Micro-contamination on an Eyeglass Lens

**Sample**
An eyeglass lens with small particles of contamination embedded in a polysiloxane coating

**Industry**
Optical/coatings

**Technique**
ATR Microscopy

**Applicable PerkinElmer instruments**
Multiscope™ Microscope and Spectrum™ Spotlight™ FT-IR Systems fitted with an Si ATR Objective accessory

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**Discussion of results**

One of the final stages of eyeglass lens preparation is the coating of the lens with a protective polysiloxane coating. In this case, small particles of contamination were observed after this coating process. Determination of the identity of these particles necessitated the use of an infrared microscope. Rather than attempting to “dig-out” particles from under the polysiloxane coating, attenuated total reflectance (ATR) microscopy was employed for in-situ analysis. The use of a Silicon (Si) ATR crystal provided optimum depth of penetration through the coating and into the contamination. The resulting spectrum was a mixture of the contamination and the polysiloxane coating. Spectral subtraction using a polysiloxane reference yielded a spectrum of the contamination which could be searched against a spectral library. The contamination was found to be a polyamide which is most likely to be synthetically-based.

![Visible image of eyeglass coating showing imperfection.](image1)

**Figure 1.** Visible image of eyeglass coating showing imperfection.

![Overlaid ATR microspectra of coating and contamination (top) and pure coating (bottom).](image2)

**Figure 2.** Overlaid ATR microspectra of coating and contamination (top) and pure coating (bottom).

![Difference spectrum (top) and library search match (bottom) indicating polyamide contamination.](image3)

**Figure 3.** Difference spectrum (top) and library search match (bottom) indicating polyamide contamination.