assessed, the composition of the batch is determined and the raw materials are mixed together. The batch is then conveyed to the furnaces.

Furnaces are used to melt the batch to produce glass. Most of the furnaces in the glass manufacturing industry are fueled by natural gas or oil. The batch is placed in the furnace and allowed to melt. Once the glass has been melted and conditioned it is channeled to a forming machine.

Forming operations consist of up to four major steps, the first of which involves a further conditioning process to prepare the glass for primary forming. Primary forming, which may include drawing, blowing, pressing, or casting, is the second step in the forming operation. This operation is usually followed by an annealing step. Annealing is the process of subjecting the glass to heat and slow cooling in order to toughen the product. The final process in the forming operation may include one or more secondary operations. Operations such as grinding and polishing, laminating, sealing and coating of glass are common secondary operations. Materials used for secondary operations vary, examples are the resins used to laminate glass to produce safety glass products, such as car windows.

(2) Cement Manufacturing. Facilities primarily engaged in manufacturing hydraulic cement (e.g., portland, natural, masonry, and pozzolana cements) are identified as SIC code 3241. The manufacturing process is generally the same for all facilities classified as SIC 3241. The three basic steps in cement manufacturing are: (1) Proportioning, grinding, and blending raw materials; (2) heating raw materials to produce a hard, stony substance known as "clinker"; and (3) combining the clinker with other materials and grinding the mixture into a fine powdery form.

The first step in cement manufacturing is proportioning, grinding and blending raw materials. The primary raw material is lime. Lime is typically obtained from limestone, cement rock, oyster shell marl, and chalk. Other ingredients in cement manufacturing may include silica, alumina, and iron. The blending and grinding of these raw materials is achieved through either "wet" processing or "dry" processing. Wet processing operations use water when grinding and blending raw materials, and dry processing operations grind and blend raw materials in a dried state. Until they are fed into kilns for clinker production, materials ground from wet processing are stored in slurry tanks,

while dry processing materials are stored in silos.

Kilns typically are coal, gas, or oil fired. In the kiln raw materials are commonly heated to a temperature of 1600 degrees Celsius (2900 degrees Fahrenheit). At these extreme temperatures, clinker is formed as raw materials begin to fuse and harden. Air is then used to cool clinker emerging from the kiln.

The final stage of the process involves adding small amounts of gypsum or stone (used to control setting times) to the clinker and grinding the mixture into a fine powdery form. The powdery product is then cooled before storage, bagging, and shipping.

There are facilities classified as SIC 3241 which only perform the final grinding step in the cement manufacturing process. These facilities do not have kilns to heat raw materials, and so obtain clinker from manufacturing plants.

(3) Clay Product Manufacturing. Facilities primarily engaged in manufacturing clay products, including brick, tile (clay or ceramic), or pottery products are classified as standard industrial groups 325 and 326. Although clay product manufacturing facilities produce a wide variety of final products, there are several similar processing steps shared by most facilities in this industry: (1) Storage and preparation of raw materials; (2) forming; (3) drying; (4) firing; and (5) cooling.

Manufacturers classified as standard industrial groups 325 and 326 typically use clay (common, silt, kaolin and/or phyllite) and shale (mud, red, blue and/ or common) as their primary raw materials. However, some industries supplement these materials with slag (cinders), cement and lime. Raw materials are generally stored outside.

Raw materials are crushed and ground prior to manufacturing. Stones are removed, and particles of raw materials are screened to ensure they are the correct size. Water is then added to raw materials in mixing chambers and "mud" is formed. The mud is molded into the desired product during the forming stage. Depending on the final product, one of several different methods will be used when forming mud into the desired shape. The most common methods use pressure or hydraulic machines to shape products.

Following the forming process, products are left to dry. Drying is necessary to reduce the moisture content prior to firing. A common method for reducing moisture content is air drying clay products in a controlled environment (e.g., a drying chamber). When the drying process is complete, the clay is ready for firing in kilns.

There are two basic types of kilns: the periodic kiln and the tunnel kiln. With a periodic kiln, products are fired for a specified period of time and then promptly removed. With a tunnel kiln, products pass through the kiln on conveyor belts, and by the time the clay reaches the end of the kiln, the firing process is complete. The primary source of energy for most firing kilns is natural gas. Natural gas is typically supplemented with coal, sawdust, or oil. Fired products may then be glazed with salt or other materials for special applications.

(4) Concrete Products. Facilities primarily engaged in manufacturing concrete products, including readymixed concrete, are identified as SIC group 327. Although concrete product facilities in SIC group 327 produce a variety of final products, they all have common raw materials and activities.

Concrete products manufacturers combine cement, aggregate, and water to form concrete. Aggregate generally consists of: sand, gravel, crushed stone, cinder, shale, slag, clay, slate, pumice, vermiculite, scoria, perlite, diatomite, barite, limonite, magnetite, or ilmenite. Admixtures including fly ash, calcium chloride, triethanolamine, calcium salt, lignosulfunic acid, vinosol, saponin, keratin, sulfonated hydrocarbon, fatty acid glyceride, vinyl acetate, and styrene copolymer of vinyl acetate may be added to obtain desired characteristics, such as slower or more rapid curing times.

Typically, aggregate is received in bulk quantities by rail, truck, or barge. It is stored outside, and kept moist, until it is conveyed to distribution bins. The first stage in the manufacturing process is proportioning cement, aggregate, admixtures and water, and then transporting the product to a rotary drum, or pan mixer.

To form concrete block and brick, the mixture is then fed into an automatic block molding machine that rams, presses, or vibrates the mixture into its final form. The final product is then stacked on iron framework cars where it cures for 4 hours. Decorative blocks may be produced by adding colors to the mix, or splitting the surface into desired shapes.

Precast concrete products, may contain steel structural members for increased strength. These products include transformer pads, meter boxes, pilings, utility vaults, steps, cattle guards, and balconies. After being mixed in a central mixer, concrete is poured into forms or molded in the same manner as concrete block and