CHAMELEON DIAMONDS:
FANCY COLOR DIAMONDS WITH A TEMPORARY COLOR

Brecken Branstrator, GIA GG

Fancy color diamonds already carry the title of rare, but among the rarest are those that change color when exposed to heat or are stored in the darkness. These are chameleon diamonds, of course, so named for their phenomenon, and are desired most by gem connoisseurs.

According to GIA, the earliest mention of a color-change diamond goes back to Paris diamond trader Georges Halpern in 1866, but it wasn't until the 1940s that the jewelry trade started using the term "chameleon diamond" to describe these color-change diamonds.

These fascinating stones have the unusual ability to change color temporarily when heated to about 150°C (a property known as "thermochromism") or after they have been stored in the dark for a prolonged period of time ("photochromism").

According to one GIA study, chameleon diamonds typically show a stable color of grayish yellowish green to grayish greenish yellow, with the unstable hue generally a more intense brownish or orangey yellow to yellow (Hainschwang et al., 2005). Their color returns quickly to its stable hue upon cooling or light exposure, but the color change after storage in the dark usually isn't as big as that seen when a stone is heated.

The cause of their color change is still not well understood—since chameleon diamonds change color when exposed to light or heat, it's possible there's more than one factor at work here, GIA said—but it's believed it has to do with defects in the crystal lattice related to hydrogen and nitrogen. But because of their color change, chameleon diamonds are among the few green diamonds that can be "conclusively identified as natural color," according to the study, since it's not a phenomenon that can be created or enhanced in a lab.

A 22.28-carat heart-shaped grayish-green chameleon diamond pictured at room temperature (left) and high temperature (right). (Photo: Robert Weldon/© GIA)

This men's diamond ring from Leibish features a 1.03-carat asscher-cut chameleon diamond at center, set in an 18-karat gold band with colorless diamond accents ($10,950). (Image courtesy of Leibish)

To be called a chameleon diamond in the comments section of a GIA report, the stone needs to have a greenish color component, phosphorescence to shortwave UV light, and have a temporary color change due to heat or the absence of light, the lab's Mike Breeding wrote in an article for the Natural Diamond Council.

Though most faceted chameleon diamonds usually weigh less than 2 carats, the largest reported is the Chopard Chameleon Diamond of more than 32 carats.

REFERENCES

Hainschwang T., Simic D., Fritsch E., Deljanin B., Woodring S., DelRe N. (2005) A Gemological Study of a Collection of Chameleon Diamonds. Gems & Gemology 41(1) 20-35. ◆

The 32-carat Chopard Chameleon Diamond. (Image courtesy of Chopard)

Gemworld International, Inc., 2640 Patriot Blvd, Suite 240, Glenview, IL 60026-8075, www.gemguide.com