



High precision dimensional inspection for industry from R&D.



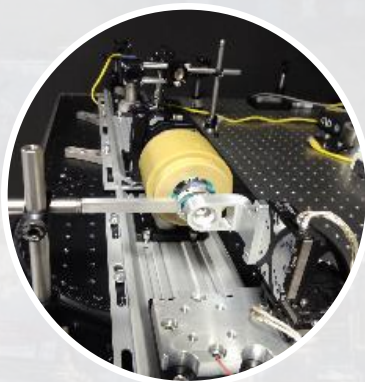
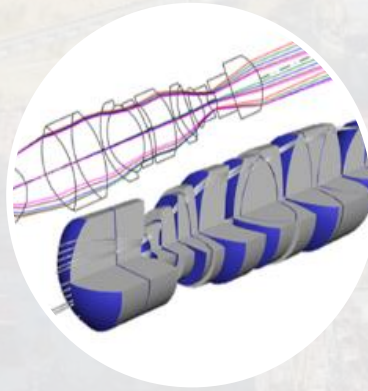
EPIC Online Technology Meeting on Optical Metrology Solutions for the Industry Technology Transfer Meetings

Andrés Cifuentes
CEO – ASE OPTICS EUROPE

INNOVATION FOR REAL WORLD OPTICAL SYSTEMS



- **High precision large area metrology**
- **In-line micro-inspection**



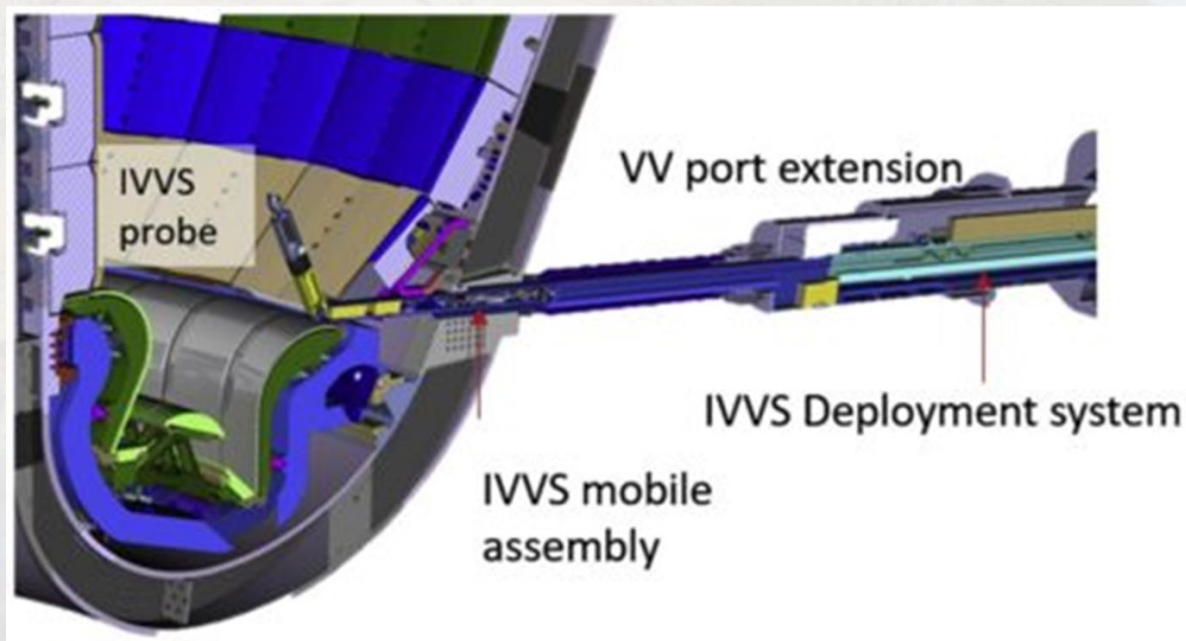
- **Fast paced innovation in optical systems, *from the lens and beyond***
- **Lean team from concept to production**
- **Cross-sector knowledge applied to generate unique solutions for new products... *and deploy them***

... FREEDOM TO INNOVATE

High precision large area metrology



- Detection and quantification of damage and erosion of the ITER plasma-facing components



capable of measuring 3D
meter-scale objects



Micron-level
absolute accuracy



Harsh environment
requirements

High precision large area metrology

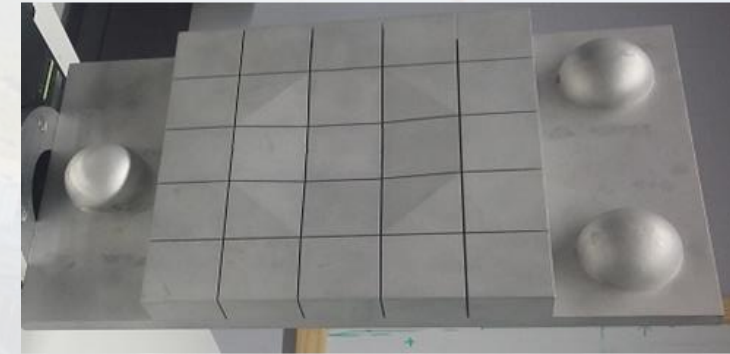
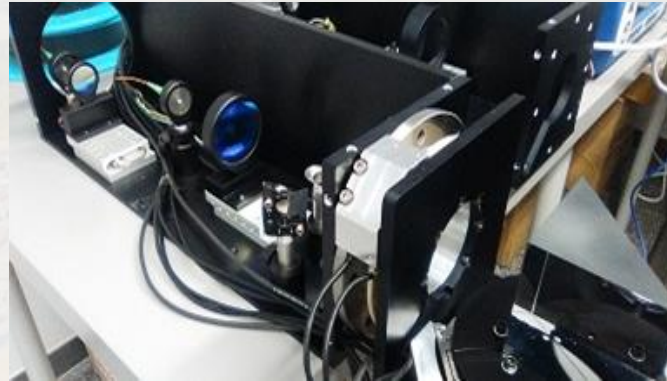


- 3D mapping of the elements inside the ITER tokamak
- Detect any damage or erosion of components
- Complete optical system design & integration
- Reduced-dimension prototype construction
- Implementation of the testing

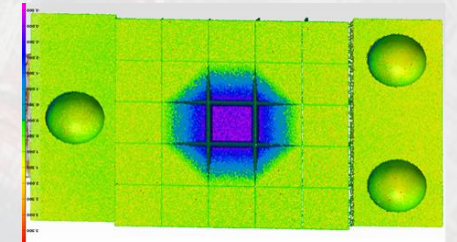
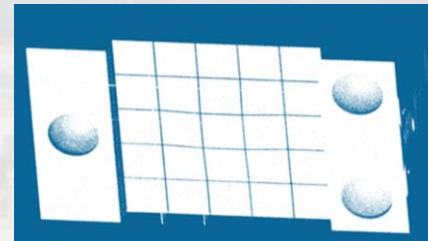
High precision large area metrology



Measuring channels: metrology & viewing channels



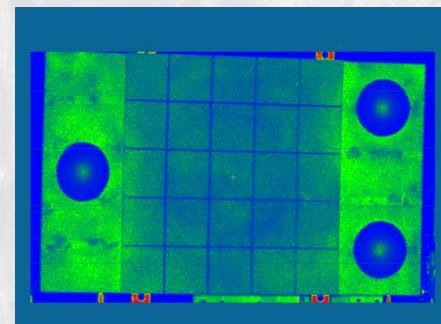
Metrology channel



✓ FM LiDAR for absolute distance measurements



Viewing channel

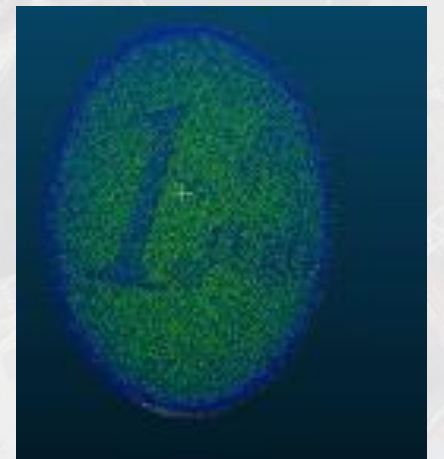
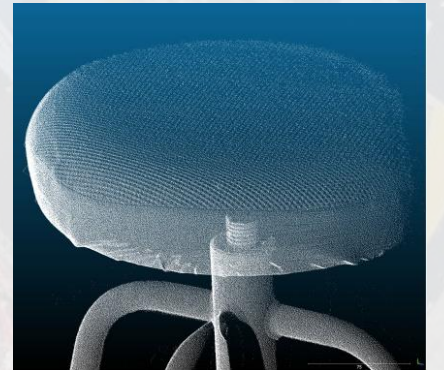
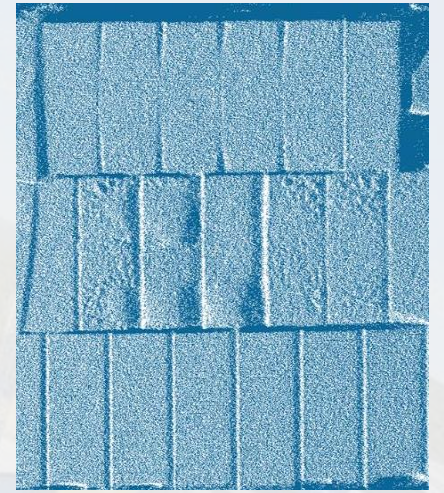


✓ AM LiDAR for surface viewings

High precision large area metrology



- Raster scan & 3D reconstruction
- Measurement range of 10m
- Depth accuracy down to 0.006mm
- Scanning range sphere 10m radius
- 200 data points per second
- Custom software: data acquisition

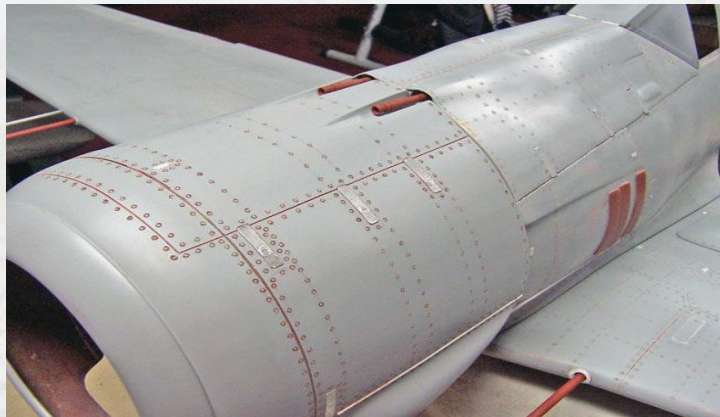


*High precision large
area metrology*

APPLICATIONS



Rivet inspection



**Finished product dimensional
quality inspection**

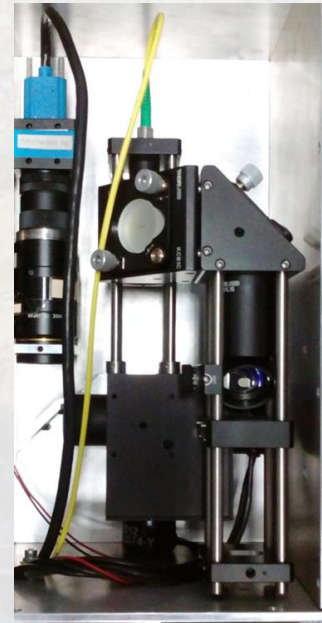


**High precision large
manufactured goods**

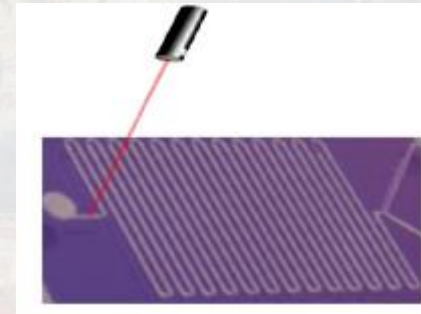


- 3D high speed inspection based on Optical Coherence Tomography and Machine Vision. (WO2018078185-PAMPH-577)

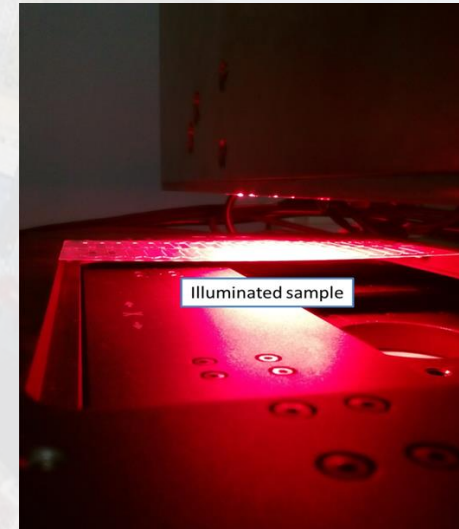
*In-line micro-
inspection*



ASE developed
OCT system



Machine vision
guides laser tool



In-line inspection
adapted

In-line micro- inspection



- **Depth inspection of microchannels**
- **Combined with 2D lateral dimensioning**
- **Adaptable tool configuration**
- **Multi-layered samples compatible**
- **Demonstrated functionality**

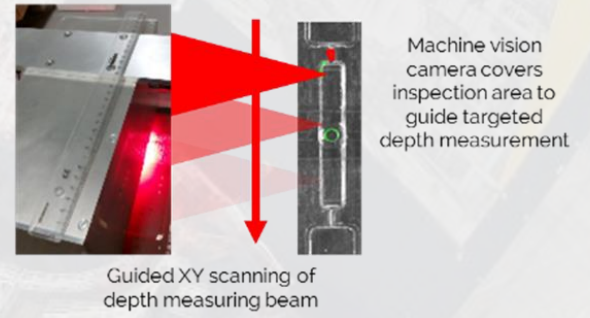
3D dimensional micro-feature inspection with micron precision matching in-line production rates

In-line micro-inspection

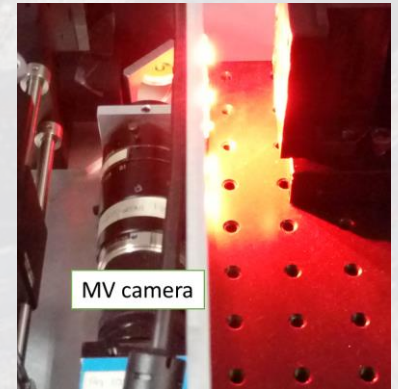


Measurement head Piece undergoing inspection

OCT Channel



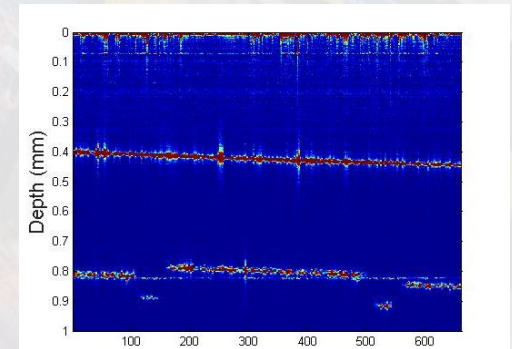
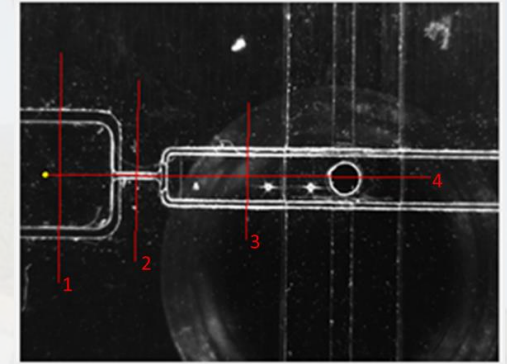
MV Channel



In-line micro- inspection

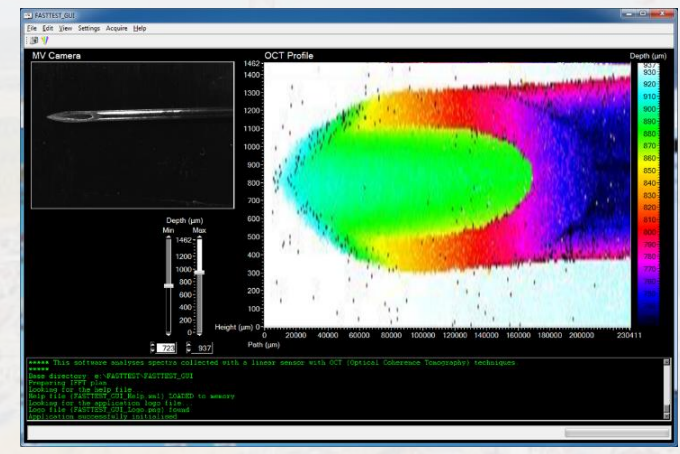


- Depth measurement and lateral measurement of micro-features
- Adjustable depth and resolution balance
- Adaptable for In-line inspection or other customized tool solution.
- Depth and lateral accuracy down to 0.002mm
- Custom software: data acquisition

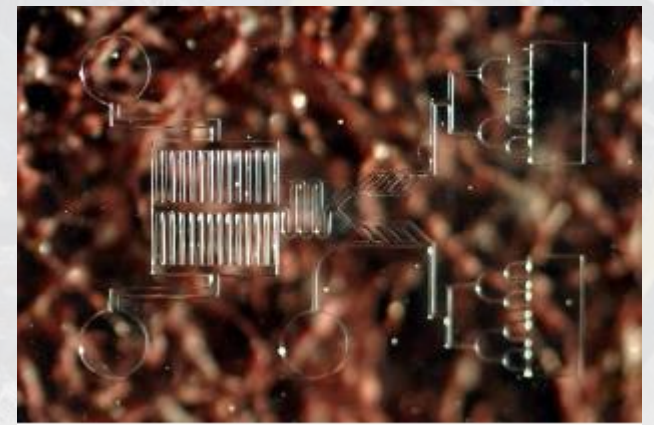


*In-line micro-
inspection*
APPLICATIONS

Micro-weld inspection



Microfluidic chip inline QC



Micro feature inspection



EPIC QUESTIONS



- **What can ASE Optics Europe do for you?**
 - **Customized solutions for optical metrology**
 - **Support in product development and low-volume, high-value series production.**
- **What can you do for us?**
 - **High sensitivity fast detectors**
 - **Fast modulation single-mode fiber coupled lasers**
 - **Reliable precision custom optics and mechanics manufacturing**

Thank you!



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