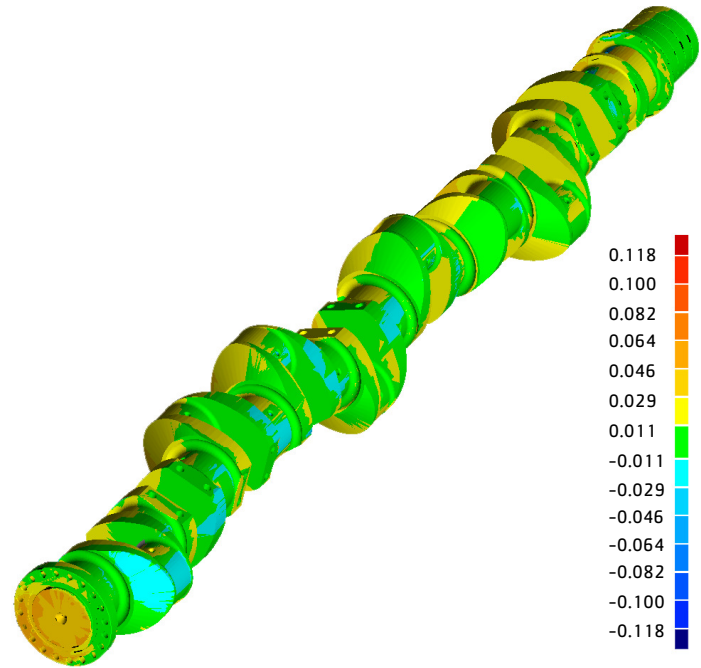
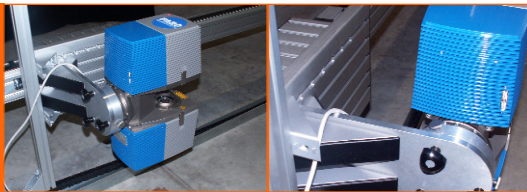


AMES

Automated Measurement and Evaluation System



Automated Measurement and Evaluation System (AMES)

AMES was developed by the FTI Group for dimensional measurement of very large components. Originally the system was intended for scanning up to 20 metre long crankshafts of ship engines, however, AMES can be used for many applications.

An advanced laser scanner captures via a rotating mirror and laser triangulation 120.000 coordinates per second resulting in a very accurate scan of even complex shapes. The laser-scanner is mounted on special and individually adjustable linear units and is driven by servomotors allowing all surfaces to be scanned.

The heart of the system is the ME Control software developed by the FTI Group. ME Control manages the configuration, control and execution of all system processes and functions. This includes the control of the drive system and the scanner as well as a portal to the Qualify software from Geomagic, which evaluates the laser-scan data. All information obtained during the measurement and evaluation process is stored by ME Control in a central database.

The output is 3D-data which can be compared automatically with the CAD-data of the measured components. Conformity and quality of an object can be evaluated, while the data is stored centrally and can be re-used at any time.

Overview

- » Automated measurement of miscellaneous components
- » Scanning of highly complex shapes
- » Fast, real-time comparison of the actual surface contours of a component with its CAD-data (CATIA, ProE, etc.)
- » Detailed test reports with numerical data, various scans, user-defined views, comments and conclusions
- » System data communication via Ethernet
- » System control and data analysis on a standard desktop PC or Laptop
- » Components up to 80 meters in length can be measured

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Software: ME Control/Geomagic Qualify

- » Fully configurable measurement path (number and position of stops)
- » User-defined evaluation (reference object)
- » Creation and management of measurement and evaluation profiles
- » Start and management of measurement and evaluation processes
- » Automatic control of measurement and evaluation processes
- » Automatic generation of process reports in PDF-format
- » Automatic angle calculation for optimal capture of the test object
- » Modification of labels on the graphical user interface
- » Automatic data storage
- » Communication to servomotors and scanner completely via Ethernet

Manual measurement and assessment

- » Trend analysis shows deviations and allows statistical process control (SPC) with several samples
- » Users can easily identify and analyse problem areas via the colour coding of discrepancies
- » Offline Quality assessment for in-depth evaluation of product and process
- » Wall thickness calculation
- » Gap and flush calculation
- » Edge comparisons
- » Assessment of form and shape tolerance
- » 2D- and 3D-measurement

Hardware:

Recommended system requirements:

- » Microsoft Windows XP SP2, Dual Processor 2,4 GHz, 2 GB RAM, 160 GB hard disk capacity, 256 MB Graphics card

Linear unit:

- » Modular system modules with dynamic elements for accurate linear and rotation movements
- » The control and drive units can be combined easily and efficiently

Drive unit:

- » Brushless servo-drive, various models with nominal amperage between 3 and 9 A
- » Single phase or three-phase VAC power supply
- » Universal-feedback to position, speed and power control
- » Supports ETHERNET Powerlink and TCP/IP

Laser Scanner LS 420

Ranging Unit

Range:	0.6 m - 20 m ¹⁾ (HE20)
Resolution:	0.6 mm - 17 Bit Range
Measurement Speed:	120 000 points/sec.
Syst. Distance Error¹⁾:	±3 mm at 20 m
Single Point Repeatability^{1,2)}:	
@10 m: 0.8 mm rms @ 90 % refl.	
1.7/1.6 mm rms @ 10% refl.	
(filtered / raw data):	
@20 m: 1.3 mm rms @ 90 % refl.	
3 mm rms @ 10% refl.	

Deflection Unit

Vertical Field of View:	320°
Horizontal Field of View:	360°
Vertical Resolution:	0.009°
	(40.000 3D-Pixel on 360°)
Horizontal Resolution:	0.00076°
	(470.000 3D-Pixel on 360°)
Angular Resolution (hor./vert.):	±0.009°
Scanning Time:	at 2 mio. points 20 sec.

Laser (Optical Transmitter)

Laserpower (CW average):	(HE20) 20 mW (Laser Class 3R)
Wavelength:	785 nm
Beam Divergence:	0.25 mrad (0.014°)
Beam Diameter (at exit):	3 mm, circular

Handling of Data

Internal PC:

Pentium III with 700 MHz, 256 MB RAM, 40GB HD;
Windows® 2000

Data Storage:

local: on internal hard disc drive (for most resolutions)
remote: via Ethernet on external PC or laptop
Scanner Control: via Ethernet or WLAN by PC or PDA,
on local network or internet

Beam Diameter (at exit): 3 mm, circular



1) Measured on a non moving orthogonal 90% reflectivity reference paper in averaging mode

2) Noise compression filter. More details upon request at info@faroeurope.com ISO/IEC 17025 accredited