OPTICAL SURFACE PROFILER

OSP 130

superior technology - superior capability
Set Up and Operation

Simply enter the nominal diameter and height of the object to be measured and the instrument will automatically move the camera and projector to their correct positions. The instrument is then calibrated by a series of measurements on a reference surface. Finally, the test object is measured. The acquired data is processed in a matter of minutes. Shiny surfaces such as those on metal tooling must be converted to a matt white finish. A surface treatment has been developed which is quick to apply, simple to remove and does not alter or damage the surface relief detail. Some tooling, such as white plaster or silicone casts can be measured without surface preparation.

How OSP 130 Works

A white light projector is used to project a periodic grating onto the tool surface to be measured. A solid state camera views the projected grating on the surface and the computer digitises the intensity pattern. The grating inside the projector is then moved under computer control to a number of different positions and the digitised images of the projected grating are stored in the computer. By using our proprietary image analysis procedures an accurate map of the tool’s surface is obtained.

Repositioning

Tools may be accurately repositioned on the OSP 130. This allows direct comparison of relief and other features on any tool during various stages of treatment, fabrication or use.

Software

A high performance 32-bit 386 microprocessor-based PC and MS DOS operating system provides control of the set-up and measurement procedure and data acquisition. The software calculates surface relief and characteristic parameters, provides interactive graphics and generates measurement reports. The software is used in either a batch mode or a user-select menu mode. The batch mode is useful when a measurement and analysis procedure has been predefined. Either mode is simple to use.

Artificial Rims

For tools without rims or surface curvature, these effects can be added in software to allow calculation as if they were present. This permits optimisation of tooling parameters prior to the formation of a physical rim or curvature and allows better comparison between various items of a tooling set.

Range of tools used in the minting process. All can be measured by the OSP 130
**OSP 130**

The OSP 130 has been custom-designed to improve the metrology and quality control capabilities of the Royal Australian Mint. It is offered for sale to other Mints, and can be designed for their applications.

**One-Person Operation**

A major feature of the OSP 130 is its ease of use. The close proximity of the instrument to the computer means one operator can carry out the entire measurement and data analysis procedure and produce the test reports.

**Major Time Saving**

The instrument dramatically reduces the time a die or hob spends in the metrology lab, resulting in substantial improvements in productivity. It takes approximately 10 minutes for calibration and alignment and 5 minutes to make the measurement.

**Immediate Software Display**

The menu-driven software produces and displays the profile data almost immediately. Once the data is stored, the part can be removed from the instrument and returned for general use.

**On-line Decisions**

The OSP 130 can assist in quality and process control by providing answers to these questions:

- Has wear in the hob or die reached the limits of tolerance?
- Are there significant differences between hobs?
- Is the die profile optimised for the press?
- What are the effects of heat treatment and hardening of tools on the relief detail?
- What are the optimum profile parameters for different materials?
Specifications

Measurement Technique: Phase stepping moire profilometry
Instrument Dimensions: 1.1 x 1.7 x 2.5 metres
Projector: White light with physical grating
Detector: 760 x 570 pixels TV camera
Data acquisition time: Less than 1 minute
Typical measurement time: Less than 15 minutes
Spatial resolution: Better than 1/500 of object diameter
Object repositioning accuracy: Better than 1/500 of object diameter
Height measurement accuracy: Typically better than 1% of maximum relief
Calculated parameters: 3D relief, low and high points, rim diameters, rim to low and high points, background convexity or curvature, volumes of impression, statistics of profiles

Computer
Hardcopy: Pseudo-colour relief plots, 2D section profiles, calculated parameters, user-defined reports
Archival Storage: Floppy, hard disc or streaming tape
Software: Menu-driven cursor and mouse control. Development mode and batch mode

Objects Measured

Types: -ve or +ve plaster, silicone-rubber and epoxy cast models; reduction punches; master dies; working hobs; working dies; coins; proof coins; medallions
Sizes: 10 mm to 300 mm diameter

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