ENGINEERED PRODUCTS

ENERGY

Our Innovation. Your Advantage.

BRADKEN®

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 castings in a range of materials weighing as much as 55,000 lbs (25,000 kg).

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)

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

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
- Lloyds register certificate
- 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

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

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

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
NUCLEAR POWER
GENERATION
OFFSHORE OIL
INDUSTRY
MILITARY-NAVAL
APPLICATIONS
HYDRO-ELECTRIC
POWER GENERATION

Products and Services

Bradken's energy 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	• 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 and offshore rigs • Mud pumps and assemblies
	Transportation	• Pumps • Valves • Gas compressors • Pipe connectors
	Refinement	• Pumps • Severe service valves • Gas compressors • Refining apparatus
Power Generation	Municipal power plants (fossil)	• 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	• High pressure steam turbine cases, steam chests • Control valves - steam • Control valves • Pumps, cooling and pressure
	Hydro electric	• Runners, wicket gates, pelton wheels, crowns, bands and blades
	Plant power & apparatus	• Steam turbines (small)
Chemical	Processsing	• Pumps • Valves • Compressor cases and nozzles
Military - Naval	Ship structures	• Beams, hatches & ports, HY80 • Rudder & stearing systems • Missile silo conversions • Elevator rails
	Ship propulsion	• Steam turbine components • Pump casings and impellers, nuclear • Valves, nuclear • Heat exchangers • Couplers & rotors
	Ship generators	• 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.

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
- HIPPING

Machining/Fabrication

Equipment and Furnaces

- AOD refining
- Large arc furnaces
- Coreless induction melting furnaces
- Heat treatment – normalizing, stress relieving, stabilization, heat soak, annealing, air/water quench and temper
- Two 80,000gal quench tanks

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

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.)

Patterns/Tooling

Personnel

- Experienced journeymen pattern maker
- 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 55,000 lbs/25,000 kg
- Carbon steels to 55,000 lbs/25,000 kg
- Corrosion resistant steels to 55,000 lbs/25,000 kg
- Heat resistant steels to 55,000 lbs/25,000 kg
- Low alloy steels to 55,000 lbs /25,000 kg

Other Non-ferrous Alloys

- Nickel-base to 55,000 lbs/25,000 kg
- Bradken alloy 864 and 865 (for specialized offshore oil applications not requiring post weld head treatment)
- Bradken alloys 804 and 806 (for specialized offshore oil applications)

Mold Process

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

Welding Capabilities

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

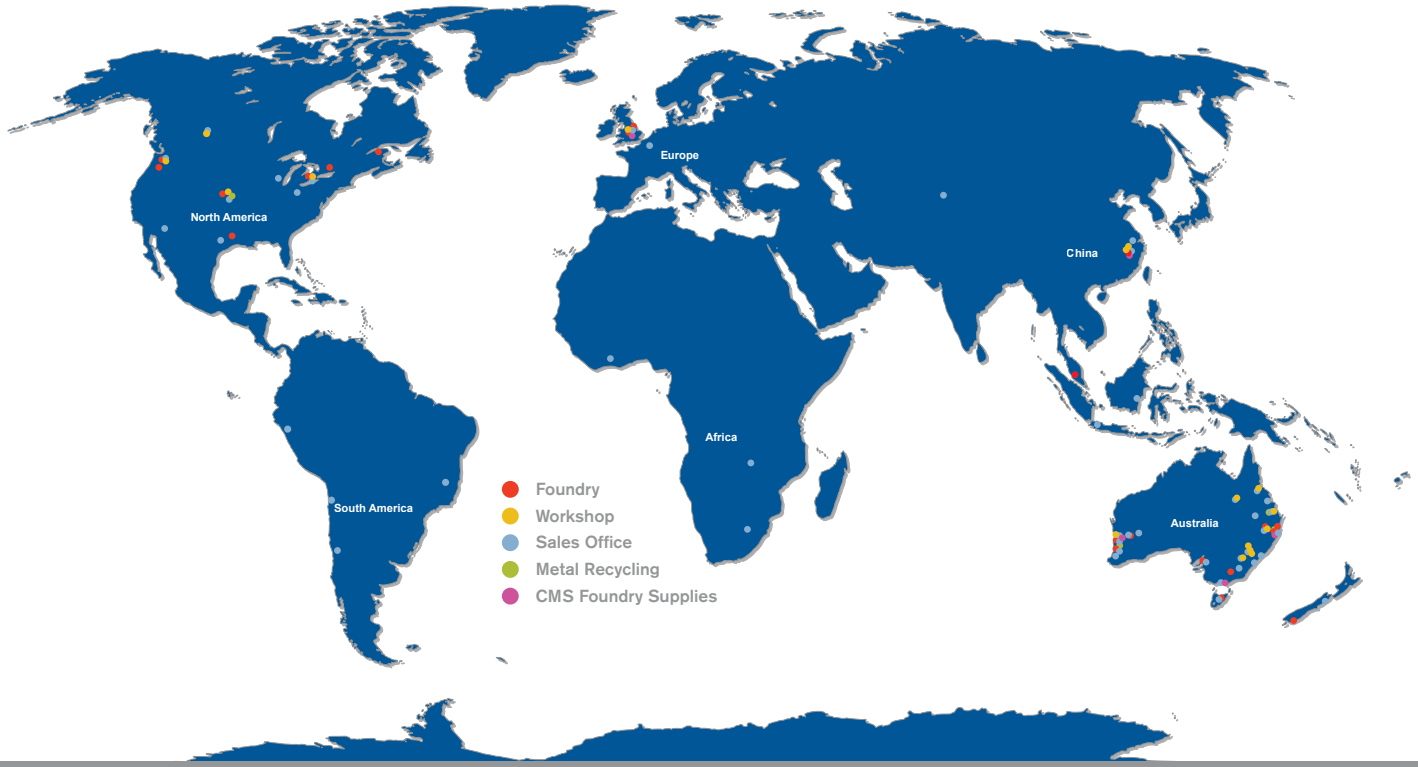
- Casting/fabrication assemblies
- Large CNC
- Large fabrications
- Complex engineered components
- Turnkey, single source supply
- Hydrostatic testing
- Painting and finishing operations

Quality Assurance Program

- ISO 9001
- 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



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Our Innovation. Your Advantage.

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