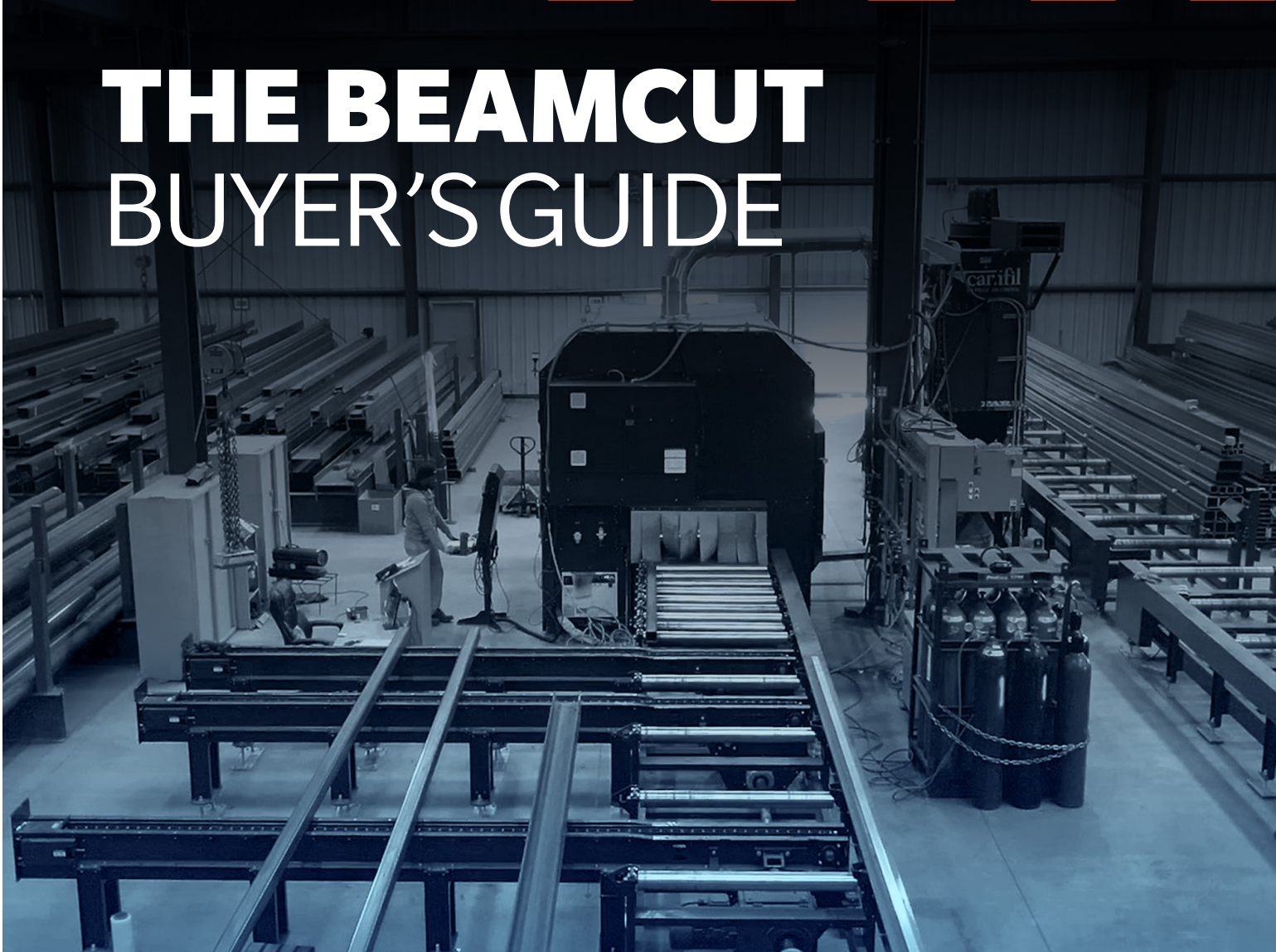




THE BEAMCUT BUYER'S GUIDE

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ABOUT THIS GUIDE

Beamcut is an advanced robotic plasma cutting solution designed for structural steel fabricators who prioritize accuracy, uptime, and long-term reliability. With Beamcut, you are automating every aspect of structural fabrication.

Structural fabrication is changing fast. What used to take a crew of skilled workers hours of manual layout and cutting can now be done with one operator and a robotic system. If you're evaluating whether a Beamcut is right for your business, this guide is your starting point.



WHAT'S INCLUDED IN THE GUIDE?

Why Empire Carries Beamcut	04
Core Features	05
Dual Measuring System: Laser Measuring and Mobile Unit	05
6-axis Robotic Arm	06
Additional Capabilities	06
Software	07
Shop Layout	08
Workflow Integration and Complementary Equipment	10
ROI and Labour Strategy	11
Right Fit for Your Production	11
Safety, Maintenance, and Testing	12
Post-Sales Service	13



WHY EMPIRE CARRIES BEAMCUT

[Beamcut](#) combines heavy-duty industrial robotics, laser-based measurement, and powerful offline simulation software to ensure part files are ready for production before they reach the shop floor.

By focusing on real-world fabrication challenges such as collision prevention, measurement consistency, and operator efficiency, Beamcut delivers a versatile, low-maintenance platform that supports complex profiles, tight tolerances, and high-throughput production with the highest confidence.

Developed by Machitech Automation, one of North America's most experienced cutting-technology manufacturers, Beamcut joins an impressive lineup of Machitech machines offered by Empire. [This complete lineup](#) enables Empire to offer automated cutting to a wide range of industries to meet any level of fabricators needs with the most capability, versatility, and reliability.



CORE FEATURES

Dual Measuring System: Laser Measuring and Mobile Unit

Accurate piece length measurement is critical in structural steel fabrication — even small errors compound quickly across a job, leading to costly rework and delays. Beamcut uses two dedicated laser measuring devices working in tandem to maintain accuracy from the moment material enters the system to the final cut.

- **Profile Laser Measuring Device**

As a new beam enters the enclosure, the Profile-Laser Measuring Device measures the leading edge, establishing the raw material dimensions and positioning of the piece. From there, it continues to measure each time the material moves, compensating for mill tolerance and ensuring all copes, notches, holes, and features are placed in the correct locations.

- **Mobile Measuring Unit**

While the Profile-Laser Measuring Device handles the shape's dimensions, the Mobile Measuring Unit follows the material along the infeed conveyor, continuously monitoring position and length in real time as the beam advances through each operation. Its design makes it up to 2x more precise than other measuring devices, and with no interruptions from rust, paint, or debris. Beamcut consistently maintains tight tolerances on cut location and length from the first operation to the last.

Together, these two systems feed real-time data to the robotic arm, which continuously adjusts cut and layout mark locations to account for any variation in material position or mill tolerances.



CORE FEATURES

6-axis Robotic Arm

The industrial FANUC 6-Axis Robotic Arm used in the Beamcut delivers best-in-class cut quality by eliminating motion sway and cutting vibration. Built with six axes, the robotic arm is capable of processing and beveling on all sides of the part, resulting in faster, cleaner, and more precise cuts.

ADDITIONAL CAPABILITIES

The FANUC robot arm is what makes the machine's broader capability set possible. The heavier payload, greater rigidity, and purpose-built design give Beamcut a meaningful advantage over competing systems, enabling features and profile handling that lighter-arm machines simply can't match.

- **Broadest profile range, including pipe.**

The robotic arm can cut nearly any shape or profile in the industry, including HSS, pipes and custom profiles like aluminum extrusions. This flexibility means fabricators aren't limited to standard beam and channel work — the same machine handles the full scope of structural profiles without reconfiguration.

- **Strongest robot arm in its class.**

The BC50 is equipped with a 50 kg heavy-duty 6-axis FANUC robot arm, while the BC25 uses a 25 kg arm. Competing systems in this category typically use 12–15 kg robots at most — a fraction of the Beamcut payload capacity. The heavier robot provides greater rigidity, durability, reach, and directly enables features that lighter-payload arms simply cannot support. Beamcut's arm is 4x stronger and more powerful than the closest competition.

- **Magnetic Breakaway Torch.**

The magnetic torch breakaway are designed to instantly detach on impact and initiate an emergency stop, avoiding damage to the torch, further contributing to machine uptime, and reducing the cost of ownership. This protective feature is only possible because of the higher payload strength of the Beamcut's robot.

- **Hypertherm Plasma**

Hypertherm's plasma systems have been designed and built for maximum efficiency and productivity for x-y cutting, chamfering, and robotics operations. Combined with the FANUC robot arm, it produces perfect bolt holes with beveling and all robotic cut sequences. Beamcut is compatible with the XPR170, XPR300, and XPR460, giving buyers the flexibility to match plasma power to their production volume and material thickness requirements.



SOFTWARE

Seamless transition from office to shop floor

Beamcut Suite is the proprietary software used with Beamcut to program the robot. Beamcut separates file creation, modification, and simulation from the machine operator, with all programming and verification completed offline. The process is created and verified in the office and off the shop floor, allowing the simulations to provide valuable feedback and an opportunity for any adjustments to take place before committing time, resources, and part files to the Beamcut.

Once the simulations have been validated and are ready for the Beamcut, they can easily be transferred to the machine via network or removable media. This approach keeps operators focused on production and eliminates bottlenecks and errors at the machine.

CATCH ERRORS BEFORE THEY COST YOU

The ability to use the simulator ensures that all potential issues are discovered and resolved before processing the beam through the Beamcut, reducing collisions, material waste, and unplanned downtime.

Beamcut Suite provides full visibility into robot motion, cut paths, speeds, and sequencing before production begins. If adjustments are needed, users can modify robot pathing and positioning directly within the software and save the changes without waiting on OEM support. Giving you more control over your robotic cutting machine than any other.

The software can run these simulations for multiple part files in large batches. Allowing you to get back to other business and essentially putting the software into auto mode for your entire project. Providing you with a detailed spreadsheet report highlighting any issues found when it's complete.

PLAN YOUR PRODUCTION

Beamcut Suite provides estimated processing times for each job, giving production planners and shop managers a reliable basis for scheduling work and setting realistic timelines for material processing. This visibility helps align cutting output with downstream fit-up and welding capacity, reducing idle time and keeping the full fabrication workflow moving.

REAL-TIME MACHINE PERFORMANCE

Beamcut's built-in Industry 4.0 analytics give shops real-time visibility into machine performance, part traceability, and productivity metrics. Over time, this data supports better scheduling, more accurate job costing, and earlier identification of bottlenecks. Combined with remote camera access for monitoring production from anywhere, it gives ownership and management the visibility to make informed decisions about staffing, capacity, and equipment utilization — without relying solely on floor-level reporting.

For fabricators building a case for automation investment, documented output data also provides concrete evidence of throughput improvements to support future capital decisions.

SHOP LAYOUT

Material Storage

One of the practical advantages of the Beamcut system is its flexibility around material storage and handling. Material can be stored outdoors and loaded onto cross transfers that pull a single beam onto the infeed conveyor for processing. Once cut, processed beams are fed to the outfeed conveyor and pulled onto the cross transfers for unloading and moving to the next process in the shop. This infeed-to-outfeed flow keeps material moving efficiently through the system with minimal manual handling.



Floor Spacing

Floor space requirements depend on the specific layout configuration, including conveyor lengths and whether cross transfers are included. As a reference point, a BC25 with 40' infeed and 40' outfeed conveyors with cross transfers would occupy approximately 103'-10" in length and 20'-10" in width. Since conveyor lengths are fully customizable, final dimensions will vary by configuration and should be confirmed with Empire based on your shop's specific needs.



SHOP LAYOUT

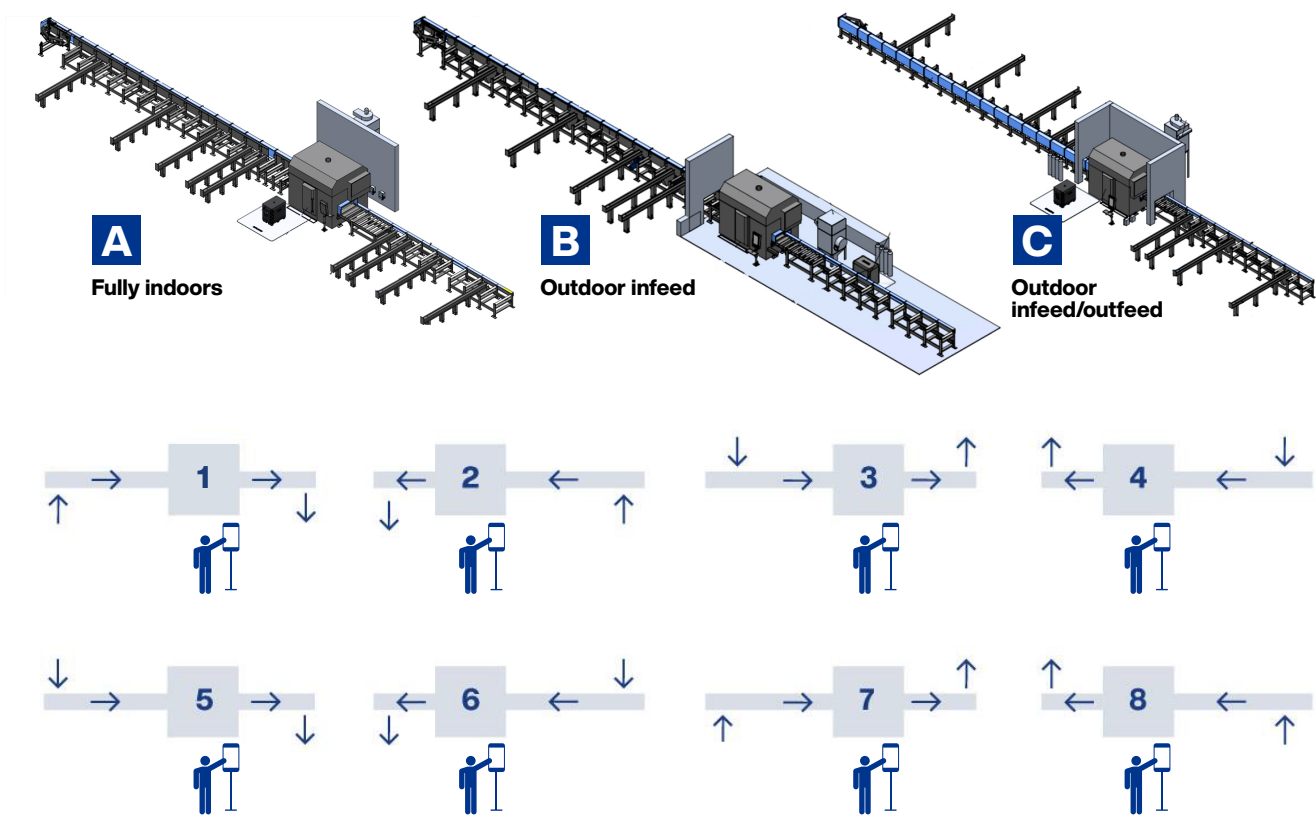
Cross Transfer Conveyors

Cross transfer conveyors are an optional addition to the infeed or outfeed conveyor that further reduce the manual labour involved in moving material through the system. Rather than loading or unloading pieces directly onto the conveyor, the cross transfer system creates a platform for increased output by handling that material movement automatically. They can be configured on the infeed side, outfeed side, or both, depending on shop workflow.

Cross transfers are built to be placed outside under harsh weather conditions, making them well-suited for fabrication shops where raw material is staged outdoors before processing.

MACHITECH

BEAMCUT LAYOUT CONFIGURATION





WORKFLOW INTEGRATION AND COMPLEMENTARY EQUIPMENT

Fitting Beamcut Into Your Existing Workflow

Beamcut is designed to slot into an existing fabrication workflow rather than require a complete operational overhaul. For most shops, it replaces several standalone machines (drill lines, beam lines, punches, and coping stations) consolidating those processes into a single automated cell. This not only reduces the floor space dedicated to cutting operations but frees up labour for other parts of the production process. Because Beamcut operates using standard DSTV, NC1, and 3D CAD files, it integrates with the detailing and engineering software most structural fabricators are already using, making the transition from manual or semi-automated cutting to fully robotic processing more straightforward than it might otherwise be.

COMPLIMENTARY EQUIPMENT

When used together, the Machitech Beamcut and the AGT Robotics BeamMaster create a highly efficient, automation-ready workflow that bridges precision cutting and robotic welding for structural steel fabrication.

1. Beamcut (BC25 or BC50) is positioned upstream to perform end-to-end robotic plasma cutting — including copes, slots, holes, weld-prep bevels up to 52°, and layout marking — using laser measurement, offline simulation, and Hypertherm plasma technology to deliver consistent, weld-ready parts.
2. These accurately prepared beams are then transferred to the BeamMaster robotic welding cell, where AGT's Cortex software automatically generates custom-tailored robotic welding programs for every unique beam. The SnapCam 3D vision camera captures an image before each weld to analyze part positioning and apply real-time adjustments, compensating for real-world material variation to ensure precise weld placement and quality.

By separating cutting and welding into dedicated, purpose-built systems, fabricators avoid compromising throughput or accuracy while maximizing uptime across both processes. Cortex batch processes an entire building from a CAD file in a single click, enabling a seamless digital handoff from Beamcut's offline programming environment to BeamMaster's no-programming welding workflow.

The result is a scalable fabrication strategy that reduces manual handling, improves fit-up, minimizes reliance on skilled labour, and delivers a repeatable, high-quality finished assembly — from raw beam to fully welded component.

ROI AND LABOUR STRATEGY

Beamcut doesn't eliminate labour, it redeploys it. By automating layout, cutting, beveling, and marking, skilled tradespeople are freed from repetitive, physically demanding work and redirected to higher-value roles such as fit-up, welding, quality control, and supervision. Offline programming and simulation also create opportunities for detailers or junior staff to take on file preparation and scheduling, reducing dependence on senior operators at the machine.

For shops where skilled labour is difficult to find and retain, this is a meaningful operational advantage. Depending on the current state of a shop's workflow, fabricators have reported throughput increases of 2x to 4x compared to manual beam processing, with labour hours per beam reduced by as much as 50–70%. Results will vary based on shop size, part complexity, and existing processes, but the directional shift is consistent: the same team supports significantly higher output, and the work they're doing becomes safer, more consistent, and more aligned with where their experience adds value.

RIGHT FIT FOR YOUR PRODUCTION

A shop should seriously consider a Beamcut system when beam processing is becoming a production constraint.

Strong Fit Indicators:

- ✓ **Cutting volume has reached its maximum point.**
Consistently processing 10–20+ beams per day with manual layout and cutting, or 1,500–3,000+ tons of structural steel per year, is a reliable threshold. At that level, manual torching, coping, and beveling begin to consume excessive skilled labour hours, create rework risk, and slow downstream fit-up and welding.
- ✓ **Operational strain is visible.**
If cutting crews are working overtime, welders are waiting on prepared material, or quality issues are surfacing from inconsistent manual cuts, automation becomes a strategic necessity.
- ✓ **Project complexity.**
Shops with high-mix / low-volume projects, complex copes and weld-prep bevels, and tight schedule requirements could justify a Beamcut investment even with lower annual tonnage, as the system delivers predictable, repeatable output regardless of part variety.

Reasons to Wait:

- ✗ **Volume is low and cutting is not a bottleneck.**
If a shop is processing under ~1,000–1,500 tons per year with minimal coping, beveling, or hole processing, the automation advantage is reduced and the return may be slower. Manual processing may still have available capacity.
- ✗ **Upstream or downstream bottlenecks exist.**
If material handling is inefficient, fit-up or welding capacity is limited, or engineering and detailing workflows are inconsistent, automating cutting may simply shift the bottleneck rather than increase overall throughput.

SAFETY, MAINTENANCE, AND UPTIME

Operator Safety

The safety enclosure housing the robotic arm features a safety-interlocked door that automatically shuts the machine down when opened during production, allowing safe operator access for maintenance and adjustments. An integrated air outlet with a 4,250 CFM blower extracts plasma smoke from the cutting area, with an optional dust collector available for additional filtration. The safety enclosure meets both OSHA and Canadian safety standards and may help lower facility insurance costs. Optional light curtains can also be added around the conveyors for increased safety in the material handling areas surrounding the machine.

Machine Protection

Beamcut is the only system in its class to include a magnetic breakaway torch. If the torch makes unexpected contact during operation, it detaches from the robotic arm instantly and triggers an immediate stop — protecting the torch head, the robot arm, and surrounding components from damage. Competing systems that rigidly fix the torch to the arm risk severe damage to both the torch and robot in the same scenario, with potentially significant consequences for parts cost and downtime.

All torch leads and wiring within the cutting area are fully enclosed in a protective loom, shielding them from plasma spatter, heat exposure, and snagging during robot movements reducing wear and the likelihood of unplanned electrical failures.

Parts Availability and Downtime

Machine uptime depends not just on reliability, but on how quickly issues can be resolved when they do occur. Beamcut's design prioritizes readily available components and is backed by Machitech's support network, reducing the risk of extended downtime waiting on parts or service technicians.



POST-SALES SERVICE

Perhaps the most important factor to consider before purchasing a Beamcut is the company's reputation for providing exceptional service following the sale. Service is one of the criteria that matters the most – when you pick up the phone, you need to be reassured that someone on the other end will answer the call and provide solutions.

When issues arise, responsiveness from your vendor, supplier, or distributor is key. Companies that excel with post-sales service know that it's more than giving their customers peace of mind, it's about dollars and cents. Every time a machine is out of commission, your shop productivity decreases, and the downtime costs eat away at your bottom line.

When you're inquiring with different manufacturers or distributors, be sure to ask what kind of post-sales support is offered. These days, machine quality is extremely high, however, if issues do come up, it's important to know that you're in capable hands.

ABOUT EMPIRE MACHINERY

Serving Canada and the U.S. since 1987 Empire Machinery & Tools Ltd. in Winnipeg, Manitoba distributes quality new and used sheet metal equipment and metal fabrication machinery. Empire has a complete in-house service department with experienced, factory-trained technicians available for Canada-wide on-site servicing.

We accept trade-ins and sell on consignment so used machinery is thoroughly checked, serviced and available with a 30 Day Used Equipment Guarantee. Contact us and we will do our best to find the right machine for you!

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**Questions about Beamcut or
plasma cutting in general?**
Contact one of our Product Specialists today at
1 (800) 665-8089