

## WHAT'S IN A NAME? CHOPPER PUMPS VS. GRINDER PUMPS AND CUTTER PUMPS

Working in the world of solids handling pumps we often come across generic pump descriptions that have become part of the wastewater lexicon. All of these descriptive names have been introduced by the manufactures usually as a method of differentiating themselves from the competition, but after many years of general use the names come up not only in conversations with end users but also as section descriptions in specifications. These include such familiar titles as “Non Clog” pumps, and “Torque Flow” pumps and the types we would like to address in this article — “Cutters and Grinders”.

To begin the comparison we should confirm that Chopper pumps, Cutter pumps and Grinder pumps are all designed for the same function. That is to use a single piece of equipment to both break solids down, and pump them. The mechanism each uses to achieve this is different and dictates the advantages and disadvantages of the design, along with how and where they can be used.

The “Chopper” pump we are familiar with uses the cutting action between the sharpened leading edge of a rotating

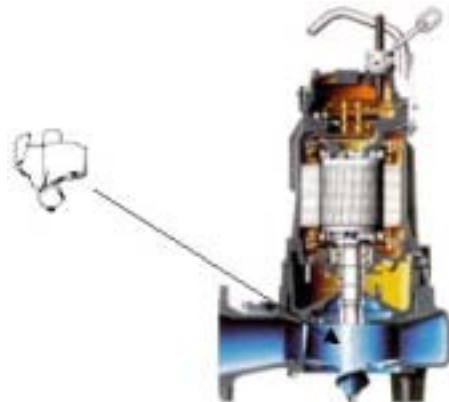
impeller against a stationary sharpened “cutter bar” which transects the pump inlet. Hayward Gordon and Vaughan have set the standard for this design.

Both “Grinder” pumps, and “Cutter” pumps have been designed for the submersible waste water pump market. This is the first major distinction to Chopper pumps — Grinders and Cutters are only available as submersible pumps. Although they can be used in dry pit applications with “Continuous in air” duty submersible motors, they only use the “close-coupled” mounting arrangement and are not available with distinct power frames or bearing housing. Of the two designs the Cutter type manufactured by companies such as Flygt, ABS, and Barnes will more often be

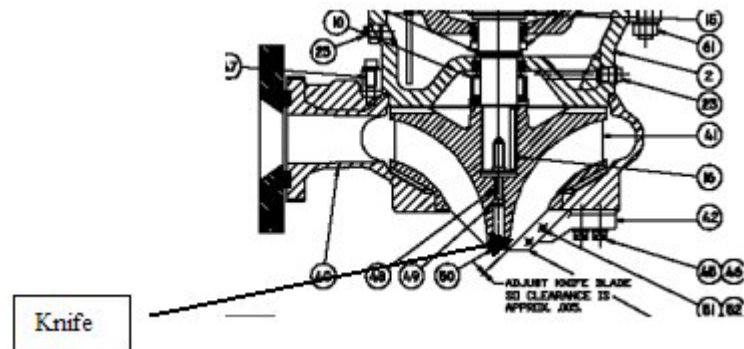
seen as a competitor to the Chopper. The Grinder pump market is more focused on lift station applications with low flow requirements (typically residential and commercial)

### Cutter Pumps

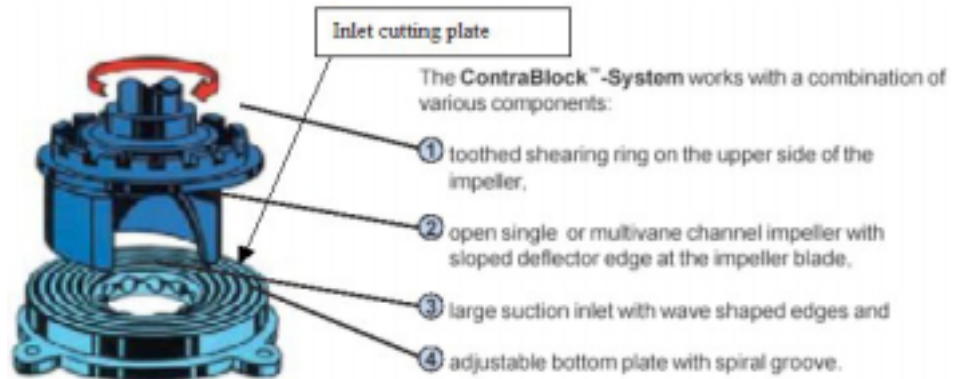
Unlike a Chopper pump which uses what Vaughan refers to as “positive chopping action” by chopping everything which enters the pump, Cutter pumps can allow solids to pass through without being reduced in size. Cutting blades are used with a close tolerance to the impeller in one of three general configurations: Externally (eg. Barnes), on a sharpened inlet suction plate (Flygt) or as edged spiral grooves on an internal suction plate (ABS).



*Flygt has an open “S-shaped” impeller with hardened cutting edges. A cutting plate is placed at the inlet. Together with the impeller, it is designed to chop up long-fiber materials before they can enter the pump.*



*Barnes Cutter Pump uses an externally mounted single “knife” which is positioned to work against the “cutter impeller” to clear debris and rags.*



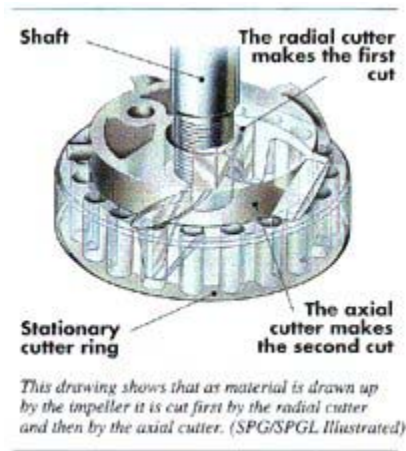
*The ABS “ContraBlock” arrangement has the impeller forward edges working against a spiral grooved suction plate, and a “shearing ring” clearing behind the impeller.*

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### Grinder Pumps

The Hydromatic pump is the typical Grinder design has a two stage cutting mechanism which can be likened to a kitchen sink disposal unit.

As solids pass through the suction inlet they are forced into the "cutter ring" by an extension to the impeller called the "radial cutter". From the "cutter ring" the solids are pushed into the impeller's leading edge which further cuts the solids. The solids leaving the pump are generally very finely ground.



The drawbacks of this method may be the investment of torque required to grind the solids to this pulpy state. This style of pump is therefore limited to the smaller end of our range (7.5 hp and down).

The "Chopper" design can safely be said to be the most versatile arrangement in this family of pumps. With the variety of installation configurations (Horizontal and Vertical Dry Pit, Vertical Cantilever, Line Bearing, and Submersible) and the "positive chopping" capabilities we are able to offer our customer a broader range of pumping options.