

# BODY DESIGN AND VACUUM FORMING

To create the bodies for our slot cars, we are going to be vacuum forming High Impact Polystyrene. The characteristics of this plastic are as follows:

Forming Temperature	Formability	Color and Clarity	Special Considerations
365 - 385°	Excellent	Translucent to opaque, all colors	Excellent deep draw, easily formed

These characteristics make High Impact Polystyrene ideal for us to make our slot car bodies out of. However, we do need to follow a logical order of steps to reach our desired outcome.

## Step #1:

Ensure that you have completed your chassis design, as this will be used as the template for your body.

## Step #2:

Design your slot car body, with taking aerodynamics into consideration. You must provide sketches and your rationale for choosing your body style. The teacher must approve all sketches before you may proceed.

## Step #3:

Once you have approval for your body design, you may get a piece of 5" X 7" X 3" pre-cut stock, and use wood hand tools to shape your body design. This piece of wood is going to act as the mould to shape your piece of Polystyrene. Hand tools that could be used are chisels, rasps, files, shapers, handsaws and sand paper. The mould must be perfectly smooth when you're done shaping. The teacher must check for completion.

## Step #4:

Once you have approval from the teacher, you may then vacuum form your car body as per the demo.

## Step #5:

Once the plastic has cooled, you may then trim up the waste plastic with either the band saw or the scroll saw. Followed by that you can use hand tools and the disk

sander to clean up all of the edges of your car body. Be sure to remember to use the drill press to drill out the mounting holes for the car body

Step #6:

Next, you must finish your car body with using acrylic paint and/or stickers and decals. Be sure to paint on the inside of your car body, this will ensure that you will have a smooth, beautiful finish.

Step #7:

Lastly, mount the car body to the frame as per the demo.

### **Slot Car Information on Calculating Top Speed:**

1 mile = 5280 feet

1 hour = 3600 sec

Track = 155ft

Lap time = 6sec

### **How fast am I going in MPH?**

$155 / 6 * .6818 = 17.613$  actual mph

$17.613 * 24 = 422.7$  scale mph

Or

$155 / 6 * .6818 * 24 = 422.7$  (that's fast)

### **Gear Ratio:**

Opinion = 9 teeth (small gear on the motor)

Spur = 30 teeth (large gear on the rear axial)

$30 / 9 = 3.333$  gear ratio