# Performance Label Material Guide for Identifying Rotary Diecutting Problems

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When investigating 3M™ Performance Label Material problems, there are a number of possible causes related to rotary diecut performance and are communicated as material related issues.

Rotary tooling is made in several types:

1) **Flexible Dies - (Mag Dies)**
   a. These are thin flexible steel plates with the cutting edges machined into them. These are mounted to a magnetic cylinder. Magnetic dies are used for relatively short runs and have a limited service life. Cost is significantly less than traditional rotary dies.

2) **Standard Rotary Tooling**
   a. This is the standard machined tooling and is generally used for longer runs as it has a longer service life than the flexible tooling, but the costs are higher.

Some label problems linked to diecutting are listed below.

- Non dispense condition / label cannot be removed from the liner
- Adhesive stringing
- Breaking matrix
- Inconsistent diecutting
- Inconsistent label size

We will detail methods to confirm each of the above conditions.

1) **Performance labels which do not release from the liner when pulled across a 90° bend or peel tip.**
   a. This condition can be caused by a deep die cut (heavy die strike) which has fractured the silicone release and allowed the adhesive to contact the paper. This can be tested by using a staining test (Malachite dyes are used ) on the release paper. The bleeding through of the color indicates fracturing of the release coating. (Back down die pressure or retool to proper material)

2) **Adhesive stringing**
   a. This can be identified by what appears to be strings / threads of adhesive (web direction) on the face of the material. The labels may appear to have a fuzzy edges as well. This is caused by incomplete die cutting. This can be due to dull tooling or incorrect route depth. This is common when a die is used for materials with release liner caliper less than the original design. Never over tighten the die to compensate for this condition. (Sharpen die or retool to specific material)

3) **Breaking matrix**
   a. This can be caused by poor design (not leaving adequate material to strip) or by damaged anvils. This can be identified by a repeating condition, causing the die to bump or jump over the areas of the anvil which are uneven. This can also be aggravated by press tension of the rewind. (replace worn components, redesign the tool and reduce take up tension)

4) **Inconsistent diecutting**
   a. This condition most often results in labels being stripped up with the matrix. The cause is generally a damaged cavity within the die or damaged anvil. This damage results in the die bouncing or jumping causing the cutting edge to lose contact with the label stock. This can be identified by a repeating condition. (Replace or repair damaged components)

5) **Inconsistent label size**
   a. This problem is difficult to troubleshoot due to the inconsistent nature of this defect. The tooling, if in spec., should be cutting labels in the correct size but due to press tensions or incorrect gear selection will cause the tooling to process at a speed which is different than the web speed. This condition can also be caused by loading dies with excessive ejection foam. (Tension adjustments or proper gear selection should remedy this condition)



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