



Barry X Ball Makes a 3D-Printed, Digitally Altered, Gold-Plated Sculpture

BY *Stephanie Strasnick* POSTED 11/19/13

Using 3D printing and scanning technologies, computer software, resin, plastic, nickel, bronze, and gold, the artist created a Boccioni-inspired sculpture

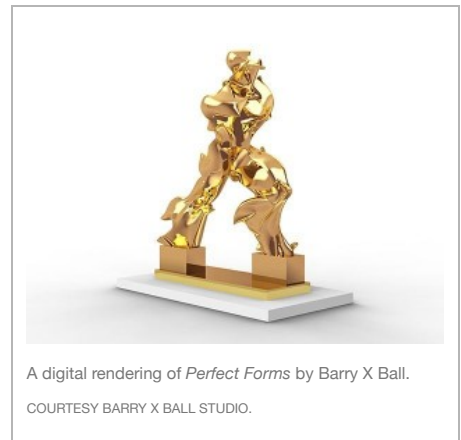


Barry X Ball wanted to complete an artwork that Boccioni never did. *Unique Forms of Continuity in Space*, which wasn't cast in bronze until after Boccioni's death, is a modernist icon. Inspired by industrialization in Italy at the turn of the 20th century, the anonymous figure cascades through space—the wind distorting his speeding body.

Using 3D scanning and printing technologies, sophisticated computer software, resin, nickel, copper, bronze, and 24-karat gold, Ball created his own version of *Unique Forms*.

Titled *Perfect Forms*, Ball's rendition measures nearly two feet tall. The abstracted body is meticulously contoured. The angles are sharp. The curves are smooth. The sleek, gold finish causes the figure to glow and perpetuates the idea that the man is in motion.

The prototype of *Perfect Forms* made its public debut in October as part of the exhibition "[Out of Hand: Materializing the Postdigital](#)" at the Museum of Arts and Design in New York. On view through June 1, [the show](#) features clothing, artwork, furniture, and jewelry that were created using 3D printers and CNC mills.



A digital rendering of *Perfect Forms* by Barry X Ball.
COURTESY BARRY X BALL STUDIO.

On a recent visit to Ball's studio—which occupies a townhouse in Williamsburg, Brooklyn—I learned about the labor-intensive process involved in constructing *Perfect Forms*. He demonstrated the various steps using editions of the sculpture, which are mirror images of the MAD prototype. Ball and his team plan to make seven editions in total. The price of the editions has not been determined, but the prototype is selling for \$225,000 through Ball's New York gallery, Sperone Westwater.

With *Unique Forms*, Boccioni "was trying to make a man of the future—a man at one with the world," said Ball. But this didn't happen during his lifetime. Boccioni died before his plaster mold of the piece was cast in bronze. It was later cast at many different venues, and the bronze *Unique Forms* sculptures found in museums today range in finish, size, and overall quality. By using the most cutting-edge technologies available to him to create *Perfect Forms*, Ball hoped to fulfill Boccioni's unmet objectives.

His first step was to scan an edition of Boccioni's sculpture from a private collection in Switzerland. Ball did this using a [Breuckmann 3D white-light scanner](#). The artist and his team then enhanced the 3D scan using the digital sculpting and painting program [ZBrush](#).



On the second floor of the studio, Ball has several computers with the ZBrush software. During my visit, his digital-modeling assistant Nathan Lahikainen showed me how their team uses the program to fine-tune 3D scans.

Nathan explained that for *Perfect Forms*, ZBrush was used to smooth the surface of the piece, sharpen its angles, and repair any nicks and scratches that were on Boccioni's bronze. This process took more than two years to execute.

After the 3D modeling was complete, a plastic prototype was printed from a [Viper Pro SLA 3D-printing system](#). The machine produces forms layer-by-layer, Ball explained, "like a reverse CAT scan." The layering process caused the model, which was cream-colored and weighed approximately two pounds, to emerge from the printer with thousands of miniscule, vertical ridges—each one signifying the start of a new layer of plastic.

The ridges needed to be buffed out. While I was visiting, studio assistant Amy Finkbeiner was in the process of smoothing out the plastic on an edition of *Perfect Forms*.



Amy Finkbeiner used sandpaper and water to buff out the ridges.

COURTESY BARRY X BALL STUDIO.

I watched as Amy, working under the bright light of a nearby floor lamp, used sandpaper to burnish the piece. Firmly pressing one rubber-gloved hand against the armature for leverage, she slowly and gingerly worked the sandpaper against the plastic with the other hand, periodically stopping to spray the paper with water. The water acts as a lubricant, which helps to create a matte finish on the plastic.

Before *Perfect Forms*, Ball used plastic 3D-printed models—which are not very sturdy and are sensitive to light and heat—to conceive and design pieces that were ultimately made by hand. Rapid prototypes, he explains, weren't intended to be permanent. The now-smooth *Perfect Forms* prototype was filled with resin to make it more durable.

To do this, Ball and his team mounted the hollow model upside-down onto a wooden workbench and poured in the resin. Filling the mold would allow the work to support the weight of the metal coatings, which came next.



Studio assistant Gary Mellon fills the hollow, plastic model with resin.

COURTESY BARRY X BALL STUDIO.

First, the plastic was coated in nickel, to create an absolutely smooth surface. Then, a heavy layer of copper was applied.

To see an edition of *Perfect Forms* at the copper stage, Barry took me to his backyard. There, he had two large sheds set up, which serve as work spaces for some of his studio assistants.

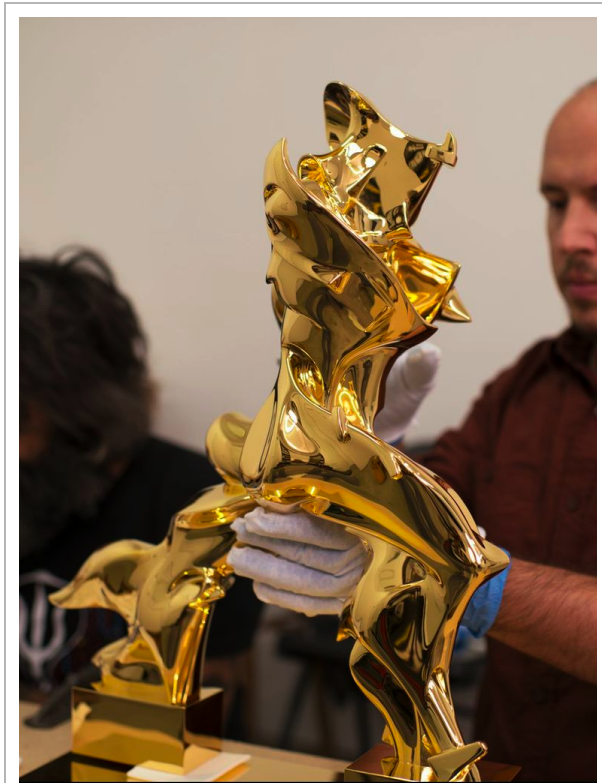
"It smells like a salad in here," he said as we walked through one of the sheds. That smell was vinegar, which assistant Mitchell Martinez was applying to the bronze *Perfect Forms*. Vinegar, Mitchell explained, works as a polishing agent for the copper, which tarnishes very easily.



Studio assistant Mitchell Martinez uses vinegar to polish the bronze on an edition of *Perfect Forms*.

PHOTO: STEPHANIE STRASNICK.

After the bronzes are polished, preliminarily, in the studio, Ball sends the pieces out to [Michael Dunlap](#), a craftsman who creates 24-karat-gold trophies for NASCAR, to finish the polishing job. Once this step is complete, the pieces are ready to be coated in 24-karat gold—the final stage of construction.



After layers of nickel and copper were applied to the plastic model, *Perfect Forms* was coated in 24-karat gold.

COURTESY BARRY X BALL STUDIO.

Perfect Forms was the first piece that Ball created in 15 years that was not made of stone. Because of that, the artist knew that he wanted to use gold, which he considers to be “the ultimate material.” And, in the interest of creating a modern man, just as Boccioni had set out to do, the shiny gold surface would be able to reflect the world around the figure.

Says Ball, “I did what Boccioni would have done in his dreams.”

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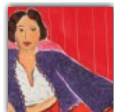
Perfect Forms

Stephanie Strasnick

Umberto Boccioni

Unique Forms Of Continuity In Space

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