CimatronE Version 8.0
A Product Review Summary

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Prepared by
CIMdata
Foreword

CIMdata, Inc. prepared this Summary Product Review as an independent and unbiased assessment of the functional capabilities of CimatronE Version 8, a CAD/CAM software product developed by Cimatron Ltd. CimatronE is a registered trademark of Cimatron. This evaluation is one in a series of software product reviews produced by CIMdata, a worldwide consulting and marketing research firm. CIMdata has authorized Cimatron to reproduce and distribute this document, without constraints from CIMdata.

CIMdata, founded in 1983, provides technical, marketing, and strategic consulting services, and market research focused on the application of computers to engineering and manufacturing. The company works with manufacturing companies worldwide, analyzing operations and information needs. CIMdata also works with software vendors to provide technology and market knowledge of user requirements, market opportunities, technology trends, strategic planning, and competitive information. The technology focus is on product lifecycle management (PLM), CAM, and mechanical CAD.

CIMdata is an industry-leading consultant on CAM software systems. It produces the NC Software Market Assessment Reports and the Compendium of NC Software Product Reviews. Market research has been conducted by CIMdata on a variety of CAM related topics. CIMdata provides consulting services to CAM software users and vendors and to the investment community.
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Cimatron is one of the worldwide CAM software industry leaders. Their focus has been on toolmakers and their intent has been to fully support the complete tooling process “from quotation to a finished product” by developing and delivering a specialized end-to-end integrated design to manufacturing solution that meets the unique requirements of this industry segment. With CimatronE Version 8, Cimatron is evolving its strategy to expand the Cimatron product offering to all segments of the CAM market, focusing on the more rapidly-growing manufacturing geographies, and shifting its product development and sales resources to match this strategy. They expect to meet the needs of the changing CAM marketplace from both an application and geographical perspective and to achieve significant revenue growth over the next several years.

Cimatron is now initiating a campaign into the production machining segment of the CAM software market. They are targeting the high end of production machining by offering tailored vertical applications that leverage their strong 5-axis machining capabilities, while at the same time introducing the first steps into 2.5-axis machining for lower-level production applications. Concurrently, Cimatron is maintaining its concentration on toolmaking, and their objective of providing the most comprehensive CAD/CAM offering for toolmakers has not changed. As such, Cimatron has adopted a two-pronged application strategy. They will continue to concentrate on toolmaking, and at the same time, evolve into the support of production machining by starting with complex 5-axis applications and then expanding to support of basic turning, milling, and mill turn operations. CIMdata is supportive of this two-pronged strategy by Cimatron and their associated implementation plans.

Background—Cimatron is a publicly-owned company with worldwide presence. They are one of the largest worldwide providers of CAM software. On the basis of revenue received, CIMdata ranks Cimatron among the ten largest suppliers to the mold, tool, and die industry segment. More than half of the Cimatron business is in Europe and they are also among the ten largest CAM vendors in Asia-Pacific. Cimatron employs the third largest product development staff among CAM software suppliers. Nearly half of their revenue is from professional services.

Cimatron takes a comprehensive solutions approach to the market. CimatronE is a single integrated offering for product design, mold design, and NC programming. It is particularly strong in hybrid surface and solid modeling, mold design, 3-axis milling including high speed machining, 5-axis positioning for deep cavity milling and cutting of deep cores, simultaneous 5-axis milling, and providing information management software for the toolmaker. The mold design suite of capabilities for core/cavity splitting, electrode design, and mold base design is impressive. Their electrode design capability is particularly strong and could be the best in the industry.

CimatronE Version 8—CimatronE Version 8 is being announced at IMTS 2006. Some of its key elements are:

- Introduction of the new progressive die design application
- Increased capability and productivity for mold design of huge and complex molds
- Introduction of CimatronE concept for molds
- Introduction of a machining preview capability
• Dramatic improvements in plate machining, including automated drilling
• Introduction of EDM setup and programming
• Major improvements in core/cavity machining
• Increased emphasis on 5-axis machining, including the application of 5-axis machining to production machining

With Version 8, Cimatron is focusing on enhancing their mold design and complex machining capabilities, such as 5-axis machining; at the same time they are entering new markets such as design of progressive dies and the 5-axis segment of the production machining marketplace. Some of the expanded or new capabilities in CimatronE Version 8 are briefly discussed below.

**Progressive Die Design**—Progressive Die Design is a new product being introduced in CimatronE Version 8. Cimatron is currently one of the few CAM software vendors to offer such a capability. Progressive dies are commonly employed to produce sheet metal components in industries such as automotive, consumer products, computers, and electronics. A progressive die sequentially transforms a flat strip of metal into a completed part by employing a series of stations that cut, form, and coin the material into the desired shape. In Progressive Die Design, a user analyzes the part, builds the strip layout, creates the die tool, and documents the process.

Cimatron Progressive Die Design is a single integrated solution that provides a broad and flexible tool set from quoting to production. It includes a combination of automation and hands-on control to offer speed, consistency, flexibility, and the ability to reduce trial-and-error iterations. It is intelligent, parametric, and associative.

Software is provided for finite element analysis, strip design, die set design, detailed tool design, tool validation, machining, and support of shop floor operations. The system allows users to work in the method they prefer, and an “Intelligent Toolbox” makes the relevant tools available for each task at the appropriate time. Integral finite element analysis is used for the standard blank calculation and thinning analysis, as well as in surfacing operations which are used for unbending, unfolding, and compensation for spring back. Cimatron offers a hybrid solid and surface-based system. A rich surfacing package is provided.

CimatronE allows users to work directly in 3D or in a 2D environment within its 3D assembly. This capability, which is especially apparent during nesting and strip design, enables users accustomed to working in a 2D environment, to continue to do so while also enjoying the benefit of 3D robustness. Users can also start designing directly in 3D.

Mr. Jay Weiner, IT Manager at CAM Tool & Die Ltd. stated, “The new Cimatron Progressive Die product is very flexible and powerful. By starting in 3D, we expect substantial productivity improvements. The surfacing package is second to none. There are no limitations on what can be done.”

**Support for Large and Complex Molds**—Cimatron is able to effectively support the design of large and complex molds. In Version 8, the
increase in capacity and performance ranges from 35% to 50%. As one specific example, a leading automotive provider utilized Cimatron E to create a bumper mold that was 3.2 meters long, had 1,200 parts, and 36,000 faces. (see Figure 2 below).

The mold design software is associative, so that as a screw is changed, the corresponding hole is automatically updated. In addition, quick-modification tools allow users to make immediate local changes. With these tools, the system can perform any complex change within seconds, even in a mature assembly holding thousands of components.

An additional new feature, particularly useful for large mold shops, is concurrent mold design. This feature allows several users to simultaneously work on the same mold assembly with each portion of the mold owned by a different user.

Other features include analysis of opening direction and draft angles for parts with ambiguous opening directions to determine the desired parting line, and automatic grouping of holes according to their shape, dimensions, and position on the plate, including automatic numbering.

CIMdata views CimatronE among the high-end software products being employed for mold design.

**CimatronE Concept**—Concept is a new product in Version 8 permitting users to quickly establish concepts, create designs, perform analysis, and collaborate with other members of design and manufacturing teams up and down a supply chain. It can be applied to estimating, quoting, and design review, and can be used by product managers, team leaders, designers, and manufacturing engineers. Native data can be accepted from all major CAD systems. Some of the specific applications of E concept include:

- Determining the feasibility of producing a part
- Establishing mass properties of a part
- Evaluating the splitting of core, cavity, and slides
- Performing a draft analysis to establish undercuts or reverse draft conditions
- Verifying engineering changes and comparison of models by use of Quick Compare software
- Viewing completed mold designs, including how a mold opens and a complex component fits into a mold

**NC Preview**—NC Preview is a new decision support capability in CimatronE Version 8. It provides a preview of a cut by showing the outcome of a toolpath without actual calculation of the toolpath. For a given set of parameters and toolpath strategy, the remaining stock or extra material at any point on a part after each cut is displayed. Potential collisions are considered. With NC Preview, users can quickly verify results and eliminate errors early in the process. This level of preview is unique to Cimatron.
Automated Drilling of Holes—In Version 8, Cimatron introduced a new automated capability for drilling of holes. Full user control is provided. With feature recognition, any type of hole geometry is recognized and similar holes are detected and grouped by type of hole. The drilling can be optimized to minimize the number of tool changes and tool movement. The software learns over time, as processes can be captured and reused in similar situations.

EDM Setup and Programming—CimatronE EDM is a new solution in Version 8 that provides a comprehensive set of programming tools to automate and optimize the end-to-end electrode design and manufacturing process. It minimizes the tedious task of EDM die sinker programming and greatly reduces the programming time. Multiple cavities and electrodes are supported. It builds upon the strong capability provided in CimatronE Quick Electrode for electrode extraction and design. Mr. Jim Dent and David Koning of LS Mold commented, “The Cimatron modeling package is first-rate. It particularly shines in electrode creation. Further, customer support from Cimatron is outstanding.”

Core/Cavity Machining—A large number of new features are included in CimatronE Version 8 to support core and cavity machining. These include:

- Strong algorithms to support a 3D stepover machining strategy for high surface quality
- Motion Editor that has knowledge of the remaining stock and can be employed to modify the toolpath and boost the NC programming cycle
- Use of different offsets to machine different areas of an electrode
- An automated capability to prevent waterfalls in a mold and part and to provide high surface quality
• Providing support for a conic tool and shank for high-speed machining and cleanup
• Collision checking considering the tool, holder, and shank during toolpath computations, as compared to checking at a later time

**Increased Emphasis on 5-axis Machining**—Cimatron has long been one of the leading CAM-centric vendors supporting 5-axis positioning and continuous 5-axis machining for moldmakers. This capability is now becoming more important as moldmakers are increasing their use of 5-axis machines as they become easier to operate and the price of the machines has decreased. Five-axis machining reduces the number of setups, permits use of shorter tools, and can reduce the number of electrodes required.

In Version 8, Cimatron has expanded the scope of 5-axis machining from toolmaking to the high end of production machining. They have defined a series of new application solutions to support 5-axis machining of production components. This includes 14 bundled and broad-based standard application solutions for machining of complex production components including pumps, turbine blades, speed boat propellers, screws, impellers, and molds for plastic plates. In all cases, a collision check is performed on the tool and holder. By employing standard application solutions, a user can increase programming consistency, quality, and productivity.

**Marketing and Sales**—From a geographical perspective and unlike most CAM-oriented vendors, Cimatron has formed wholly-owned subsidiaries in major geographies to serve local markets. Their sales channels span more than 30 countries in North and South America, Europe, and Asia. Cimatron is now placing increased emphasis on the emerging manufacturing segments of the world including China, India, and South Korea. They also plan to add focus to their North American operations. They attach major importance to consulting and product support.

**Summary Comment**—CimatronE Version 8 is a substantial and significant release that will greatly enhance and broaden the Cimatron CAD/CAM offering. It introduces totally new applications, new product features, and also provides substantial improvement to existing functions within CimatronE. With this expanded scope of applications, product enhancements, and focus on the more rapidly growing areas of CAM technology and market, Cimatron expects to increase their rate of revenue growth and profitability. CIMdata is favorably impressed by the evolution in the Cimatron product and market strategy, and the sizeable content of Version 8. It is expected that the product will be well received in the worldwide market.