CAF Central Analytical Facilities
STELLENBOSCH UNIVERSITY

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CT Scanner Facility

MicroCT analysis applications series

Tech note 3 Metal powder analysis

By Dr Anton du Plessis

Introduction

Metal powders can be analyzed in detail by microCT, and is especially useful for checking for presence of internal porosity, roundness of the particles and particle size distribution. Although more complex analyses such as sphericity is possible, the routine analysis of viewing the internal details of particles is demonstrated here, with a basic particle size distribution analysis.

Results

A sample of Ti6Al4V powder is shown in Figure 1, loaded in a pipette tip of approx. 3 mm diameter. This sample is subjected to high resolution micro/nano CT scan, the data reconstructed and basic analysis performed.

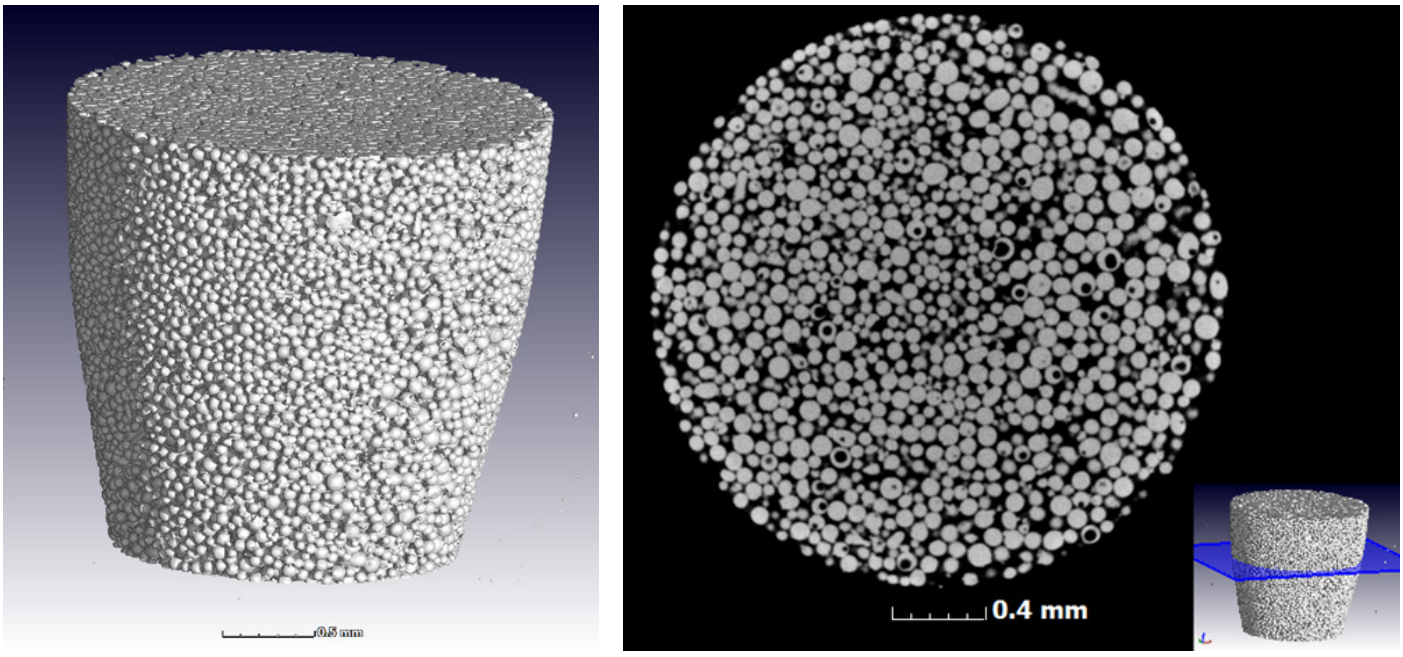
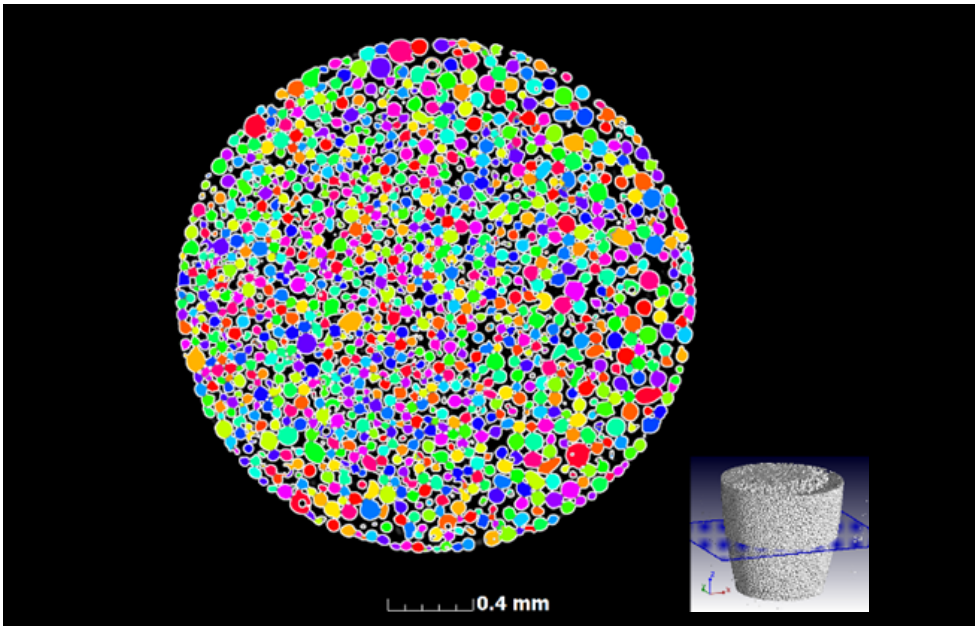


Figure 1: *Non-destructive viewing internal details of metal powders – internal porosity clearly visible*



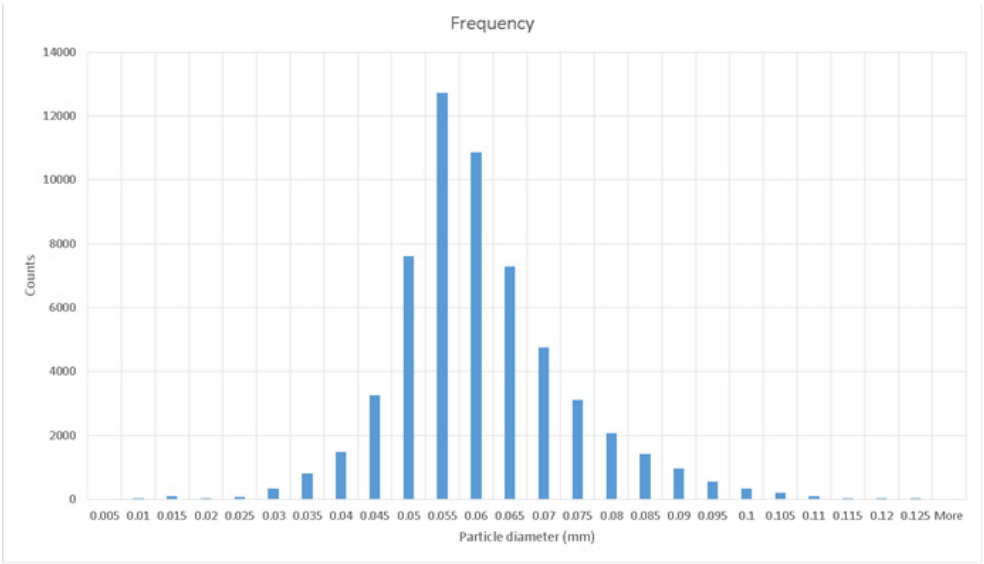


Figure 2:
Particle size distribution analysis in 3D. Unlike laser diffraction, real particle volumes are determined. This analysis comprises of 50 000 particles in total in the 2x2x2 mm³ volume.

Limitations?

Smallest particles that are reliably quantified are >5 µm. Smaller is possible but at excessively longer scan times. Sampling is limited to 2x2x2 mm volume for this type of analysis.

How to go about it

Send your samples or bring it in. For a routine scan and basic analysis as above, we now (2017) charge R6100 per sample incl VAT. For >10 samples, 7% discount. This includes images and a video of every sample, plus porosity/inclusion analysis automated report. Reduced rates for student research projects at South African universities. International rates US$ 600 per sample.

Full data can also be provided at additional cost with free viewer software. We use Volume Graphics VGStudioMax 3.0, and myVGL viewer. For full processed data add R1500 per sample.

SAMPLE SHIPPING AND FORMAL QUOTES

Dr Anton du Plessis
CT Facility
PO Sauer building
Bosman Rd
Stellenbosch
7602
SOUTH AFRICA

Anton2@sun.ac.za

+27 (0)21 808 9389

www.sun.ac.za/ctscanner

For more info on image analysis check our youtube channel (click here)

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