

2023 Gothenburg

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PDA EU00107 Container Closure Integrity Testing – Basic Course

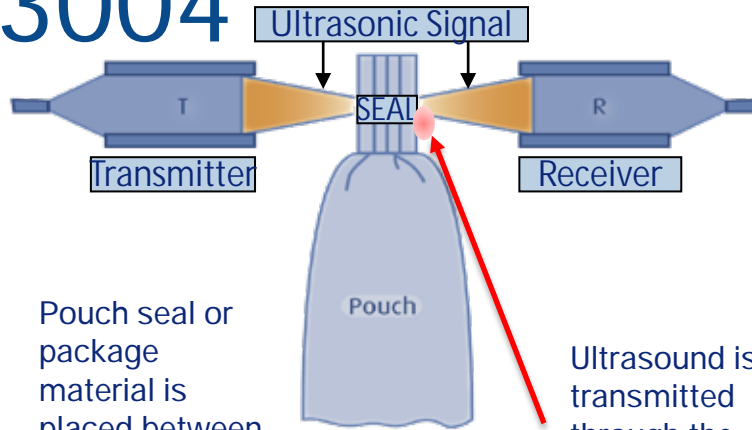
Airborne Ultrasound Technology Seal Quality Inspection



Standard Test Method for Evaluation of Seal Quality and Integrity Using Airborne Ultrasound

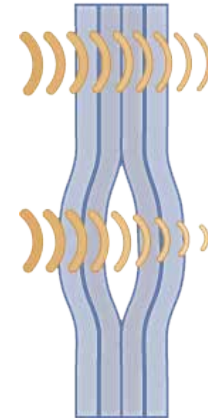
- Seal Quality
- Ultrasonic waves propagate through air
- Quantitative
- Deterministic
- Non-destructive

Principles of ABUS F3004



Pouch seal or package material is placed between ultrasonic Transmitter T and Receiver R.

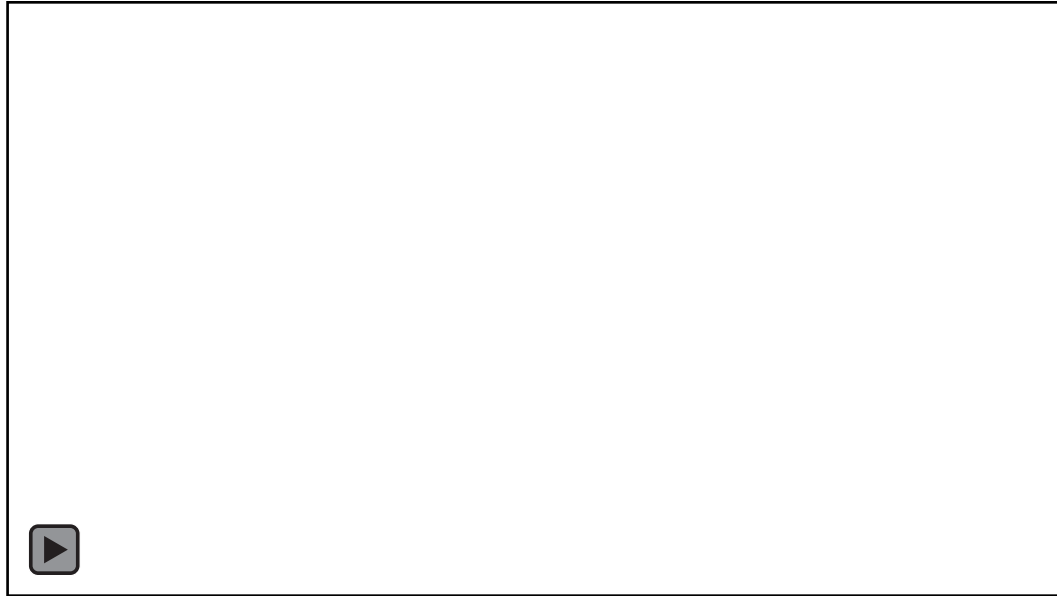
Ultrasound is transmitted through the seal at variable focal sizes.



Propagate through single or multiple layers of well bonded materials.

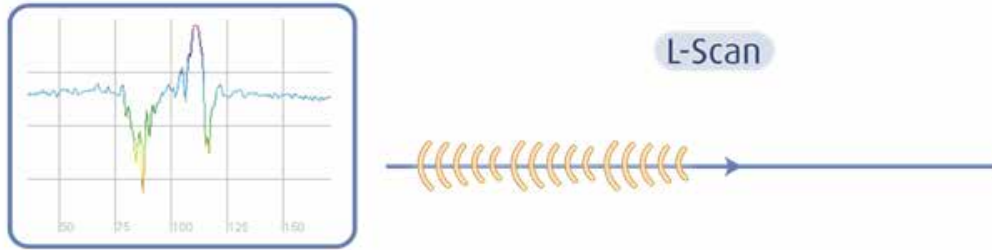
Reflection/absorption of sound waves by multiple layers.

Seal-Scan

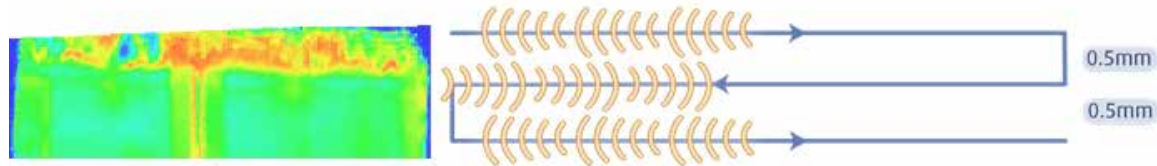


Scanning Modes

L-Scan is a single linear scan along the X-axis of seal that provides a line graph of seal integrity.

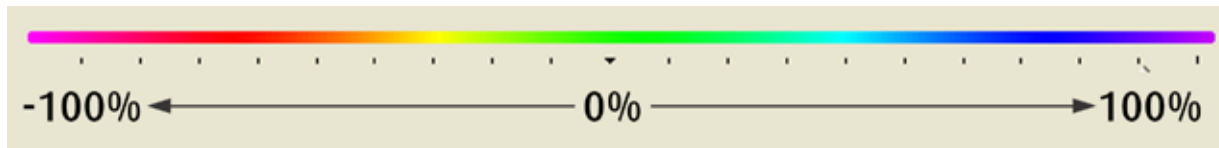


C-Scan produces multiple scans (along X and Y axis of seal area) that provide a high-resolution ultrasonic image of seal structure.



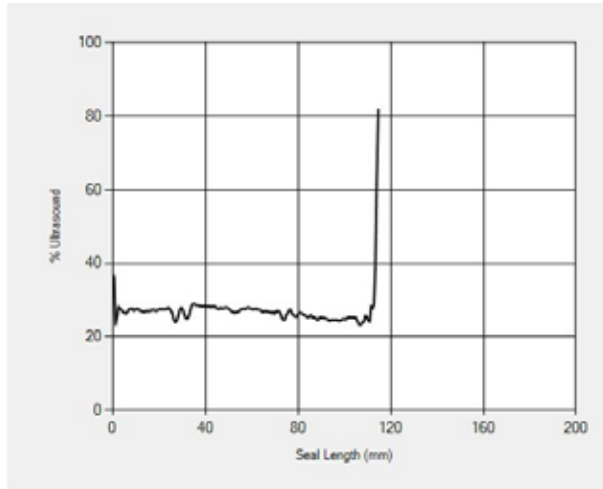
Seal Scan Signal Scale

- The colored gauge represents the scan signal measurement.
- Pink is low signal, green is normal signal (good seal), purple is high signal.
- Total 6000 grades of color are used.

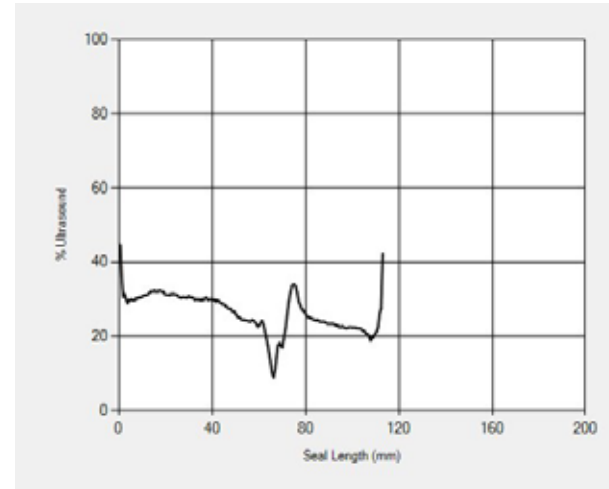


L-Scan Results

Negative Control



Positive Control



Seal-Scan Technology

Technology: Airborne Ultrasound - ASTM F3004-13

USP<1207> Chapter Reference: Deterministic Method for Seal Quality Testing

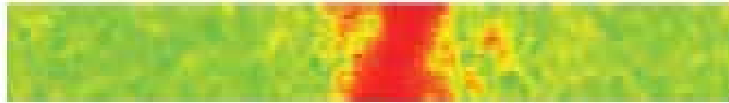
Benefits:

- Rapid - Overall faster method than alternatives
- Effective for flexible packages
- Non-Destructive, Quantitative
- Analyze, Improve, Control your process
- More robust testing of seal integrity:
 - Seal delamination
 - Short seal
 - Folds
 - Seal contamination
 - Weak seals
- Able to identify location of defect





Good seal



Side seal inclusion



Side seal with 0.75mm defect



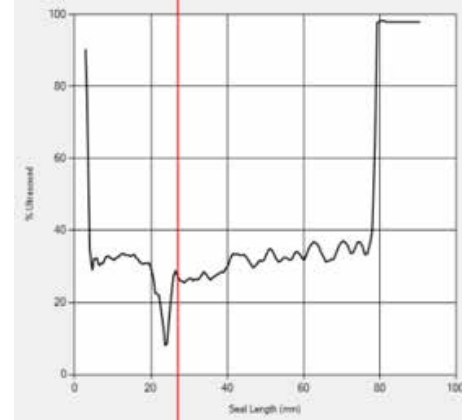
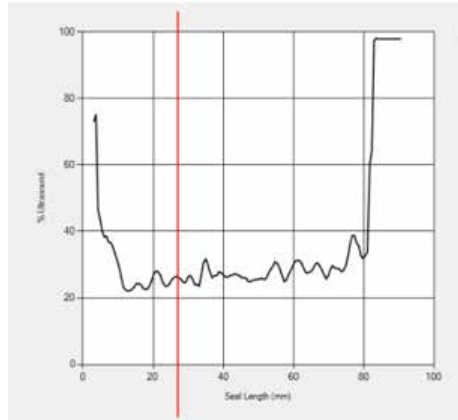
Side seal with pinhole

Case Study: Seal-Sensor Tyvek Poly

- Tyvek Poly Pouch
- Incomplete seal
(Wide Channel)
- 500 kHz Seal
Sensor Head
- 4mm Focal point
- Rotary Motion



Case Study: Seal-Sensor Tyvek Poly



Thank you !

Joerg Reinecke