



CORNERSTONE

Journal of the Accredited Gemologists Association

MATH & AFTERMATH

A great deal of dispute has erupted following our publication of Sharon Wakefield's article "Fracture-Filled Diamonds: A Ticking Time Bomb?" (Autumn, 1993). The editorial pages of *Rapaport Diamond Report* (Jan-May, 1994) and *Mazal U'Bracha* have been particularly active. What began as a scientific study has evolved into a fascinating display of rhetorical fireworks, full of vitriol, hyperbole and the thundering cannons of "sporting challenges." This is a duel of science, market perception and opinion – with the gauntlet now thrown our direction.

A "Letter to the *Cornerstone* Editor" from Daniel Koss was received in our offices in early May, with a request that we publish it, "to answer [Wakefield's] findings." To oblige Mr. Koss, we have published the full text of his letter exactly as written. In fairness, we have offered Sharon Wakefield an opportunity to respond. In defense of free speech and our duties regarding the exchange of educational and professional information, *Cornerstone* has responded to this exchange with an editorial which follows the presentation of both letters.

Letter to the Editor

April 15, 1994

Dear Editor,

I am turning to you, as publishers of Sharon Wakefield's misleading and slanted article, "Fracture-Filled Diamonds: A

Ticking Time Bomb," which ran in your Autumn 1993 issue. Ordinarily, we would have dismissed her article as unworthy of discussion. However, Ms. Wakefield's transparent attempt to seek publicity at our expense, together with the cynical misuse of her article by our competitor in an attempt to discredit us, has prompted us to speak up.

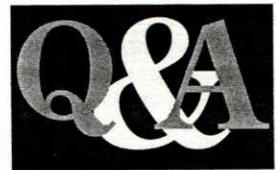
Absolutely nothing is new in this so-called study. Far more authoritative sources subjected fracture-filled stones to far more sophisticated tests long before Ms. Wakefield jumped on the bandwagon. Enough said.

Koss Diamonds has been operating since 1929, and began manufacturing color enhanced diamonds in 1972. Three years ago we added clarity enhancement to our repertoire and have enhanced over half a million stones from 0.01 ct. to 50 cts. since then with the number of complaints being less than negligible.

The most astounding "finding" of Ms. Wakefield concerns filler degradation under *short UV* radiation. She reached this learned conclusion by subjecting a Koss enhanced stone to a 254nm short-wave UV lamp for 101 hours. Unfortunately, the shortest rays of UV radiation which penetrate the earth's atmosphere are 292nm, with most of the shortwave rays being between 300nm-400nm. It is therefore impossible to create a simulation between a lamp of this wavelength and natural solar radiation.

continued on page 2

The Koss "Letter to the Cornerstone Editor" is reprinted here, verbatim. Wakefield's complete response follows. This is a free exchange of information and opinion; decide for yourself where the credibility lies.



Here's the
MATH part.

Cornerstone has a prize for the first AGA Member who can calculate correctly how many daylight hours tick by in 40 years.

Fax your response to 512.263.1775

AGA is a nonprofit research, education and ethics organization, benefiting professional and avocational gemologists as well as the consumer interest. Membership programs include advanced gemological education seminars, professional computer software reviews and workshops, and the AGA-Certified Gemological Laboratory Program.



CORNERSTONE

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Mr. C. R. "Cap" Beesley has resigned as AGA President for reasons he stated to the Board of Directors in a letter dated June 9, 1994. Mr. Leo J. Schmied, current Vice-President, has assumed the full duties of AGA President.

Not only are Ms. Wakefield's findings incorrect from a physical standpoint but from a mathematical one as well. In her "study" she places a stone 10mm away from a 4W shortwave lamp, and makes a calculation of the incident shortwave radiation. This study was the focus of an article in the April 1994 addition of Mazal U'Bracha. In this article they draw the following conclusion about her calculation, "The quoted figure of 0.04 w/m² appears far too low. A quick calculation indicates a figure nearer 90 w/m² (ie. about 2000 times greater.)"

Once the 2000 increase is figured, it becomes clear that actual exposure time would have to be 80,000 hours, or nearly 40 years of daylight exposure in comparison with Wakefield's ridiculous calculation which shows 40 hours. We find it incredible that a mathematical error of this magnitude by an accredited gemologist should have gone undetected.

As stated quite nicely in Mazal U'Bracha, "One should take the findings of Sharon Wakefield's research very seriously - if one happens to be an astronaut walking on the moon wearing fracture-filled diamond set jewelry. If one does not belong to this very exclusive interstellar group of diamond jewelry consumers, one can totally dismiss Wakefield's findings. Not just because they are scientifically questionable, but also because they are irrelevant."

This being the case, all that Ms. Wakefield has accomplished through her study is, cause Koss Diamonds unwarranted damage to our reputation commercially and create unnecessary panic in the market. As it is very easy to create a public scare, and quite difficult to diffuse it, we have begun to take legal action against Ms. Wakefield.

May I suggest that in the future you take greater care to research the credibility of articles prior to their publication. As stated earlier, once the damage has been done, it is very difficult to un-do it.

Daniel Koss, MA
Koss & Shechter Diamonds Ltd.
Ramat-Gan, Israel

Response from Sharon Wakefield

Dear Editor,

Mr. Koss' defamation of my work and my professional credibility is unfounded. He resorts to personal censure contrived in vague innuendo. He proclaims that my motives are shallow and self-serving; that I am technically incompetent; that I am unprofessional and that my work is sloppy and without merit. Koss substantiates these charges with pseudo-scientific hyperbole, misrepresentation of documented fact, or not at all. He seems indifferent to the harm he inflicts and the difficulty of repairing such damage.

Daniel Koss begins by charging that my report "is misleading and slanted." He says I "transparently" seek publicity at his expense, implying collusion with some unnamed "cynical" competitor. His foundation for such damning accusations is conspicuously absent.

Koss says: "*Far more authoritative [sic] sources subjected fracture-filled stones to far more sophisticated tests long before Ms. Wakefield jumped on the bandwagon.*" Who are these unnamed authoritative sources, what tests and results, which bandwagon or body of investigative reports? Koss is silent on the specifics of these challenges.

Now Daniel Koss tells us he is "astounded" that I subjected his stones to a short-wave UV lamp. Why did I conduct short-wave UV tests? Simply because of product claims, which I quote from a Koss sales brochure:

After exposing the [filler] material to short ultra-violet rays of [sic] hundreds of hours - the equivalent of exposing it to hundreds of years of daylight - Koss scientists discovered no change whatsoever.

Koss' short-wave test was not astounding when he performed it - only after I undertook to verify his test. Only after I reported conflicting results does he ridicule both the test and me.

Koss' attempt to discredit my "learned conclusions" reveals either ignorance of the scientific facts, or his intent to misrepresent them. He declares: "most of the short-wave rays [are] between 300nm and 400nm." Surely Mr. Koss knows better:

- Long-wave ultraviolet is 400nm to 315nm.
- Medium-wave ultraviolet is 315nm to 280nm.
- Short-wave ultraviolet is 280nm to 200nm.

Short-wave ultraviolet is not "between 300nm and 400 nm." Koss goes on to proclaim my test results meaningless, because I used short-wave ultraviolet. If this is the case, why did Koss & Shechter Diamonds employ short-wave testing for their product in the first place, then advertise the results as though meaningful?

Most important among the scientific facts Koss either overlooks or evades is the unique diamond property that dominates this entire issue: **Ninety-eight percent of all natural gem diamonds (Type 1a) do not transmit UV below 340 nanometers.** Therefore, short-wave UV cannot degrade filler inside the stone.

OFFICER NOMINATIONS

Consider becoming a member of the Board of Regional Governors, or an Executive Officer of AGA. Call First Vice-President Leo J. Schmied to indicate your interest, or to find out more about AGA Officer Nominations.
615/966-0580



Let us examine the scientific basis of my conclusions. Most short-wave UV lamps, such as the one in my laboratory, also emit low level long and medium UV wavelengths. My investigation suggests that, because neither short nor medium waves can penetrate the stone, these long-wave emissions caused the discoloration I reported. My original calculations account for this phenomenon and incorporate *only wavelengths that penetrate the stone*. I corroborated these calculations by testing with a conventional long-wave UV source.

Long-wave UV exposure, which is earth-reaching, darkened and degraded the filler in this sample of Koss diamonds.

Let us now confront Koss' reference to the *Mazal U'Bracha* editorial. Curiously, Chaim Even-Zohar, author of the editorial, admits no competence to conduct scientific inquiries. Yet, under the artifice of editorial opinion, he published a searing "expert" criticism of my report – conspicuously omitting any statement of his professional credentials, or lack thereof.

My previous comments about the characteristics of short-wave UV lamps illuminate Even-Zohar's innocence of the technical foundations of laboratory study. Rigorous mathematical analysis is clearly beyond the scope of this letter; however, Even-Zohar's (and Koss') failure to recognize elementary technical factors reveals either ignorance or willful misrepresentation of my work. Here are four examples:

- Type 1a diamonds do not transmit short-wave ultraviolet radiation.
- Fresnel's laws of refraction and reflection.
- Transcendental functional relationships between test specimens and energy sources.
- Out of band UV radiation emitted by the short-wave lamp.

Rigorous scientific and mathematical procedure, as well as understanding of underlying scientific principles, are required to produce accurate, meaningful results. Calculation of refracted incident radiation does not lend itself to arithmetic

dabbling. Truncated application of the inverse square law, as proffered in *Mazal U'Bracha* and repeated by Koss, is simply inadequate.

Furthermore, I informed Even-Zohar of his technical errors weeks before publication of the *Mazal U'Bracha* editorial. He flatly refused to consider my offer of clarification and declined to print any rebuttal in the *Mazal U'Bracha* issue bearing his technically flawed editorial. Despite the fact that I was promised pre-publication review of my article and any commentary, a "reprint" of Even-Zohar's critical editorial was circulated to the US trade press prior to actual publication. This unauthorized (?) version was distributed without my knowledge and release. It is this editorial, questionable both in technical credibility and motivation, which Koss now submits as "expert criticism" to defame me and protect his product from scrutiny.

Daniel Koss' attacks are doubly egregious because he knows my report is valid. Mr. David Shechter, Koss' Vice-President and Technical Engineer, confirmed my results in a letter addressed to me, dated January 22, 1994. On the subject of "deterioration of our filler due to UV exposure," Shechter says: "Fortunately, quite long ago, we also discovered this phenomena through our quality control test." Shechter goes on to blame the instability on a chemical vendor and states that they subsequently corrected the problem.

Could this acknowledgement be what Koss had in mind when he admitted: "Absolutely nothing is new in this so-called study."? Has Koss notified anyone who purchased the defective goods Shechter concedes having produced? If Koss & Shechter Diamonds has resolved the infilling deterioration problem, as claimed in their January letter to me, why does the current product – invoiced as Genesis II – appear to degrade similarly under UV?

In light of Mr. Shechter's letter, it is peculiar that Koss boasts of having "begun to take legal action against" me.

In conclusion, I can only quote Daniel Koss: "May I suggest that, in the

future [Mr. Koss], you take greater care to research the credibility of your [defamation and ridicule] prior to their publication. As stated earlier, once the damage has been done, it is very difficult to undo it."

Sharon Wakefield, BS ChE, GG
Boise, Idaho, USA

Cornerstone Editorial Response

"The only filler with a transparency and color identical to diamonds – highly stable, no flash effect, no color degradation"

Koss & Shechter Diamonds
Advertisement
Diamond World Review
(Oct–Nov 1992)

Motivated by the well-advertised gemological threat of a clarity enhancement which was difficult to detect, Sharon Wakefield conducted an initial laboratory study of flash effect in Koss treated stones (October–November 1992). She discovered that all six of her sample Koss stones exhibited "a very distinct flash." According to Wakefield, repeated attempts to have Koss explain his product claims in the light of her testing results were unsuccessful (November–December 1992). She next investigated the stability of sample stones in various stimulation environments (ultrasonic, ultraviolet radiation, and heat). Results of AGA Lab Program Chair Wakefield's ongoing study were published to AGA Members, in a *Cornerstone* edition dated Autumn 1993, and released December 10, 1993 (reprinted February, 1994).

"Top quality diamonds, enhanced with a truly color-identical highly stable filler, guaranteed for life against discoloration"

Koss & Shechter Diamonds
Advertisement
Diamond World Review
(Oct–Nov 1993)

At the same time, Koss himself ignited a series of public volleys by again claiming "almost zero flash effect" in the editorial

pages of *Rapaport Diamond Report* (December 3, 1993). As previously reported (*Cornerstone*, Spring 1994), *RDR* became the forum for a fracture-filled diamond "debate-in-print" as first Wakefield, and then fracture-filled diamond competitor Yehuda, responded to product claims, criticisms and challenges initiated by Koss.

The Koss Letter

Now, Koss appeals to *Cornerstone* for vindication of his viewpoint. His letter attests that some unnamed higher authorities have reached better conclusions than those rendered by Wakefield. However, he has not provided us with any such testing results, nor has he provided the references upon which he predicates this dismissal of her study. *Cornerstone* welcomes any such documentation, which would be of great interest to the professional gemological community.

Enclosed with Koss' letter was a full reprint of "Editor Chaim Even-Zohar on the Wakefield Exposure: Gemological Research out of this World" (*Mazal U'Bracha* 57, pp 46-47, 50). Mr. Koss' "Letter to the *Cornerstone* Editor," seeks to use this single source to invalidate and dismiss Wakefield's findings regarding the Koss fracture-filled diamond.

Mazal U'Bracha: Reading Between the Lines

Cornerstone readers who may have missed this issue deserve a few particulars by way of context. *Mazal U'Bracha* 57 also included a reprint of Wakefield's Koss fracture-filled diamond report. Her professional study was published under the *Marketing* section (pages 40–43), and was accompanied by an *Editor's Note* serving as a disclaimer. Even-Zohar's editorial was published under the *Gemology* section. No reference was made in the *Gemology* section to *Mazal U'Bracha's* disclaimer.

This disclaimer noted that *Mazal U'Bracha* does not conduct research, and therefore is not qualified to arbitrate disputes among experts or contending parties. However, just such professional criticisms and judgments seem to have been

made in the editorial, and relied upon by Koss in his "Letter to the *Cornerstone* Editor." The interested reader may be further informed by reading issue 57 fully.

Mazal U'Bracha did publish Wakefield's complete article, which originally appeared on these pages. Regrettably, they failed to offer proper publication attribution. *Cornerstone* is happy to allow republication of articles. However, we do request original publication attribution, the courtesy of review and correction, and publication copies. *Mazal U'Bracha*, to our knowledge and to date, has provided none of these professional obligations and courtesies.

Cornerstone Viewpoint

Cornerstone readers are intelligent enough to suffer this debate of experts without further editorial guidance. But we do wish to restate a few principles of significance to readers. First, AGA is a non-profit organization which serves to further professional education and the public interest. AGA publications serve as a forum for Member views and opinions – in effect, a public discourse. As such, writers are free to disagree. Readers are free to draw their own conclusions.

For *Cornerstone*, the editorial role generally is one of formal moderator, rather than peer reviewer, arbitrator or censor. Additionally, we report on stories and exchanges in other forums. Through editorials, we ask that our readers consider the professional and consumer issues presented – from an informed viewpoint, in context, and with ethical reflection upon their implications.

April Fools

On April 1 of this year, Sharon Wakefield received a facsimile letter from the Park Avenue legal firm of Loeb and Loeb, litigation counsel for Koss & Shechter Diamonds. Among numerous demands which bear upon the free exchange of information, Wakefield is advised to notify *Cornerstone* of an insurance liability. In his April 15 letter, Koss intimates a similar and veiled threat to AGA.

Member News

WELCOME NEW MEMBERS

AGA joins Membership Chair Stanley Cohen of Fort Worth, Texas in offering a big Texas WELCOME to our new members.

- **Lynn A. Neakrans, GG**
of Metalworks & Jewelry Design Ltd,
Normal, Illinois
- **Ralph D. Mueller, GG,**
Supplier Member,
of Ralph Mueller & Associates,
Scottsdale, Arizona
- **Karen O. Underhill, GG**
of Jewelry Designs, Danbury
Connecticut
- **James R. Lytle, GG**
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California
- **Carl Schmieder, GG, CGA**
of Schmieder & Son Jewelers,
Phoenix, Arizona
- **Ted A. Irwin, GG**
of Northwest Gemological Institute,
Bellevue, Washington

PUBLISHED

Anna Miller of Pearland, Texas has published, and is teaching, the international Master Valuer Program. Part One is a 30 lesson correspondence course on gems and jewelry, which she says is the first study-at-home course to be offered specifically on gem and jewelry appraising. Part Two is a 3 day hands-on intensive jewelry appraising workshop. Currently, correspondence students are enrolled in southeast Asia, Canada, the UK, as well as the US. For more information, contact Ms. Miller at PO Box 1844,

Pearland, TX 77588; or call 713/485-1606 (voice or fax).

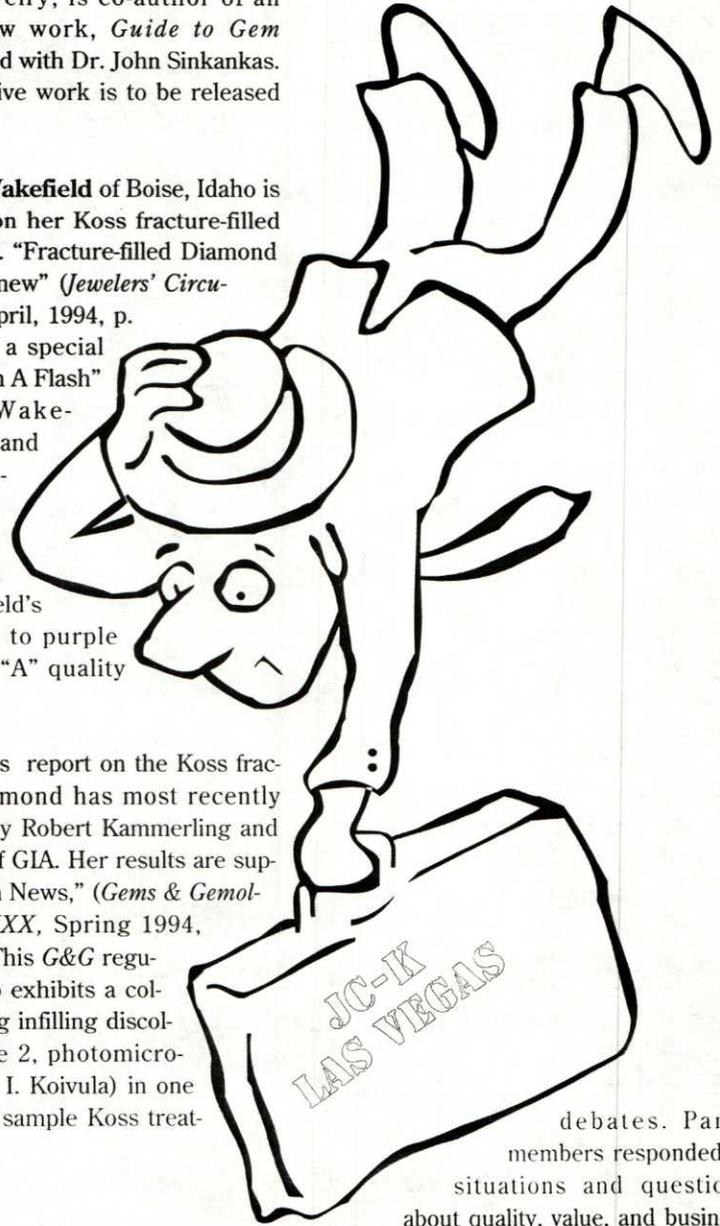
Ms. Miller, author of four books on gems and jewelry, is co-author of an upcoming new work, *Guide to Gem Values*, authored with Dr. John Sinkankas. The collaborative work is to be released October, 1995.

Sharon Wakefield of Boise, Idaho is again quoted on her Koss fracture-filled diamond study. "Fracture-filled Diamond Fight Flares Anew" (*Jewelers' Circular Keystone* April, 1994, p. 66-69) carried a special sidebar box, "In A Flash" examining Wakefield's results, and Koss's criticisms. The feature was illustrated with one of Wakefield's slides of blue to purple flash in Koss "A" quality diamonds.

Wakefield's report on the Koss fracture-filled diamond has most recently been studied by Robert Kammerling and John Koivula of GIA. Her results are supported in "Gem News," (*Gems & Gemology Volume XXX*, Spring 1994, pages 47-48). This G&G regular feature also exhibits a colorplate showing infilling discoloration (figure 2, photomicrograph by John I. Koivula) in one of Wakefield's sample Koss treated diamonds.

JUST IN, FROM THE JC-K LAS VEGAS SHOW

David Atlas of Philadelphia was a featured panel member, "Mr. Knowstones," for an entertaining ethics debate at the Vegas show. Other role-playing participants were retail jewelers from different parts of the country and various size stores, a "Consumer" actress, and an ethicist whose professional credentials include her years of programming public television ethics



debates. Panel members responded to situations and questions about quality, value, and business practices.

"Tangled web" circumstances brought out serious consumer and professional concerns — and a lot of laughs. Highlights included insurance adjuster's questions, and the consumer response, regarding insurance buyers' discounts and inflated values for replacement business. Many differences in response to consumer concerns were noted between big city retailers and their small town counterparts

Lab Notes

**DIAMOND FLUORESCENCE,
UNHEATED RUBY**

Gary Roskin of EGL Los Angeles reports a recent increase in diamonds showing yellow fluorescence. Although yellow is a known indicator for cubic zirconia, these are natural diamonds. Many of these yellow fluorescing diamonds contain clouds; some of these cloudy areas exhibit fluorescence which can be either yellow with pockets of blue, or blue with pockets of yellow. More rarely seen are orange fluorescing diamonds. Perhaps these fluorescing diamonds are the product of a particular mining vein. They may also be part of the general tendency to market lower and cloudier clarity types.



Also seen at EGL recently was a high quality ruby with straight planes of blue sapphire running through the stone. It was reminiscent of the blue hazy colors seen around seed crystals in older flux synthetic materials. Also present were fingerprint inclusions heavy with liquid in wide channels. Obviously unheated, this gem was most probably from the Vietnamese/Cambodian areas.



Facts are facts and will not disappear
on account of your likes.

— Jawaharial Nehru



Answer to the Math Question: Reader, Be Wary

Q: How many daylight hours tick by in 40 years?

A: Which 40 years, and at what location?

The question apparently yields an easy calculation, pertinent to the exchange between Koss and Wakefield. But it is a trick question. It points out the difficulty of making assumptions and determining results without comprehensive knowledge of the entire problem—and underlying predicates.

First, we must be sure to ask the *right* question. Even-Zohar, in his *Mazal U'Bracha* editorial presumes that Wakefield has made "mathematical errors" in her study. At the same time, he admits that he has no understanding of her calculations and methodology, adding that he can't "begin to guess where the error is until we further examine all the relevant aspects." Yet he goes on to provide alternative figures for part of the report's conclusions. Relying upon the *Mazal U'Bracha* figures, and finding them

preferable to Wakefield's, Daniel Koss finds it "incredible that a mathematical error of this magnitude by an accredited gemoogist [sic] should have gone undetected." Did anyone in this exchange ask the *right* questions for reaching reliable conclusions?

So, let's rephrase the initial question: How many daylight hours in 40 years, *on average*? This requires assumptions. Wakefield's original calculation used 12 average hours of daylight, and we will use 365 average days per year.

**12 hours X 365 days X 40 years =
175,200 average daylight hours**

How does this compare with your own estimate, and that of Daniel Koss? And, is it crucial to the debate? When buying arguments, it's reader beware.

The Last Word...

Science is simply common sense at its best —
that is, rigidly accurate in observation,
and merciless to fallacy in logic.

— Thomas Huxley

Please send me a membership application for Accredited Gemologists Association

Name _____
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Application Guidelines

Membership with full voting privileges is available to professionals holding gemological diplomas from accepted institutions. Associate Membership is available to students of gemology and avocational gemologists. Supplier Membership is available to providers of goods & services to the gem & jewelry industry.

Membership Dues & Fees

\$25 Processing Fee (one-time, non-refundable) will be retained by AGA.
 \$125 Initial Voting Member Dues.
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 \$175 Initial Supplier Member Dues.
 Make checks payable to Accredited Gemologists Association, in US funds.
 Membership is renewable annually (Voting \$100, Assoc. \$50, Supplier \$150).

Return This Request To:

Stanley Cohen, AGA Membership Chair
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The Accredited Gemologists Association (AGA) is a not-for-profit professional organization that promotes computerization for every aspect of the jewelry industry through software reviews, seminars and workshops around the country. The AGA offers advanced training in gemology and a certified Gem Laboratory Program. We advocate for ethical codes of conduct within the gemological appraisal business.

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