APM Technologies

Acumen for Accuracy
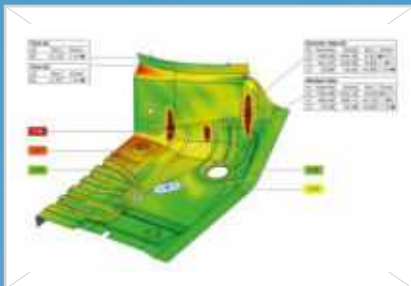
ACCURACY, QUALITY & COMMITMENT

g•om | certified partner

User Segments:-

- Automotive
- Aerospace
- Defence
- Research & Development Centers
- Moulds & Dies Manufacturing
- White Goods
- And many more ...

APM Technologies started in 1999 with an aim to bring world class technologies to the doorstep of Indian Industry, to meet the challenges of...

- Better Quality
- Faster Development
- Higher Productivity
- Better Safety Standards
- Lower Cost

Since 1999 APM is associated with M/s GOM GmbH, world leader in 3D-Scanning and optical measuring technology

Sales Division sells products of M/s GOM Germany which includes-

- **ATOS - 3D Scanner**
- **TRITOP Photogrammetry**
- **ARAMIS**
- **ARGUS**
- **PONTOS** Live

Services Division offer services of 3D Scanning Quality control, Reverse engineering , RPT, Product Development & Part or CAD verification
Today APM enjoys pioneering & market leading status in the field of 3D- Scanning, Quality control & Reverse Engg. with an experience of scanning over 50,000 parts.

APM's facilities include ATOS, TRITOP, ARGUS & ARAMIS systems along with a team of highly skilled and dedicated engineers.
APM has inhouse facility for Reverse Engg. an advanced 3D-CAD workstations. APM has facilities and experience to scan parts ranging from a small coin to an aircraft and almost everything in between. APM offer in-house service as well as on site service for large, heavy, sensitive or confidential parts.

Proud to be associated with :-

Atlas Copco	AUTODAL	BAJAJ	D C M	faurecia	Ford
FORCE	GHATGE PATIL INDUSTRIES LTD.	GM	Gestamp	Godrej	HONDA
HINDUJA	JAYA HIND	JBM Group	JOHN DEERE	MARUTI SUZUKI Way of Life!	Mahindra
MAHARASHTRA SCOOTERS LTD.	TEL	TATA MOTORS	TATA STEEL	TVS	VW

World leading ATOS family of Blue light scanners and TRITOP Photogrammetry system from GOM GmbH, Germany (www.gom.com) are the cornerstone of APM's vision to make available world's best technology in the field of scanning, product development and quality control. APM offers these products in Indian Market as the authorized sole distributor of GOM.

Industrial High-End 3D Digitizer

ATOS is an industrial, high resolution, optical 3D scanner. It delivers three-dimensional measurement data quickly and accurately to optimize engineering processes and improve manufacturing work flows.
ATOS is widely used in various industries for components such as sheet metal parts, tools and dies, turbine blades, prototypes, injection moulded and casted parts. Full part geometry is captured in a dense point cloud or polygon mesh describing the object's surface and primitives precisely.

ATOS 3D Digitizers

ATOS 3D Digitizers are utilized in a large number of different engineering applications to reduce time and eliminate cost with return of investment.

Application areas include:

- Quality control
- Reverse engineering
- Rapid prototyping
- Rapid milling
- Digital mock-up

### From coins to cars to aeroplanes

ATOS measures different object sizes, materials, and complexities giving versatility to 3D digitizing by delivering:

- Accurate 3D coordinates and high data quality
- Parametric inspection and evaluation
- Full-field deviation to CAD, 2D and part-to-part
- Section based analysis, GD & T, Trend Analysis
- Complete measuring reports

Make Parts - First Time Right

ATOS 3D-Blue Light Scanning and Inspection system is a versatile tool to check all major parts and assemblies in an automobile to produce clear, concise and easy to understand graphical reports.

INTERIORS

TYRES

CASTINGS

SHEET METAL PARTS

PLASTIC PARTS

LIGHTS

SEATS

Products offered
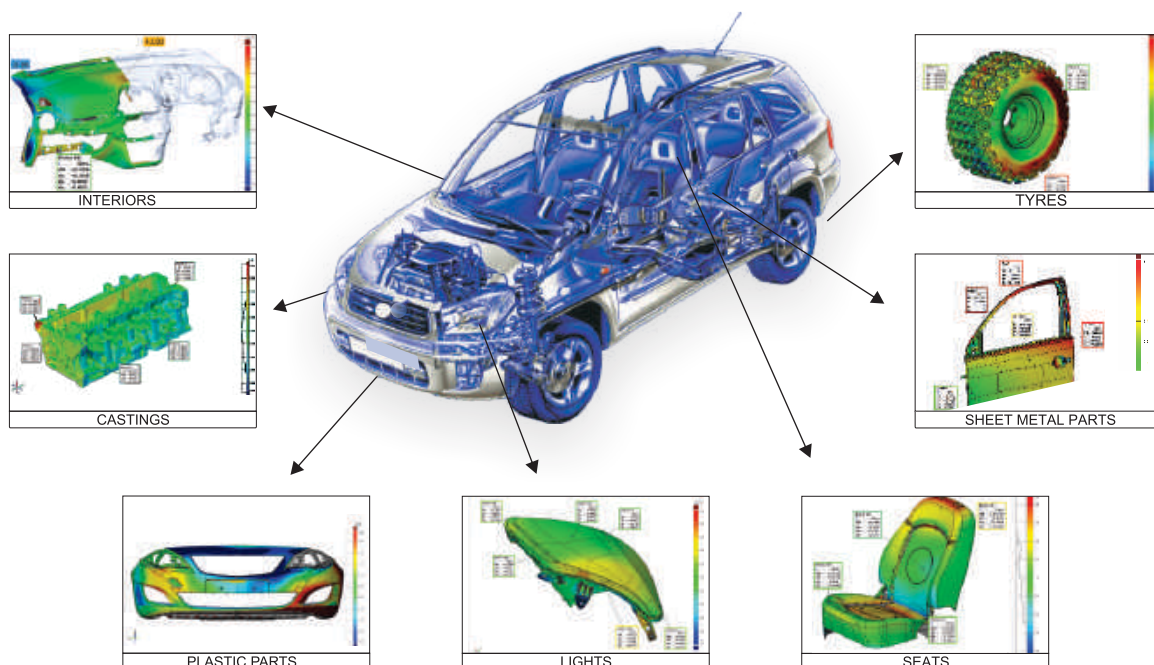
ATOS Corε Industrial Optical 3D Scanning

One Core - Three Solution

ATOS Core is characterized by its compact form. It is ideal for 3D digitizing of small and medium-size components. The three product lines offer solutions for diverse measurement tasks, ranging from the handling of basic 3D scans to fully automated measurement and inspection processes.

Essential Line
3D Scanning with GOM Scan

The ATOS Core Essential Line with the GOM Scan software is designed for basic scanning tasks. Its focus lies on 3D scans which produce high-quality data for applications such as reverse engineering and rapid prototyping. The GOM Scan software is easy to use and supplies high-quality 3D polygon meshes in STL format.

Professional Line
3D Metrology Solutions

The ATOS Core Professional Line comes with the ATOS Professional software for comprehensive shape and dimension analysis. Parametric inspection can be used to completely trace and link all actions and analysis steps in the software. Functions include selective and back projection as well as dynamic referencing for tracking, touch probes or adapter applications.

Kinematics Line
Automated Small Objects Inspection

The ATOS Core Kinematics Line is used for automated measurement and inspection of small parts and components. The robot-guided sensor is integrated in the ready-to-use ATOS ScanBox measuring cell and enables efficient quality controls during the production process.

Space Saving Integrated Design

Proven Blue Light Technology

Affordable

Plug & Play

3D digitizing and inspection of small and medium-sized components

- 3D scanning
- Complex metrology applications
- Automated measurement and inspection
- Three product lines offering customizable growth path
- Sustainable investment
- Functionality and features can be added as project requirements progress

Products offered

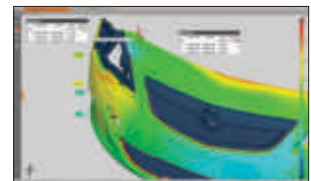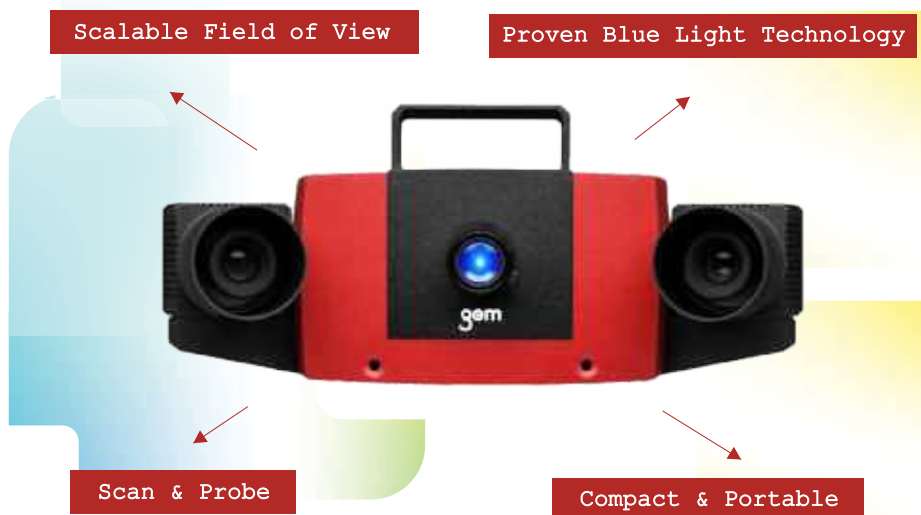# ATOS Compact Scan

Portable 3D Scanner

The ATOS Compact Scan is in a class of its own. This modern 3D scanner combines the latest ATOS Blue Light Technology and software into a compact design with an affordable price. Manufactured with high-quality components, this lightweight and compact sensor ensures ultimate adaptability for various applications and environments, especially in narrow and confined areas. Quickly measure castings, design models, forms, injection molded parts, interiors, prototypes, vehicles and much more.

The Compact Class

The ATOS Compact Scan's advanced hardware is integrated with GOM's powerful software for scanning and inspection, making it the ideal solution for 3D applications.

- Blue light Technology
- A complete ready-to-scan system in a compact package
- Fast high definition data and results
- Simple measurement regardless of environment
- Measure various object sizes from small to large
- Quickly measures in narrow and confined spaces
- Complex measurement and inspection tasks
- Easy transport in a single lightweight suitcase
- Extremely fast setup

Scalable Field of View

Proven Blue Light Technology

Scan & Probe

Compact & Portable

Scan & Probe

Scanners are limited when measuring deep pockets, holes or optically inaccessible areas. The ATOS Compact Scan solves this by combining ATOS full-field scanning with GOM's Touch Probe Kit.

- ATOS optically tracks GOM Touch Probe
- Instantly change between ATOS and Touch Probe measurements
- Measure unaccessible areas, holes, cavities, and hidden geometries
- Quick measurement of individual points
- Alignment of components, adjustment of fixtures, clearance determination, and more ...

ATOS Capsule Optical Precision Measuring Machine

The ATOS Capsule is an optical precision measuring machine (OPMM) for full-field digitizing of contoured part geometries. The fringe projection system of the ATOS series is used for production quality assurance of small to medium-sized parts and excels by its high precision for fine details. ATOS Capsule is used, for example, for first article inspection of gears, turbine blades and wheels as well as medical parts. Due to its housing design, the ATOS Capsule provides process stability for automated applications.

Precisely manufactured metal unibody housing ensures maximum stiffness and precise measuring results for industrial use. Optics and electronics are protected against dust and splashing water. For this purpose, the lenses are protected by a cover, integrating a thin non-reflecting glass pane. In addition, the sensor electronics are hermetically sealed and the cooling takes place via external cooling fins along the housing. Industrial ports increase process reliability and ensure an interference-free data transfer.

ATOS Capsule in Use

In the standardized measuring machine ATOS ScanBox, the ATOS Capsule is used for fully automated measuring and inspection of contoured parts. The ATOS ScanBox is a complete optical 3D measuring machine that was developed by GOM for an efficient quality control in production and manufacturing processes. Various measuring systems are available for different part sizes and applications.

Used in the ATOS ScanBox of series 4, the ATOS Capsule serves as a mobile and therefore flexible measuring system for small parts. In the ATOS ScanBox models of series 5 and 6, the ATOS Capsule can be extended with a Plus Box photogrammetry add-on. Thus, bigger components or several parts can be measured simultaneously. Manually, the ATOS Capsule is used with a studio stand or a desk stand. For the semi-automatic use, a 3-axis motorization kit, including a lift module for the sensor and a Tilt & Swivel Unit for the fixture, is available.

ATOS 5/5X

High Measuring Speed

ATOS 5 sensor provides full-field 3D coordinates for each individual measurement. Within a few seconds, up to 12 million independent measuring points are captured per scan. This is possible by the low noise level of the Blue Light Equalizer. As a result, the measuring data is characterized by very high detailed reproduction, thereby enabling very small component features to be measured.

Blue Light Equalizer

ATOS 5 is equipped with a Blue Light Equalizer, which increases the brightness of the light source by a factor of 1.5 and transmits uniform, non-coherent, speckle-free light to the projection unit. The Blue Light Equalizer of ATOS 5 is so powerful that even on unconventional surfaces can be scanned in short measuring times and the precise coverage of complex geometries are possible.

Triple Scan Technology

In addition to GOM's stereo camera technique, the ATOS 5 also uses the right and left cameras individually in combination with the projector.This new method results in 3 individual sensors, each with different viewing perspectives of the object.
This new technology enables even higher detailed feature capture with faster measurement times for various part sizes, surfaces, finishes, and geometries, regardless of environmental lighting conditions.

Full Automation with Optical Metrology:

- Increased efficiency in quality control
- Higher throughput
- Higher repeatability
- More comprehensive part inspections
- Major cost reductions
- Accelerated return on investment

High Resolution

Triple Scan Technology

Proven Blue Light Technology

Industrial Sensor Head

Automation Ready

Blue light equalizer

ATOS 5 Innovation

- High speed scanning- 0.2 sec per scan
- Blue light equalizer
- Laser light compressor
- Fibre optic connectivity
- Robot precision

The new approach of parametric inspection

GOM Inspect Professional is a process-safe, parametric, traceable evaluation software for dimensional analysis of 3D point clouds from white light scanners, laser scanners, CTs and other sources.

Traceability

GOM Inspect Professional offers deep and comprehensive traceability, from result back to element creation, to increase overall process safety. The exact creation parameters, measurement and point selection of any element are known and can be traced back to origin and checked.
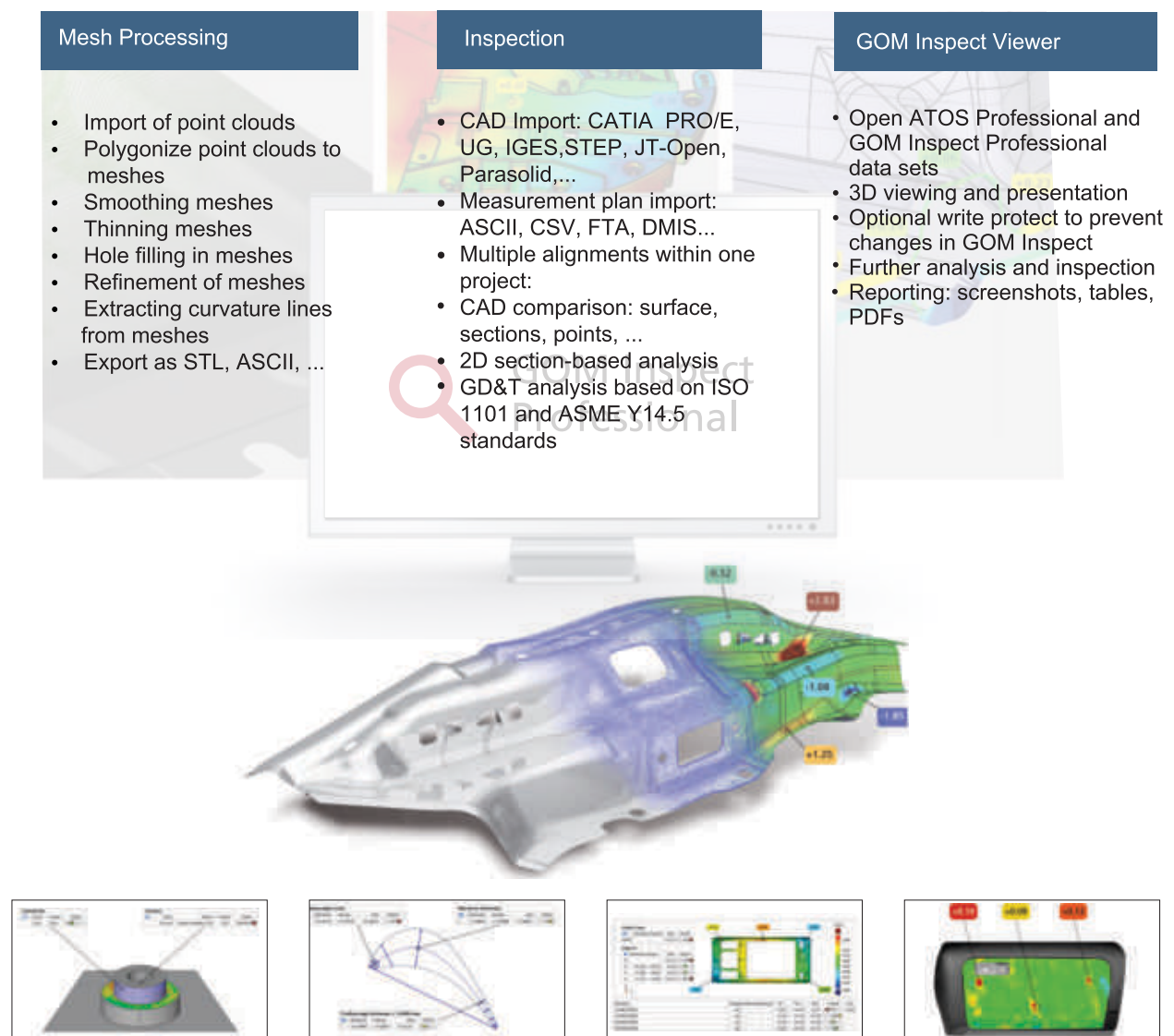
Teaching By Doing

With GOM's Teaching By Doing, all evaluation steps are available without the need for scripting, advanced planning or user intervention. Teaching By Doing reduces programming time to zero. The result is identical workflow for single and multiple part evaluation, saving time and costs.

3D inspection, mesh processing and viewer software

Share ATOS results, further analyze data and easily discuss and detect problematic areas with colleagues, suppliers, and customers for effective collaborations to speed- up decision making process.

Features:

Mesh Processing	Inspection	GOM Inspect Viewer
• Import of point clouds • Polygonize point clouds to meshes • Smoothing meshes • Thinning meshes • Hole filling in meshes • Refinement of meshes • Extracting curvature lines from meshes • Export as STL, ASCII, ...	• CAD Import: CATIA PRO/E, UG, IGES,STEP, JT-Open, Parasolid,... • Measurement plan import: ASCII, CSV, FTA, DMIS... • Multiple alignments within one project: • CAD comparison: surface, sections, points, ... • 2D section-based analysis • GD&T analysis based on ISO 1101 and ASME Y14.5 standards	• Open ATOS Professional and GOM Inspect Professional data sets • 3D viewing and presentation • Optional write protect to prevent changes in GOM Inspect • Further analysis and inspection • Reporting: screenshots, tables, PDFs

The ATOS SCANBOX is a plug-and-play measuring cell for fully automated 3D digitizing and inspection. It combines optimized industrial components, mobility and highest safety in an off-the-shelf 3D measuring machine. ATOS Triple-Scan is mounted on a ROBOT which can be visually programmed for scanning from within ATOS Software.

Complete workflow in one software application

ATOS Professional is a process-safe software solution that controls the ATOS SCANBOX, programs the ROBOT offline or online, produces precise 3D surface data, edits and post-processes the data and offers complete inspection and reporting in one software package.

- Monitoring early trend analysis within production processes for multiple parts.
- Establishing root cause analysis to detect engineering issues
- Higher productivity and increased efficiency in quality control
- Quality assurance with fewer personnel and increased performance

Series 4

Series 5

Series 6

PLUG & PLAY Standardized, automated optical metrology

ATOS 3D-Scanner mounted on a ROBOT and parts positioned on a CNC- Rotary table coupled with ATOS Professional software offers complete automated inspection up to generation of reports.

Series 7

Salient Features of ATOS SCANBOX

- Fully Automated inspection workflow.
- Optimized layout with optimized components
- High Safety
- Plug & Play Plus Portable setup
- 1:1 transfer of measurement programs
- Fast delivery time
- Complete solution from one source

Series 8

Products offered

**Two-Sided Measurement of Long and Wide Components**

With the ATOS ScanBox Series 8, GOM is offering a measuring system that can measure complete vehicles both outside and inside. The main application areas are analyses in Meisterbuock and Cubing, inspection of complete vehicles and quality control in body manufacturing. Measurements from several components can be merged virtually in order to evaluate information about flush and gaps. Other areas of application include, for example, the scanning of cast blanks, quality control of milled tools and tool maintenance.

Two 8-axis kinematic systems and sensors in duplex operation – The new GOM 8-axis kinematic concept enables the measurement of complete car bodies from above, below, from the side and inside, while at the same time taking up very little space.

The duplex operation enables a synchronous and coordinated deployment of two robots in one measuring cell. In this process, a joint data set of measurements is created, as the robot operation takes place in a shared coordinate system. Series 8 of the ATOS ScanBox also enables the independent measurement by two robots on two different components.
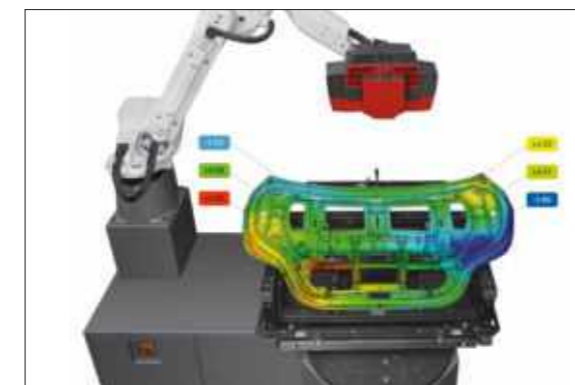
TRITOP - Optical 3D Coordinate Measuring Machine

The portable TRITOP CMM system measures coordinates of three-dimensional objects quickly and precisely. Measuring tasks that traditionally were performed by tactile 3D coordinate measuring machines can now easily be carried out with the TRITOP CMM system. It does not require any complex heavy and maintenance-intensive hardware. The measuring machine comes to the object.

As with tactile coordinate measuring machines TRITOP CMM records the coordinates and their orientation in space for any feature of interest:

- Surface points and sections
- Primitives
- Holes, punch holes and edges
- Diameters, Lengths, Angles.

After the 3D coordinates have been determined, the measurement is mathematically transformed into the coordinate system of the component by alignment methods like...

- RPS
- Gage alignment
- Best-fit ...

The measured and aligned data is used for various tasks

- CAD comparison
- Verification of shape and position tolerances
- Verification of specifications from drawings files or tables
- Initial measurements
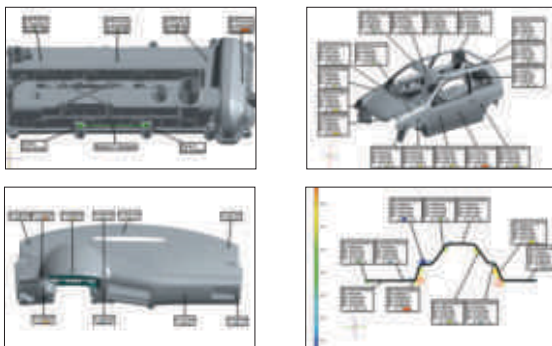
When comparing the measuring data with CAD data (IGES, VDA, STEP, Catia, ProE, UG ...), the corresponding measuring reports are created in the familiar formats:

- False-color representation
- Deviation of individual points as labels
- Sections, angles and distances
- Diameters and flatness
- Table and lists

Advantages of the TRITOP CMM Technique

- Complete 3D measuring machine with minimum hardware requirements (2 cases with a total weight of 23 kg)

- The objects are not touched during measurement

- High accuracy for small as well as large objects

- No wear and tear, no decrease of accuracy

- Easy handling

- Independent of environmental conditions (climatic chamber, open air...)
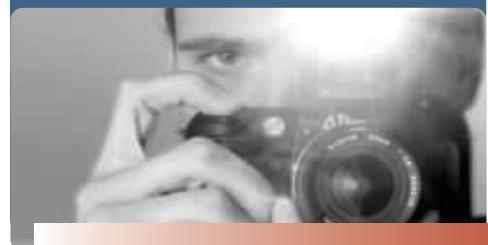
ARAMIS

Optical 3D Deformation Analysis
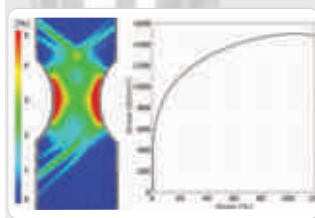
Product development process needs exact determination of material properties, usage of new materials, validation and improvement of FEA calculation.
The deformation measurement system ARAMIS is ideally suited to measure, with high temporal and local resolution as well as a high accuracy, 3D deformation and strain in real components and material specimens.
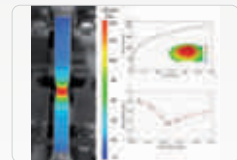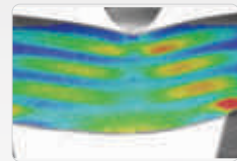
Results

The results for static or dynamically loaded specimens or components are:

- 3D surface coordinates
- 3D displacements
- 3D speeds and acceleration
- Plane strain rate

The non-contact and material independent
ARAMIS system is ideal for many different deformation tasks:

Applications

- Material testing
- Determination of material properties
- Determination of Forming Limit Curves (FLC)
- Verification of numerical simulation

Features

- Objects from 1mm up to 1000 mm can be measured with the same sensor.
- Strain determination in the range of 0.05% up to more than 100%.
- Full-field and graphical representation of the measurement results .
- Mobility and flexibility with a simple and compact measurement system.
- Determination of the forming Limit Curves from standardized measurements.
- 2D and 3D measurements.
- Integrated data logger and triggering device.
- CAD Import for alignment of results
- Comparison of FEA results to measured results
- Measurement at high temperature
- Measurement at ultra high speeds of the order of 1,50,000 Hz

ARGUS

Sheetmetal Formability Measurement

The optimization of the sheet metal forming process, taking into account the correct material selection and the optimization of tools is a decisive factor for competitiveness, particularly in the automotive industry.

The forming analysis system ARGUS supports such optimization processes by generating precise results of the forming distribution on the components. In addition, it provides full-field results for the verification of numerical forming simulations.
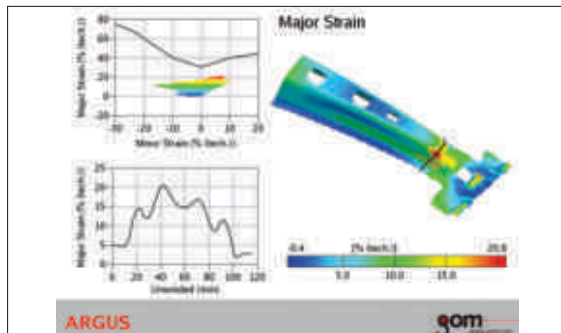

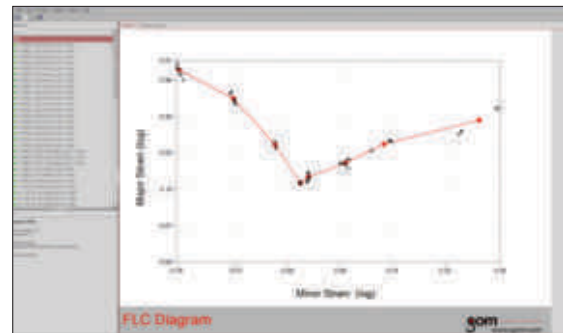The results from the Argus system provide full-field information about
- 3D coordinates of the component's surface
- Form change (major and minor strain)
- Thickness reduction
- Forming Limit Diagram (FLD)
- Sheet metal hardening

Software Features

Possibility to create automated result reports
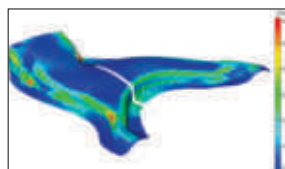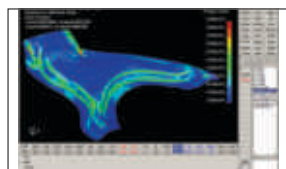

Completely integrated Forming Limit Curve Mode in ARGUS

FEA data comparison

Direct comparison of FEA datasets for a full-field data Surface (geometry), displacements and strains

- Import of FEA Datasets
- ABAQUS (ABAQUS input)
- Autoform (AF)
- LS-DYNA (DYNAIN)
- PAM-STAMP (M01)
- ASCII (for other FE software packages)

Applications

ARGUS provides full-field results with high local resolution for small as well as for large components. Therefore, it is ideal numerous sheet metal forming tasks like...

- Detection of critical deformation areas
- Solving complex forming problems
- Optimization of forming processes
- Verification and optimization of numerical simulations.

PONTOS Live

Dynamic 3D Analysis

Modern product development demands a better understanding of the dynamic component behavior. This requires an efficient component development in just a few iteration cycles. For the measuring technology to be used, this means that in addition to high absolute accuracies, numerous measuring points and an efficient practical handling are required.

In contrast to conventional displacement measuring system, the PONTOS system reduces the measuring procedure to a fraction of the time. In addition, the understanding of the measuring results is visually supported by an animated representation.
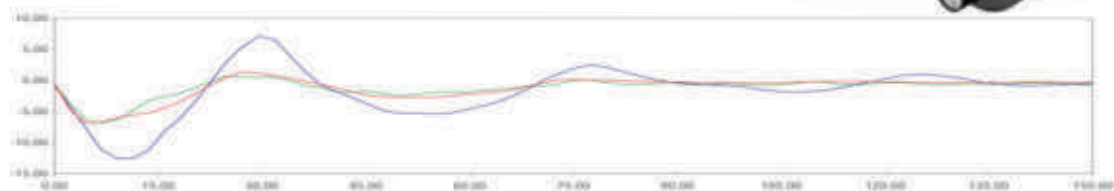
Conventional measuring setup

PONTOS based measuring setup

Results

- 3D Coordinates
- 3D Displacement
- Deformations
- Velocity
- Acceleration

Applications

PONTOS replaces conventional displacement measuring systems and accelerometers. Independent of the structures to be measured, displacements and deformations are captured rapidly in a non-contact manner.

- Door/hood slam
- Dynamic behavior of components
- Component position in windtunnel
- Deformation measurement of aerodynamically loaded structures
- NVH
- Drop tower tests
- Verification of simulations

Features

- Simple specimen preparation
- Ultra-light measurement targets
- Frame rates independent of the number of the captured markers
- Customized triggering of the image acquisition
- Recording of analog signals
- Insensitivity to ambient conditions, such as vibrations and light changes
- Easy adjustment to different measuring areas and tasks

Products offered

DIRECTION MAP

Dhaula kuan
Ring Road
New Delhi
Ashram
Maharani Bagh
Violet Line Metro
Sarai Jullena
Escorts Hospital
AIIMS
South Ex.II
Lajpat Nagar
Moolchand
IGI Airport
East of Kailash
Sukhdev Vihar
Outer Ring Road
Lotus Temple
Modi Flour Mills
Munirka
Asian Village Complex
Greater Kailash
Nehru Place
Kalka ji
NSIC
Banarsidas Chandiwala
Mathura Road
Siri Fort
Govindpuri
IIT
Kalka ji
Okhla
Apollo Hospital
Chirag Delhi
Greater Kailash II
C.Lal Cowk
APM Technologies
BRT Corridor
Sarita Vihar
Mehrauli
Saket
Crown Plaza
M.B.Road
Guru Ravidas Marg
Ma Anandmayee Marg
Mathura Road
M.B.Road

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