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## CHEMICAL INDUSTRY

The term "chemical industry" includes those manufacturers which produce basic chemicals, as well as products by predominantly chemical processes. There are three general classes of products included in this definition:

1. Basic chemicals, such as acids, alkalis, salts and organic.
2. Chemical products to be used in the further manufacture of items like synthetic fibers, plastic materials, dry colors and pigments.
3. Finished chemical products to be used for ultimate consumption, such as drugs, cosmetics and soaps, or to be used as material or supplies in other industries, such as paints, fertilizers and explosives.

### Basic Chemicals

Typically, manufacturers of basic chemicals would be corporations such as Dow Chemical, DuPont and Huntsman Corporation, to name but a few. The applications here are involved in the actual manufacturing process, consisting mainly of pumps, mixers and metering devices. When the chemical is in a liquid form, various types of pumps are used throughout the process to maintain constant flows, pressures, weights, temperatures, etc. In other words, we control a variety of parameters by using the signal outputs of various types of transducers. More important, though, is the requirement to work with computer outputs, since these processes are most often computer-controlled and highly automated. Depending upon the chemical being produced, the application can present various demanding environmental conditions. Highly corrosive and caustic atmospheres are typical. Explosive atmospheres are not uncommon.

In addition to pump drives, various types of metering devices are used for batch mixing of ingredients, both liquids and solids. Many different types of mixers are used. Many of these applications require adjustable speed drives. Horsepower sizes range from fractional up through several hundred, with the majority of pump applications being in the 1 to 50 HP range. In their order of priority, the following are the usual industry criteria for choosing a drive:

1. Reliability
2. Serviceability
3. Cost

The Eddy-Current product line meets the criteria of reliability, serviceability and cost – not only initial cost but life-cycle cost, a term which is being used more and more in industry today. Our water-cooled clutches continue to be purchased by some areas of this industry over DC drives, based primarily on their reliability and serviceability.

## **Chemical Products**

The second classification in chemical products are those used in the further manufacture of items such as synthetic fibers, plastic materials, and the like. This is rich in applications for adjustable speed equipment.

1. Cellulosic: Derived from cellulose, the fibrous substance in plant life.
2. Noncellulosid: Derived from combining raw materials such as nitrogen, oxygen, hydrogen and carbon.

Most man-made fibers are made by forcing a syrupy substance (about the consistency of honey) through the tiny holes of a device called a spinnerette. The fine, threadlike filaments emerging from holes are then hardened or solidified. This process of extrusion and hardening is called spinning (not to be confused with the textile operation of the same name). In some cases, the filaments are spun into a wet media that promotes hardening or after they are hardened, the fibers are stretched. This reduces the fiber diameter or size and causes the molecules in the fiber to arrange themselves into a more orderly pattern. In a given fiber type, the strength increases and the fiber's ability to stretch without breaking decreases as the pattern of the molecules' arrangement becomes more and more orderly or better orientated. It is in this area that there are applications for adjustable speed drives.

Environmental conditions are generally not too severe. Many segments of this industry have some lint and fiber in the air. Textile industry AC motors are usually totally enclosed, fan-cooled (TEFC) units. Applications include:

1. Synthetic Fiber Spinning
  - a. Extruders
  - b. Metering Pumps
  - c. Godet Rolls
  - d. Traverse Drives and Winders
2. Synthetic Fiber Processing
  - a. Feed Rolls – Holdback
  - b. Draw Rolls – Stretch
  - c. Conveying Rolls – Load Tension
  - d. Crimping and Cutting

Typical companies in this second classification would be in the plastic materials area. Here, again, this covers a wide range. Adjustable speed drives are used on mixers, extruders and pelletizers, to name but a few. Where plastic film and sheeting are made, adjustable speed drives are needed for driving press rolls, calendars, windup reels, etc.

### **Finished Chemical Products**

The third classification of the chemical industry is finished chemical products used for ultimate consumption (such as drugs, cosmetics, and soaps) or to be used as material or supplies in other industries (such as paints, fertilizers and explosives). This area has many applications such as:

1. Conveyor Lines
2. Packaging Machines
3. Labeling and Marking
4. Bottling
5. Others

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The Dynamatic® name has been associated with various chemical applications for many years.

Some of our clientele include:

- Equistar
- Exxon Mobil
- Huntsman Polymer
- Union Carbide/Dow Chemical
- DuPont Corporation

For further information or details on these and more chemical applications, please contact one of our application specialists.