



Instrument Description

Sub Folder: Physical Analysis



Jr25 Profilometer

Principle:

The Jr25 is a 3D, non-contact, optical profilometer that is manufactured by NANOVEA. It utilises white light to obtain height and intensity profiles/area data of a sample's surface. This technique involves separating white light into its colour components, and each wavelength is focused at a different distance.

Differential focusing such as this creates a vertical measurement range where these wavelengths of light interact with the surface. As the pen moves along the sample, the height associated with that area is analysed. As the surface of interest is scanned, it will fall within a measurement range of a single wavelength and will therefore be in focus whilst the rest of the surface will be out of focus. This newfound focused wavelength will travel back through the pen and reach the CCD spectrometer where it is interpreted to correspond to the vertical height of the surface.

Profilometry is the gold standard analysis technique when investigating a sample's surface morphology and its respective parameters. It is a very valuable tool in quantifying surface roughness for coatings as the average of a set of individual measurements of a surface's peaks and valleys (R_a , μm) can be obtained through simple profile scanning or extensive 3D area scans.

Through area scanning, a 3D image can be generated portraying the sample's surface geometry. Moreover, the depth, width, length, and height of various surface failures and deformities can be quantified and compared to standard samples.

The Jr25 can analyse coating damage, measured by the volume of holes left by removed sample as a result of abrasion, allowing it to work alongside other destructive surface tests.



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Current model:



Figure: Jr25 Profilometer

Video link: <https://www.youtube.com/watch?v=hw2YNwdWeLo>

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The test is conducted using profilometry pens with different ranges. CREST has a 300 μ m pen. This pen is adjustable to accommodate to a samples size and scan area of up to 25mm x 25mm.

Typical samples:

The Jr25 is extremely versatile in terms of suitable samples for analysis, samples of all shapes and sizes can be subjected to profilometry. These may be a paint, a varnish, polymers, or other related products.

Standards:

Samples can be assessed in accordance with international standards such as ISO 4287 and ISO 25178.

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