

PolyJet Patterns Improve Harmonica Trio’s Look, Sound and Performance

“With PolyJet patterns and RTV molding we were able to produce amplifier housings that make it easier to play the harmonica, sound better and look much more professional.”

— Dror Adler, Musical Director, Adler Trio

SITUATION

The Adler Trio is an integral part of Israel’s cultural scene and its members regarded internationally as harmonica virtuosos. Their music can be heard all over the world in concert and on their many albums. But one of the difficulties of performing with a harmonica is holding the microphone while also using both hands to play. This can be tiring during a prolonged concert and increases the risk of the musician missing a note. Another related problem is that the microphone tends to pick up interfering sounds from the mouth and nose.

Dror Adler first attacked these problems decades ago by hand-building a device made of wood and metal to affix the microphone to the harmonica. Later, he added noise-cancelling electronics to muffle conflicting noise. Although the resulting amplifier did the job, it didn’t look very professional and had a tendency to come apart at inopportune moments.

It was after other harmonica players saw Dror Adler using the devices, and asked him where they could buy their own, that he began to consider producing a more polished product. He spoke to an engineer who recommended room temperature vulcanization (RTV) molding — the process of creating a mold by pouring liquid silicone rubber over a pattern — to construct an enclosure that would attach

to the harmonica, hold the microphone, and accommodate the necessary electronics. The resulting mold could then be used to make housings with extremely complex geometry, intricate detail, and tight tolerances.

Patterns used in silicone molding are traditionally produced by CNC machining, but this approach is expensive and time consuming because new patterns are needed for each design change and model, and to replace worn-out molds. In this case, the engineer estimated that one pattern could be produced in two weeks and cost \$1,000

SOLUTION

The engineer connected Adler with Erez Rapid Prototyping service bureau in Holon, Israel.

How does PolyJet compare to traditional methods for Adler?

Method	Production Time	Cost
CNC	14 days	\$1,000
PolyJet	0.5 day	\$100
SAVINGS	13.5 days (96%)	\$900 (90%)



The PolyJet printed pattern (below) with the urethane cast part (top).



Silicone mold just after casting with the molding pattern.



The urethane cast part with vents and runner next to the PolyJet master (top).



Urethane cast parts after initial painting.



The final product after finishing, painting and assembly.

“We use several different rapid prototyping technologies, but selected a PolyJet™ 3D printer to build the pattern because the ultra-low layer thickness creates fine details and smooth surfaces right off the printer. Plus, the dimensional accuracy of the resulting mold would also provide a precise fit,” said Erez Sherman, President of Erez Rapid Prototyping.

RESULTS

An initial pattern was produced in about four hours at a cost of \$100. The service bureau then produced the RTV mold and created the finished parts.

“PolyJet 3D printing technology was the ideal solution for the production of these molds because it provided excellent surface quality, high accuracy and fine details,” Sherman said.

Dror Adler added, “With PolyJet 3D printed patterns and RTV molding we were able to produce amplifier enclosures that made it easier to play the harmonica, sound better and look much more professional. In addition, we have also sold a substantial number of these microphone holders to other harmonica players around the world.”

Stratasys | www.stratasys.com | info@stratasys.com

7665 Commerce Way	2 Holtzman St.
Eden Prairie, MN 55344	Science Park, PO Box 2496
+1 888 480 3548 (US Toll Free)	Rehovot 76124, Israel
+1 952 937 3000 (Intl)	+972 74 745-4000
+1 952 937 0070 (Fax)	+972 74 745-5000 (Fax)

ISO 9001:2008 Certified

© 2014 Stratasys Ltd. All rights reserved. Stratasys, Stratasys nautilus logo, FDM and Objet are registered trademarks and PolyJet, Eden260V, Eden350V, Eden500V, FullCure, Objet Studio, Objet24, Objet30, Objet30 Pro, WaveWash, VeroGray, VeroWhite, Digital ABS, Objet 260 Connex, Objet350 Connex, and Objet500 Connex are trademarks of Stratasys Ltd. and / or its subsidiaries or affiliates and may be registered in certain jurisdictions. All other trademarks are the property of their respective owners, and Stratasys assumes no responsibility with regard to the selection, performance, or use of these non-Stratasys products. Product specifications subject to change without notice. Printed in the USA. SSYS-ACS-Silicone Molding-1-14

For more information about Stratasys systems, materials and applications, contact Stratasys Application Engineering at 1-855-693-0073 (toll free), +1 952-294-3888 (local/international) or ApplicationSupport@Stratasys.com.

