RHOPOINT INSTRUMENTS

Optimap PSD

Objective Appearance Measurement

Appearance of surface finish

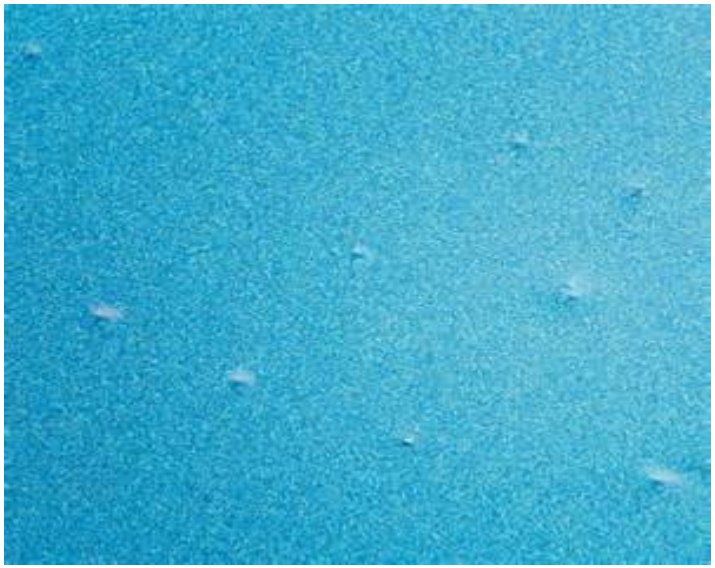
Many factors can affect surface appearance quality These include:-

- **Surface texture or waviness (Orange Peel)**

Appearance of surface finish

Many factors can affect surface appearance quality These include:-

- **Defects – inclusions, scratches, dents, pinholes.**



Appearance of surface finish

Quantifying these effects is problematic

- **Waviness – Profilometry (Laser / Stylus)**
- **Defects – Confocal Microscopy / Interferometry**
  Photography!!!

Both methods are either time consuming or lack detail and definition making detection and analysis difficult

RHOPOINT INSTRUMENTS

Optimap PSD

- **Unique handheld measurement solution for quantifying appearance quality**

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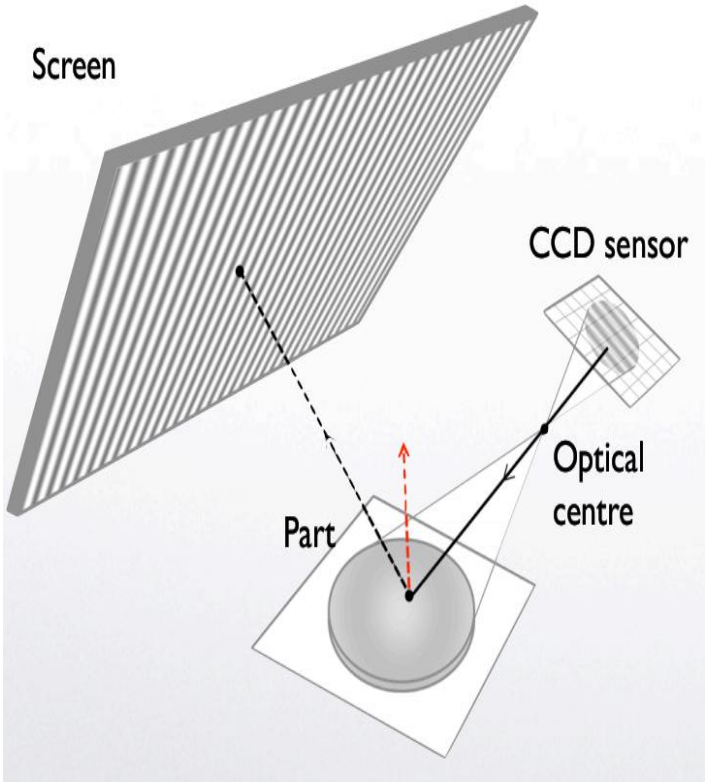
What is Optimap?

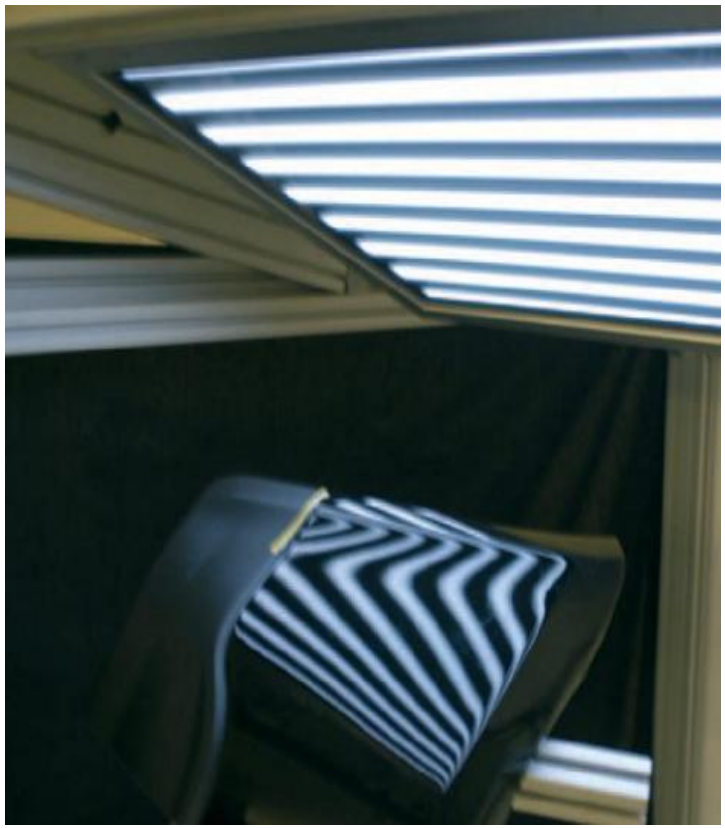
- Maps, measures and quantifies surface appearance quality
- Objectively measures surface texture and waviness
- Identifies and locates common surface defects
- Produces detailed full field 3D surface images
- Displays images in traceable SI units (m^{-1}) or in standard industrial scales
- Requires no movement over the surface

How does Optimap work?



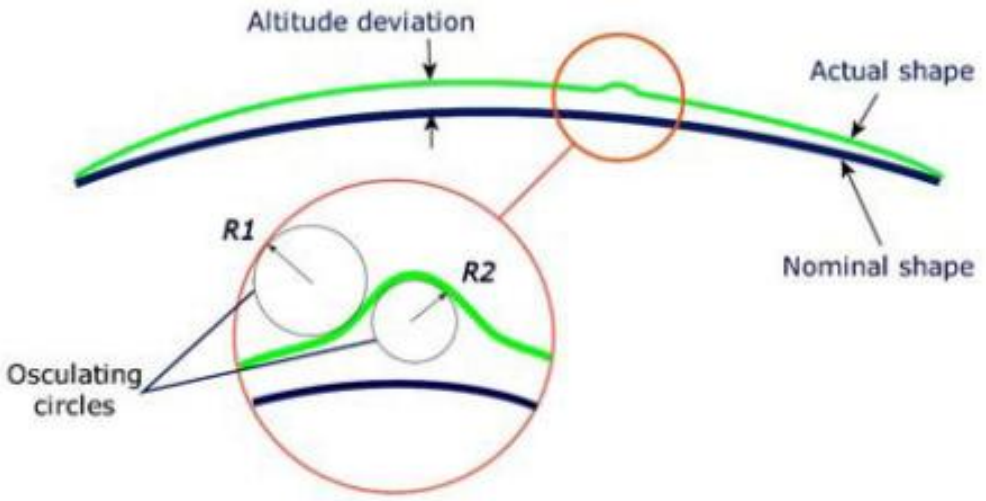
- Phase Stepped Deflectometry.
- A white light optical technique
- Provides fast, full field, non contact surface measurement.
- A periodic sinusoidal waveform is projected onto the surface
- and the reflected image captured.

How does Optimap work?



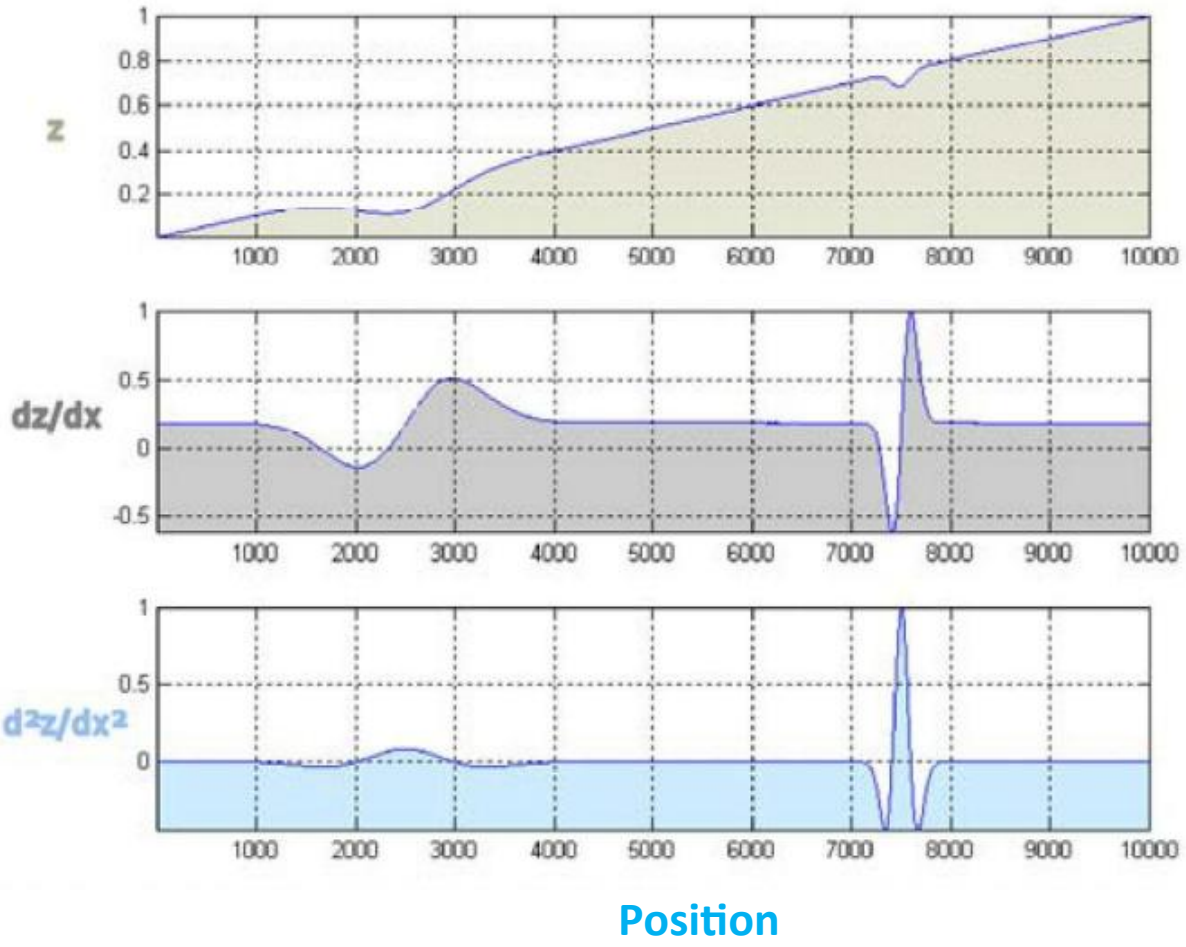
- The pattern acts like a ruler across the surface allowing each point (X, Y, Z) to be mapped.
- By phase stepping the pattern across the surface in both directions each point on the surface is spatially modelled,
- to accurately calculate the curvature at each point.

How does Optimap work?



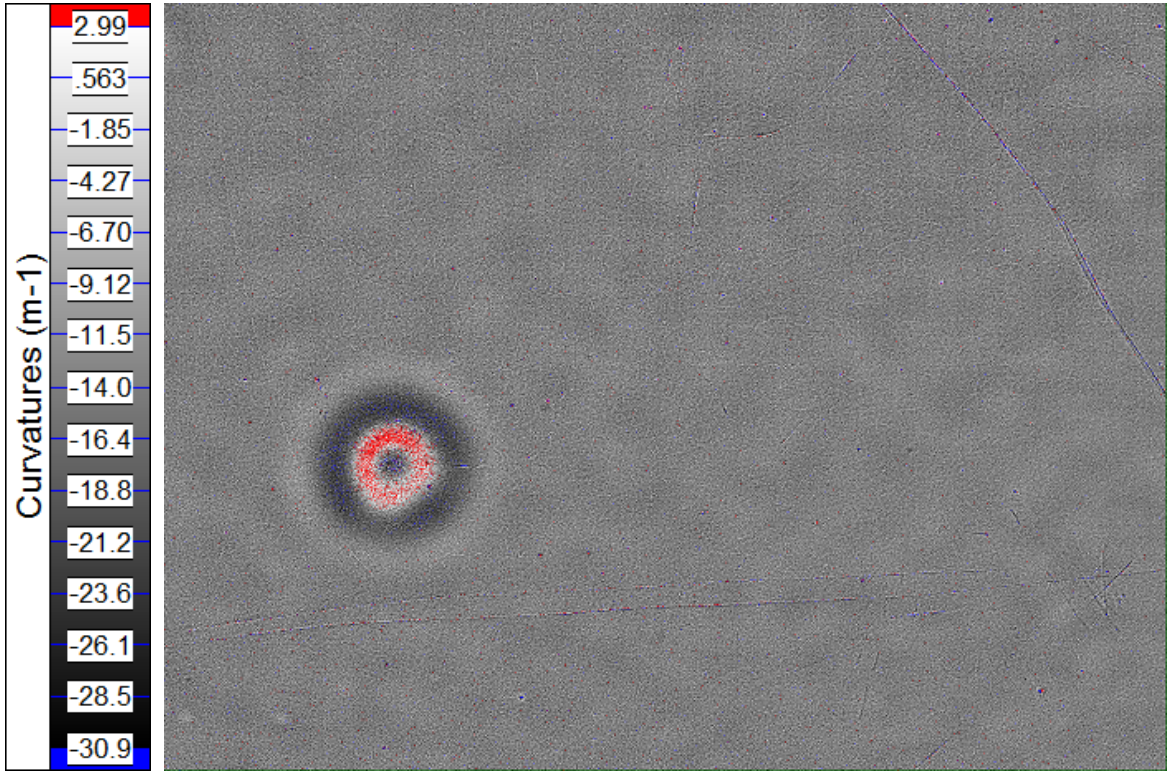
- Consider a surface (green) compared to its normal shape
- An observer is unlikely to notice the gradual variation across the whole surface
- But will notice the sharp deviation

How does Optimap work?



The second derivative of altitude (z) produces a curvature profile that is more representative of what the human eye really sees

How does Optimap work?



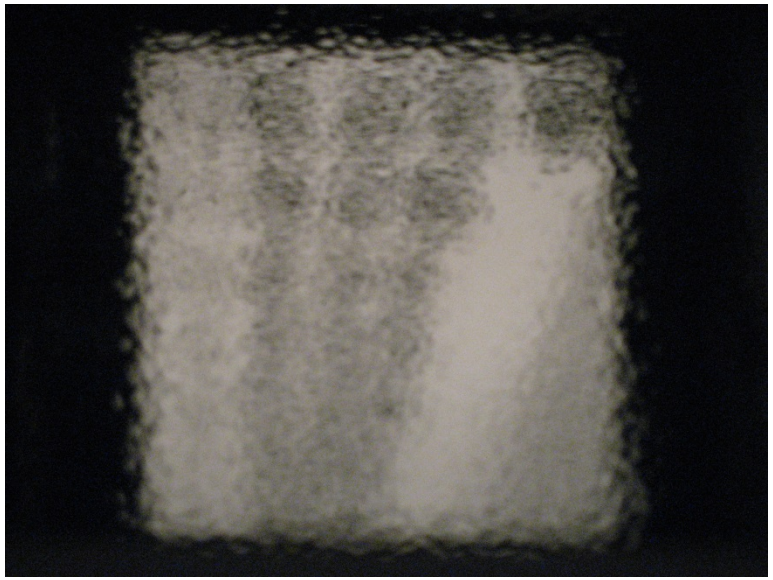
95 x 70mm

Global surface curvature map (K)

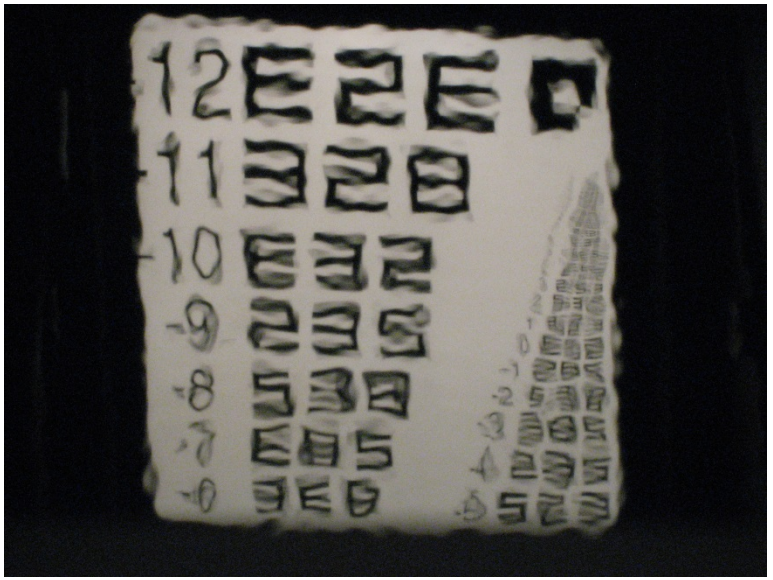
Why use Optimap?

High quality surfaces are often evaluated visually

Why use Optimap?



Small Waves



Large Waves

Appearance changes according to structure size

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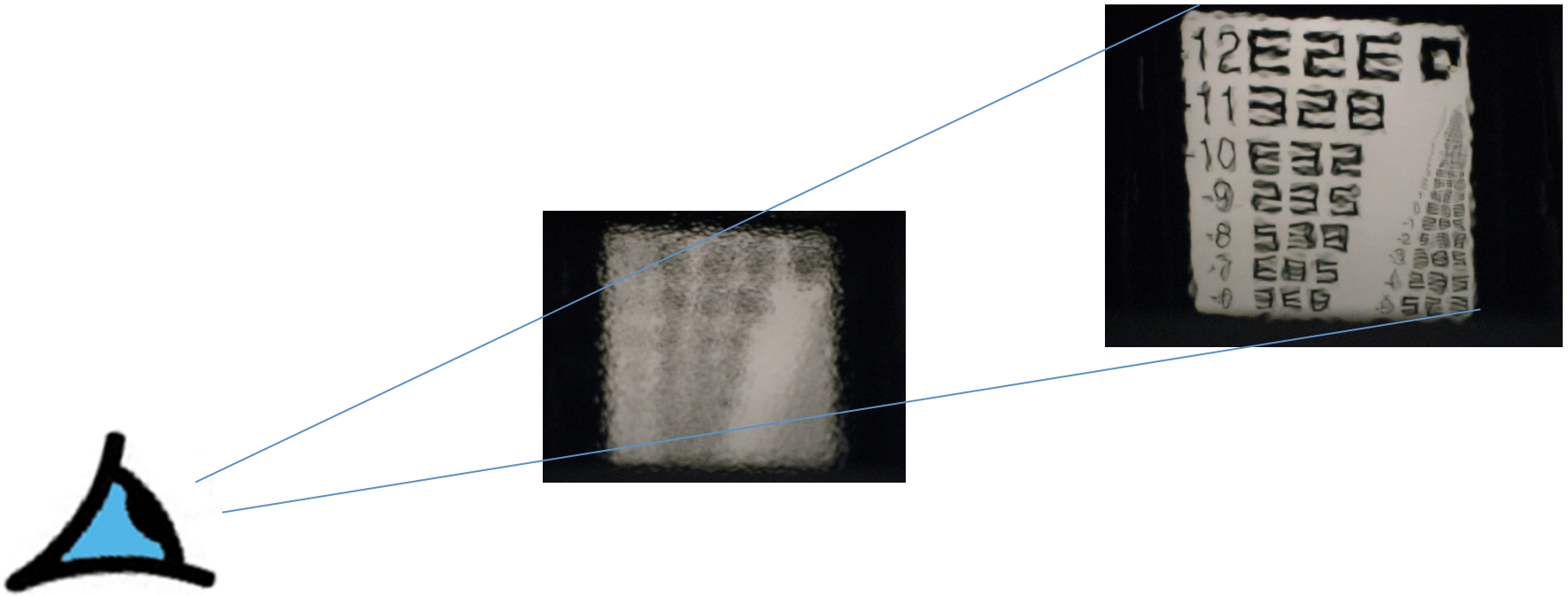
Why use Optimap?



Visibility of structures is dependant on the observation distance

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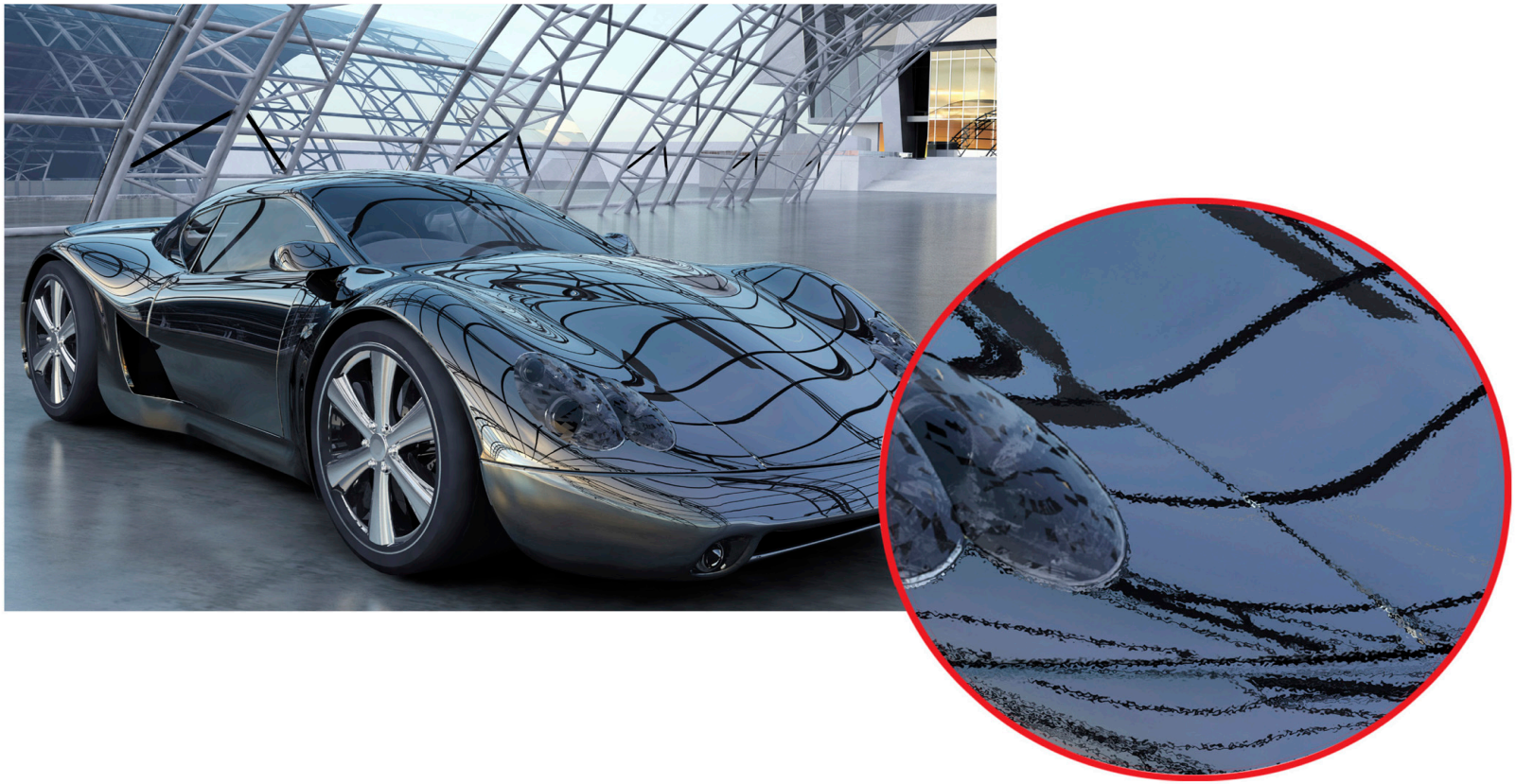
Why use Optimap?



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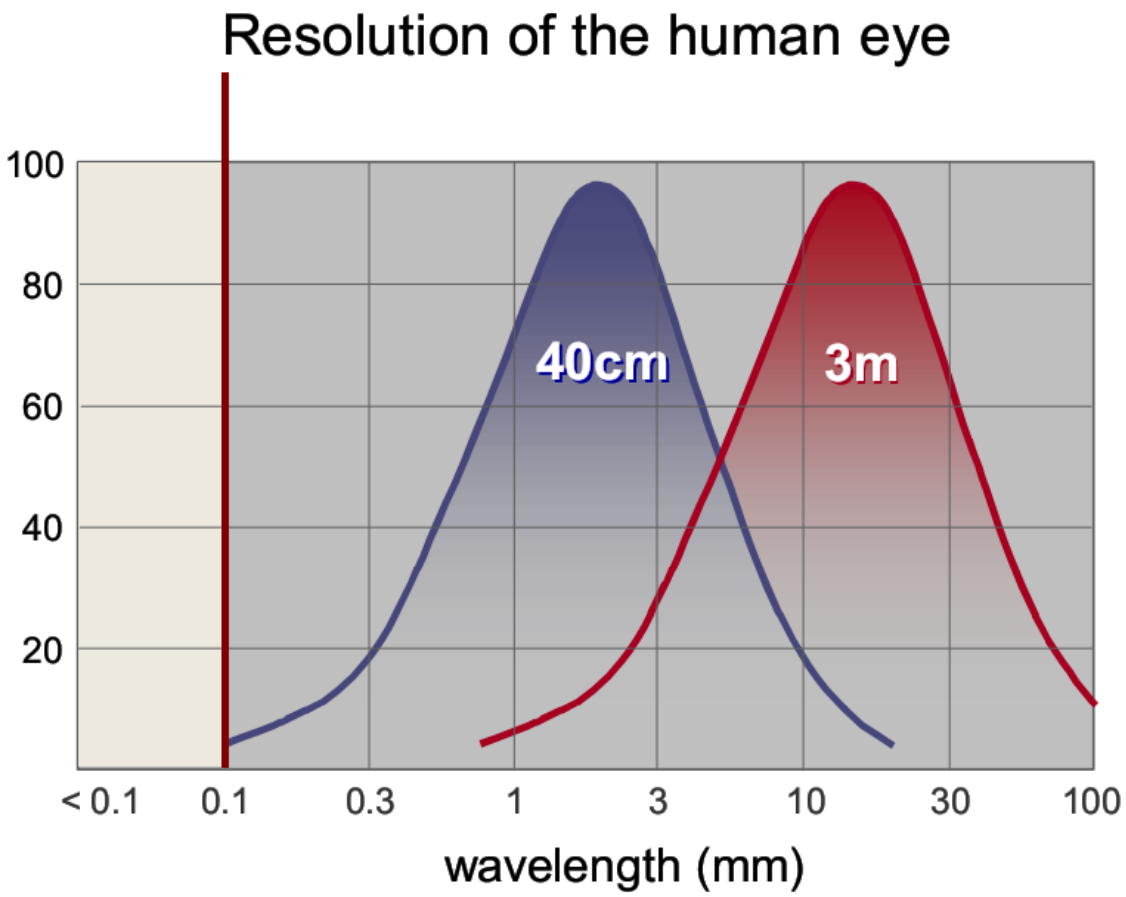
Why use Optimap?



Value	Wavelength
K	0.1 – 30mm
Ka	0.1 – 0.3mm
Kb	0.3 – 1.0mm
Kc	1.0 – 3.0mm
Kd	3.0 – 10mm
Ke	10 – 30mm

Why use Optimap?

- By applying standardised equations to curvature values
- Optimap calculates the correlated value of Waviness for each wavelength band
- These values are displayed as Texture (T), (Ta – Te), (TL-TS)
- Provides a best fit correlation from a dimensionless single scan measurement to an objective full field traceable scale

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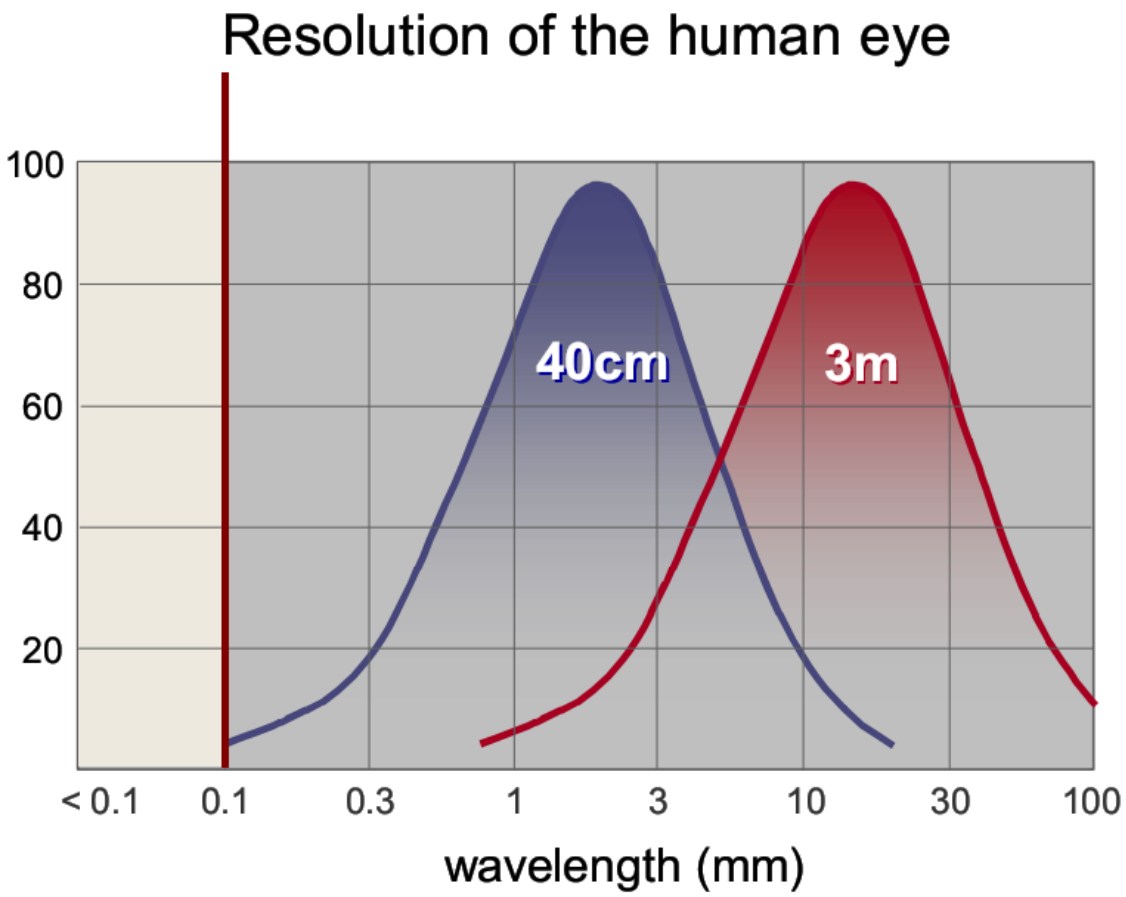
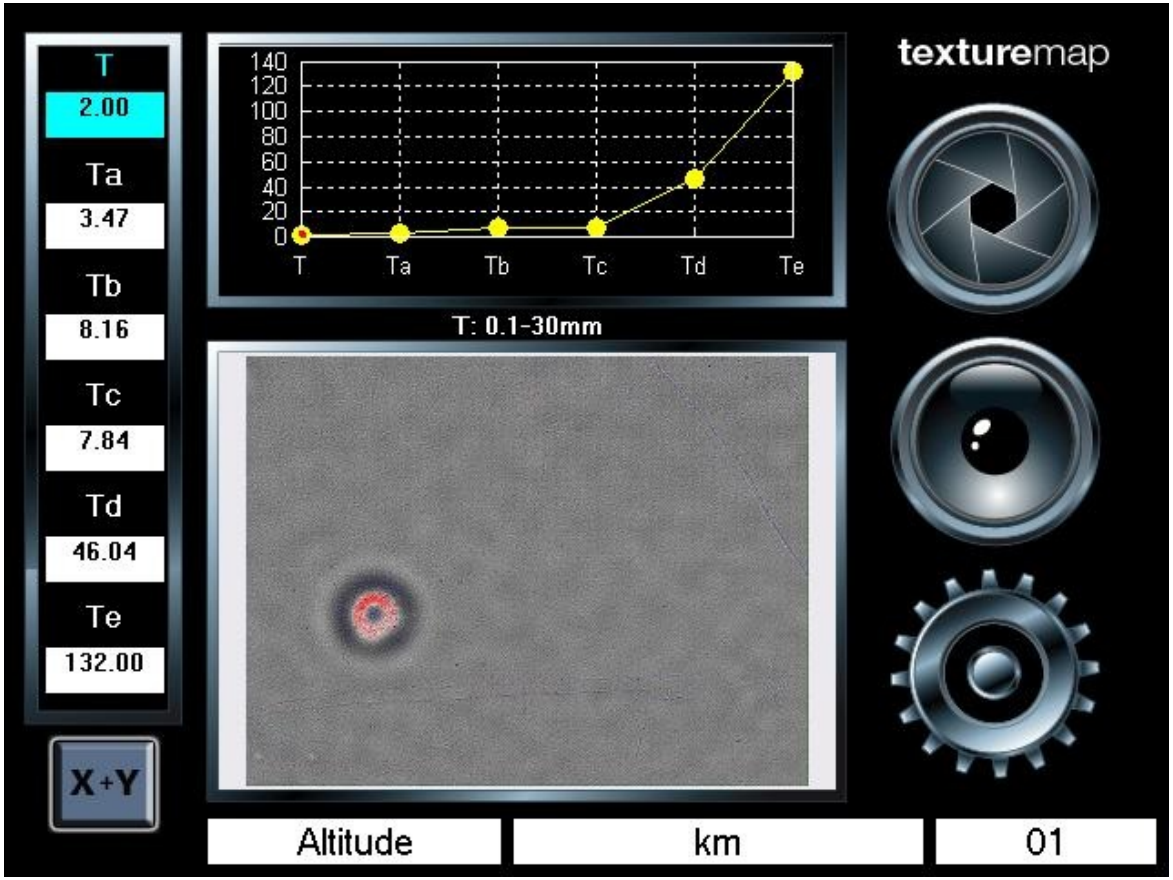
Why use Optimap?



Value	Wavelength
T	0.1 – 30mm
Ta	0.1 – 0.3mm
Tb	0.3 – 1.0mm
Tc	1.0 – 3.0mm
Td	3.0 – 10mm
Te	10 – 30mm

RHOPOINT INSTRUMENTS

Why use Optimap?



RHOPOINT INSTRUMENTS

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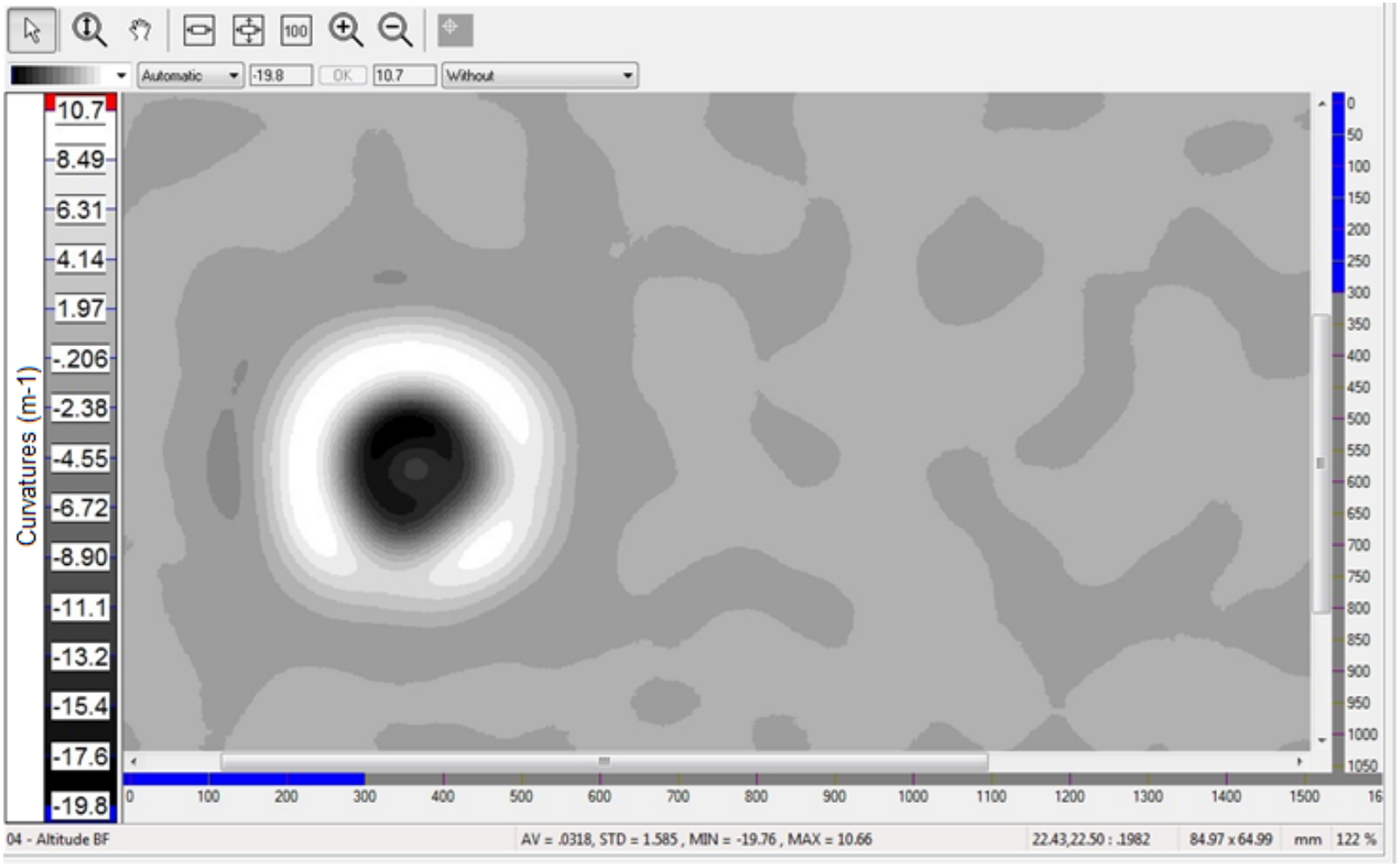

RHOPOINT INSTRUMENTS

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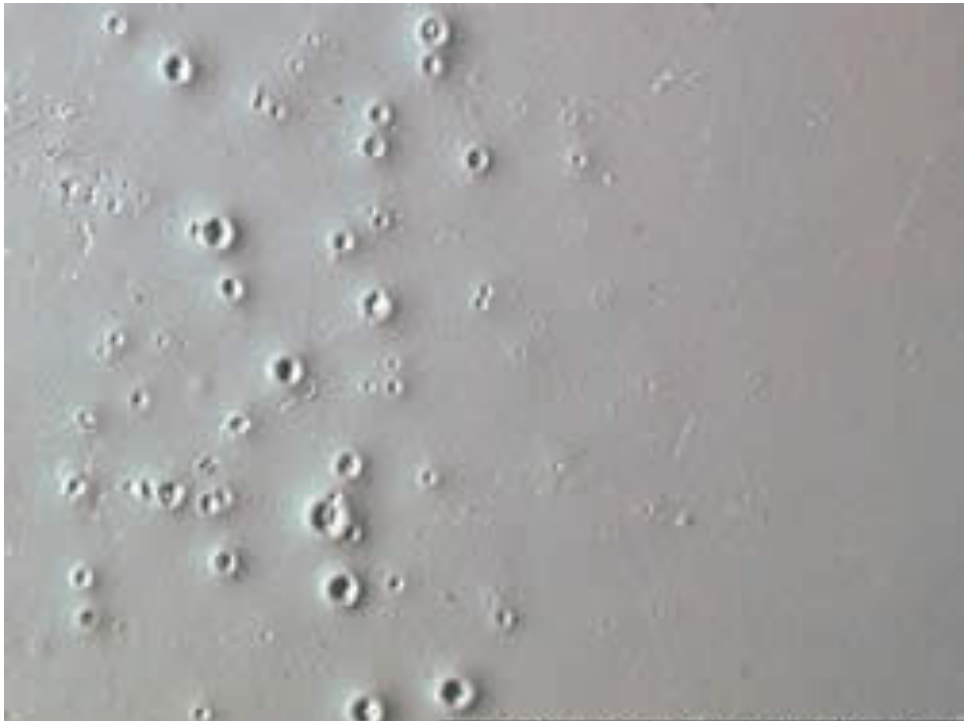


Evaluation of defects is subjective

Why use Optimap?

Making measurement difficult and time consuming

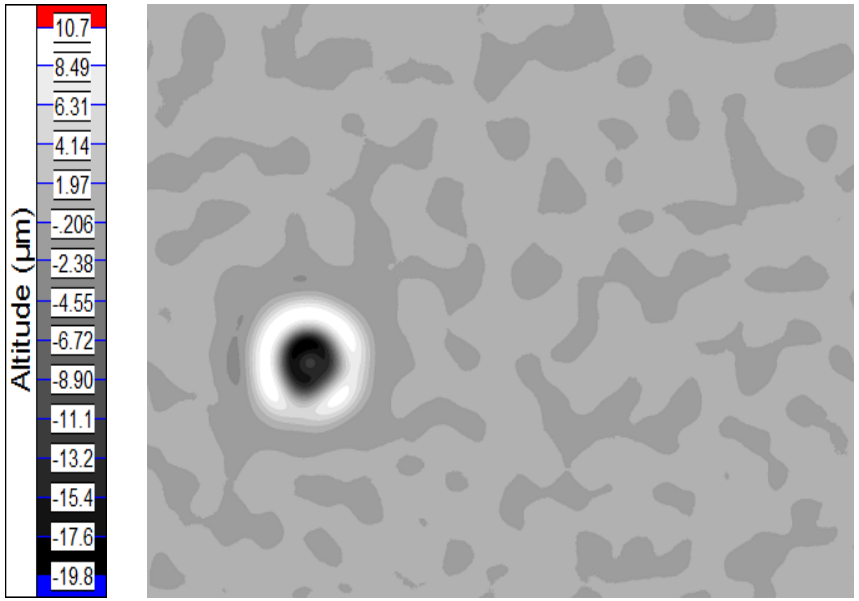
Why use Optimap?

High resolution data can be transferred to PC allowing post processing in Rhopoint Ondulo Reader Software

Simple data transfer using USB key included

Why use Optimap?

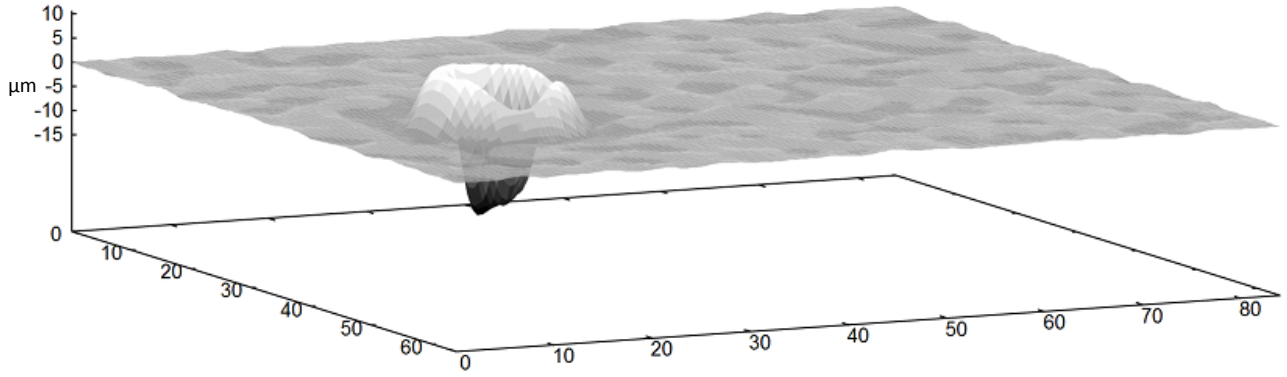
Predefined analyses in Ondulo Reader allow conversion of curvature data (m^{-1}) into altitude in µm



Surface effects including texture and local defects can be identified and analysed.

RHOPOINT INSTRUMENTS

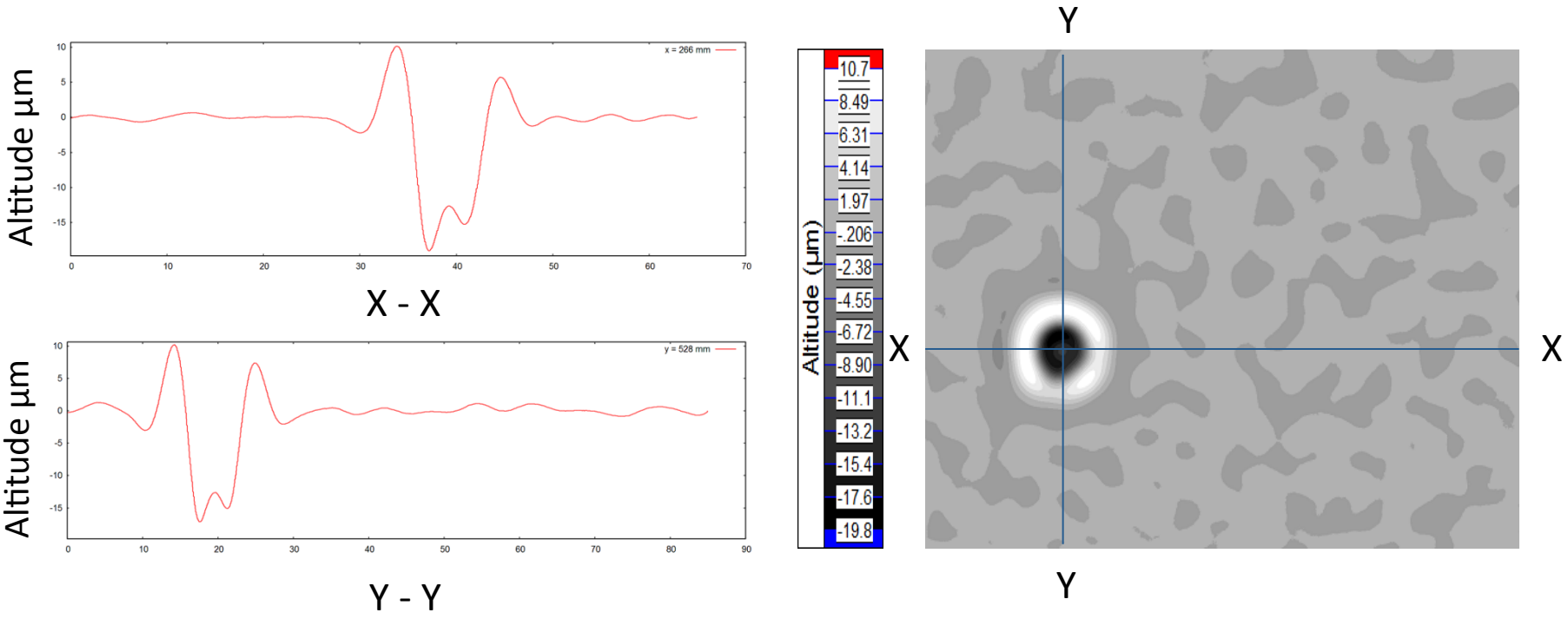
Why use Optimap?



3D Viewer allows full 360°rotation of image topology

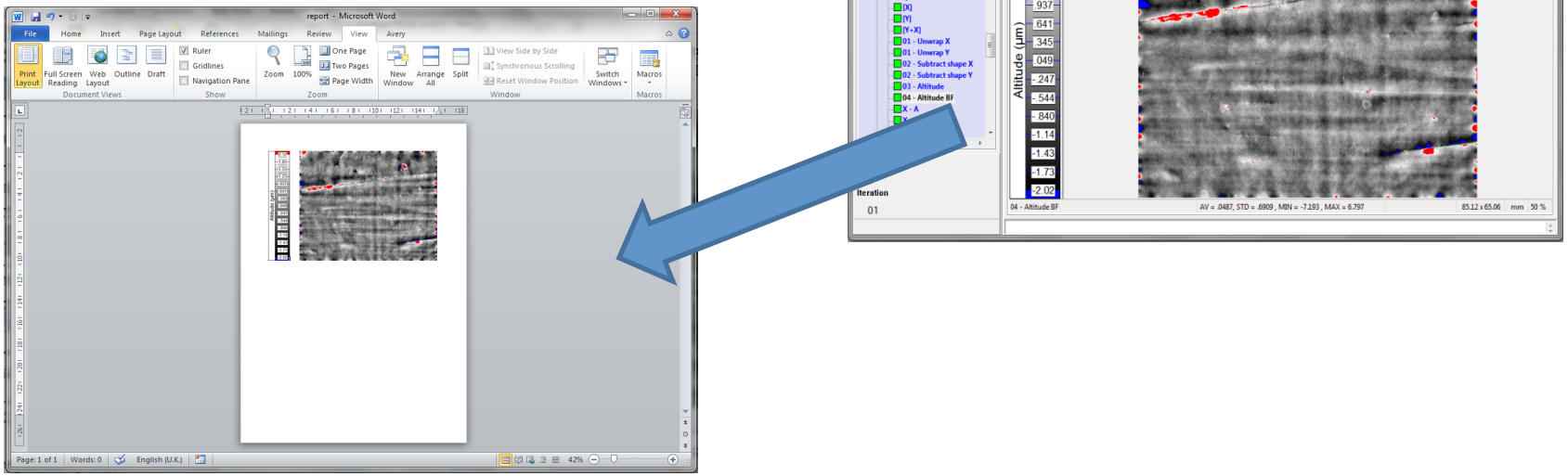
Why use Optimap?

Profiles of curvature or altitude can be characterised



Cross sectional viewer allows accurate characterisation of defect

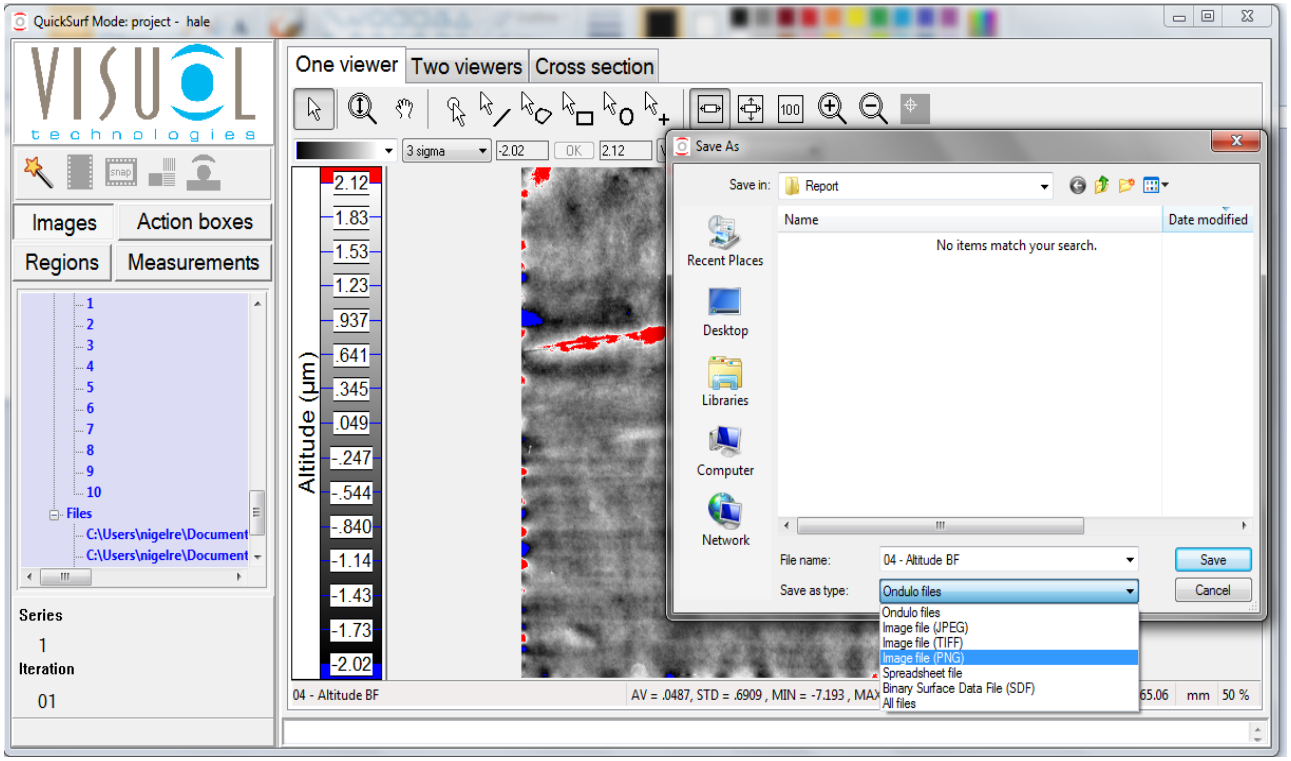
Why use Optimap?



Drag and drop images and data into Microsoft Word for instant reporting

Why use Optimap?

Images can be saved in a variety of different formats



.jpeg

.tiff

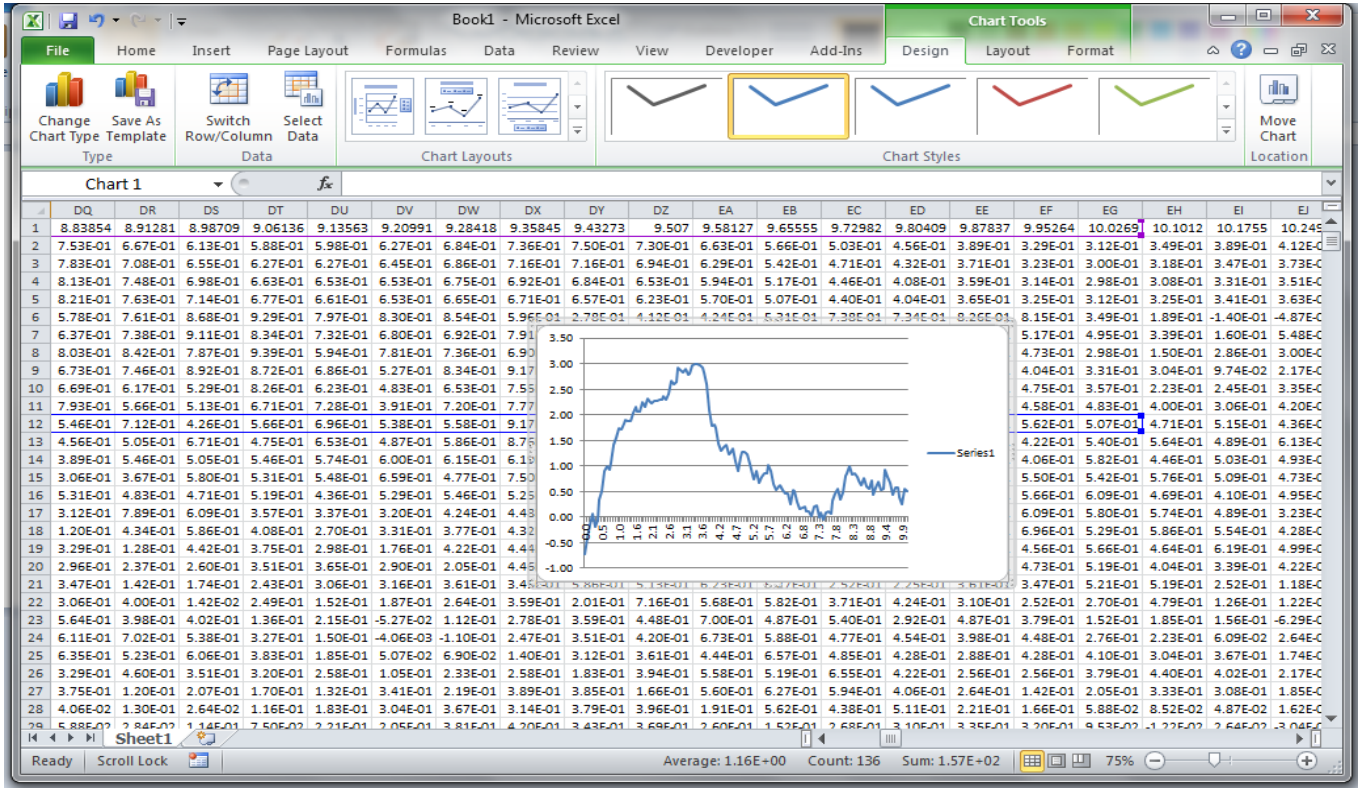
.png

.xls

.sdf

RHOPOINT INSTRUMENTS

Why use Optimap?



.xls format stores each 75µm X,Y,Z point across surface allowing advanced analysis within Microsoft Excel

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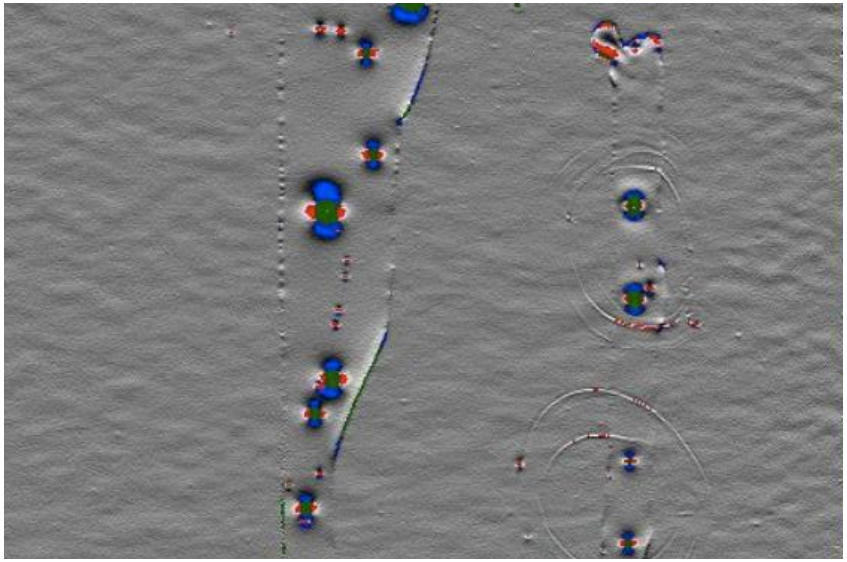
Why use Optimap?

sdf format

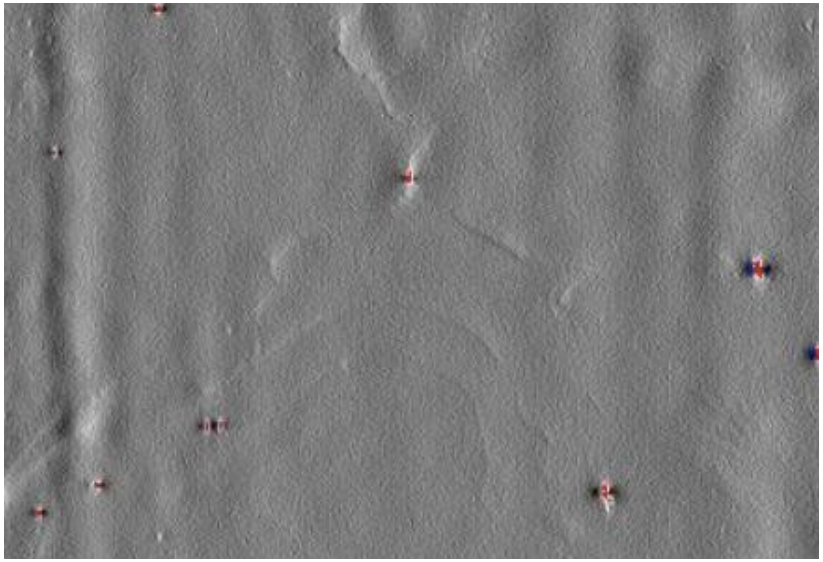
.sdf format stores surface data as an SQL database

Why use Optimap?

Identify and quantify common surface defects



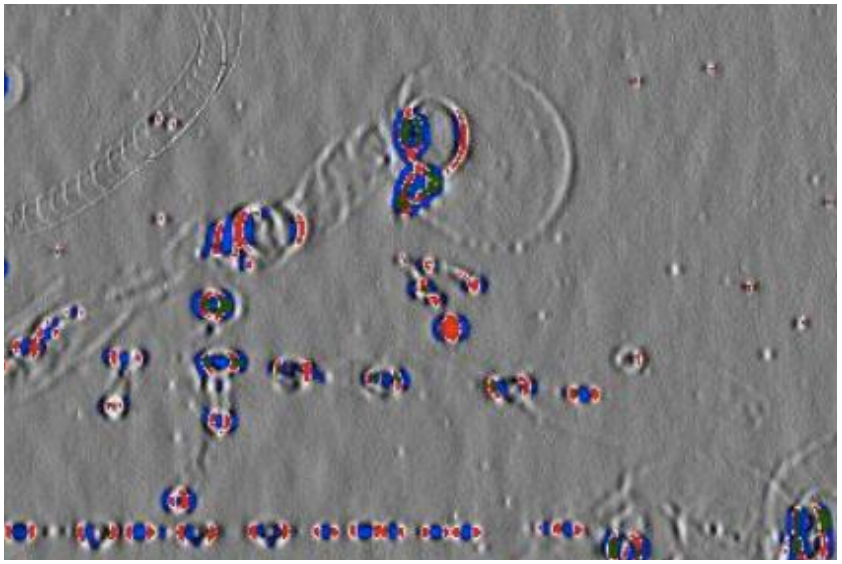
Blistering



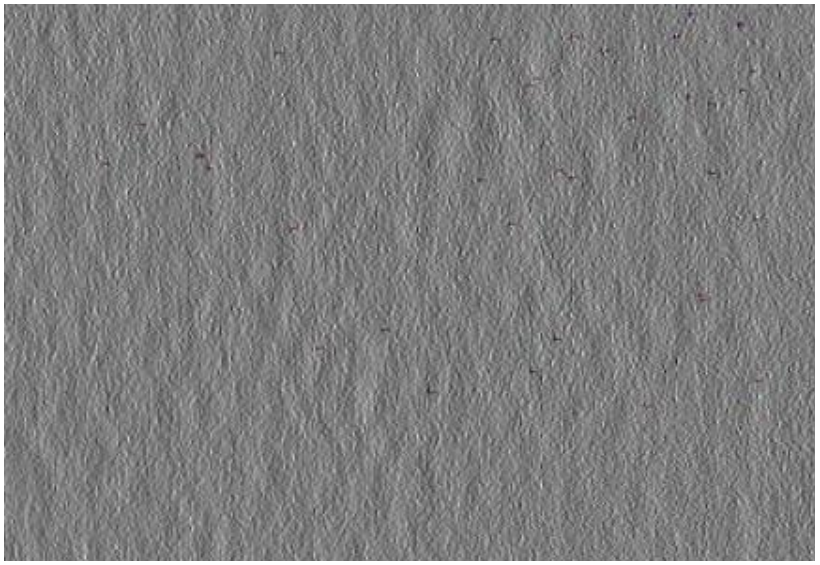
Orange Peel

Why use Optimap?

Identify and quantify common surface defects



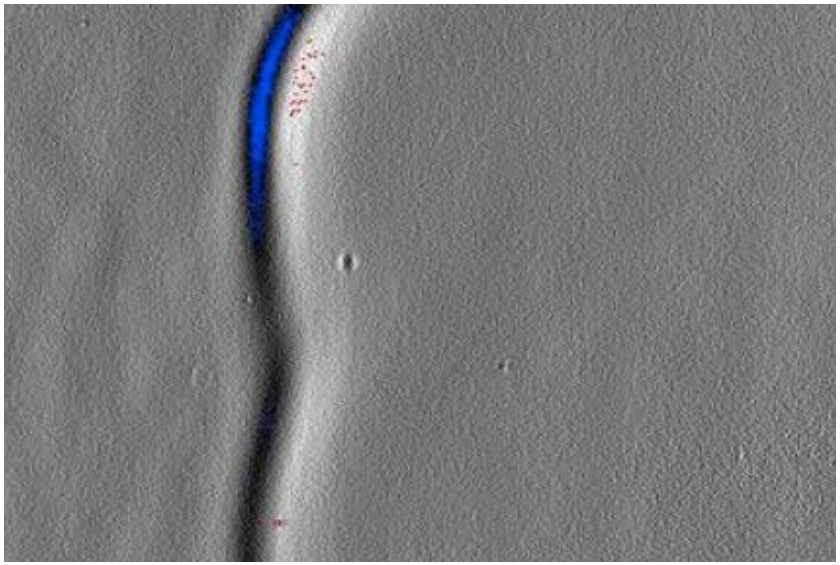
Water Stain



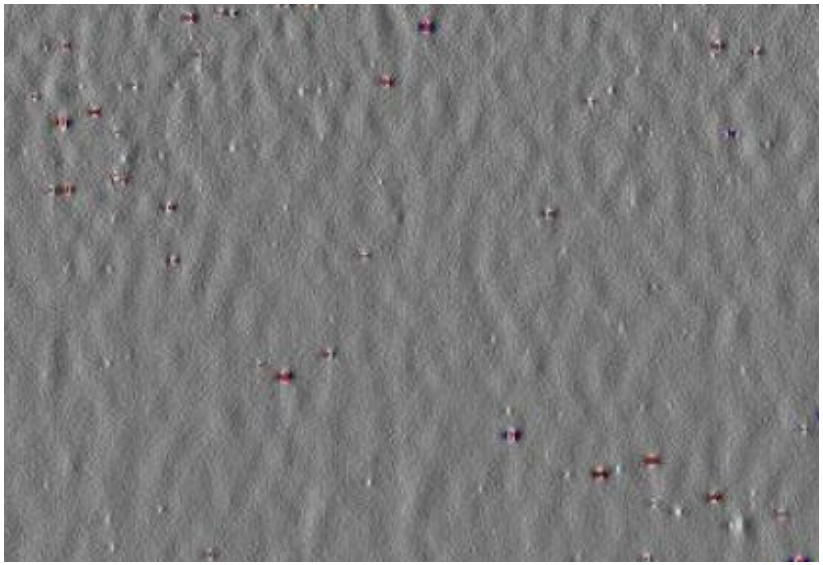
Overspray

Why use Optimap?

Identify and quantify common surface defects



Sagging



Inclusions

Which surfaces can be measured?

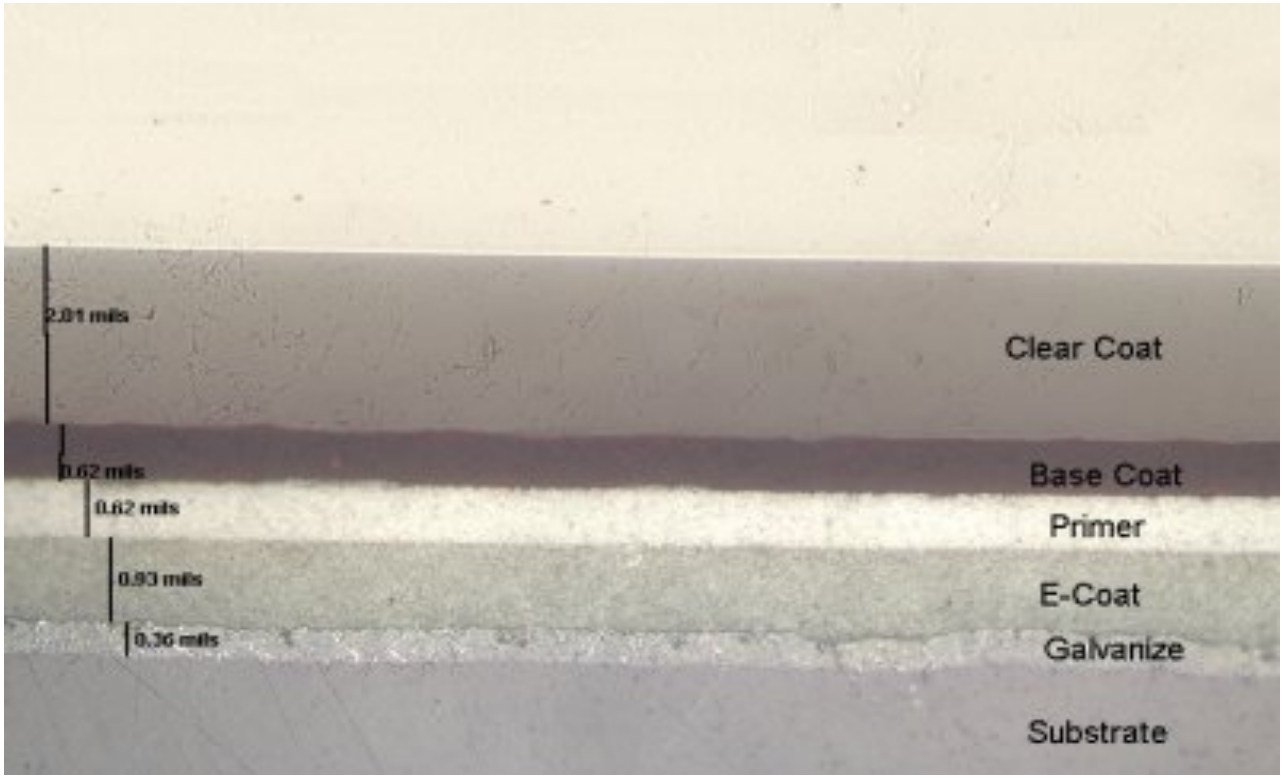
Optimap can be used on a wide range of surfaces from ultra low gloss ……..

Which surfaces can be measured?

To mirror gloss finish

RHOPOINT INSTRUMENTS

Which surfaces can be measured?



Allowing detailed analysis of each stage of the coating process

Benefits of using Optimap

- Full Field 3D measurement with spatial resolution 75µm
- Detailed analysis of waviness, texture and common defects
- Produces detailed full field 3D surface images
- Reporting in traceable SI units (m^{-1}) and microns
- Can be used on a wide range of surface finishes from ultra low gloss to mirror finish

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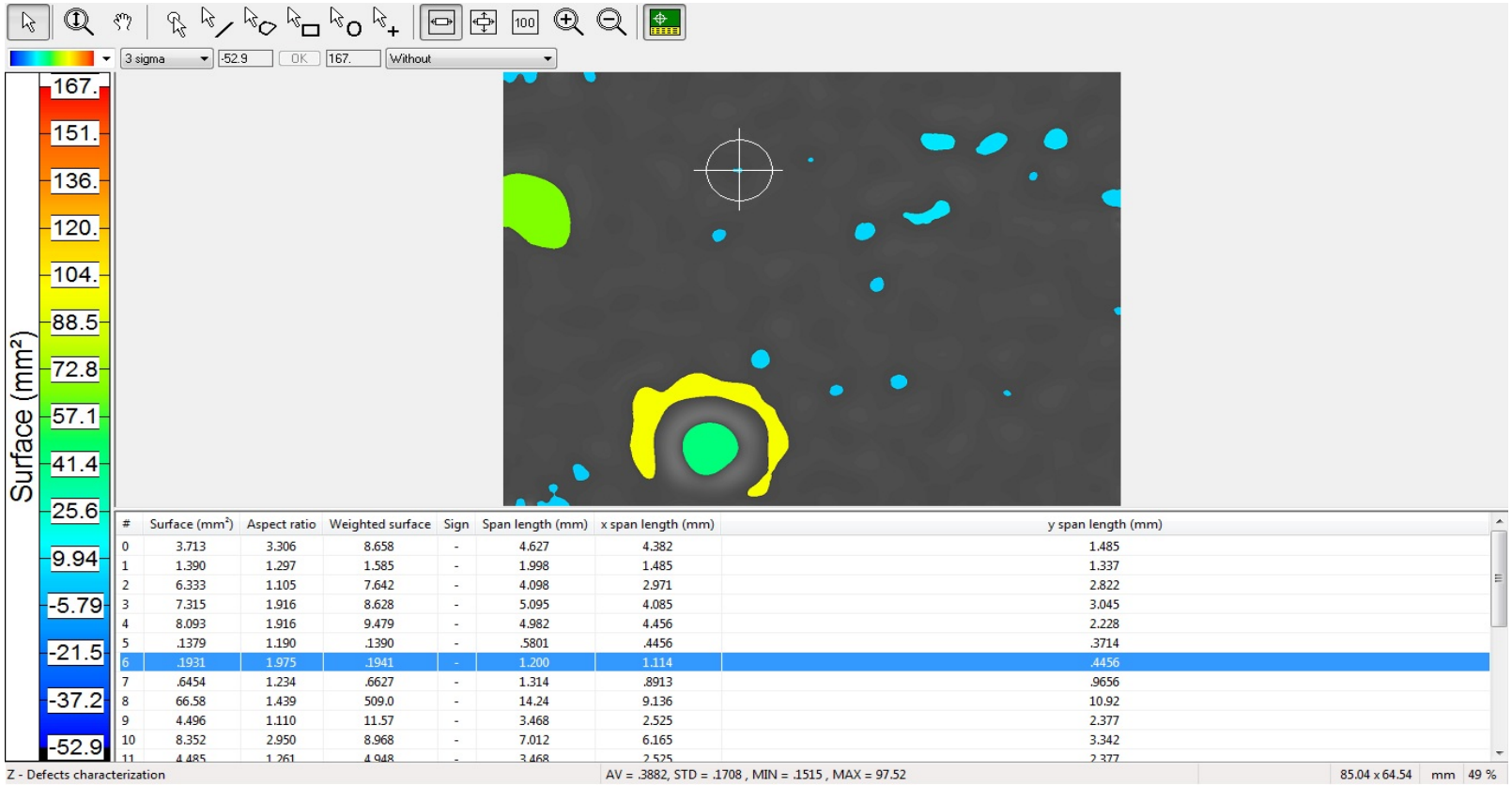
Defects Detection Software NEW!

Advanced software for the analysis of surface defects



#	Surface (mm²)	Aspect ratio	Weighted surface	Sign	Span length (mm)	x span length (mm)	y span length (mm)
0	3.713	3.306	8.658	-	4.627	4.382	1.485
1	1.390	1.297	1.585	-	1.998	1.485	1.337
2	6.333	1.105	7.642	-	4.098	2.971	2.822
3	7.315	1.916	8.628	-	5.095	4.085	3.045
4	8.093	1.916	9.479	-	4.982	4.456	2.228
5	.1379	1.190	.1390	-	.5801	.4456	.3714
6	.1931	1.975	.1941	-	1.200	1.114	.4456
7	.6454	1.234	.6627	-	1.314	.8913	.9656
8	66.58	1.439	509.0	-	14.24	9.136	10.92
9	4.496	1.110	11.57	-	3.468	2.525	2.377
10	8.352	2.950	8.968	-	7.012	6.165	3.342
11	4.485	1.261	4.948	-	3.468	2.525	2.377

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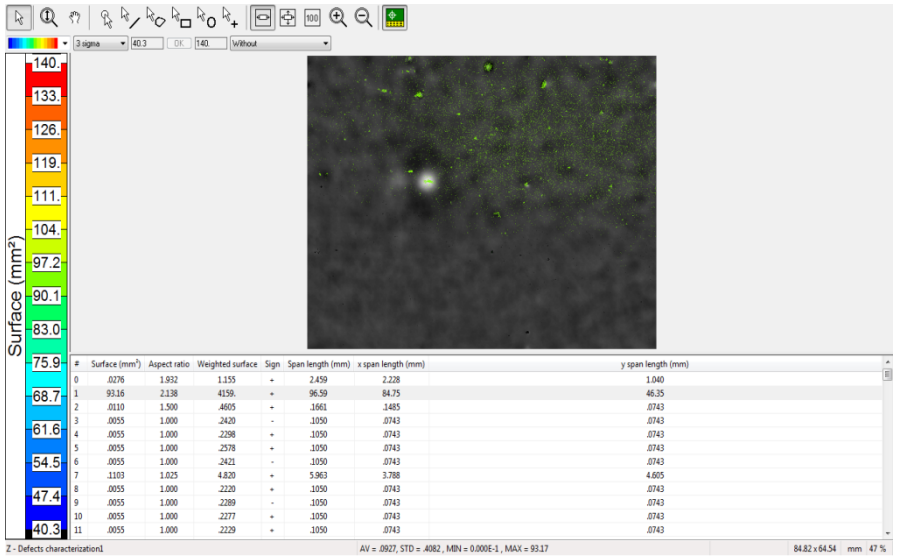
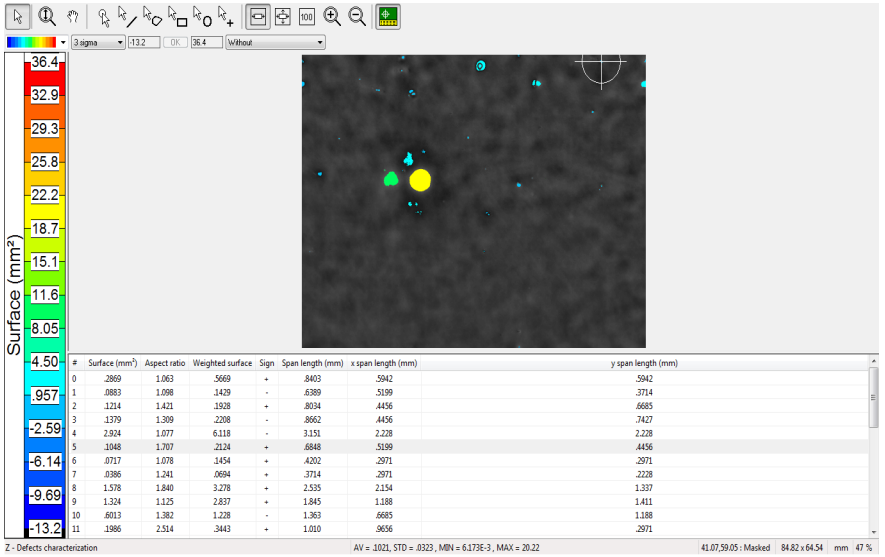
Defects Detection Software NEW!

Automatically analyse defects in any image





In Curvature (m^{-1})

or Altitude (µm)

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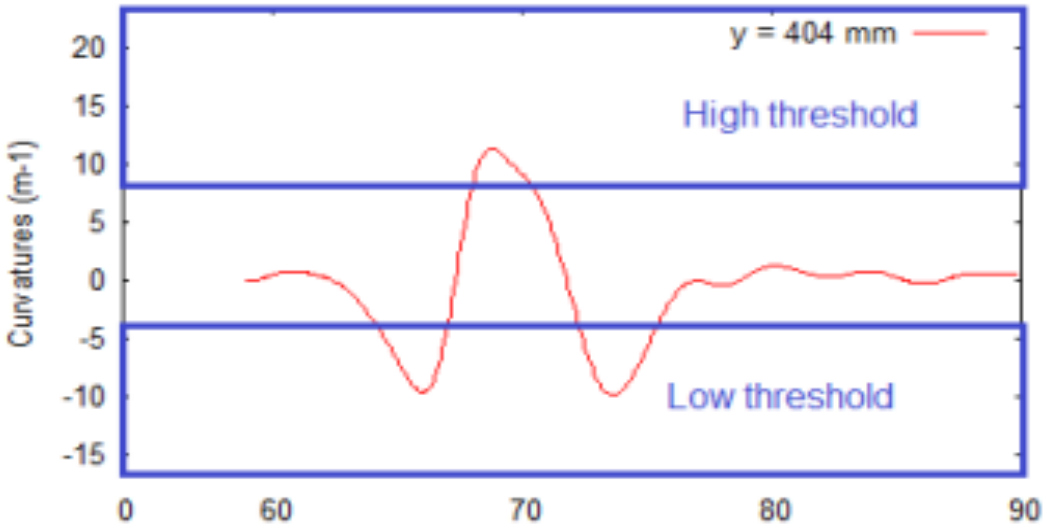
Defects Detection Software

NEW!



Capture all defects above and below user definable thresholds

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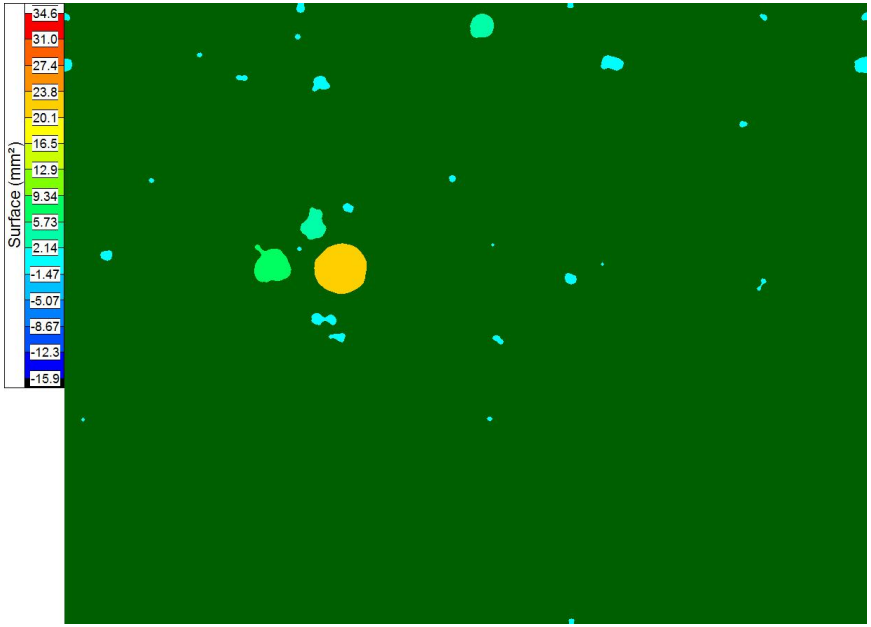
Defects Detection Software NEW!

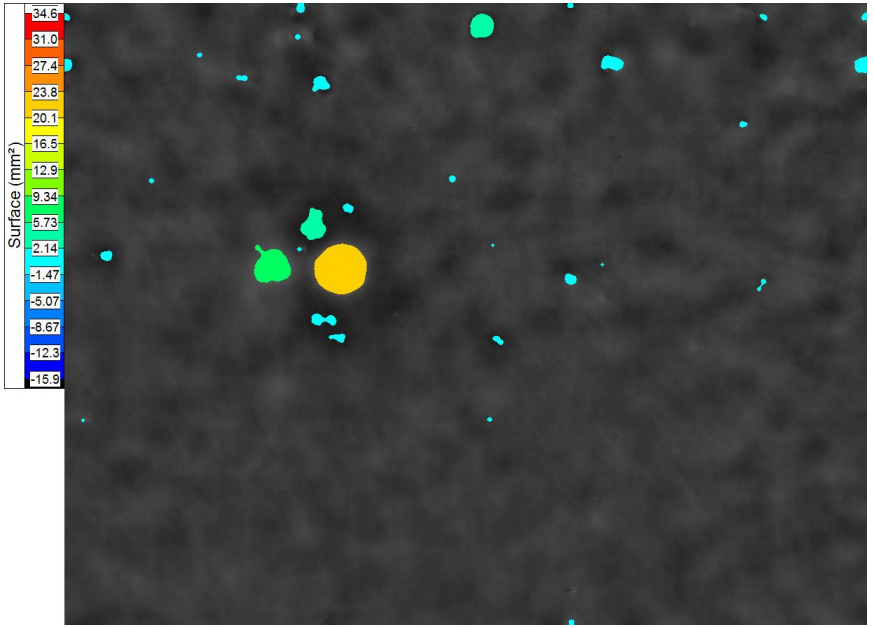
Using user definable limits, select and display -

- **Number of defects**
- **Surface Area (mm^2) – of defects above / below limits**
- **Aspect Ratio – the ratio of defect height and width**
- **Weighted Surface – weighted sum of each defect pixel**
- **Sign – (+/-) direction of defect in the surface**
- **Span Length - maximum length of defect**
- **X/Y Span Length – mid-length of defect in X/Y directions**

Defects Detection Software NEW!

Overlay defects analysis on original image





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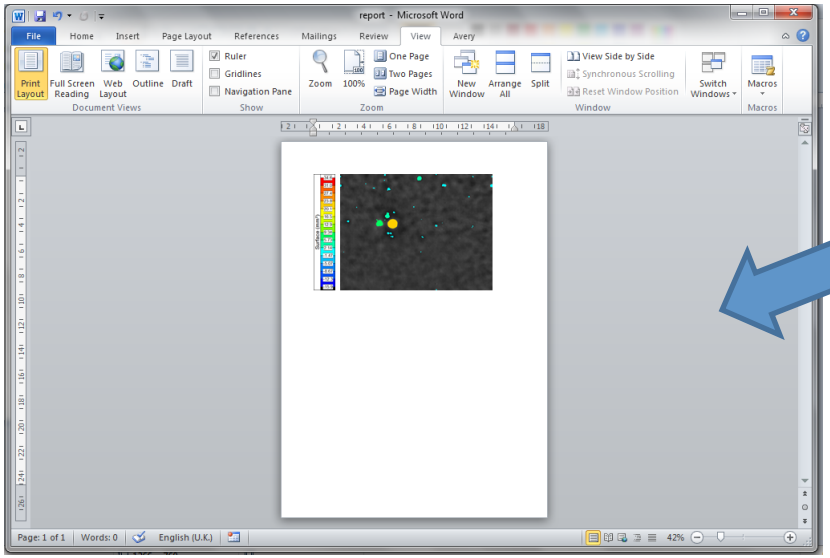

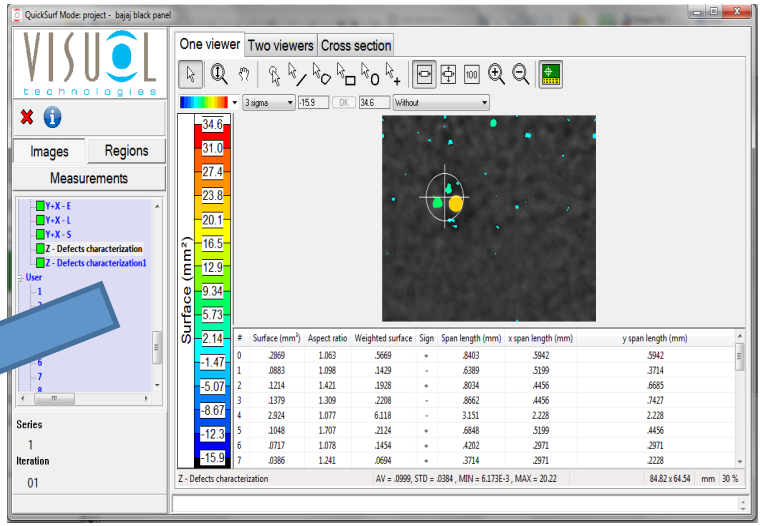

Drag and drop defect analysis into Microsoft Word for instant reporting

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Optimap PSD

Portable objective surface quality measurement