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MANUFACTURING

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## FAQ

Low Pressure Molding - Frequently Asked Questions

### Applications:

#### 1. Can you over-mold a PCB with surface mounted components?

Yes, we can over-mold a populated circuit board without damaging boards/components or reflowing solder. Tests show that material injected at 210°C (410°F) typically will cool down to less than 135°C (275°F) by the time it reaches the board

#### 2. Is the final component distorted in any way with this process?

No, not if proper design guidelines are followed. (Uneven encapsulation, such as a very thick material section on one side of a PCB with a thin layer on the other, could result in warping).

#### 3. Will the part maintain dimensional stability after molding?

Shrinkage ranges from 1.5% to 2.0% for the different Macromelt materials.

#### 4. How are air bubbles avoided in the final molded part?

Ensuring that the mold-set is vented correctly and optimizing the injection profile is the key to avoiding air bubbles. Densely populated circuit boards may require several steps in the injection profile to avoid any "shadow effects" behind components. Cavist will typically start by optimizing molding parameters with translucent materials to detect if voids occur, and then change to black materials for production.

#### 5. Can batteries be over-molded without reducing their effectiveness?

Yes, many types of batteries have been successfully over-molded with Macromelt. However, simple prototype over-molding for a particular battery is recommended before starting full-scale production.

#### 6. Which wires, cables, circuit boards and solder masks do these materials adhere to?

Macromelt® adheres well to most substrates including PVC wires and PCB's.

#### 7. When should this technology be considered for grommets and strain relief molding?

When true strain relief is needed especially for sensitive cables/applications such as Cat 6 patch cords and RJ-connectors, the Macromelt® materials are superior.

#### 8. Are over-molded parts water proof?

Over-molded components will typically meet or exceed IP 67. This means they are dust tight and protected against the effects of immersion. The selection of Macromelt® material grade is critical as there are different degrees of water resistance.

### Molding Materials:

#### 1. What molding material do you use for your LPM process?

We use Macromelt® High Performance Polyamide and Polyolefin Adhesives. They are thermoplastic materials that solidify simply by cooling down. They do not cross-link or release any toxic fumes. These molding materials offer strong adhesive properties and they are designed specifically for insert molding of electronics.

#### 2. What are the advantages of using these materials?

We often replace Epoxy potting of electronics. Low Pressure Molding is a faster and more efficient process. With LPM we can "Sky Line" the molding material around your product. This gives us a shorter cycle time and saves raw material at the same time. It also eliminates the housing otherwise needed to contain the potting material. Our Polyamide molding material simply "becomes the housing". Low injection pressure allows us to gently mold around fragile components. This technology offers a good solution when standard high injection pressure is a problem.

#### 3. What is the typical shrinkage of the materials?

Shrinkage varies during injection and can usually be controlled by packing the mold with pressure. The shrinkage rate 24 hours after injection is 1.5% to 2.0%, depending on the grade of material.

#### 4. Which colors are available?

Standard polyamide materials are supplied in amber and black. For high volumes applications we can offer custom colors.

#### **Low Pressure Molding Machines:**

##### **1. What type of molding equipment do you use?**

We use range of Mold-man™ machines in our facilities. These machines are developed exclusively for Low Pressure Molding.

#### **Application Engineering and Prototyping:**

##### **1. Will Cavist help with evaluation and application engineering?**

Yes, we offer input for new applications to make sure that we find the best product solution.

##### **2. Can you help with prototyping?**

Yes, we typically mold prototype components as a first step. Our goal is build prototype components that are very similar to what an actual production component would look like. This way it can be used for testing purposes as well as presenting it to your customer.

#### **Mold-sets for Low Pressure Molding:**

##### **1. What type of mold-set are you using?**

We typically use 7075 Aluminum as it is well suited for mold-set manufacturing. Aluminum offers excellent heat transfer (i.e. short cycle times) and it tends to give you better looking products. If the component to be over-molded has steel or other hard components, we will add steel inserts in this area of the cavity. This is generally required when molding connectors.

##### **2. Do you use mold release?**

The Macromelt® molding material has strong adhesive properties and tends to stick to most surfaces and we typically use a mold release agent. We also use permanent release coatings for some mold-sets.

##### **3. What is the lead time for mold-sets?**

Typical lead time for production molds is 6 to 8 weeks.

##### **4. Are multi-cavity molds practical?**

Multi cavity molds are normally used for production molding.