

<b>ViaSat, Inc.</b>	Process Area: <b>Quality</b>	Document Number: <b>070-QA-048</b>	Revision: <b>B</b>
Name of Document: <b>Requirements for Injection Molds</b>		Process Category: <b>Quality</b>	Page: <b>1 of 3</b>

## 1 Purpose and Scope

The purpose of this procedure is to establish requirements for plastic injection molds to insure quality plastic injection parts for use in products to be sold by ViaSat, Inc.

This procedure applies to all plastic molds for thermoplastic materials.

## 2 General Procedures

### 2.1 Mold Design and Construction

- Mold design and construction type shall conform as described in the “Classification of Injections Molds for Thermoplastics Guide” established by the Society of Plastics Industry, Inc. (SPI). (ViaSat will supply copies when requested.)
- Prior to beginning work on molds, Vendor shall specify SPI mold type as indicated in “a” above, the number of cycles, tool material, and injection resin type to be used, i.e. ABS-polycarbonate blend.
- During mold fabrication, molder shall furnish ViaSat weekly tool progress reports listing milestones. If for any reason the molder believes he may not meet scheduled milestones, molder must notify ViaSat immediately.

### 2.2 Required Marking on Molded Parts

- Each mold shall have a standard insert showing cavity number (if multiple cavity mold), shift, month, day, and year molded into part. The mold shall also have the ViaSat name, part number, with dash number & revision letter via an “interchangeable pin”, molded into the part.

### 2.3 Process Control

- ISO compliant documentation is required at the molding machine and is to be supplied with molded parts. Documentation records are also to be maintained a minimum of seven years, unless otherwise defined by contract. Documentation shall include:
  - Material identity (UL Rating, Resin, Color, manufacturer)
  - Machine identity
  - Cycle time
  - Mold pressure/Clamp Pressure/Resin Temperature
  - Any special instructions (such as hand added inserts)

### 2.4 Molding Resin

- Molding Resin used must be rated UL94VO. Molder must maintain records of raw material used, including UL and/or CSA supporting documents. Documents shall be maintained a minimum of seven years, unless otherwise defined by contract..
- ViaSat shall specify the type and source of molding resin to be used.
- ViaSat shall specify color, texture, and gloss of the molded parts by part sample and/or by the use of industry acceptable color-texture-gloss standards. Any changes require ViaSat CCB approval through the Purchasing department.

### 2.5 Re-grind Limits

- The molder shall use no more than 20% re-grind or manufacturers suggested re-grind without written approval from ViaSat Purchasing. Re-grind shall consist of runners left over from production of ViaSat material. No other material is allowed for re-grind.

### 2.6 Inserts

- ViaSat shall specify the inserts to be used plus flush surface requirements. Changes require written approval from the ViaSat Purchasing department.

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## 2.7 **First Article Approval**

- Molder will provide a detailed First Article Report (FAIR) performed on a minimum of (25) First Article parts. The FAI parts shall be tagged with a serial number for verification of readings to FAI samples and shall be submitted with the FAIR to ViaSat for approval. Production of molded parts shall not commence until written approval is received from the ViaSat Purchasing department.

## 2.8 **Molded Part Changes**

- Once first article approval is complete and part drawings and/or CAD files are released, all part changes shall be by ViaSat authorizing change notice. Molder is not authorized to make any changes to the tool without a signed and approved ViaSat change order.
- After a mold change, First Article approval is again required, as described above, before resuming production.

## 2.9 **Ownership of Molds**

- It is understood that molds built to make injected moldings of ViaSat parts are the property of ViaSat. Molds shall be delivered to ViaSat upon written notice from ViaSat. ViaSat will pay all shipping costs.
- ViaSat shall provide Capital Equipment Asset Tags for all ViaSat mold tooling. These tags shall be permanently affixed to each piece of mold tooling, as assigned by ViaSat. A photograph of each mold tooling, clearly showing the ViaSat Capital Equipment Asset Tag, shall be submitted to ViaSat for verification that all items have been properly tagged.

## 2.10 **Expected Lifetime of Molds**

All mold tooling developed for ViaSat molds shall be capable of the minimum number of shots as specified in the applicable ViaSat Process Control Drawing, while still producing molded parts with acceptable quality.

## 2.11 **Normal Maintenance of Molds**

- The “normal maintenance” of molds should include:
  - Clean and lubricate moving mechanisms.
  - Replace worn leader pins and bushings.
  - Repair damage unrelated to fatigue or tool longevity.

## 2.12 **Storage of Molds**

- The molder is responsible for storage and protection of the plastic injection mold against damage and outside contamination.

## 2.13 **Transportation of the Plastic Injection Molds**

- After First Articles are run, molder must have a written approval from ViaSat Purchasing department before moving Molds off the premises. The molder is responsible for proper shipment of molds to protect against damage. All pertinent records pertaining to the molds under Section Process Control, and Section Molding Resin, shall stay with the mold during and after moving.

## 2.14 **Deviations/Waivers to Mold Requirements**

Any deviations from the mold requirement specified herein shall be submitted to ViaSat in writing on the supplier’s formal Deviation/Waiver Request form. ViaSat will then respond through Purchasing after the request has been formally processed through ViaSat’s Change Control Board.

## 2.15 **Part Visual Inspection Requirements**

The following items found in injection-molded parts, when viewed from a distance of 12 inches under incident lighting with the unaided eye, are not acceptable and subject to rejection:

- a. Incorrect material used. (See Section, Molding Resin)
- b. Flammability rating not UL94VO. (See Section, Molding Resin)
- c. Broken or cracked parts
- d. Weld line cracks that degrade strength
- e. Weld line cracks on outer surfaces

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- f. Dirt, oils, corrosion on surfaces
- g. Runner break off that extends above the plane of the part.
- h. Part markings are missing. (See Section, Required Marking on Molded Parts)
- i. Sink Marks
- j. Mold release left on parts
- k. Broken or “short shot” parts
- l. Deformed bosses due to release from mold or handling
- m. Wrong inserts or inserts installed improperly. (See Section, Inserts)
- n. Mold scuff marks visible on outside surfaces of parts
- o. Trim gates not trimmed precise & cleanly
- p. Adjoining parts have a perceptible color difference or variance
- q. Color does not match specifications. (See Section, Molding Resin)
- r. Texture does not match specifications. (See Section, Molding Resin)
- s. Gloss does not match specifications. (See Section, Molding Resin)

#### 2.16 **Parts Shipped to ViaSat**

- Parts shall be packaged with cardboard and other wrappings dividers to provide damage protection. Individual cartons shall not weigh more than 50 pounds. Individual cartons shall be identified with the ViaSat Name, Address, and Part Number(s) of enclosed parts.
- The ViaSat PO #, Part Number and Revision, and quantity contained therein shall be listed in text and bar code on the exterior of each shipping carton.

### 3 **References**

#### *Documents*

- **Customs and Practices of the Moldmaking Industry. Classifications of Molds for Thermoplastic and Thermoset Materials:** A Guide for the Purchaser or Manufacturers of Molds. This guide defines: customary business practices of the moldmaking industry when specifying or purchasing a mold; classifications for different types of molds (and their approximate life-spans) to minimize confusion when quoting or placing an order for a mold. Guide also includes sample Progress Report and Mold Data Quotation Sheet forms for the reader's use. Revised edition, 1996.  
Ref: <http://www.plasticsindustry.org/business/literatu.htm>
- Applicable ViaSat Process Control Drawing