



Columbia Gear Corporation

A SUBSIDIARY OF INDUSTRIAL MANUFACTURING COMPANY

INTEGRATED SOLUTIONS IN CUSTOM GEARING





COLUMBIA GEAR

INTEGRATED SOLUTIONS FOR SUCCESS.

What does it take to satisfy the custom precision gearing needs of some of the world's largest OEMs? Columbia Gear answers that question with fully integrated services, cutting-edge production, superior information technology, and large-scale production capacity.

Equally important is our commitment to innovation in everything we do – seeking out new answers, and continually adapting to today's customer challenges. We accomplish this by continually analyzing manufacturing processes...building upon proven design solutions...streamlining production and assembly schedules – always taking ground gearing quality to higher levels.

In short, we do whatever it takes to meet customers' needs and deliver greater value. For that, Columbia Gear has earned a proven record of success and superior customer satisfaction.

INTEGRATED SOLUTIONS

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Main Manufacturing Plant

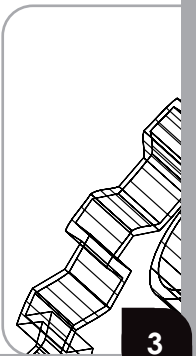




COLUMBIA GEAR'S PRODUCTION FACILITIES IN AVON, MN

Columbia Gear specializes in the design and manufacturing of custom spur and helical gears, gearbox assemblies and related products. Its two state-of-the-art plants encompass more than 235,000 square feet and are conveniently located in Central Minnesota adjacent to Interstate 94.

Plant 2

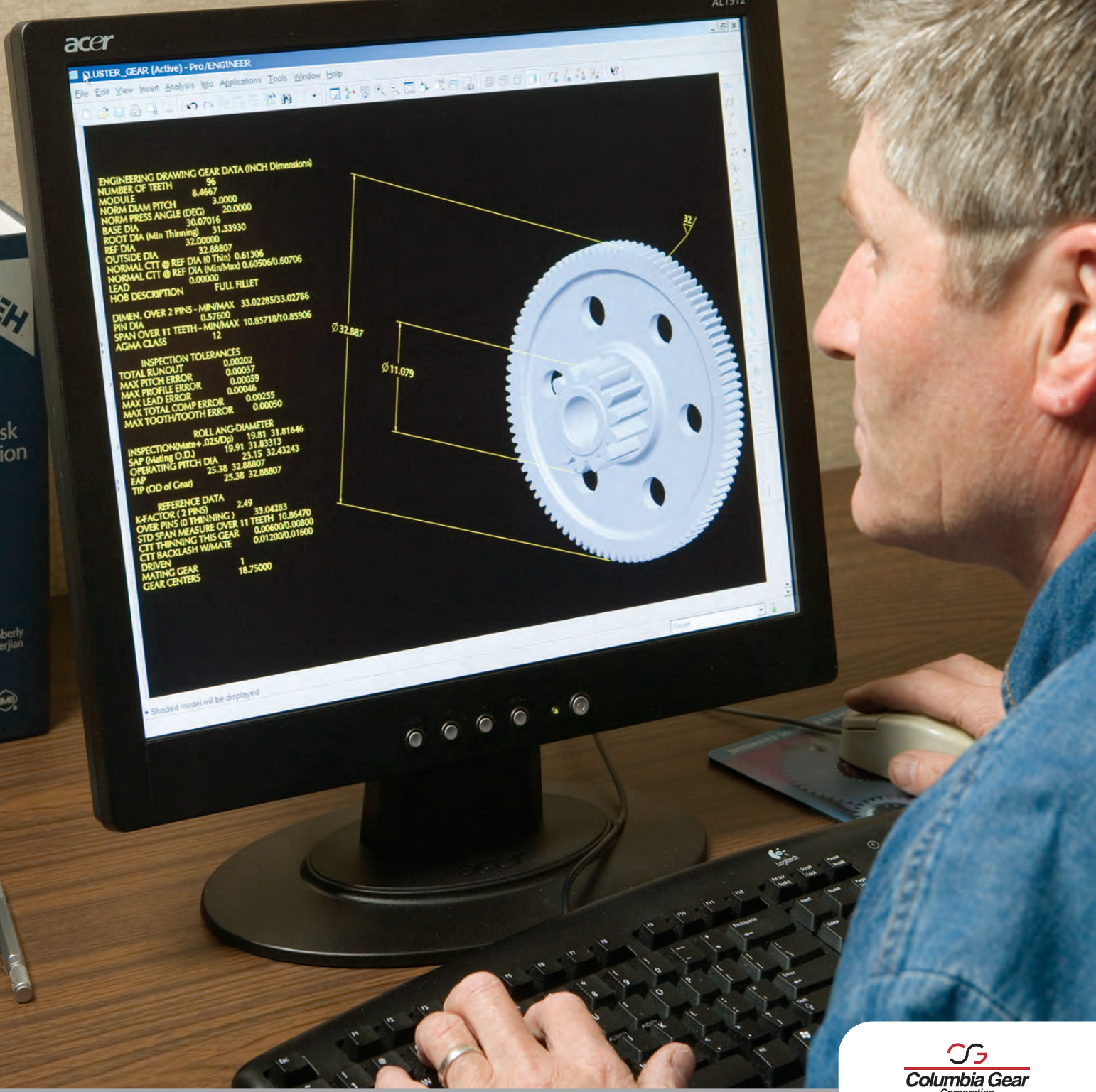




CUSTOMER DRIVEN

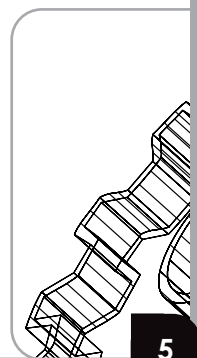
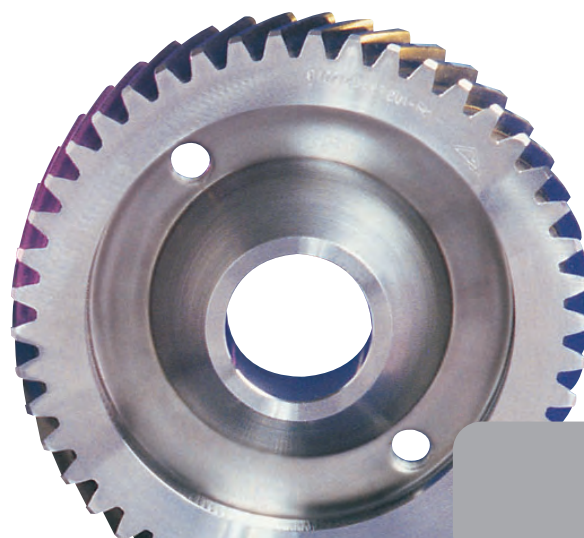
Whatever it takes. That's the philosophy on which Columbia Gear's success is built, and on which we continue to thrive. It's evidenced in such significant responses as plant expansions, ongoing major capital expenditures, and production reorganization in response to specific new projects and clients.

You'll see Columbia Gear's commitment to solutions on a human level as well. Our team response includes representatives from design through production on every project, enhancing overall efficiency and communication. Responding to customer needs with this "no barriers" attitude is yet another reason behind Columbia Gear's continued status as an industry leader.



STATE-OF-THE-ART DESIGN

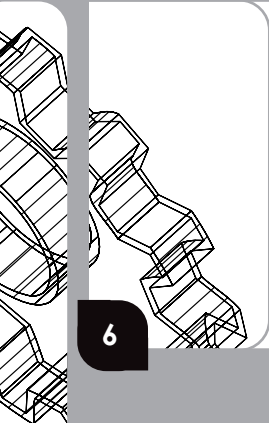
While some Columbia Gear customers furnish ready-for-production gear designs, many turn to us for complete design assistance. In these instances we draw on our wealth of expertise and powerful CAD technologies, including the latest versions of Pro/Engineer, AutoCAD and internally developed software used to generate gear data, create solutions and develop prototypes. Working closely with each customer, our team of design, production and service representatives collaborate to outline production plans that satisfy overall project objectives.





TAILORED PRODUCTION MEETS SPECIAL DEMANDS

Columbia Gear's cell concept expedites production of small and large volume projects, and accommodates specific product lines such as yokes and planetary drives. Supported by the combined expertise and dedication of Columbia Gear's project managers, design engineers, machinists and quality control teams, cell production provides customers with single-service value and added peace of mind.



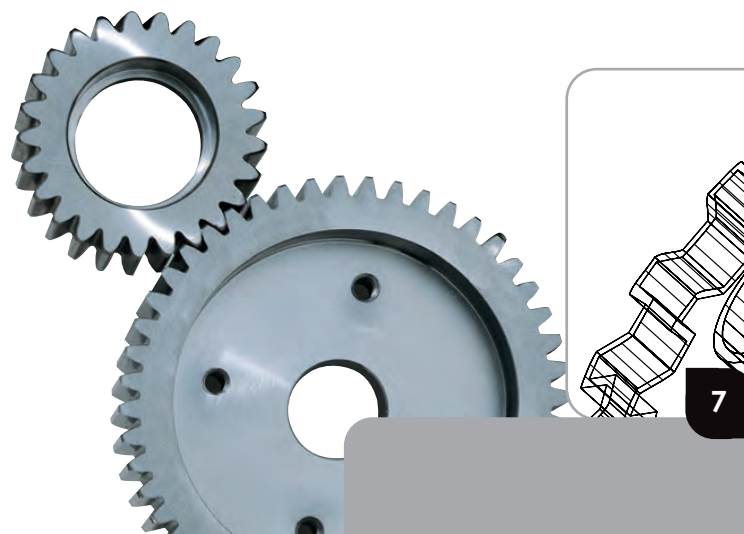


CELL CONCEPT: COMPRESSING THE PRODUCTION CYCLE

Columbia Gear's cell concept in action. Clustering machines required for complete manufacture of specific products in one area enhances production turnaround and quality.

Opposite Page - Low lot cell

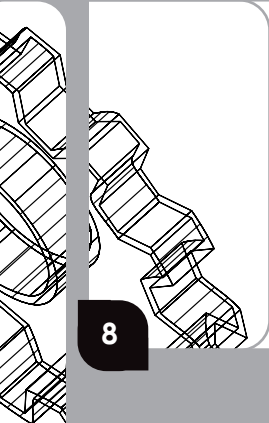
Above - Large Turning Cell

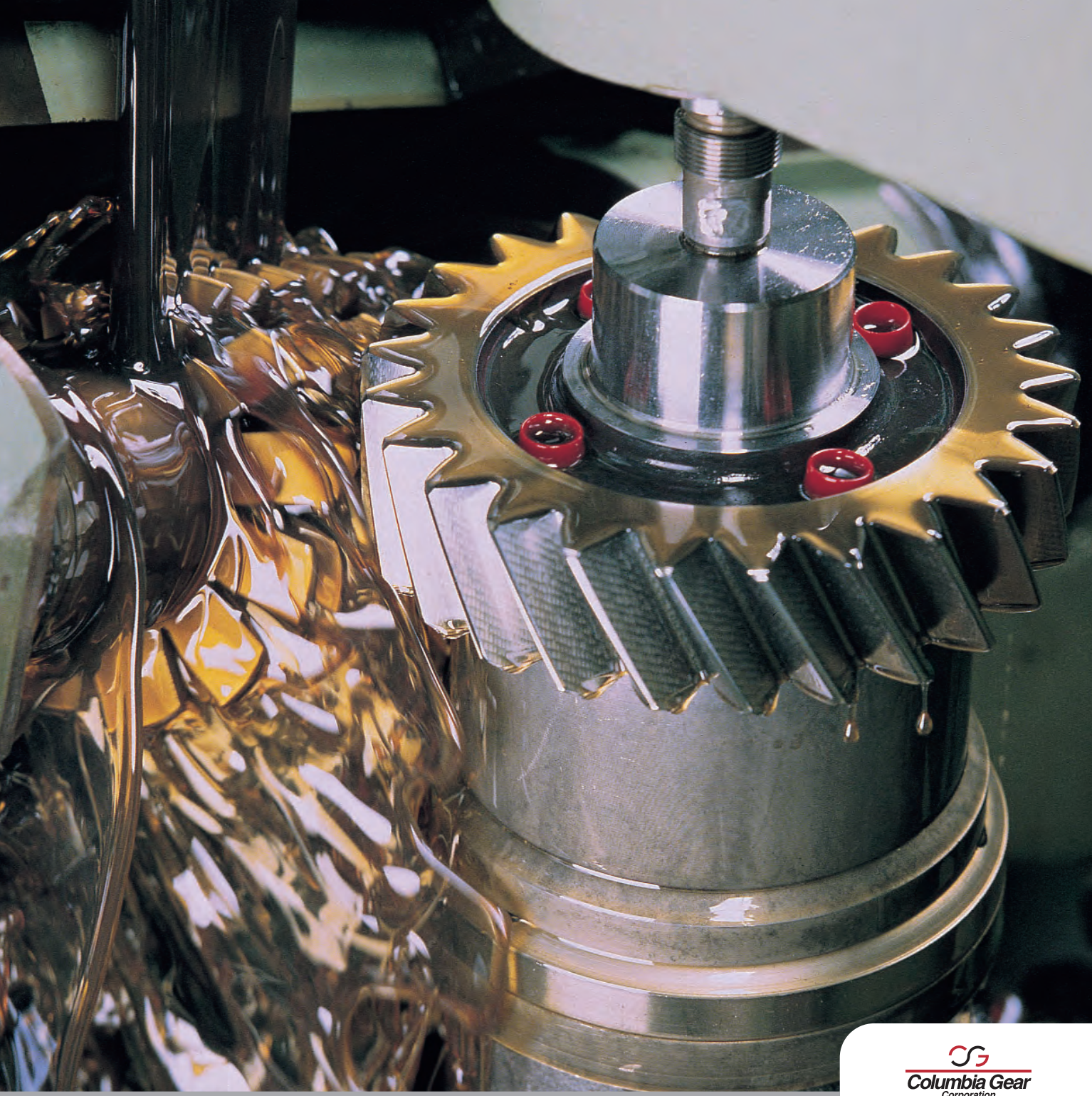




COMPREHENSIVE CAPABILITIES

Columbia Gear's CNC gear hobbing equipment represents the future of gear cutting technology at its finest. With its labor-reducing, auto-loading capability, this gear hobber dramatically increases production volume and efficiency. It's yet another example of Columbia Gear's commitment to providing the most comprehensive array of gear manufacturing capabilities, all under one roof.

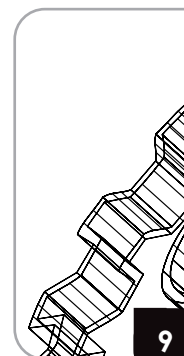




HIGH-TECH TOOLS

Opposite page – One of many auto-loading gear hobbers accommodates higher volume production.

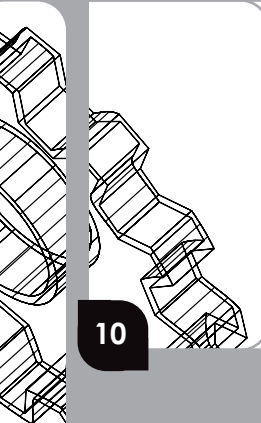
Above – The latest technology in cutting tools improves gear cutting efficiency.

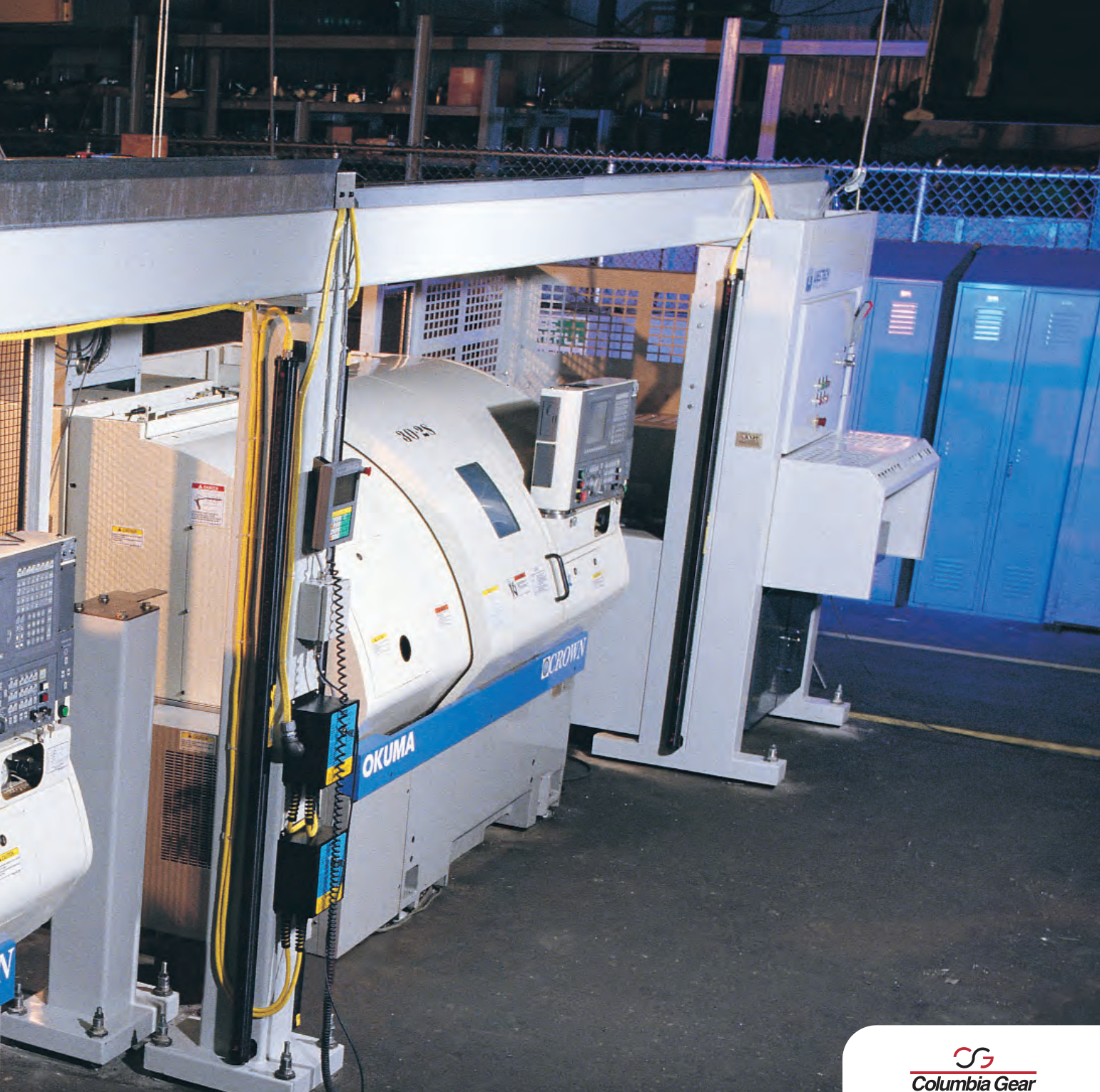




AUTOMATED EFFICIENCY

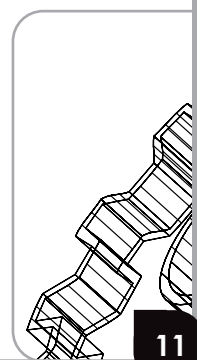
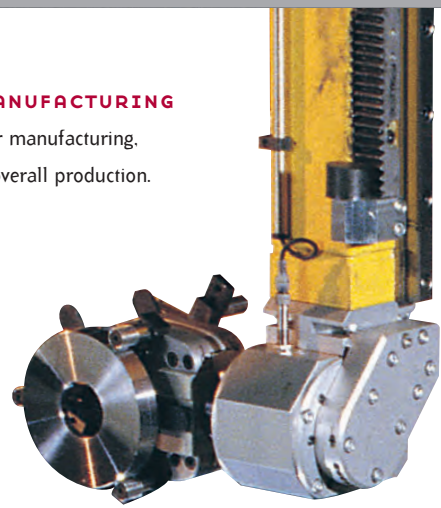
Columbia Gear's world-class, automated production technology assists in satisfying our customers' needs for precision, fast turnaround and quality. In this complete gear manufacturing cell, a robotic loader automatically handles the machining of a gear blank. Machined components are then conveyed to a carousel hobber. From rough material to completed gears ready for heat treating, the latest technology enhances the process at every stage.





ROBOTIC PRECISION SPEEDS GEAR MANUFACTURING

Above – A robotic loader completely automates gear manufacturing, eliminating operator involvement while expediting overall production.





PRECISION GRINDING

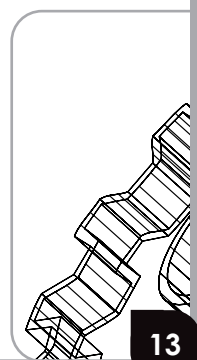
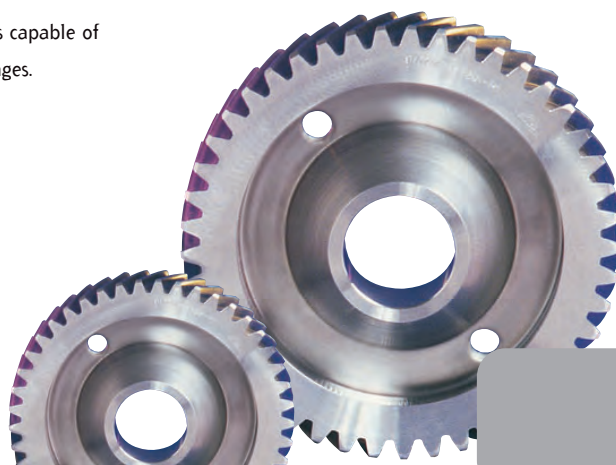
Consistently delivering ground gearing as high as AGMA level 15 requires state-of-the-art machining technology as well as time-honored craftsmanship. A variety of machining equipment gives us the versatility to handle both generative and form grinding processes, including CBN grinding. Columbia Gear's reputation for precision grinding has been earned through years of performance for some of the world's largest manufacturers – with some of the most demanding quality standards.

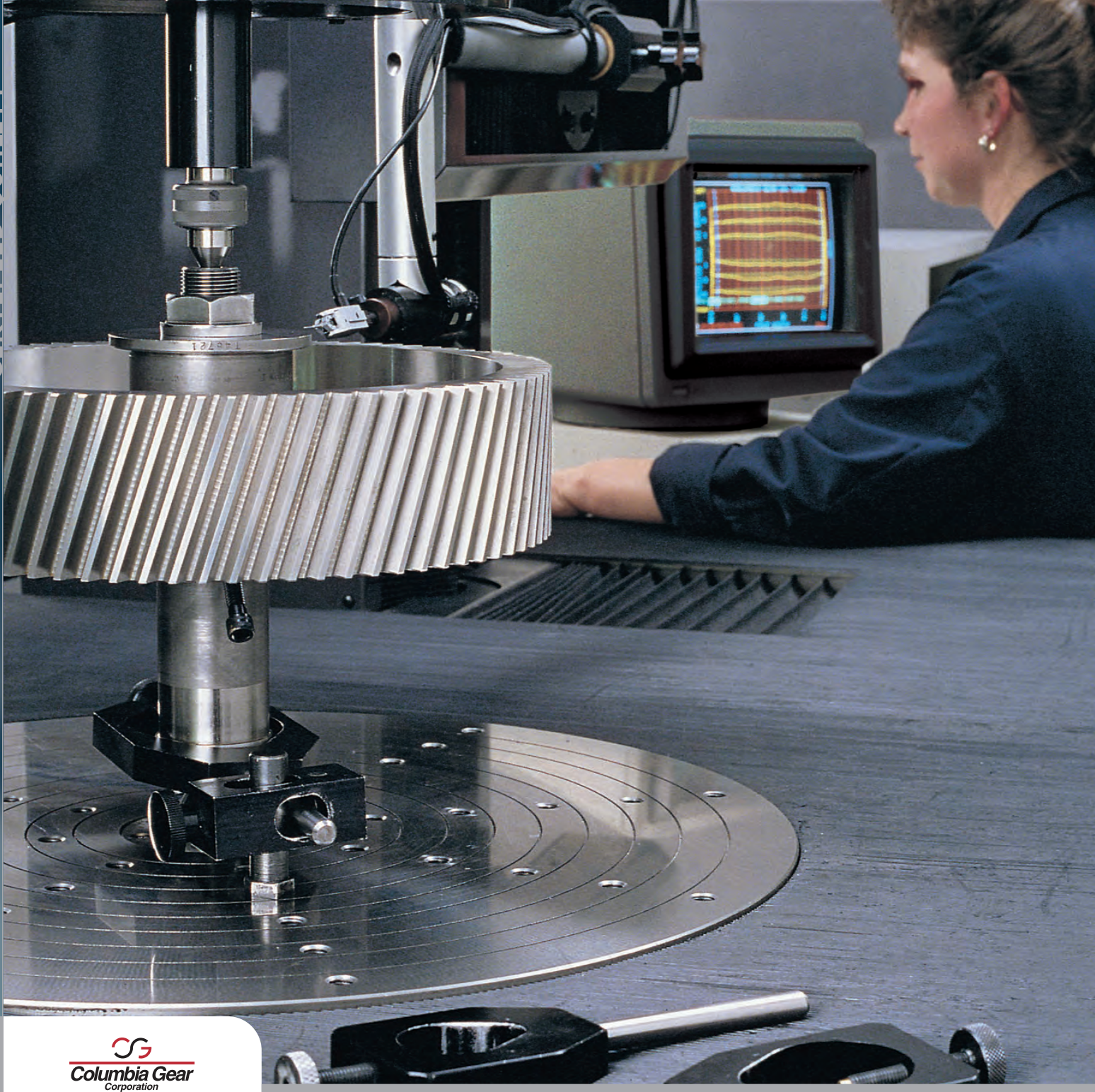
Maintaining this level of customer satisfaction requires a special combination of talented people and technology – and our commitment to both has never wavered. In fact, providing the best people with the best tools has always been the foundation for Columbia Gear's longstanding record of customer satisfaction.



PRODUCTIVITY ON EVERY SCALE

Among the industry's finest, Columbia Gear's grinding equipment is capable of producing even the most demanding helical and spur gear challenges. Capabilities include both generative and form grinding options, as well as CBN grinding.





CERTIFIED QUALITY

Columbia Gear's quality assurance programs have always been integral to our success. In 1994, we were among the first U.S. custom gearing suppliers to achieve ISO 9002 certification. Our ongoing leadership role within the gear industry is also evidenced by our ISO 9001:2015 certification, and a comprehensive TQM system including Six Sigma, Lean Manufacturing, and Value Stream Mapping.

In addition to our general quality program certifications, we meet the rigorous quality standards of the U.S. Military and leading OEMs serving markets worldwide. We've also added the stringent international automotive quality assurance standard of IATF 16949:2016 to our list of quality practices and certifications.



ENSURING QUALITY AT EVERY STAGE

Opposite page – Throughout component production, the focus is on quality at Columbia Gear. Rigorous quality standards ensure that tolerances are achieved at each and every stage.

Above – In Columbia Gear's metallurgical lab, heat-treated samples are analyzed for quality compliance.





SINGLE SOURCE RELIABILITY AND EXPERTISE

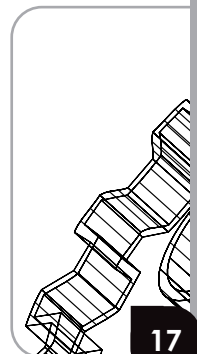
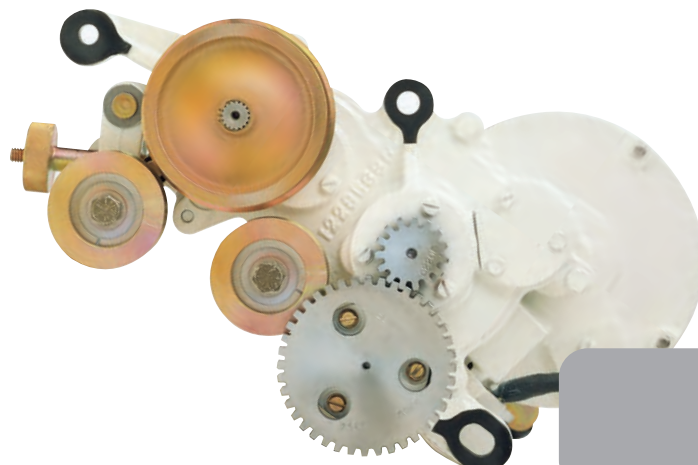
From preliminary design development through final assembly, Columbia Gear's fully integrated manufacturing capabilities enhance overall project quality and reliability. We've covered it all – everything from automated machining and precision gear grinding (as high as AGMA Level 15) through component sourcing, assembly, painting, testing and inspection. Our goal is to provide complete support in a total solutions package, and ultimately, to deliver overall project efficiency and value.



TOTAL SOLUTIONS

Opposite page – A five HMC Pallettech system eliminates set-up time and enhances overall machining efficiency.

Above – With full-service assembly, Columbia Gear becomes an extension of your operation, working on your behalf to handle everything from sourcing components to final assembly and testing.





DESIGN TO DELIVERY — INTEGRATED SOLUTIONS FOR GEARING SUCCESS

At Columbia Gear, integrated solutions means nothing is overlooked. More than a mere slogan, this philosophy is the foundation of our value-added services — the guide by which our people work together to ensure project success and your satisfaction. Over the course of a typical project, Columbia Gear's team of custom gearing specialists will:

- ▲ Identify solutions to enhance component life and reduce production costs
- ▲ Coordinate the purchase of components and raw materials
- ▲ Develop and maintain a custom quality control program
- ▲ Implement quality control processes, including testing and inspection
- ▲ Assemble and paint finished parts and oversee shipment

Meet your custom gearing challenges with integrated solutions from Columbia Gear. For more information, a quote or to discuss a specific design, manufacturing or assembly challenge, call:

[800] 323-9838

FAX: [320] 356-2131

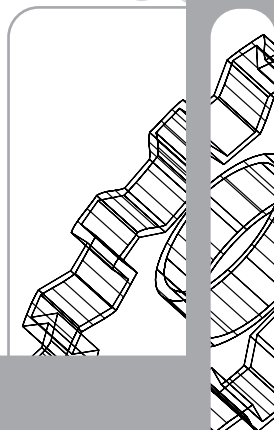
E-MAIL: INFO@COLUMBIAGEAR.COM



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