

## General Information

Tuthill manufactures a wide range of positive displacement pumps in the internal gear, circumferential piston and external gear designs. Ranging in capacity from .5 GPH to 550 GPM and available in iron, stainless steel, and other materials. Tuthill pump products lend themselves to a variety of successful applications in the pulp and paper markets,

With the GlobalGear® and Technaflo products, Tuthill offers a full range of very low to high flow rate magnetically coupled gear pumps. Magnetically coupled pumps are seal-less, and are used for difficult to seal liquids such as caustics, and for hazardous chemicals such as biocides.

The GlobalGear® internal gear design pump offers a heavy-duty modular design capable of back pullout access to the fluid chamber without disturbing the piping. The modular design features also minimize maintenance costs and inventory requirements compared to other internal gear pumps.

The Tuthill HD Series is a circumferential piston design pump, capable of running dry without damage, handling a wide range of viscosities, slurries, and is a low shear design. This design incorporates the use of externally mounted, synchronized timing gears operating close clearance impellers with external shaft bearing support. It is available in ductile iron and stainless steel construction as standard.

The Tuthill Technaflo products include precise, low-flow pumps available in a variety of materials of construction. For adjustable flow, these pumps can readily be supplied with variable frequency drives. These pumps can be supplied with accessories to support a variety of chemical feed control systems. TechnaFlo products are also available in Hastelloy C and Titanium construction. With a closed-loop feedback system, TechnaFlo products provide a pulse free accurate feed of chemicals in processes

## Black Liquor Soap – Pulp Mills

Black liquor soap, a by-product of digestion in a kraft mill, tends to display characteristics such as abrasiveness, air entrainment, and a wide range of viscosities, dependent upon the temperature of the product. These characteristics require the use of a positive displacement pump, and the difficulties presented by the air entrainment and abrasives require the use of the Tuthill HD circumferential piston design pump.

The Tuthill HD process pump is commonly used for pumping black liquor soap. Soap has traditionally been handled by gear pumps with short wear life due to meshing teeth on an abrasive fluid combined with system air entrainment. The Tuthill HD product, with its non-meshing impeller and ability to run dry, provides a real advantage on most applications.

Tuthill enhances the rugged durability of its HD pumps by interference fitting the timing gears, increasing the pump's ability to handle the most abusive pumping conditions. In addition, the use of carbon housing bushings provides the self-lubricating qualities needed to run dry.

Tuthill HD pumps generally are run at speeds of less than 250 RPM, which also adds to the life of the pump. They are used as black liquor soap transfer and power house feeds.

For less demanding black liquor soap applications, Tuthill offers the GlobalGear® internal gear product line. It is available with a steam jacket and a variety of sealing arrangements. This product features a back pullout assembly to minimize down time when replacing fluid chamber components. The rotating components and bearing assembly can be removed without disturbing the installation piping.

## Tall Oil – Pulp Mills

After the black liquor soap is converted to tall oil by a boiling process with sulfuric acid, it becomes a dark brown viscous liquid containing about 95% equal amounts of rosin acids and fatty acids. The tall oil is then processed further for use in protective coatings, inks, soaps, detergents, plasticizers and many other products.

It is common to find Tuthill HD and GlobalGear® pumps in distillation plants producing tall oil. They are often used for black liquor soap loading, unloading and transfer; on tall oil loading, unloading and transfer and on pitch transfer and loading applications. In all cases, the requirement for a heavy duty industrial positive displacement pump capable of handling abrasives, varying pressures and running dry without damage has made Tuthill a mainstay for handling this product with the HD product line. For sealing effectiveness combined with tolerance for intermittent run-dry conditions, GlobalGear® and HD pumps can be fitted with Tuffseal cartridge lip seals.

The GlobalGear® product is selected for the less demanding applications for transfer, processing, and unloading during and after the refining process. With capacities to 550 GPM, the GlobalGear Series is capable of handling a variety of applications with tall oil.

## Chemicals – Throughout Pulp & Paper Mills

There are a variety of chemicals requiring the use of positive displacement pumps in the pulp and paper-processing field. Tuthill Technaflo products are used for the low- flow metered capacity applications such as hydrogen peroxide for bleaching, felt washing solutions, dyes, creping aids, retention aids, and release aids. In addition, Technaflo pumps have successfully been used for de-inking chemicals in recycle paper mills.

Tuthill Technaflo pumps are used for water and wastewater treatment chemicals in pulp and paper mills. Common applications include additives such as ferric ions, polyelectrolyte coagulants, acids, caustics, and biocides.

As a manufacturer of a wide range of positive displacement pumps, Tuthill provides numerous products for an extensive variety of applications in the pulp and paper market.

## Clay Coatings – Coated Papers

Coatings or additives are necessary in order to utilize a limited number of types of pulp and produce a variety of papers. They may be applied as surface treatment to the wet or dry web or be added to the stock.

Kaolin is used as a filler, and as a clay coating because it is inexpensive, white in color, soft and increases the opacity of the sheet. Clay has a tendency to agglomerate and set up, and has a wide range of viscosities. This slurry adversely affects the life and performance of most pumps due to abrasion.

Both the HD and GlobalGear® lines have been used successfully for clay coating applications including rail car loading, unloading, transfer, and coating and filler feed systems. For the HD and GlobalGear product lines, Tuthill offers hardened fluid chambers and hardened wear parts such as tungsten carbide bushings and hard face mechanical seals to significantly extend pump life with abrasive fluids. Use of hardened wear parts and operating the pumps at slower speeds are both helpful for extending pump life in abrasive clay coating services.

Tuthill pumps have repeatedly demonstrated their ability to handle abrasive material, run dry without damage and provide repeatable, accurate flow per revolution.

## Sizing Agents

Sizing agents are added to improve the quality of the paper. Starch and rosin are commonly handled by the internal gear design pump. The repeatable flow of this positive displacement pump provides assurance of fluid capacity regardless of solids concentration.