CASE STUDY

AUTOMATED SPECTRAL DIAMOND INSPECTION

UNI BASEL

unitectra
Technology Transfer of the Universities of Basel, Bern and Zurich

Problem – Challenge

The watch and jewellery industry uses large quantities of polished colourless natural diamonds (often of small size) for their luxury products. They have a high interest to separate such diamonds from other kinds of colourless diamonds, such as natural diamonds containing chemical impurities which have been treated to appear colourless, colourless synthetic diamonds, or colourless diamond imitations. So far, there was no technology to automatically separate such diamonds. The separation is therefore performed manually, being very time-consuming and costly.

Solution

The University of Basel (Michael Steinacher, Insitute of Physics) and the Swiss Gemmological Institute SSEF have joined their expertise and developed the first device which can analyse very large quantities of small colourless diamonds at low cost. A Raman probe identifies all possible diamond imitations and rejects them. Then, in order to identify and reject treated natural or synthetic diamonds, a highly sensitive spectrometer checks the short wave ultraviolet (SWUV) transparency of each diamond. The average sorting speed is 4'000 stones per hour.
The devices are now marketed and sold by the newly formed company SATT GEMS. They are already operating at major Swiss diamantaires and major Swiss watch and jewellery groups.