

Bond Testing

Find Every Failure™

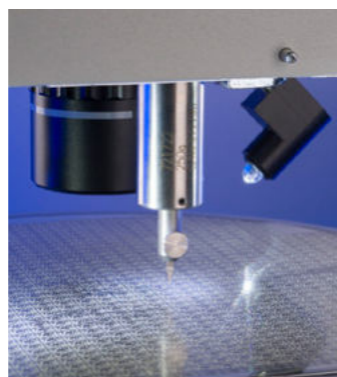
www.nordson.com/TestInspect

Nordson
TEST & INSPECTION

Complete Integration

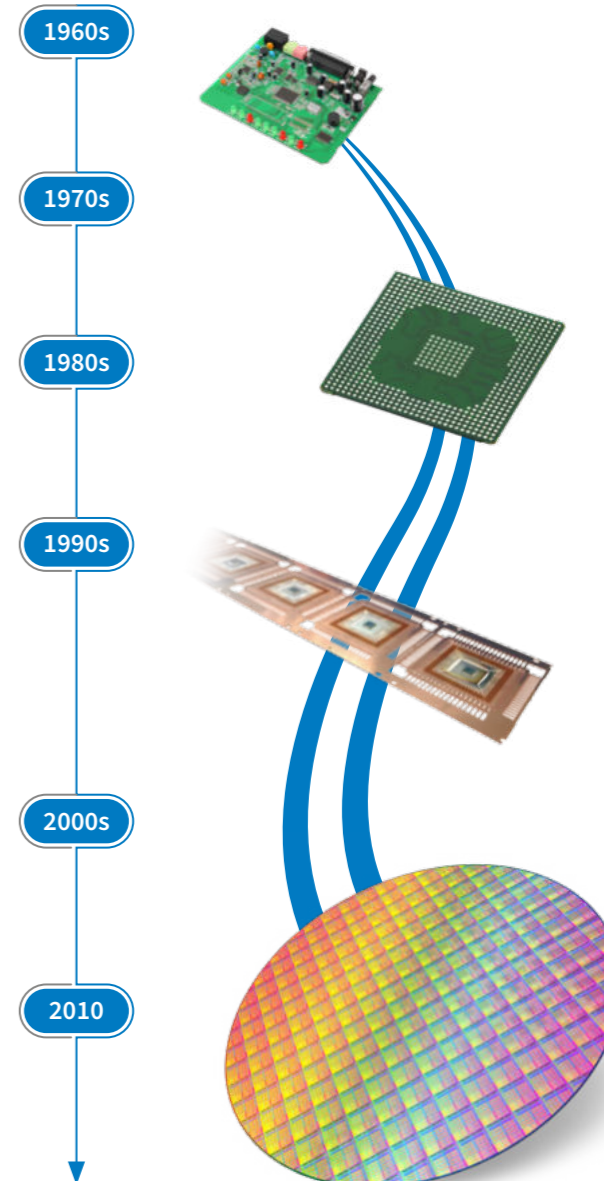
For over fifty years Nordson has been the market leading provider of award winning Bond Test Systems.

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.



Pioneers of Bond Testing



- DAGE established
- First dedicated Bondtesters introduced
- BST12 pull system launched with pull capability up to 100g
- Introduction of Bondtesters with selectable destruct and non-destruct modes
- Adjustable load rate introduced
- MCT20/22 introduces microprocessor control
- First intelligent tool landing and ball shear
- BT22A increases load range to 20kg
- 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
- Cold bump pull test patented by DAGE
- Nordson acquires DAGE
- Rotating shear load cartridge introduced
- 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



The Right Product for the Right Application



Production

4000PLUS

Advanced Bondtester

STELLAR 4000

The Gold Standard Bondtester

Bond Testing

Operator-Free

4600-W




Non-Contact Wafer Bondtester

4600



Automated Bondtester

4800



Automated Wafer Bondtester

4800 INTEGRA™



CLEAN ROOM

Factory Integrated Wafer Bondtester

Automated Bond Testing

Gold Standard Bondtester - STELLAR 4000

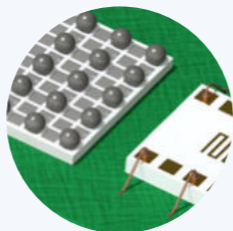
Advanced Bondtester - 4000Plus

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

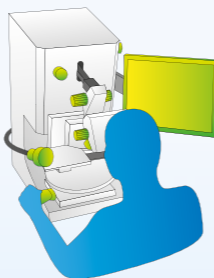


“ I spend a lot of time manually testing. I chose the STELLAR 4000 as it is the most ergonomic and easy-to-use system. ”

Simple PCBAs and components



Ergonomic and easy-to-use



High precision

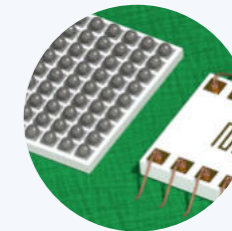


Superior accuracy for complex samples and advanced test types.



“ 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

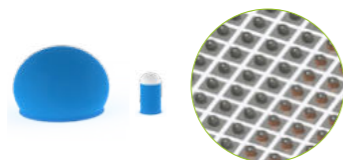


Test More With Automation

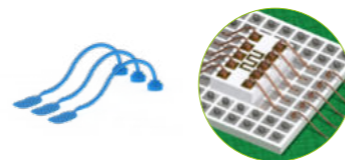
For the most complex devices with a high density of bumps or very fine pitch wires, automation is the only way to ensure maximum test accuracy.

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

Small dimensions
High density



Complex product
Fine pitch



Automated Testing - 4600 Series

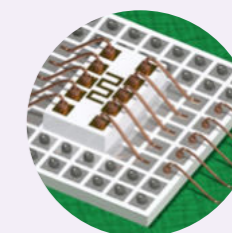
Maximum repeatability for the most demanding applications.



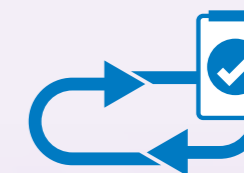
My interconnects are extremely small and it is crucial to remove operator influence. The 4600 allows me to test a whole batch at once.

	Manual	4600	Handler <small>Wafer / Lead Frame</small>
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)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

Highest complexity products



Maximum repeatability and accountability



Ultimate precision

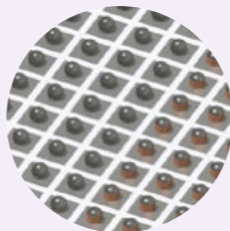


Wafer Solution - 4600-W

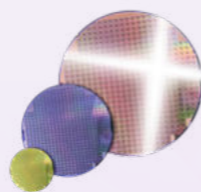
High precision automated wafer handling with OCR.



Micro-bumps, micro pillars



50mm - 250mm wafers



Extreme precision



Robotic handler

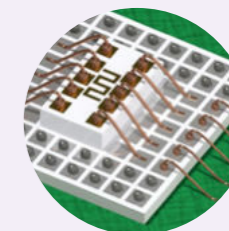
“ My wafers have sensitive fine pitch bumps and it’s too easy to damage them. 4600-W gives me peace of mind with zero broken wafers. ”

Leadframe Solution - 4600-LF

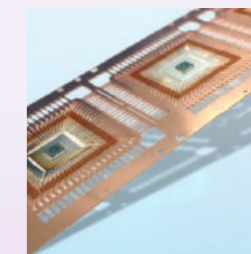
High precision automated leadframe handling with OCR.



Fine pitch wires and bumps



25 - 100 mm wide, 100 - 320 mm long strips



Extreme precision



Robotic handler

“ My product is flexible and high density, it can only be handled by a robot. 4600-LF guarantees more repeatable test results. ”

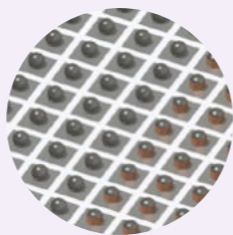
Dedicated Wafer Tester - 4800

High density interconnect quality control.

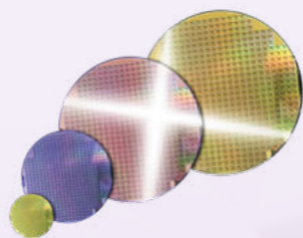


“ I perform fine pitch testing on bumps and pillars for a range of wafer sizes. The 4800 even handles my extremely warped wafers. ”

Micro-bumps, micro pillars



50mm - 300mm wafers

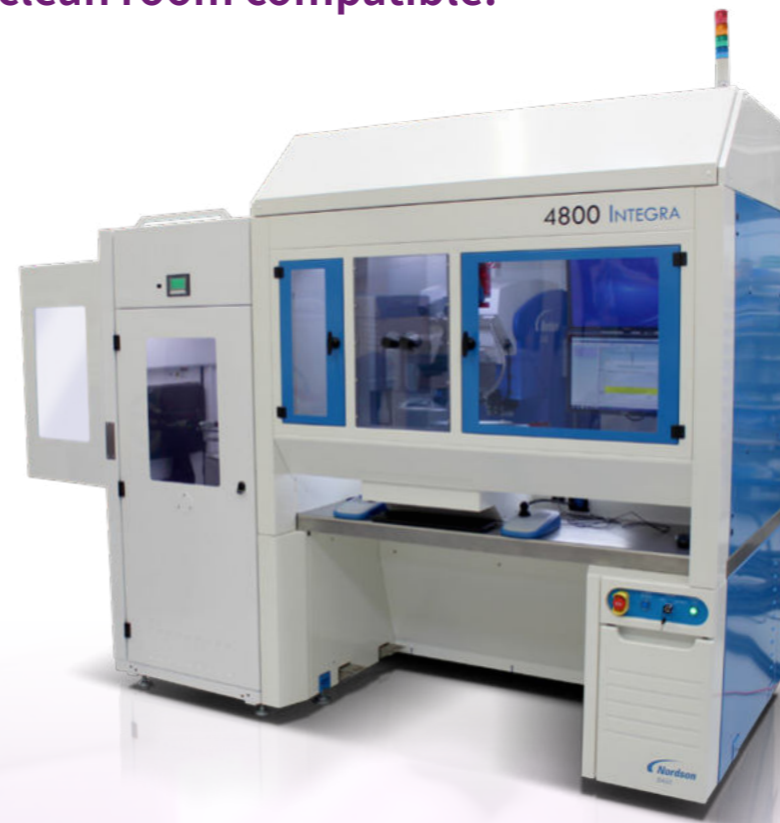


Ultimate precision

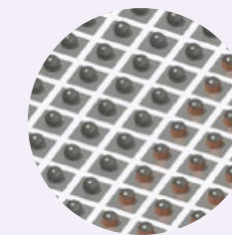


Semiconductor Wafer Tester - 4800 INTEGRA™

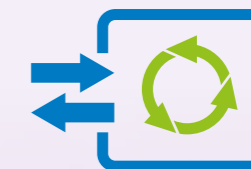
Integrated wafer handling that's clean room compatible.



Micro-bumps, micro pillars



Island of automation



Extreme precision

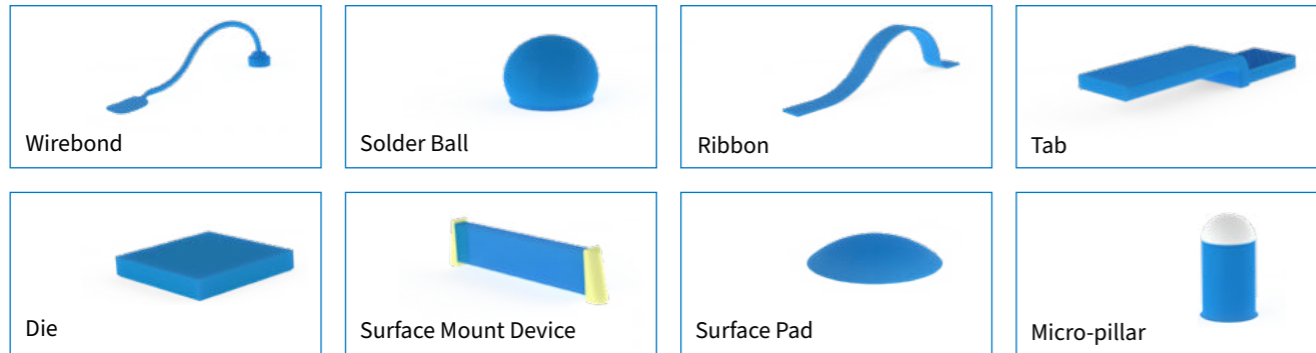


Robotic handler

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

Find Every Failure

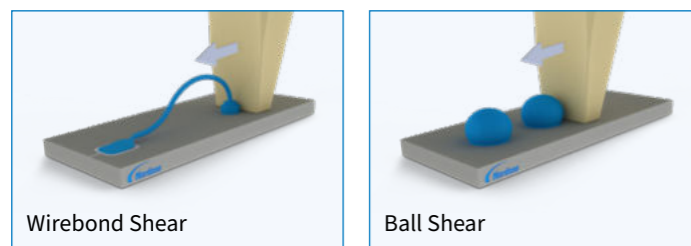
Test Components



Standard Pull Tests

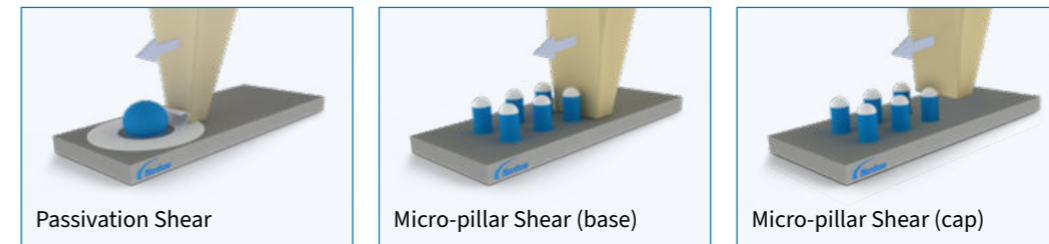


Standard Shear Tests

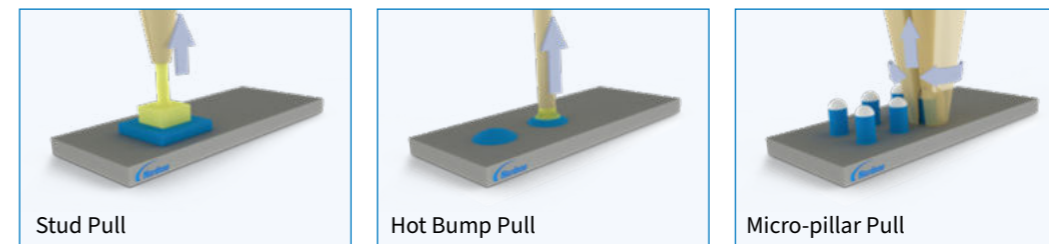


Advanced Tests

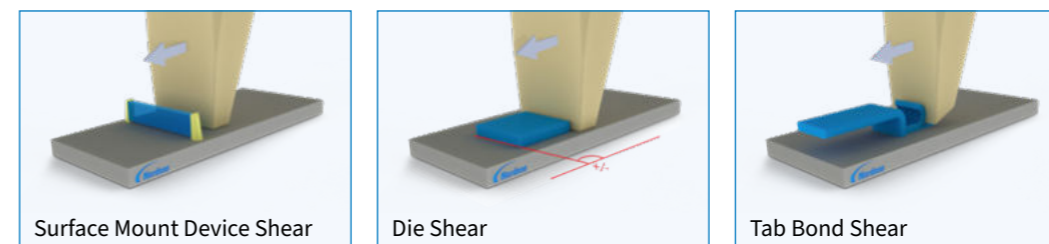
Variable heights and dimensions.



For difficult to grip or small dimensions.

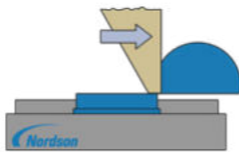
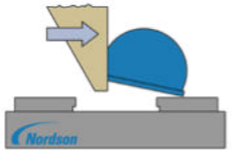
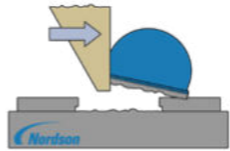
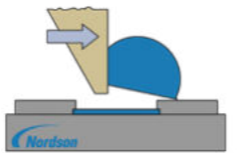
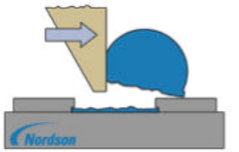
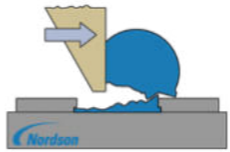


Larger components and higher forces.

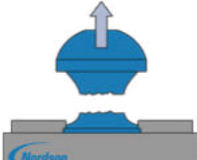



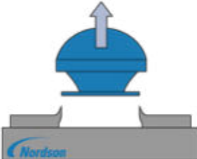
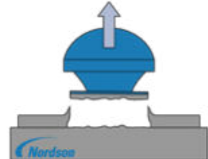
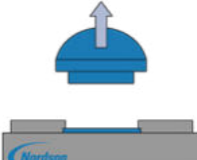




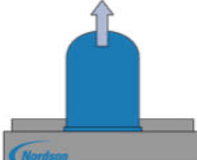


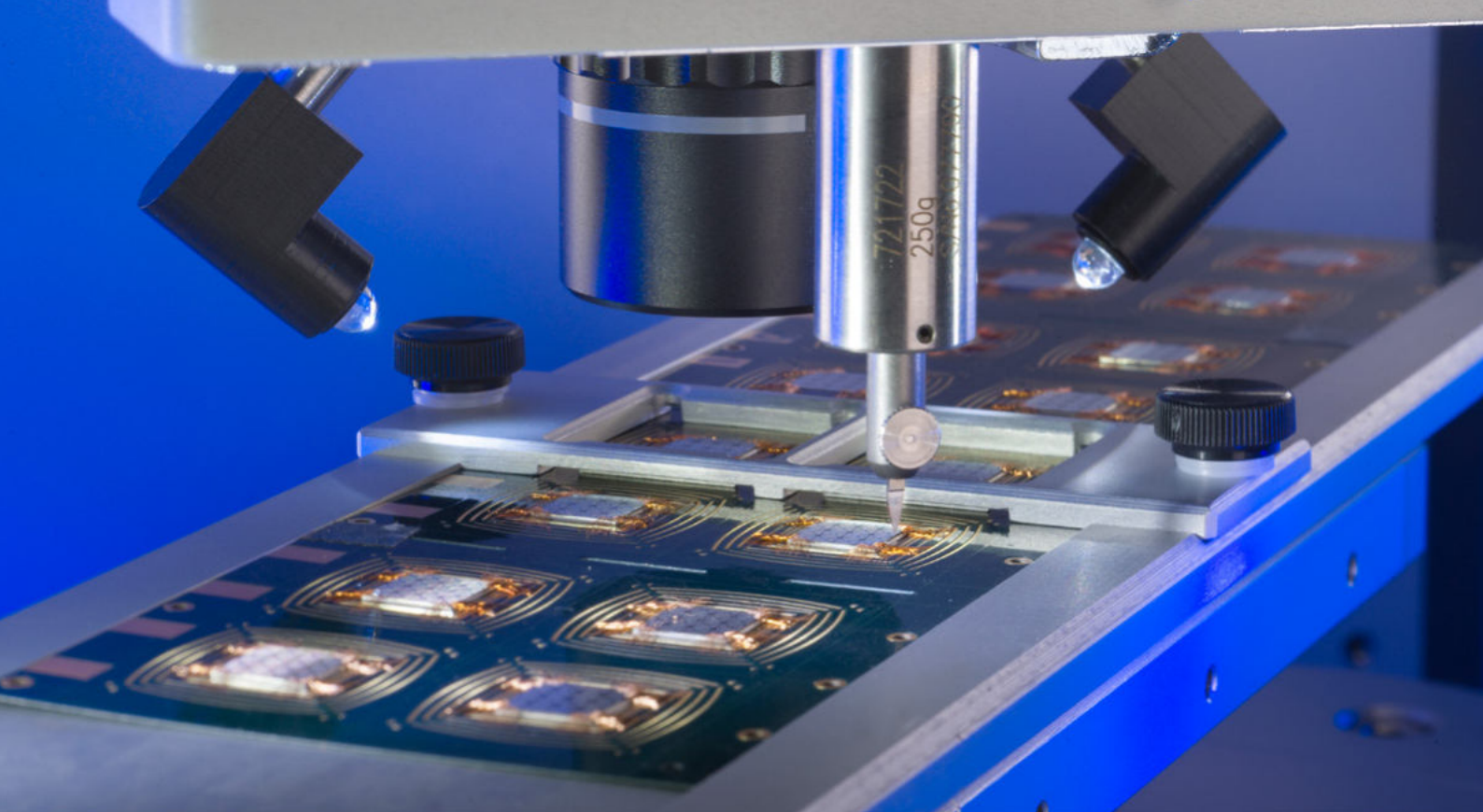
Bond Test Failure Modes

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.	  <p>Pad separation at base material or Lifted pad includes ruptured base material</p>
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.	  <p>100% interfacial fracture or Dominant failure mode at tool contact is interfacial fracture</p>

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.	 <p>Ductile (pad fracture surface view) </p>
Type B: Quasi-Ductile	B – Quasi-Ductile: Mixed ductile/brittle fracture with the dominant failure mode (>50% area) being ductile.	 <p>Quasi-Ductile (pad fracture surface view) </p>
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.	  <p>Pad Lift Pad Crater</p>
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.	 <p>Brittle (pad fracture surface view) </p>
Type B: Quasi-Brittle	B – Quasi-Brittle: Mixed brittle/ductile fracture with the dominant failure mode (>50% area) being brittle.	 <p>Quasi-Brittle (pad fracture surface view) </p>
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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