

TIP 0305-23

OLD TIP NO. 205-47
ISSUED – 1982
REAFFIRMED – 1988
REVISED – 1994
REVISED – 2000
CORRECTION – 2000
WITHDRAWN – 2007
REVISED AND REINSTATED – 2007
©2007 TAPPI

The information and data contained in this document were prepared by a technical committee of the Association. The committee and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability or responsibility under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

Rotary cutting die maintenance

Scope

Why it is economical and profitable to perform minor in house maintenance of rotary cutting dies.

Safety precautions

Insure that safety glasses are worn at all times when making minor repairs and insure that adequate air ventilation is available in the repair area. Wear cut-resistant type gloves while handling die boards.

Introduction

Fifteen to twenty years ago, an expenditure of \$8,000 to \$10,000 for cutting dies was considered a sizable outlay for most corrugated boxplants. Since then, however, the demand has grown to the point where many plants now spend \$50,000 - \$75,000, (and more) for dies.

Cutting dies are not one-time investments, of course. They are used again and again, as a plant's job requirements demand. For this reason, it is incumbent upon plant management to give some consideration to the maintenance of these dies. Damage to them can affect production, quality, and profits.

Like most other things, cutting dies last longer and perform better when they receive proper maintenance. This care involves primarily two things: (1) attention immediately after a run and (2) good storage facilities for the dies.

Die inspection

When a die is taken off a press after a run, it cannot be assumed that it is still in good condition and ready to be used again. Some of the slots may be packed with corrugated board and have to be cleaned. It may be necessary to put on fresh rubber. Other minor damage may also have to be repaired.

Any boxplant can profit from assigning a person to inspect and repair dies as they come off the press. This procedure may take only 10 minutes, but the amount of money to be saved through improved operating performance is considerable. Putting an unchecked die back on a press for a second run can lead to major production problems. If slots have not been cleaned and new rubber is not put in, the slot will continue to pack, making a considerable amount of unproductive hand stripping necessary. Perhaps the die may even have to be taken off the press to correct the situation.

The optimum time to inspect and repair is immediately after the die is removed from the press. If the schedule should change suddenly, an unrepaired die could cause major problems. A customer's request for early delivery could mean that there is not time to accomplish even small repairs. Thus, the unrepaired die may have to be put on the press as is with subsequent quality and productivity deterioration.

TIP Category: Automatically Periodically Reviewed (Ten-year review)



Documents
Document Sharing Hub

Therefore, pennies spent in the care of a cutting die can save large dollars. A little care immediately after a run goes a long way to prolong the life of a die.

With a rotary die, reknifing is not a serious concern. Rotary dies cut against a urethane anvil, which has a lesser tendency to dull knives. If cared for properly and if properly applied on a press, a rotary die can last almost indefinitely. The plant has to insure good anvil rotation procedures, maintenance of the diecutting section, i.e. bearings, shaft, TIR, conditions of the die drum, station-to-station register and so on.

Finally, the rubber should be inspected after the die has been used. Rubber on a rotary die will wear down, burn off, flatten, and lose its life because of the friction caused by the contact with the corrugated sheet. Scrap that gets caught on a rotary die can begin to pile up to the point at which it will break the wood. Such repair of a rotary die can be costly.

Bad rubber on a die can be easily seen. Rotary dies should be inspected to make sure that rubber in the slots is not compressed or worn out. Because of the friction caused by the action of a rotary diecutter, the rubber on a rotary die must be checked more often and more carefully than that on a flat die.

In-plant repair

It is not necessary for a boxplant to keep a large supply of materials on hand in the maintenance department to make repairs to damaged dies. Suppliers can usually deliver material to a plant on relatively short notice, but the plant should have at least a small amount of stock available for repairs. This avoids the "raiding" of one die in order to help repair another and saves time otherwise spent searching for material on other dies. Since labor costs are not low, the time saved in quick repair by keeping a small stock of supplies — proper glue, rubber for the dies, embossed letters, and slot rubber — can result in dollars saved and increased production. The supplier of the dieboard should correct any problems where the scrap is not being stripped or ejected. It is the supplier's responsibility to ensure guaranteed stripping. Have the supplier in the plant on the initial run to initiate changes as required.

If a plant is set up to do minor repairs, it is highly recommended that it keep on hand a minimum quantity of some extra rules for reknifing—perhaps 25 to 50 feet (10 - 20 m) of cutting rule and 25 feet (10 m) of creasing rule. This, too, helps save time in making minor repairs.

It is poor practice for a boxplant to do more in the way of making minor repairs or revisions to dies than its personnel is capable of doing. To do more may be false economy. For example, if a plant is averaging 4000 impressions an hour using a purchased die, it may not pay to have the die reknifed in the plant. If it is not mitered properly, or if one piece is poorly made, production could drop to 3500 impressions an hour because of problems this causes. Consequently, the dollars the company may have thought it saved are paid out *with interest* over and over again.

Complexity of dies

Because of the growing demand for boxes and displays of higher quality and greater attractiveness, more complicated dies are being utilized.

Any plant spending \$50,000 to \$175,000 or more a year on dies could justify having one employee devote half of his or her time to die maintenance. This person need not be a diemaker. The ability to clean the dies, touch up the rubber, and make sure the die is put properly on the storage rack, ready for the next run, is the only qualification for this job. A few thousand dollars spent in this endeavor can mean many thousands of dollars earned in better diecutting and improved production.

Die repair identification system

An effective die identification practice for die repair uses a four-tag system to signal management and crew personnel the repair condition of the die.