

MANUFACTURING CONSULTING, DESIGN, AND PROCESSES IMPROVEMENT

20 PLUS YEARS OF DEFENSE
MANUFACTURING,
DESIGN, DEVELOPMENT, AND
PROCESS IMPROVEMENT OF
MACHINE GUN WEAPON
SYSTEMS

RBROWN_CONCEPTS LLC

Founded in 2022, Rbrown Concepts LLC is a product development business and a consulting resource to share manufacturing experience, process improvement, and design services within the defense weapons industry. With 40 years of experience in machine shop practices, Robert (Rob) Brown has accumulated a vast knowledge of machining, machine processes, and approaches to simplify and reduce manufacturing costs. I can assure you the upmost results for your projects as I'm backed with an extensive network of professional contacts ranging from equipment sales, tooling suppliers, robotics intergrators, and engineering design specialists.

MY AREAS OF EXPERTISE ARE:

- Weapon systems: M2, M60, M240, M249, and MK19
- Assesment of your operation to develop or design a preferable manufacturing process.
- Utilize existing equipment and tooling to get the most efficent cost savings when possible.
- Maximizing machines, tooling, and fixturing to improve part production and quality.
- Part and fixture design concepts for most CNC and manual machines.
- Develop: Assembly, Testing, Riveting, and Check fixturing.
- Trouble shooting and solutions focused.
- Machine cell development.
- Simple to complex designs.
- Budget minded concepts to match the customers expectations.



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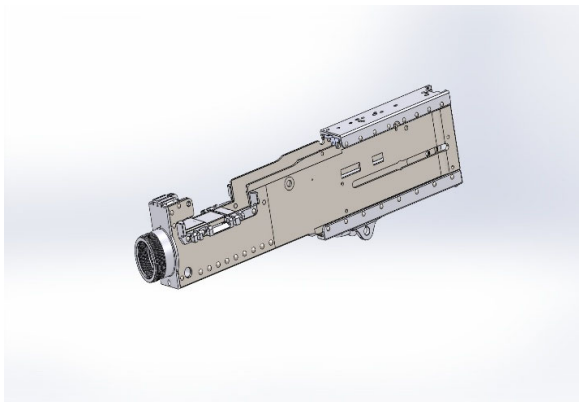
I have always been engaged with machining throughout my 40 year career. Starting with manual machines and advancing my skills to learn multiple CNC technologies. The last 20 years has been heavily focused within the defense/weapons manufacturing industry. I've made a lot of friends and contacts over the years and yet to this day I'm learning newer concepts as they evolve.

Rob Brown

WEAPONS PROJECT SUMMARIES:

- Analysed new products and design concepts for manufacturability and presented analysis to decision makers with recommendations
 - Prototyped and processed development of the M2 (.50 Cal) machine gun systems for production. Designed and built fixtures, tooling, and programming for multiple types of C.N.C. machining applications.
 - Prototyped and processed development for the M60-E4 & E6 machine gun, M240B machine gun, M3 machine gun, and Mk-19.
 - Developed assembly procedures for M2, M60, M249, and M240 Machine Gun Receiver Assemblies and final machining operations to complete final system operations. Designed and built assembly, production riveting, and machining fixtures.
 - Developed M2, M60, and M240 barrel production machining cells. Received U.S. Government first article testing approval in 3 months for the M2 HB barrel vs. standard of 6 months. Co-Developed all gun drilling, reaming, rifling, lathe turn, stress relieving, straightening, milling operations, and quality processes. The barrels produce shooting accuracy groups tighter than any competitor.
 - Designed and prototyped the M2A2 QCB (Quick Change Barrel) System standardizing a 1 breech lock system. Implemented the production cells and quality standards. Familiar with GD's M2A1 systems.
 - Designed and built the Stellite-lined M240 Machine Gun Barrels for production using multi-axis C.N.C. lathes. Updated assembly processes for the M60 and M2 Stellite-lined barrels. Standard 1pc barrel manufacturing.
 - R&D- developed and implemented part/component manufacturing processes/improvements for military weapon systems. Responsible for compliance of manufacturing processes to performance, regulatory, and safety standards.
 - Pre-heat treated and stress-relieved materials resulted in reduced loss of parts in manufacturing process
 - Eliminated costly part broaching operations (machine upkeep, dull or broken broaches, and operator errors) by converting the broaching processes over to production Wire EDM processes.
 - Designed fixtures and tombstones for vertical/horizontal machine centers for continuous production.
 - Barrel chambering machine cell development.
 - Planned and implemented lean production cells, assembly stations, testing and quality control standards:
 - Efforts resulted in better quality and output within barrel cells by upgrading the grinding operations from manual grinders needing multiple setups to C.N.C grinder operations.
 - Streamlined weapons assemblies by eliminating the pre-assembly drilling operations of rivet thru-hole patterns by adding the thru-hole patterns built into initial part manufacturing operations
 - Reduced setup times. Designed and built fixtures, production tooling, and quality check gauging. Performed testing to ensure adequate performance of assembly processes and tooling
 - Upgraded all VMC's and HMC's with probing and tool detection systems to reduce setup times
- Quality Control Focus. Performed first article, in-process, completed assembly inspections & post-failure product analysis.





RECENT PROJECT

The customer was running 7075 aluminum valve bodies, doing 2 different end detail operations in a CNC lathe and 6 separate mill operations in 3 double vices to complete the parts. Conventional tooling like HSS drills, taps, and carbide endmills for steel grades was being used. A staggering combined 78 minutes to finish a single part and then an additional amount of time to deburr. Noticing that the customer had just recently purchased a newer horizontal machine center with a pallet pool system I proposed that this part would be the correct fit for that machine. I designed a concept with a budget in mind using cast aluminum tombstones, ground sub-plates, and Mitee-bite® clamping and fixturing components. I worked with a tooling specialist to spec out tooling for machining aluminum. Insert tools, coolant feed drills, thread mills, and endmills were an upgrade over the existing tools. The tombstone designed has 2 machining positions per face for a total of 4 faces. From raw stock to finish, the part is completely manufactured in 25 minutes including deburring and port polishing in the machine. 4 complete parts per 100 minutes. 5 complete tombstones were produced to perform un-attended and lights out running production.

