DIES GUIDE

Label and tag stocks have different material characteristics. The differences in these characteristics significantly impact die cutting considerations. Uncoated paper versus coated paper, paper versus tag, tag versus Tyvek, Tyvek versus polystyrene, polystyrene versus polypropylene…they all die cut differently. The differences in material density, bursting strength, tear strength, and tensile strength all affect the wear and cutting ability of dies. Material must be pinched or compressed to near-bursting strength before a die will actually cut the material successfully. The significant differences lie between paper/tag stocks and film stocks.

DIECUTTING PAPER/TAG FACESTOCKS: Paper and tag materials have a narrow range of die cutting characteristics. Uncoated paper and tag stock more easily compress, do not stretch easily and have low-bursting thresholds. Coated paper and tag are more difficult to compress, most having been previously compressed during the coating process. Particular coated grades, most notably thermal transfer, have very abrasive surface coatings. These coatings wear out standard dies quickly. As a result, higher quality dies are required in order to have any useful life in a die.

DIECUTTING FILM STOCKS: Because of the variety of film materials available….polypropylene, low/medium/high density polyethylene, polyolefin, polyester, acetate, polystyrene, vinyl, Tyvek, etc….there is a wide range of different film characteristics. Furthermore, all of these materials are available in different thickness, method of manufacture, polymer content, coated or uncoated surface, and degree of extrusion orientation (single oriented or bi-axially orientated). Generally, film materials are more difficult to compress, stretch more easily, and have high-bursting thresholds than paper and tag stocks. Specifically, the easiest films to die cut are those that are stiff and have very little elongation. Generally, white films are easier to die cut than clear films, however the pigments making films white usually wear out dies faster. As a rule, film facestocks wear out dies faster than paper/tag facestocks.

ADHESIVE AND LINER CONSIDERATIONS: Adhesives and liners used with film facestocks compound die cutting difficulty. Adhesive formulations and liner thickness and hardness and ruggedness affect the ability of a die to cut film facestock. A hard liner is preferred when die cutting a film facestock. These would include liners made of polyester, polypropylene, super-calendared kraft and glassine. With the move to thinner film liners, there is greater difficulty in cleanly cutting the facestock since there is less liner bulk to absorb the die compression upon the facestock. Thinner may be more economical from a materials standpoint for both film facestocks and film liners, however thinner is not better for die cutting…thinner is more challenging. The savings gained in lower material cost may be lost in higher waste cost.

DIE OPTIONS: Dies come in a variety of grades from standard steel to high grade coated steel. Depending upon the material to be cut and the run length of the order, a different quality of die may be chosen. When a die is tooled to cut paper/tag facestock with a specific liner thickness, the die can usually be used to cut almost any paper/tag facestock with that liner or a similar liner. However, that die is not compatible with film facestocks. A higher quality of die is required to cut film facestocks. While dies tooled for paper facestocks cannot be used for film facestocks, dies tooled for film facestocks can usually be used for paper facestocks, assuming the liner on both is similar.

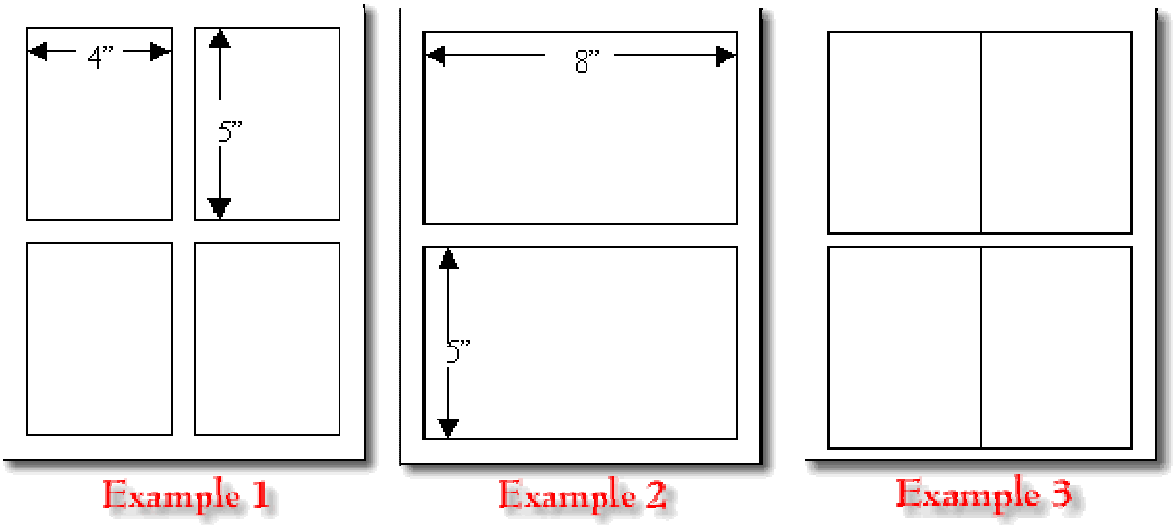
DIE CUTTING NON PRESSURE SENSITIVE MATERIALS: Die cutting non-pressure sensitive materials requires metal-to-metal cutting. As a result, a very durable die is required as the die is compressed against a metal anvil. This would be the case for die cut pieces like membership cards or for special hole punching. Depending upon the size of the die cut area; vacuum or air-eject dies may be required to remove the die cut area from the product.

DETERMINING THE CORRECT DIE SIZE: Getting the correct size of die can make the difference between one that works and one that doesn't. A good rule of thumb is: the circumference of the die should be at least as large as the width of the die. If the diameter of the die is too small there is a good possibility the die will flex and not cut deeply enough in the middle.

DIE COSTS: There are three primary factors that impact the cost of a die:

1. The width size of the press being utilized: Wider web presses require rotary dies with greater circumferences (see determining the correct die size). For example, a 7" wide web press requires a die with at least a 7" circumference; a 16" wide web press requires a die with at least a 16" circumference. Costs increase geometrically, so a die for a 16" press is considerably more expensive than a die for a 7" press.

2. The size and number of shapes on a die: The cost of engraving the label shape into the die is based upon the number of linear inches cut on the surface of the die. In Example 1 below, there are four shapes cut into a die, each shape being 4" x 5". Each shape therefore has 18 lineal inches (4"+4"+5"+5"). There are four shapes on the die for a total of 72".



In Example 2 there are two shapes cut into a die, each shape being 8" x 5". Each shape therefore has 26 lineal inches (8"+8"+5"+5"). There are two shapes on the die for a total of 52".

Example 1 has 20" more cutting and therefore is more expensive.

In Example 3, the four separate die patterns shown in Example 1 have been butted together. This reduces the total lineal inches to 54", thereby reducing the die cost.

3. The quality of the die material being utilized: There are a number of different die quality options available. The quality of hardened steel will provide either the ability to cut more difficult stocks like thermal transfer and films, or provide extended die life for the production of less demanding facestocks like laser. In addition to different degrees of hardened steel, life-extending surface treatments are also available on dies.

DIE RETOOLING: Dies wear out. Die wear is a function of use and care. Most dies may be re-tooled, meaning they can be sharpened to extend the life of the die. Retooling is less expensive that buying a new die, however, retooled dies do not have the longevity as a new die. Typically, dies may be retooled 3-4 times before there is not more recoverable useful life.

 12807 Airport Way Portland, OR 97230 503.257.5097