

PRINCIPLES OF NON-CONTACT SURFACE MEASUREMENT

Proscan 2100 scans the top surface of specimens over an area of up to 150mm x 100mm. A graphical 3D representation of the scanned data is shown on screen. Using surface analysis tools within the software, the specimen is accurately quantified.

To make a scan, simply load the specimen onto the scanning plate and press start. The sensor moves over the surface, measuring height deviation as it goes. The surface profile appears immediately on the PC monitor.

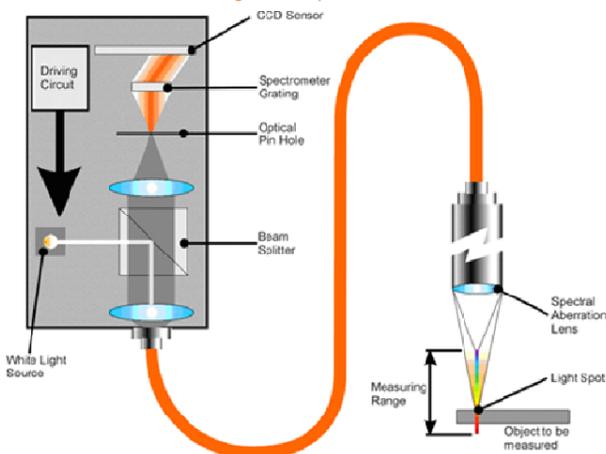
UNIQUE MEASUREMENT TECHNOLOGY

At the heart of the technology is a patented Confocal multiplexing sensor with up to 0.005um resolution. The technology works well on human enamel and dentine for two reasons. It is a non-contact technique, measuring surfaces sensitive to the influence of a contact technology. It does not experience problems with penetration, displayed using laser displacement techniques.

Safe white light is transmitted through a lens, which has carefully manufactured spectral aberration built in. It is this effect that takes the white light and divides it into the full spectral field, focusing each different colour frequency at a slightly different point through a defined measuring range. When an object is placed within this range, only one particular colour frequency reflects back from the surface.

This information passes back into a processor where a spectrometer analyses the signal and converts it to a measurement. Proscan combines these measurements with the precise location of a moving X and Y linear table, giving three co-ordinates from which a three dimensional profile is created.

The Chromatic Measuring Technique



VARIETY OF SENSORS, WITH MEASUREMENT RANGES

Scantron recommends:

S3/130 SENSOR for the measurement of tubules

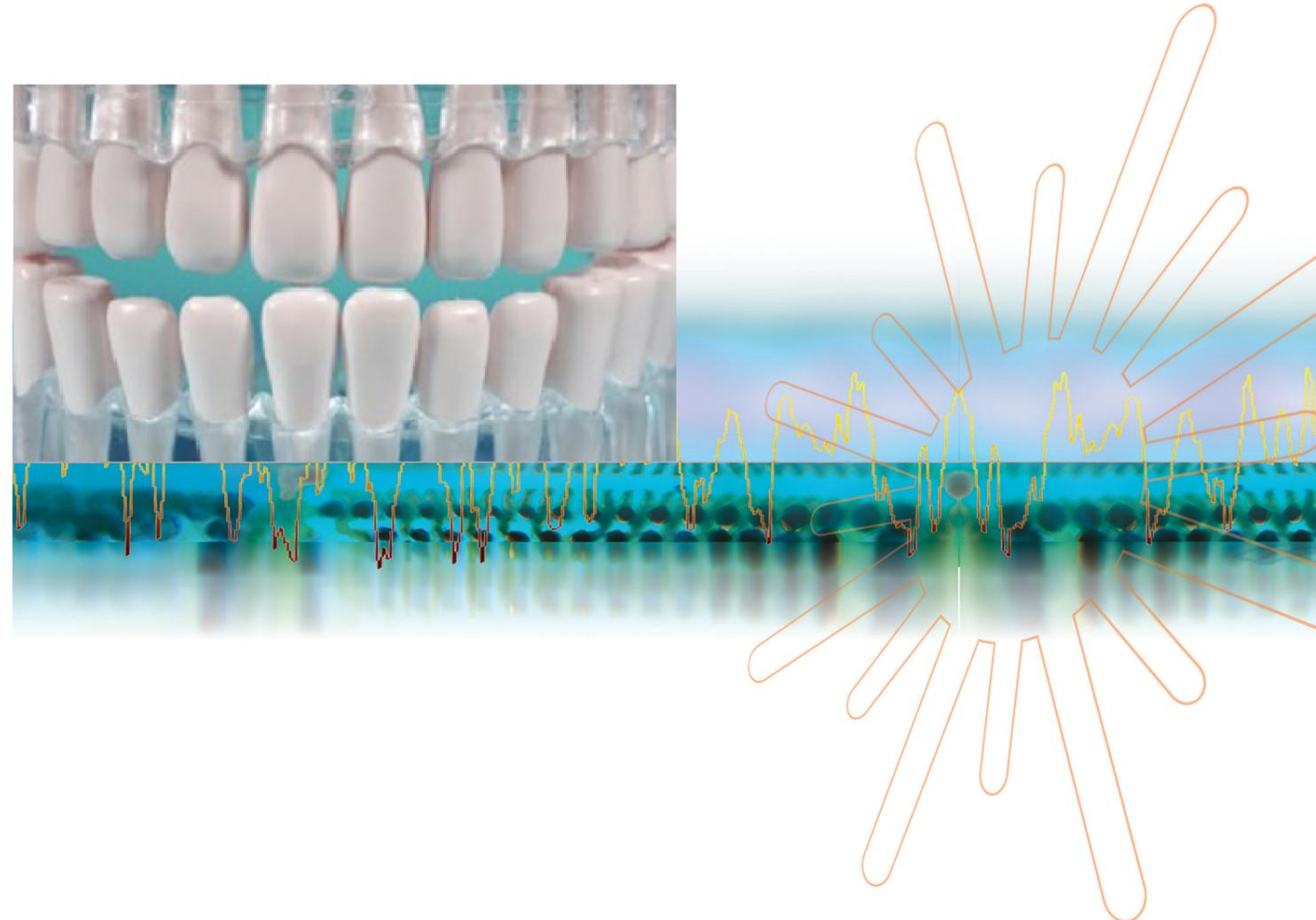
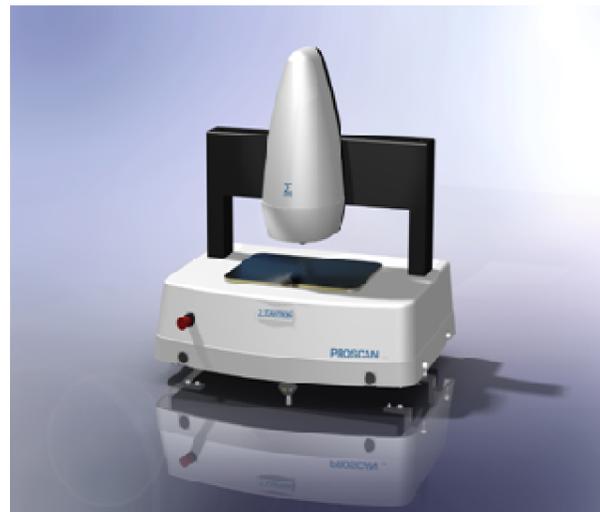
S11/400 SENSOR for the measurement of small specimens, such as enamel and dental composites.

S16/4 SENSOR for measuring erosion on individual tooth specimens.

S29/12 SENSOR for measuring a multiple of teeth or a full arch.

SENSOR MODEL	RESOLUTION (0,µm)	MEASURING RANGE	STAND OFF (mm)	SPOT SIZE (0,µm)
S3/130	0.0027	130 µm	3.3	1.9
S11/400	0.008	400 µm	11.0	2.3
S12/1.4	0.02	1.4 mm	12.7	4.0
S16/4	0.05	4.0 mm	16.4	8.0
S29/12	0.18	12.0 mm	29.0	14.0
S20/24	0.30	24.0 mm	19.6	16

The Proscan 2100



PROSCAN 2100 DENTAL

PRECISE NON-CONTACT SURFACE MEASUREMENT FOR DENTAL RESEARCH



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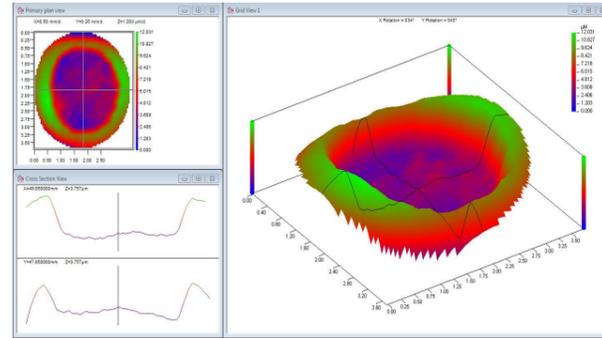
PROSCAN 2100

SCANTRON IS THE WORLD LEADER IN NON-CONTACT PRECISION MEASUREMENT FOR DENTAL RESEARCH. LABORATORIES AND RESEARCH ORGANISATIONS AROUND THE WORLD CHOOSE PROSCAN 2100 FOR PILOT PROJECTS AND CLINICAL STUDIES.

Being ultimately practical, Proscan suits many applications and replaces expensive instruments capable of just one specific task. The measurements you need are achieved quickly and inexpensively, by equipment proven to last for many years with minimum maintenance and calibration.

EROSION

Proscan measures the direct effect of erosion on enamel and dentine by acid foods and drinks. Small specimens are mounted onto, or into, acrylic holders for in-vitro testing. The surface profiles are measured both before and after exposure to the erosive element.

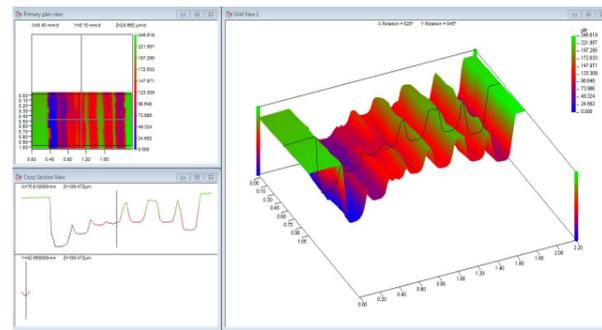


EROSION: Proscan scan of eroded enamel.

Once scanned, a datum profile is produced for each sample showing sufficient detail to identify the enamel rod structure. The difference between the two scans is qualified either as height deviations or as a volume measurement.

ABRASION

Proscan is fast becoming the benchmark for enamel abrasion measurement. Favoured for its ease of use, the system easily captures the true surface profile of enamel both before and after abrasion testing.



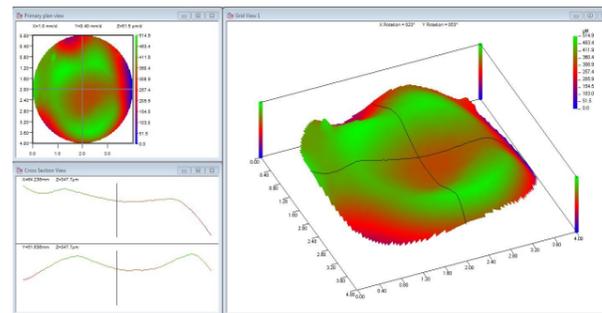
ABRASION: Brush marks from wear rig on dentine.

Fast, accurate surface topography allows the user to qualify the exact amount of material abraded away, expressed either as height deviations or as a volume measurement.

ATTRITION

The entire topography of occlusal, incisal and proximal surfaces are captured through either in-situ modelling or in-vitro testing.

Accurate 3D measurement of the polished facets formed on the cusp tip or the flattening of the incisal edge allows qualification of wear levels, especially where analysis over time is concerned.



ATTRITION: Scan of attrition on a molar

SURFACE POROSITY

Sub-micron resolution allows measurements on the inter-crystalline structure to be analysed. Studies into the effect of white-spot lesions reveal vital information.

Calculation	Mean ZC	Min ZC	Max ZC	Count ZC	Mean Y	Min Y	Max Y	Count Y	Strich
ISO J	7.54	5.47	1.00	39	1.04	0.46	7.52	41	µm
ISO P	8.87	8.08	0.80	39	0.87	0.44	1.38	41	µm
ISO Pt	2.68	1.82	0.86	39	2.20	1.44	4.38	41	µm

ATSurface Roughness Measurementt R_A — R_Z

SURFACE ROUGHNESS

Choose from a wide range of standard ISO and DIN surface roughness analysis tools to accurately determine the true surface texture of a material.

PROFORM SOFTWARE

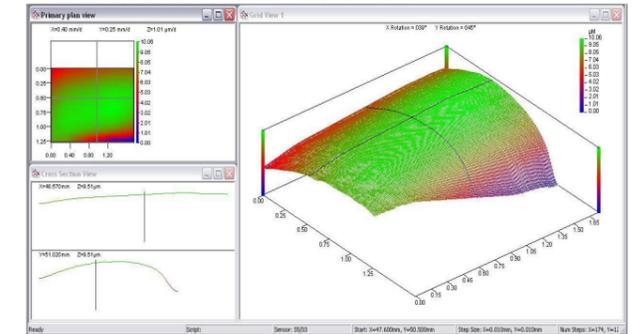
PROFORM IS A VERY POWERFUL ANALYSIS TOOL FOR IDENTIFYING THE DIFFERENCE BETWEEN TWO SAMPLES BY OVERLAYING THEIR SCANS.

ProForm by Scantron allows very accurate comparison of two scans. The precise difference can be expressed in volume, maximum height difference and mean height difference.

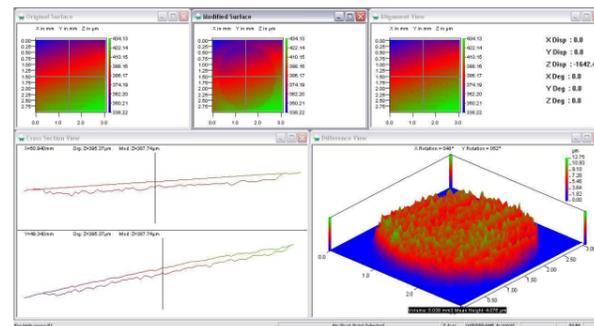
In the case of wear analysis ProForm interprets the exact amount of wear. A specimen is scanned, subjected to wear and scanned again. ProForm compares the two scans, zooming in to the resolution of the scan to match distinguishing features.

Once a distinguishing feature is matched between the original and modified sample, this pivot point is fixed. Once fixed, the modified scan is rotated over the original to obtain the best fit. A three dimensional view can be toggled to match the two scans and a two dimensional cross-section in the X and Y axes is shown to assist very fine matching.

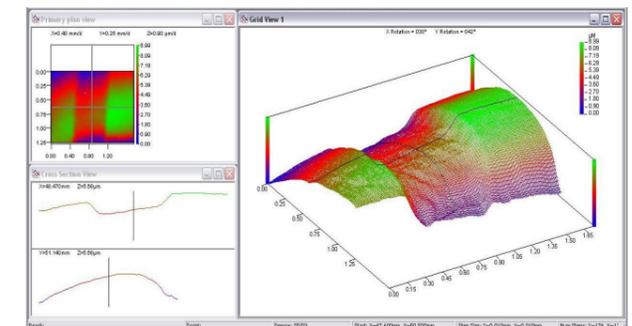
The software matches three selected areas of the mating surfaces automatically, displaying the accurate resultant difference as a three dimensional image. ProForm includes the ability to manipulate scans manually, giving full control of the image in all three axes.



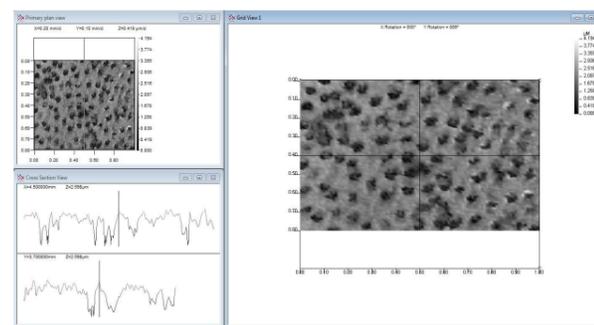
Scan of enamel before erosion test.



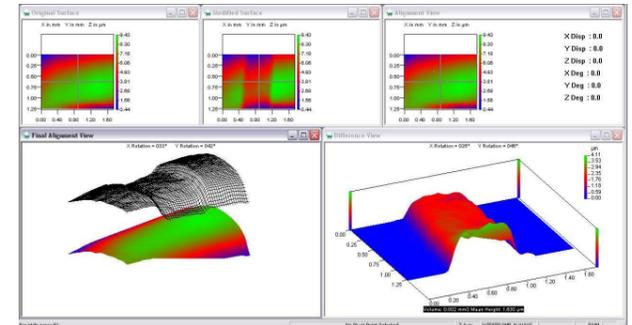
Erosion from an acidic drink on enamel, shown in volume and max height.



Scan of enamel after erosion test.



Scan of tubules in dentine.



Difference between the two.