Complexity Simplified

XM8000
Intelligent X-ray Metrology

www.nordson.com/TestInspect
Your Defect Detection Expert

Founded in 1961, Nordson is part of the Nordson Corporation with a revenue of over $1.8 billion and over 6,000 employees worldwide.

Based in the UK, Nordson Test & Inspection is the market leading provider of award winning X-ray inspection systems. We enable our customers to detect defects earlier in the manufacturing process to maximize product quality, ROI and reduce costs.

Over 25% of Nordson Test & Inspection employees are dedicated to Research, Design and Development. Our vertically integrated approach gives full control over all key technology components in our X-ray inspection and metrology systems.

Dedicated X-ray and Semiconductor teams have focused their expertise to create the ultimate platforms for wafer and packaging level metrology.

Measured Solutions

**TSV Metrology**

XMR8000-T TSV delivers high throughput metrology of TSVs. Advanced 3D techniques are used to analyze shape, fill and voiding at sub-micron levels.

**Wafer Bump Metrology**

XMR8000-5 WB measures wafer bump characterization including voiding, presence, position, shape, size and bridging. Unlike optical tools, XMR8000-5 WB can measure voids within the wafer bump.

**Wafer Level Packaging**

XMR8000-WLP enables in depth analysis of all forms of wafer level packaging. The analysis is customized for such defects as Cold Joints, Head in Pillow (HiP), misalignment and missing features.

The intelligent, self learning capability of XMR8000 allows unrivaled detection of micro defects in complex packages.

**Layer Alignment**

- HEMS
- FPGA
- RF
- CIS
- Memory
- Photonic
- TSV
- Wafer Bump
- Cold Joint
- Head in Pillow
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.

**Intelligent defect measurement**

The 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 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 DAGE, 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.

**Clean by design**

The XM8000 creates an ISO 1 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.

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.

**Device Protection**

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 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.

Dedicated 24/7 support
Nordson Test & Inspection provide around the clock support. Dedicated service support engineers maximize your system uptime.

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

Fully automated solution
The 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.

Customized Solutions

The 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 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 at a Glance

## XM8000 3D IC

<table>
<thead>
<tr>
<th>Feature</th>
<th>XM8000-5 WB</th>
<th>XM8000-7 TSV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tube</strong></td>
<td>NT100M filament free sealed transmissive</td>
<td>10W</td>
</tr>
<tr>
<td>Max power</td>
<td>10W</td>
<td>30 - 160KV</td>
</tr>
<tr>
<td>Voltage</td>
<td>30 - 160KV</td>
<td>100mm</td>
</tr>
<tr>
<td>Feature recognition</td>
<td>100nm</td>
<td>Minimum 5000 X-ray ON hours</td>
</tr>
<tr>
<td>Lifetime</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Detector

<table>
<thead>
<tr>
<th>Feature</th>
<th>XM8000-5 WB</th>
<th>XM8000-7 TSV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detector type</td>
<td>Flat Panel or Compact Flat Panel</td>
<td>Flat Panel</td>
</tr>
<tr>
<td>Analysis techniques</td>
<td>2D/2.5D/3D</td>
<td>2D/2.5D</td>
</tr>
<tr>
<td>Detector pitch</td>
<td>75µm</td>
<td>1-50mm</td>
</tr>
<tr>
<td>FoV range</td>
<td>Application Specific</td>
<td>Flat Panel</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.18µm/pixel - 10µm/pixel</td>
<td></td>
</tr>
</tbody>
</table>

## Automation

<table>
<thead>
<tr>
<th>Feature</th>
<th>XM8000-5 WB</th>
<th>XM8000-7 TSV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughput</td>
<td>Minimum 25 WPH*</td>
<td>50 WPH*</td>
</tr>
<tr>
<td>IC-Safe compatible</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Manipulator speed</td>
<td>1m/sec</td>
<td></td>
</tr>
<tr>
<td>Axes</td>
<td>Application Specific 5 or 7-axis</td>
<td>Application Specific 7-axis</td>
</tr>
<tr>
<td>Sample loaders</td>
<td>Application Specific</td>
<td>Application Specific</td>
</tr>
</tbody>
</table>

## Installation

<table>
<thead>
<tr>
<th>Feature</th>
<th>XM8000-5 WB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footprint</td>
<td>2294 W x 1895 D x 2068 H (mm) for X-ray cabinet only</td>
</tr>
<tr>
<td>Weight</td>
<td>4562Kg (10058 lb) for X-ray cabinet only</td>
</tr>
<tr>
<td>Power</td>
<td>200 - 230 V AC, 50/60Hz single phase with ground</td>
</tr>
<tr>
<td>Pneumatic air supply</td>
<td>0.7-0.8 MPa (7-8 Bar) / &lt;20 l/min</td>
</tr>
<tr>
<td>Vacuum required</td>
<td>-65 kPa (9 psi) / 6 l/min</td>
</tr>
<tr>
<td>Network SECS-GEM</td>
<td>Ethernet 10/100 Mbit/sec, 8-Pin RJ45 with min Cat5e cable</td>
</tr>
</tbody>
</table>

## Safety

<table>
<thead>
<tr>
<th>Feature</th>
<th>XM8000-5 WB</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray leakage</td>
<td>All readings below 1µSv/hour</td>
</tr>
</tbody>
</table>

*300mm Wafer Bump example, 5-site measurement, minimum 50 bumps / site, single wafer loading

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

- **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 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

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