

# Molding 101

by Brian Savage



Recently on a trip to Hasbro in Pawtucket, I was fortunate enough to get to visit with Jason Krikorian of Mars 2000. Mars 2000 is the company that molded the Tiger-Ray, Stun and Dreadnok Motorcycle for this year's 40th Anniversary Convention Souvenirs. Mars 2000 is one of the few remaining injection molding companies operating on the East Coast. While most others have

moved off shore, Jason has managed to take a dormant business and in 6 years make it into a rapidly expanding profitable venture.

Mars has a long history with Hasbro. Back in the 1960's Jason's father ran the company and he made many different items for Hasbro, everything from checkers to Monopoly pieces, to pieces for G.I. Joe. (No, they don't have anything left over, I already asked, so don't call them.)

They also did a lot of business with different cosmetic companies and in 1990, one of the major cosmetic companies made Jason's dad an offer he couldn't refuse. He sold the company to them but...he kept the building and equipment and basically shut the doors, leaving everything in storage. In 1997 Hasbro called and asked if he would like to manufacture a product called Treasure Rocks for them. This project was to have a 2-year run. He said he was not interested in getting back into the molding business but his son Jason (who was just graduating from college) might be interested, and...he was.

Mars 2000 was reborn with all of the vintage equipment they still owned and one new machine to help them in their 24-hour a day, 7 day a week new project. This gave Jason the business he needed to re-establish the company and attract other projects. Six years later, he is still doing various work for

Hasbro and has expanded his product line making everything from plastic dishes to Easter eggs.

Many of the Hasbro tools



that have been used for prior projects are still stored in Rhode Island. Some are serviceable, while others need new parts. The tools we needed for the vehicles last year were still in Hasbro's warehouse. It only made sense to have the pieces run there instead of moving the tools back to China. So, you can be proud that the Tiger-Ray, Stun and Dreadnok Motorcycle are all American made.



Jason was very kind to take the time to show me around and explain how the molding process works. I got a big kick out of visiting, as it is a step back in time. The company is in a sort of back alley warehouse district in turn of the century buildings with wooden floors. Once you step inside, it could still be 1965. Jason told me that a lot of the vintage equipment they use is identical to many of their modern counterparts. He showed me a room with machines that fold little molded boxes and the only difference between the 1950s version and the new version of this folding machine was the safety cover! He said they trade parts between the machines all the time.

Here is how a plastic toy is molded. First you need to have a tool. What is a tool? Well it's not something you have in your garage or carry around in a toolbox. A tool is the mold that a piece is made from. Tools range in size from a couple hundred pounds to thousands of pounds. If a tool is made from class A steel, it can withstand hundreds of thousands of impressions. Something they are



currently making at Mars is the C3PO figure collector case. This picture shows finished cases awaiting packaging.

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C3PO started as thousands of tiny plastic pellets that were all white as seen in this large box. The manufacturer takes these pellets and puts them in a 55 gallon drum with "colorant".

Colorant is the same type of plastic pellets but they contain concentrated color. The usual mix could be as little as a pound of colorant per a hundred pounds of white pellets. The drum is then placed on a shaker machine



that tumbles the drum and mixes the colorant with the white pellets as seen here in this picture.



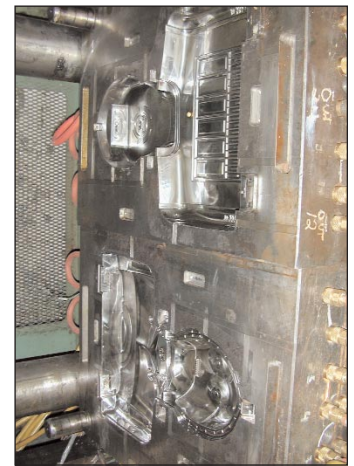
Next the pellets are fed into a press where the pellets are melted and mixed and when the tool is pressed together and sealed; the melted mixture is forced into the tool. The picture below shows a press with the safety door closed as it presses the tool together.

The picture at the top of the next column shows the C3PO tool mounted on the press. C3PO has a top and bottom as well as details on both sides. Each of these tools weighs around 4,000 pounds! Why are they so heavy?

Well, when the press pushes them together it exerts many thousands of pounds of pressure. The mixture is pumped into the tool under pressure so that the raw material fills out every bit of space in the tool. If there is not enough pressure, the plastic will not fill up the tool. The melted plastic is forced into the tool and there are sprues where the plastic leaks out to tell the operator that the tool has been filled to capacity.



When the tool cools slightly, it is pulled apart and the molded piece drops out. The raw part is then finished by



*These two pictures show each side of a tool while it is attached to the press. The press pushes these two pieces together. You can see the hoses on the sides where the plastic is forced into the tool.*

cutting away any flashing, sprues or runners (runners are the "trees" you see model parts come on). As you can see from this picture, they are molding Easter Eggs. Notice the pieces under the machine still have the runner attached to some of the eggs.

Next the piece is painted (if necessary). On a figure, this is where they would paint on the camouflage, facial details and weapons details. These are called spray-ops. Some of the spray-ops can be quite complicated.



Several of the convention figures this year had over 50 different spray-ops. They weren't painting anything the day I was there so I don't have a picture. When they spray an item, there is a mask that is cut from copper sheeting that covers the piece, and only areas where holes are cut receive paint.

After a piece is painted, it is sent to final assembly where the case, (in this example) is put together. Next it is sent to packaging where the piece is put in its retail box and then packed into shipping crates.

I hope that my tour of Mars 2000 helps you understand the different steps taken when molding an action figure or anything made of plastic. Thank you once again to Jason Krikorian for sharing his story and allowing me to tour and photograph his factory. We wish you many years of success!

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