CT Scanner CAF Central Analytical Facilities STELLENBOSCH UNIVERSITY

CT NEWS

The Stellenbosch CT scanner facility newsletter

"more than just a scan"

March 2015

In This Issue

Recent interesting scans (clickable links)

Sugar pot tests
http://blogs.sun.ac.za/ctscanner/3d-printed-sugar-pot-test/

Image quality indicators
http://blogs.sun.ac.za/ctscanner/image-quality-indicator/

Radio controlled airplace engine 3D NDT
http://blogs.sun.ac.za/ctscanner/3d-x-rays-of-radio-control-airplane-engine/

Titanium aerospace casting

Castings can be produced at varying quality and the defects that occur in the castings can have a serious impact on the component lifetime and is a safety risk. Non-destructive testing can assist to improve or qualify a process and ensure best quality components are produced.

This case study shows how a practical sized object of 225 mm height can be analyzed using automated analysis functions from a CT scan. In Figure 1 only the largest defects are shown as well as the 2D slice image. See the case study paper for more details:

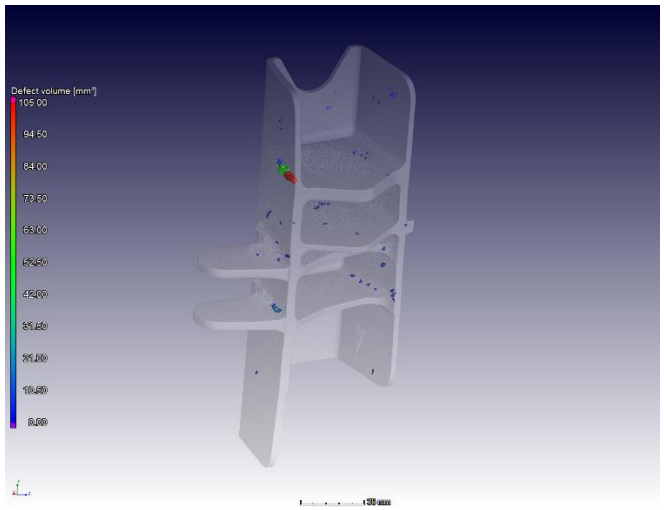
http://www.sciencedirect.com/science/article/pii/S2214657115000040

See a breakdown of analysis types and associated costs using this example here:
http://blogs.sun.ac.za/ctscanner/non-destructive-testing-case-study/

Welcome

Welcome to our March newsletter. The aim of this newsletter is to keep you up to date and to show you what CT can be used for. Book your scan projects today!

Of particular interest this month is our case study: we show you the range of non-destructive testing and analysis possible on almost all metal, plastic or ceramic parts, including the cost structure for routine non-destructive testing.



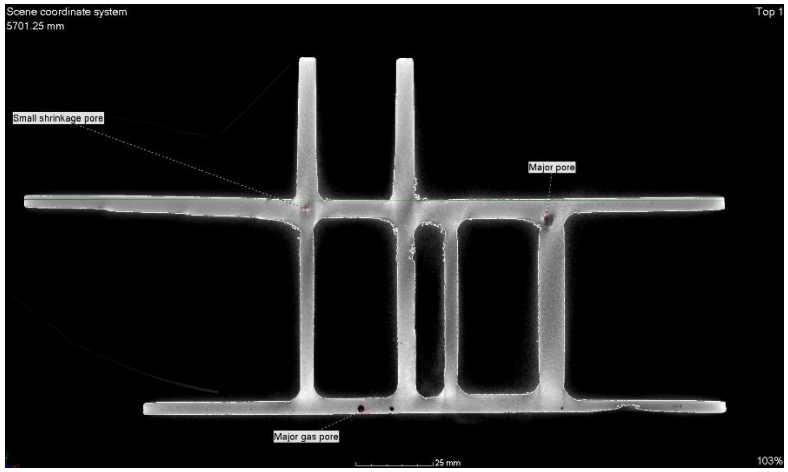


Figure 1: Titanium aerospace investment casting analysis

Concrete porosity analysis

Concrete porosity analysis is possible in 3D providing information on pore size distribution, pore shapes and more. For more information see a recent paper here:

http://link.springer.com/article/10.1617/s11527-014-0519-9

Porosity analysis is something that works very well and the power of visualizing and analyzing each individual pore is not always understood. In Figure 2 we show how the pore data is sorted and by highlighting one pore in the data spreadsheet, that pore is visualized automatically in slice and 3D views (the green one). Also shown is the resulting pore size distribution.

Upcoming events & News

The recently held South African Spectroscopy Society's Student Symposium went very well, see the prize winners in Figure 3 and more photos at

http://blogs.sun.ac.za/ctscanner/spectroscopy-symposium-photos/

There are some important events upcoming and all hosted at our facility, please join us for these:

- **Zeiss X-ray microscopy workshop**: **Tuesday 24 March**, see more information here, there are still 10 spots available, RSVP NOW: http://pages.microscopy.zeiss.com/3D-XRM-Workshop-Registration.html
- **TRAINING: Monday 30 March Introduction to CT image analysis: limited space book now by email to lerouxsg@sun.ac.za. R1500 pp, 9:00-16:00**
- 2nd national microCT conference IMGRAD (imaging with radiation): 10-11 September, first announcement: http://blogs.sun.ac.za/ctscanner/imgrad2015/

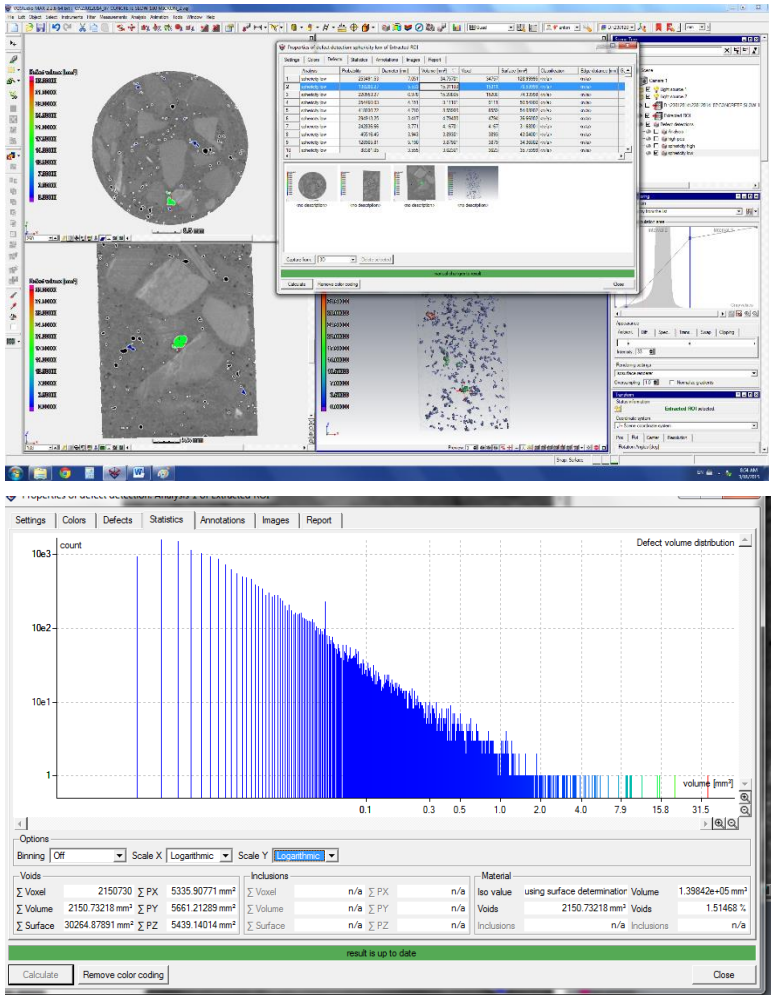


Figure 2: Concrete porosity analysis showing individual pore viewing from the sorted results (top) and the pore size distribution histogram (bottom)

Figure 3: Spectroscopy Symposium prize winners – 1st John Woodland (left) and 2nd Letitia Schoeman (middle) with Werner Barnard (SASS representative, right)

Special offers

1. **Analysis services**

The Analysis Facility is open for regular users at R2500 per month or we can provide analysis services for you depending on your requirements. 4-hr bookings can be made 8:00-12:00 or 12:00-16:00, and this costs the equivalent of 1 hr CT time = 4 hrs analysis. Ie. R600 for external academics and R275 internal for 4 hrs analysis.

2. **Gauteng clients**

Cients in Pretoria and Johannesburg can contact Anton for a personal visit next week Friday 27 March, to briefly discuss your projects.

Contact Us

http://www.sun.ac.za/ctscanner

Staff scientist – Anton du Plessis, PhD

anton2@sun.ac.za

Analyst – Stephan le Roux, MSc

lerouxsg@sun.ac.za

021 808 9389

Physical address for sample deliveries:

CT Scanner Facility, Room 1046

PO Sauer building - Dept Forestry and Wood Science

Bosman Street, Stellenbosch

7602

Watch this space

The CT scan facility is expanding: we will be offering 3D printing services through a new lab at the University's launchlab facility. For a sneak preview, check http://blogs.sun.ac.za/idea2product/ . This lab will have its own newsletter and expect the first one by the end of next week with lots of details of this exciting initiative.

Acknowledgements

The CT scanner equipment acquisitions were made possible with grants from the National Research Foundation and Stellenbosch University. The Department of Science and Technology Internship program is also acknowledged for its support of this facility. We encourage and welcome any form of sponsorship or support in order to keep delivering the best quality. Stellenbosch University support of CAF allows special internal rates, subject to acknowledgement of our facilities in publications.

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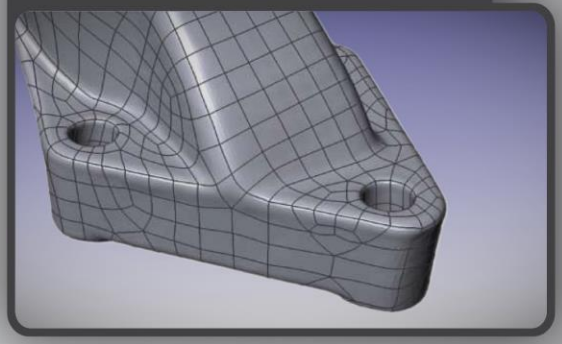
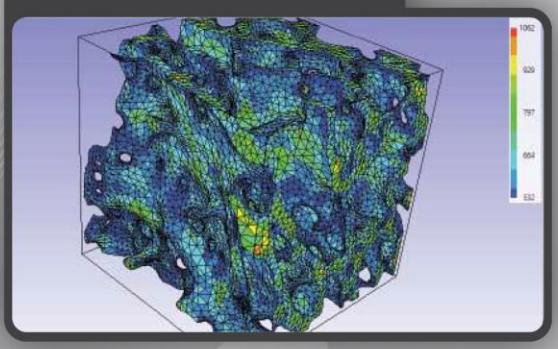


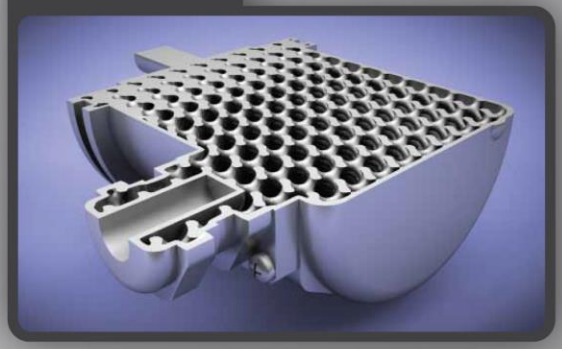
Generate watertight computational models for design and analysis

Physics-based Simulation



Calculate and visualise effective material properties of image data

3D Printing



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