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Machinery considerations and selection: yoked scoring slotting section

Scope

What are the common problems and considerations necessary in selecting a yoked scoring slotting section?

Safety precautions

The flexo folder gluer needs to be in a lockout mode whenever an operator or maintenance is working in the slotting section.

Update

Flexo folder gluers have changed dramatically since this TIP was last revised. The accuracy and the quality have changed dramatically. Speeds are now running consistently in the mid 300s and up to 400 boxes per minute with four color graphics and die cutting. This requires a different mindset for the operator and all the support teams. When we look at the scoring and slotting section of these flexos, we notice everything is now becoming automatic and adjusted by the computer and not a wrench. The intricacies of the equipment have to be much more accurate as the speed increases. With the increased speed comes the need for increased maintenance, lubrication, and much more cleaning. Little items turn into bigger problems at a later date if they are not taken care of accurately and on schedule. Remember that one machine is now doing the work of three of the older flexos.

Maintenance considerations and selection

All flexo folder gluers have the scoring and slotting heads yoked together and powered for quick setup. Several different methods are used to align the upper and lower heads with one another, and different techniques used to position the heads laterally along the shafts.

Some machines are equipped with the lead and trail knives mounted to one head with a mechanism to adjust the trail knives to obtain box depth. Others have dual or even triple slotting shafts with the lead edge knives mounted to one set of heads and the trail edge knives on another. Some of the older machines will not have a mechanical mechanism to adjust one set of knives, requiring that this be done manually. Be sure to find out why dual- and single-stage slotters are available and which of the two best fits your needs. Some manufacturers offer split length slotter knives to allow more flexibility regarding box depth. What split knife lengths are offered? Some suppliers now offer a system to lock out the slotting heads so that you can run a die cut or just printed sheet without any slots.

How effective are the slotting knives at producing clean, square slots? How do these knives insure clean slotting? What is the difference between straight and serrated Blades? How about the serrated vs the flat tip on the slotting blade? Are they using hardened steel? What kind of board are you running? Are you running any preprinted

liners? These items will make a difference on what kind of a blade you should use. How is the slot accuracy affected by the shape of the male and female slotter knives? Different profiles on some of the newer flexos are designed to remove scrap much more reliably than the old profiles. Some of the newer designs on the slotting heads are designed to give you straighter slots.

What is the typical estimated life of the slotter knives? How long does it take to change the slotter knives?

Note particularly the width of the heads in their yokes; it will vary depending upon the technique used to align the heads. This will have a direct effect on panel sizes. Check the minimum and maximum panel sizes available on each machine. This may be critical when the required minimums or maximums are achievable on one machine but not necessarily the other.

Different methods are used to guide or align the heads in the yoking mechanism. Some use carbon plates on either side of the heads. Others use special alloy inserts that rub against hardened surfaces to guide the heads. Others use specific alloy inserts that rub against special steel wear plates.

Try to talk to the mechanics to determine what is involved when the wearing surfaces that guide the heads have to be replaced. Because the heads revolve and are being positioned laterally by means of the wearing surfaces, in time friction will wear them out. If they are adjustable inserts, how often must they be adjusted? What determines when they should be adjusted? Who makes the adjustment: operator or mechanic? How does this person go about adjusting or replacing the insets so as to keep the heads well in control and the knives from chipping? Try to get someone to describe exactly how this procedure works. Lacking this, ask the sales representative to describe in detail showing what is done, without actually performing the job. Be sure to find out how long it will take to actually do the task.

Explore the different methods used to move the heads laterally. On some machines, it is necessary to engage the male and female slotter blades during this lateral movement; on others, it is not. Why is this? How much, if any, of a problem is this to the crews? What problems, if any, are experienced with blade damage because the male and female blades are not engaged during this movement? What maintenance problems are experienced on the various machines? Recognize that there is a lot of mechanism involved in mounting these heads and moving them. It could be a source of maintenance, particularly if excellent housekeeping is not practiced.

A big source of folding problems (out of square, fishtailing, etc.) begins with improper scoring. What methods are used to score the boxes? How does the shape of the new scoring heads help control and insure good folding? Some machines do this in one stage; others do it in two. What profiles do they use for both the primary and the secondary stage? How much crush is needed prior to the score? Why does this give a better score and a squarer box? What are the advantages and disadvantages of each?

Does the folding section include gauging or forming rollers to continue the process of accurate folding? How effective is the design and function of these forming rollers in concert with the scoring produced in the slotter creaser section? After talking with the salesman for his pitch, talk with the operators and find out their experiences. Look at the boxes and see what kind of scoring is achieved.

Dealing with edge trim can sometimes be a real problem, especially on large machines. If the trim knives are located inside the machine, can the scrap removal system effectively handle it? Are trim choppers available? If the trim knives are located last, is the trim properly diverted away from the glue mechanism?

While some companies use a serrated blade into a soft anvil to cut the glue lap, many machines use steel against steel. What are the pros and cons of each? Observe what problems, if any, the crew has in cutting off the glue lap trim. It would be educational to see what they go through if they are having problems and how successful they are in getting good clean cuts consistently. Most manufacturers offer auto-setting of extended glue tabs. Does the machine include this? How effective is the mechanism? What kind of system does the manufacturer use to make sure that the glue tabs will not stay with the boxes when they should go into the waste system at high speeds?

Different methods are used to convey the scrap off at right angles into a blower system on the various machines. Some use belt conveyors; others use airveyors, through which low volume air is blown to move the scrap off to the side. How does each of these systems do the job? Are there any problems in disposing of the trim with either? Are there any problems with too much air being blown so as to actually toss the scrap up and beyond the conveyor and get it back into the press? Does the air motion on the airveyor system create dust that gets back into the flexo system? What type of surface will you use to help the scrap slide down the sides of the scrap pit – epoxy? Stainless steel?

Keywords

Scoring, Slotting, Trimming, Folder gluers