

# Printed car might make the world a greener place

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*RedEye On Demand and Stratasys have been selected by Winnipeg-based KOR Ecologic to build the first 3D-printed, production-ready car called Urbee. Photo: Minneapolis Star Tribune/MCT*

Kor Ecologic Inc. founder Jim Kor has been described as a shaggy introvert and hermit.

Yet this engineer is out to change the world with the Urbee, a unique hybrid — that is, a car that runs on both ethanol fuel and electricity. It is a vehicle that dares to be plastic, can zip across the country on 10 gallons of fuel and is manufactured using a sophisticated 3-D printer.

"We want to create the greenest car on Earth," said Kor, who designs tractors and city buses for mass production.

Kor snatched the idea from nature. The Urbee, an electric vehicle with ethanol Backup, needed to be light and strong like a

falcon and fast like a cheetah. But making this happen took a special 3-D printing technology to deliver strength and speed at a low weight.

## Making Urbee Piece By Piece

By late 2011, Kor and his team had designed their dream. They built the car's body in Stratasys' RedEye 3-D printing factory in Eden Prairie, Minn.

Computers read the design software and "printed" each car part layer by layer. A plastic bumper was born, then a hood and so on. While 3-D printing has long been used to make gears, grilles, tools, parts and models for other manufacturers, it had never been used to build the entire body of a car.

"It became the first car to have its body 3-D-printed and now it's the greenest practical car ever made. The Urbee uses eight times less energy than the average little car," Kor said.

Stratasys, the leader in the 3-D printing world, is thrilled about what the vehicle will be able to do. "Without 3-D printing, you can't make a car as efficient as this one," said Stratasys spokesman Joe Hiemenz.

Usually it takes years of altering designs and materials and developing the tools needed to create the model of a car. With 3-D printing, designers can tweak details on a computer and click the Print icon.

## An Affordable Hybrid

Once printed, the Urbee car parts were shipped and assembled back in Kor's lab in Winnipeg, Manitoba. They were outfitted with two electric motors and a small ethanol engine. Today, the two-seater, three-wheeled Urbee is on tour. It's in England this month, where science and car enthusiasts are going ga-ga over the vehicle.

"One day all cars will look like this. ... I'd like to license two-and-a-half billion Urbees," Kor said with a laugh, noting that there are only 1 billion cars in the world today. The goal is to commercialize his baby and to sell each one for about \$16,000, the price of a Fiat 500. "We need a sustainable car like this. But it has to be low-priced and affordable," Kor said.

Two weeks ago, Stratasys customer service supervisor Ashley Voigt hoisted a red Urbee bumper from one of Stratasys' refrigerator-sized printing machines. "This one took a straight day and a half to make. We could have made it faster if we didn't care how it looked," Voight said. By taking the time to precisely lay each plastic fiber, she got a smooth, high-resolution surface that looks like a finished part.

During an industry conference at Stratasys last month, Kor said he has already designed the Urbee 2. The first-generation Urbee gets 70 miles per gallon of fuel, while the Urbee 2 will get 120 to 290 miles per gallon.

But Kor first needs \$3 million to turn drawings into reality. Fundraising started Oct. 30. If successful, production will begin in 2014 at Stratasys' RedEye 3-D printing factory in Eden Prairie. A cross-country drive from New York to San Francisco is scheduled for 2015. On board will be Kor, his son and dog.

### **Only The Beginning Of 3-D**

"We'll start with a half-scale model car in 2014. Once we have that tested, we are only a month away from making the full-scale model," Kor said. Because all the designs are in the computer, it doesn't take long to scale up.

Hiemenz said Stratasys is excited by the Urbee's possibilities. "Jim is this longhaired and small-town guy with a great idea. This car can be charged from a garage outlet or with power from a solar panel kit attached to the car."

The Urbee is one of the more exciting outcomes of the 3-D printing revolution. Twenty years ago, 3-D plastic "printing" was a garage hobby. Now it's a \$2.2 billion industry enthusiastically embraced by General Electric, General Motors, UPS and others.

"It took 20 years to make \$1 billion. It only took five years to grow to \$2.2 billion. We predict it will take three years to double again" and by 2021 will be a \$10.8 billion industry, said Tim Caffrey, an 3D printing analyst with Wohlers Associates.