

NANOVEA

WELD SURFACE INSPECTION

USING A PORTABLE 3D PROFILOMETER



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INTRODUCTION

It may become critical for a particular weld, typically done by visual inspection, to be investigated with an extreme level of precision. Specific areas of interest for precise analysis include surface cracks, porosity and unfilled craters, regardless of subsequent inspection procedures. Weld characteristics such as dimension/shape, volume, roughness, size etc. can all be measured for critical evaluation.

IMPORTANCE OF 3D NON-CONTACT PROFILOMETER FOR WELD SURFACE INSPECTION

Unlike other techniques such as touch probes or interferometry, the **NANOVEA** 3D Non-Contact Profilometer, using axial chromatism, can measure nearly any surface, sample sizes can vary widely due to open staging and there is no sample preparation needed. Nano through macro range is obtained during surface profile measurement with zero influence from sample reflectivity or absorption, has advanced ability to measure high surface angles and there is no software manipulation of results. Easily measure any material: transparent, opaque, specular, diffusive, polished, rough etc. The 2D and 2D capabilities of the **NANOVEA** Portable Profilometers make them ideal instruments for full complete weld surface inspection both in the lab and in the field.

MEASUREMENT OBJECTIVE

*In this application, the **NANOVEA JR25** Portable Profiler is used to measure the surface roughness, shape and volume of a weld, as well as the surrounding area. This information can provide critical information to properly investigate the quality of the weld and weld process.*

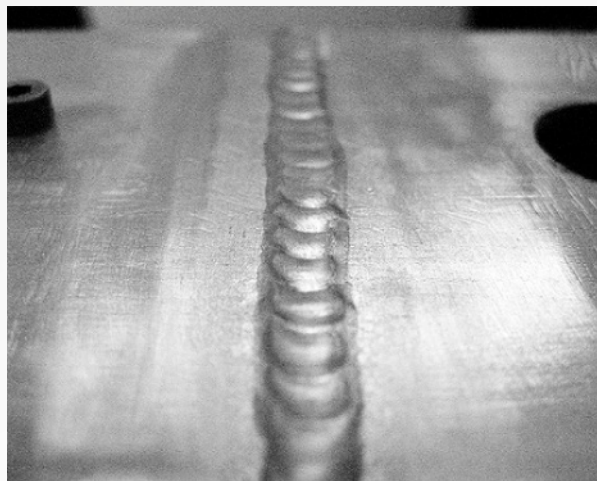
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ABOUT THE INSTRUMENT](#)

NANOVEA
JR25

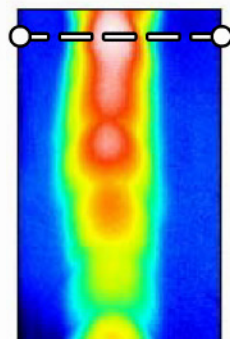
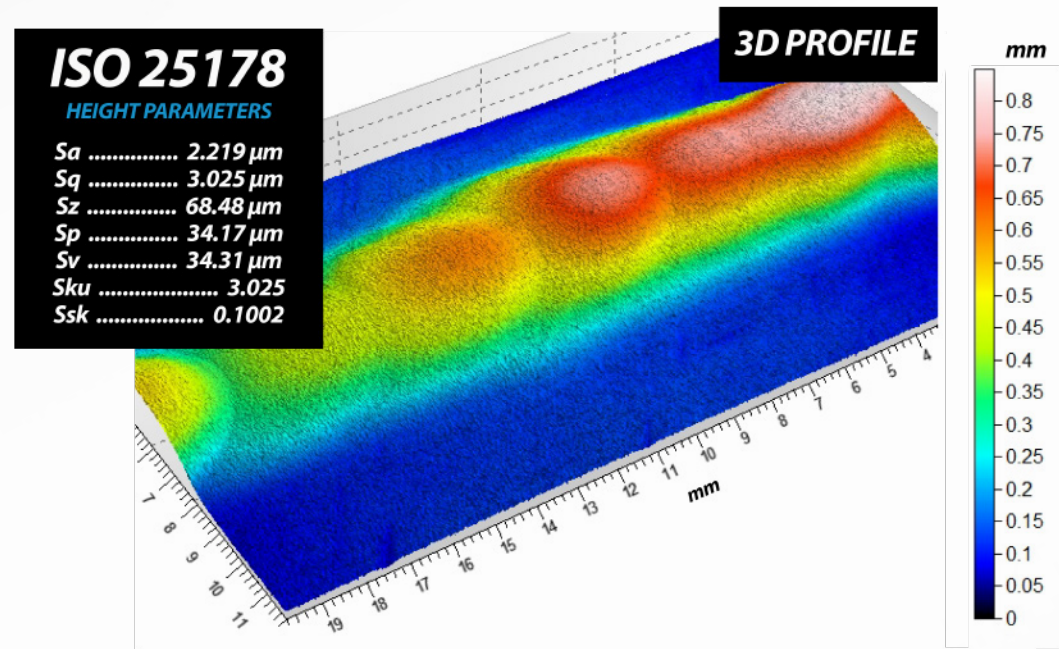


THE RESULTS

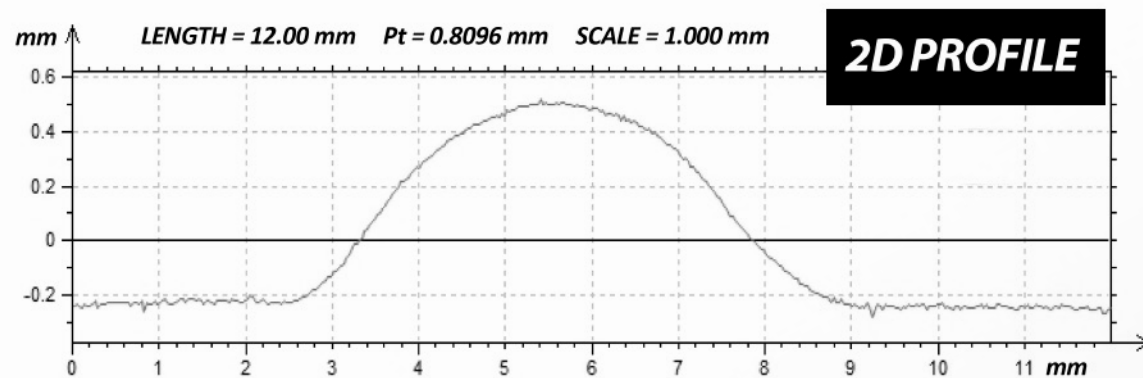
The image below shows the full 3D view of the weld and the surrounding area along with the surface parameters of the weld only.
The 2D cross section profile is shown below.



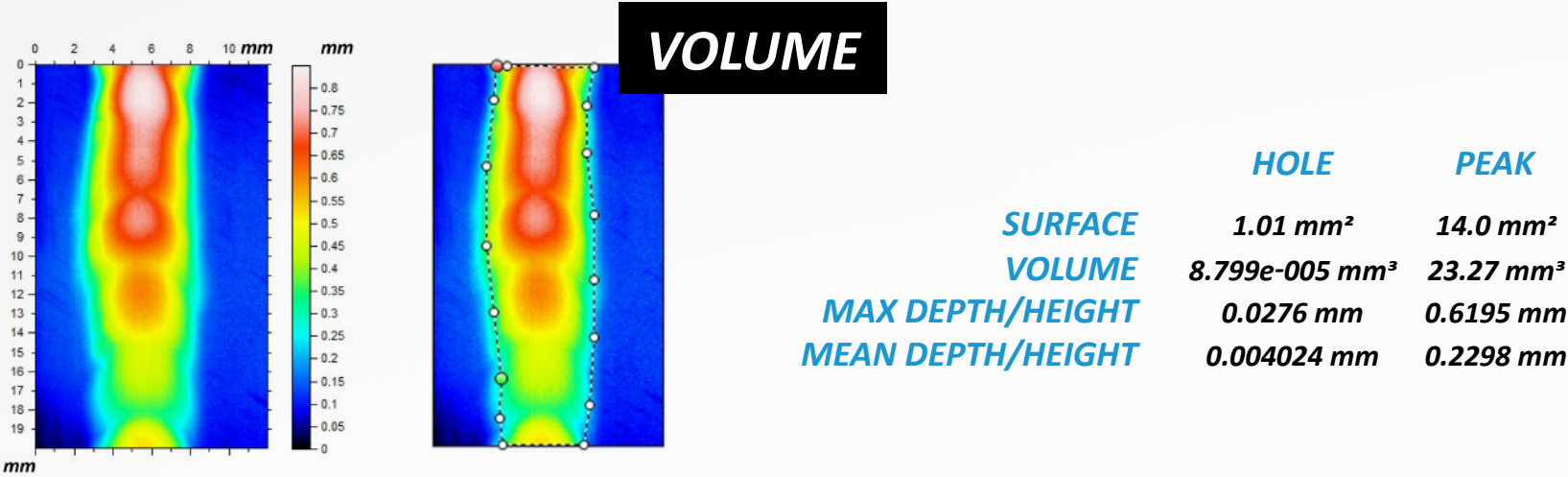
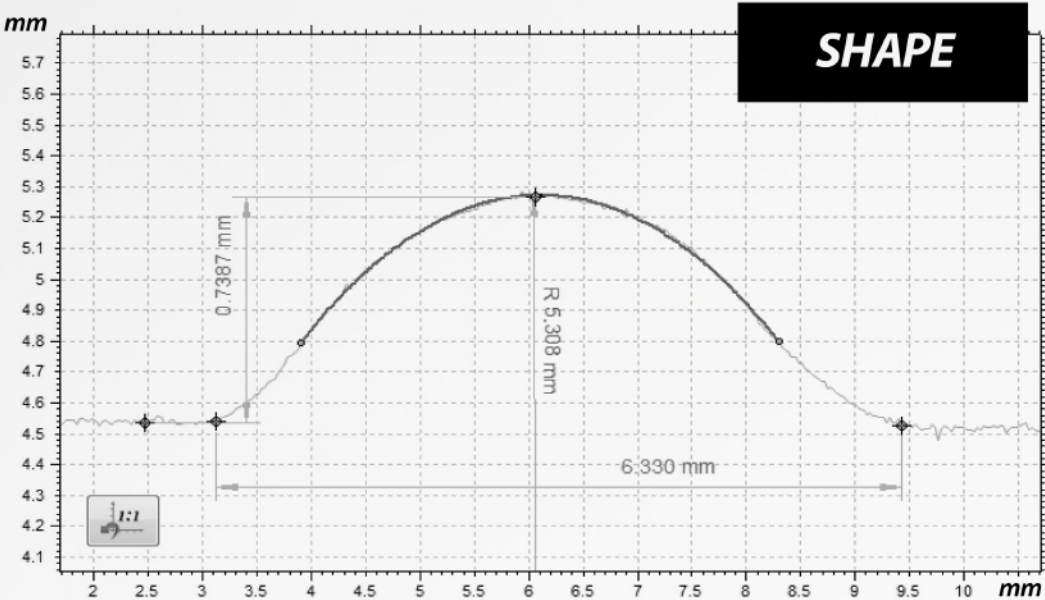
the sample



EXTRACTED PROFILE



With the above 2D cross section profile removed from the 3D, dimensional information of the weld is calculated below.
 Surface area and volume of material calculated for the weld only below.





CONCLUSION

In this application, we have shown how the **NANOVEA** 3D Non-Contact Profiler can precisely characterize critical characteristics of a weld and the surrounding surface area. From the roughness, dimensions and volume, a quantitative method for quality and repeatability can be determined and or further investigated. Sample welds, such as the example in this app note, can be easily analyzed, with a standard tabletop or portable **NANOVEA** Profiler for in-house or field testing.

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