



REDUCING DIECUTTING COSTS

ANVIL COVER MAINTENANCE IS KEY

EXTENDING ANVIL COVER LIFE WITH PROPER MAINTENANCE AND CARE CAN LOWER DIECUTTING COSTS AND IMPROVE OVERALL PRODUCT QUALITY.

BY JOHN HARMON DICAR

The practice of rotary diecutting seems simple; a rotary diecutter, a die board, sheets of corrugated and trained machine operators. With these basic elements we can begin to produce corrugated containers. But much more is involved, and the process can become costly. When exploring ways to reduce those costs, the anvil covers, also referred to as blankets, pads, lagging or one of many other terms, are frequently overlooked.

The anvil covers work in conjunction with the die board to ensure proper cutting and scoring. The covers, and what affects their usefulness and durability, must first be understood. By understanding the properties of anvil covers and the causes of their wear, they can then be maintained to increase productivity, lower diecutting costs and improve overall product quality.

Properties of Anvil Covers

Of the many properties designed into a quality anvil cover, four are dimensional accuracy, cut resistance, energy return and fatigue resistance.

■ **Dimensional Accuracy:** Anvil covers are designed to be machine specific and take into account factors such as anvil cylinder type, length and circumference. Using the wrong anvil cover can result in premature anvil cover failure.

■ **Cut Resistance:** Anvil covers must be engineered for cut resistance but must also be compressible enough to allow for the effective scoring of the corrugated sheet as needed. Even though the anvil covers are designed for cut resistance, they must also allow for trimming and grinding on those machines that have those functions that are used to maintain a uniform anvil cover surface.



THE ANVIL COVERS WORK IN CONJUNCTION WITH THE DIE BOARD TO ENSURE PROPER CUTTING AND SCORING.



■ **Energy Return:** Also referred to as rebound. This is the ability of the cover to return to its previous state after being compressed. Proper rebound will result in the ability to use less impression to cut and clean the corrugated container, thereby allowing for minimal stress on the anvils, equipment and tooling.

■ **Fatigue Resistance:** All materials, including the lock section and backing, must withstand continual cutting and must be resistant to deformation. There should be no stretching of the covers or soft spots at the lock section of the anvil cover.

Variables

With the proper anvil cover chosen for the application we can now look at some of the several variables that can affect the anvil cover life. These include but are not limited to replicate designs, sustained heat, machine condition, design characteristics, cutting rule selection and unnecessary excess diecutting pressure.

■ **Replicate Designs:** This refers to long production runs of similar size and design with repeated cutting in a limited area of the anvil covers. If scheduling to reduce repeated cutting in the same area is not feasible, then frequency of anvil cover rotation may need to be increased.

■ **Sustained Heat:** Residual heat in the corrugated sheets from the corrugator can have an effect on the urethane used in the manufacture of the anvil covers. This, in conjunction with the heat that can be generated from the friction of the knives, scores and ejection rubber used during the diecutting process, can affect anvil cover life. When possible, allow the corrugated sheets to 'cure' or cool prior to converting.

■ **Machine Condition:** Maintaining the machine to OEM specs is vital to extending anvil cover life. Check for proper anvil cylinder oscillation, parallelism and concentricity. This can be included in

the machine preventive maintenance schedule.

■ **Design Characteristic:** Die boards with long lead edge knives and cross corrugation require additional demand to cut. Also, designs with large concentrations of cutting rule and narrow slots can require additional impression.

■ **Cutting Rule Selection:** Rule selection should be matched to the material being cut and the surface being cut upon. Improperly matching the rule to the substrate will result in less than desirable cutting results. Beware of unlike knife heights in multiple piece die boards and perimeter shells with inserts. Additionally, repairing dies with unlike rule heights and profiles will cause premature anvil wear.

■ **Unnecessary Excess Diecutting Pressure:** This means over rubbered slots, low scores, unwanted nicks at the joint line and bad habits. When it comes to re-rubbing a die board on site or adding impression to cut, it's sometimes an all-you-can-eat buffet mentality — more is better, but that is not necessarily the case in rotary diecutting. Many times, rather than recognizing and repairing problem areas, such as over rubbered slots and cracked or nicked cutting rule that can cause scrap to remain attached, additional impression is used, again resulting in excessive anvil cover wear.

An Easy Process

Extending anvil cover life can be easy. Begin by regularly checking these three quick hit items that are major causes of anvil cover wear:

Diecutting for Results



REPAIRING DIES WITH UNLIKE RULE HEIGHTS AND PROFILES WILL CAUSE PREMATURE ANVIL WEAR.

■ **Oscillation** — Check the oscillator. Is it operational? Travel should be 1 ¼' – 1 ½'. Total travel time should be between 1 – 1 ½ minutes

■ **Rotations** — Whether the machine has a trimmer or not, a pattern of rotations specific to the plant mix should be implemented

■ **Installation of Die Board** — The cutting and scoring rule must be securely mounted to the die board cylinder. If the sole method of mounting is with bolts, all bolt holes must be used.

Mastering these basic items, then moving to more advanced concepts in this article, can dramatically improve the effectiveness of any diecutting operation.

Troubleshooting accelerated anvil cover wear does not have to be intensely time consuming. Include suppliers in the troubleshooting process; many are available to assist their respective customers in using their products more effectively. Understanding and establishing a focus on the aspects that affect anvil cover life will help to reduce costs, increase productivity and improve quality.

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