

LIKE A ROCK

Would you propose with a diamond grown in a lab?

Jenni Avins | April 06, 2016



Diamond love

NUSHMIA KHAN, JENNI AVINS

It was a grey afternoon in February when I gave Martin his diamond back. He was already waiting at a window-side table at the Gramercy Park Hotel when I arrived. It felt like it could snow at any second, but he was suntanned, just back from the British Virgin Islands. He wasn't wearing his glasses.

"Before I forget," I said, taking the diamond out of the burgundy velveteen pouch I'd been carrying in my purse.

"Thanks," he said. He tucked it into his wallet without looking at it.

I'd be lying if I said I've never imagined my engagement ring. My picture of the metal, the setting, the style—even the man offering it—has changed throughout the years, but aside from a brief dalliance with emeralds, the stone has remained the same: a white diamond.

But this diamond came with no promise of commitment, no dream of a life together, no ring. This

diamond was never mine to keep. This diamond—a round-cut brilliant stone, just shy of half a carat—was made in a plasma reactor at the headquarters of Diamond Foundry, Martin Roscheisen’s San Carlos, California startup. It was a loaner.

Diamond Foundry first crossed my radar just three months prior, in November of 2015, when Leonardo DiCaprio tweeted that he was proud to be an investor in the company. That month marked Diamond Foundry’s first foray out of stealth mode, since Roscheisen co-founded the company in 2012 with engineers Jeremy Scholz and Kyle Gazay, both colleagues from Roscheisen’s former solar energy startup, Nanosolar. It would take a behemoth to disrupt the \$81 billion diamond jewelry industry. Yet with just 50 employees between the US and Israel, patents pending on their tooling and technology, plans to break even this summer, and Silicon Valley royalty, Ev Williams and Mark Pincus among its investors—not to mention DiCaprio—it’s fair to say Diamond Foundry has gotten everyone’s attention.

Right around the time DiCaprio tweeted about his investment, Diamond Foundry’s website went live, offering white diamonds of varying carat-size, clarity, and cut at prices slightly less than those of Blue Nile, the leading online loose diamond supplier in the US. A first batch of 160 diamonds sold out in less than two weeks.

I had no emotional attachment to the diamond I had just returned to Roscheisen, Diamond Foundry’s 46-year-old CEO. But I had been on a mission to figure out if I could learn to love it—especially since I knew for certain it had never armed a terrorist, been mined by a child, or caused catastrophic environmental harm, as some natural diamonds do. I wondered whether a diamond grown in a lab could carry the same emotional weight as the real thing, without the guilt. And really, if it was identical to a natural diamond down to every last atom, as Roscheisen swore it was, what does it even mean to be the real thing?

Was this not as real as a natural diamond, forged in the depths of the earth, spat toward the surface by an ancient volcano? And perhaps even ethically superior?

Roscheisen would like for me—and millions of women like me—to believe that it is.

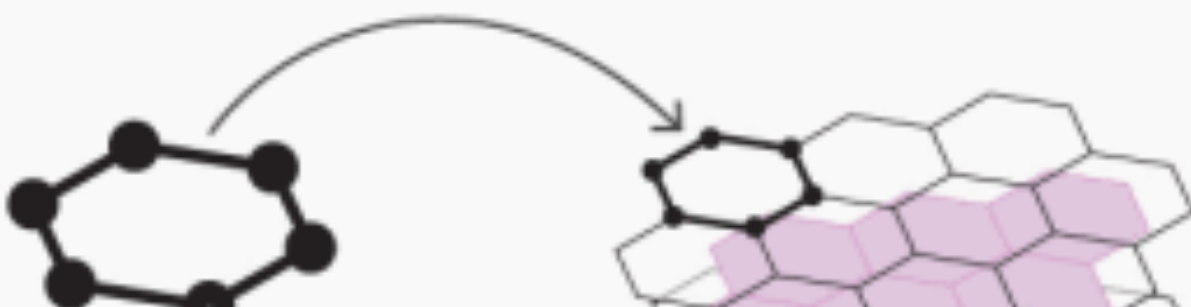


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Diamonds are many things, but at their basest level, diamonds are carbon. Carbon, if you (like me) don't remember your chemistry lessons, is one of the 118 elements on the periodic table. Its symbol is C, its atomic number is 6, and it is vital to all of life on Earth. Without carbon, we wouldn't have DNA. We wouldn't have hair, or skin, cells, photosynthesis, trees, or plants. And we definitely wouldn't have diamonds.

Graphite v. Diamond

Graphite is made up of hexagonal groupings of carbon connected in sheets that stack.

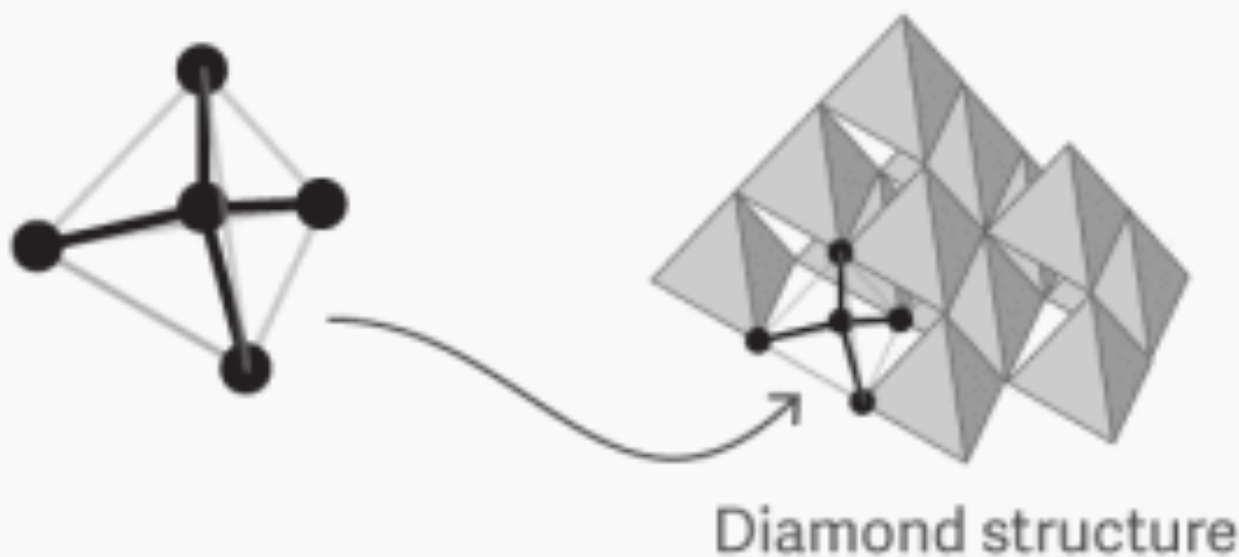




Carbon
atom



Diamond is made up of tetrahedral groupings of carbon that interconnect.



David Yanofsky | Quartz | qz.com

A carbon atom has four electrons in the shell around its nucleus—four little guys just looking to bond with electrons of other atoms. If four of those electrons form single bonds with, say, four hydrogen atoms, you'll get CH₄, methane. If the carbon atoms bond with more carbon atoms in a layered, chicken-wire pattern, you'll have graphite—just one of many forms of pure carbon.

And if each electron from one carbon atom bonds with an electron from a different carbon atom in a perfectly tetrahedral structure—which is to say, if they bond in an infinitely repeatable pattern made of pyramids with four corners, four triangular faces, and six straight edges—and they keep on doing that, many billions of times, you'll get a diamond.

So when you think about it, diamonds are a life force in its mightiest form: The densest, hardest, strongest expression of carbon, the element underlying all of life on earth.

As scientific knowledge goes, our understanding of the conditions that cause carbon to bond this way, or exactly how long it takes, is limited. That's because it occurs over 100 miles inside the planet, at extreme

temperatures and pressures. Many of the world's diamonds were formed billions of years ago, and scientists don't know exactly how those carbon atoms got down there inside the mantle to begin with. One (rather unsatisfying) theory is that carbon is naturally occurring in the mantle's minerals; it's just there. Another is that those carbon atoms were once pieces of another life form—a seashell, a piece of kelp, a snail antenna—that the planet's shifting plates forced deep into the earth hundreds of millions of years ago.

Another hypothesis still, supported by scientists at the Harvard-Smithsonian Center for Astrophysics and the University of Chicago, poses that some of these carbon atoms came to earth on meteorites formed at the very beginning of our solar system. Those particles—so small that trillions of them could fit on the head of a pin—got here as microscopic shrapnel from pre-solar supernovas, or dying stars. Quite literally, according to this theory, diamonds are born of stardust, older than the sun and earth.

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Roscheisen and his partners are making them in a garage in San Carlos, California, a sleepy suburb in Silicon Valley.

Soon after I heard about Diamond Foundry, I called Roscheisen. In a clipped Austrian accent punctuated with an effusive laugh that can only be transcribed as *hya hya hya*, Roscheisen told me how he and his co-founders first got into diamonds for high-tech energy applications. Then, they gave a friend-of-a-friend a stone to use for his engagement.

“We were just focused on growing the crystal all day, and then we see her smiling and so happy about the engagement ring,” said Roscheisen. “We recognized we have a quite emotional product.”

Three weeks later, Roscheisen, who looked like a consummate tech CEO in frameless glasses, grey jeans, and a zippered mock-neck one might wear skiing, pumped my hand in Diamond Foundry's headquarters. It was “the smallest facility with the largest amount of power in it” they could find, he said, and laughed, *hya hya*.

Scholz, one of Roscheisen's co-founders, is a lanky engineer with a turquoise hoodie and brown tousled hair. He handed me a pair of clear plastic safety glasses, pushed through a door marked with a yellow and red toxicity symbol and led me into a hacker's paradise. We stopped short at a worktable alongside a shelf stacked with electrical components, tools, rolls of plastic wrap, and wire coils.



Jeremy Scholz, Martin Roscheisen, and Kyle Gazay

About 20 feet from where we stood, a heavy blue curtain was pulled open to reveal a machine the size of a small trailer. When Roscheisen told me about the plasma reactor over the phone, I had pictured R2D2, with a little glowing stone inside his robot head, and that wasn't too far off. There was a cylindrical metal chamber, with camera lenses and sensors aimed inside a series of small glass ports around its walls. The chamber was clearly the center of the action, but engulfed by the structure that surrounded it, a monstrous series of off-white metal boxes and tanks that looked like a robotic furnace. A tangle of silver, red, and yellow hoses and tubes extended out of its roof, and a tower of primary colored lights topped one corner. At one end, a computer screen and keyboard sat ready: mission control.

"This is where the magic happens," Scholz said, without apparent irony.

The "magic" is growing diamonds atomically identical to those found in nature. It's possible that Scholz, a 32-year-old MIT graduate and the chief technology officer of Diamond Foundry, understands this alchemy better than almost anyone.

He picked up a molecular model of a diamond crystal, a mini jungle gym of silver sticks joined by black, gumball-like spheres.

"Each one of these represents a carbon atom," he said, popping off one of the balls. "You need a way to separate these carbon atoms from a source material, be it a gas, be it a solid, and then you can create an environment where this carbon atom wants to join with a vacancy, in the existing crystal." Scholz jammed the atom back into the model and put it on the table.

Though the natural conditions that force carbon atoms to bond into a diamond's crystalline structure in nature are somewhat mysterious, Scholz and his team have created an environment to catalyze exactly that.

Here's how it works. They place a fingernail-sized sheet of natural diamond—a reusable numbered plate they refer to as a “seed”—inside a chamber that's heated to around 10,000 degrees Fahrenheit, approximately the temperature of an outer layer of the sun. They shoot a cocktail of greenhouse gases, including carbon and methane into the chamber, creating an unstable gas also known as a plasma. This results in a sort of chemical orgy, where carbon atoms are separated from the molecules they arrived with, and encouraged to attach to the diamond seed, arranging themselves in that very specific tetrahedral lattice.

If everything goes right, the reactor collapses what might have been several million years of production into just two weeks, and produces what looks like a small, bullet-sized block of graphite: a diamond in the rough.

“If something goes wrong,” said Scholz, “it sends us a text message.”

Since 2012, plenty of things had gone wrong. There had been explosions, plasma tornados, and batches of brown stones. But on that sunny Wednesday in January, the dazzling, pea-sized foundry diamond I rolled between my fingertips lit up with disco ball brilliance.

In the physical sense, the stone was a diamond down to each of its atoms. Yet anyone who's ever considered buying a diamond or wished to wear one can tell you atomic structure has little to do with it.

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A diamond, of course, is not just a tetrahedral arrangement of carbon atoms, or even dust from a dying star. A diamond is love, commitment, legitimacy, achievement, romance. Diamonds are a girl's best friend; diamonds are baller. A diamond, the industry would remind you, is forever. And it is nowhere more symbolically fraught than it is on the fourth finger—the ring finger, that is—of a woman's left hand.





📷 Yes. (De Beers)

The dazzling optimism of engagement ring-studded Pinterest pages, prism-streaked #Isaidyes selfies, and shriek-eliciting ring revelations at the office—that deep-down belief that this stone is special, forever, and meant only for you—can be attributed to a single company: De Beers. For several decades, De Beers has been laser-focused on making consumers believe in its greatest asset, which isn't actually diamonds, but rather the idea of diamonds.

The company explicitly defined the “diamond dream” in a 2014 report: “The allure that diamonds have for consumers, based on their association with romance and a sense of the eternal, and the fact that they are seen as a lasting source of value.”

This is the exact same dream De Beers conceived about 75 years prior, with the help of Philadelphia-based advertising agency, N.W. Ayer. After the Great Depression nearly destroyed demand for diamonds, N.W. Ayer launched a campaign to make the stones—specifically those set in engagement rings—not only an accessory, but a cultural touchstone.

Treasures of the heart Where is the storehouse strong enough to store the treasures of the heart—the soaring joy of a love-enchanted world—the first intent awareness when soul calls to soul? Her engagement diamond is a drop of magic flame fashioned through eons to preserve such scenes and memories in its shining lights. Safe from all harm, clear to her eyes, there she will see them always.

Remember, color, cutting and clarity, as well as carat weight, contribute to a diamond's beauty and value. A trusted jeweler is your best adviser. Extended payments can usually be arranged.





1/4 carat (25 points) \$80 to \$205
 1/2 carat (50 points) \$190 to \$455
 1 carat (100 points) \$455 to \$1155
 2 carats (200 points) \$1225 to \$3270



Love Scene—painted for the De Beers Collection by Pierre Jeco

In April, 1955, jewelers throughout the country were asked for the prices of their top-grade engagement diamonds (unmounted) in the weights indicated. The result is a range of prices, varying according to the qualities offered. Exceptionally fine stones are higher priced. Add Federal tax. Exact weights shown are infrequent.

a diamond is forever
 De Beers Consolidated Mines, Ltd.

© C. 1954 & 1957

📷 That is some copy. (Flickr/National Museum of American History Smithsonian Institution)

N.W. Ayer’s campaign would come to be understood as the most successful of the 20th century—and unlike anything that came before it. As Edward Jay Epstein [chronicled in The Atlantic](#) magazine in 1982, the agency focused not simply on sales, but what it called “a problem in mass psychology”—its mission to make the diamond engagement ring “a psychological necessity capable of competing successfully at the retail level with utility goods and services.”

It worked. In just three years, between 1938 and 1941, N.W. Ayer helped increase De Beers’ US diamond sales by 55%. Far more importantly, the agency planted the powerful idea in the American psyche that a diamond was an essential step in romantic courtship—and its size was directly proportional to the love, worth, and prowess of the man who offered it. (Naysayers need look no further than a more contemporary De Beers ad featuring a diamond with the caption, “Where’d you get that diamond?” beside a bigger one with the caption, “Where’d you get that man?” In other words: size matters.)

In 1947, Frances Gerety, a female copywriter (unmarried) captured precisely the sentiment De Beers needed when she penned the line “a diamond is forever,” and rewrote the history of American advertising. In four words, Gerety evoked the totemic weight of a diamond, and the old-as-the-stars wonder of its natural origins. While Gerety continued to write poetic copy for De Beers’ print advertisements, her partner in crime at N.W. Ayer, Dorothy “Diamond Dot” Dignam (also single), launched a celebrity

placement campaign decades ahead of its time. Just like Harry Winston, Chopard, and Bulgari do today, N.W. Ayer loaned diamonds for movie stars to wear to awards shows and social events. Before the age of the email blast, Diamond Dot chronicled celebrities' diamonds in a weekly newsletter she circulated to 125 newspapers.

In 1951, N.W. Ayer declared victory in an annual report: "For a number of years we have found evidence that the diamond engagement ring tradition is consistently growing stronger. Jewelers now tell us 'a girl is not engaged unless she has a diamond engagement ring.'"

In just a little over a decade, De Beers and N.W. Ayer had effectively invented the diamond engagement ring tradition.

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De Beers dreamed all this up, of course, to peddle the diamonds from its mines in South Africa. The idea that a diamond was a deeply personal symbol of love not only encouraged consumers to buy diamonds, it discouraged them from selling them. This helped De Beers control the flow of diamonds on the market—and the price with it. Back then, the company held a near-complete monopoly on the supply, and could control the scarcity of diamonds simply by throttling back on its production. Today, it shares control of the \$19 billion market with four other multinational mining companies. But an integral part of its living legacy—this diamond dream—is still about scarcity, and crucially, authenticity: A finite, perfect supply, billions of years in the making, in the depths of mother earth. This makes natural diamonds special and worthy of their status as a once-in-a-lifetime, never-let-it-go embodiment of the love between a couple.

This is what Diamond Foundry is up against.

Utter the words cubic zirconia to try and wrap your head around how hard it will be for Diamond Foundry to break into the diamond dream. (And if you're too young to remember it, moissanite.) Other manufacturers of lab-grown diamonds have been here before, too. In the early 2000s, a Florida-based company called Gemesis [made a splash](#) with its yellow diamonds, but struggled to achieve the bright white clarity consumers covet. The company's color offerings have improved, and it has since changed its name to Pure Grown Diamonds—but it's still hardly the stuff that dreams are made of.

It is a formidable challenge for Diamond Foundry, to be sure, but it's not insurmountable. For starters, the diamond industry has struggled mightily in the wake of the financial crisis. The fallout has forced some diamond cutters and polishers out of business, and others to seek out alternative suppliers of rough diamonds. Meanwhile, a growing millennial customer base cares about where its stones come from. They want nothing to do with blood diamonds, tainted by war or repression. These shoppers value transparency, good origin stories, and clean ethical and environmental records—hardly the strong suit of the mined diamond industry. They favor companies that smack of innovation, technology, and convenience—think Tesla, Warby Parker, Uber, and Netflix. Perhaps, just possibly, all this creates an opening for Diamond Foundry as the purveyor of carbon-neutral, artisanal diamonds, grown, cut, and polished in California.

Plus, Diamond Foundry has Leonardo DiCaprio, early investor, *Blood Diamond* movie star, Oscar winner, and painfully eligible bachelor.



📷 Diamond Foundry investor Leonardo DiCaprio. (Reuters/Mike Blake)

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If creating a diamond in a plasma reactor seems audacious, consider what it takes to get one out of the ground.

In Russia, Alrosa—neck-and-neck with De Beers for the highest production—has dug chasms into the earth over a mile wide and nearly half-a-mile deep. In Namibia, De Beers' ships sweep the seabed, sucking up the ocean floor at rates approaching half a million cubic feet per hour, dredging and straining for diamonds to be packed into canisters and flown out by helicopter. On a snow and ice-covered island in the sub-Arctic Northwest Territories of Canada, a Rio Tinto and Dominion Diamond Corp. partnership drills for stones below the water table of Lac de Gras. (You can see the mine's evolution over the past 21 years [here](#).) In Botswana, Debswana—a joint venture of the government and De Beers—excavated some 20 million carats of diamonds in 2015 from its pit mines, which are [visible from space](#).



This is a satellite's-eye view of the Orapa diamond mine in Botswana.

To offer a sense of the mine's massive scale, we've magnified five tiny dots in the larger image to reveal an excavator and dump trucks, each of which is capable of hauling at least 100 tons of material.

David Yanofsky | Quartz | qz.com

Imagery courtesy DigitalGlobe

Compared to the ongoing cost of a diamond mining operation—say, [a cool \\$1.3 billion](#) for a sub-Arctic, underwater heated retaining wall—the \$100 million that Diamond Foundry has raised from investors seems modest.

“Diamond mining really does not makes sense,” Roscheisen told me at Diamond Foundry, while two men sat at laser cutters in the next room, paring rough diamonds from their seeds—the wafer-like slices of natural diamond that would be sent back to the reactor, to grow another stone.

“It doesn’t make sense to move 20 tons of soil to discover a miniscule quantity of diamond, and have all the environmental and social costs associated,” said Roscheisen. “It doesn’t make sense today and it won’t make sense 10 years from now. The amount of capital investment—it takes billions of dollars to prepare a mine for exploitation—those types of investments will make less and less sense in the future.”

The fact is, it’s been some time since mining companies have even had the opportunity to make those types of investments in the \$15 billion rough diamond market—and when they do, the lead times are long. Rio Tinto found the last source of diamonds worth mining in 2004, a deposit in India called Bunder—and it’s still not producing stones. De Beers began work on Gancho Kué, a pit mine in northern Canada

where temperatures reach -40 celsius, in 1995. It is only expected to start producing diamonds this year.

“The supply of rough diamonds is pretty flat,” said Fazal Chaudri, an independent consultant for the industry. “We know where the mines are. We know what they’re producing. We know that in the next few years there’s not really going to be a huge upswing in supply.”

Chaudri advises players in what the diamond industry calls the “midstream,” cutters and polishers who buy rough diamonds, turn them into gemstones, and sell them for jewelry. While multinational corporations control diamond mining, the midstream is still largely made up of private, family-owned businesses—some several generations old.

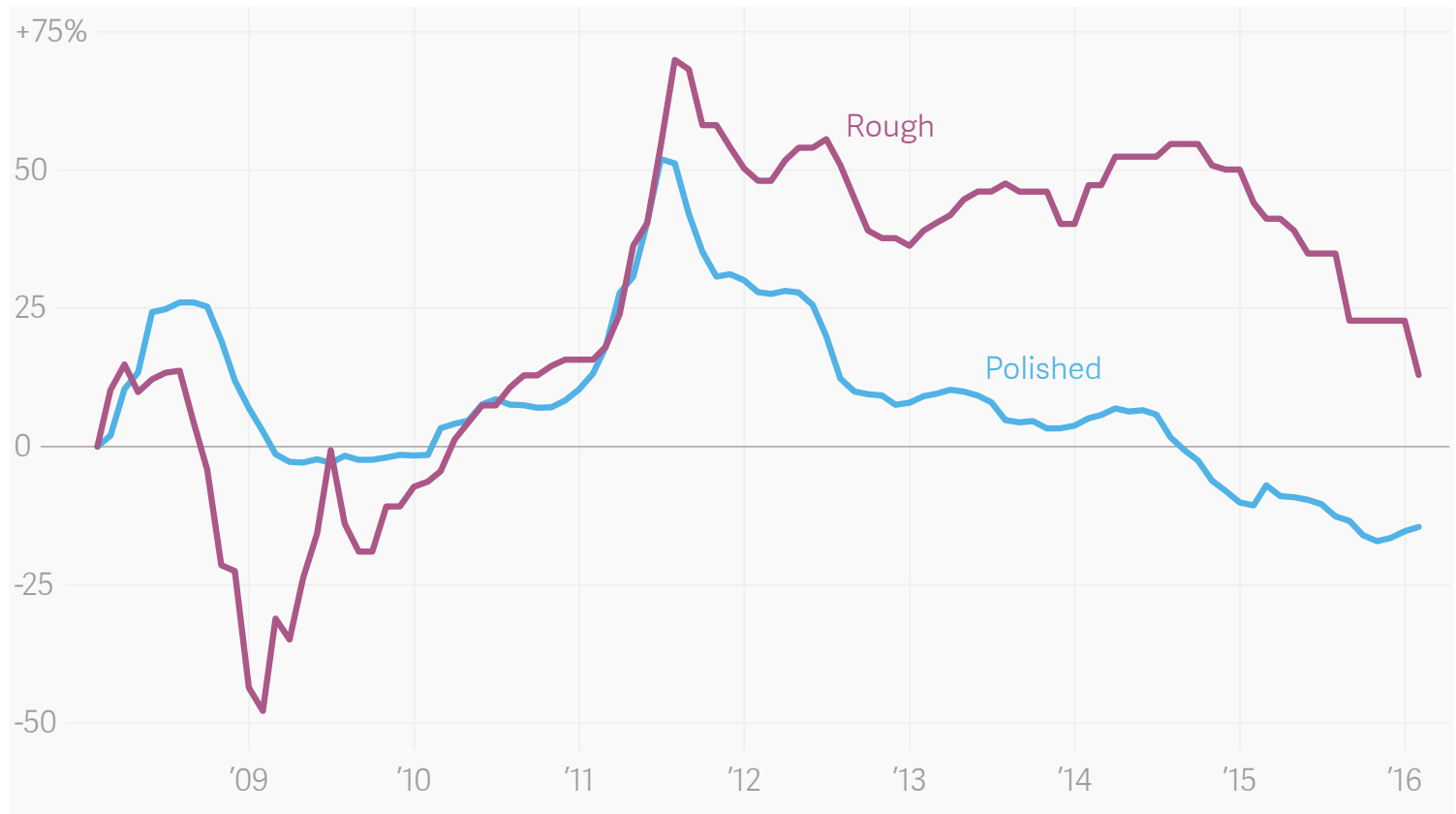
This sector of the industry has had a brutal few years, to say the least.

Just like the cheap loans that led to the US mortgage crisis, easy credit in the diamond industry supported a bubble in rough diamond prices for years. For a while, this worked for everyone. Cutters and polishers paid mining companies handsome prices for their rough diamonds, which they financed with easy-to-get, low-interest loans. So long as the price for their finished, polished diamonds stayed high, everybody won.

But the polished diamond price didn’t stay high. Demand in important markets like the US and China flagged, the polished price fell, and many cutters and polishers were left holding bags of rough diamonds for which they’d overpaid—and loans they couldn’t make good on. This gave the diamond industry—and probably more than a few diamond cutters—an acute case of what [the Financial Times called](#) “indigestion.”

Worse still, the price for rough diamonds, largely controlled by a small handful of companies, remained high.

Cumulative change in diamond prices



△ T L △ S Data: Rapaport

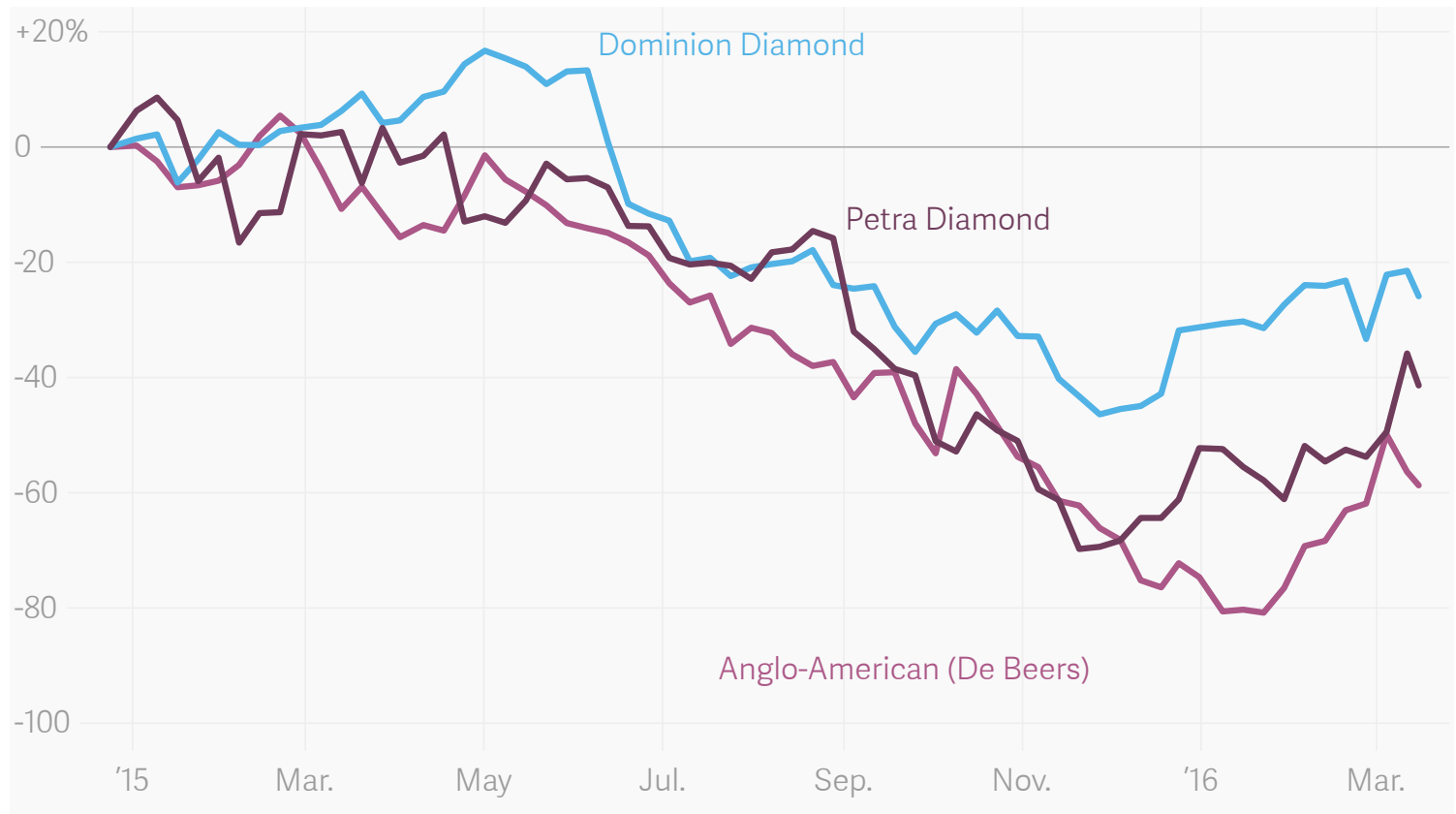
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“The raw [rough] diamond price is still high but the polishers have to sell cheaper because of the drop in demand,” Chirag Kakadia, an Indian diamond polisher, [told the Financial Times](#) in January, 2016. “We are forced to purchase higher but sell lower. Our production has dropped 40% from 2014 but our sales are 50% less.”

That squeeze on midstream margins forced some cutters and polishers out of the industry altogether. Many who remained have struggled to stay afloat. In the wake of the financial crisis, access to financing to purchase rough diamonds has remained elusive, and in some cases, dried up all together. In 2014, the Belgian government forced the closure of the Antwerp Diamond Bank, one of the major financiers to the midstream, as a condition for bailing out its parent company, KCB. The State Bank of India, Britain’s Standard Charter Bank, and other top lenders have also tightened their purse strings.

“The cutters felt very, very squeezed from a margin point of view and from a finance point of view, from a liquidity point of view,” said Chaudri. “So they just stopped buying. And so you see that the big miners hardly sold any rough diamonds in the second half of the year...The second half of last year, 2015, was a really bad one. It’s been quite a tough year for the industry.”

Share price performance of diamond mining companies



△ T L △ S Data: FactSet

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“There is no doubt that 2015 saw major challenges in the midstream of our business,” Lynette Gould, a De Beers representative, wrote in an email. She described the steps De Beers had taken to ease their customers’ pain: Lowering rough diamond production, reducing prices, and spending around \$100 million on new marketing campaigns—including what she described as “the largest-ever investment in Forevermark’s *A Diamond is Forever* Christmas campaign in the US.”

What smells like [blood in the water to some](#), smells like opportunity for Diamond Foundry.

“The middle tier is being squeezed, and the loyalty is breaking up in the industry,” Roscheisen told me. “Everyone is looking for other ways to grow.” One of Diamond Foundry’s biggest customers, he added, was a De Beers’ sightholder—the rarely privileged diamond trader with a contract to buy in bulk directly from the mining company—for 40 years.

“He opted out this year for good,” said Roscheisen.

For now, Roscheisen and his partners can only produce about 2,000 carats per month, nowhere near sufficient to satisfy such a dealer. (Diamond Foundry’s current production puts it at not quite 0.02% of the 125 million carats the mining industry turns up each year.) They’re considering supplying outside cutters and polishers once the foundry’s production capacity—which has already doubled since November—can support it. Until they’re able to, though, Diamond Foundry is content to focus on its own team of cutters and polishers in the US and Israel, and about 25 independent jewelry designer partners. Together, Roscheisen believes his business has the opportunity to do something different: Create a new diamond

dream altogether.



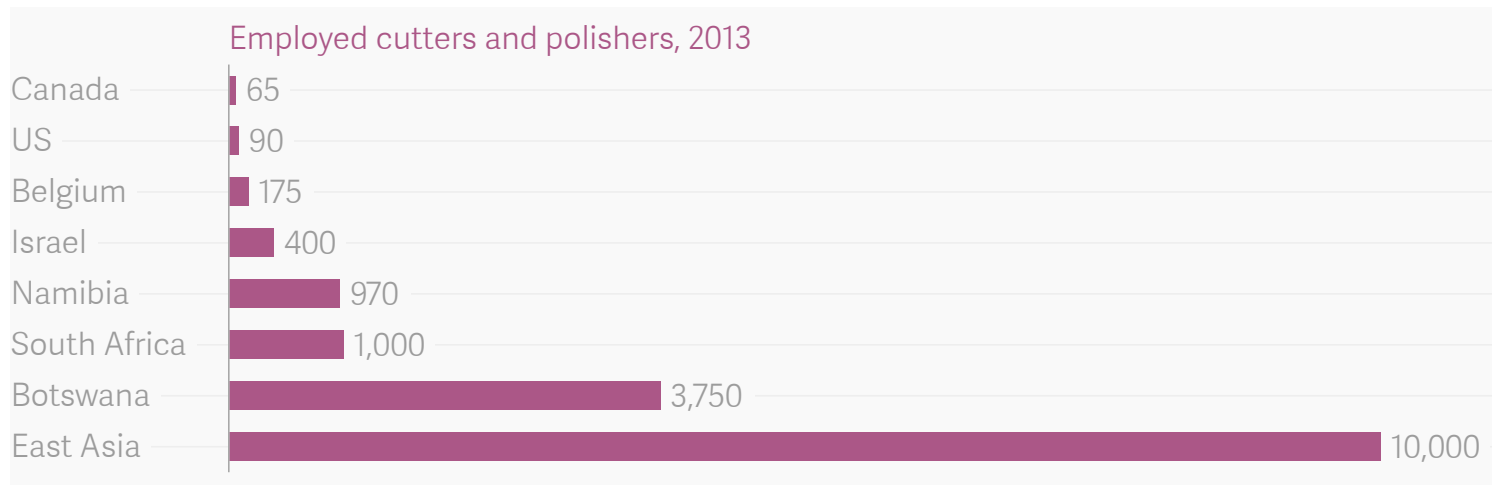
Maarten de Witte

At Diamond Foundry’s headquarters I met Maarten de Witte, a 64-year old diamond cutter with a wiry silver beard, cornflower eyes, and a diamond stud that sparkled from his ear. The sleeves of his pale chambray shirt were rolled up to reveal his thick wrists, one of which was tattooed with an octahedron, to represent the form rough diamonds often take in nature.

“The diamond cutters I grew up with are few and far between,” he told me. “We mostly have become repair artists, fixing broken diamonds, old-fashioned diamonds, things like that.”

For almost 20 years, de Witte trained salespeople for Hearts on Fire, a Boston-based brand that wholesales diamonds to jewelers. He also designed and developed special cuts for the brand, which were executed by cutters at a factory in China. In 2013, De Beers estimated that China and India were home to more than 800,000 diamond cutters and polishers between them, compared to less than 100 in the US.

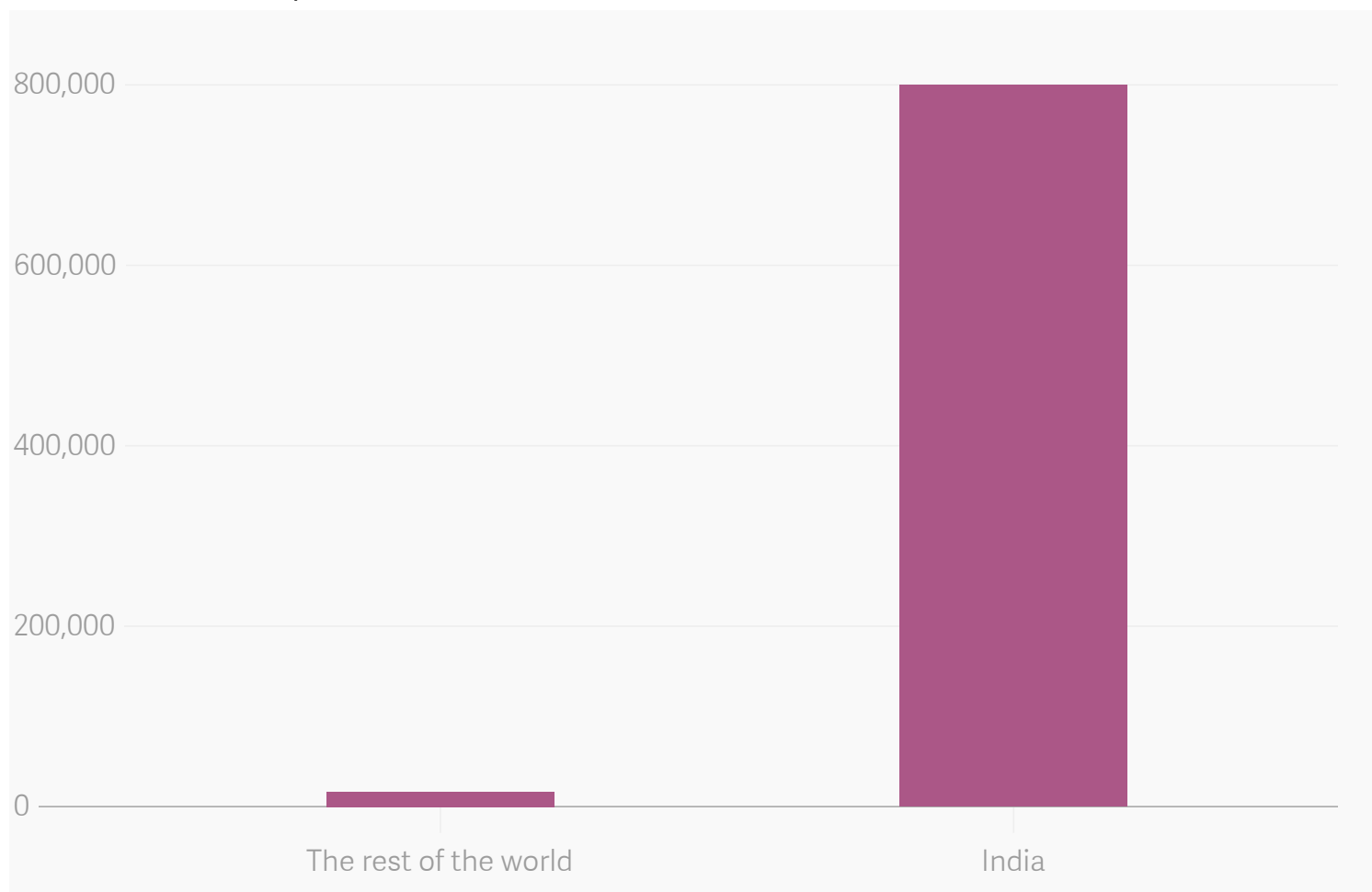
Diamond cutters and polishers worldwide (excluding India)



△ T L △ S Data: De Beers estimates

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Diamond cutters and polishers, 2013



△ T L △ S Data: De Beers estimates

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De Witte has the designation of “master diamond cutter,” making him the rare craftsman who can take a diamond in its rough form—a stone most of us wouldn’t pick up off the sidewalk—and turn it into a conversation-stopping, symmetrically-faceted dazzler. But in his 30-odd years as a cutter, de Witte has rarely had the chance to do that, because most diamonds are cut in India before he can get his hands on them. He told me he had only cut a few dozen diamonds from their rough, original state in his entire career when he got a call from Diamond Foundry in October. They had a piece of lab-grown rough diamond they wanted cut locally.



“As an artist, all of a sudden there’s material available,” he said. “And that’s been virtually unheard of my entire career.”

The foundry diamond Roscheisen loaned me was a 58-faceted round brilliant cut stone, as are the vast majority of diamonds American women say “yes” to today. Easily repeatable, scientifically proven to maximize light return, and—most importantly—highly saleable, the round brilliant diamond has become the industry standard.

“You can’t blame the diamond industry in terms of the very conservative portfolio of designs that they have. It’s a very expensive material to experiment with,” said de Witte. “I’ve been trying to get unique cuts into the marketplace for years, and been stonewalled because the reaction within the market has been, ‘Look, we make a round brilliant, we have no problem selling it. Whatever we buy, we cut, we sell, so what do we need [unique cuts] for?’”

De Witte described the portfolio of new designs he’s planning to roll out, domed faceting patterns that maximize sparkle, and capitalize on the depth of stones that Diamond Foundry is capable of producing. Because the reactors grow diamonds in a cube shape, rather than the octohedrons usually found in nature, he could employ new geometries.

“Like in jazz, you could have a jazz signature,” he said, snapping his fingers. “Like it’s nine-seven time—so it’d be nine [facets] on top and seven on the bottom. I mean, you could do anything you want, and the material can be affordable enough that the experimentation can take place,” he said.

What's more, the short, local supply chain could allow customers to work directly with de Witte to develop a custom cut: a couture engagement diamond. While it's true a foundry diamond—which already sounds worlds sexier than “lab-grown”—doesn't come with the million-year-old pedigree of a diamond dug from the ground, it could come with bragging rights of its own: the fact that its wearer (or her partner) worked closely with an artisan to create something unique, made especially for her.

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For now, Diamond Foundry is still producing plenty of round brilliants, like the one they loaned me—and also like the one that Christine Guibara, one of the jewelry designers making pieces the company sells on its website, was preparing to fit into an engagement ring that afternoon for a customer in Texas. Guibara, 30-years old, wore a bright smile, floral blouse, slim jeans, and watermelon-colored Ferragamo flats when she met me at her studio less than 10 miles from Diamond Foundry, in Burlingame, California.

The place was like the diamond dream incarnate.



Christine Guibara

In Guibara's workspace, above a sprawling studio where her father, a metal sculptor, works, illuminated circus-style letters spelled out L-O-V-E above a sofa scattered with decorative pillows. Giant clamshells on pedestals displayed earthy and whimsical work: Pearls set in organically shaped gold petals, and gold owl cufflinks with sapphires for eyes. Linen-lined display boxes beside Guibara's computer held dozens of the designer's most beloved one-of-kind stones: opals, emeralds, and tourmalines that naturally grew in mosaic patterns and multicolor variations.

When I asked Guibara about a favorite gem, her eyes flashed.

“I love diamonds,” she said, with a laugh. “They have a luster that some stones don’t have. It’s been scientifically proven and all those things—but you can see it when you work with the diamonds.”

And Guibara handles a lot of diamonds. About 70% of her business is bridal, and she sources a custom stone for almost every ring, working with dealers from Israel and Antwerp to her local San Francisco diamond district. Depending on the customer, she might find a mined stone from Canada (which comes with a sparkling human rights record), or Africa (less so). Guibara also helps clients track down what she calls “post-consumer” diamonds, which are stones recycled from old pieces of jewelry—like the reclaimed wood of diamonds.

Now, she’s added foundry diamonds—made in Roscheisen’s reactor just eight highway exits away—to that list of options.

Guibara was working with a single-carat round brilliant foundry diamond, of a I VS2 color and clarity, which indicates a slightly warm white diamond with inclusions that are only visible under a magnifying glass. It would have set the customer back about \$4,000, plus another \$2,500 for a yellow gold art deco-style setting. A similar stone from the online diamond retailer Blue Nile, without a setting, would carry a price tag of between \$11,000 and \$14,000.



Guibara says she doesn’t see the demand for natural diamonds going away, but believes Diamond Foundry could bring her customers that may have otherwise opted out of a diamond altogether, a new

generation of diamond dreamers who care about environmental footprints and traceability.

“Basically, it solves an issue that a lot of people had and will bring more people into the diamond industry,” she said. “Some people who would have gone alternative bridal—not had a ring, not had a stone—may be really interested by this.”

What’s more, foundry diamonds are priced at about 10-15% less than their natural counterparts, offering customers a little more bling for their buck—worth noting, as today it’s the upwardly mobile who [drive luxury spending](#) with conspicuous signifiers of their newly acquired wealth.

As Guibara and I talked, I couldn’t help getting distracted by her hands. She wore multiple rings, but the one I couldn’t take my eyes off was on her left ring finger, a weighty white diamond that sat in polished gold prongs which held it like talons. The stone seemed to flash at me in indigo, orange, and lime.

In that moment, I’ll confess that my research became more personal than professional. Setting aside all those questions about supply chains, marketing schemes, and luxury spending, I just had to ask: What is *that*? (And by extension, how do I get one?)

This, Guibara told me, was her own engagement ring, holding out her hand. Gazing into the diamond’s center felt a little like looking into the ocean’s surface in the sun. Guibara said it was an up-cycled old European cut, and had probably had its wide, sloped facets since the 1800s. Back then, she said, cutting techniques were cruder, and made for stones that reflected less light than contemporary cuts, but more color. If today’s densely faceted modern brilliant cuts sparkled like crushed ice, said Guibara, old European cuts were confetti.

That night, I left Guibara’s studio giddy with my new knowledge of old European-cut stones, considering how one might look on my own finger. In the weeks since, I’ve scrolled through [her Instagram account](#) many times, admiring up-cycled stones with captions describing proposals on the cliffs at Big Sur, and close-ups of solitaire settings. I’ve considered that were I—or someone else—to fork over thousands of dollars for a stone that was cut over a century ago, no multinational mining company or sketchy smuggler would see those profits. But then again, with a pedigree that old, it would very possibly be connected to miserable working conditions or exploitation somewhere in its history.

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Much of that nagging guilt—along with that of the “alternative bridal” customers Guibara described—is no doubt the result of the “blood diamond” entering the popular conscience a decade ago, when DiCaprio starred in a blockbuster film of the same name. The film, set in 1999 Sierra Leone, grippingly illustrated how diamonds mined in war-torn African countries financed rebel forces and fueled unspeakable violence.

Blood Diamond came three years after the diamond industry established the Kimberley Process, an international certificate protocol designed to stem the flow of conflict diamonds. But the Kimberley

Process hasn't so much protected Africans from diamond-fueled violence and illegal exploitation as it has protected consumers and diamond dealers from the thought that their diamonds may have blood on them.

Outside of jewelry stores, the Kimberley Process's ineffectiveness is widely acknowledged. In 2011 Global Witness, the NGO that helped establish the process in 2003, announced its resignation as official observer, citing the protocol's failure to address conflict diamonds and horrific violations in Cote d'Ivoire, Venezuela, and Zimbabwe. More recently, a United Nations panel estimated that the Central African Republic, where both Muslim rebels and Christian militias benefit from the diamond trade, was the source of an estimated \$24 million of smuggled diamonds between the Kimberley Process's suspension of its exports in May 2013 and October of the following year. Plus, the Kimberley Process's definition of a conflict diamond [is maddeningly narrow](#).

In the US, anyone buying a diamond will be advised of the all-important Gemological Institute of America (GIA) certification. You'd be a sucker to buy a diamond without one, since the price of a diamond is determined, in large part by the four C's the GIA assesses: cut, clarity, color, and carat. The GIA will laser-sear your diamond with a microscopic inscription, lest a shady jeweler try to switch it on you, and draw a map of flaws which are invisible to the naked eye. But it can't tell you where a diamond came from.

For the most part, asking a jeweler where a diamond initially came from will get you a nebulous answer: "We only buy from reputable sources;" "They're all conflict-free," and so on. But the fact, with few exceptions, is that no one really knows where on earth it originated.

"These diamonds get more air miles than your average American in a year," Chaudri told me, describing a typical diamond's journey from a mine in Africa, to traders in Antwerp, cutters and polishers in India, jewelry manufacturers in China, and, ultimately, a retailer in the US. "If you're a consumer, to know that this diamond came from this mine in Botswana is almost impossible."



Diamond Foundry, on the other hand, can account for every single atom of its products, and guarantee it was created, cut, polished, and set entirely in California.

But some people will still say it's not a real diamond.

When I brought my Diamond Foundry loaner to the New York City diamond district—a gritty stretch of 47th street—one dealer told me it was a nice stone, quoted a price for it, and then knocked it in half when I told him it came from a lab. More than one jeweler asked if I was single, and advised me to make sure I got a natural diamond when the time came—even if it was half the size. One whispered in my ear, asking me the difference between fake boobs and real boobs, as if this would convince me of the classiness of a natural diamond.

The jewelry designer Anna Sheffield, who makes and sells edgy, elegant engagement rings with natural diamonds in downtown Manhattan, told me she'd consider using foundry diamonds, but wouldn't offer them in the same settings she uses for their natural counterparts.

“Just to protect my clients who have come the extra mile and gotten a [natural] D-flawless,” she said. “To not have someone be next to them on a the train that has a giant fake diamond—because I feel like, in a way, it devalues the brand.”

Brand is paramount. Of course, that's Diamond Foundry's challenge in a nutshell: How to take its physically correct diamonds and shake the word “fake.” A foundry diamond needs to evoke authenticity, value, class, and that same sense of eternity De Beers created more than 75 years ago. It needs to sell a new diamond dream.

Names like Tiffany, Cartier, and Harry Winston all command a certain respect and price tag when it comes to diamonds. In a 2013 report on the diamond industry, McKinsey stated that shoppers with “new money,” who are less likely to have inherited jewelry, increasingly prefer branded jewelry.

Roscheisen gets that. He is working on it. As we left the Gramercy Park Hotel and walked toward Park Avenue to find him a cab, he seemed increasingly like, well, the CEO of a luxury brand, and less like a Silicon Valley engineer. It was Fashion Week, and he had just flown in from Richard Branson’s private island in the Caribbean. That night he was going with Wendi Murdoch, Rupert’s fashionable ex-wife and an advisor on the Diamond Foundry’s board, to a premiere of *Zoolander 2*. In a Barney’s bag, he carried the new Prada suit he would wear. Next, he would go to the birthday party in Aspen of Mark Pincus, the Diamond Foundry investor. In the interim, he had spent the day in meetings at the New York office of Karla Otto, the international public relations firm that represents brands such as Céline, Dior, and—now—Diamond Foundry.

The real PR coup, I told Roscheisen, would be to get DiCaprio to propose with a foundry diamond. He laughed.

“Yeah, I have a story about that,” he said, and stopped himself.

For Hollywood’s most-eligible bachelor to get engaged with a Diamond Foundry stone would be a very 21st century homage to the work Frances Gerety and “Diamond Dot” Dingnam did for De Beers some 60 years ago—not to mention DiCaprio’s own work in *Blood Diamond*. It would also place Diamond Foundry at the heart of a new diamond dream.

As for me, I keep thinking about those old European-cut diamonds, and scrolling through Christine Guibara’s Instagram account. I quite like the idea of collaborating with her and Maarten de Witte on a foundry diamond with an old-fashioned cut, made in California, just for me.

Really, it’s all about the diamond dream you can believe in.

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Video portraits by Nushmia Khan

Read this next: [How to propose with a diamond as rock-solid as your ethical values](#)

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