

# Customer Furnished Material Guidelines

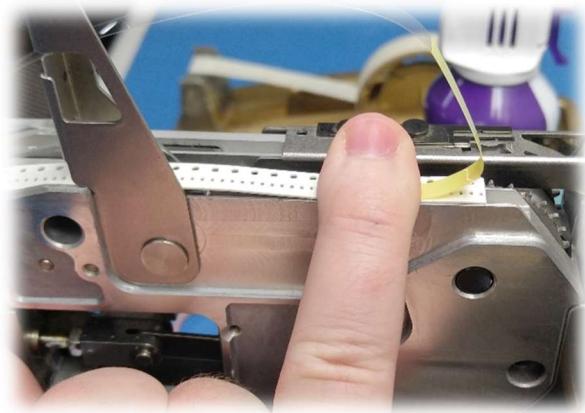
## Summary

To minimize production time and errors, SMT Manufacturing highly recommends reviewing and adhering to the following guidelines. These guidelines ensure that our machines run at maximum efficiency, and reduce the need for hand-placement, replacement parts, and rework.

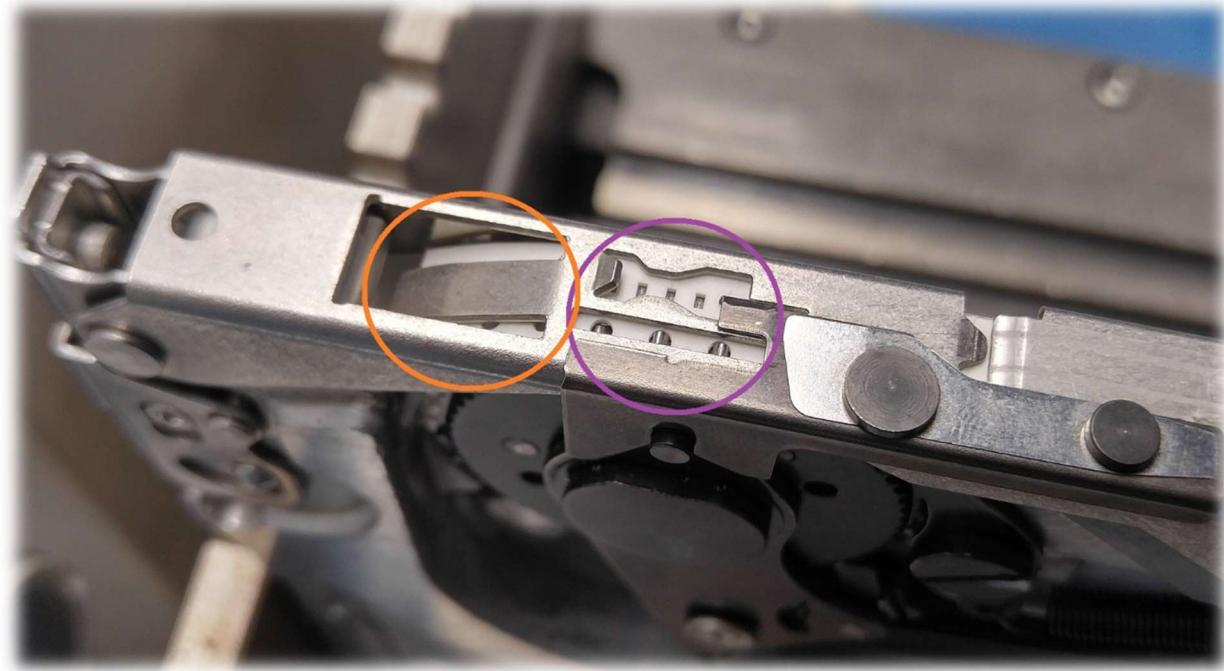
1. Form Factor – Our machines work better and faster with certain form factors:
  - a. While both are accepted, Full reels are highly preferred over Cut Tape (all excess parts are returned)
  - b. Vibration Tube and IC Tray are accepted.
  - c. Avoid bulk packaging, as damage and manufactory errors are more prominent.
  - d. To improve manufactory speed, Cut Tape and Reels should have leader tape attached.
  - e. In 4-pitch tape with less than 200 parts does not require a reel.
2. Attrition – Some components are lost during the manufactory process:
  - a. 0603 or smaller passive components in Cut Tape or Reels should have an additional 4" or double the number of components (whichever is least).
  - b. 0805 or larger passive components in Cut Tape or Reels should have an additional 10% (or 10-15 pieces, minimum) of required components.
  - c. Active components should have additional 2-3% of required components. We accept exact quantities of "high dollar" components, but it is preferred to have more than exact quantities to cover defective components and errors.
  - d. All unused parts will be returned to the customer.
  - e. Reels should not contain more blank tape than parts.
3. Part IDs – A variety of parts may fit your needs, but they need to be properly identified.
  - a. Ensure that your part numbers match the parts listed on the BoM.
  - b. If substitute parts are used, please indicate the part ID in with the appropriate description and reference on the BoM, also.
4. Circuit Boards – Shape and size affect the manufacturing process.
  - a. Boards with parts near the edges should have 1/8" to 1/4" removable edge rails if possible.
  - b. Consider using a fixture for boards that are thin and flexible.
  - c. Boards of unusual shape should be panelized.

## Attrition During Loading Process

Waste is an unavoidable side-effect of our surface mount placement process. For this reason, it is very difficult – sometimes even impossible – to complete a job when exact quantities are provided on cut tape / reel. You should always provide extra components (+2%-10%, depending on component cost and form factor) to ensure the job is completed quickly and without error.

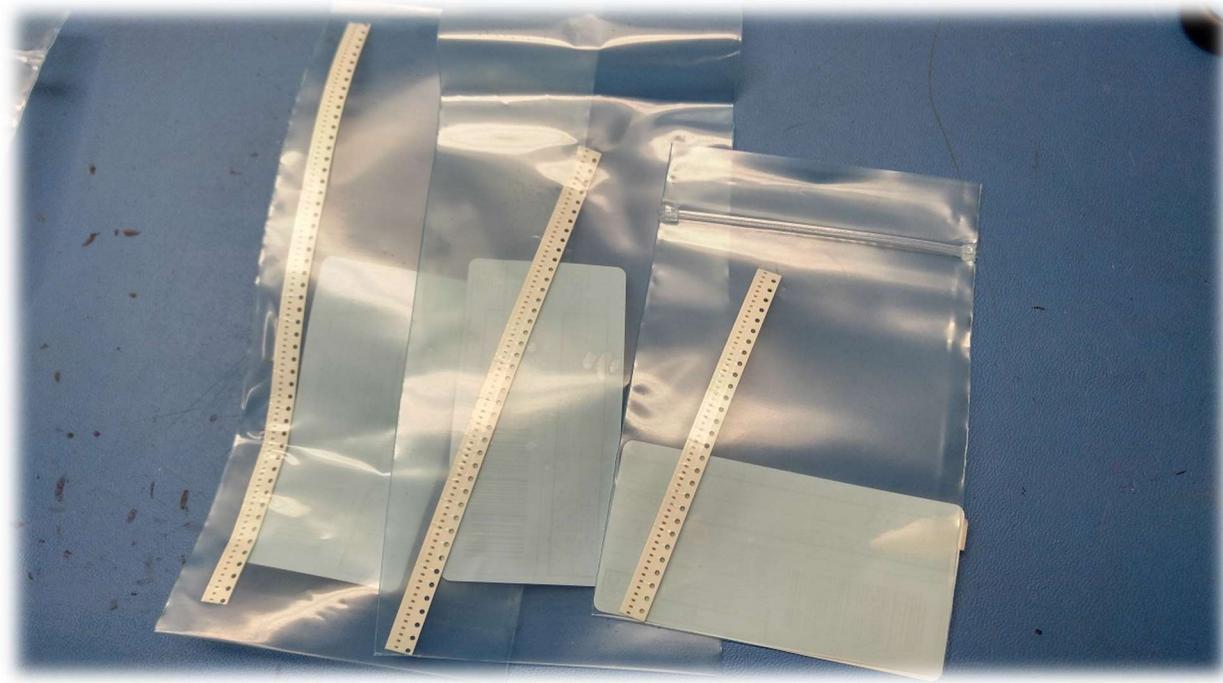


Tape must be fed several “positions” before it is secure in the feeder and ready for the machine. Because of this, many parts at the beginning of cut tape are wasted. In the image to the left you can see the teeth used to feed the cut tape. The machine pulls parts from the top of that gear (purple circle in the image below). When loading the feeder, the tape must be securely fastened in the gear past the point of extraction, leading to wasted tape (orange circle).

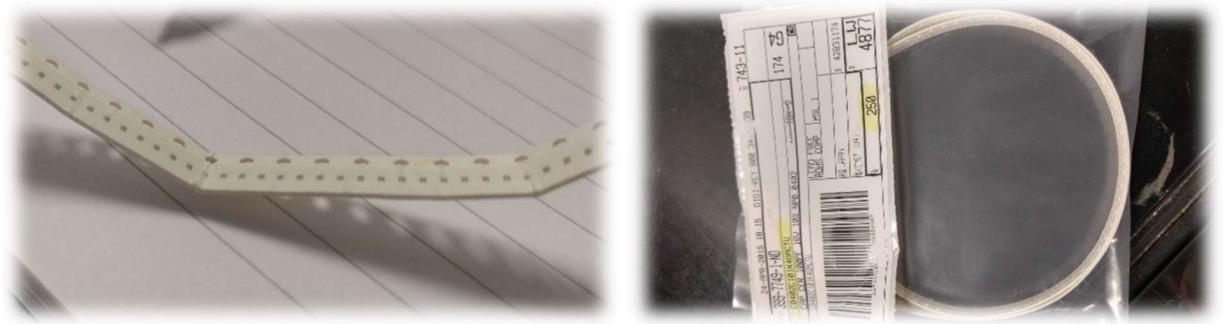


## Non-Preferred Conditions

These parts – while identical – were provided in three small strips. This prevents continuous operation of the component placement machine, as the technicians will have to stop and load three separate feeders. Additionally, without excess tape there will be three times the waste. If these were provided in exact quantities, the technicians will have to recover the wasted parts and place them by hand.

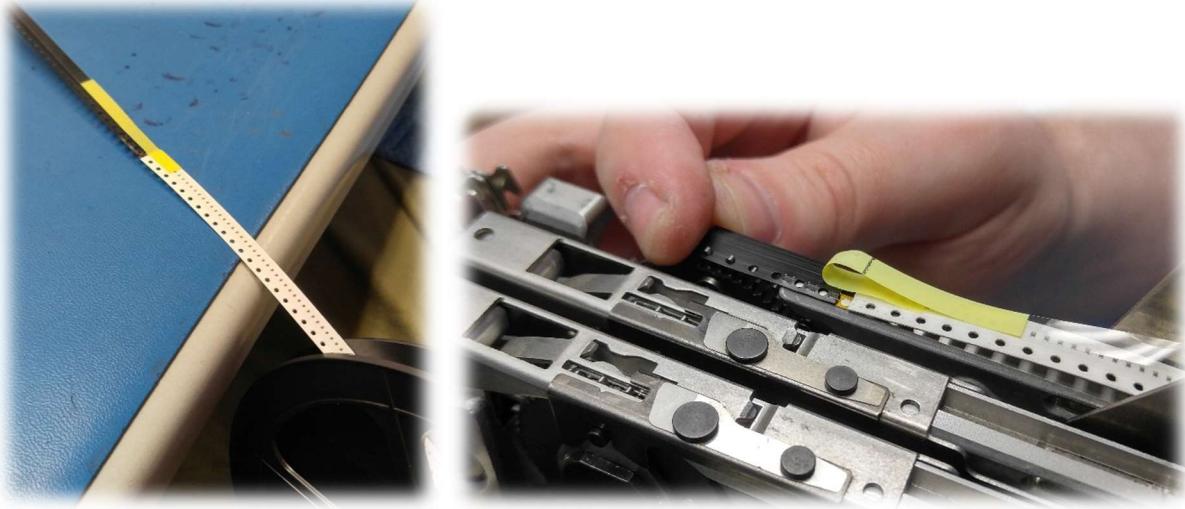


Cut tape is easily “kinked” when not on a reel. In the above image, the cut tape in the leftmost bag was folded, causing bends shown in the picture below (left). This can cause tape to bind up, or parts to escape the feeder. For quantities under 200 (4-pitch tape and below), cut tape should be a single strip properly coiled as pictured below (right). For quantities higher than 200 or for larger components, cut tape should be on a reel.



## Minimizing Waste with Leader Tape

When possible, your cut tape/reels should come with additional length of blank tape, and/or an attached leader strip. This blank tape will allow the feeding action to occur without exposing any packaged components. Excess blank tape needs additional configuration by our technicians and should be avoided.



Cut tape without a leader tape must have a custom leader tape attached by the technician. Any time the parts run all the way to the end of the tape, a custom leader tape must be used (below, left). Again, this causes waste, as several parts will fall out of the feeder during the loading process (below, right).

