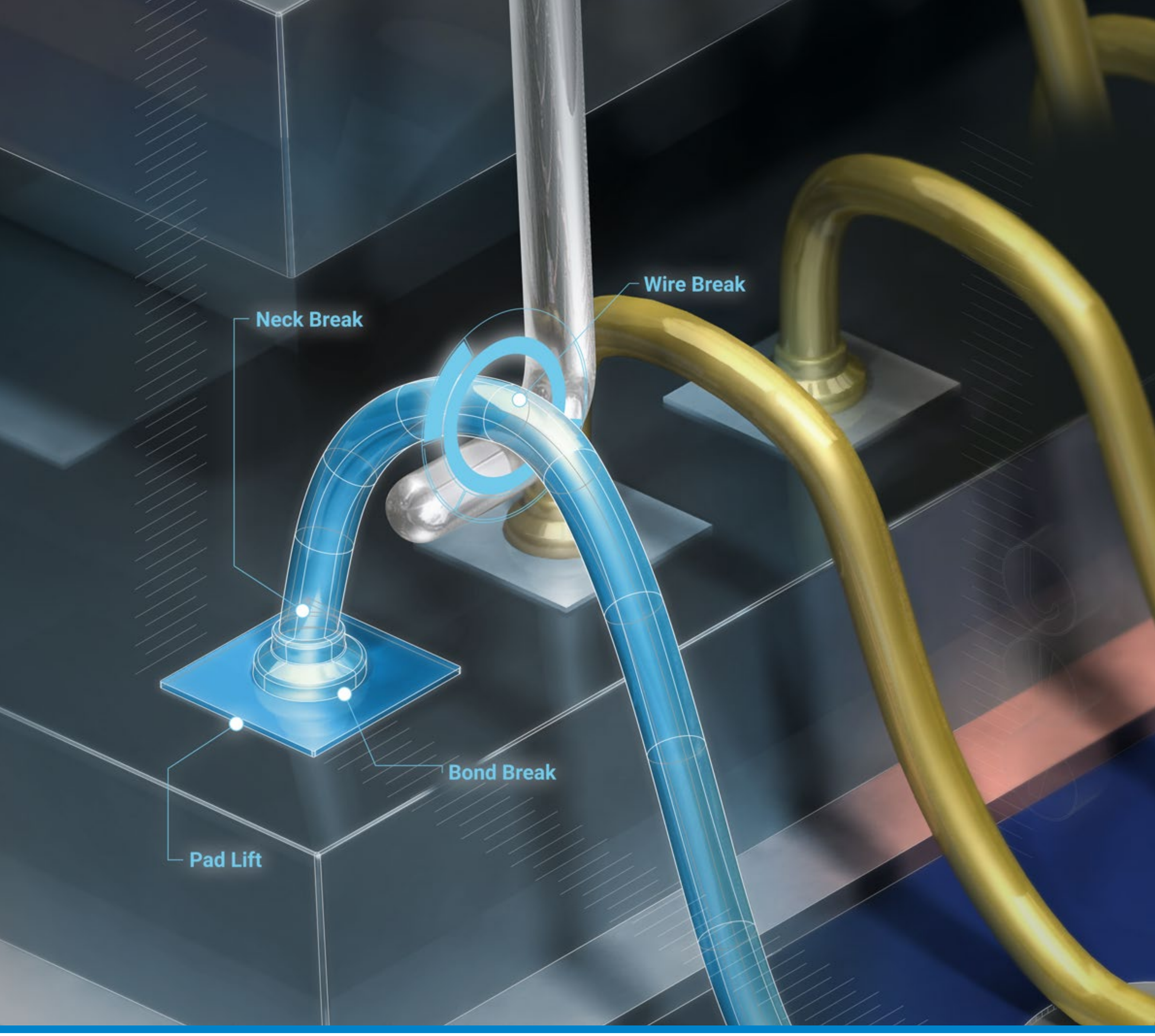


BT Products Portfolio

Bond Testers

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.

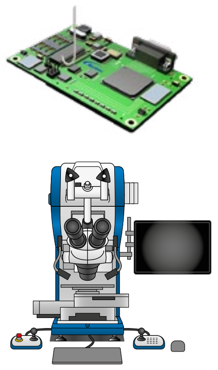
Nordson Test & Inspection offers its SMT & Semiconductor customers a robust product portfolio, including Acoustic, Optical and both Manual and Automated X-ray Inspection systems, X-ray Component Counting systems and Semiconductor measurement sensors. Nordson Test & Inspection is uniquely positioned to 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

BT Products

Test Your Design

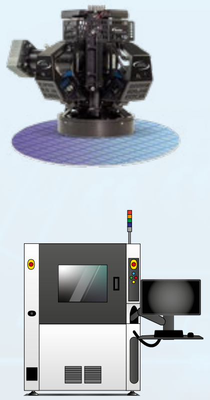
Bondtesters



AOI Products

Proprietary Advanced Technology

Optical Inspection & Metrology



WS Products

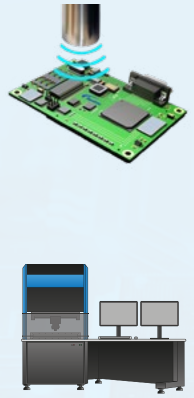
Improve Your Yields

Semiconductor Metrology Sensors

AMI Products

Qualify Your Design

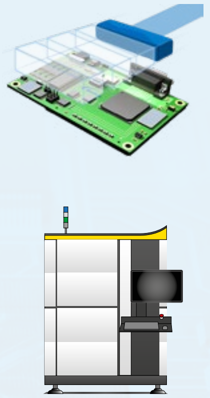
Acoustic Inspection



AXI Products

High Speed High Flexibility

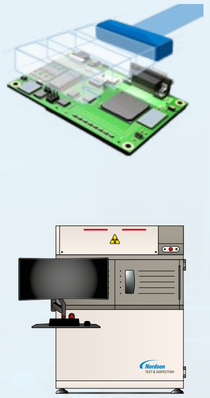
Automated X-ray Inspection



MXI Products

Making the Invisible, Visible

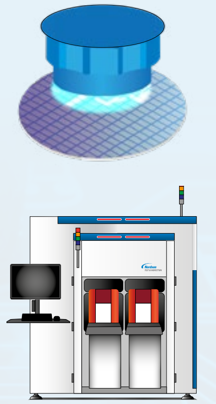
Manual X-ray Inspection



AXM Products

Measuring the Invisible

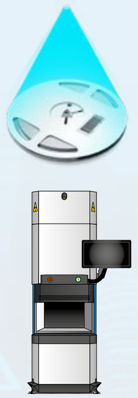
Automated X-ray Metrology



CC Products

Maximize Efficiency

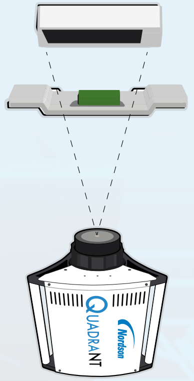
X-ray Component Counting



XT Products

High Speed High Resolution

X-ray Technologies



Pioneers of Bond Testing

1960s

DAGE established

First dedicated Bondtesters introduced

BST12 pull system launched with pull capability up to 100g

1970s

Introduction of Bondtesters with selectable destruct and non-destruct modes

Adjustable load rate introduced

1980s

MCT20/22 introduces microprocessor control

First intelligent tool landing and ball shear

BT22A increases load range to 20kg

1990s

First PC controlled Bondtester, the PC2400

Hot bump pull load cartridge invented by DAGE

Industry standard 4000 Bondtester launched

Series 5000 launched pioneering 25µm ultra-fine pitch

2000s

Cold bump pull test patented by DAGE

Nordson acquires DAGE

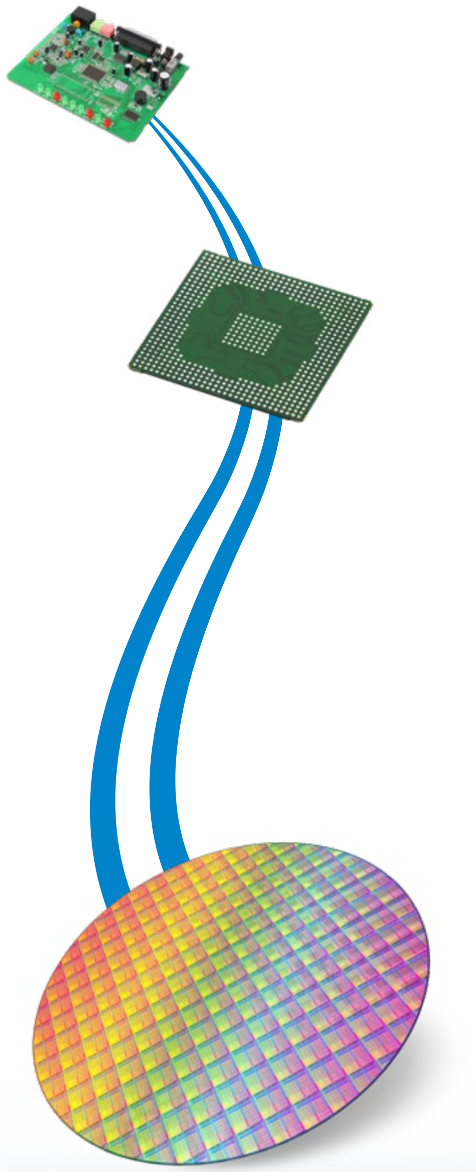
Rotating shear load cartridge introduced

2010

4000Plus Bondtester launched, industry first dual Bondtester and Micro-materials tester

Paragon™ software introduces camera assist automation

4800 INTEGRA™ with EFEM integration and SECS/GEM



Complete Integration

For over fifty years Nordson has been the market leading provider of award winning Bond Test Systems.

Produced at our state of the art production facility in Aylesbury, UK and engineered for excellence to ensure ultimate accuracy and repeatability, Nordson Bondtesters are at the forefront of technology to meet the wide range of applications required by our customers.

QUALITY Nordson TEST & INSPECTION SERVICE

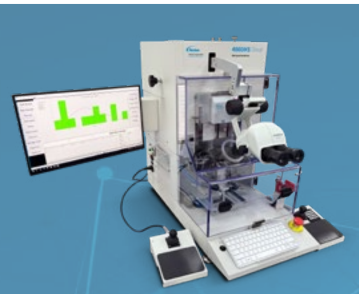
QUALITY Nordson TEST & INSPECTION PARTS

The Right Product for the Right Application

Bond Testing

Production

4000HS Shear



High Speed Bondtester

STELLAR 4000

The Gold Standard Bondtester

4000PLUS

Advanced Bondtester

Automated Bond Testing

Operator-Free

4600

Automated Bondtester

4600-W

Non-Contact Wafer Bondtester

4800

Automated Wafer Bondtester

4800 Integra Plus

CLEAN ROOM

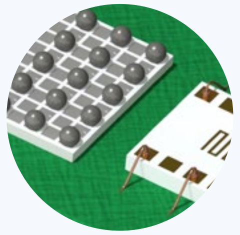
Factory Integrated Wafer Bondtester

High Speed - 4000HS Shear

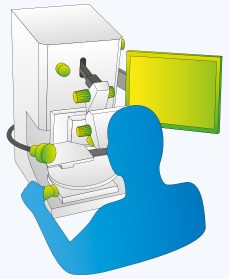
Fast set-up, easy to learn, maximum comfort.

> “I spend a lot of time manually testing.
> I chose the 4000HS Shear as it is the most ergonomic and easy-to-use system.”

Simple PCBAs and components



Ergonomic and easy-to-use



High precision

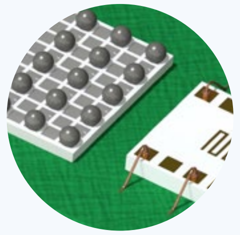
✓ ✓ ○ ○

Gold Standard - STELLAR 4000

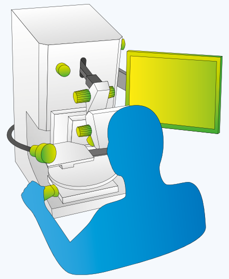
Fast set-up, easy to learn, maximum comfort.

> “I spend a lot of time manually testing.
> I chose the STELLAR 4000 as it is the most ergonomic and easy-to-use system.”

Simple PCBAs and components



Ergonomic and easy-to-use



High precision

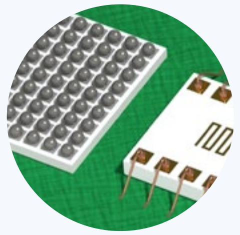
✓ ✓ ○ ○

Advanced Bondtester - 4000Plus

Superior accuracy for complex samples and advanced test types.

> “My samples are complex with a wide variety of components. The 4000Plus gives me the accuracy and flexibility I need.”

Complex and high density components



High accuracy and high flexibility

Very high precision

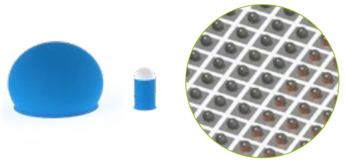
✓ ✓ ✓ ○

Test More With Automation

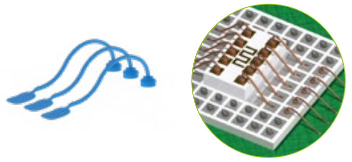
For the most complex devices with a high density of bumps or very fine pitch wires, automation is the only way to ensure maximum test accuracy.

Automation gives you the precision required to achieve the highest data integrity, test after test.

Small dimensions
High density



Complex product
Fine pitch



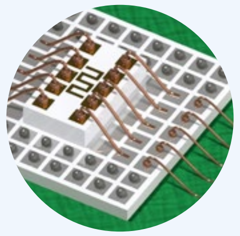
	Manual	4600	Handler Wafer / Lead Frame
Test repeatability	Rotary encoders	High resolution linear encoders	
Data integrity	Operator alignment	Fiducial recognition alignment	Fiducial recognition + OCR
Test procedure	Operator control	Automatic test	
Product safety	Manual load / unload		Automatic load / unload
Throughput and ROI	Variable (operator dependent)	✓ ✓ ✓ ○	✓ ✓ ✓ ✓

Automated Testing - 4600 Series

Maximum repeatability for the most demanding applications.

My interconnects are extremely small and it is crucial to remove operator influence. The 4600 allows me to test a whole batch at once.

Highest complexity products



Maximum repeatability and accountability

Ultimate precision

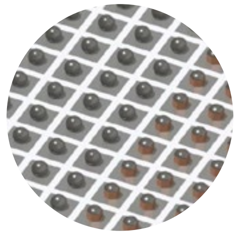
✓ ✓ ✓ ✓

Wafer Solution - 4600-W

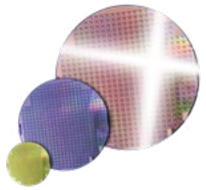
High precision automated wafer handling with OCR.

“ My wafers have sensitive fine pitch bumps and it’s too easy to damage them. 4600-W gives me peace of mind with zero broken wafers. ”

Micro-bumps, micro pillars



50mm - 250mm wafers



Extreme precision

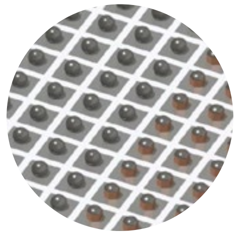
✓ ✓ ✓ ✓ ✓

Robotic handler

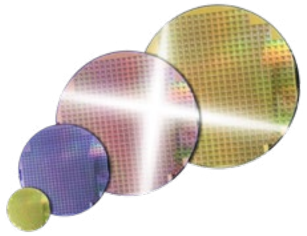
Dedicated Wafer Tester - 4800

High density interconnect quality control.

Micro-bumps, micro pillars



50mm - 300mm wafers



Ultimate precision

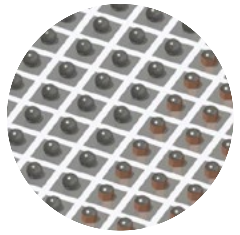
✓ ✓ ✓ ✓

> “I perform fine pitch testing on bumps and pillars for a range of wafer sizes. The 4800 even handles my extremely warped wafers.”

4800 Integra Plus

Integrated wafer handling that’s clean room compatible.

Micro-bumps, micro pillars



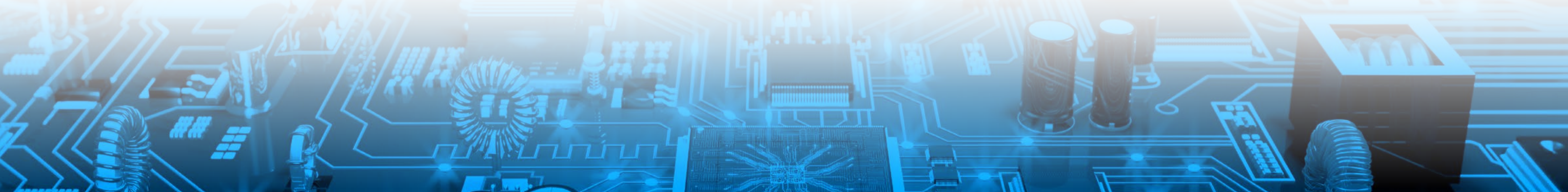
Island of automation

Extreme precision

✓ ✓ ✓ ✓ ✓

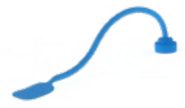
Robotic handler

> “I test a high volume of wafers and achieve the highest throughput with the 4800 Integra Plus. It’s fire and forget so I can be more efficient.”



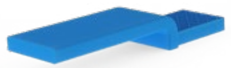
Find Every Failure

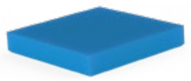
Test Components


Wirebond


Solder Ball


Ribbon


Tab

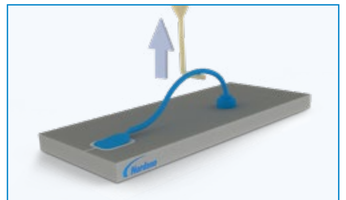

Die


Surface Mount Device

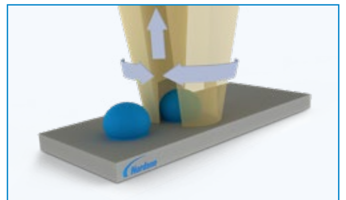

Surface Pad


Micro-pillar

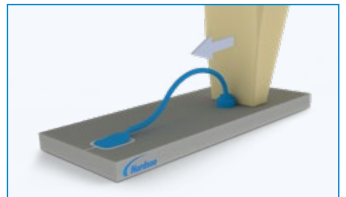
Standard Pull Tests

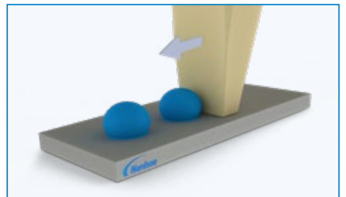

Wirebond Pull


Ribbon Pull


Cold Bump Pull

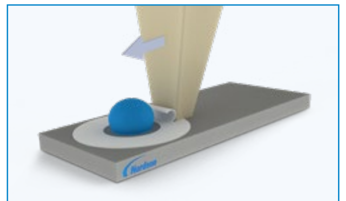
Standard Shear Tests

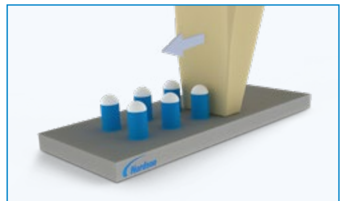

Wirebond Shear

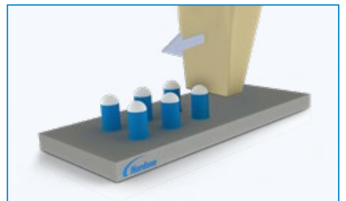

Ball Shear

Advanced Tests

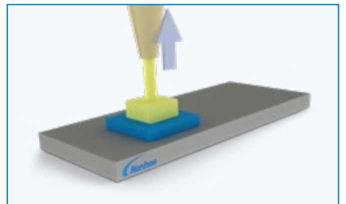
Variable heights and dimensions.

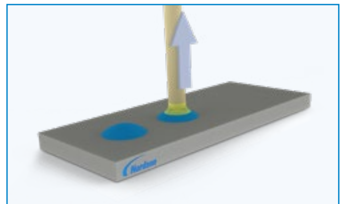

Passivation Shear

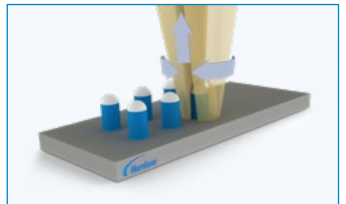

Micro-pillar Shear (base)


Micro-pillar Shear (cap)

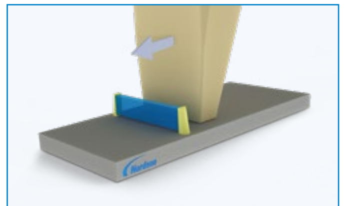
For difficult to grip or small dimensions.

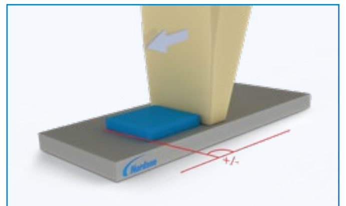

Stud Pull

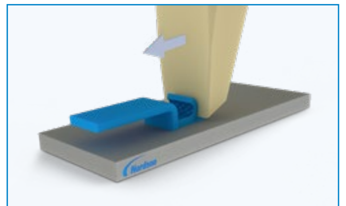

Hot Bump Pull

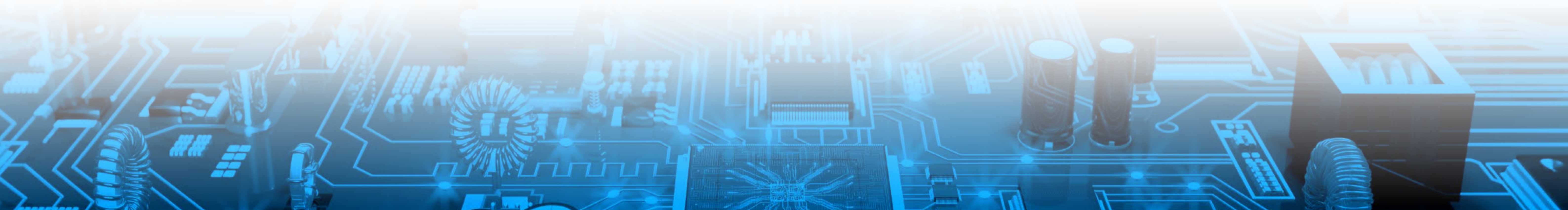

Micro-pillar Pull

Larger components and higher forces.


Surface Mount Device Shear

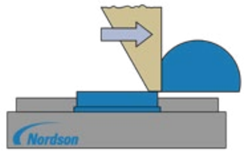
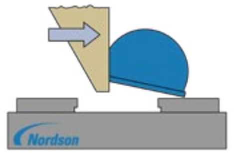
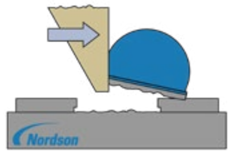
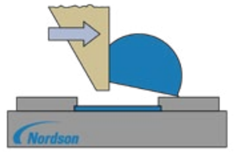
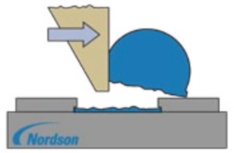
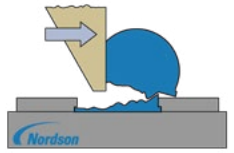

Die Shear


Tab Bond Shear

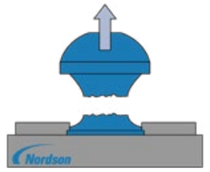
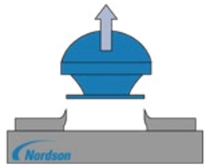
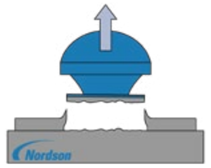
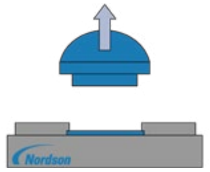
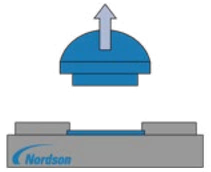
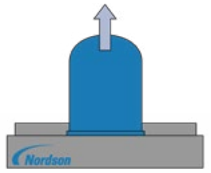


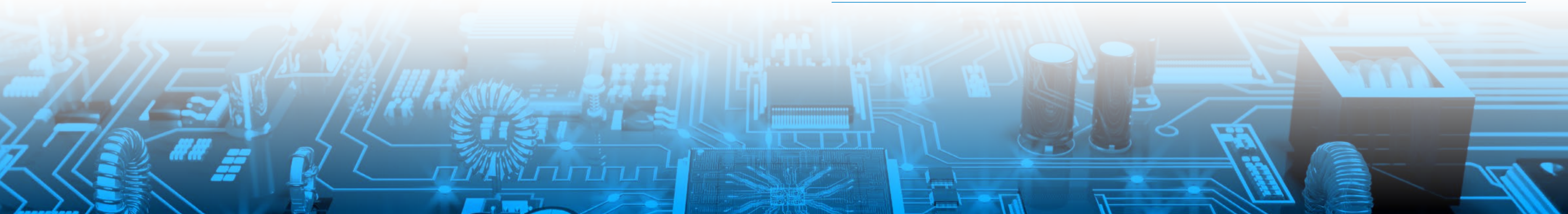
Bond Test Failure Modes

Solder Ball Shear Testing

Failure Mode	Description	Illustration
Ductile	Solder ball fracture at or above the surface of the solder mask within the bulk solder material.	
Pad Lift	Solder pad lifts with solder ball; lifted pad may include ruptured base material.	 Pad separation at base material or  Lifted pad includes ruptured base material
Ball Lift	Solder ball lifts from pad; pad is not completely covered by solder/intermetallic and the top surface of the pad plating is exposed.	
Interfacial Break	The break is at the solder/intermetallic interface or intermetallic/base metal interface. The interfacial fracture may extend across the entire pad or be the dominant failure mode at the tool contact region.	 100% interfacial fracture or  Dominant failure mode at tool contact is interfacial fracture

Solder Ball Pull Testing

Failure Mode	Description	Illustration
Type A: Ductile	A – Ductile: Solder ball fracture at or above the surface of the solder mask within the bulk solder material.	 
Type B: Quasi-Ductile	B – Quasi-Ductile: Mixed ductile/brittle fracture with the dominant failure mode (>50% area) being ductile.	
Type A: Pad Lift Or Type B: Pad Crater	A – Pad Lift: Solder pad lifts with solder ball. B – Pad Crater: Lifted pad includes ruptured base material.	 Pad Lift  Pad Crater
Non-wet	Solder ball lifts from pad and any portion of the pad top-surface plating is exposed.	
Type A: Brittle	A – Brittle: The break is at the solder/intermetallic interface or intermetallic/base metal interface.	 
Type B: Quasi-Brittle	B – Quasi-Brittle: Mixed brittle/ductile fracture with the dominant failure mode (>50% area) being brittle.	
Ball Extrusion	Solder ball is stretched but not fractured. Invalid failure – repeat test with replacement solder ball samples after appropriate adjustments.	



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

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