



Flexible cutting die use and maintenance

The use of flexible cutting dies is becoming increasingly popular. While the dies compare to or exceed the life of a standard solid die, certain measures must be taken in order to achieve the highest quality cut possible. The flexible cutting die has a die height and cutting angle specific to the substrate being converted and the backing liner thickness. The cutting line itself is the most delicate part of the die. It takes very little to damage this die line, resulting in premature failure of the die. By following a few recommendations, the life of the die can be greatly increased.

- Be careful when handling the die
 - The edge of the die is fairly sharp. While the edges are filed down to minimize the sharp edge created, it is still sharp enough to cut skin if not handled carefully.
- Always clean the cylinder before mounting a flexible cutting die.
 - Wipe off the cylinder with a clean rag
- Always clean the front and back of the flexible cutting die using a soft clean rag.
 - Any foreign material on the die OR the cylinder will cause premature wear of the die. If the foreign material is large enough, it could raise the cutting line to the point where it comes in contact with the anvil cylinder, flattening the cutting line in this area.
 - Make sure there is no oil on the die.
 - Oil on the die can change the cutting characteristics of the die. Just a small amount of oil on the die can change the cut from a perfect kiss cut to a hard strike or nearly a through cut (depending on the backing liner)
 - Oil on the face of the die can also stain or mark the face material.
- Protect the cutting edge of the die - When the cutting edge of a die is damaged, it is nearly impossible to maintain a satisfactory cut.
 - Never lay a die face down on any metal surface.
 - A die should only be put face down on wood or pvc for cleaning only
 - Do not set anything on the die
 - It takes very little to damage the die line – Even a pencil or pen dropped on a die with a small cutting angle can create a low spot in the die.
 - When mounting the die, avoid contact with other material
 - Do not allow the cutting edge to come in contact with any other objects... Anvil, Die cutting frame, Gears, etc.
 - Remove rings or watches to avoid contact with the die.
- Avoid bending the die
 - Bends or creases in the die will cause the die to fracture or operate improperly
- Store the die in a safe place.
 - Clean the die using alcohol to remove any adhesive buildup
 - Wipe the die down with oil (WD40)
 - Return the die to the plastic sleeve and place it back in the tube or box for storage.

Other parameters for successful die cutting.

- A solid die cutting unit.
 - Die cutting units that are older or worn out will not have the same tolerances as a new cutting unit. This can cause the die to wear out prematurely. To prevent this, provide all scheduled maintenance to the machine and replace any worn or broken parts.
- The ratio between the width of the cylinder and the circumference can have a large affect on die cutting.
 - It is recommended that the ratio be no less than 1:1. A cylinder with a wider width than circumference may cause flexing of the cylinder.
- It is important to know the undercut of the cylinder
 - The undercut is the distance between the magnetic cylinder and the anvil
 - Typically this gap/undercut is .019" (480micron)
 - While this is a "standard" undercut, there are variations and tolerances that go along with this. It is important to know exactly what the undercut measures when placing an order for a flexible die.
 - Over time, the bearers can become worn. This will change the undercut of the cylinder and will adversely affect die cutting. For kiss cutting applications, the die may strike too hard or cut through the liner. For through cutting, the edge of the die line may be smashed – greatly decreasing die life.
 1. Make sure that bearers receive proper maintenance
 2. Replace or repair any worn bearers.
 3. Minimize pressure on the bearers – Increased pressure will decrease the life of the bearers.
 4. The use of pressure gauges can help to minimize the wear on the bearers when the pressure is kept within reasonable tolerances.
- The tolerance of flexible dies must be taken into account.
 - Flexible dies must have a tight tolerance to perform correctly. Typically this tolerance is +/- .002 micron.
 - As the die wears, the height decreases. Adding pressure to the bearers can counteract this loss in height. However, as mentioned above, too much pressure will decrease the life of the bearers.
- It is important to know the substrate being converted.
 - While any die will normally cut through a particular substrate for a limited amount of time, it is best to know the properties of this material and adjust the cutting angle accordingly.
 - When ever possible, it is recommended that a sample of the material be sent for testing.
 1. This provides the information that is needed to produce a die that will perform best given the particular material.
 2. This also ensures greater accuracy of the die.
 3. Properties vary greatly from one substrate to the next. Not only from a paper material to a film, but also between a similar material from two different suppliers.
- In order to serve you better, keep a record of die life and performance
 - Without feedback it is difficult to improve the quality of the die.
 - Make notes of:
 1. Total run length (in feet or meters)
 2. Required pressure
 3. Any problems with the die, ie. Stripping problems or tags on the labels.
 4. Any additional comments that may be useful.