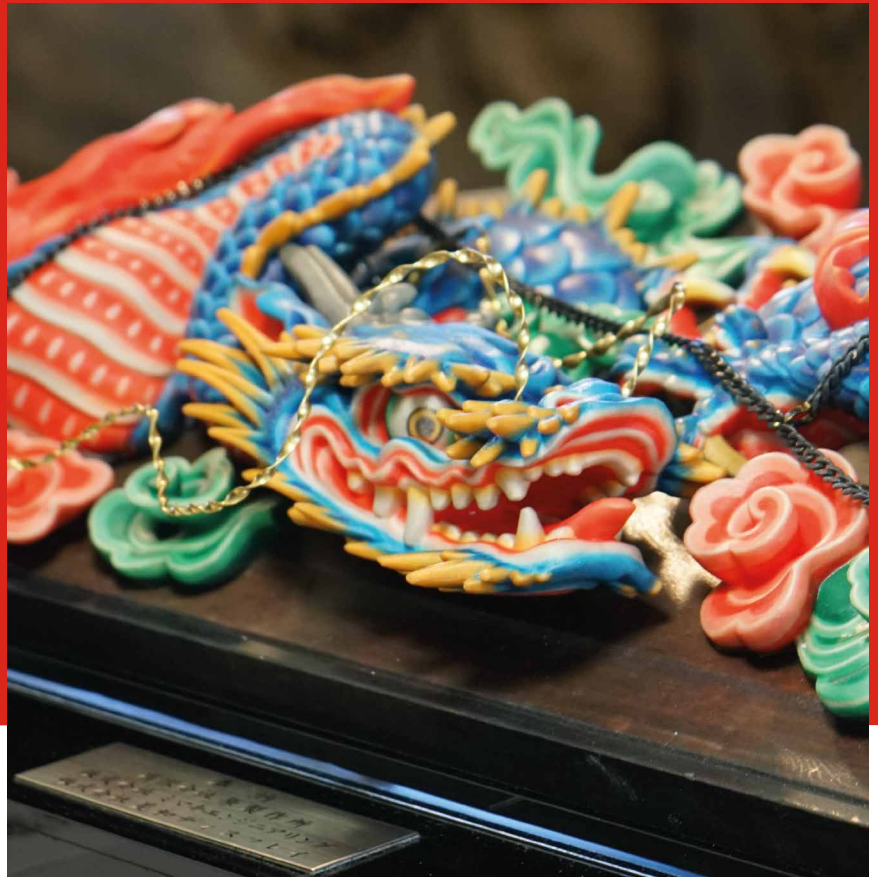


COLLABORATION

CHICHIBU SHRINE
HARA SEISAKUSYO CO. LTD.
KOWA DISPLAY CO. INC.



Mimaki®

The Mimaki 3DUJ-553 Full-Color 3D Printer Recreates "Tsunagi no Ryu," a Painted Wood Carving from the Chichibu Shrine Collection

As Chichibu Shrine (Saitama Prefecture) celebrated its 2100th anniversary, a project was launched to replicate and dedicate the "Tsunagi no Ryu" (Chained Dragon), a painted wood carving created by Hidari Jingoro (1584-1644), famous for the "Nemurineko" (Sleeping Cat) of the Nikko Toshogu Shrine.

For this project, Hara Seisakusyo (HARA SEISAKUSYO Co., Ltd.) took charge of 3D scanning and 3D data creation, 3D printing was performed by Mimaki Engineering using its full-color 3D printer the 3DUJ-553, and Kowa Display Co., Inc. manufactured the display case.

Using full-color 3D data to reproduce the techniques of Edo's master craftsmen

"In the Edo period, the blue color of the dragon was created with mineral pigments made of crushed natural stone, so it was difficult to reproduce.





Cover: Full-color 3D printed replica of "Tsunagi no Ryu" modeled on the 3DUJ-553

Above: 3D scanning of "Tsunagi no Ryu" by Hara Seisakusyo

“This was our effort to record the technique of Hidari Jingoro used over 400 years ago by means of modern 3D printing technology. It was also a challenge in terms of to what extent sophisticated techniques of the early Edo period can be reproduced using a 3D printer.”

It took a lot of trial and error," said Yosuke Hara, president of HARA SEISAKUSYO Co., Ltd. Using high-precision full-color 3D scanning, the "Tsunagi no Ryu" was scanned 360 degrees and converted into 3D data. The data was 3D printed by Mimaki Engineering's full-color 3D printer the 3DUJ-553 to create a 1/5th size replica. The printer uses over 10 million colors to accurately reproduce full-color 3D data.

In general, the protection of cultural assets is often done by hand. For this restoration, no manual work, such as carving or hand-painting, was done. Instead, 3D data and 3D printing were used.

Mr. Hara, who created the 3D data, said, "We have never been able to 3D print color data before, but Mimaki Engineering's full-color 3D printer is so rich in color expression that we were able to faithfully reproduce the full-color data. I think the most attractive thing is that we were able to combine these two technologies."

Passing on cultural assets of the Edo period to future generations

Mr. Hara added, "Globally, there many cultural assets. We don't know when they will disappear due to natural disasters such as earthquakes. That's why I would like to archive them as 3D data first, then preserve and leave them behind. I think the data will be a good starting point for restoration, so I would like to make use of the 3D scanning technology in this way."

Getting close to objects once only seen from afar

Mr. Sonoda, assistant chief of the Chichibu Shrine, said regarding the replication work in the project, "This was our effort to record the technique of Hidari Jingoro used over 400 years ago by means of modern 3D printing technology. It was also a challenge in terms of 'to what extent sophisticated techniques of the early Edo period can be reproduced using the 3D printer.'

Top Right: Dedication ceremony held on October 20, 2021

Bottom: The full-color 3D printed replica of "Tsunagi no Ryu" next to the 3D scanned data by Hara Seisakusyo



“Normally, I am only able to view the original from below, at the foot of the shrine pavilion, but now that I can closely inspect the replica from every angle, I have a renewed recognition of its perfect color expression.”

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angle, I have a renewed recognition of its perfect color expression.”

The replica of the “Tsunagi no Ryu” is displayed as a special exhibit in the shrine compound.

