

Rotary Die-Cutting for Short-Run Cartons

How does the rotary die-cutting process work?

- Rotary die cutting machines will utilize 2 magnetic cylinders spinning towards one another. The machine operator adheres a thin flexible die cutting form (aka a die) onto these magnetic cylinder face(s) (some machines use two magnetic cylinders, others use one magnetic cylinder and an anvil) and then apply pressure to the cylinder section. When the cylinders spin inward on each other and a piece of paper or material travels between them the downward pressure applied via the machine will push the cutting blades through the paper or material and yield a die cut sheet after the rotation is completed.

What are the advantages of rotary diecutting vs. conventional diecutting with a steel rule die?

- Advantages over steel-rule die cutting include;
 - i. Ability to create physically more complex die cutting patterns because the dies are produced via CNC engraving machine rather than physically bent steel rule cutting knives.
 - ii. Ability for the same die to contain both die cutting and kiss cutting blades at extremely precise heights; a flex die could kiss cut to three different heights on a single die where as a steel rule die could never do that.
 - iii. Storage of huge libraries of flexible dies can be contained inside a small filing cabinet; storage of steel rule dies often times takes up as much as 1/3 of a customer's warehouse floor space where valuable machinery could be placed instead.
 - iv. Ability to change a machine over within ~ 10 minutes; most conventional steel rule machines will require a high level of skill via the machine operator to "set up" the cutting dies whereas flexible die cutting requires no make ready or shimming of the die plates; the cutting levels are guaranteed via the mechanics of the machine.

What are the limitations with rotary and steel rule die-cutting?

- i. A major limitation of rotary die cutting over steel rule die cutting is material thickness and density; A flexible die can only cut a substrate thinner than the

overall plate is produced at; steel rule dies are conventionally 2-3" thick which allows them to utilize much physically taller cutting blades aka they can "reach" through more material.

- ii. A major limitation of steel rule die cutting machines is that because the movement of the machine involves cutting "the whole sheet at one time" vs. the rotary process of "rolling" through the sheet millimeter by millimeter a rotary die cutting machine can often times use far less pressure to die cut than a steel rule system, allowing the cutting tools to last much longer.

Conclusion

Folding carton production on rotary systems are ideal for short run given the ability to change from one carton skew to another in something like 5-10 minutes which enable run quantities of 500 or less to be economically processed with a single operator. Often times a customer with a large platen die cutting system cannot justify the make ready / setup time of 45 minutes to run for 4-7 minutes to produce the 500 sheet job.