

What are Sterling Opals?

Sterling opals, debuting at Tucson in 2012, are produced by the Sterling Turquoise & Opal laboratory in Phoenix, Arizona and owned by Sterling Foutz. These products were created by James E. Zachery, the same individual responsible for the Zachery-treatment process applied to turquoise. These are generally considered to be polymer-impregnated synthetic opals, or laboratory-grown opals with a composition of around 80% silica and 20% resin. Reading materials provided by the manufacturer states that the drying and settling steps take between 4 to 6 months to complete. These manufactured products have also been referred to as Monarch opals, amongst other trade names assigned it to by vendors.



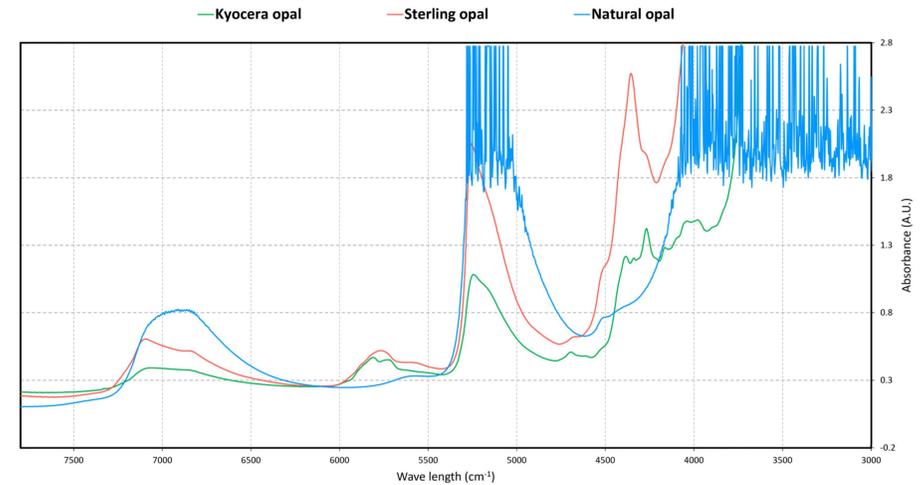
Physical Appearance

No dyes are used in the creation of Sterling opals, and are offered in blue, white, and green body colors. Rough material sold as tiles at around 12 grams each typically show black veining that can sometimes be removed when cut into cabochons. This veining may emulate natural structures to those unfamiliar with natural opals. Depending on the width of the “veining”, transparent polymer material can be observed with a microscope. Weak columnar structures (also known as honeycomb or snakeskin) are observed in small scattered patches. Several submissions of this material to GIA have produced identification results for a plastic-opal composite material depending on the amount present.

Gemological Properties

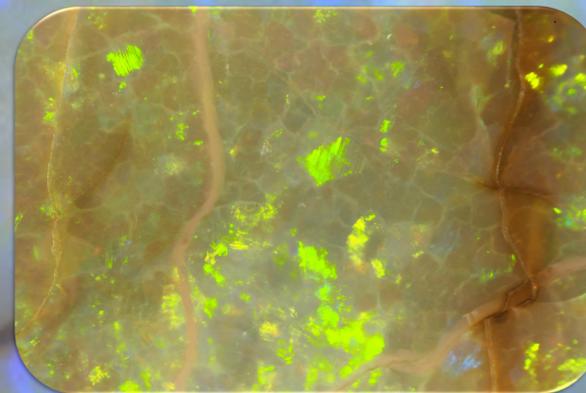
GIA examined some of this material shortly after the 2012 Tucson shows to find a hardness of 4-5 on the Mohs scale, a refractive index of 1.465 and 1.467, and a hydrostatic specific gravity of 1.72 and 1.74. The author recently examined ten samples purchased from the manufacturer, observing a range of 1.450 to 1.460 for their refractive index, 1.70 to 1.80 for their specific gravity, and moderate to strong blue fluorescence when exposed to long wave ultraviolet light.

Opal FTIR Analysis



Three overlapping FTIR spectra compare natural precious opal, polymer-impregnated synthetic opals from the Kyocera corporation, and Sterling. These stones, like other polymer impregnated laboratory-grown and natural untreated opals, exhibit strong absorption features between 5000 – 5300 cm^{-1} and 6700 – 7200 cm^{-1} attributed to vibrations of molecular water. A weaker absorption feature at about 4500 cm^{-1} , caused by vibrations in silanol groups, is present in all opals tested here.

Absorption features between 3859 – 4770 cm^{-1} are not found in natural opals and vary between polymer-impregnated laboratory-grown opals based on the manufacturer. Absorption features observed between 5660 – 6200 cm^{-1} are not in natural opals or laboratory-grown opals without polymer impregnation, but sterling opals in particular show unique features at 5700 and 5572 cm^{-1} . Sterling opals also feature a strong absorption peak at 4355 cm^{-1} with a shoulder at 4270 cm^{-1} , and a peak at 4005 cm^{-1} .



Conclusion

Sterling opals are rarely encountered, but readily available synthetic opals on today’s market. These materials can often be identified by their characteristic black polymer-filled fissures but are not observed in all finished products offered by the manufacturer. Still, all Sterling opals tested with FTIR displayed nearly identical absorption features to distinguish it from other synthetic opals. The slightly higher refractive index and lower specific gravity separate the material from its natural counterpart. Despite some concerns with their durability, Sterling opals make for a visually intriguing and comparatively inexpensive alternative to natural precious opals.