications using weld positioners

### Facility Information

500,000 sq ft Mfg.  
640 employees

**In Business**  
Since 1899

**Capabilities**  
Casting  
Machine Shop  
Fabrication  
Assembly

**Metals Cast**  
Cast Steels  
Austenitic-Ferritic Duplex  
200 to 45,000 lbs.  
Carbon Steels  
200 to 45,000 lbs.  
Corrosion Resistant Steels  
200 to 45,000 lbs.  
Heat Resistant Steels  
200 to 45,000 lbs.  
Low Alloy Steels  
200 to 45,000 lbs.  
Other Nonferrous Alloys  
Nickel-Base  
200 to 45,000 lbs.

Molding or casting process used  
Air-Set/Nobake  
200 to 45,000 lbs.

Flask sizes  
Minimum 28" X 28"  
Maximum 192" X 192"  
or 144" x 268"

Specialized casting capabilities  
AOD refining  
Magmosoft  
Simulation

**In-house Heat Treating**  
Furnaces Multiple

Furnace Sizes  
Minimum 44" X 144" X 96"  
Maximum 168" X 240" X 108"

Type of Heat Treating  
Normalization  
Stress Relieving  
Annealing  
Quench and Temper

Other  
Heat Soak  
Stabilization  
Water quenched to 50 tons

### Quality and Process

**Controls**  
Hardness  
Dimensional Layout  
Microstructure  
Radiography  
Charpy Impact Testing  
Magnetic Particle Examination  
Liquid Penetrant Examination  
Chemical Analysis  
Sand Control  
Ultrasonic Examination  
Mechanical Testing  
Lean Manufacturing & Six Sigma  
Certified Welding Standards:  
ASME Section IX, AWS  
D1.1, MIL-STD-248D, NAVSEA  
250-1500-1

### Machine Shop Capability

**Company Owned: Large Fabrication & Machining Facilities**

**Maximum Lifting Capacity**  
80,000 lbs.

### Turning – Vertical

up to 254" swing  
118" Table  
102" Height

### Turning – Horizontal

Boring 240" HT  
Milling 80" VT

### Horizontal

CNC Machining Centre  
Maximum Length  
100" Horizontal Travel  
Maximum Width  
30" Reach  
Maximum Height  
60" Vertical Travel  
Maximum Part Weight  
40,000 lbs. (centered wt.)

Willing to accept responsibility for materials & provide turn-key parts

### Fabrication Capability

**Maximum Lifting Capacity**  
80,000 lbs.

### Welding Capabilities

FCAW  
GMAW SAW  
GTAW SMAW  
Fabrications to 80,000 lbs

Capabilities include robotic production welding, large jobbing work, mechanical assembly, Rig up, assembly, hydrostatic testing and paint capabilities

Welders certified ASME, Sec IX, AWS D1.1, FCAW, GMAW, SAW, GTAW, SMAW

### Quality Assurance Program

ISO  
ISO 9001  
API  
API 610, 8C and 2SC  
ABS  
Marine Steel Castings  
MMPS No. 5165  
ASME  
QSC-204 Exp.  
Date Sept. 23, 2010  
ASTM  
NACE  
MR0103, MR0175  
DNV  
Certificate No. AMM-2617  
Other  
NAVSEA Qualification for HY-80 and HY-100 Materials  
Lloyds Register Certificate  
No. MD00/3366/0001/2

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# BRADKEN

## MANUFACTURING FACILITIES



Mechanical assembly and testing



Efficient, highest quality robotic production welding



Large fabricated skid

### Bradken - Atlas (Machining and Fabrication)

#### Safety, Quality, Integrity and Experience

Operating for over 80 years, the Bradken – Atlas manufacturing facility has the unique combination of fabrication and machining capabilities to provide customers with large complex finished components and assemblies.

We safely do what we say, when we say. Our reputation in the industry is based on honesty and integrity. Our customers know they will receive high quality components delivered on-time.

Our capabilities include heavy fabrication, NDE, stress relieving, large conventional and CNC machining, dimensional inspection, mechanical assembly, coatings and functional testing. Semi-production and production manufacturing is accomplished using state-of-the-art robotic welding, repetitive tooling, and efficient handling procedures.

Our rare capabilities have enabled Bradken to undertake business in a wide variety of industries including energy generation, underground and above ground mining, aerospace tooling and ground support, nuclear transportation and handling, satellite handling, oil drilling, aggregate support, hydro turbine, dredging, hydraulic crane, and many more.

#### Manufacturing Capabilities (Overview)

- Heavy fabricated weldments from 50 lbs to over 80,000 lbs (36,000kg)
- 24 ft under-hook height
- Qualified weld procedures in accordance with AWS or ASME to meet customer specific needs
- FCAW, GMAW, SAW, GTAW, SMAW capabilities
- Full time on-site AWS CWI (certified welding inspector)
- Six axis robotic welding
- Large horizontal milling up to 240" (horizontal travel)
- Large vertical turning up to 254" diameter
- CNC machining
- FARO Arm inspection equipment and laser tracking ability
- Complete mechanical assembly and functional testing

#### Key Differentiators: Turn-key Production

- Our unique combination of heavy fabrication, machining, assembly and testing at the same facility eliminates costly transportation and handling operations. Couple this with our state-of-the-art Bradken - Atlas foundry and heat treat facility right down the street and you have a "One Stop Shop" for your specialty products.
- We specialize in large prototype (jobbing) projects as well as semi-production and production quantities requiring dedicated tooling and manpower.
- Our ability to work with our customers and provide valuable feedback regarding the manufacturability of new products is yet another value-added component to our client-supplier relationship.

# BRADKEN

## MANUFACTURING FACILITIES



Heavy fabrication from 50 to 80,000+ lbs.



Large conventional and CNC machining



FARO Arm inspection equipment

### Facility Information

#### Lifting Capability over 40 tons (over 36,000 kg) 42,000 square feet

- 3 X 20Ton Capacity Demag Overhead Cranes
- Variety of smaller overhead, gantry, and jib cranes

#### Horizontal Boring Mills – Maximum travel 240" (6 meters)

- Sinada 5" Floor Model HBM, 80" X 80" Infeed Rotary Table 197"H.T. X 72"V.T.
- Sigma HP100 4" Floor Model HBM, 86" X 86" Infeed Rotary Table (X)240"H.T. X (Y)80"V.T.
- Sigma W100 4" Table Type HBM (multiple machine centers) 64"H.T. X 49"V.T.

#### Horizontal CNC Milling Centers - Maximum travel 120" (3 meters)

- Cincinnati Milacron 10HC-2500, 31" X 104" Table with 30" Rotary Table 100" X 60" X 30"
- Wakayama 5" Table Type with 96" X 96" Rotary Table 120" X 72" X 48"

#### Vertical Boring Mills – Maximum diameter 254" (over 6 meters)

- Toshiba-Shibaura 30/55 254" X 118" X 102"
- Toshiba-Shibaura 20/40 (multiple machine centers) 157" X 79" X 87"
- Toshiba-Shibaura TX16 78" X 63" X 63"

#### Machining Equipment Lathes – Maximum swing 42", Maximum length 216"

- Summit 42" Swing X 216"
- Axelson 28" Swing X 86"
- Graziano, Sag 14 (multiple machine centers) 14" Swing X 48"
- MillTronics, ML1440 CNC 14" Swing X 48"

#### Drill Presses – Maximum reach 72"

- Nardini, Radial 6' Arm
- Bergonzi, Radial 3' Arm

### Saws

- Marvel Ser 8 MKI, Vertical Band Saw 20"
- Powermatic, Vertical Band Saw 20"
- Horizontal, Automatic Bar Feed 10"

### Welding Processes - FCAW, GMAW, SAW, GTAW, SMAW Equipment (multiples of most)

- ESAB LAD 1400 Amp Miller Inteliweld 650 Amp
- Linde V1400 MIG 400 Amp Miller Dimension 652 Amp
- Linde V160, 600 Amp Miller Dial Arc 250 Amp
- Linde V1800, 800 Amp Airco DCT 600 Amp
- Linde V1252, 205 Amp Airco Pulsed Arc 350 Amp
- Linde Heliarc UCC 305, 300 Amp Hobart MC 500 Amp
- Lincoln 3R3, 250 Amp Lincoln V350
- Miller Plasma Torch 3/8"

### Robotic Welding Equipment

- Robotic Weld Cell FANUC, ARCMATE 100iB 6-Axis with 450 AMP Lincoln Power Supply

### Material Handling – 120,000 lbs (54,000 kg)

- Ransom Weld Positioners from 16,000 lb up to 120,000 lbs capacity
- Aronson Turning Rolls up to 60,000 lbs capacity

### Miscellaneous Manufacturing Equipment

- Ideal Vertical Press, 38" wide, 36" tall, 20" stroke 500 Ton
- HTC Hydraulic Shear 1/2" X 12'
- HTC Press Brake 400 Ton
- Cadillac Tracers 4", 6", and 10"
- Electro Arc 250 Metal Disintegrator 2-SA
- Scotchman, Hydraulic Ironworker
- Kokie IK-70 Circle Burner
- Heck Bevel Mill
- CMM FARO ARM Platinum 8' Arm, 7-Axis
- ISO 9001 registered

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# BRADKEN

## MANUFACTURING FACILITIES



Atchison/St. Joseph – Single source supply: pattern, casting, machining and assembly



Large steel castings to 55,000 lbs. AOD capable



In house pattern construction, rigging and solidification modelling

## Bradken – Atchison/St. Joseph

Known for their high quality production of steel castings in carbon, low alloy, armor, stainless, duplex and AOD melted steel; the Bradken – Atchison/St. Joseph facility has been manufacturing engineered steel castings for over 135 years. With a rich history of experience in the Industrial, Military, Locomotive Rail, Transit, Mining & Construction markets, Bradken – Atchison/St. Joseph possesses the experience and infrastructure to support the specification intensive markets.

### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
- ISO 9001 certified world-class foundry
- Weight range: 200 to 55,000 lbs
- Patterns, castings, machining and sub-assembly
- First Article castings are supplied quickly using agile manufacturing technology, state-of-the-art CNC pattern making, solidification simulation, CNC machining and dynamic modelling
- Assisted engineering for fabrication to casting conversions and improved castability

### Key Differentiators:

- AOD Capable: A full range of high, low alloy & stainless steel castings
- Jobbing & semi-production capable
- In house testing and X-Ray capabilities
- Solidification Modelling/Assisted Engineering
- Finish machining, testing & assembly

# BRADKEN

## MANUFACTURING FACILITIES



Locomotive undercarriages are a specialty of Bradken - Atchison/St. Joseph



Finish machining and value added painting/assembly at our St. Joseph integrated facility



Complex large industrial valves in specialty steel

### Facility Information

**In Business**  
Since 1872

**Capabilities**  
Casting  
Machine Shop  
Fabrication  
Assembly

**Metals Cast**  
Cast Steels  
Carbon Steels  
500 to 55,000 lbs.  
Corrosion Resistant Steels  
500 to 25,000 lbs.

Low Alloy Steels  
500 to 25,000 lbs.

Molding Process  
Air-Set/Nobake  
500 to 55,000 lbs.

Flask Sizes  
Minimum 42" X 42"  
Maximum 168" X 240"

Specialized Casting  
Fabrication Capabilities  
AOD Refining  
Magmasoft  
Solidification  
Modelling

**In House Heat Treating**  
Furnaces Multiple

Furnace Sizes  
Minimum  
125" X 194" X 96"  
Maximum  
180" X 312" X 96"

Type of Heat Treatment  
Normalization

Stress Relieving  
Quench and Temper  
Weld Preheat  
(5 additional furnaces)  
Painting capabilities

**Quality and Process Controls**  
Hardness  
Dimensional Layout  
Microstructure  
Radiography  
Charpy Impact Testing  
Magnetic Particle Examination  
Liquid Penetrant Examination  
Chemical Analysis  
Sand Control  
Ultrasonic Examination  
Mechanical Testing

**Certified Welding Standards**  
ASME section IX

**Maximum Lifting Capacity**  
65 Ton crane capacity

**Turning - Vertical**  
CNC  
Minimum OD 24"  
Maximum OD 168"  
Maximum Length 83"

Manual  
Minimum OD 24"  
Maximum OD 132"  
Maximum Length 69"

**Turning - Horizontal**  
CNC  
Minimum OD 8"  
Maximum OD 29"  
Maximum Length 29"

**Milling - Vertical**  
CNC  
Maximum Length 265"  
Maximum Width 118"  
Maximum Height 65"  
Maximum Part Weight  
70,000 lbs.

**Milling - Horizontal**  
CNC  
Maximum Length 244"  
Maximum Width 100"  
Maximum Height 140"

Maximum Part Weight  
70,000 lbs.

Manual  
Maximum Length 240"  
Maximum Width 100"  
Maximum Height 144"  
Maximum Part Weight  
70,000 lbs.

**Quality Assurance Program**  
ISO 9001  
Other AAR, Military and Nuclear

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# BRADKEN

## MANUFACTURING FACILITIES



Naval steel castings for USS NY



Carbon steel and low alloy steel castings to 55,000 lbs. ship weight



Large steel casting for mining industry OEM

### Bradken - Amite

As one of the larger, established North American steel foundries, Amite's growth strategy involves investments by Bradken in technical resources such as Pro/ENGINEER and MAGMASOFT solidification modelling. Bradken - Amite's history shines in both the industrial and mining/ construction markets; by providing superior products and services for these industries. Complex engineered castings are becoming more of a focus as we implement technical tools and advanced infrastructure to manufacture more challenging steel sand castings. Basic arc melting contributes to the high standards of our castings and an on-site machine shop provides rapid delivery of machined castings from a single source.

#### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
- ISO 9001 certified world-class foundry
- Casting weight range: Up to 55,000 lbs in carbon and low alloy steels
- In-house X-ray and non-destructive testing facilities
- Machining and value added offerings

#### Key Differentiators:

- Large low alloy & carbon steel castings
- Specializing in jobbing and one-off projects
- In house testing and X-Ray capabilities
- Solidification modelling
- Machining

#### Safety & Training

Bradken - Amite is dedicated to safety. The Amite facility has been recognized as one of the winners for the Millionaires Safety Award. The annual award recognizes facilities that reach the one million mark of consecutive man hours worked without incurring an occupational injury or illness that results in days away from work. This commitment to safety and safety record has made our Amite facility a very distinct business unit within Bradken and within the North American steel foundry industry. The commitment to training is evident in the leadership programs also woven into the Bradken - DNA:

- Skills assessment to determine the area of training needs for supervisors
- Tailored curriculum based on needs
- Weekly training sessions
- Lean manufacturing training

The end result...

**Professionalism:** Enhanced customer focused approach

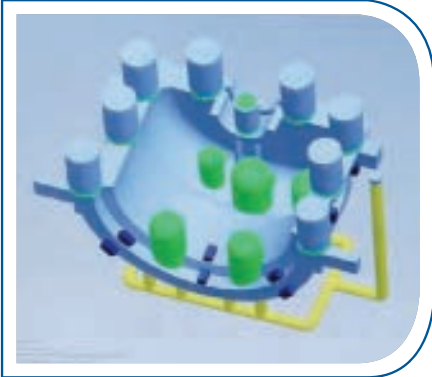
**Ownership:** A stronger feeling of capability

**Supervisor Morale:** A sense of accomplishment

Quality castings, value added offerings and pride in workmanship. Bradken - Amite is a natural choice for large carbon steel and low alloy steel castings.

# BRADKEN

## MANUFACTURING FACILITIES



Bradken - Amite uses Pro/ENGINEER and solidification modelling to ensure casting integrity



Inspection of a large support casting



Large, machined steel differential for mining truck

### Facility Information

**In Business** Since 1992

#### Capabilities

Casting  
Machine Shop

#### Metals Cast

Cast Steels  
Carbon Steels 5,000 to 55,000 lbs.  
Low Alloy Steels 5,000 to 55,000 lbs.

Molding or casting process used  
Air-Set/No bake 5,000 to 55,000 lbs.

Flask sizes  
Minimum 16" X 16"  
Maximum 192" X 192"

**In House Heat Treating**  
Furnaces Multiple

What Type  
Normalization  
Stress Relieving  
Annealing  
Quench and Temper

Furnace Sizes  
Minimum 146" X 146"  
Maximum 264" X 288"

In-house Machining Operations  
Painting Capabilities

#### Quality and Process Controls

Hardness  
Dimensional Layout  
Magnetic Particle  
Microstructure Out Sourced  
Radiography  
Charpy Impact Testing Out Sourced  
Magnetic Particle Examination  
Liquid Penetrant Examination  
Chemical Analysis  
Sand Control

Ultrasonic Examination  
Mechanical Testing  
MagmaSoft  
Solidification  
Analysis

Certified Welding Standards  
ASTM, ASME, MIL-S-248

### Machine Shop Capability

**Maximum lifting capacity**  
60,000 lbs.

#### Turning – Vertical

CNC	V-16	V-12	V-10
Minimum OD	20"	20"	20"
Maximum OD	192"	144"	120"
Maximum Length	100"	180"	106"

#### Milling – Horizontal

CNC			
Maximum Length	240"	144"	136"
Maximum Width	144"	72"	72"
Maximum Height	120"	96"	90"
Maximum Part Weight (lbs)	80,000	40,000	40,000

#### Quality Assurance Program

ISO 9001  
Military (Naval)

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# BRADKEN

## MANUFACTURING FACILITIES



Pattern, casting and machining facilities located in London, Ontario Canada (Single Source Solutions)



Diverse pattern and tooling manufacturing capabilities



A wide variety of steels and specialty materials: NiHard, NiResist, ductile irons to 10,000# ship weight

### Bradken – London

#### (Patterns & Castings)

For over 60 years, Bradken – London, Ltd. casting facility has positioned itself as the preferred supplier for patterns, high integrity ferrous castings and machined components. 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. As an integrated manufacturing company Bradken – London, Ltd., casting facility operates locations. The Pattern location specializes in the manufacture of wood, metal and plastic patterns for the foundry industry. The Foundry location specializes in high integrity and difficult to produce components in a wide variety of alloys including such diverse materials as heat and corrosion resistant stainless steel, carbon steel, Ni-hard, Ni-resist and ductile iron. Bradken – London casting facility has a workforce of 120 employees with skilled metallurgical engineers and technicians, and qualified, highly skilled mold and melt crews. We have produced over 50,000 unique castings for nine distinct market sectors. Our customers see us as a jobbing foundry resource providing expertise in casting engineered products with difficult geometries and varying alloys. New customers often find that we offer the right solution as we have experience with reverse engineering and casting unique, one-off components.

#### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
- ISO 9001 registered world-class foundry
- Casting weight range: 20 to 10,000 lbs in a variety of steels, specialty stainless steels, NiHard, NiResist, ductile iron and unique metallurgies
- Value added machining, painting & light assembly
- World-class pattern shop with CNC and CAD/CAM capabilities
- Located within minutes of our Bradken machining facility. The two facilities add value and solutions for our customers' wide-ranging needs

#### Key Differentiators:

- Complex highly engineered castings
- Extensive list of alloys poured: Over 280
- In house NDE and certified upgrade
- Single source solutions: Patterns, castings, machining & testing

#### Pattern Shop

Bradken – London began as a one man jobbing wood pattern shop in 1948. During the 1950's the company established a reputation for building very large patterns for hydroelectric, steel mills, and resource processing equipment. During the 1960's the demand for metal patterns increased, so the pattern shop expanded into metal tooling. We provide tooling for large jobbing foundries as well as high production foundries.

# BRADKEN

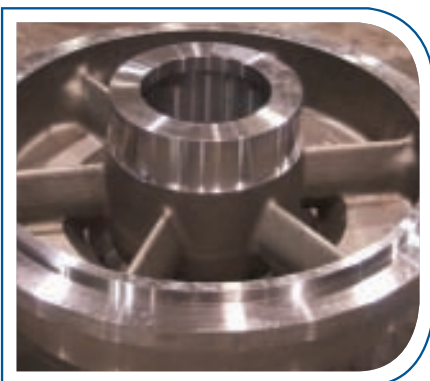
## MANUFACTURING FACILITIES



Difficult castings and specifications for the energy market



Dimensional stability and high integrity castings



Machined turbine component

In 1980 we became the first Pattern Shop in North America to utilize CAD/CAM for the design and manufacture of tooling. Today we can make your tooling in wood, metal, plastic and Styrofoam, using either CNC or conventional methods. We also supply jigs, fixtures, models and templates.

### Facility Information

<b>In business</b>	Since 1948
<b>Capabilities</b>	
Casting	
Machine Shop	
Fabrication	Outsourced
Value Added	Pattern Shop

### Metals Cast

Cast Steels	
Austenitic-Ferritic Duplex	20 to 10,000 lbs.
Carbon Steels	20 to 10,000 lbs.
Corrosion Resistant Steels	20 to 10,000 lbs.
Heat Resistant Steels	20 to 10,000 lbs.
Low Alloy Steels	20 to 10,000 lbs.
Ni Hard	20 to 10,000 lbs.
Ni Resist	20 to 10,000 lbs.
Ductile Iron	20 to 10,000 lbs.
Wrought Grades	20 to 10,000 lbs.

Molding or casting process used	
Air-Set/Nobake	20 to 10,000 lbs.

Flask sizes	
Minimum	32" x 32"
Maximum	110" x 110"

### Pattern making and solidification modelling

Pattern Shop	
3 CNC tools up to 236" x 132" x 59"	
Magmasoft Simulation	

### In-house Heat Treating

Furnaces	Multiple
Furnace Sizes	
Maximum	110" x 72"
Type of Heat Treating	
Normalization	
Stress Relieving	
Annealing	

### Quality and Process Controls

Hardness	
Faro Arm for Dimensional Layout	
Microstructure	
Radiography	
Charpy Impact Testing	
Magnetic Particle Examination	
Liquid Penetrant Examination	
Chemical Analysis	
Sand Control	
Ultrasonic Examination	
Mechanical Testing	

Certified welding standards: ASME IX

Painting capabilities

### In House Machine Shop Capability

Maximum lifting capacity	10,000 lbs.
Turning – Vertical	CNC
Minimum OD	18"
Maximum OD	78.7"
Maximum Length	70.9"

### Quality Assurance Program:

ISO 9001	
American Bureau of Shipping	
Cage Code Registered - US Government	
Defense Logistics Information Service (DLIS)	
CGP -Canadian government controlled goods program	
ASME Section III, NCA-3800 2001	

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# BRADKEN

## MANUFACTURING FACILITIES



Machining and casting facilities located in London, Ontario Canada  
(Single Source Solutions)



Extensive variety of machine tools: Large jobbing and production machining



Engineering and programming for complex machining and precision

### Bradken – London (Machining)

In business for over 34 years, Bradken - London, Ltd. machining division has the machine tools, support equipment, people, and skills necessary to finish and assemble machined products. With a history of serving the Rail and Industrial markets, continuous investment in machine tools are now providing growth in the areas of Energy, Mining and Construction. We have more than 70 machine tools and more than half of them have CNC capabilities for custom and production machining. Capabilities include handling and machining of products from 50 lbs up to 40 tons. The London machining facility has assembly experience and machine rebuilding capabilities. Located within minutes of our Bradken casting facility, the two facilities add value and provide complete solutions for our customers' wide ranging needs.

### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
- ISO 9001 registered
- CNC and manual machine tools for a variety of applications and run sizes
- Coordinate Measuring Machine (CMM)
- Over 70,000 sq. ft. floor space, under crane working height 25 feet and 20 ton crane capacity
- Turnkey casting, machining and value added supply solutions

### Key Differentiators:

- Finish machining
- Large jobbing & semi-production machining
- Single source solutions: Patterns, castings, machining & testing

# BRADKEN

## MANUFACTURING FACILITIES



Energy and Industrial gearbox machining



Oil Field pipeline valve: Cast by Bradken and finish machined by Bradken



Hydro turbine Wicket Gate: Pattern, casting, machining and CMM layout.

### Facility Information

**In Business** Since 1974

#### Capabilities

Machine Shop  
Fabrication  
Other Assembly

#### Turning – Vertical

CNC  
Minimum OD 1"  
Maximum OD 213"  
Maximum Length 103"

Manual

Minimum OD 0.25"  
Maximum OD 98"  
Maximum Length 54"

#### Turning – Horizontal

CNC  
Minimum OD 1"  
Maximum OD 32"  
Maximum Length 168"  
Manual  
Minimum OD 0.25"  
Maximum OD 28"  
Maximum Length 216"

#### Milling – Vertical

CNC  
Maximum Length 48"  
Maximum Width 24"  
Maximum Height 24"  
Maximum Part Weight 4,400 lbs.

Manual

Maximum Length 36"  
Maximum Width 8"  
Maximum Height 16"  
Maximum Part Weight 1,000 lbs.

#### Milling – Horizontal

CNC  
Maximum Length 384"  
Maximum Width 39"

Maximum Height 117"  
Maximum Part Weight 66,000 lbs.  
Manual  
Maximum Length 228"  
Maximum Width 30"  
Maximum Height 100"  
Maximum Part Weight 20,000 lbs.

#### Grinding – OD

Minimum Length 0.25"  
Maximum Length 48"  
Maximum OD 16"  
Maximum Weight 1,000 lbs

#### Grinding – ID

Minimum Length 0.375"  
Maximum Length 16"  
Maximum ID 10"  
Maximum Weight 300 lbs.

#### Grinding – Surface

Maximum Length 53"  
Maximum Width 22"

#### Drilling / Honing

Maximum Depth 30"  
Tolerance -0.062  
Willing to accept responsibility for materials & provide turn-key parts

Welding capabilities

Mig Stick Tig

Welders certified

CWB (Canadian Welding Bureau)

#### Quality Assurance Program:

ISO 9001

ASME

ASTM

Maximum Lifting Capacity 40 Tons

For more information contact Bradken at [EngProd@bradken.com](mailto:EngProd@bradken.com)

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# BRADKEN

## MANUFACTURING FACILITIES



Offices strategically located at port of Tacoma, WA and manufacturing in Xuzhou, China



Global Services offers a comprehensive and single source supply for finished castings



Large mining truck differential

## Bradken Global Services

Bradken Global Services is exactly that: Global - Bradken serves all continents and countries. Twenty years ago Bradken Global Services was created to service the North American marketplace, filling the need for a lower cost country solution. Today we assist our Western facilities by providing economical additional capacity, with the same security & Quality Assurance. We process castings in China and serve both Western & Asian markets: Providing inspection and finishing services to Chinese foundries.

Global companies supply global solutions and Bradken Global Services can deliver.

### Manufacturing Capabilities (Overview)

- Each Bradken business unit makes use of continuous improvement programs and maintains specialists at the business unit and corporate levels to drive improvements and efficiencies
- Quality steel castings in a variety of configurations, materials, sizes & processes
- State-of-the-art upgrade and testing facility with in-house heat treatment
- Value added machining
- Company inspectors, process engineers and quality personnel
- Project management and complete documentation services
- True global coverage to all parts of the world
- Supported by one of the largest and most respected global foundry & machining organizations – Bradken, Ltd

### Key Differentiators:

- Fully staffed in China with Supplier Quality Engineering Staff
- Offices/Facilities at Port of Tacoma, WA USA & in Xuzhou, China
- International support from Bradken - Atlas capabilities and Bradken - Australia
- Single Source Solutions: Assisted engineering, pattern/tooling, castings, machining & simple assembly

# BRADKEN

## MANUFACTURING FACILITIES



Global services offers a full range of non-destructive testing and protective coatings ensuring quality



Bradken - Global Services employees inspect and provide process engineering



Large steel castings for a variety of industrial markets

### Facility Information

Fully staffed Bradken Quality and Process Engineering personnel supporting a growing skilled employee base.

**In Business** Since 1988

#### Capabilities

**Castings** Globally Sourced/  
Globally Supplied

**Machining** Globally Sourced/  
Globally Supplied

#### Metals Cast

**Cast Steels**

**Carbon Steels** 5 to 70,000 lbs.

**Corrosion Resistant Steels** 5 to 70,000 lbs.

**Heat Resistant Steels** 5 to 70,000 lbs.

**Low Alloy Steels** 5 to 70,000 lbs.

**Manganese Steels** 5 to 70,000 lbs.

**Molding or casting process used**

**Air-Set/Nobake Investment Casting** 5 to 70,000 lbs.

**1 to 50 lbs.**

**Lost Foam (EPC)** 1 to 50 lbs.

**Shell Mold** 1 to 50 lbs.

**Lost Wax** 10 to 250 lbs

#### In-house Heat Treating

**Type of Heat Treating**

Normalization

Stress Relieving

Annealing

Quench and Temper

**Furnace Sizes**

**Maximum** 120" X 120"

### Value Added Processes

Machining services  
Painting and finishing services

### Quality and Process Controls

**In House**

Welding

Grinding

Inspection (Visual, Magnetic Particle, Dye penetrant, Ultrasonics, Radiography)

Dimensional Inspection

Heat Treating

Normalizing

Austenitizing

Quench and Temper

Microstructure Analysis

Mechanical Testing

Spectrographic analysis

Hardness Testing

**Outsourced**

Charpy Impact Testing

Liquid Penetrant Examination

Chemical Analysis

For more information contact Bradken at [EngProd@bradken.com](mailto:EngProd@bradken.com)

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