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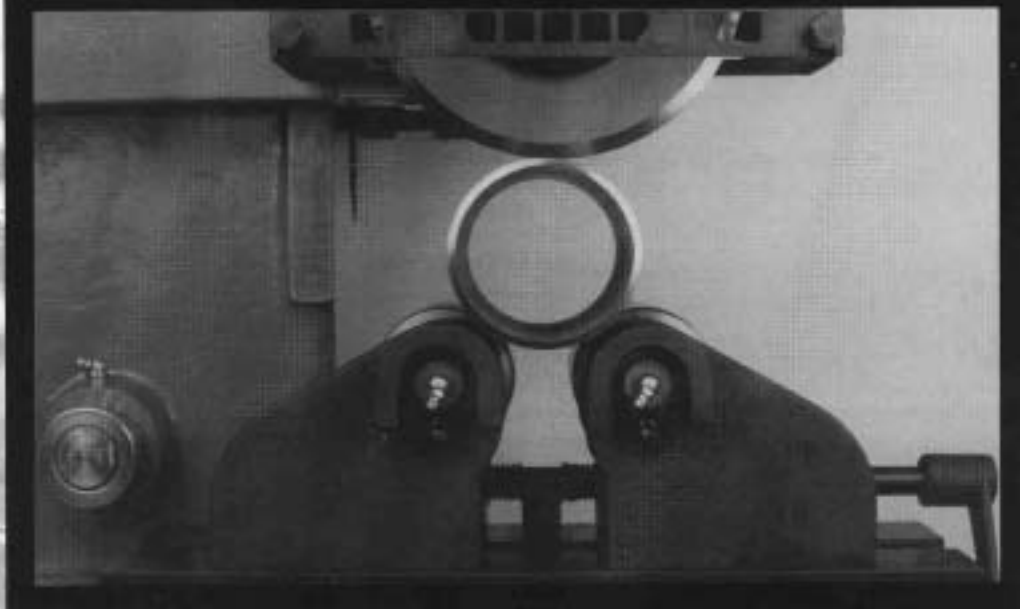
The Basics of Rotary Cutting

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by

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Continental Pipe and Tube Cut-Off Machines



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The Basics of Rotary Cutting

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Machines

The rotary cutoff concept is not new. Since its introduction in 1919, it has developed into an effective method of production tube and pipe cutting, regardless of lot sizes.

In industrial applications, a rotary cutter is basically a motorized version of a plumber's tube cutter. The tube is placed on rollers in the machine, and the rotating cutoff blade engages the tube, causing it to spin. When downward pressure is applied to the blade, it passes through the wall of the material (rather than traveling through the diameter) and parts the tube wall. Because the metal is parted, no material is removed during cutting, so waste is eliminated. This type of chipless cutting can also eliminate the need for additional cleaning and deburring operations.

Material flow can be regulated with an adjustment to the feed rate or speed of the cut. Generally the slower the cut, the more material flow to the outside diameter (OD); the faster the cut, the more material flow to the inside diameter (ID). The cut is typically square to within several thousandths of an inch. The machine's footprint is generally 24 by 30 inches, which allows for easy integration into a workcell. Material flow is unrestricted and stock piling of tubing is not required.

Applications

A variety of pipe and tube diameters and lengths can be handled with rotary cutting. In general, round tube measuring from 1/4 to 12 3/4 inches OD and 0.020 to 0.500 inch wall thickness can be cut with this method.

Pipe cutting using a rotary cut-off machine



Rotary cutting is used in the automotive, metal fabrication, conveyor, sprinkler, heat exchanger, cylinder manufacturing, game equipment, and pipe and nipple industries, as well as pipe and tube mills.

The rotary cutoff is suited for cutting all types of rounded metal, including copper, brass, steel, aluminum, stainless, and titanium. However, different grades of material determine different tooling lifespans. With hard material, blade life is reduced, requiring more frequent sharpening.

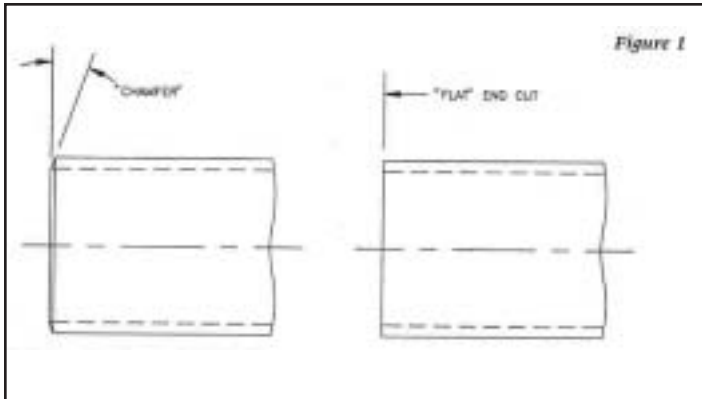
In a rotary cutoff, the blade parts the wall thickness and does not go through the entire diameter,

The Basics of Rotary Cutting

(continued)

thus creating a slight chamfer on the OD to the ID. This type of cutting may not be desirable when flat end cutting is required (see Figure 1).

Machine Types



Rotary cut-off machines are available from a number of manufacturers. The two main styles of machine they offer are manually operated and air-operated, each with its own benefits for specific cutoff requirements.

Manual machines provide an economical option for shops with intermittent cutting operations or with frequent changeovers for cutting a variety of sizes.

Manual machines are appropriate for short runs. They require an operator to advance the material to the length gauge stop and pull a handle to initiate the cuts. The quality of the end cut depends on the operator's touch.

Air-operated machines allow each job to be tailored to the production rates and required end conditions with minimal adjustment. They reduce operator fatigue by adjusting the speed of the cut, air pressure, the cutoff blade, and the position of the head assembly. These machines can create the same cut from the beginning of a production run to the end of the run, regardless of piece count.

Accessories

A variety of accessories are available to improve the efficiency of the cutoff operation. Listed here are several that are available from most manufacturers.

Cutter Block Assemblies: These are available in different

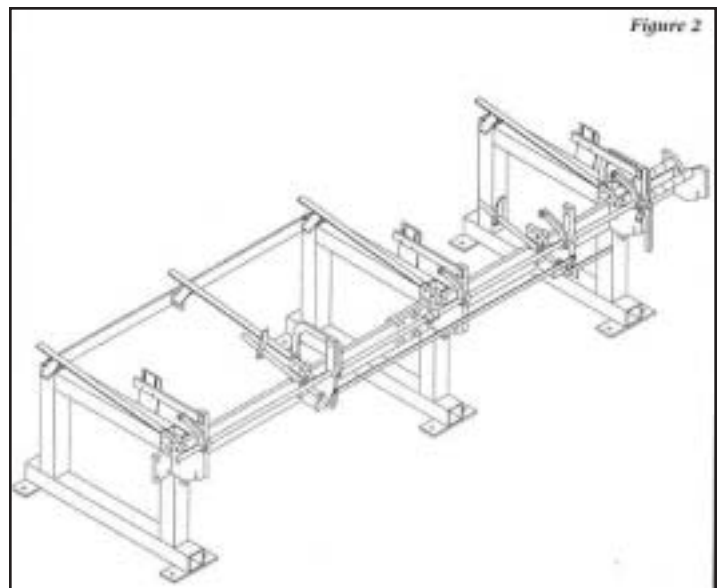
sizes for specific tube and pipe diameters, providing support at the machine for the material while it is being cut. Cutter block rolls should be spaced so the diameter of the tube or pipe is cradled a third of the way into the rolls. Generally, spreading the rolls farther apart reduces OD burr. Moving them closer together reduces ID burr.

Length Cage Assemblies: Standard length gauge assemblies provide a positive stop for repetitive cutting of material. The assembly permits consistent, repeated cuts in production runs without remeasuring. Automatic length gauge assemblies permit a positive stop for repetitive cutting and automatically initiate the cutoff cycle when the material length has been determined. For high production runs, an automatic length gauge can add speed and efficiency on air-operated models while reducing worker fatigue. The stop is set to the desired length, and when the material hits the stop, it activates a microswitch that bypasses the foot switch and starts the cutting cycle automatically. This accessory makes the cutting a semi-automatic option.

Support Systems

Several types of support systems are available:

1. Tube support systems permit storage of multiple tubes and pipes and operator access to the tube feed section of the cutoff machine (see Figure 2).



2. Individual support stands hold one piece of material for tube and pipe cutting.

3. Automatic tube feed systems can provide tube storage, transfer of individual tubes and pipes into the tube feed section, tube and pipe feed into the cutoff machine, and the length gauging on an automatic basis.

4. Custom support systems can be designed by most manufacturers to meet customer-specific tube and pipe support requirements.

Descaling Attachments: These attachments are available to remove rust, scale, concrete, and other surface contaminants from tube and pipe. The attachment automatically feeds the pipe through the descaling rolls, and most tube and pipe can be suitably cleaned in a single pass.


Maintenance

A cutoff machine can endure many years of active service when simple preventive maintenance steps are taken.

For example, checking levels of fluid in the air line lubricator and of the hydrocheck unit (for air-operated machines); lubricating pivot points and bearings; and checking drive belts for wear, tightness, and adjustment should be done on a routine basis. These steps can enhance the longevity of a cutoff machine.

Conclusion

Because of its economy and efficiency, rotary cutting of tube and pipe presents a viable option for small shops that require several hundred cuts per day or large production operations that require thousands of cuts.



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