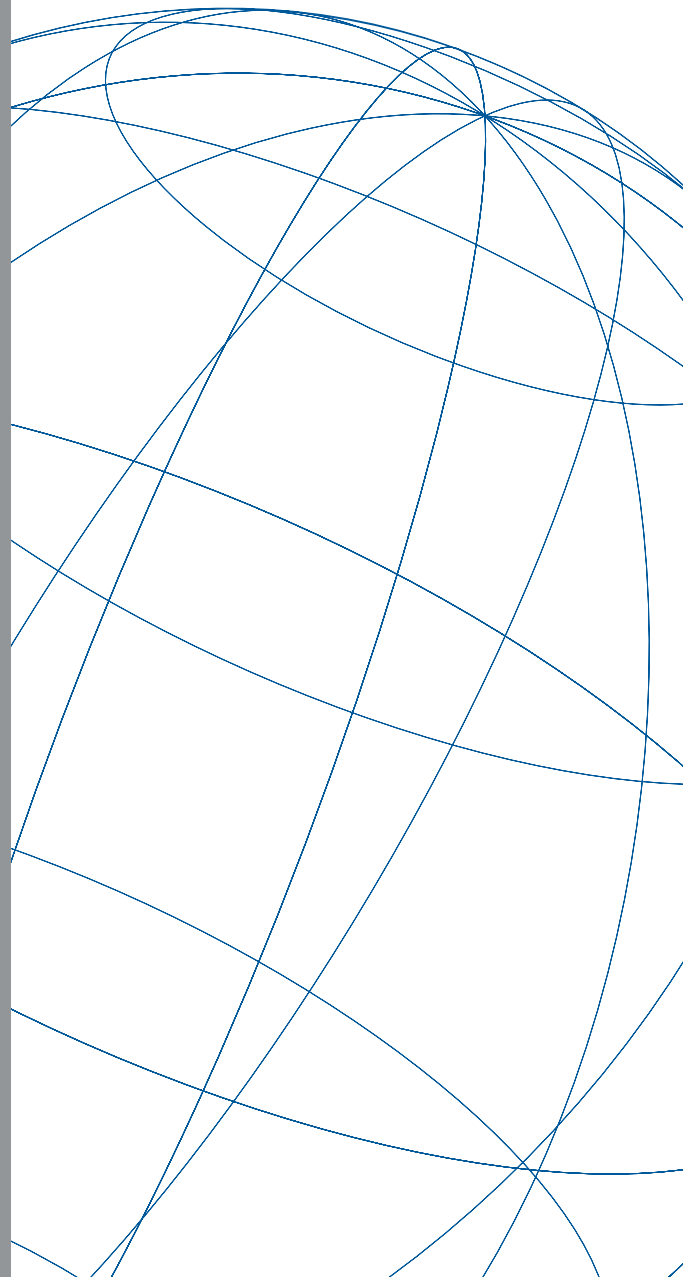


Energy Products



Our Innovation. Your Advantage.



Bradken's Engineered Products Division is a full service steel foundry and machining organization. Producing carbon, low alloy, stainless steel and specialty alloy castings weighing as much as 45,000 lbs/20,500 kg., we cover a wide range of materials and configurations.

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

- Assisted engineering (fabrication to cast, improving castability)
- Patterns & tooling
- Carbon/stainless & specialty steel castings
- Linatron x-ray capabilities for wall thicknesses beyond 6.5"
- Certified ASME nuclear material manufacturer
- Machining & value added services
- Global sourcing

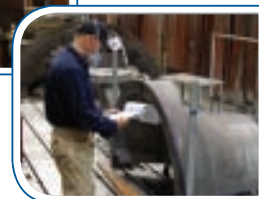
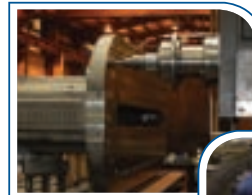


Our Innovation. Your Advantage.

Anchored by one of the premier foundries in North America, Bradken - 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 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 Tacoma Washington (USA) and London, Ontario (Canada) facilities are not just foundries; we have evolved into manufacturers of major metal components and value added offerings.

Bradken - Atlas excels in the following areas; demonstrating itself as a differentiated supplier:

- We offer a full range of carbon steel, alloy steel, stainless steel, and duplex stainless: In sizes ranging to 45,000lbs/20,500kg, our manufacturing flexibility supplies a wide range of configurations and specifications for the varied requirements within the energy market.
- We recognize that energy markets have very demanding specifications and customer inspection points. We are certified to produce high pressure and other specialty castings for ASME Nuclear, US Navy, ISO 9001-2000, and numerous highly specific requirements for hydro-electric and the Oil Industry (surface and subsurface).
- Experience, experience, experience...: Our journeyman pattern makers, foundry process engineers, mold makers, cleaning room staff and inspection personnel speak the language of energy markets. In addition to our in-house NDT facilities and Level III certified inspectors for visual, MPE (magnetic particle examination), LPE (liquid penetrant examination), UE (ultrasonic examination), and RE (radiographic examination), we have a fully staffed Linatron facility in our Atlas, Tacoma WA business unit for section thickness up to 20"/508mm.
- From engineered concept to finished product: We are a full service steel casting supplier to OEM companies with robust engineering, technical support, pattern construction, non-destructive testing, machining, fabrication and cast/fabrication combinations.



Certifications & Specification

Understanding and possessing the necessary qualifications is vital in being able to supply the exacting standards of the energy market. Engineered Products knows this and our facilities maintain these critical certifications and quality systems.

In addition to our numerous customer certifications, Bradken – Atlas holds the following certifications

- ISO9001
- Nuclear certification by ASME, QSC No. 204
- DNV approved manufacturer of steel castings
- CGP – Canadian government control goods program
- ABS – American bureau of ship building
- ASME – Section III, NCA 3800 2001
- Navy Nuclear qualified to NAVSEA 250-1500
- Approved to manufacture HY-80 and HY-100 castings by the department of the Navy
- Off-shore oil & gas certified by numerous OEM's and countries with material qualified to EN 10225 and API RP2Z
- In house ASTN level III non-destructive testing specialists
- Lloyds register certificate
- NACE
- ASTM





Testing and Inspection

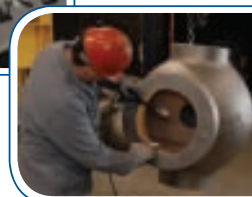
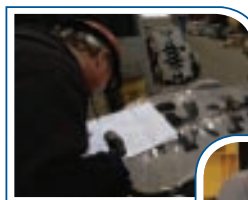
In addition to the stringent qualifications, Bradken – Atlas and the Energy Products group offers depth of certified experience in the areas of engineering, testing and inspection.

- Pro/ENGINEER
- CAD/CAM software
- Solidification modelling
- Full dimensional layout and visual inspection
- In house ASTN level III non-destructive testing specialists

We offer a full complement of testing and inspection:

1. Visual
2. Dimensional
3. Microstructure
4. Charpy impact
5. Chemical analysis
6. Liquid penetrant examination (LPE)
7. Magnetic particle examination (MPE)
8. Ultrasonic examination (UE)
9. Radiography
10. Linatron x-ray for section thicknesses in excess of 6.5"/165mm

Bradken – Atlas maintains Linatron X-Ray capabilities for well thicknesses up to 20"/ 580mm. Our Tacoma facility is one of the few facilities in North America with a Linatron.





Foundry Process

Energy products require that facilities be equipped to process castings and finished product to the highest standards. Bradken's manufacturing plants have the necessary skilled personal and equipment to complete task to exacting specifications.

People:

- Skilled foundry process engineers understand critical to quality cast components
- Quality personnel/metallurgists review and digest the specifications
- ARC Furnace, induction or AOD pressed materials to meet required mechanical properties
- Experienced molders, melt crews and finishers process the components guided by electronic workflow travelers throughout the plant
- Skilled non-destructive testing, ASNT certified inspectors ensure the components comply with your defined specifications
- Certified ASME Section IX welders further assure that upgrading is performed with precision



We speak the technical language of our customers, since we understand the critical nature of the Energy market.



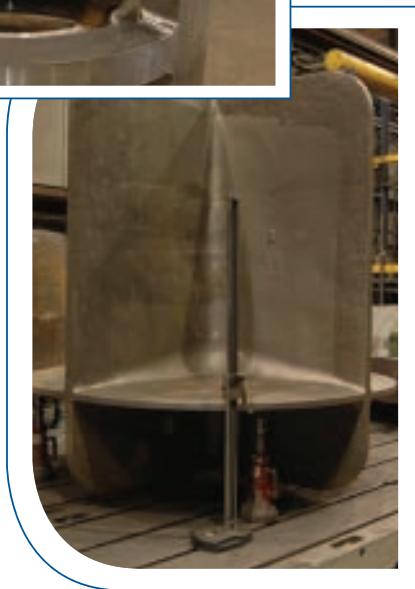
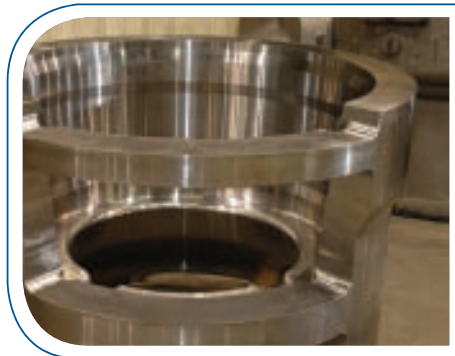
Offshore Oil Industry

Bradken-Atlas has become the oil industries source for custom engineered castings designed for the most critical surface and sub surface applications.

Why?

- Bradken- Atlas has been in continuous operation since 1899
- Superior AOD refined materials: specialty cast metals with characteristics of strength, toughness and field weldability
- Numerous OEM customer and country approvals
- Extensive non-destructive testing including Linatron radiography for section thicknesses in excess of up to 20"/ 580mm
- Complete scope supply: assisted engineering, pattern/tooling construction, complex casting, machining, cast/fabrication inspection and testing

Typical castings supplied including finish machining and special coatings are: tendon porches, roto latch receptacles, load rings, lug shrouds, nodes, pile transitions, riser baskets, trunion blocks, subsea wye bodies, diverless clamps, chain stoppers, latches, and hot taps





Products and Services

Bradken – Atlas facilities are positioned as the preferred supplier for patterns, high integrity ferrous castings, machining, cast/fabrication, fabricated and tested components.



END MARKET	MARKET SEGMENT	PRODUCTS
Oil & Gas	Exploration	<ul style="list-style-type: none"> Offshore platform structural components: Deck nodes, tendon porches, receptacles, load rings, lug shrouds, riser baskets, Subsea wye bodies, diverless clamps, and hot taps Oil tool, land based Mud pump shafts and frames
	Transportation	<ul style="list-style-type: none"> Pumps Valves Gas compressors Pipe connectors
	Refinement	<ul style="list-style-type: none"> Pumps Severe service valves Gas compressors Refining apparatus
Power Generation	Municipal power plants (fossil)	<ul style="list-style-type: none"> Steam turbine cases, steam chests Stop & control valves - steam Steam boiler, dryer, & piping components Pumps Gas turbine cases, blade rings, inlet housings
	Nuclear power plants	<ul style="list-style-type: none"> High pressure steam turbine cases, steam chests Control valves - steam Control valves Pumps, cooling and pressure
	Hydro electric	<ul style="list-style-type: none"> Runners, wicket gates, pelton wheels, crowns, bands and blades
	Plant power & apparatus	<ul style="list-style-type: none"> Steam turbines (small)
Chemical	Processing	<ul style="list-style-type: none"> Pumps Valves Compressor cases and nozzles
Military - Navy	Ship structures	<ul style="list-style-type: none"> Beams, hatches & ports, HY80 Rudder & steering systems Missile silo conversions Elevator rails
	Ship propulsion	<ul style="list-style-type: none"> Steam turbine components Pump casings and impellers, nuclear Valves, nuclear Heat exchangers Couplers & rotors
	Ship generators	<ul style="list-style-type: none"> Steam turbine components

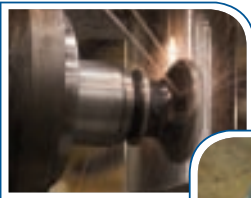


Lean manufacturing, and Six Sigma processes are employed to continuously assess and improve all aspects of our business to ensure we exceed our customers' expectations. The essence of our success must be delivering reliable components on time with superior service and exceptional value.



Hydro

The Engineered Products Division has extensive experience in the Hydro-electric market and is perfectly positioned as a tested full scope supplier.



Why?

- Supply scope: assisted engineering, pattern/tooling construction, complex casting, machining, cast/fabrication and testing
- Superior AOD refined and induction materials: Bradken casts a variety of stainless steels and duplex stainless steels to meet industry specifications
- Numerous OEM customer and country approvals
- Extensive non-destructive testing including Linatron radiography for section thicknesses in excess of up to 20"/ 508mm

Typical castings supplied including finish machining are: crowns, bands, wicket gates, pelton runners, francis runners and francis blades

Patterns/Tooling – Engineered Castings – Fully Machined Components

Patterns/Tooling

Personnel

- Experienced journeymen pattern makers
- Foundry process engineers and solidification modelling experts
- Experienced and skilled metallurgical engineers, foundry technicians, skilled finishers/welders and qualified, highly skilled mold/melt crews

Technology

- Solidification modelling and casting simulation software up to 20"/508 mm
- CAD/CAM capable, CNC pattern cutting
- Visual, radiography, ultrasonic, liquid penetrant, magnetic particle
- Linatron radiography
- Metallurgical and sand testing

Castings - Metals Cast

Cast steels

- Austenitic-ferritic duplex to 45,000 lbs/20,500 kg
- Carbon steels to 45,000 lbs/20,500 kg
- Corrosion resistant steels to 45,000 lbs/20,500 kg
- Heat resistant steels to 45,000 lbs/20,500 kg
- Low alloy steels to 45,000 lbs/20,500 kg

Other Nonferrous Alloys

- Nickel-base to 45,000 lbs/20,500 kg
- Bradken – Atlas alloy 864 and 865 (for specialized off-shore oil applications not requiring post weld head treatment)
- Bradken – Atlas alloys 804 and 806 (for specialized off-shore oil applications)

Mold Process

- Flask-less and flasked
- Air set/no bake

Machining

Equipment and Furnaces

- AOD refining
- Large arc furnaces
- Coreless induction melting furnaces
- Heat treatment – normalizing, stress relieving, stabilization, heat soak, annealing, quench and temper

Specialty

- Complex highly engineered castings
- Linatron radiography for section thickness beyond 6.5"/165 mm
- Value added supply (patterns, casting and machining)
- Alloy selection and AOD refining

Machining/Fabrication

Personnel

- Experienced, skilled machinists, fabricators, programmers and operators

Technology

- CNC programming and tooling
- CMM layout

Equipment

- Maximum lifting capacity 80,000 lbs/36,287 kg

Turning – vertical

- up to 254"/6,452 mm swing
- 118"/2,997 mm Table
- 102"/2,591 mm Height

Turning – Horizontal

- Boring 240"/6,096 mm HT
- Milling 80"/2,032 mm VT

Horizontal

- CNC machining centre maximum length 100"/2,540 mm horizontal travel
- Maximum width 30"/762 mm reach
- Maximum height 60"/1,524 mm vertical travel
- Maximum part weight 40,000 lbs/18,144 kg (centered wt.)

Welding Capabilities

- FCAW
- GMAW SAW
- GTAW SMAW
- Fabrications to 80,000 lbs/36,287 kg
- Capabilities include robotic production welding, large jobbing work, and mechanical assembly
- Rig up, assembly, hydrostatic testing and paint capabilities
- Welders certified ASME, Sec IX, AWS D1.1, FCAW, GMAW, SAW, GTAW, SMAW
- Willing to accept responsibility for materials and provide turn-key parts

Specialty

- Casting/fabrication assemblies
- Large CNC
- Large fabrications
- Complex engineered components
- Turnkey, single source supply
- Hydrostatic testing
- Painting and finishing operations

Quality Assurance Program

- ISO 9001:2000
- API 610, 8C and 2SC
- ABS marine steel castings
- MMPS No. 5165
- ASME QSC-204
- ASTM
- NACE
- MR0103, MR0175
- DNV

Other

- NAVSEA qualification for HY-80 and HY-100 materials
- Lloyds register certificate



North American Facilities

Industrial Products

Atchison

400 South Fourth Street
Atchison, KS 66002
USA

T +1 913 367 2121
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
USA

T +1 253 475 4600
F +1 253 473 8710

Chehalis

109 Sears Road
Chehalis, WA 98532
USA

T +1 253 475 4600
F +1 253 473 8710

Tacoma (Fabrication and Machining)

3611 South Warner
Tacoma, WA 98409
USA

T +1 253 475 3464
F +1 253 475 3466

Bradken Head Office

2 Maud Street
Mayfield West NSW 2304
Australia

PO Box 105
Waratah NSW 2298
Australia

T +61 2 4941 2600

F +61 2 4967 5003

E bradken@bradken.com.au

W bradken.com

Engineered Products Head Office

12200 N.W. Ambassador Drive
Suite 647, Kansas City, MO
64163

T +1 816 270 0700

F +1 816 270 0799

E engprod@bradken.com

W bradken.com

