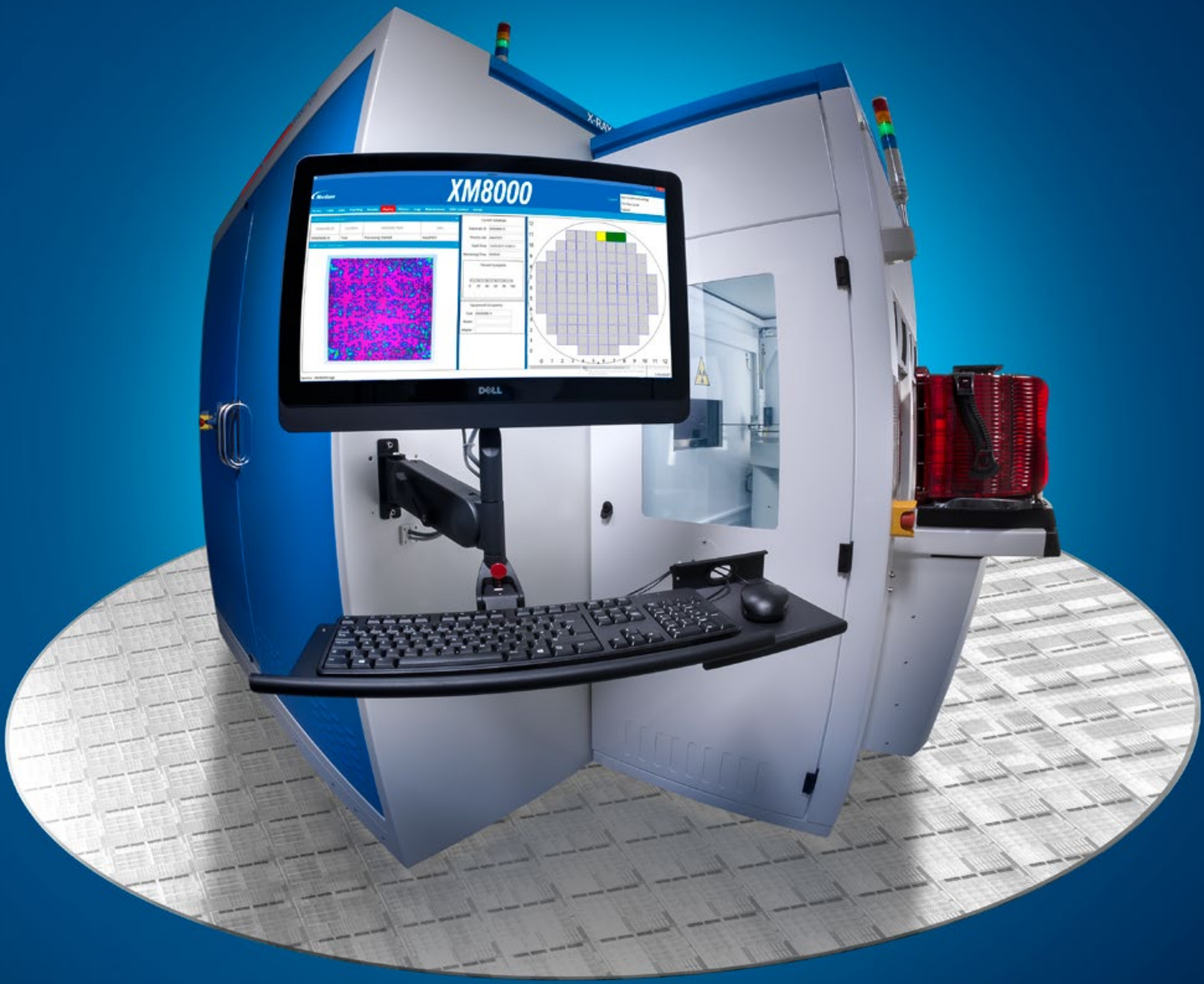
Measuring the Invisible™



Nordson XM8000™ Series

Automated X-ray Metrology

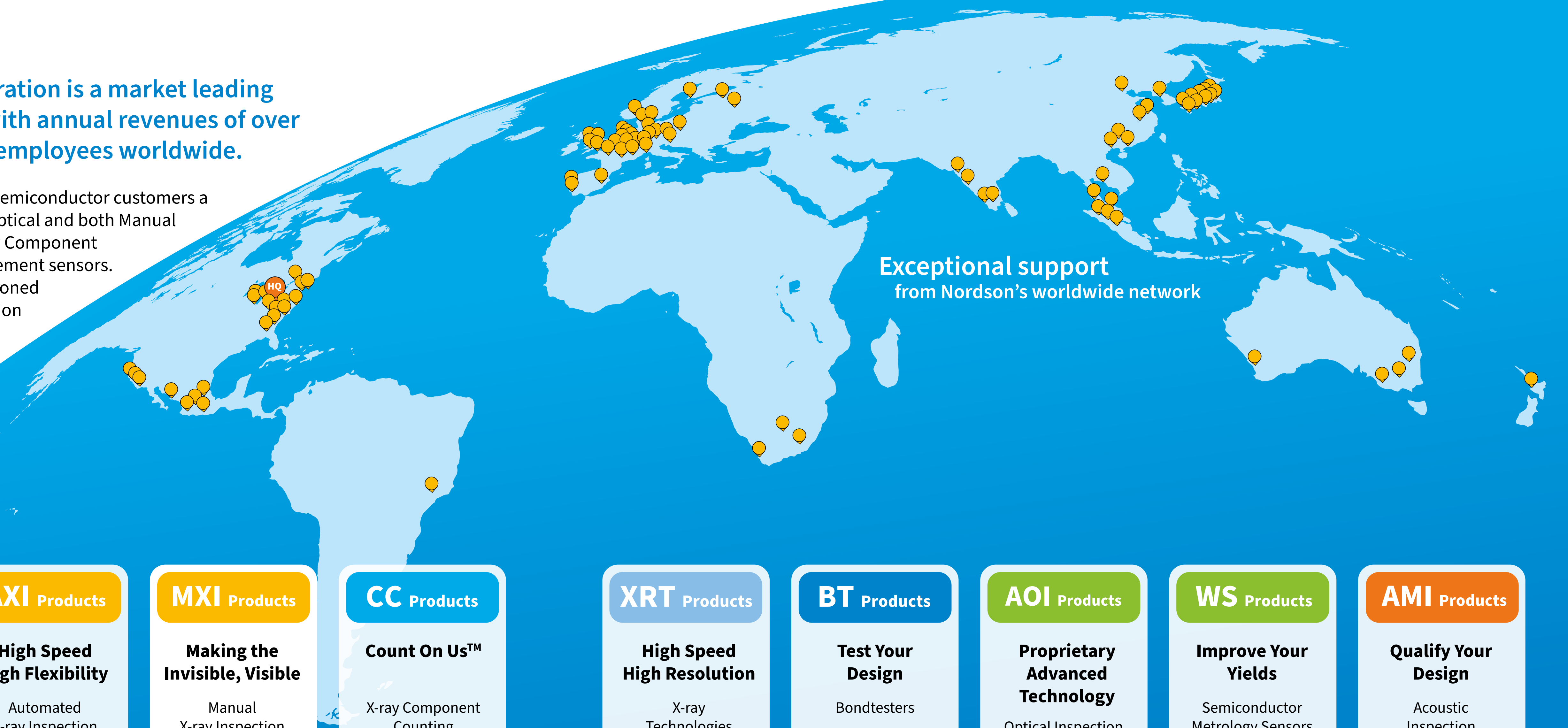
www.nordson.com/TestInspect

Nordson
TEST & INSPECTION

Nordson TEST & INSPECTION

Founded in 1954, Nordson Corporation is a market leading industrial technology company with annual revenues of over $2.1 billion and more than 7,500 employees worldwide.

Nordson TEST & INSPECTION offers its SMT & Semiconductor customers a robust product portfolio, including Acoustic, Optical and both Manual and Automated X-ray Inspection systems, X-ray Component Counting systems and Semiconductor measurement sensors. Nordson TEST & INSPECTION is uniquely positioned to serve its customers with best-in-class precision technologies, passionate sales and support teams, global reach, and unmatched consultative applications expertise.

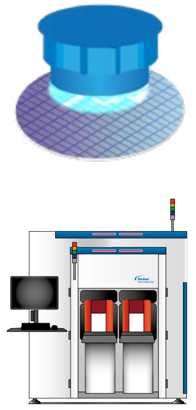


Exceptional support
from Nordson's worldwide network

AXM Products

Measuring the Invisible

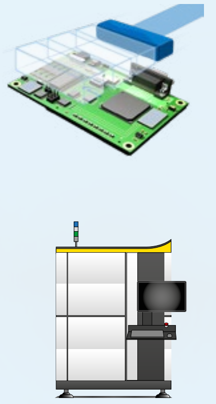
Automated
X-ray Metrology



AXI Products

High Speed High Flexibility

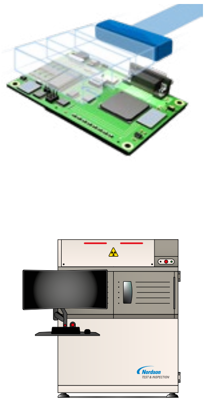
Automated
X-ray Inspection



MXI Products

Making the Invisible, Visible

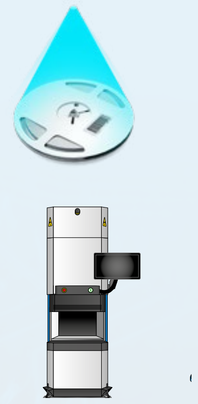
Manual
X-ray Inspection



CC Products

Count On Us™

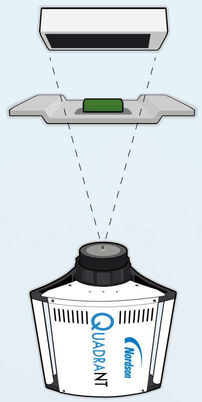
X-ray Component
Counting



XRT Products

High Speed High Resolution

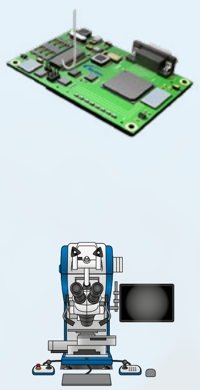
X-ray
Technologies



BT Products

Test Your Design

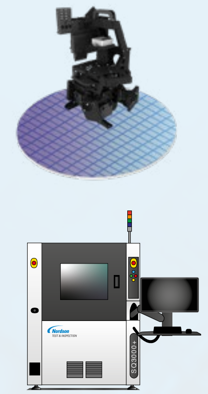
Bondtesters



AOI Products

Proprietary Advanced Technology

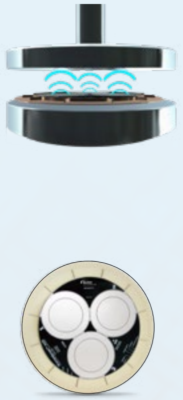
Optical Inspection
& Metrology



WS Products

Improve Your Yields

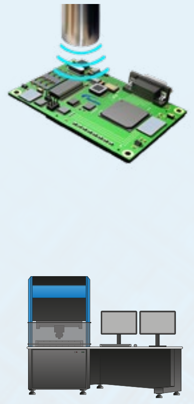
Semiconductor
Metrology Sensors



AMI Products

Qualify Your Design

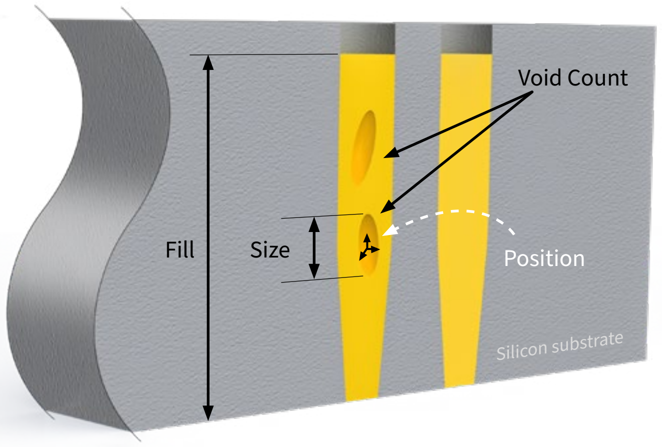
Acoustic
Inspection



Measured Solutions

TSV Metrology

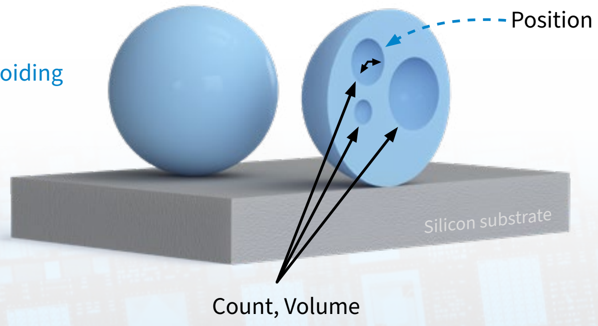
Nordson XM8000-7 delivers high throughput metrology of TSVs. Advanced 3D techniques are used to analyze shape, fill and voiding at sub-micron levels.

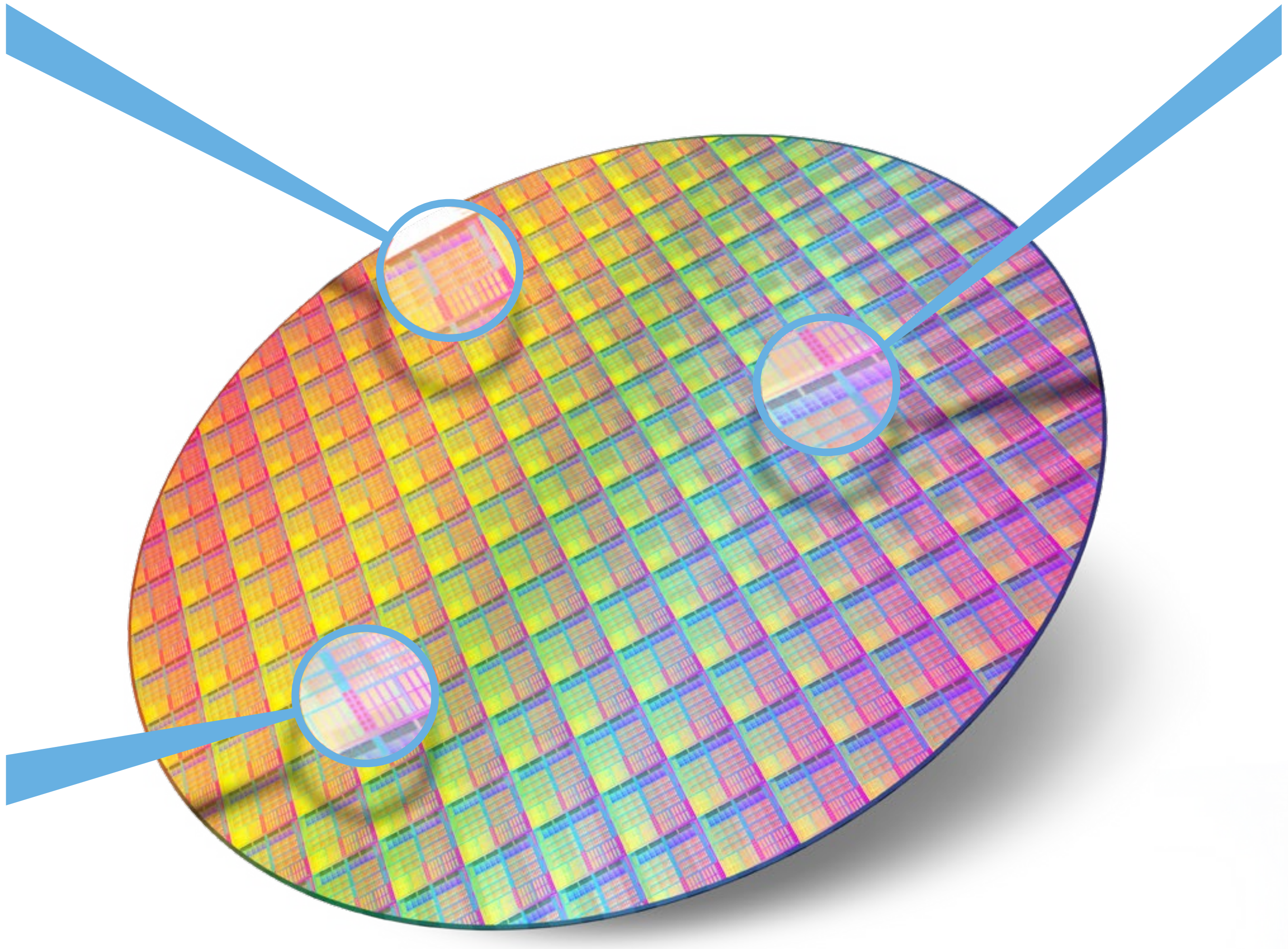


Wafer Bump Metrology

Nordson XM8000-5 measures wafer bump characterization including voiding, presence, position, shape, size and bridging. Unlike optical tools, XM8000-5 can measure voids within the wafer bump.

Presence
Profile
Position
Percentage Voiding



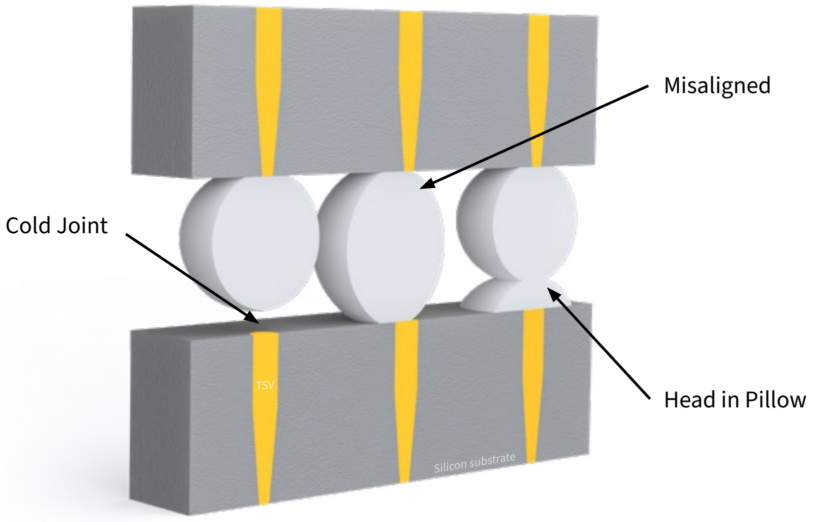


Wafer Level Packaging

Nordson XM8000 enables in depth analysis of all forms of wafer level packaging. This analysis is customized for such defects such as Cold Joints, Head in Pillow (HiP), misalignment and missing features.

The intelligent, self learning capability of XM8000 allows unrivaled detection of micro defects in complex packages.

Layer Alignment



MEMS
FPGA
RF
CIS
Memory
Photonic

Intelligent Defect Analysis

Intelligent defect measurement

The Nordson XM8000's intelligence provides optimum defect analysis, which eliminates the need for operator interpretation and minimizes false calls. As a fully automated system, exact measurement criteria are measured, reproduced and repeatable for consistent analysis across multiple sites, customized to the specific device.

Continuous learning

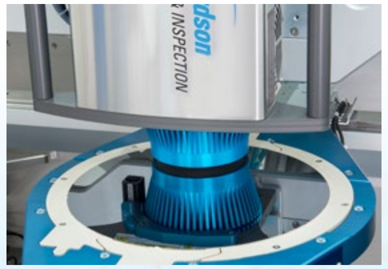
The Nordson XM8000 continuously learns so it can improve reliability and repeatability of defect recognition, further eliminating false calls.

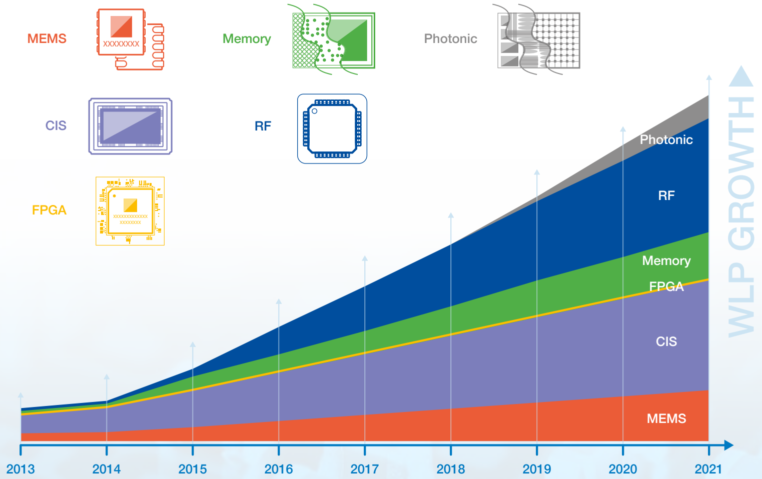
Unbeatable resolution

100nm defect recognition opens up a whole new world of X-ray metrology applications. The patented NT100M X-ray tube, unique to Nordson TEST & INSPECTION, is 10 times brighter and intrinsically more stable than conventional X-ray tubes. NT100M utilizes a LaB_6 emitter instead of the traditional tungsten filament, which typically only achieves 350nm defect recognition.

Consistency as standard

With unrivaled GR&R to less than 5%, the XM8000 utilizes the latest high resolution stages to 1um accuracy providing supreme repeatability.





TSV wafer starts, breakdown by application. Source: Yole Développement September 2016.

The semiconductor market demands increasingly complex devices that are enabled by technologies such as TSV, PoP, 2.5D and 3D integration. These complex products demand a new level of metrology. The XM8000 system delivers fully automated, non-destructive, radiation safe defect detection for all complex devices.

Device Protection

As devices become more complex and sensitive to radiation exposure, providing protection is ever more paramount. **IC-Safe Technology**, unique to Nordson TEST & INSPECTION, allows products to be safely inspected in-line without risk of radiation damage.

IC-Safe filters

Protect samples from X-ray over exposure with IC-Safe filters. Specifically designed for your application to give total peace of mind for your devices.

IC-Safe shields

When selective sampling is utilized, IC-Safe shields completely eliminate radiation exposure to all other device samples not under test.

IC-Safe Radiation Shield

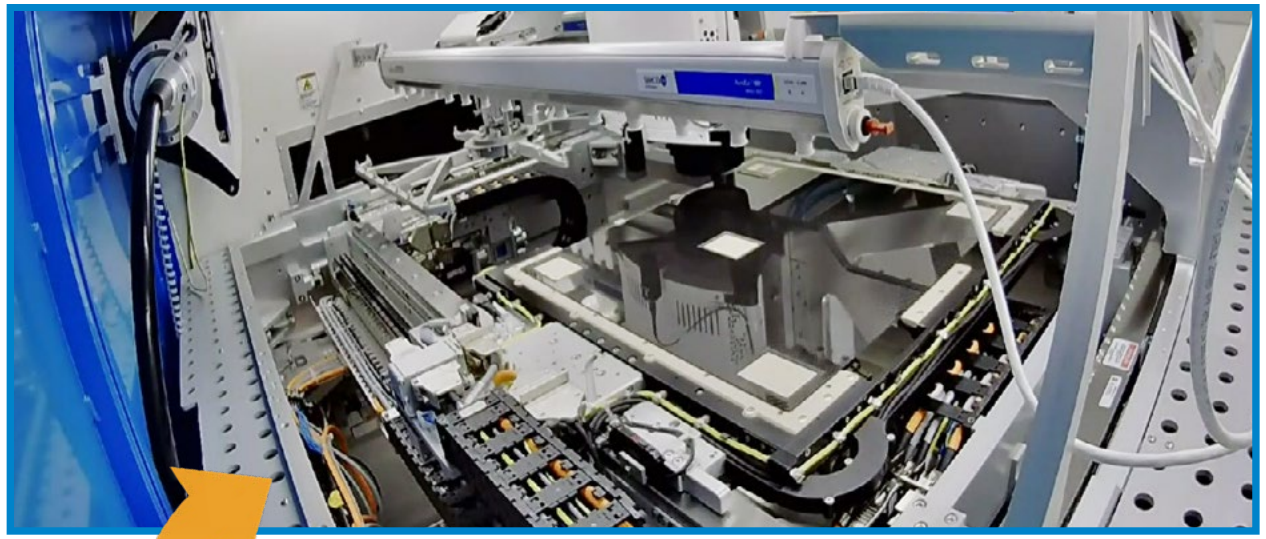
Clean by design

The Nordson XM8000 creates an ISO3 (at rest) and ISO4 (in motion) environment for your sample. Manufactured in a certified clean room environment and specifically designed for use in a semiconductor FAB, the XM8000 design has been optimized to keep your samples clean.

Panel Level Packages

The Nordson XM8000-7P is specifically designed for X-ray inspection of panel level packages with maximum panel size of 510mm x 515mm. Enabling manufacturers to identify even the smallest defects, buried inside multi-layer semiconductor panel level packages.

The 7-axis system includes a detector gimbal for 3D capabilities which is the pinnacle of accuracy for fully-automated X-ray metrology.



Upgraded Handling

The XM8000-7P and EFEM has been upgraded to support wafer panels up to 510mm x 515mm in size. The system is designed to be tolerant to 6mm panel warpage and weights up to 3kg.

Imaging Performance

The XM8000-7P has the same X-ray imaging chain as the regular 7 variant. This means there is no compromise on image quality, delivering the same levels of accuracy and precision. High resolution 3D imaging as standard down to 0.2 micrometers per pixel.

Up to 30 Times Faster

The Nordson TEST & INSPECTION XM8000 is the future of defect inspection operating 30 times faster than any conventional X-ray system.

Maximize throughput

The Nordson XM8000 performance is unbeatable in 24/7 operation. Clean room compatible and designed to S2 and S8 standards, XM8000 fully integrates into your production process further reducing unit cost.

High throughput automated sample loaders for wafers, singulated packages, tape frames and tray loaders are available.

Fully automated solution

The Nordson XM8000 is compatible with all SECS/GEM factory host systems. This guarantees completely automated processing with real time results fed back to optimize FAB performance.

Dedicated 24/7 support

Nordson TEST & INSPECTION provide around the clock support. Dedicated service support engineers maximize your system uptime.

The Nordson XM8000's robust platform will run continuously with minimum maintenance and dedicated support, maximizing your throughput.

In-Line Inspection and Metrology

Customized Solutions

The Nordson XM8000 is customized and configured for your production line.

Applications

With over 150 collective years of industry experience, our technical team develop custom algorithms to detect and measure the defects specific to your samples.

Consistent reliability

Proven consistency with unbeatable GR&R reliability at micron levels across a multitude of sample applications.

Sample handling

A comprehensive range of sample formats is supported, including wafer, tapeframe, singulated dies and panels.

Factory automation

All Nordson XM8000 systems are configured for your SECS/GEM factory host as standard.

Future proof

As your needs change in the future, Nordson TEST & INSPECTION is with you every step of the way providing continuous, customized applications support ensuring your system meets today's and tomorrow's technology.

Specifications

<table>
<tr><th></th><th>Nordson XM8000-5</th><th>Nordson XM8000-7</th><th>Nordson XM8000-7P</th></tr>
<tr><td>X-ray source</td><td colspan="3">NT100M filament free sealed transmissive</td></tr>
<tr><td>Max power</td><td>10W</td><td>10W</td><td>20W</td></tr>
<tr><td>Voltage</td><td colspan="3">30 -160KV</td></tr>
<tr><td>Feature recognition</td><td colspan="3">100nm</td></tr>
<tr><td>Lifetime</td><td colspan="3">Minimum 5000 X-ray ON hours</td></tr>
<tr><td>Detector</td><td colspan="3"></td></tr>
<tr><td>Detector type</td><td>AspireXL</td><td>Varex1512</td><td>Varex1512</td></tr>
<tr><td>Analysis techniques</td><td>2D/2.5D</td><td>2D/2.5D/3D</td><td>2D/2.5D/3D</td></tr>
<tr><td>Detector pitch</td><td>50µm</td><td>75µm</td><td>75µm</td></tr>
<tr><td>FoV range</td><td>1mm - 25mm</td><td>0.5mm - 12.5mm</td><td>0.5mm - 12.5mm</td></tr>
<tr><td>Resolution</td><td colspan="3">0.2µm/pixel - 10µm/pixel</td></tr>
<tr><td>Automation</td><td colspan="3"></td></tr>
<tr><td>Throughput</td><td>25 WPH @ 5 FOVs; 7 WPH @ 50 FOVs</td><td>7 WPH @ 5 FOVs; 1 WPH @ 50 FOVs</td><td>Up to 7 WPH (application specific)</td></tr>
<tr><td>IC-Safe compatible</td><td colspan="3">Yes</td></tr>
<tr><td>Cleanroom</td><td colspan="3">ISO3 (stationary), ISO4 (in motion)</td></tr>
<tr><td>Axes</td><td>5-axis</td><td>7-axis</td><td>7-axis</td></tr>
<tr><td>Sample loaders</td><td colspan="3">Dual port EFEM</td></tr>
<tr><td>Installation</td><td colspan="3"></td></tr>
<tr><td>Footprint</td><td colspan="2">Cabinet only: 2388mm (W) x 1895mm (D) x 2086mm (H) • Including EFEM: 2388mm (W) x 3131mm (D) x 2086mm (H)</td><td>Cabinet only - 2388mm (W) x 1895mm (D) x 2086mm (H) • Including EFEM - 2388mm (W) x 3867mm (D) x 2400mm (H)</td></tr>
<tr><td>Weight</td><td colspan="2">Cabinet 4562 kg (10058 lbs) • EFEM 543 kg (1196 lbs)</td><td>Cabinet 4562 kg (10058 lbs)
EFEM 2500 kg (5510 lbs)</td></tr>
<tr><td>Power</td><td colspan="3">200 - 230 V AC, 50/60Hz single phase with ground</td></tr>
<tr><td>Pneumatic air supply</td><td colspan="3">0.7-0.8 MPa (7-8 Bar) / <20 l/min</td></tr>
<tr><td>Vacuum required</td><td colspan="2">-65 kPa (9 psi) / 6 l/min</td><td>-100 kPa (14.5 psi) / 14 l/min</td></tr>
<tr><td>Network SECS-GEM</td><td colspan="3">Ethernet 10/100/1000 Mbit/sec, 8-Pin RJ45 with min Cat5e cable</td></tr>
<tr><td>Safety</td><td colspan="3"></td></tr>
<tr><td>X-ray leakage</td><td colspan="3">All readings below 1µSv/hour</td></tr>
</table>

For more information, speak with your Nordson representative or contact your Nordson regional office

Nordson Test & Inspection Europe, SEA, Africa
ti-sales-eu@nordson.com

Nordson Test & Inspection Americas
ti-sales-us@nordson.com

Nordson Test & Inspection China
ti-sales-cn@nordson.com

Nordson Test & Inspection Japan
ti-sales-jp@nordson.com

Nordson Test & Inspection Singapore
ti-sales-eu@nordson.com

Nordson Test & Inspection Taiwan
ti-sales-tw@nordson.com

Nordson Test & Inspection Korea
ti-sales-korea@nordson.com

Nordson Test & Inspection products are patent protected and covered by the patent listed at www.nordson.com.

BR-XM8000 19/03/2024-V2

www.nordson.com/TestInspect

Nordson
TEST & INSPECTION