

print

DECLARATIONS OF INDEPENDENCE

Exhibitionism with a conscience, DIY gone digital, and 35 other trends from a wild and contradictory decade.

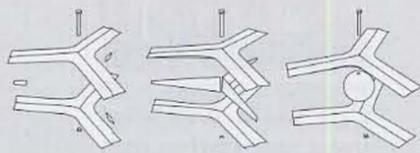
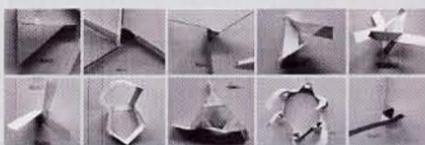


END PRODUCT

The process behind the product

By Michael Dumiak

Blow-Up



1 Using the experimental data gained in the graduate program he founded, Zieta and colleagues Philipp Dohmen and Uwe Teusch first model potential outcomes in the Computer Aided Architectural Design (CAAD) department at their lab at the Swiss Institute of Technology.

2 FIDU is similar to hydroforming, a process developed for lightweight autobodying, but without the million-dollar molds. Zieta uses a CNC machine to cut the sheets of rolled steel because its precision allows adjustments down to a fraction of a millimeter. These alterations affect how the 2-D objects inflate.



3 The two metal sheets are welded together, and the team attaches an air compressor hose through a hole in one of the plates. Air is added at low pressure—as low as 0.36 bars, less than what a bicycle tire requires. The steel bends, curves, deforms, and inflates.

4 The final result can be unique, like this stool (above), or uniform, as in the bench (right). The stool's legs are not bent by hand—they fold that way because the material "wants" to, as Zieta puts it. So long as the rolled steel remains flat, it'll be flexible and floppy.

WHEN THE Polish-born architect Oskar Zieta displayed his inflated footstool, Plopp (second from left), at Berlin's DMY festival earlier this summer, visitors invariably picked it up thinking it was another piece of blown-up plastic. Surprise! It's sheet metal, and its featherweight construction supports up to 5,000 pounds.

This year, Zieta has shown increased range with two new inflated objects: a park bench and a vertical-axis wind turbine. The smooth bench is made using the exact same methods as the puffy Plopp stool, and they both come from the same place—Zieta's lab at the Zurich-based Swiss Institute of

Technology, where he set up a graduate program eight years ago to research lightweight architecture and design.

Zieta's work method is called FIDU, a German acronym for "free-inner-pressure casting." It's deceptively simple: The team cuts two-dimensional pieces of lightweight, flexible rolled steel, laser-welds them together, and inflates them with air, water, or oil. The old rule that form follows function is reversed. "Normally, you design something and then decide how best to make it," says Philipp Dohmen, who works with Zieta. "With FIDU, it's upside down."

The FIDU process demands repetitive experimentation—over the last eight years, Zieta's team has produced many experimental "sculptures"—but the architects have begun to master the formula. It's like an algorithm. A 2-D shape, drawn by computer and cut by a laser, will naturally inflate certain ways in three dimensions. The real secret, though, is trial and error. "For the first two years, everyone laughed," Zieta says. "The experiments looked so buckled, you couldn't imagine what to make out of it."

OSKAR ZIETA / blech.arch.ethz.ch