GUIDE TO CONVERTING WASTE REMOVAL

By Midway Rotary Die Solutions

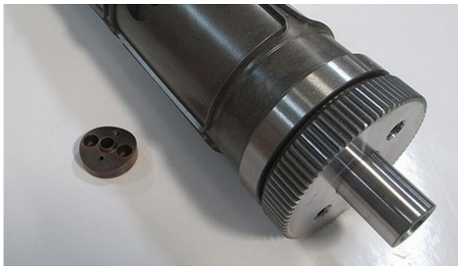
As converters seek efficiencies in production, die manufacturers increasingly receive requests about automated methods to remove web waste. Gaskets almost always have at least one internal cavity that needs to be removed when cutting via rotary. The main purpose of rotary converting is to produce a product at high speed with low cost and minimal labor input. Without the use of appropriate slug and scrap removal technology, the results can negatively affect both production speed and cost. Inefficient scrap removal may also cause tooling and press damage when slugs accumulate inside a die cavity, causing pressure to build rapidly and can result in blade damage or even complete blade failure. If scrap material were to get between the anvil and contact surface of the rotary die (bearers), the die can lift from the anvil surface and result in an uncut part or misalignment of the die and thus potential blade damage. Rotary dies can be built with or used in conjunction with one of many in-line waste removal options described below to alleviate inefficient waste removal issues.

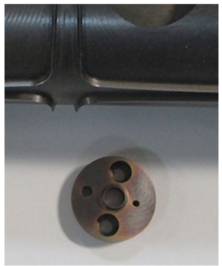
Ejection Foam/Rubber

The simplest waste removal solution is applying ejection foam or rubber to the cavities of the die. Applying foam to the cavities of the die can help extract the slugs or even the finished parts themselves. Various thicknesses of foam are available to pair with various material types. Similarly, rubber insert ejection offers a low-cost method for preventing slug buildup in tooling, avoiding blade damage caused by clogged cavities. This method is used when lower press speeds and cost are dictated by the job. Rubber ejectors are also used in small cavities where air ejection is not feasible.

Vacuum-Thru Inserts

Vacuum dies offer an effective means for removing small die cut waste from the web. A vacuum die uses suction to pull waste through the center of the die, and out the end of the journal using a vacuum assist block. Removable inserts are used to provide increased clearance for the waste slugs that must pass into the die's core, reducing the chance of buildup that could cause blockage of the air passage. Vacuum dies are most effective on small cavities, tag stock, materials without adhesive, thin materials, polyesters, etc.



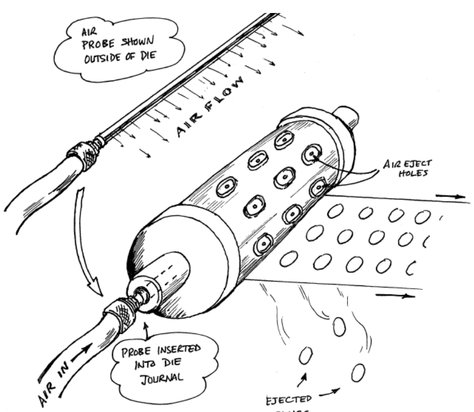


Spring Plunger Ejection

Screw-in spring plungers offer positive slug removal from die cavities when cutting stiffer materials. The spring-loaded plunger "pushes" out the scrap, freeing it from the die to be collected with a vacuum collection system. The plunger extends beyond the blade of the die but retracts as the die rotates in the press. This method is highly effective for ejecting stiff materials such as metal, thick tag, rigid vinyl, and polycarbonate.

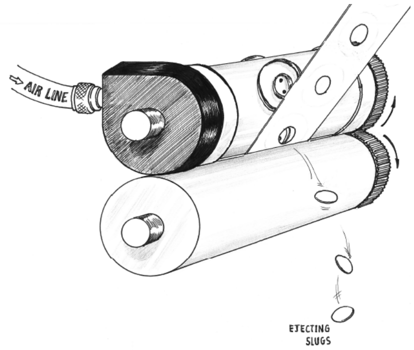
Standard Air Waste Ejection:

This method utilizes an air probe inserted through the journal of the die to deliver forced air through the die cavities with each rotation of the die. It is a relatively low-cost solution and is simple to set up and use. It is most effective with smaller diameter dies.



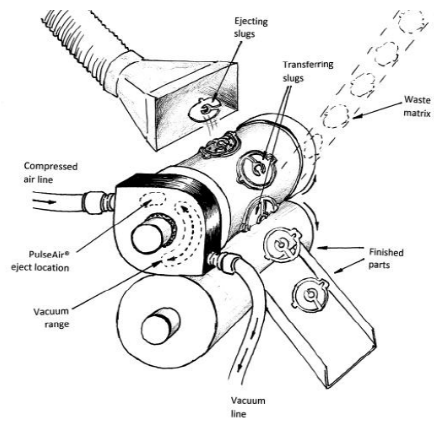
Pulse Air Waste Ejection:

A pulse air system offers an improvement over standard air eject tools. This system utilizes a special air manifold to control and direct the burst of air to each cavity as the tool rotates. This allows you to achieve the most effective slug removal while reducing the amount of air pressure required. Pulse air dies require no press modification.



Vacuum-Transfer with Pulse Air Ejection:

Sometimes due to certain constraints it is not convenient to eject a slug immediately after cutting. The Vacuum-Transfer method allows slugs to be held in the die cavity under vacuum and transferred around the die to a preferred point of ejection into your collections system.Vacuum Transfer also allows you to separate an inner slug from a finished (OD) part without using separate die stations. This eliminates the need for die-to-die registration between die stations.



Stripping Pin Matched-Set Tooling

This system uses a matched die and anvil configuration. On press, it has been run at speeds over 800 feet per minute with 100% scrap removal. Matched set tooling uses a "pin" to pierce the scrap and pull it down through a removal comb. To accomplish this, the support/drive rolls will require minor modification for pin clearance, and the comb assembly must be installed.