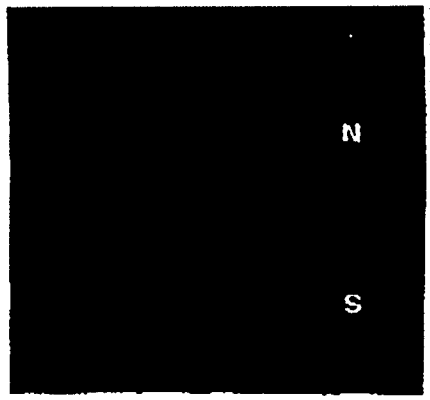


Surfscan 7200
Patterned Wafer Inspection System

Specifications

Substrate Size
100, 125, 150, 200 mm diameter wafers

Sensitivity
0.4 μm (latex spheres on bare silicon)

Throughput
22 wafers per hour (150 mm)
19 wafers per hour (200 mm)

Repeatability
Count repeatability error less than 3% (Mean count greater than 500, 0.5 μm diameter latex spheres).

Contamination
No more than one 0.3 μm diameter or larger particle per pass based on 25 passes.

Digital Signal Processing
High-speed digital signal processing using 80486 microprocessor (25 MHz).

Illumination Source
5 mW Argon-Ion laser, 488 nm wavelength.

Operating System
Menu-driven user interface with color-keyed Inspection and Recipe screens.

Scan Modes
Pattern Viewing, Particle Viewing, and Microscan Viewing modes.

Data Communications
Compatible with many optical and SEM review stations. Full GEM/SECSII implementation. Direct DECnet™ to VAX support.

HEPA Filter
Standard HEPA filter purifies air entering the system by removing airborne particles.

Physical Characteristics

Height:	152 cm	(60″)
Width:	121 cm	(47.6″)
Depth:	80 cm	(31.25″)

Weight

Instrument:	385 kg	(850 lbs)
Shipping:	454 kg	(1110 lbs)

Printer Enclosure

Height:	30.5 cm	(12″)
Width:	46.0 cm	(18″)
Depth:	69.0 cm	(27″)

Installation Requirements
Vacuum: 584 mm (23″) Hg min; 1.0 cfm min. Hose diameter of 3.18 mm (0.125″).
Electrical:
- USA: 125/250 VAC ±10%, 60 Hz, 20 A (4 wire: 110V, 110V, neutral, ground)
- Europe: 220 VAC ±10%, 50 Hz, 10 A
- Japan: 200 VAC ±10%, 50 Hz, 10 A

Ducted Venting: Fittings are required to accept two 102 mm (4″) exhaust hoses. 150 cfm minimum total.
Laminar Flow: Class 100 or better. 91.4 cm (36″) minimum depth.

U.S. Patent No. 4893171 and 4532981.
Specifications subject to change.

Printed in USA 8/91 #422

TENCOR INSTRUMENTS
2100 Charleston Road
Mountain View, CA 94043
Telephone: 415-969-6767
FAX: 415-969-5371
TWX: 910-379-6936

New Surfscan 7200 system sees more defects and interprets them faster—on line.

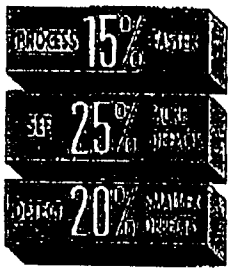
Higher performance in on-line patterned wafer inspection.
If you liked the Surfscan® 7000, you're going to *love* the 7200...

It sees more and does more—with 15% higher throughput: An entire 200mm wafer in just over 3 minutes!

It uses more advanced algorithms and new 486 computing power.

Precise wafer registration coordinates are automatically "learned" and remembered. Optimum measurement settings are automatically computed.

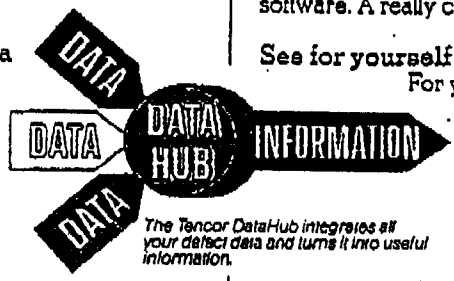
See 25% more defects. See 20% smaller defects.



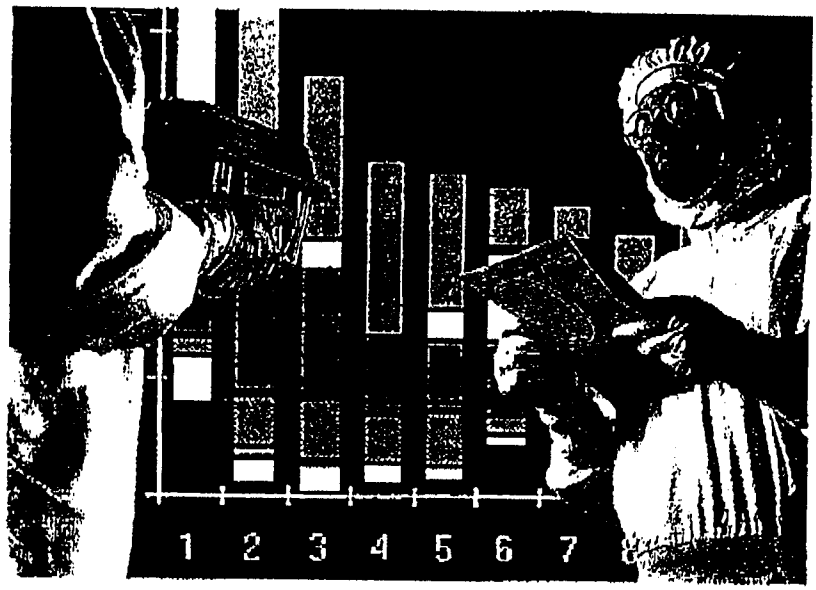
Enhanced signal processing and *Differentiator*™ technology make possible an even finer discrimination between defects and pattern features. For a 25% higher defect capture rate.

Plus, new signal amplification electronics make the 7200 even more sensitive. To spot defects that are 20% smaller.

Enhanced data analysis, too.
The Tencor® DataHub™ pulls all your data together, from the on-line 7200 and off-line review stations.



The Tencor DataHub integrates all your defect data and turns it into useful information.



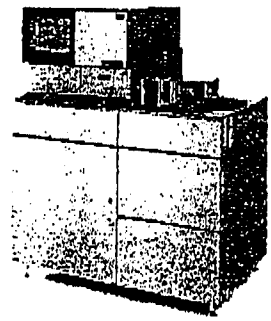
It now gives you even faster, more sophisticated defect data crunching: Running comparisons. Monitoring trends. Pinpointing your defect sources.

Upgrade your 7000s.
If you already have Surfscan 7000s, here's more good news...

We can field-upgrade them to full 7200 capability. Both hardware and software. A really clean solution.

See for yourself...
For your on-line patterned wafer inspection, Surfscan 7200 is the *one*. Get all the details:

Tencor Instruments, 2400 Charleston Rd., Mountain View, CA 94043. Telephone: (415) 969-6767. TWX: 910-379-6436. FAX: 415-969-6371.



TENCOR INSTRUMENTS

The Measure of Success

Surfscan, Tencor, Differentiator and DataHub are trademarks of Tencor Instruments

Tencor Instruments
New Product Release Information

The Surfscan 7200
Patterned Wafer Inspection System

Tencor Instruments has released a new generation patterned wafer inspection system called the Surfscan 7200. This new system provides improved performance and reliability as compared to the original Surfscan 7000. In addition, the 7200's new software includes several features which improve the ease of use and enhance the integration of the system into production environments. The improvements of the Surfscan 7200 relative to the Surfscan 7000 are described below.

The performance of the system has been improved in three critical areas: sensitivity, throughput and defect capture rate. New front-end signal amplification electronics have provided a 2.5x improvement in sensitivity to light scatter. This translates into a 20% improvement in the specified lower detection limit of the system from 0.5um down to 0.4um. The new electronics have also improved the dynamic range of the amplification circuit by a factor of four. This provides better resolution of defects on high scatter areas of the device like memory arrays.

Throughput of the system has been increased by roughly 15%. This has been accomplished through an improvement in the data processing speed. The systems microprocessor has been upgraded to an Intel 80486 running at 25 MHz. In automatic mode, the 7200 can scan a full 200mm wafer in less than 3 1/2 minutes (3:05 without registration, 3:20 with auto registration) and a full 150mm wafer in less than 3 minutes (2:40 without registration, 2:55 with auto registration)

Perhaps the most significant performance improvement in the Surfscan 7200 is in the area of defect capture rate. The combination of new "Periodic Feature Elimination" ("PFE") hardware and new signal processing algorithms has demonstrated an average increase of 25% in the number of defects captured on a given wafer at the same recipe settings. This increase in defect capture is a result of better characterization of the raw data generated during the scan and improved differentiation between "periodic" events (i.e., pattern) and "non-periodic" events (i.e., defects). The improvement realized on a given wafer is dependent on several factors including the die size, defect density and distribution, and on the area

inspected per die. As the PFE is exercised more extensively (e.g, higher number of die compared, higher defect density or lower area inspected) the improvement in the capture rate is increased.

The reliability of the system has been improved primarily by reducing the suceptability of the handler electronics to high levels of ESD. During certain operations, the original handler electronics were suceptable to ESD on the order of 3KeV to 5KeV. The new handler electronics can handle discharges greater than 15KeV to 20KeV during all phases of operation. The typical problem associated with the ESD suceptability has been handler vacuum errors, especially at the flat finder module and the wafer puck. Handler vacuum errors have been the top cause of system resets and service calls.

The Surfscan 7200 also includes a number of software enhancements which are geared to improve the systems utilization in production environments. The set-up of inspection recipes has been simplified for initial product level (i.e., new device) learns and a new process level learn mode has been added. The new "learn" program has been streamlined and allows the user to define the area per die to be inspected. A new algorithm then automatically determines the best gain, collection and display threshold to be used. This allows for quicker, more consistent inspection recipe set-ups.

A major improvement in the operation of the system is the addition of automatic coordinate registration. No longer is it necessary to perform manual registration scans to ensure that coordinate accuracy is maintained from scan to scan. The system is now able to "learn" the proper grid registration point and all wafers can automatically be registered without any operator intervention. The automatic registration feature provides better coordination between the Surfscan 7200 and off-line review stations and also aids in the use of the map to map comparison software in the Data Hub.

There is also a new "production" mode which streamlines the operation of the system by eliminating the "Data Edit" mode at the end of a sequence. In this production mode, the operator can not delete or save modified inspection recipes. This mode is selected using the keyswitch on the front of the system. A significant data communications enhancement is now available in an optional DECnet communications package. This package allows the Surfscan 7200 to directly send defect review files to a VAX computer.