

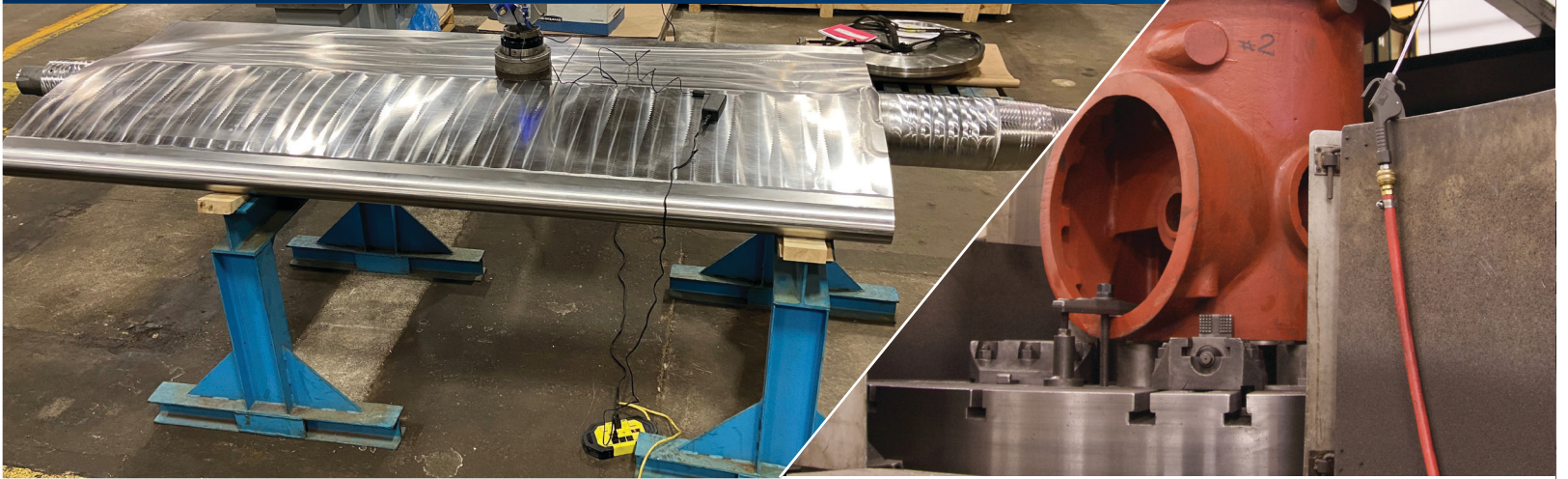


# **Specialty Products** **North America** **Energy Markets**

**Our Innovation. Your Advantage.**



# Our Business



Bradken is a full service steel foundry and machining organization with a longstanding reputation for producing the most complex engineered steel castings in the world.

**From engineered concept to finished product, we provide value for our customers by making high quality, complex engineered steel castings up to and over 30,000 kilograms or 65,000 pounds.**

Bradken employs leading edge technology coupled with extensive industry experience and value add offerings including:

- Concurrent engineering (fabrication to casting conversions, forging to casting conversions, and improved castability)
- Pattern making and tooling
- Certified ASME nuclear material manufacturer
- Carbon, stainless and speciality alloy castings
- Complete Non-Destructive Testing (NDT) facilities and Level III certified inspectors
- Ancillary services (including machining and sub-assembly)

All products listed in this brochure are



**MADE IN THE USA**





# Foundries

Bradken has a rich history in the Energy market possessing the technical tools, infrastructure, and expertise to manufacture the most challenging steel and stainless steel castings to the most intense specifications.

As the premier foundry in North America, our Tacoma, WA facility has been producing high integrity steel castings for customers around the world for more than a century. The site employs state of the art technology (including a fully staffed Linatron Radiograph facility) to produce complicated components with stringent metallurgical and quality requirements.

**We offer a full range of materials including:**

- ☒ **Carbon steels**
- ☒ **Alloy steels**
- ☒ **Stainless steels**
- ☒ **Duplex stainless**
- ☒ **Nickel based steels**
- ☒ **Specialty Irons**

**Our manufacturing flexibility supports a wide range of configurations and specifications for the varied requirements within the Energy market.**



# Energy

**Highest Standards  
Testing Specialists  
Superior Materials**





# Certifications & Specification

Understanding and possessing the necessary qualifications is vital in being able to supply the exacting standards of the energy market.

**Understanding this, our facilities maintain a number of critical certifications and quality systems in addition to numerous customer specific certifications.**

**Bradken holds the following certifications:**

- ISO9001
- Nuclear certification by ASME, QSC No. 204
- ASME – Section III, NCA 3800 2001
- DNV approved manufacturer of steel castings
- CGP – Canadian government control goods program
- ABS – American bureau of ship building
- 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 ASNT level III non-destructive testing specialists
- NACE
- ASTM



# Our People



**We speak the technical language of our customers because we understand the critical nature of the Energy market.**

Bradken requires that facilities be equipped to process castings and finished products to the highest standards.

Our manufacturing plants have the highly skilled personnel and world class equipment necessary to complete each and every task to the most exacting specifications.

## **Our workforce includes:**

- Skilled foundry process engineers who understand critical to quality cast components
- Quality personnel and metallurgists who review and digest the specifications
- Experienced molders, melt crews and finishers who process the components guided by electronic workflow travelers throughout the plant
- Skilled NDT and ASNT certified inspectors who ensure the components comply with all defined specifications
- Weld Engineers and Certified ASME Section IX welders who ensure that upgrading is performed with precision.





## Engineering

**Bradken offers certified experience in the areas of:**

- Pro/ENGINEER
- CAD/CAM software
- Solidification modelling

## Testing and Inspection

**We offer a full complement of testing and inspection services including:**

- Visual
- Dimensional
- Microstructure
- Charpy impact
- Chemical analysis
- Ultrasonic testing (UT)
- Radiographic testing (RT)
- Liquid penetrant testing (LP)
- Magnetic particle testing (MP)



Bradken's Radiographic testing facility is second to none and is capable of examining wall thickness of up to 20"/ 580mm.

### **Our Radiographic capability includes:**

- One 8 MEV linear accelerator
- One 9 MEV linear accelerator
- One 249 curies Cobalt 60 radioactive source
- One 100 curies Cobalt 60 radioactive source
- One 100 curies Iridium 192 radioactive source



**Oil & Gas  
Transportation**

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**Nuclear Power  
Generation**

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**Offshore Oil  
Industry**

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**Military-Naval  
Applications**

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**Hydro-Electric  
Power  
Generation**





# Products and Services

Bradken's focused 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"> <li>Offshore platform structural components: Deck nodes, tendon porches, receptacles, load rings, lug shrouds, riser baskets, Subsea wye bodies, diverless clamps, and hot taps</li> <li>Oil tool, land based and offshore rigs</li> <li>Mud pumps and assemblies</li> </ul> |
|                  | Transportation                  | <ul style="list-style-type: none"> <li>Pumps</li> <li>Valves</li> <li>Gas compressors</li> <li>Pipe connectors</li> </ul>   |
|                  | Refinement                      | <ul style="list-style-type: none"> <li>Pumps</li> <li>Severe service valves</li> <li>Gas compressors</li> <li>Refining apparatus</li> </ul>   |
| Power Generation | Municipal power plants (fossil) | <ul style="list-style-type: none"> <li>Steam turbine cases, steam chests</li> <li>Stop &amp; control valves – steam</li> <li>Steam boiler, dryer, &amp; piping components</li> <li>Pumps</li> <li>Gas turbine cases, blade rings, inlet housings</li> </ul>   |
|                  | Nuclear power plants            | <ul style="list-style-type: none"> <li>High pressure steam turbine cases, steam chests</li> <li>Control valves – steam</li> <li>Control valves</li> <li>Pumps, cooling and pressure</li> </ul>  |
|                  | Hydro electric                  | <ul style="list-style-type: none"> <li>Runners, wicket gates, pelton wheels, crowns, bands and blades</li> </ul>  |
|                  | Plant power & apparatus         | <ul style="list-style-type: none"> <li>Steam turbines</li> <li>Severe Service Valves (Specializing in C12A, AOD refined material)</li> </ul>  |
| Chemical         | Processing                      | <ul style="list-style-type: none"> <li>Pumps</li> <li>Valves</li> <li>Compressor cases and nozzles</li> </ul>   |
| Military – Naval | Ship structures                 | <ul style="list-style-type: none"> <li>Beams, hatches &amp; ports, HY80</li> <li>Rudder &amp; steering systems</li> <li>Missile silo conversions</li> <li>Elevator rails</li> </ul>   |
|                  | Ship propulsion                 | <ul style="list-style-type: none"> <li>Steam turbine components</li> <li>Pump casings and impellers, nuclear</li> <li>Valves, nuclear</li> <li>Heat exchangers</li> <li>Couplers &amp; rotors</li> </ul>  |
|                  | Ship generators                 | <ul style="list-style-type: none"> <li>Steam turbine components</li> </ul>  |

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.

# Capabilities



Bradken's reputation for producing high quality, innovative products results from understanding our customers operating conditions and providing superior performance. Our designs are based on providing functional solutions and are characterized by their reliability, efficiency, cost effectiveness and value.

**Our capabilities include:**

## Assisted Engineering

- Fabrication to casting conversion
- Forging to casting conversion
- Improved castability and performance

## Analysis

- Dynamic simulation analysis
- Fatigue analysis
- Chemical analysis

## Materials

- Superior AOD refined materials
- Over 130 custom engineered alloys
- Proprietary alloys

## Experience

- Metallurgists (wide range of difficult alloys)
- Weld engineers (over 450 different welding procedures)
- Pattern makers

## Additional Services

- Heat treatment
- Rough and finish machining
- Specialized TSA coating
- Weld overlays
- Hydrostatic testing
- HIPING



# Other Capabilities

| Machining/Fabrication   | Patterns/Tooling  | Welding Capabilities  |
|---|---|---|
| <b>Equipment and Furnaces</b> <ul style="list-style-type: none"> <li>AOD refining</li> <li>Large arc furnaces</li> <li>Coreless induction melting furnaces</li> <li>Heat treatment – normalizing, stress relieving, stabilization, heat soak, annealing, air/water quench and temper</li> <li>Two 80,000gal quench tanks</li> </ul> | <b>Personnel</b> <ul style="list-style-type: none"> <li>Experienced journeymen pattern maker</li> <li>Foundry process engineers and solidification modelling experts</li> <li>Experienced and skilled metallurgical engineers, foundry technicians, skilled finishers/welders and qualified, highly skilled mold/melt crews</li> </ul>                                | <b>Welding Capabilities</b> <ul style="list-style-type: none"> <li>FCAW</li> <li>GMAW SAW</li> <li>GTAW SMAW</li> <li>Fabrications to 80,000 lbs/36,287 kg</li> <li>Capabilities include robotic production welding, large jobbing work, and mechanical assembly</li> <li>Rig up, assembly, hydrostatic testing and paint capabilities</li> <li>Welders certified ASME, Sec IX, AWS D1.1, FCAW, GMAW, SAW, GTAW, SMAW</li> <li>Willing to accept responsibility for materials and provide turn-key parts</li> </ul> |
| <b>Specialty</b> <ul style="list-style-type: none"> <li>Complex highly engineered castings</li> <li>Linatron radiography for section thickness beyond 6.5"/165 mm</li> <li>Value added supply (patterns, casting and machining)</li> <li>Alloy selection and AOD refining</li> </ul>  | <b>Technology</b> <ul style="list-style-type: none"> <li>Solidification modelling and casting simulation software up to 20"/508 mm</li> <li>CAD/CAM capable, CNC pattern cutting</li> <li>Visual, radiography, ultrasonic, liquid penetrant, magnetic particle</li> <li>Linatron radiography</li> <li>Metallurgical and sand testing</li> </ul>                       | <b>Specialty</b> <ul style="list-style-type: none"> <li>Casting/fabrication assemblies</li> <li>Large CNC</li> <li>Large fabrications</li> <li>Complex engineered components</li> <li>Turnkey, single source supply</li> <li>Hydrostatic testing</li> <li>Painting and finishing operations</li> </ul>  |
| <b>Personnel</b> <ul style="list-style-type: none"> <li>Experienced, skilled machinists, fabricators, programmers and operators</li> </ul>  | <b>Castings – Metals Cast – Cast Steels</b> <ul style="list-style-type: none"> <li>Austenitic-ferritic duplex to 55,000 lbs/25,000 kg</li> <li>Carbon steels to 55,000 lbs/25,000 kg</li> <li>Corrosion resistant steels to 55,000 lbs/25,000 kg</li> <li>Heat resistant steels to 55,000 lbs/25,000 kg</li> <li>Low alloy steels to 55,000 lbs /25,000 kg</li> </ul> | <b>Quality Assurance Program</b> <ul style="list-style-type: none"> <li>ISO 9001</li> <li>API 610, 8C and 2SC</li> <li>ABS marine steel castings</li> <li>MMPS No. 5165</li> <li>ASME QSC-204</li> <li>ASTM</li> <li>NACE</li> <li>MR0103, MR0175</li> <li>DNV</li> </ul>   |
| <b>Technology</b> <ul style="list-style-type: none"> <li>CNC programming and tooling</li> <li>CMM layout</li> </ul>   | <b>Other Non-ferrous Alloys</b> <ul style="list-style-type: none"> <li>Nickel-base to 55,000 lbs/25,000 kg</li> <li>Bradken alloy 864 and 865 (for specialized offshore oil applications not requiring post weld head treatment)</li> <li>Bradken alloys 804 and 806 (for specialized offshore oil applications)</li> </ul>   | <b>Other</b> <ul style="list-style-type: none"> <li>NAVSEA qualification for HY-80 and HY-100 materials----</li> </ul>  |
| <b>Equipment</b> <ul style="list-style-type: none"> <li>Maximum lifting capacity 80,000 lbs/36,287 kg</li> </ul>  | <b>Irons</b> <ul style="list-style-type: none"> <li>Ni Hard</li> <li>Ni Resist</li> <li>Ductile Iron</li> <li>Wrought Grades</li> </ul>   |   |
| <b>Turning – vertical</b> <ul style="list-style-type: none"> <li>up to 254"/6,452 mm swing</li> <li>118"/2,997 mm table</li> <li>102"/2,591 mm height</li> </ul>  | <b>Mold Process</b> <ul style="list-style-type: none"> <li>Flask-less and flaked</li> <li>Air set/no bake</li> </ul>  |   |
| <b>Turning – Horizontal</b> <ul style="list-style-type: none"> <li>Boring 240"/6,096 mm HT</li> <li>Milling 80"/2,032 mm VT</li> </ul>  |   |   |
| <b>Horizontal</b> <ul style="list-style-type: none"> <li>CNC machining centre maximum length 100"/2,540 mm horizontal travel</li> <li>Maximum width 30"/762 mm reach</li> <li>Maximum height 60"/1,524 mm vertical travel</li> <li>Maximum part weight 40,000 lbs/18,144 kg (centered wt.)</li> </ul>                               |   |   |

# Contact Bradken globally to find a solution for your business.



**Our Innovation. Your Advantage.**

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