

Choosing the best shakeout technology for your process.

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In the modern foundry, there are many options when it comes to choosing the proper shakeout technology for your metal casting facility. Improper selection can lead to poor throughput, casting damage, and unnecessary down time, all which costs your foundry money. There are many different shakeout designs available on the market today, including brute force, variable drive, and two-mass high-frequency vibrating shakeouts, vibratory drums, and rotary shakeouts. Each technology is particularly suited to a specific casting style and metallurgical type.

Vibratory shakeouts have been a staple in foundries since the dawn of the modern metal casting facility. There are essentially two different styles of vibratory shakeouts available: brute force and two-mass. The simplest of all shakeouts, brute force shakeouts are basically a steel box or trough with a perforated surface and unbalanced drives attached to create a force into the body of the machine. This vibratory force is transmitted into the mold, activating the sand and causing it to break away from the casting. Brute force shakeouts are limited in their application, as the horsepower required for operation is significantly higher than other types of shakeouts. A development in brute force shakeouts is the addition of electronic process controls which allow the angle of attack to be varied in the vibration. Units like the General Kinematics Vario-Drive™ use these controls to speed up, slow down, or completely stop horizontal travel of material on the shakeout body. What this means to the metalcaster is they can retain the casting on the shakeout deck for as long as they like to ensure complete sand removal. Both standard brute force, as well as variable angle brute force shakeouts, work well in foundries that produce a low mold count, as there is a delay required between molds to achieve the proper retention and shakeout time.

Two-mass high-frequency shakeouts take the brute force shakeout concept to the next level. Using a two-mass natural frequency spring system between the drive and the shakeout body, two-mass shakeouts create a high frequency impact force that is imparted into the casting with a minimum hp and energy requirements. Machine stroke is easily adjustable on two-mass shakeouts, which makes them adaptable to any shakeout situation. Two-mass shakeouts are ideal for high mold volume facilities.

Vibratory drums are optimal for no-bake, brass, and all other foundry applications where the reduction or elimination of casting damage is necessary. Benefits of the non-rotating, totally enclosed design include ease of dust collection and air system attachments, the ability to add peripheral attachments such as water addition, and for mating auxiliary equipment to the drum. Vibratory drums such as General Kinematics Vibra-Drum®, deliver high capacity throughput plus superior material motion for efficient sand and casting processing. The Vibra-Drum's natural frequency vibration produces a beneficial drum-like rotary motion of the sand and casting bed that quickly reduces sand lumps, cools and moisturizes sand, breaks down sand lumps, and cleans surface sand from castings without causing the castings to fall and tumble on each other. The castings and sand are typically discharged onto a vibratory screening to quickly separate the processed sand from the castings.

Rotary drums have been used for many years as a simple, cost effective solution for processing castings in all types of foundries. However, rotary drums tend to lift and drop castings, which can cause unnecessary damage and increased scrap rates. One place that rotary drums still have application is in the ductile foundry, where gates, runners and sprue need to be removed limiting the amount of manual labor required to de-gate castings. Due to the lift and drop action of rotary devices, tangling of castings and sprue is also reduced. Innovations in rotary technology, such as General Kinematics new Ducta-Series™ rotary drums, allow ductile foundries to effectively process castings without the typical high maintenance costs found in older rotary designs. The key to the Ducta-Series is the fabricated A/R liner systems, which are easy and safer to replace, and can be customized to meet the customers specific throughput and sand removal requirements. Rotary drums are designed to perform specific processes. Drums such as the Ducta-Sprue® are specifically engineered to quickly clean and break up sprue for cleaner recycle. Units like the GK Ducta-Screen® rotary shakeout breaks apart molds, separates sand, and removes sprue and gates from castings. Media drums, including the Ducta-Clean®, use media to clean ductile castings prior to the blast process while removing mold and core sand.

As you can see, there are many options to consider when selecting the correct shakeout for your foundry. Throughput, casting metallurgy, and casting design play an important role in choosing a shakeout that will offer your foundry the highest level of satisfaction and payback.