

Mentor Consulting: Yield Enhancement Services

D A T A S H E E T



Mentor Consulting provides best-in-class engineering expertise to IC design companies and semiconductor manufacturers that assure effective utilization of Mentor Graphics Calibre® solutions. By taking full advantage of Mentor Consulting services, and the capabilities of the Calibre platform and yield diagnostics tools, customers achieve faster development cycle time, higher yield and faster time to market.

Major Service Offerings

- Yield enhancement and DFM solutions based on Calibre technology and methodology
- Delivery of highest quality rule decks, OPC models and recipes, and other solution components
- Expert resources for peak demands and special projects
- Engineering methodology and flow automation

Major Service Benefits

- On-time technology
- Optimal performance
- Lower cost of ownership
- Knowledge transfer of advanced technologies for accelerated adoption of Calibre® platform

Solutions for Industry Challenges

The drive to smaller geometries, higher performance and lower cost creates new challenges for managers responsible for technology development and tapeout operations. Increased number and complexity of physical verification rules is driving up the cost and time required to develop, maintain, and qualify rule files. Nanometer lithography requires more complex resolution enhancement technology (RET) for more layers, thus driving up the cost and cycle time required to develop, maintain, and qualify RET solutions. Turn-around-time for tapeout operations is increasing as a result of more complex physical verification and RET requirements. The growing impact of design characteristics on yield demands new solutions to assure manufacturability. Migration to the next technology nodes creates peak demands for engineers and expertise exceeding available resources, putting time-to-market at risk.

Meeting these challenges requires best-in-class tools and engineering expertise to ensure that technology is delivered on-time and that solutions deliver optimal performance. Technology engineering teams must come up to speed on new technologies quickly, and technology development must be accomplished efficiently to maintain lowest cost of ownership.

Mentor Consulting Yield Enhancement Services

Mentor Consulting Yield Enhancement Services (YES) delivers the experience and excellence needed to meet these challenges. Our team of experts has broad experience working with customers to achieve success through the most advanced technologies. Our commitment to excellence has resulted in successful engagements with the world's leading IC companies.

Achieving for Optimal Performance

Achieving fast turnaround time (TAT) in the GDS-to-mask flow is essential for competitiveness and profitability. Fast TAT enables faster time to market, higher customer satisfaction, higher market share and better fab utilization. Our consultants provide the expertise and project management skills required to complete critical tasks. YES consultants work with you to identify the bottlenecks, define and prioritize opportunities, and deliver the improvements needed to accomplish your goals. These may include the optimization of physical verification rule files, migration to the latest releases of Calibre to take full advantage of new capabilities, and optimizing OPC models and recipes for speed and accuracy. By taking full advantage of Mentor Consulting services and the capabilities of the Calibre platform, customers have reduced TAT by more than 50% while maintaining accuracy and reliability.

Assuring for On-Time Technology

On-time technology has long been recognized in the semiconductor industry as critical to success. Mentor Consulting provides creative solutions to accelerate development of physical verification rule decks, OPC models and recipes, and process design kits. These solutions include building automated methodologies for rule deck and OPC development, and QA, as well as providing expert resources to meet peak demands. YES consultants have successfully implemented automated flows for physical verification and OPC development. This has substantially reduced engineering cycle time and increased productivity so that decks and OPC solutions can be released faster, at highest quality standards, and at a lower cost.

Lower Cost of Ownership

Mentor Consulting enables low cost of ownership by providing efficient, automated methodologies and expert resources that reduce engineering cycle time and increase productivity. Solutions are delivered faster and at lower cost. Many customers have reduced permanent staff and fixed costs by relying on YES consultants to meet peak demands or to meet requirements for specialized expertise.

Accelerating the Learning Curve

YES consultants not only provide hands-on creative solutions for design and manufacturing challenges, they ensure the teams they work with also learn the technologies, best practices and methodologies used during the consulting engagement. Knowledge transfer and an accelerated learning curve help engineering teams continue to meet business objectives.

Experts in the GDS to Mask Flow

Mentor Consulting provides the expertise and project management skills required for effective deployment of solutions for the Calibre® platform from Mentor Graphics. This includes:

- Calibre® DRC, LVS and xRC for physical verification and extraction technologies
- Calibre YieldAnalyzer, YieldEnhancer, YieldServer and LFD (litho-friendly design) for design for manufacturing solutions
- Calibre OPC, Calibre nmOPC, Calibre OPCverify, and Calibre MDP for resolution enhancement technologies (RET) and mask data preparation
- Yield Assist™ for advanced yield diagnostics

Mentor Consulting is fully aligned with product roadmaps to deliver complete and effective integration of advanced technologies into existing design and manufacturing environments.

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Case Study: Fast TAT

For a leading IDM, tapeout turn around time (TAT) for performing resolution enhancement technology (RET) was increasing with each new advanced process node. Long tapeout times were impacting time-to-market and an ability to compete in the marketplace. TAT was also unpredictable with some layers taking >4 times the average TAT to complete.

The customer goals were to reduce average RET TAT by at least 50% for all mask layers and eliminate the problem of unpredictable TAT. In addition, they wanted to optimize hardware utilization. Their main obstacles to achieving these goals were lack of expert resources and proven methodology to accomplish these improvements and assure consistent yield from the optimized solutions.

Mentor Consulting structured the engagement with a systematic approach: Calibre® RET tools release migration, recipe optimization, hardware configuration and sign-off, all performed within an ongoing verification and validation process.

Results exceeded expectations. Average TAT was reduced by 50 to 70 percent. Long RET runs were eliminated. All performance targets were met. The project was completed on time, and the customer was highly satisfied.

About Mentor Consulting

Mentor Consulting provides customers with excellence and expertise in electronic design automation infrastructure and methodology. It is the only service partner in the industry that invests in the transfer of knowledge to its customers to ensure a smooth deployment and integration of new tools and methods. Mentor Consulting solutions for silicon yield enhancement, verification, cabling, and data management are engaged worldwide by forward-looking electronics companies to optimize design productivity and advance adoption of the latest industry design best practices. For more information, contact mentor_consulting@mentor.com or visit www.mentor.com/consulting.