

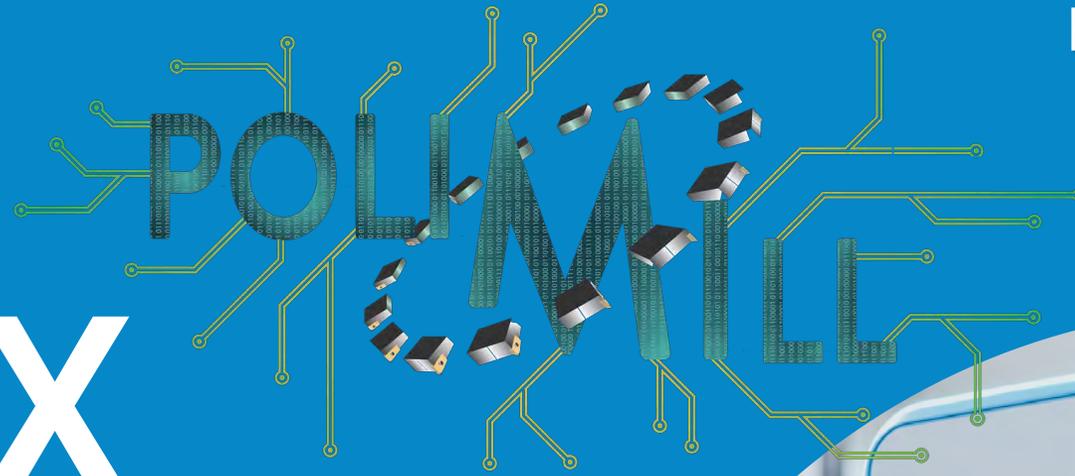
Massimo Paletta
Hossein Rastegarian
2024

Bruker alicona

FocusX

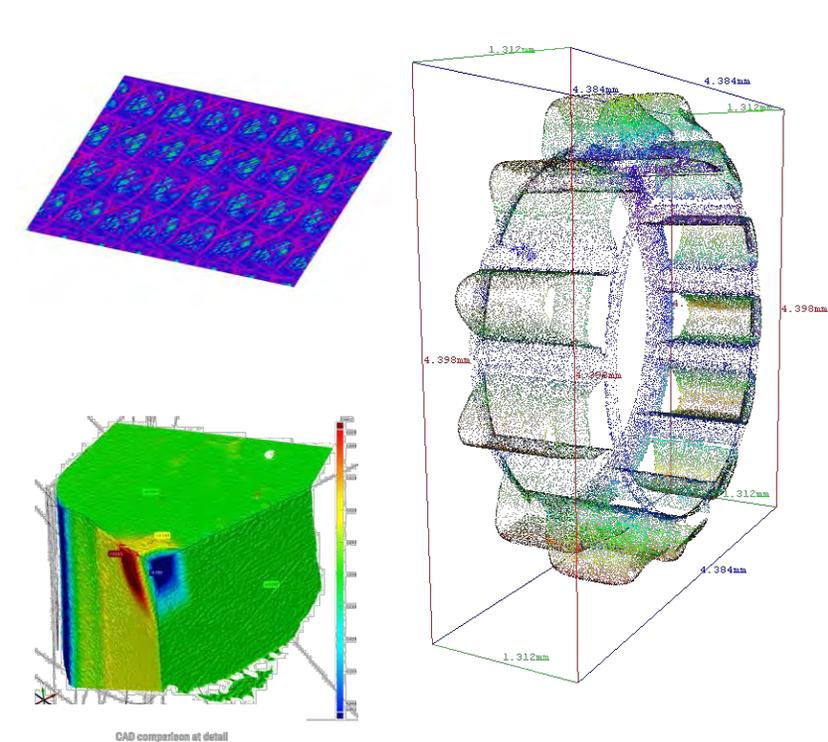
Experience Metrology!

**SI PUÒ REALIZZARE UN
PEZZO COMPLESSO AL
PRIMO COLPO!**



Bruker Alicona

- » Fondata nel 2001 in Austria (Graz)
- » Team internazionale di 150 persone
- » Età media 34 anni
- » Bruker (7000 dipendenti)



-Bruker Confidential-





Hossein Rastegarian
Application Engineer

M +39 389 989 2942

M hossein.rastegarian@bruker.com



Massimo Paletta
Sales Manager

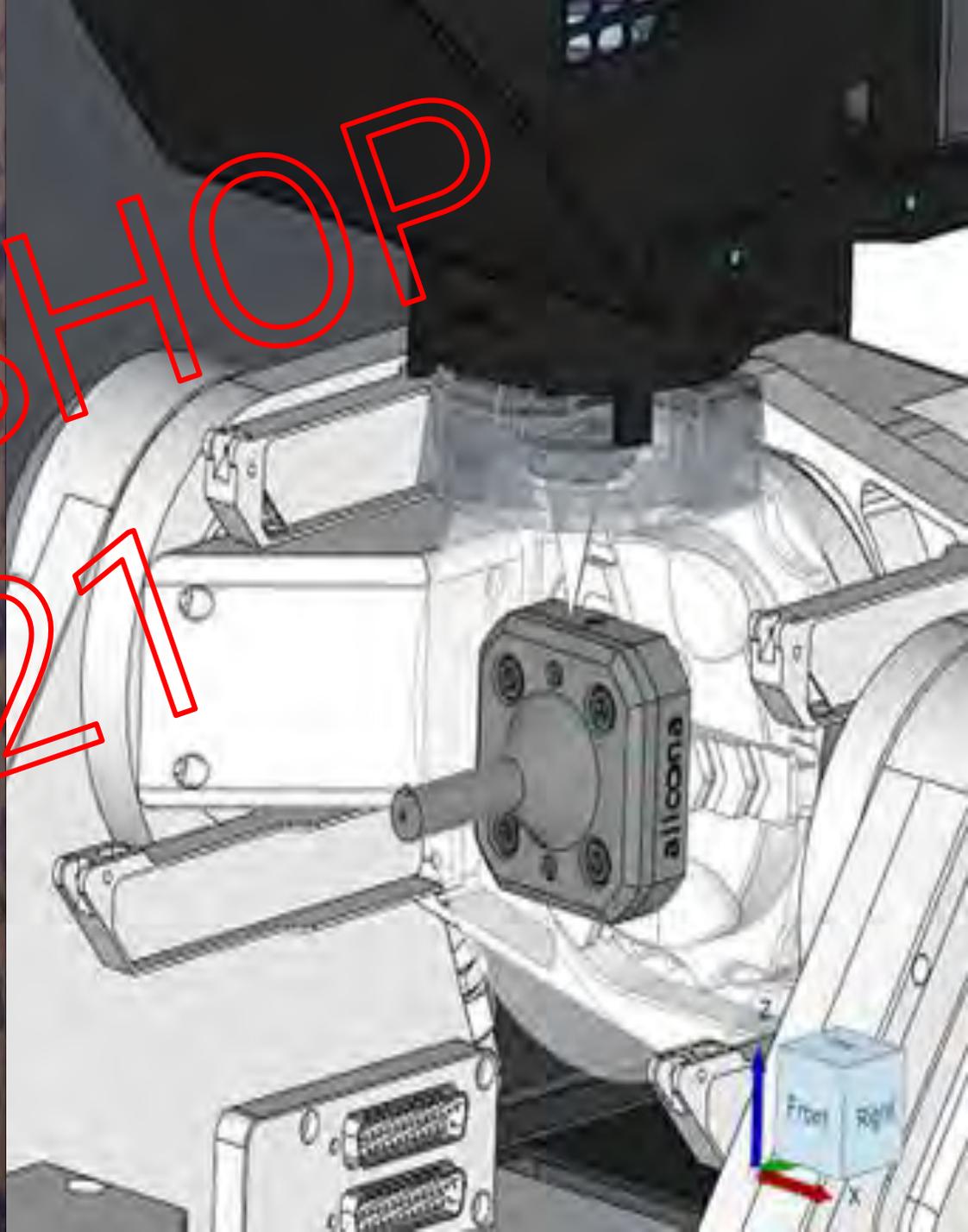
M +39 340 8419670

M massimo.paletta@bruker.com



DIGITAL TWIN

WORKSHOP
2021



PILLOLA ROSSA

CONTINUI A MISURARE
COME GIA' FAI

PILLOLA BLU

PROG.STEP

PMI → CAD

GD&T+Rugosità

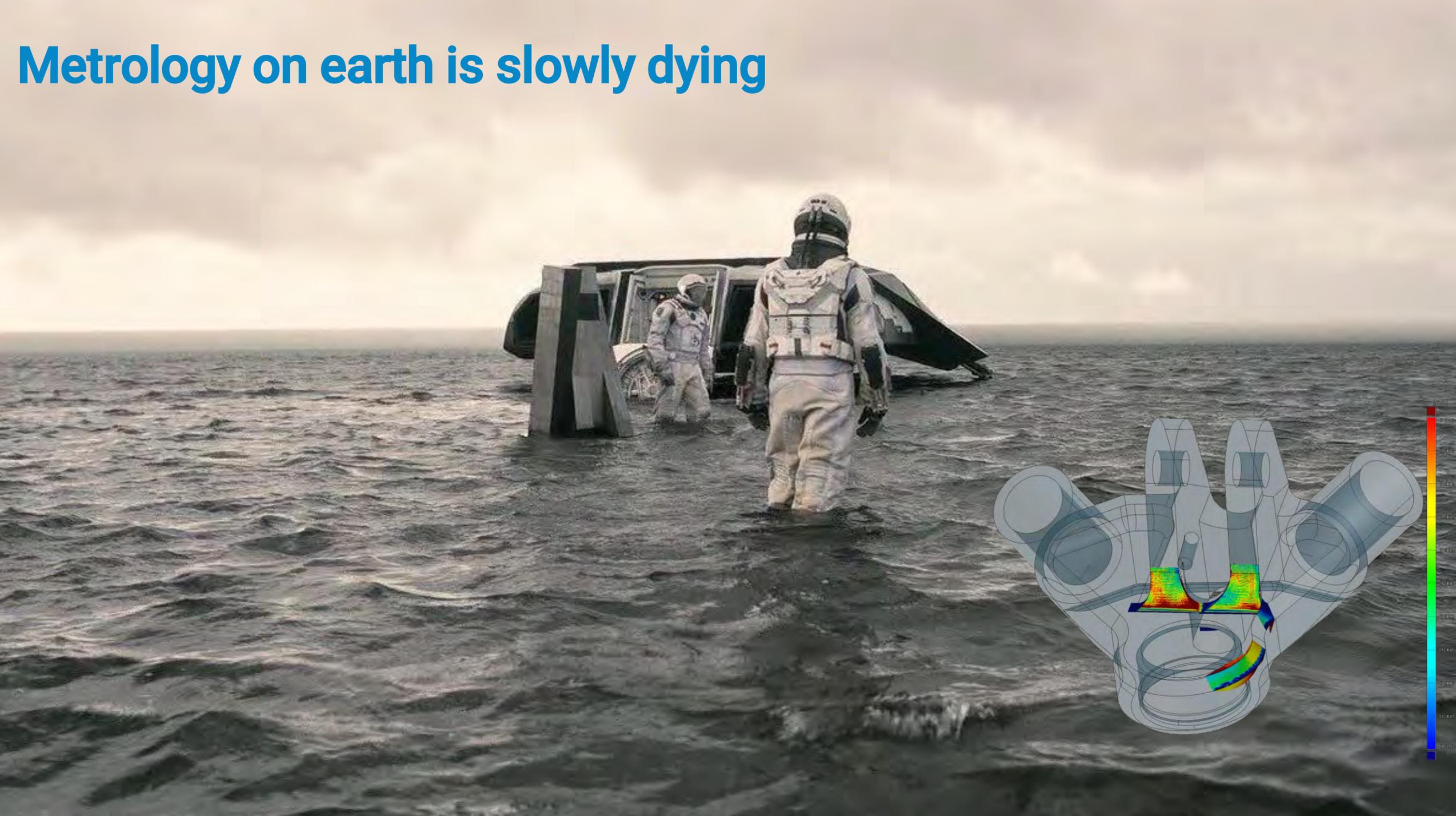
Automazione

WORKSHOP
2023



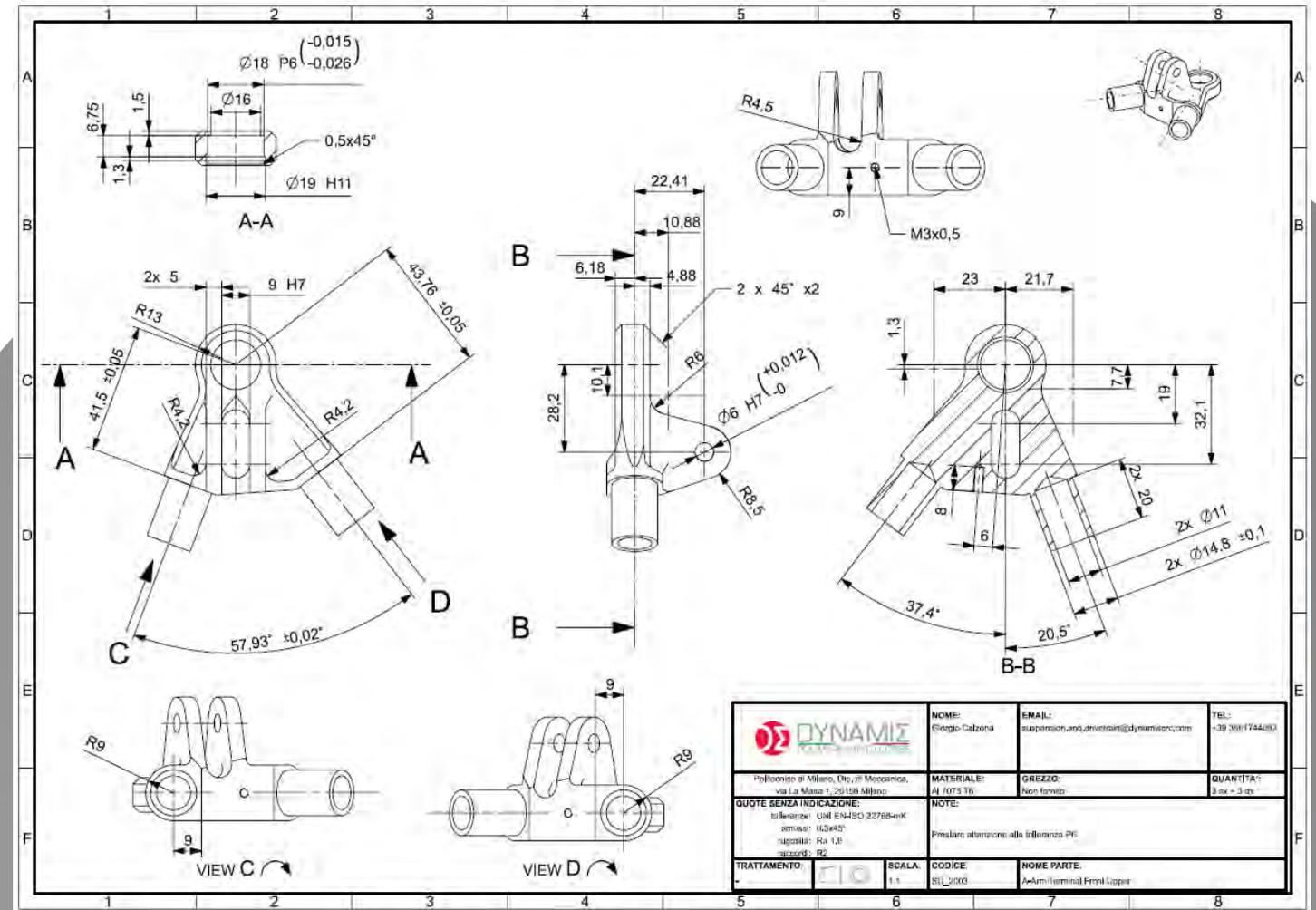


Metrology on earth is slowly dying



Measurement Task

- Characterization of the defect verified by Vericut
- Roughness Measurement – Surface finishing comparison on 2 different parts
- GD&T – Hole Diameter / Hole Cylindricity / Angle between the two hole axes
- GD&T - Profile of a surface without datum - Comparison of the 2 different parts
- CAD Comparison - Comparison of the 2 different parts



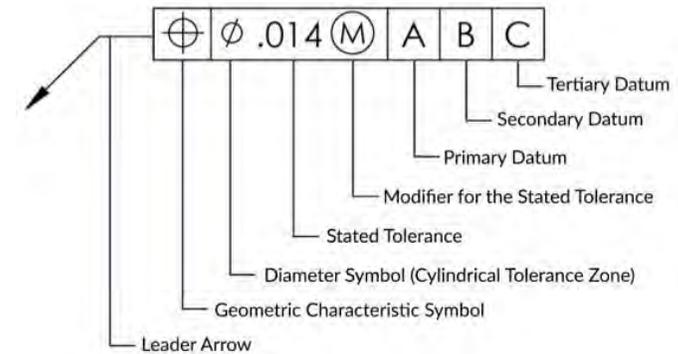
A-Arm Terminal Front Upper

Precisione ed Intricatezza: come le esprimo?



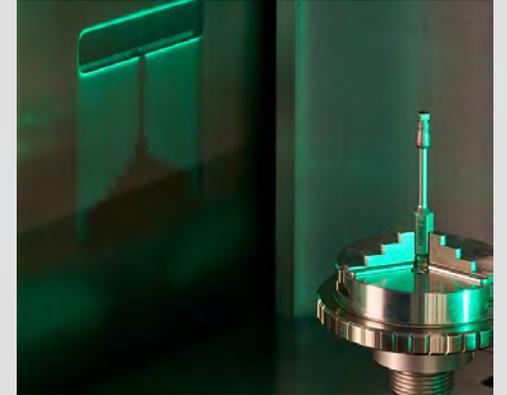
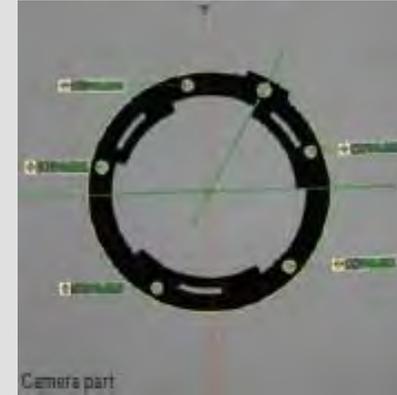
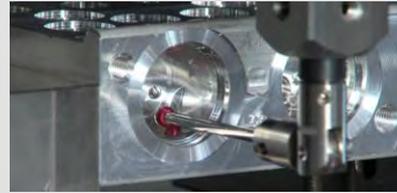
Questa piccola manovra ci costerà 51 anni

- GD&T
- RUGOSITA'
- BAVE
- SCHEGGIATURE
- SCRATCH



Precisione ed Intricatezza: come le esprimo?

□ GD&T



□ RUGOSITA'

□ BAVE

□ SCHEGGIATURE

□ SCRATCH



Precisione ed Intricatezza: come le esprimo?

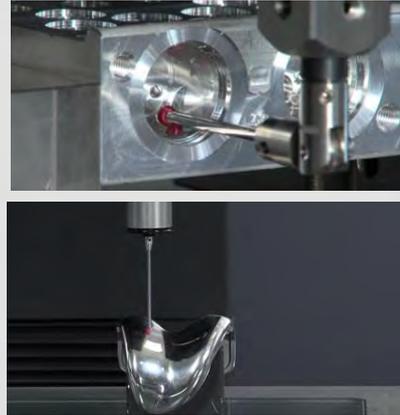


NON OGGETTIVO
SE SBAGLIO IL
POSIZIONAMENTO

SMUSSI – BREAK
EDGE POCO
RIPETIBILI



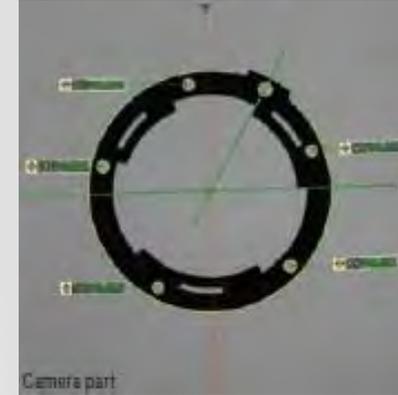
NON OGGETTIVO



NUMERO DI PUNTI RIDOTTO

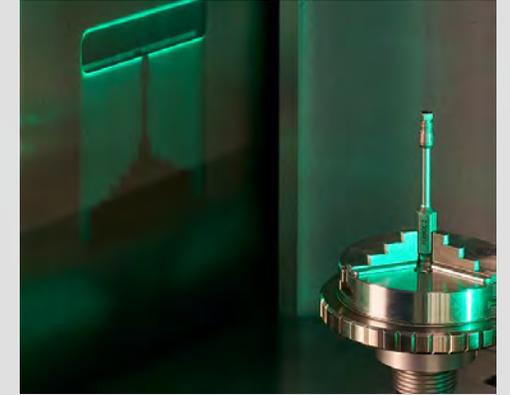
INGOMBRO

FORME LIBERE



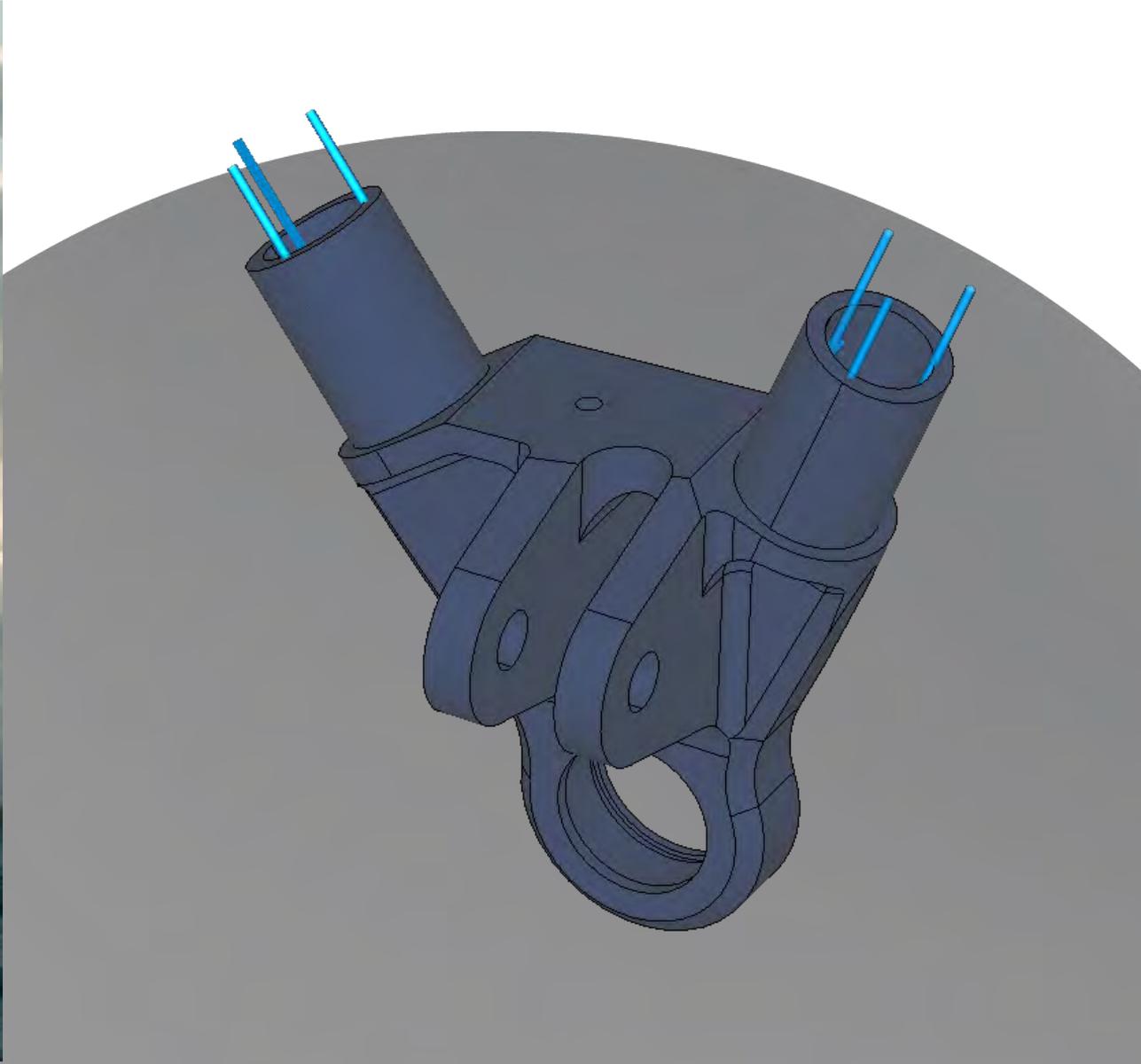
PROEZIONE 2D di una MISURA 3D

STAFFAGGIO

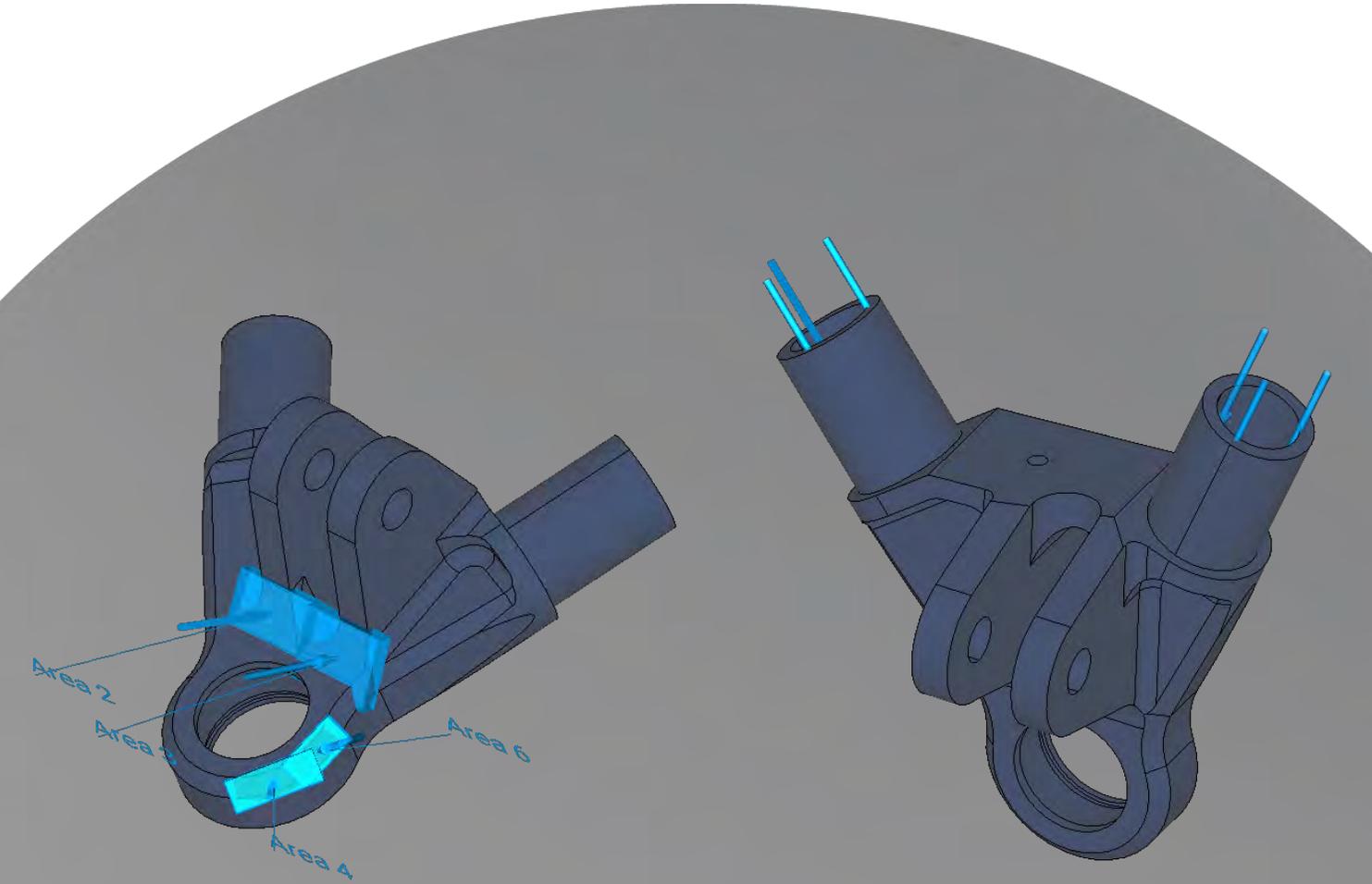
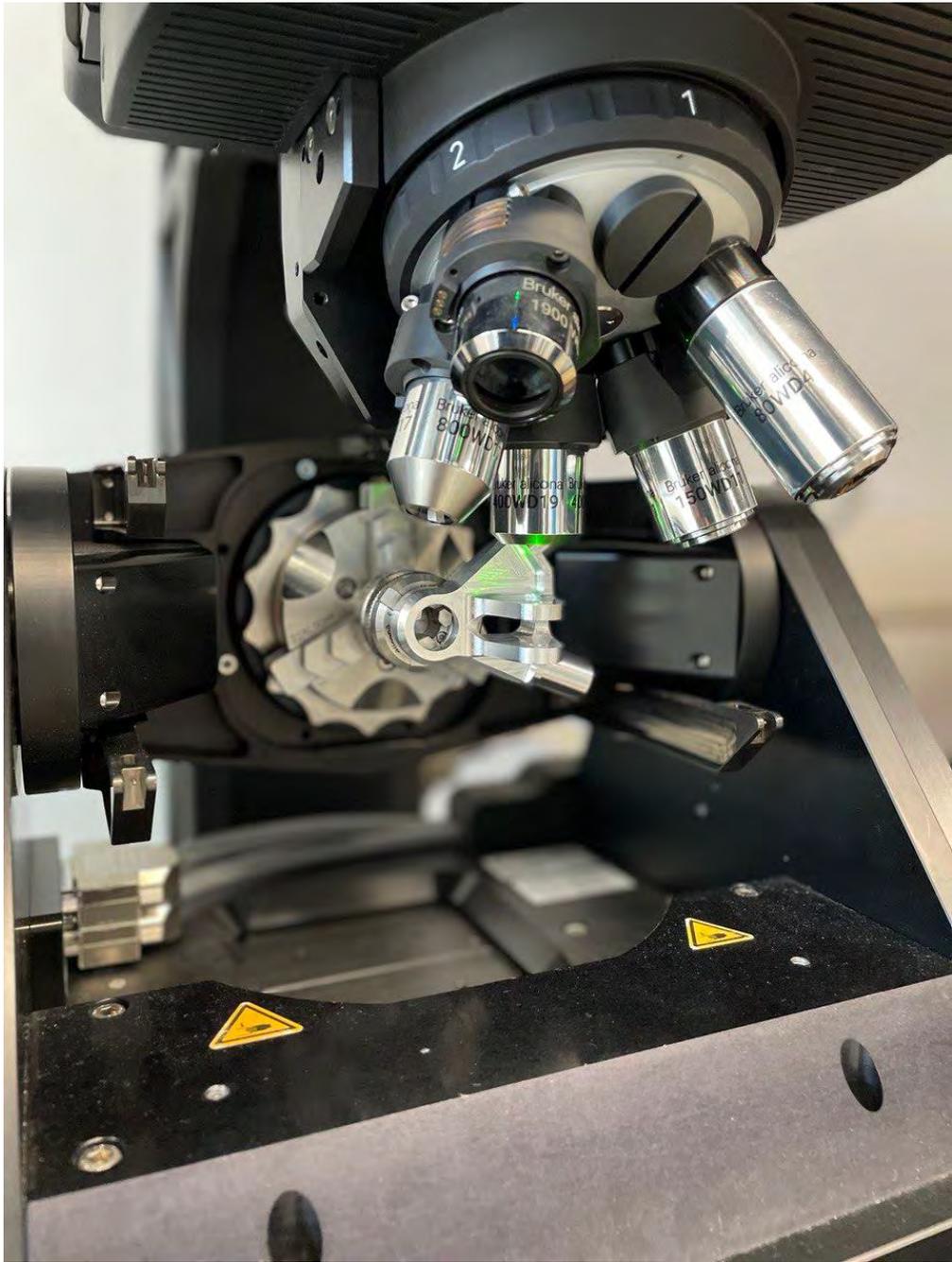


Questa piccola manovra ci costerà 51 anni





MetMax Metrology Software



MetMax Metrology Software

User Friendly



Measurement

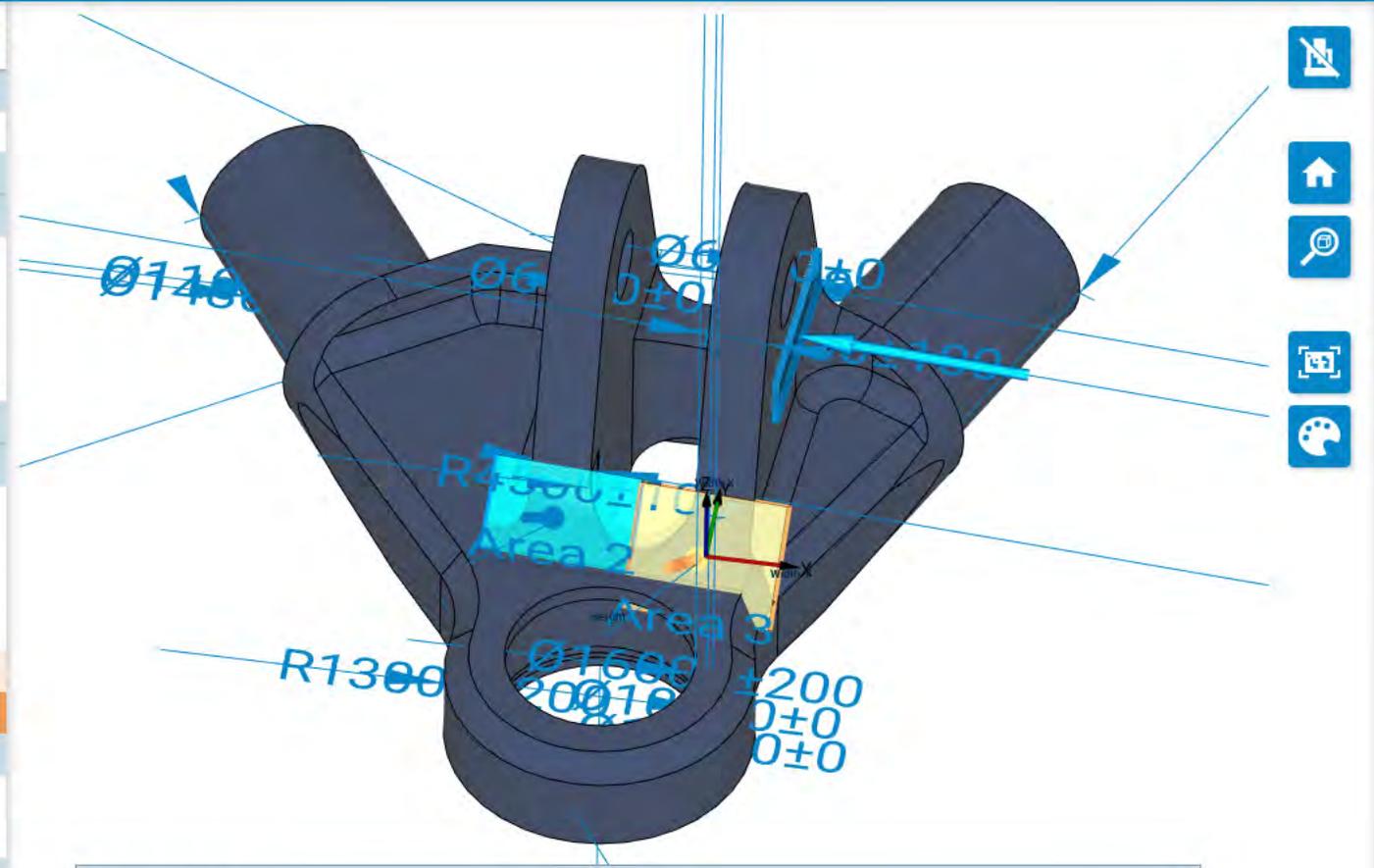
- Area
- Real3D
- Hole & Pin
- Contour
- Profile

Other

- Datum

Project Data

- CAD/PMI
- SU_2004 - A-Arm Front Upper Right
- Measurement Results
- Data
 - Area 1
 - Area 1 Data 1
 - Area 2
 - Area 2 Data 1
- Geometries
- Measurement Definitions
 - Area 1
 - Area 1 M 1
 - Area 2
 - Area 2 M 1
 - Area 3
 - Area 3 M 1
- Coordinate Systems
- Clamping
- Machine
- Documents



- Zoom In
- Home
- Zoom Out
- Fit
- Color

Measurement Plan

- CAD Import
- No Zero Point
- Area 1 Measurement
- Area 2 Measurement
- Area 3 Measurement
 - Area 3 M 1

Position X	7.040	mm
Position Y	11.940	mm
Position Z	5.789	mm
Rotation (-B)	286.221	°
Tilt (A)	43.412	°
Width X	12.562	mm
Width Y	10.562	mm
Height	2.500	mm

Objective: 800 WD17

AdvFV, Res.: 0.50/3.13µm
Attached to Workpiece

Settings: [Gear] [Check] [Close] [Measure]

Settings Update

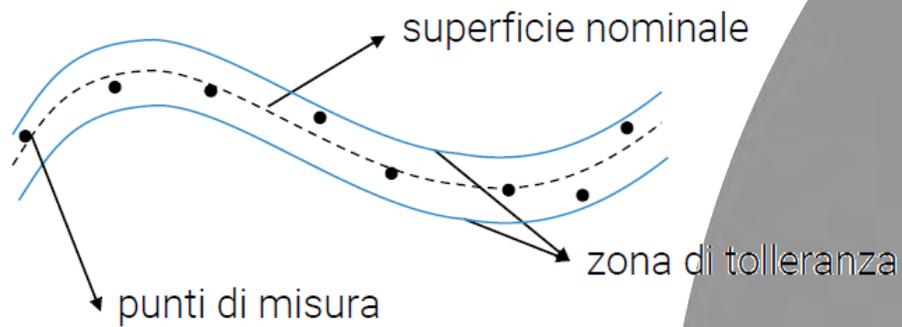
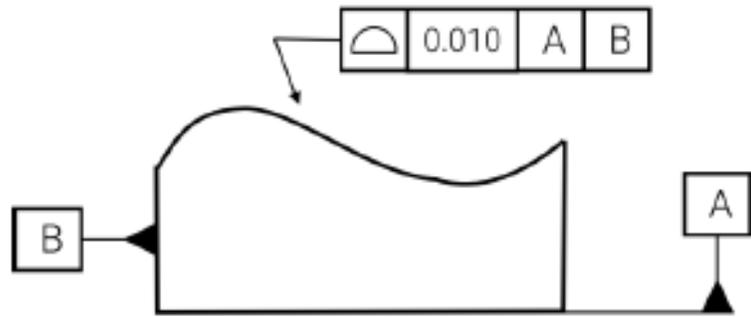
Check and edit the settings in the LiveView.

'Accept & Measure' should use 'High Precision Mode'.

- Accept & Measure: Accept the changes and perform the measurement.
- Accept: Accept the changes.
- Discard: Discard all performed changes.

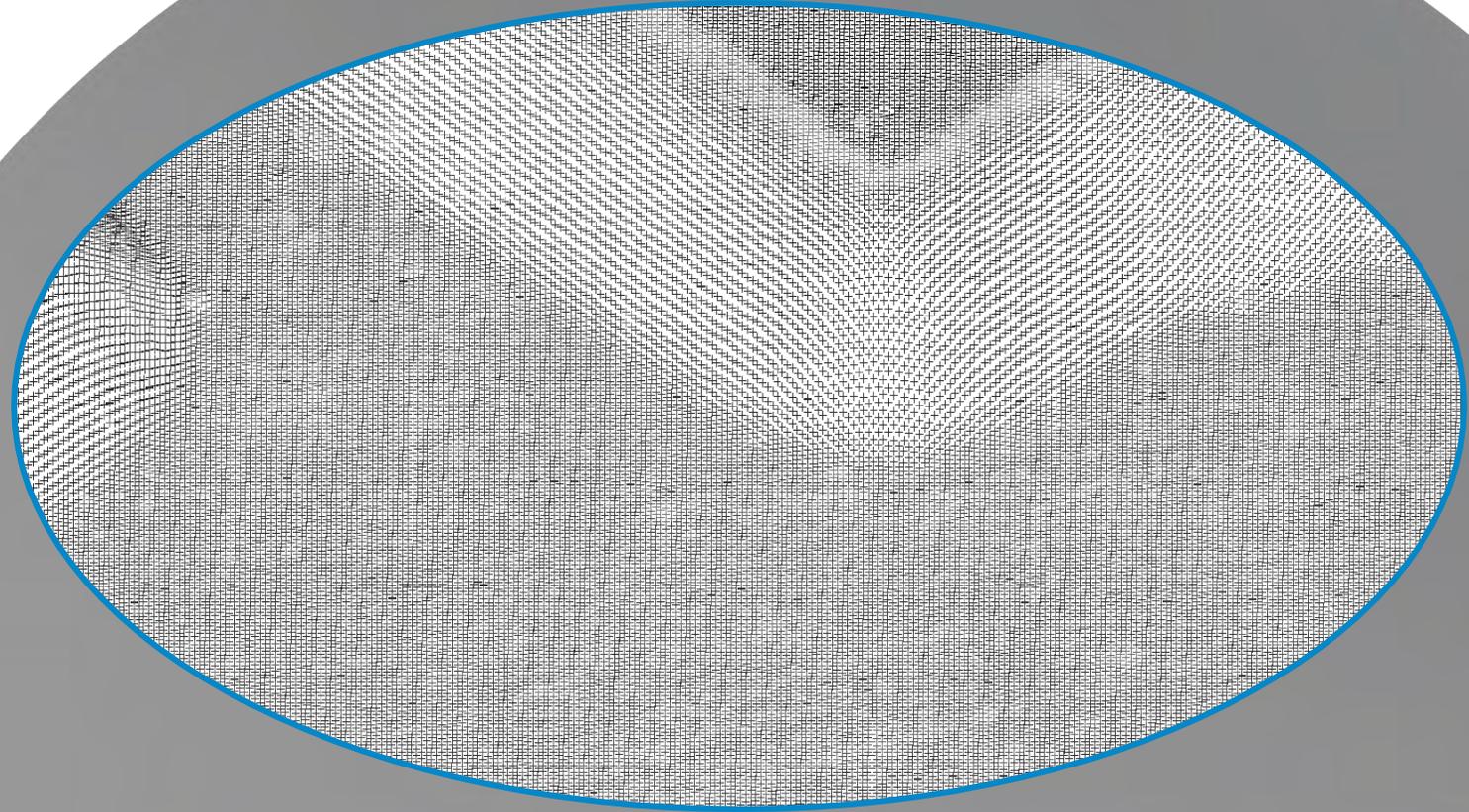
Start

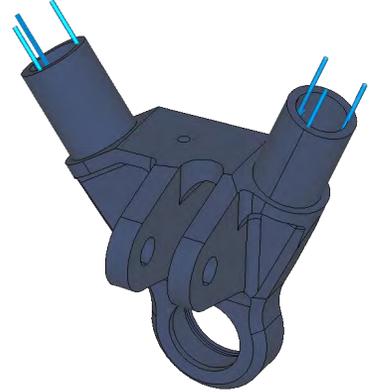
GD&T



Tolleranze multidirezionali
< 0,010 mm

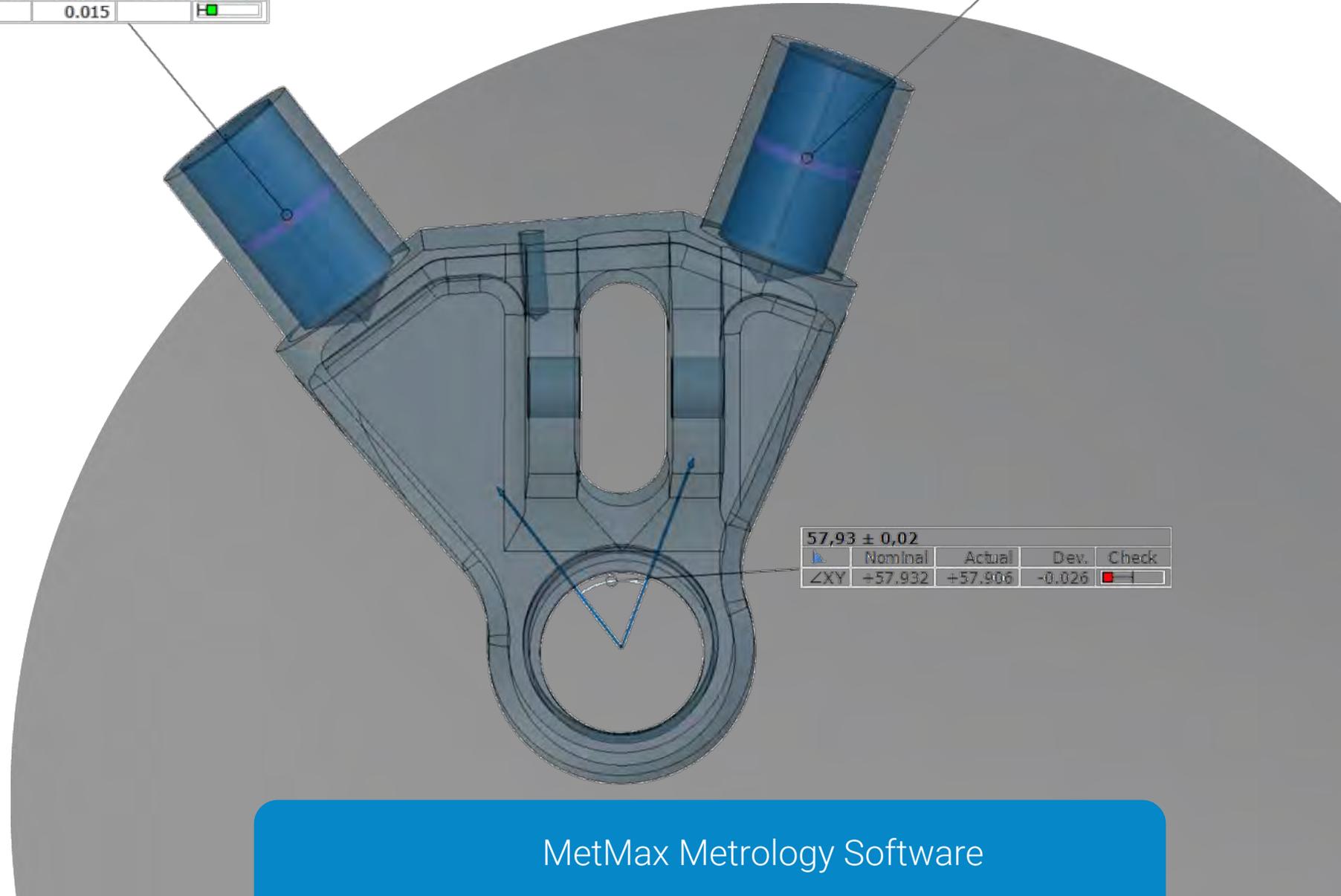
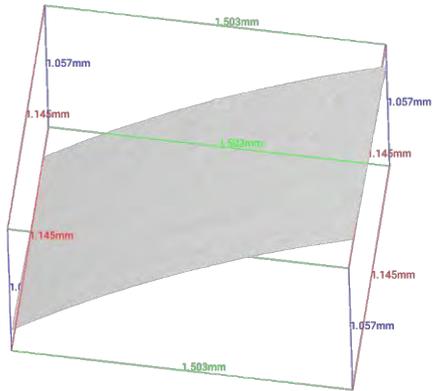
» Misurare l'intera superficie con un'alta densità di punti di misura





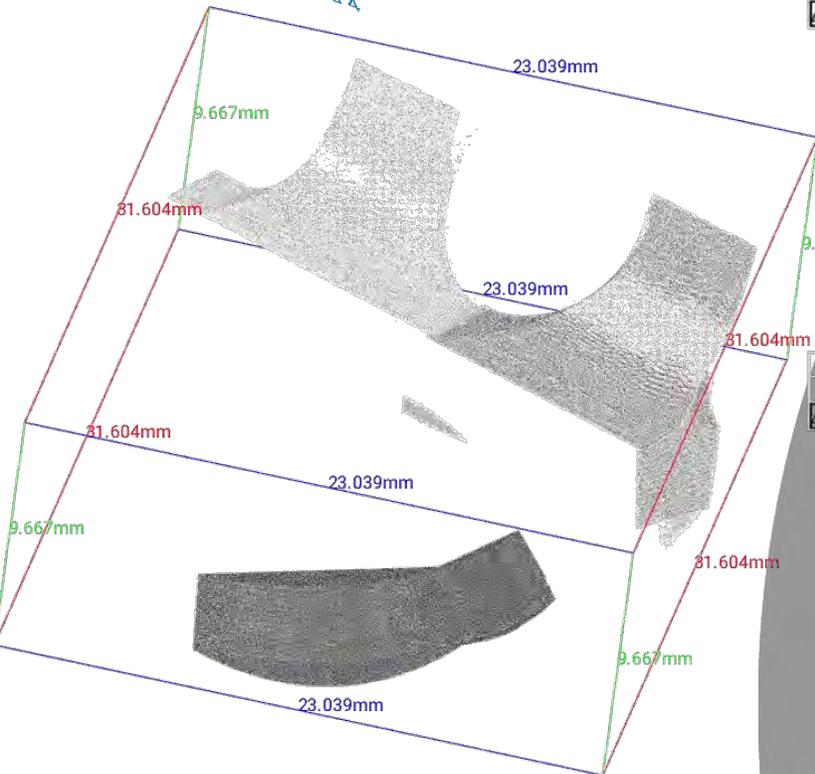
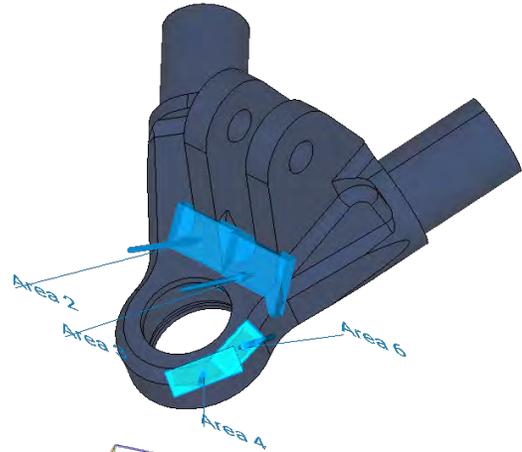
Ø11_1			
	Nominal	Actual	Dev. Check
Ø	+11.000	+11.004	+0.004 <input type="checkbox"/>
⊂	0.100	0.015	<input type="checkbox"/>

Ø11_2			
	Nominal	Actual	Dev. Check
Ø	+11.000	+11.004	+0.004 <input type="checkbox"/>
⊂	0.100	0.012	<input type="checkbox"/>



57,93 ± 0,02			
	Nominal	Actual	Dev. Check
∠XY	+57.932	+57.906	-0.026 <input type="checkbox"/>

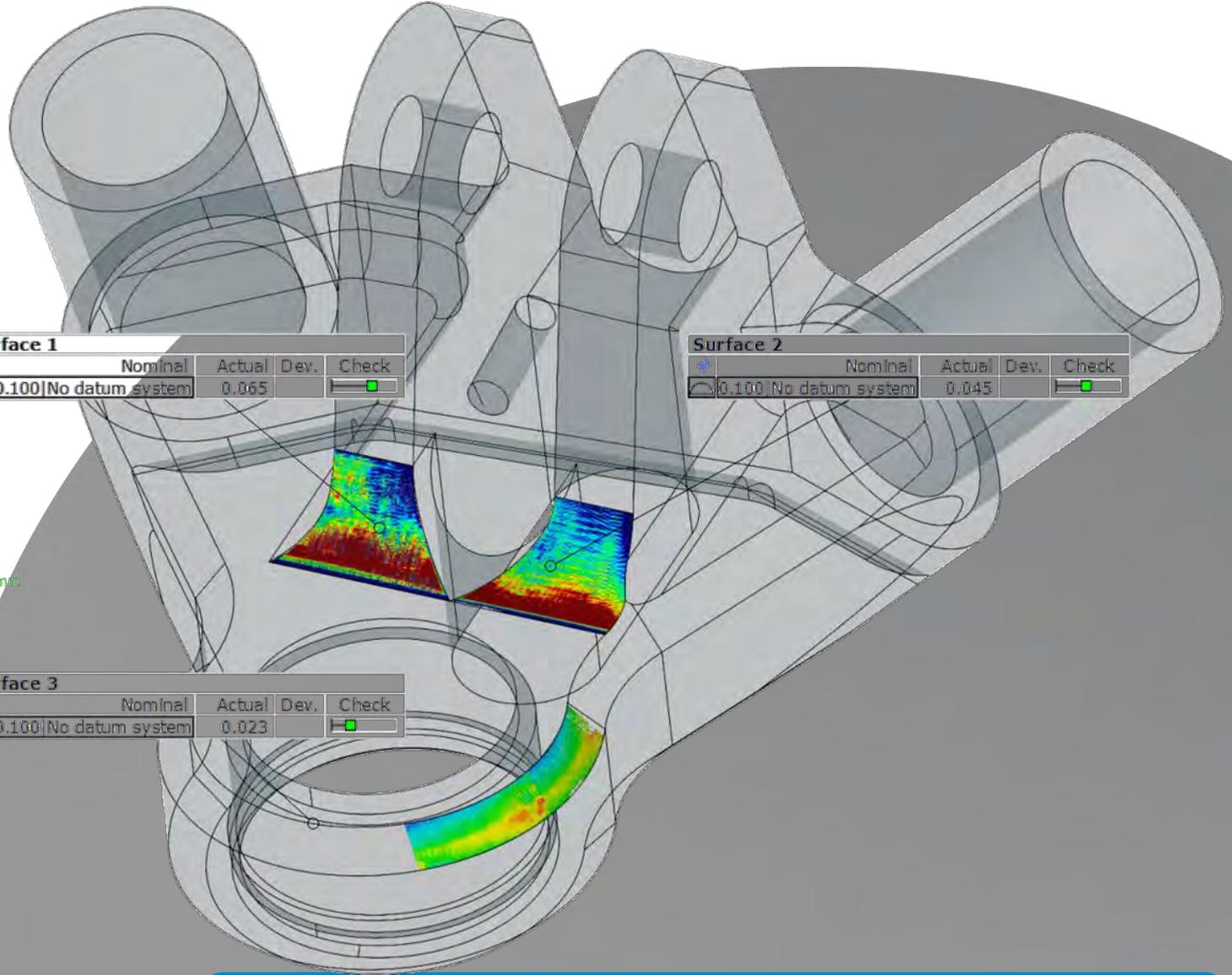
GD&T



Surface 1	Nominal	Actual	Dev.	Check
0.100 No datum system		0.065		<input checked="" type="checkbox"/>

Surface 2	Nominal	Actual	Dev.	Check
0.100 No datum system		0.045		<input checked="" type="checkbox"/>

Surface 3	Nominal	Actual	Dev.	Check
0.100 No datum system		0.023		<input checked="" type="checkbox"/>



[mm]

0.010

0.008

0.006

0.004

0.002

0.000

-0.002

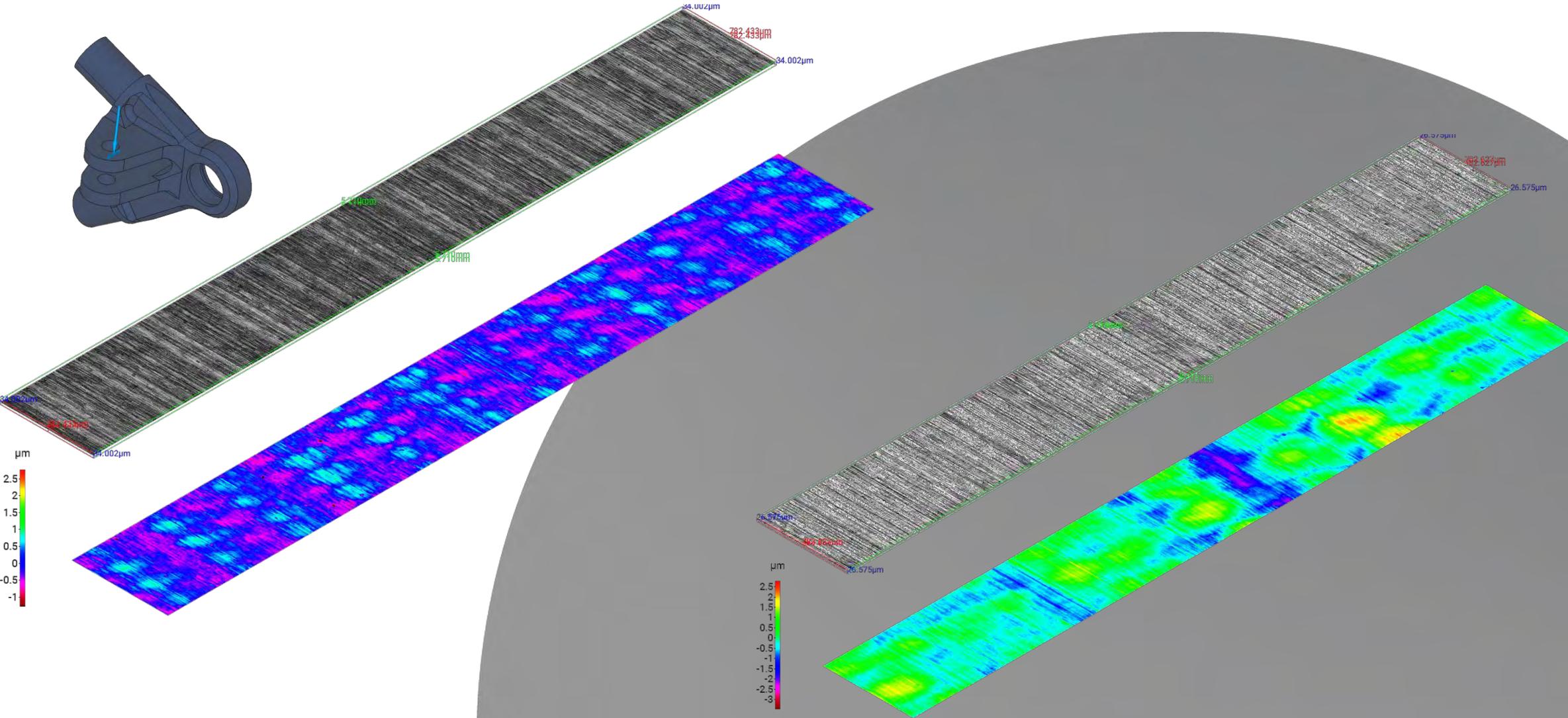
-0.004

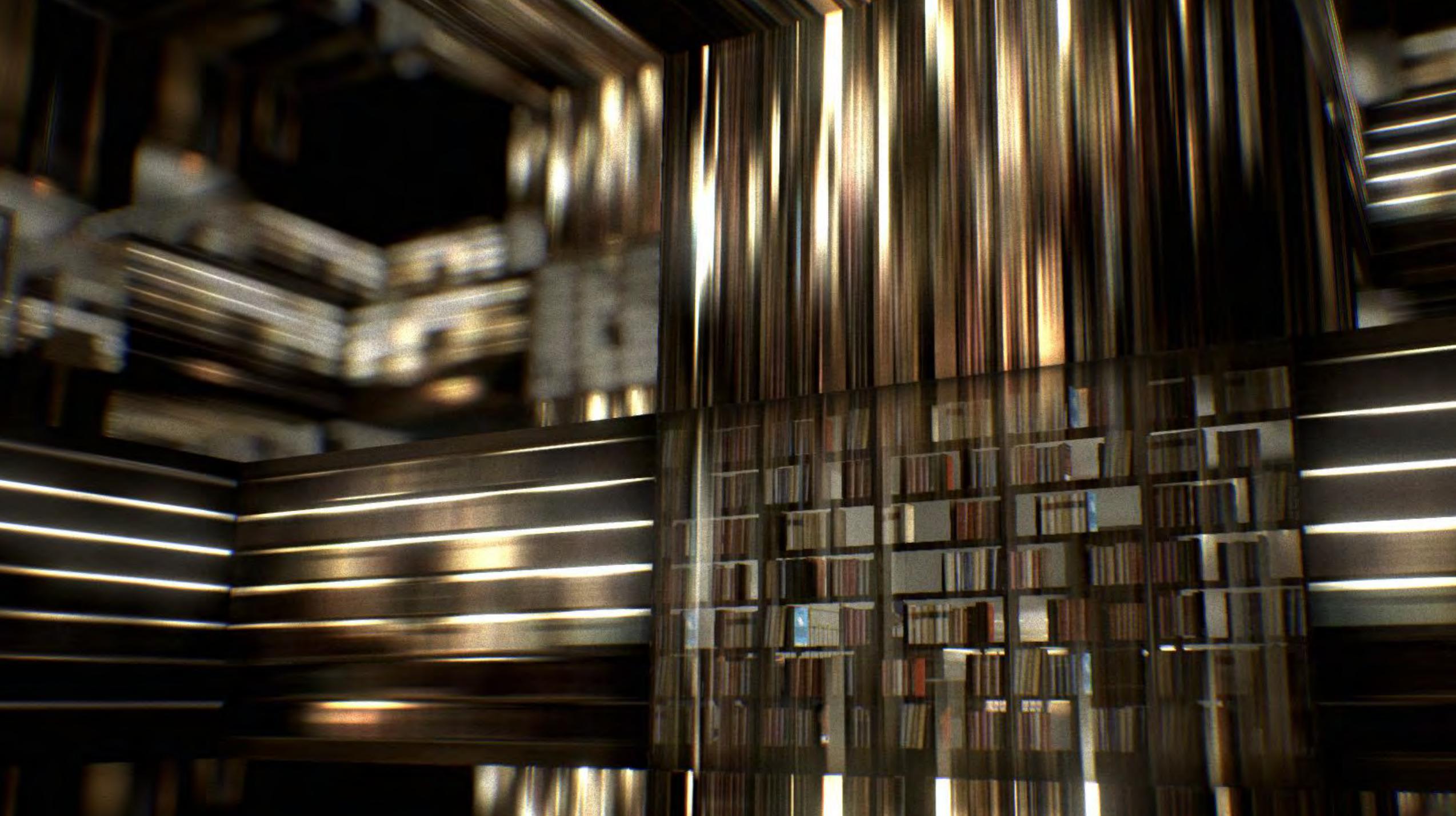
-0.006

-0.008

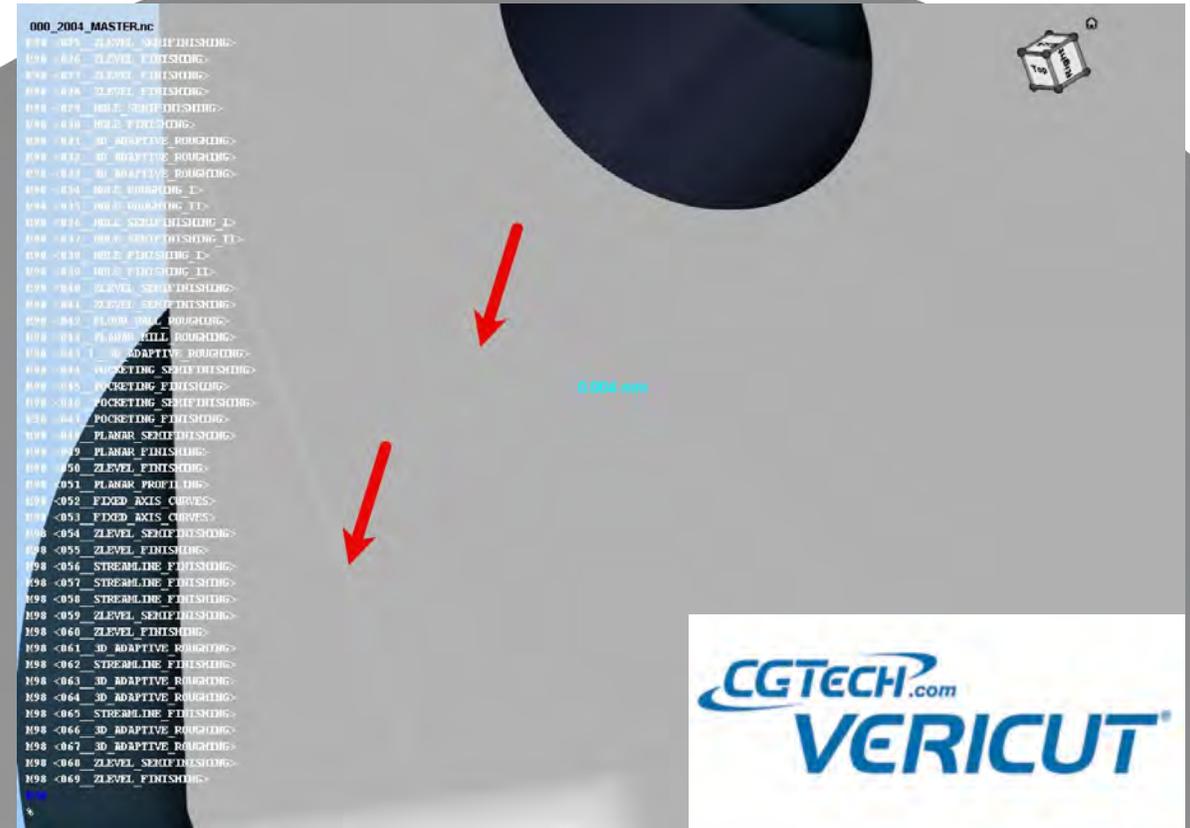
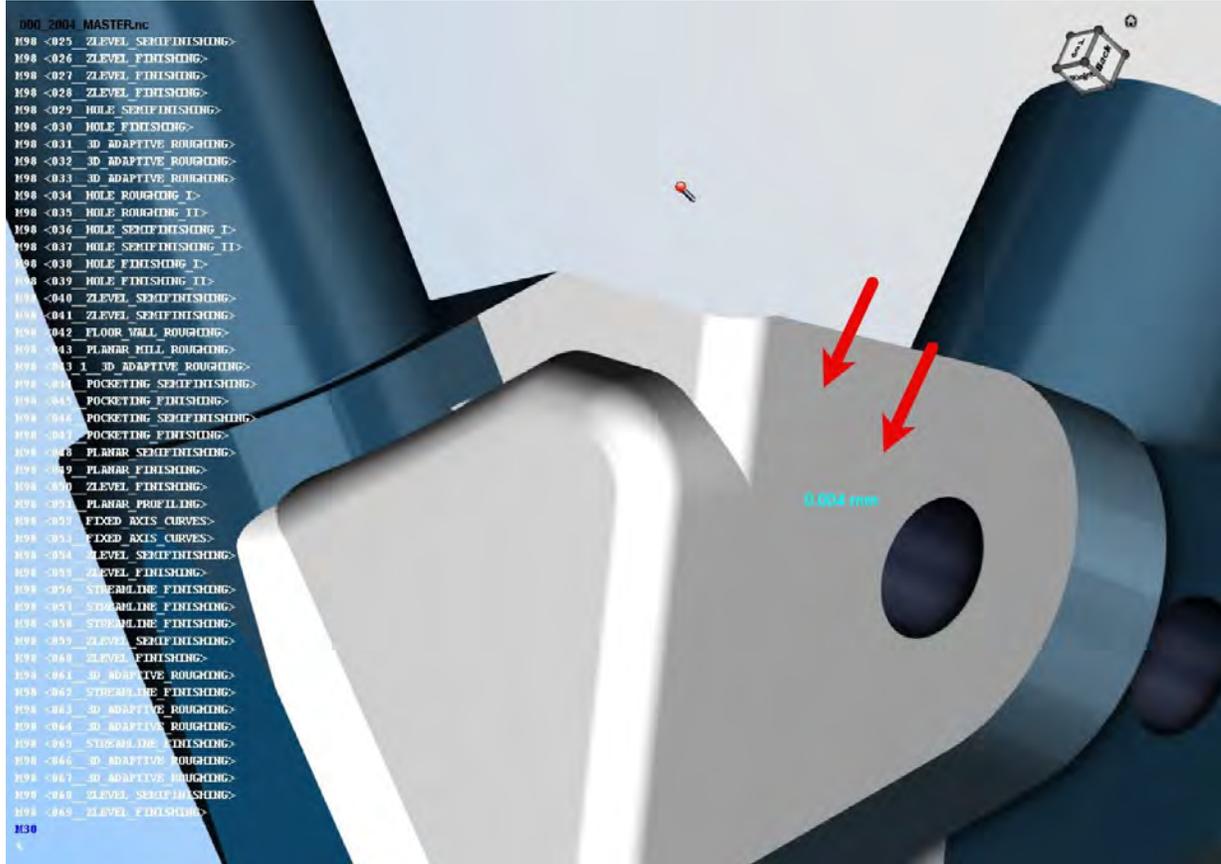
-0.010

RUGOSITA' e SUPERFICIE

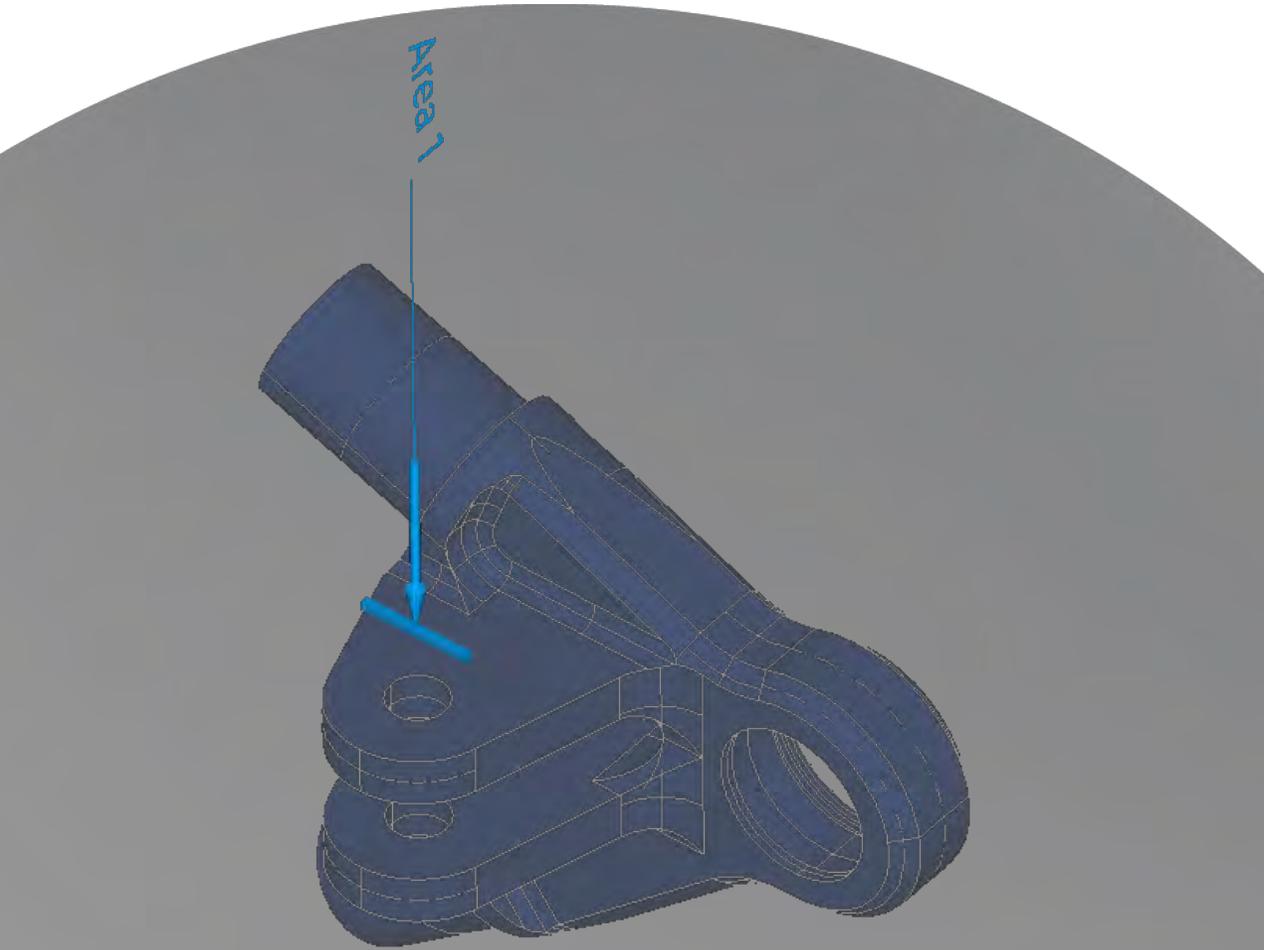




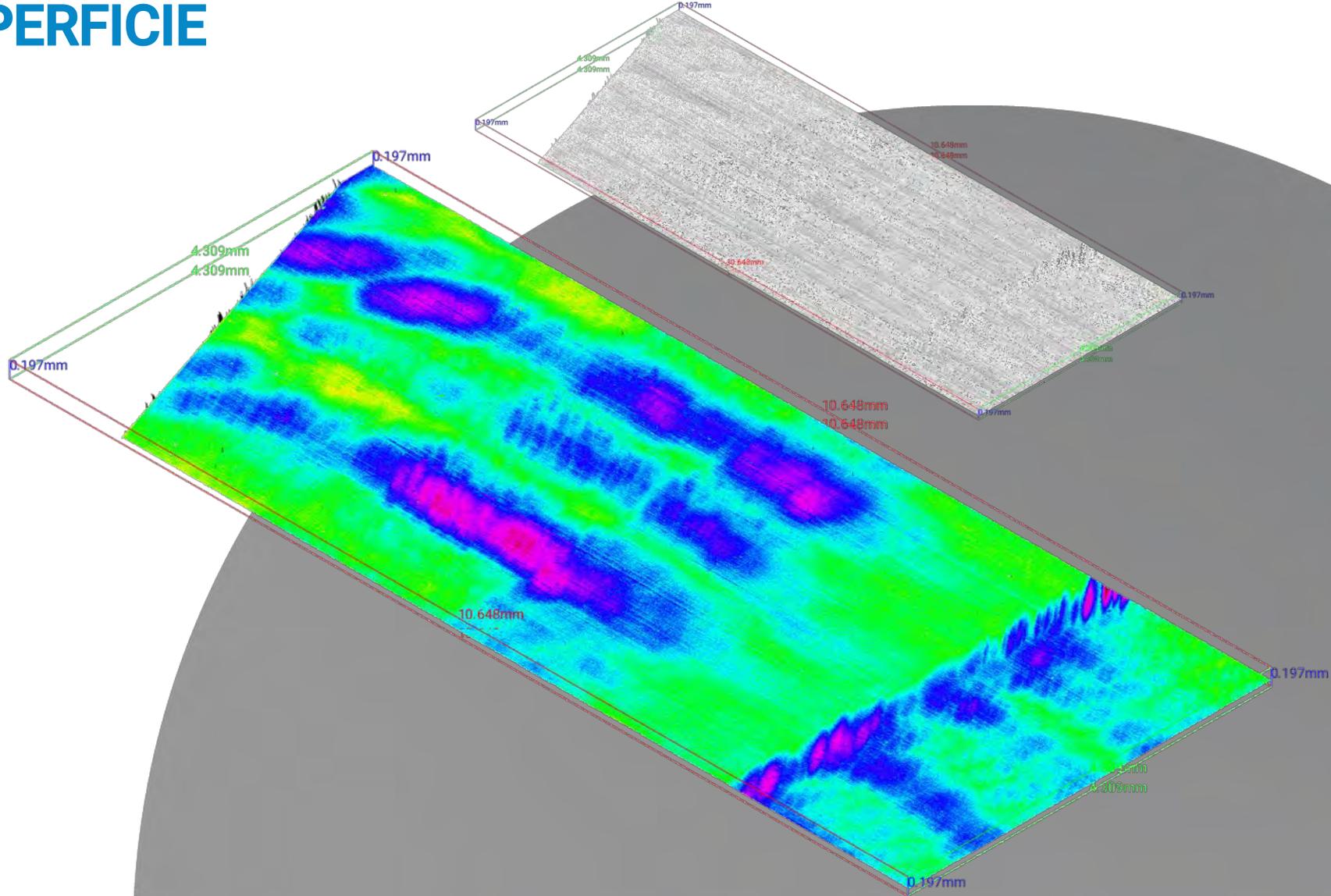
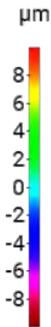
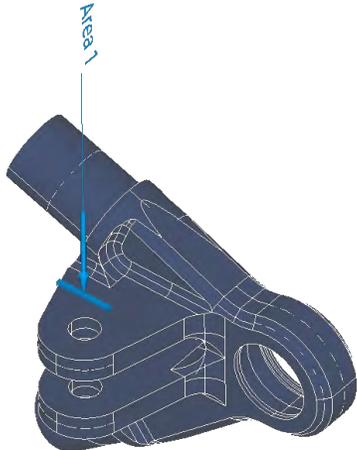
LA DIGITALIZZAZIONE E' FATTA DI PARTNER IN CARNE ED OSSA



RUGOSITA' e SUPERFICIE

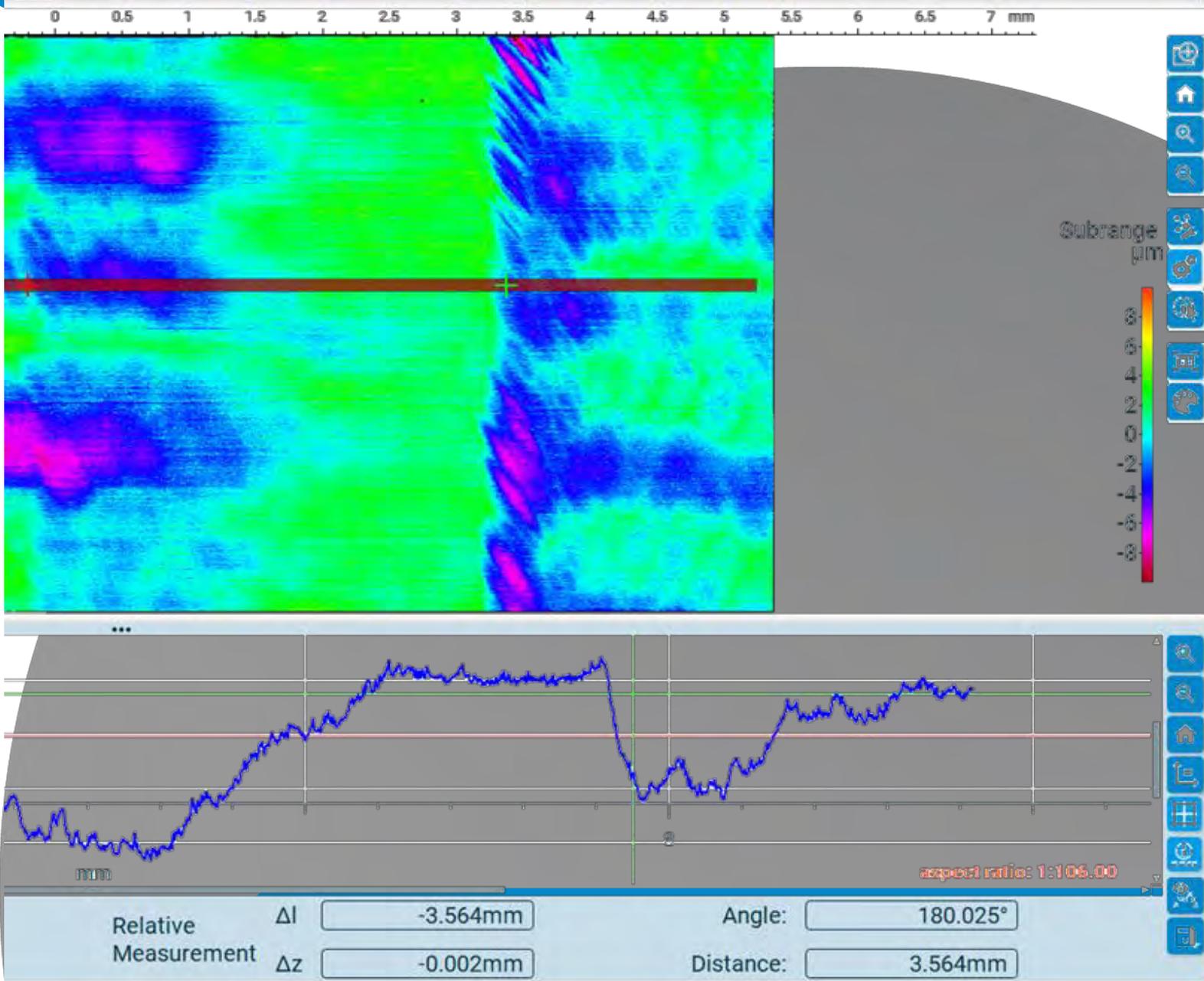
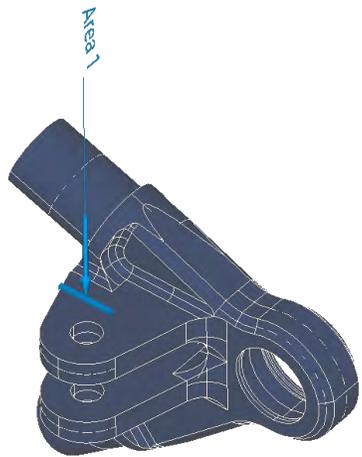


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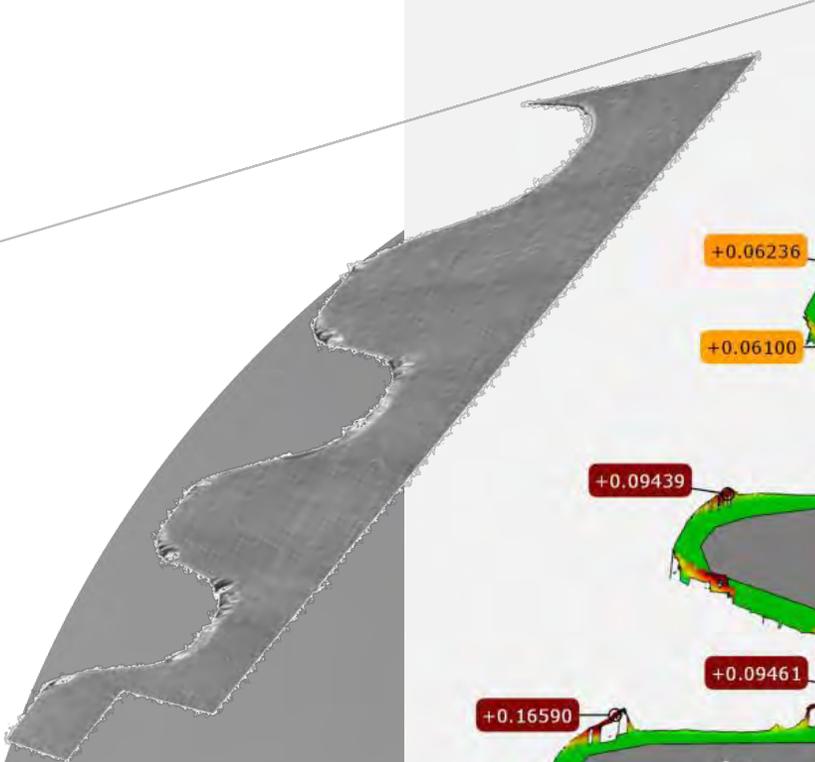


Surface Defect

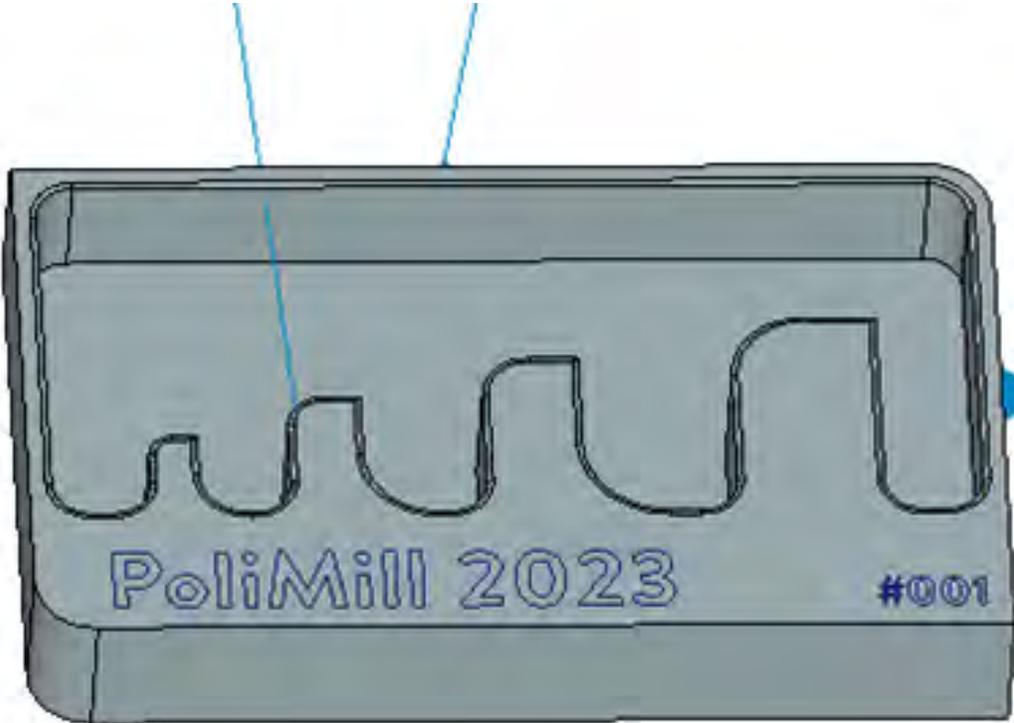
RUGOSITA' e SUPERFICIF



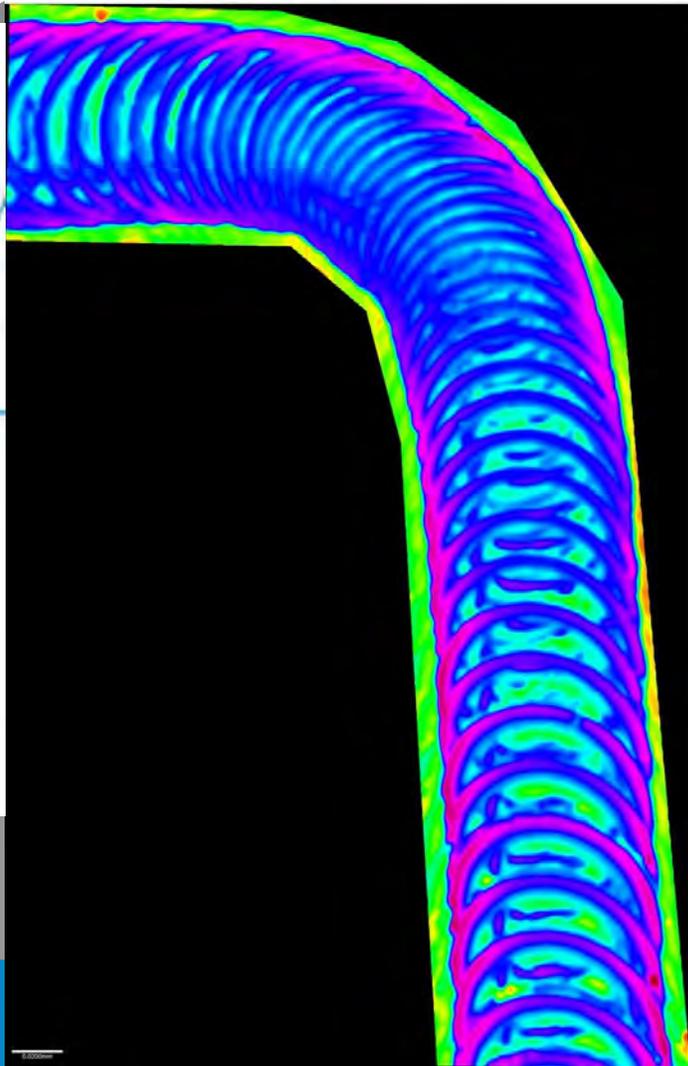
RUGOSITA' e SUPERFICIE



RUGOSITA' e SUPERFICIE



surf2:100x22



Height µm



**SI PUÒ REALIZZARE UN
PEZZO COMPLESSO AL
PRIMO COLPO!**

INTERSTELLAR