

# 3D PRINTING RECREATES HISTORY

Yamagata Prefectural Museum uses 3D printing to recreate a national treasure.

*“3D printing, a modern and innovative technique, is both preserving and changing history.”*

— Susumu Abe, Yamagata Prefectural Museum

*Yamagata Prefectural Museum is 3D printing models of this 4,500-year-old sculpture to provide patrons with a close-up view of history. Photography by Yasunari Kikuma.*

Finally, a museum is encouraging patrons to touch the art. The Yamagata Prefectural Museum is using 3D printing technology to create replicas of a 4,500-year-old national treasure for museumgoers to better learn, explore and touch their history.

Established in 1971, Yamagata is a community museum with approximately 300,000 exhibit items. The museum started attracting more attention recently with the exhibition of a 4,500-year old goddess clay doll replica. Unearthed in Funagata-cho, Yamagata, in 1994, the original doll was handcrafted in the Jomon period (12,000 B.C. – 300 B.C.), and is known as the Jomon-no-megami or Jomon Goddess. Japan designated the Jomon Goddess a national treasure in 2012.

## Preserving National Treasures

“3D printing is being widely applied by manufacturers to successfully minimize costs and time in the product development cycle,” says Abe. “I thought that 3D printing could also be used on our collections, making these precious historical antiques more accessible, with the objectives of preserving history and educating the public on national heritage.”

Abe started the project in September 2013. A 1-1 scale replica of the goddess was recreated in three months, along with several 1-to-3 ratio copies for external educational events and samples.

Yamagata, the first museum in Japan to use 3D printing technology to produce replicas, used an Objet®30 Pro™ 3D Printer to make the doll replicas. The 3D printed replicas offer researchers, scholars and the general public wider access to the historic artifacts. Not only can they be restored and recreated, the artifacts can also be used for educational events and traveling exhibitions. “3D printing, a modern and innovative technique, is both preserving and changing history,” Abe says.



Life size (Left) and 1/3 (right) models.



Susumu Abe, Vice Director Yamagata Prefectural Museum.

### Precision on Details

The museum chose the Objet30 Pro 3D Printer because of its fine details, accuracy and wide range of materials. "There are interesting ancient patterns around the waist of the goddess. It is important that we capture the details that showcase the uniqueness of the doll," says Abe.

The 3D printer's PolyJet™ technology empowered Abe to print not only detailed replicas, but also smooth surfaces within a shortened timeframe. A 1-1 model could be created in 20 to 30 hours while it took only three to four hours to print a smaller one. The opaque VeroWhite™ material used to 3D print the dolls created a close resemblance between the 3D printed dolls and the authentic goddess doll.

### More Fun, More Visitors

With the media coverage of Japan's first 3D printed ancient replica, the museum has enjoyed unprecedented publicity, resulting in increased visitors. Abe says that the annual number of visitors to the museum reached 45,000 for the first time in 2013, and is likely to grow.

The replicas provide a more engaging way to learn about the past by allowing visitors to touch and feel the replicas.

"History is a wonder and may seem a bit out of reach for most people. But with 3D printing, we offer visitors the opportunity to interactively walk through history," says Abe.



The Objet30 Pro 3D Printer captures the fine details and accuracy of the Jomon Goddess sculpture, like the patterns around the waist of the goddess.



National Treasure "Jomon Goddess".  
Photography by Yasunari Kikuma.

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