Complexity Simplified

XM8000

Intelligent X-ray Metrology

Nordson
DAGE

Your Defect Detection Expert

Founded in 1961, Nordson DAGE 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 DAGE 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 DAGE 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 expertize to create the ultimate platforms for wafer and packaging level metrology.

Complexity Simplified

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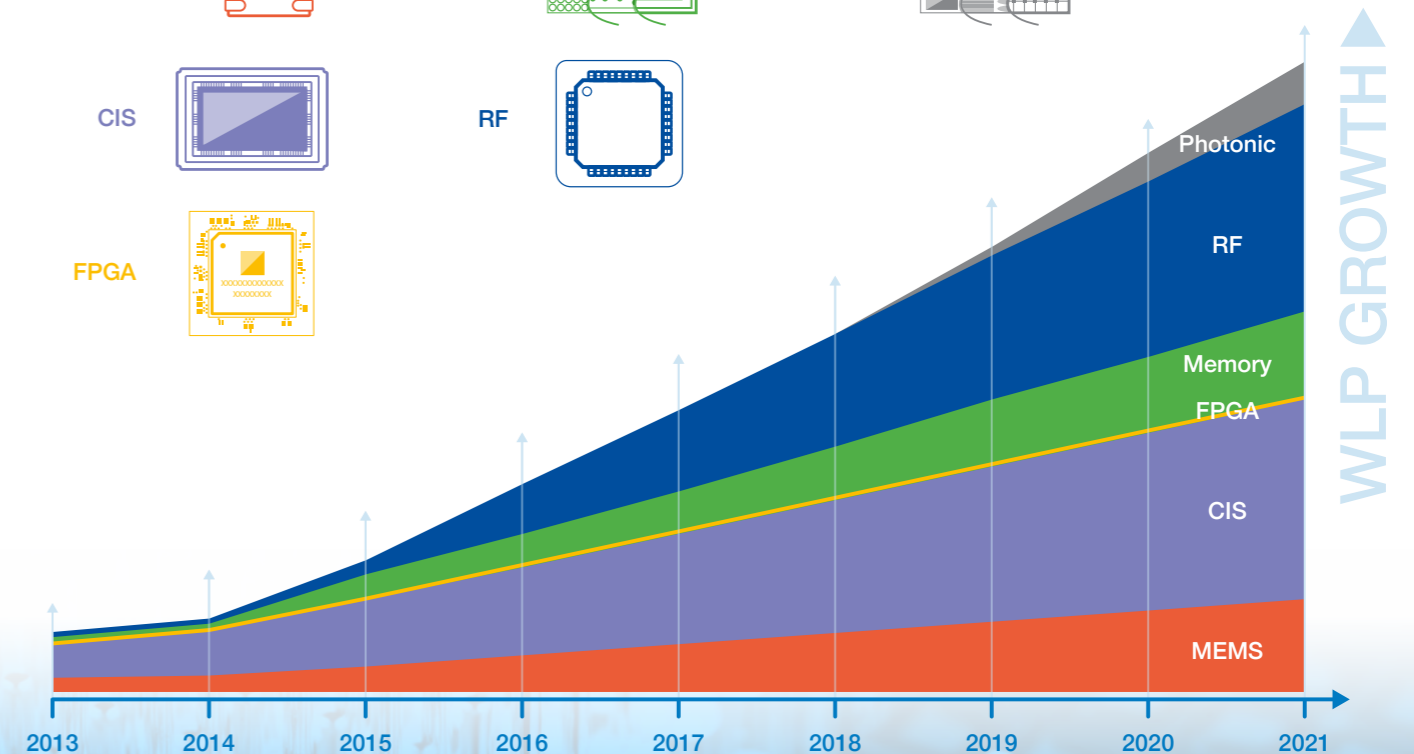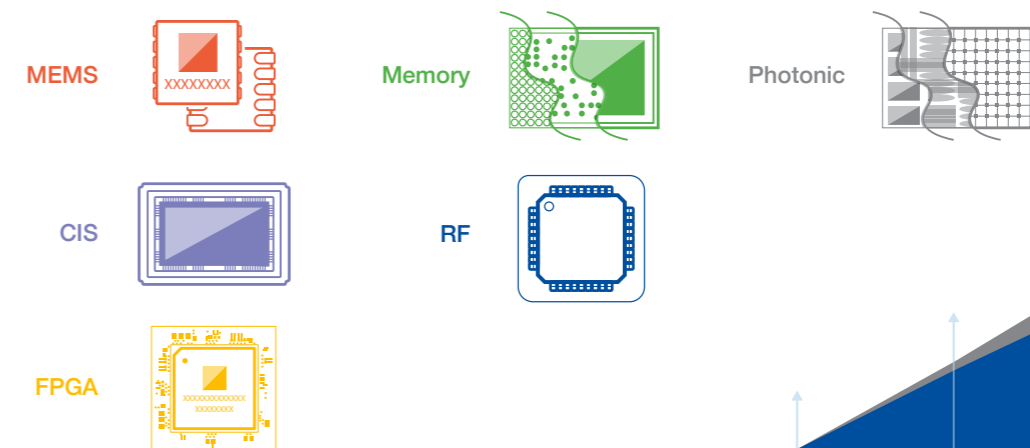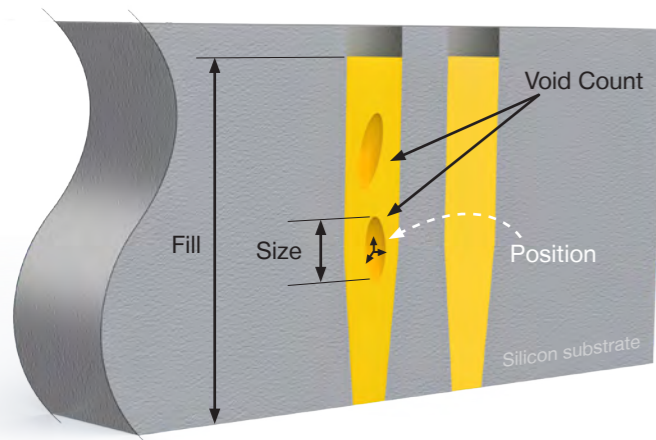
TSV wafer starts, breakdown by application. Source: Yole Dévelopment September 2016.

Measured Solutions

TSV Metrology

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

Void Count

Fill Size Position

Silicon substrate

Wafer Bump Metrology

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

Presence
Profile
Position
Percentage Voiding

Position

Silicon substrate

Count, Volume
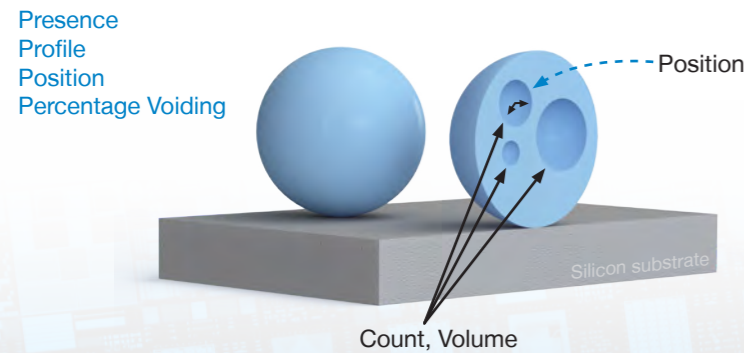
Wafer Level Packaging

XM8000-WLP 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

Misaligned

Cold Joint

Head in Pillow

Silicon substrate

MEMS

FPGA

RF

CIS

Memory

Photonic
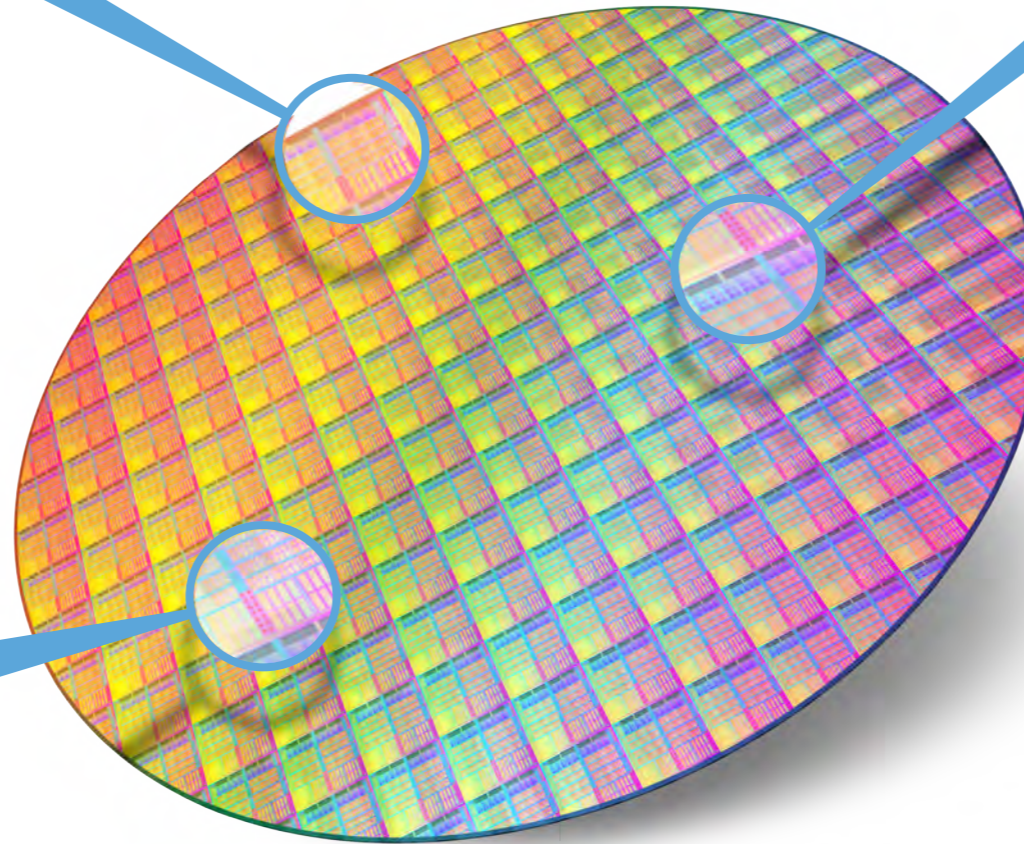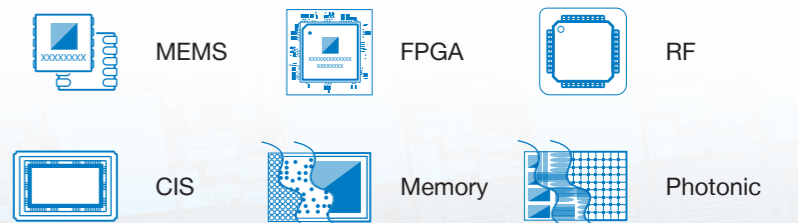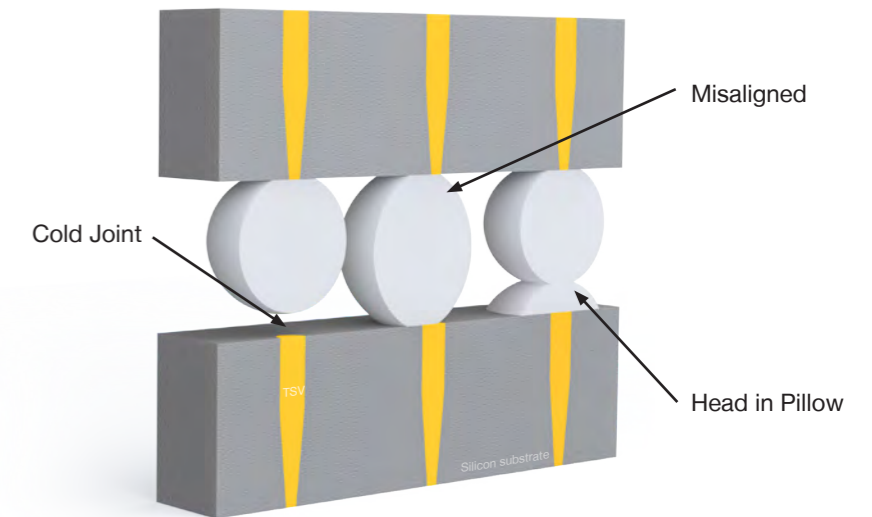
Intelligent Defect Analysis

Device Protection

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.

As devices become more complex and sensitive to radiation exposure, providing protection is ever more paramount. **IC-Safe Technology**, unique to Nordson DAGE, 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 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.

Up to 30 Times Faster

Customized Solutions

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

The XM8000 is customized and configured for your production line.

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.

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.

Dedicated 24/7 support

Nordson DAGE 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.

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 DAGE is with you every step of the way providing continuous, customized applications support ensuring your system meets today's and tomorrow's technology.

In-Line Inspection and Metrology

Specifications at a Glance

	XM8000 3D IC	XM8000-5 WB	XM8000-7 TSV
Tube	NT100M filament free sealed transmissive		
Max power	10W		
Voltage	30 -160KV		
Feature recognition	100nm		
Lifetime	Minimum 5000 X-ray ON hours		
Detector			
Detector type	Flat Panel or Compact Flat Panel	Flat Panel	Compact Flat Panel
Analysis techniques	2D/2.5D/3D	2D/2.5D	2D/2.5D/3D
Detector pitch	75µm		
FoV range	Application Specific	1-50mm	0.5mm - 25mm
Resolution	0.18µm/pixel - 10µm/pixel		
Automation	Sample Specific		
Throughput	Minimum 25 WPH*		
IC-Safe compatible	Yes		
Manipulator speed	1m/sec		
Axes	Application Specific 5 or 7-axis	5-axis	7-axis
Sample loaders	Application Specific		
Installation			
Footprint	2294 W x 1895 D x 2068 H (mm) for X-ray cabinet only		
Weight	4562Kg (10058 lb) for X-ray cabinet only		
Power	200 - 230 V AC, 50/60Hz single phase with ground		
Pneumatic air supply	0.7-0.8 MPa (7-8 Bar) / <20 l/min		
Vacuum required	-65 kPa (9 psi) / 6 l/min		
Network SECS-GEM	Ethernet 10/100 Mbit/sec, 8-Pin RJ45 with min Cat5e cable		
Safety			
X-ray leakage	All readings below 1µSv/hour		

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

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