Schmitt Europe Ltd, a leader in light scatter measurement technology provided by Schmitt Measurement Systems of the USA, is pleased to announce that our portable surface measurement instrument, the SMS µScan System is being used to test and measure components for a proposed renewable energy, solar power plant in South Africa.

The South African Company Eskom is exploring renewable electricity generating solutions which can contribute to growing electricity demand whilst reducing reliance on conventional CO_2 emitting technologies. Eskom is assessing the feasibility of constructing a “Concentrating Solar Power” (CSP) plant in the Northern Cape Province of South Africa based on harnessing the power of the sun’s rays to generate heat for electricity production.

An example of a CSP plant using central receiver technology. This is a 10MW demonstration plant built in the USA. (Image courtesy of NREL).

Thousands of large, two-axis, tracking mirrors known as “heliostats” track the sun and reflect the solar radiation to a common focal point. This focal point, the receiver, is situated on a tower above the heliostat field. The receiver is in essence a heat exchanger which collects the solar radiation from thousands of mirrors and concentrates the heat into a molten salt solution which, in turn, is used to produce steam for electricity generation using conventional steam turbines. The heliostats are arranged in an elliptical formation around the focal point with approximately

8000 to 10,000 heliostats at 130m^2 each, within the heliostat field. The system is also capable of storing approximately 16 hours of energy as heat for electricity generation at night.

An example of a heliostat. The heliostat merely reflects the suns rays and is quite safe to be at during operation. (Image courtesy of NREL).

For optimum performance of the CSP plant, the heliostat mirrors need to be highly reflective, absorb very little of the suns energy and minimally scatter light. In collaboration with Wilford Steel Lasers of South Africa, Schmitt Europe Ltd has been able to provide Eskom with our SMS µScan System. Preliminary results show that the surface reflectance, roughness and scatter of the heliostat mirrors can be measured very quickly and highly accurately with the SMS µScan System. This has allowed Eskom to accurately measure the effectiveness of the heliostat mirrors and identify any problems such as surface soiling of the reflective mirror surfaces which would reduce the operating efficiency of the CSP plant. Considering that an estimated 8000 to 10,000 heliostat mirrors are required for the CSP, the ease of use, operation and accuracy of the SMS µScan System makes it perfect for this application.

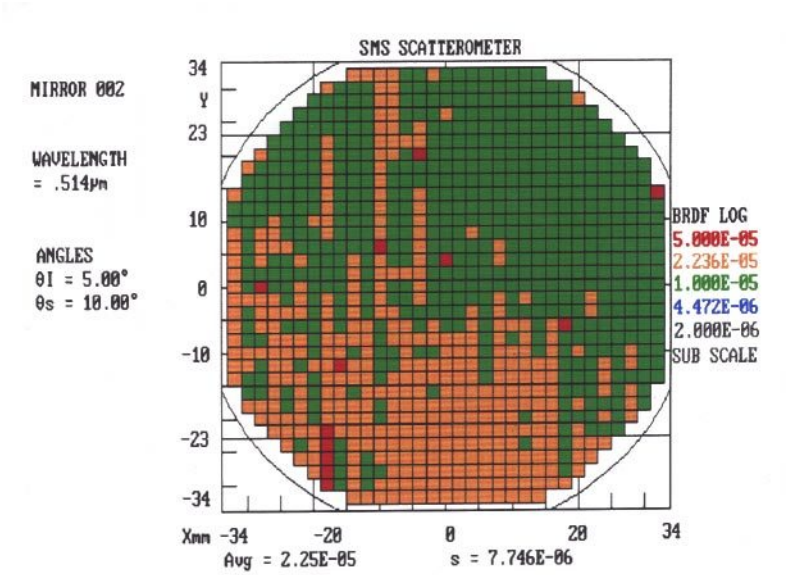
The SMS µScan System consists of a hand held Control Unit, an interchangeable measurement head and separate charging unit. To perform a measurement, the operator places the laser measurement head on the surface to be analysed and simply presses the button. Each measurement takes less than 5 seconds demonstrating how the SMS µScan System is excellent for quality control applications.

The Schmitt Europe Ltd, SMS µScan System.

The results are clearly displayed and stored in the system memory. The SMS UScan can store 700 measurements in 255 files and provides capability for pass/fail criteria. Software is available for control, analysis and file conversion. The SMS µScan System allows the operator to rapidly take measurements at the sample, where needed, in seconds. From a single measurement, a

user can determine RMS surface roughness, reflectance and scattered light level (Bidirectional Reflectance Distribution Function & Bidirectional Scatter Distribution Function) on flat or curved surfaces under any lighting conditions. Other applications include optical surfaces, semiconductor wafers, and precision machined surfaces and rolled and formed surfaces.

An example is given below where the SMS µScan system laser beam has sampled the entire surface of a mirror to measure light scatter. As the mirror is 'sampled' by the laser beam, the light scatter is continuously recorded and the data presented as a map using multiple colours. Lighter colours represent greater scattering and therefore greater surface roughness in comparison with darker colours showing the least scattering and better surface smoothness.



Light scatter SMS µScan of a sample mirror.

Eskom report that as part of their feasibility study, they have ***"already taken the first measurements and it works great!"*** In response, Mr Tim Wood, International Sales Manager of Schmitt Europe Ltd, has said that this SMS µScan application represents a significant step forward in overseas collaboration with the renewable energy sector and high technology companies in South Africa. For more information please go to www.schmitteurope.com or telephone Schmitt Europe on +44 (0) 2476 697 192.