

CASE STUDY

PROJECT SIZE: MEDIUM (\$5,000 – \$15,000)

TIMEFRAME: 2 – 4 WEEKS

Adhesion Problems in Polymer Laminate Films

Client: A polymer manufacturer approached FibreCITY with an adhesion problem that occurs routinely during the fabrication of laminated polymer films used as packaging materials.

Problem: The client wanted to identify the adhesive material and mechanism that was causing the problem in order to find a solution.

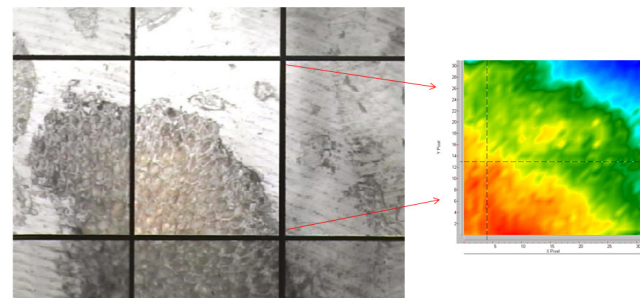
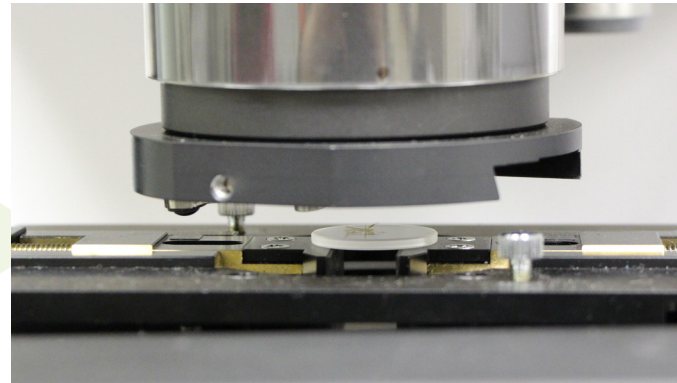
Details:

- Contaminants were very small (~40 μm) and could not be identified using traditional ATR-FTIR systems, which perform single point measurements

Recommended Tests & Rationale:

FibreCITY suggested using FTIR spectroscopic mapping, which was able to provide insights regarding the chemical heterogeneity across the samples, specifically at the interface of the layers of the polymer film.

- **Axio Imaging** – preliminary assessment of the samples using high-definition images of the cross-sections of the samples
- **FTIR Spectroscopic Chemical Imaging Test** – examined multi-layer laminates using IR imaging microscopy to determine the spatial distribution of the contaminant.
- **Hyperspectral Imaging Analysis** – hyperspectral images were generated using a spectral peak that was unique to the contaminant, allowing us to determine the location and identity of the contaminants.



Outcome

Based on the IR imaging results, FibreCITY determined that the adhesive glue had overflowed onto the packaging material causing the adhesive problem. Using these findings, the client was able to fix the problem and continue production with minimal disruption.