MASTA

Empowering transmission engineers to reach new levels of quality when developing gearbox, transmission and driveline systems

SMT

Design, analyse and optimise complex transmission systems in a comprehensive and simple to use CAE workflow

MASTA is the most comprehensive CAE software package for the entire development cycle of any gear-shaft-bearing based systems. Trusted by over 100 blue chip companies and used by engineers worldwide, MASTA is the software package of choice for professionals leading their industry.

- Make informed decisions early on in product development
- Easily discover new ways of creating cutting edge systems
- Enhance the efficiency and accuracy of your workflow
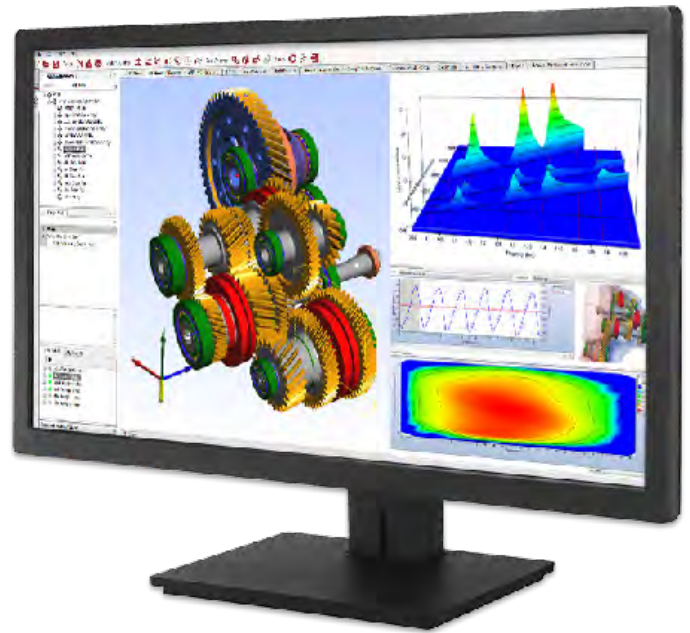- Unlock the full potential of your innovation

MASTA

Comprehensive CAE software for the design, analysis & optimisation of advanced transmission systems from concept through to manufacture.
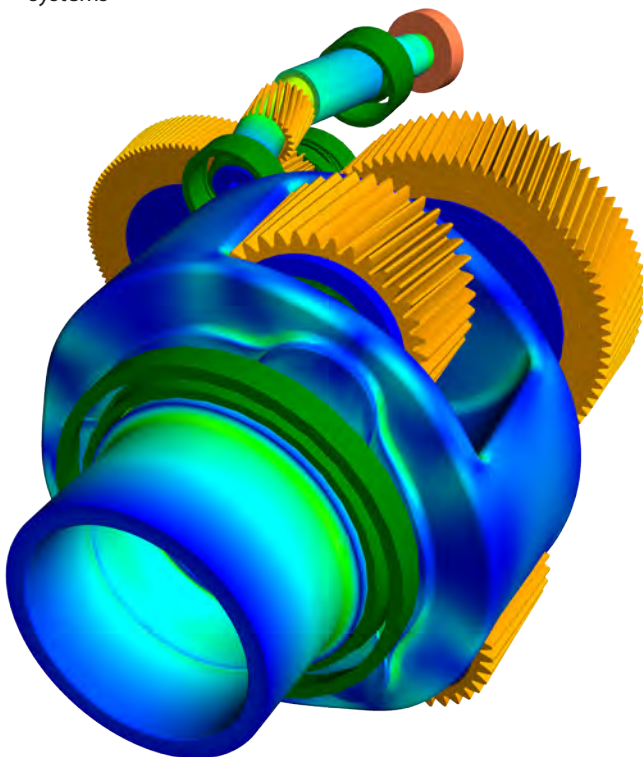
MASTA BENEFITS

- Accurately and rapidly design transmission systems from scratch or imported concepts
- Comprehensively understand the life of a mechanical part over the entire customer duty cycle
- Identify potential failure modes early in the product development cycle
- Rapidly predict key performance characteristics at the design stage
- Easily explore changes in transmission layout, component selection and/or design, materials and manufacturing processes in the convenience of a virtual environment
- Perform full system simulations for any transmission or driveline configuration
- Incorporate manufacturing simulation at the design stage to reduce process development time & cost
- MASTA's unique and modern architecture written from the ground up in C# makes it a significantly more stable comparative solution for current and future operating systems
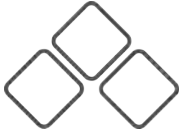
CORE FEATURES

- Design entire transmission and driveline systems using a comprehensive selection of components and design databases
- Gear tooth geometry optimisation
- Durability analysis for gears, bearings, shafts & splines
- System Deflection Analysis & Optimisation
- Imported FE for casings
- System NVH analysis & optimisation
- Loaded Tooth Contact Analysis
- Shaft Fatigue & Stress Analysis
- Shift Performance & Quality
- System Dynamics
- Gear Cutter Design and Manufacturing Process Simulation
- Housing & Shaft Deflection
- Gear Scuffing Analysis
- Drivetrain Simulation
- Planetary Load Sharing
- Command line running mode to interface with any external software / optimisation routine
- Parametric study tool and Monte Carlo analysis

Microsoft Partner
Gold Application Development

ONE FEATURE PACKED PACKAGE

A key advantage to using MASTA is its unification of the development process. Different teams can work together in a seamless workflow to design, analyse and optimise transmission systems without the need for additional software.
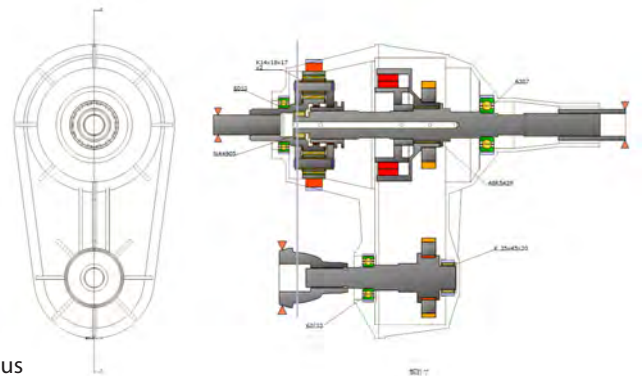
MODULAR DESIGN

MASTA's modular design allows you to completely tailor a fully integrated environment to the needs of your development cycle and each user. With over 75 modules and integration options to choose from MASTA can be well integrated to the requirements to any industry using gear-shaft-bearing systems.

Design

Conceptualising ideas is integral to kick start the development process so MASTA ensures it is effortless to rapidly create designs from scratch or import them in from CAD models or alternative CAE packages.
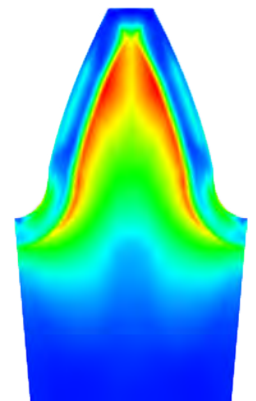
- Cylindrical gear design
- Complex planetary gear set design
- Bevel and hypoid gear design with link to Gleason's CAGE™ software
- Gear macro geometry database
- Comprehensive database of bearings & bearing types
- Flexible and hybrid bearing rings
- Bolts to VDI standard
- Detailed shaft modelling including stress concentration factors for fillet radii, cross hole grooves, etc.
- Splines & other couplings
- Import 2D CAD for shaft profile design and component placement
- Import models from alternative CAE packages
- Import FE models for housing and shafts from ANSYS, Nastran and Abaqus

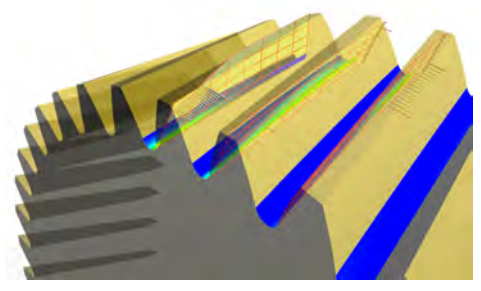## Analyse

Component analysis

- Durability analysis for gears, bearings, shafts & splines to international standards
- Detailed internal load distribution & stress results for individual bearing elements
- Shaft fatigue and stress analysis
- Detailed calculation of gear TE, root stress & contact patch
- Planetary load sharing analysis
- Calculate and predict crack initiation risk for Tooth Interior Fatigue Fracture (TIFF)

System analysis

- System NVH & system dynamics
- Efficiency & power loss analysis
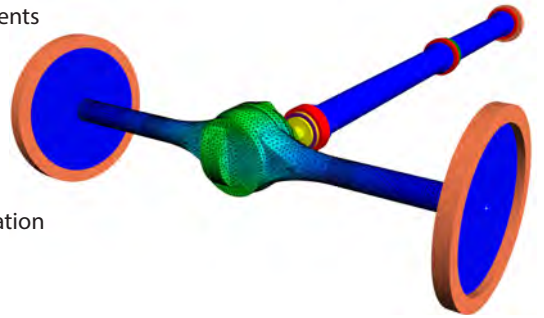- Static deflection: Full gear, shaft, bearing and casing system stiffness model deflecting under load

Batch running available for large duty cycles distributed across multiple machines.

SMT

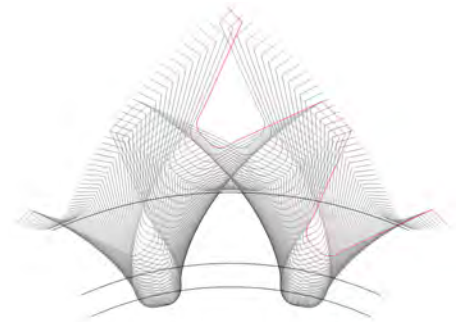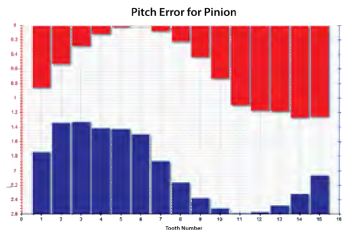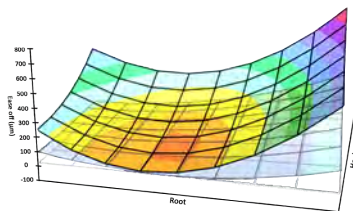• UK • USA • China • Portugal • Korea •

Optimise

- Minimise system deflection including the effects of non-symmetric components
- Transmission error reduction
- Automatic optimisation of:
    - Gear tooth macro-geometry for strength or NVH
    - Gear tooth root geometry for strength
    - Gear tooth micro-geometry for contact pattern & TE
- System optimisation for NVH
- Interface to third-party tools (e.g. iSight) for multi-parameter global optimisation

Simulate Manufacture

MASTA can also be used for manufacturing analysis and process simulation:
- Optimise cylindrical gear cutter profile for maximum gear bending strength
- Cylindrical gear hobbing, shaping, shaving & grinding process simulation to predict gear quality
- Spiral bevel & hypoid gear tooth flank simulation & optimisation
- Spiral bevel & hypoid gear machine setting & cutter simulation
- Design for 6 Sigma

Pitch Error for Pinion

Why MASTA?

MASTA is the CAE software for experts developed by experts. SMT regularly collaborate alongside companies at the leading edge of technology and have some of the best minds in the industry. The software itself is trusted and actively used by over 100 blue chip companies worldwide, 22 of which are Global 500 companies and 10 of which are in the USA Fortune 500.

Aside from its unique features, MASTA's modern architecture written from the ground up in C# makes it a significantly more stable comparative solution for modern operating systems and hardware. Unlike alternative packages MASTA also makes full use of multicore processing and 64-bit architecture to fully harness available memory and processing power.

Discover for yourself

SMT offer a full evaluation of all available modules for you to try. Alongside this you have full access to our dedicated support team and online client portal for quick and easy access to the most up to date resources and advice.

Call +44 (0)115 941 9839
or email **sales@smartmt.com**

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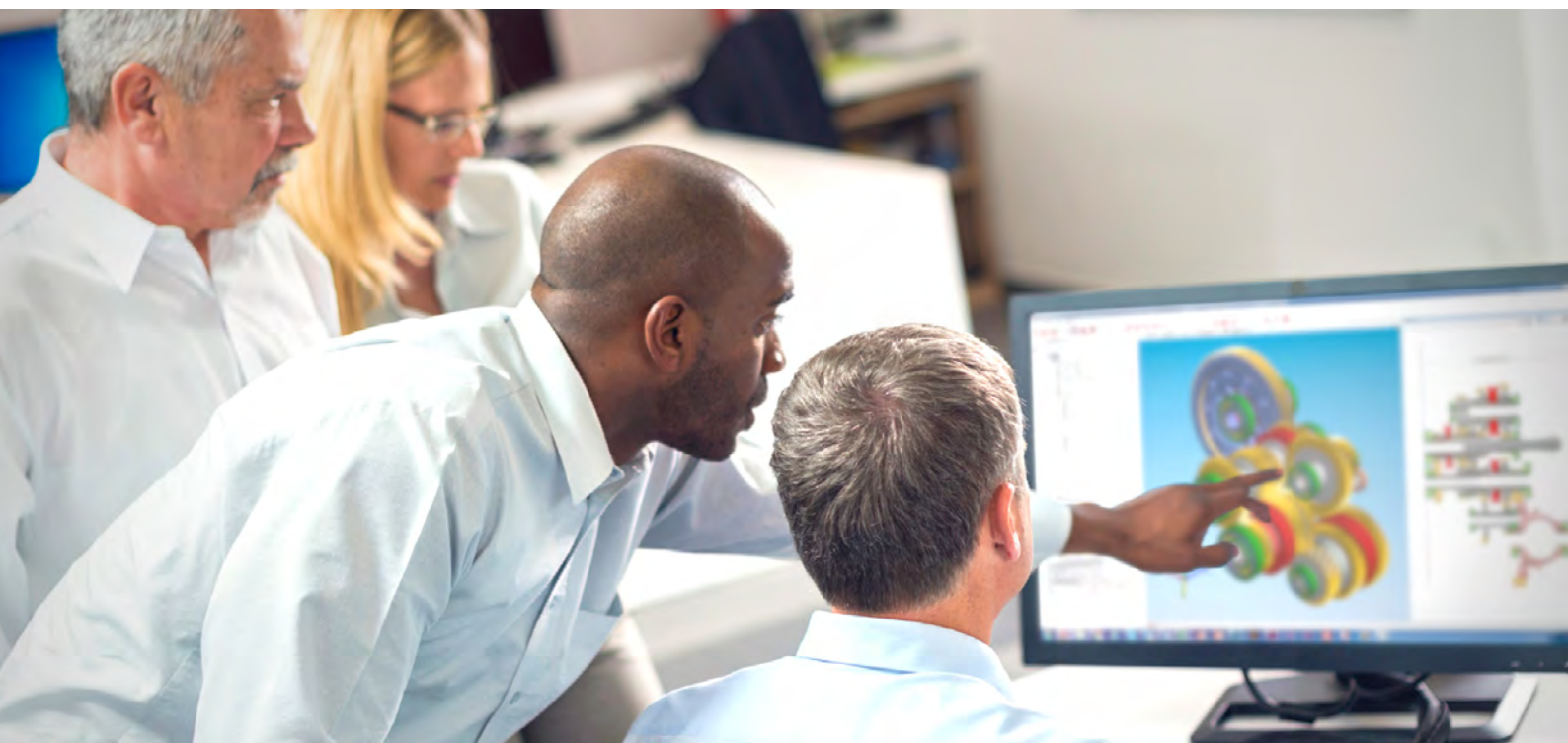
UKAS MANAGEMENT SYSTEMS
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SMT

CAE Software Support

Maximise your investment at consistently affordable rates

The CAE Maintenance Subscription enables you to maintain the most up-to-date design and analysis environment and improve your operational efficiency by giving you immediate access to new CAE software releases and upgrades, technical support and an online portal full of learning resources to ensure you get the most from your design and analysis experience.

- Access to the latest software releases so that you are always up-to-date.
- Prompt technical support for the speedy resolution of issues to ensure you remain productive.
- Previous version rights enables you to run both the latest and previous versions of the software if required.
- Access to the SMT Portal where you can watch tutorial videos, see FAQs, download resources, submit support or enhancement requests and much more!

Visit **www.smartmt.com/support** for further details.

SMT Worldwide Locations

UNITED KINGDOM

Smart Manufacturing Technology Ltd.
Chartwell House, 67-69 Hounds Gate, Nottingham, NG1 6BB, UK
Tel: +44 (0)115 941 9839 **Fax:** +44 (0)115 958 1583
Email: sales@smartmt.com

CHINA

SMT Beijing
Room 2908, C, Jin Chang An Building, No. 82, Dong Si Huan Zhong
Road, Chaoyang district, Beijing, 100124, China
Tel: +86-10-87765729 **Fax:** +86-10-82658258-8000
Email: sales_china@smartmt.com

KOREA

SMT Korea
1008 Gongjangdong, Ilsantechnotown, #138 Ilsan-Ro, Ilsandong-Gu,
Goyang-City, Gyeonggi-Do, 410-722, S. Korea
Tel: +82 70 7010 7190 **Fax:** +82 31 812 8454

PORTUGAL

SMT Portugal
Rua dos Fundões 151, 3700-121 S. João da Madeira, Portugal
Email: info@smartmt.com

USA

SMT North America
5000 Worthington Way, Fayetteville, New York, 13066, USA
Tel: +1 315 440 4657 **Email:** sales_usa@smartmt.com

www.smartmt.com

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