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# Component Packaging Test Services

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# Component Qualification Testing

## Test Environments

- Temperature
- Temperature Cycling
- Temperature/Humidity
- Vibration
- Mechanical Shock
- Drop
- Bending
- Pull/Shear
- Combined Environment (Vibration + Temperature)

## Test Methods

- JESD22 (A and B)
- AEC Q100
- IPC 97XX

## Failure Analysis

- Decapsulation (gold and copper wire)
- Cross-Sectioning
- Optical and Electron Microscopy

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# Temperature and Temperature Cycling

- Sun Electronics
- Twenty Two (22) Test Chambers
  - Internal Convection Fans for Spatial Temperature Control
  - Gravity ovens for component thermal testing (theta Jc)
  - Up to 8 cubic feet
- Chamber Parameters
  - Up 40°C/min ramp rates
  - Max Temp of 315C
  - Min Temp of -150C

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# Temperature / Humidity

- ESPEC

- Three (3) Test chambers
  - Internal Convection Fans for Spatial Temperature Control
  - Up to 8 cubic feet

- Chamber Parameters
  - 0%RH to 98%RH
  - Up 5°C/min ramp rates
  - Max Temp of 100C
  - Min Temp of -40C

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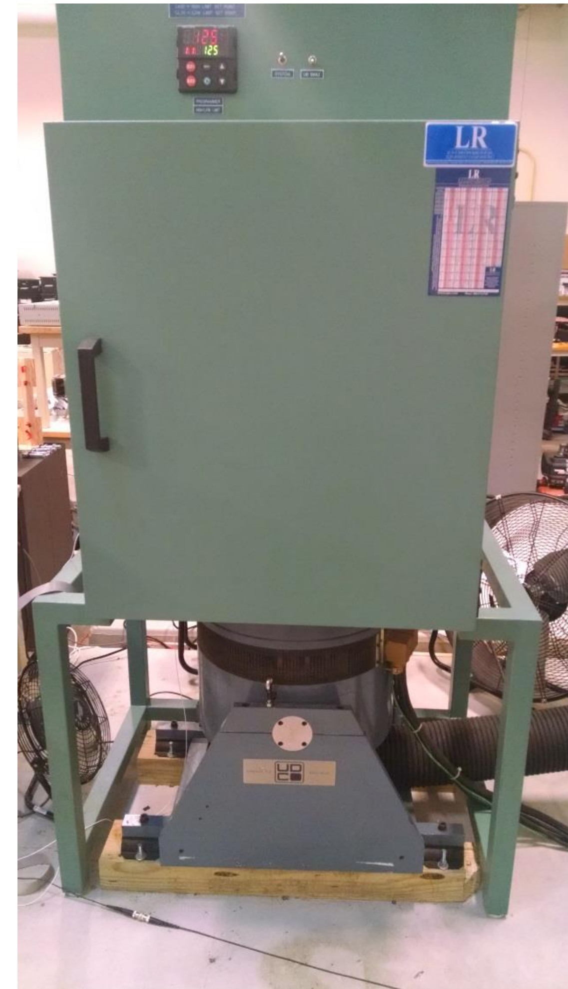
# Vibration and Mechanical Shock

- Unholtz Dickie
- Capability
  - Sinusoidal and Random
  - 0 to 5000 Hz frequency
  - Up to 100G Shock
  - Up to 1,000 lbs Force
  - 10 lbs Armature Weight
  - 2 inch Displacement
  - Event Detector
- In combination with temperature or temperature cycling

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# Drop Testing

- Lansmont
- Capability
  - Automated
  - Up to 125 drops per hour
  - Up to 3000 Gs of force
  - Half sine pulses with 0.2 to 1ms pulse width
  - Event Detector

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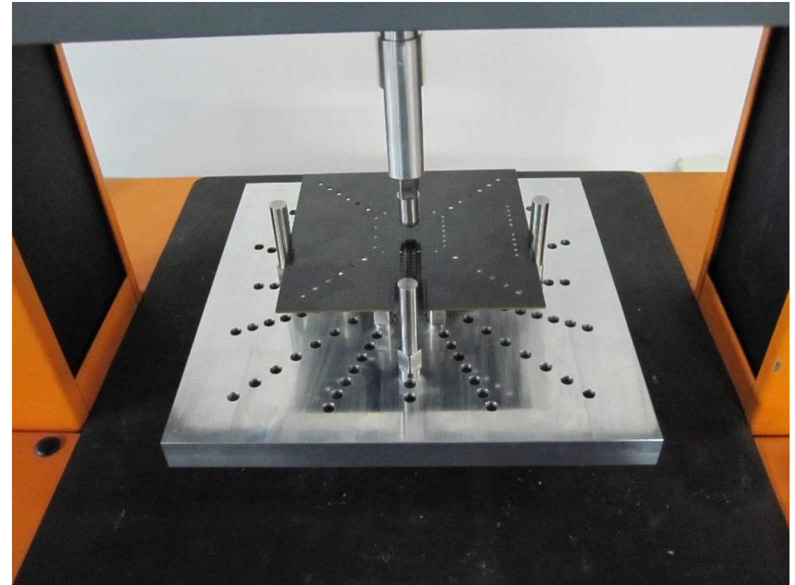
# Bend Testing

- Instron, MTS, and Bose
- Multiple Mechanical Testers
- Capability
  - Cyclic and Monotonic
  - 3-Point, 4-Point, and 9-point
  - Up to 300 Hz
  - Up to 8500N
  - Single-Point Pressure to Measure Deflection Radially
  - Event Detector



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# Semiconductor Packaging Customers (Examples)

- Contact sales@dfrsolutions.com for a list of existing customers

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