

Avery Dennison®

Cutting Methods of Retroreflective Films

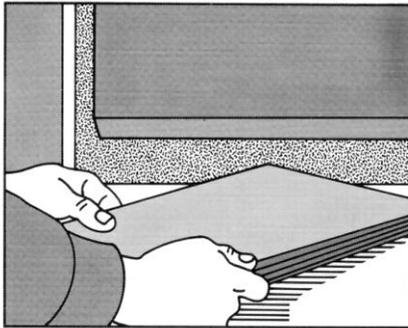
Instructional Bulletin #8.20
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Introduction

Avery Dennison Reflective Sheeting can be cut by a variety of methods. The preferred technique will depend on the volume of material being cut. Single sheets can be hand cut using scissors, knife, paper cutter, or razor blade. For volume cutting, the methods generally used are die-cutting, guillotine, roll cutters, and band saw cutting.

Whatever method you choose be sure to keep your cutting blade clean and sharp. Always cut with the reflective face up, so that the blade goes through the reflective material to the liner or through the liner, as desired.

Guillotine Cutting



Guillotine cutting is best suited for cutting a large volume of straight edged sheets. The type and condition of the cutter will determine the accuracy, tolerances, and quality of the cut.

To clean adhesive build-up from the blade, use a cloth dampened with toluene, acetone, methanol or heptane.

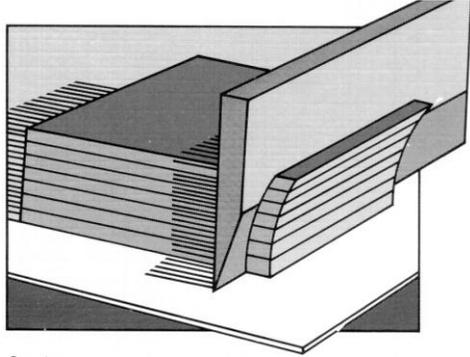
Warning: Do not use a silicone lubricant on the blade, as it may contaminate the sheet and cause printing problems. Never use a spray lubricant or spray adhesive near stacked or racked reflective material. The printable surface of the sheeting can become contaminated; which can inhibit printing.

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Cut in short lifts (2 inches(5cm) or less, face up). Cut with the bevel of the knife toward the waste, because there will be some edge distortion on the bevel side. If cutting a sheet in such a way that there is not a waste side, allow room for a second trim cut on the edge, which was against the bevel on the first cut.



Cutting pressure should be 25 to 35 psi. If you can't adjust pressure, place a few sheets of cardboard on the lift to absorb shock. Cardboard inserts can also be used as counters. Note that these cardboard sheets are included in the 2-inch (5cm) maximum stack height.

Steel Rule Die-Cutting

Avery Dennison Reflective sheeting can be readily cut if proper care is taken. The most important step is the preparation. To prevent uneven cut-through and unnecessary wear to the knives and anvil, set up the die carefully, backing up where necessary to ensure that the height of the rule is even. Take care in adjusting the pressure on your press so that the material is kiss-cut or cut through as desired, and that the knives are not driven into the anvil. Determining the correct pressure will require some trial and error. Always start with a low pressure, and then build up until you just obtain the cut desired.

For best results, we recommend cutting single sheets using a side bevel rule with the bevel toward the waste. If less precise cutting is required, a standard center bevel will suffice. Mitered corners should not be used. The mitered corner will make a small nick in the material, which may propagate into a tear or crack. Use a minimum radius bend instead, and join sections of rule in a straight area, not a corner.

Because of the tough plastic matrix and glass bead construction used to make some reflective sheeting, die life will be less than when cutting other types of stock. To get maximum die life, use the hardest rule possible to get the tightness of bend required. For extremely tight bends, use a soft or dead soft rule and harden it after bending. Some manufacturers also provide soft rules with hardened edges and coated rules, which are two other approaches to increasing die life. 1¹/₂ or 2 point rules should be used to cut reflective materials.

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Even when a hard rule is used and proper care is taken during set-up, the rule may dull during a long run or if the die is being used for frequent repeat orders. In such cases, it is advisable either to have steel rule and bending equipment available in house, or to purchase a duplicate die to use while one is sent out for resharping.

When rubbering the die, consider the configuration and size of the piece being cut. Where a large amount of rule is being bent into a small area of block, a harder rubber will be needed to eject the piece cleanly. It also provides firmer support to the material while cutting. In these tight areas, the entire space should be filled with rubber, instead of only gluing small blocks around the edges. For a large die with much open area, complete space filling is impractical. A 1/2" (1.3cm) wide strip of rubber along each side of the rule is advised for this type of die. If the rubber is too soft, or if none is used, a rippled edge on the cut piece of reflective material may result, and the piece may be difficult to remove from the die.

For dies with a simple outside shape and a detailed design to be cut out of the interior, a combination of different rubbers may be used, with hard rubber in the detail area and softer type along the outer edges.

Thermal Die-Cutting

Avery Dennison Reflective Sheeting with pressure sensitive adhesive may be thermally die-cut using etched zinc or magnesium plates. Start your vacuum laminator at temperatures of 325°-375°F (163-190.5°C) for 0.5 seconds dwell, then adjust temperature and dwell as needed to obtain the best cut.

Band Saw Cutters

Avery Dennison Reflective Sheeting can also be cut using a band saw type cutter. This method is used for cutting large sheets or designs in either stacks of applied, or unapplied sheeting.

Stack sheets tightly and support them with cardboard, thin aluminum, plywood, etc. Trace a pattern for the desired design or copy on the top of the support to use as a guide when cutting.

With any processed designs and/or copy make sure each individual sheet is properly aligned with the stack.

The speed at which the stack is cut is very important. The use of heavy pressure to accelerate the stack through the cut is NOT RECOMMENDED. Cut the stack at a steady pace so the blade is not overheated. Overworking the blade may cause the edge of the sheeting to become fused or chipped, leading to difficulties in separation. Always use a clean sharp blade.

Roll Cutters (Baloney slicers)

When rolls are larger than the desired width, they can be cut down to smaller widths using a roll slitter machine. A slitter machine equipped with a shear type blade works the best. Accuracy and quality of the cut is determined best by the type of machine used. Contact the machine manufacturer or an Avery Dennison Technical Representative for further information.

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The above Avery Dennison literature provides information to the user for proper application, storage, and other requirements. Please refer to Product Data Bulletins or your local Avery Dennison Representative for warranty information. Find the latest information on the Avery Dennison website, www.reflectives.averydennison.com. We encourage you to check our website periodically for updates.

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