

cleaning. In addition to drum washers, systems are also available to clean smaller containers such as totes and pails. Examples of drum washing units are shown in the column to the right.

2.2.5 Mercury Bulb Crushers

Fluorescent lamps are widely used in businesses, as they provide an energy-efficient source of lighting. The commercial and industrial sectors dominate usage of fluorescent lamps, accounting for over 90 percent of total usage. Fluorescent lights are designed so that approximately half of them will operate after 20,000 hours of operation. Where these lamps are being used on a small scale, they are generally replaced as they burn out, one at a time. However, in large companies and industries, this method is not practicable, and, therefore, group relamping is done on a regular basis. Typically, group relamping is performed at 15,000 hours, or 75 percent of the lamp's rated life. This translates to replacement every two years for continuous operations, and every three to five years for noncontinuous operations, which are much more common. Approximately 20 percent of all lamps are currently replaced annually. Group relamping operations generate large quantities of lamps to be disposed of at a single time.

A typical fluorescent lamp is composed of a sealed glass tube filled with argon gas at a low pressure (2.5 Torr), as well as a low partial pressure of mercury vapor, thus the tube is a partial vacuum. The inside of the tube is coated with a powder composed of various phosphor compounds. Tungsten coils, coated with an electron emitting substance, form electrodes at either end of the tube. When a voltage is applied, electrons pass from one electrode to the other. These electrons pass through the tube, striking argon atoms, which in turn emit more electrons. The electrons strike mercury vapor atoms and energize the mercury vapor, causing it to emit ultraviolet radiation. As this ultraviolet light strikes the phosphor coating on the tube, it causes the phosphor to fluoresce, thereby producing visible light. The most commonly used fluorescent lamp is the 40-watt, 4-foot long tube, although smaller,



View of interior Drum Washer.