

**WAC 296-17A-3510 Classification 3510. 3510-05 Plastics: Foam molding, rotary molding, liquid molding**

**Applies to:**

Businesses engaged in manufacturing plastics using the foam molding, rotary molding, or liquid molding process.

**Processes used include:**

- Foam molding - Liquid polymer is mixed with one or more ingredients, including a foaming agent, then heated to control the foaming action. It may be forced through pipes or hoses from a dispensing machine into the mold, or workers may carry it in buckets from the mixing pot and pour it into the molds. The top of the mold is put in place and secured. Heat and air pressure is applied inside the mold, which causes the foam to rise and form the shape of the object made. The mold may be lined with vinyl or other fabric, or wire frames may be placed inside the molds. Goods usually set overnight, and then the flashing (excess plastic) trimmed off.

- Liquid molding - Liquid plastic, such as urethane, without a foaming agent, is used to make products that are extremely tough. Liquid mixtures are poured into molds and cured in ovens.

- Styrofoam molding - Small styrofoam beads that expand by heating, then forced or blown into a mold and heat-expanded to form the product.

- Rotary molding - Rotary molding is used for large hollow items like garbage cans or buckets. Plastic powder, mixed with color, is poured into molds. The molds are closed and moved on a rotating arm through a large oven in a tumbling action while the mold heats. The plastic powder sticks to the inside of the mold and melts. The mold is removed from the oven while still tumbling, and air and/or water-cooled. Finished products are removed from the molds.

**Product manufactured include, but are not limited to:**

- Aircraft or machinery parts;
- Armrests, cushions, or dashboards for vehicles, boat, or aircraft;
- Styrofoam cups or plates;
- Styrofoam packing materials;
- Garbage cans;
- Buckets.

Raw materials usually received in barrels, drums or rail cars.

**Materials used include, but are not limited to:**

- Plastic beads;
- Pellets;
- Powders;
- Liquids;
- Foaming agents.

**Equipment includes, but is not limited to:**

- Conveyors;
- Delivery trucks;
- Eye protection;
- Face masks;
- Forklifts;
- Hearing protection;
- Molds;
- Respirators;
- Sanders.

**Work activities include, but are not limited to:**

- Laboratory personnel formulate plastic compounds to meet specifications such as rigidity, flexibility, or fire retardation;
- Workers may carry materials in buckets to the molds;
- Workers secure and seal the tops of molds;
- Flashing (seams and excess plastic) trimmed;
- Brand names may be printed onto the product using a special offset press;
- Finished products are removed from molds.

**Exclusions:**

- Worker hours engaged in any other method of manufacturing plastics are reported separately in the appropriate classification.
- Manufacturing graphite composite goods is classified in 3510-07.
- Worker hours or businesses engaged in fiberglass goods manufacturing are reported separately in classification 3511.

**3510-06 Plastics: Injection molding**

**Applies to:**

Businesses engaged in manufacturing plastics using the injection molding process.

**Note:** Businesses in this classification may manufacture molds used in injection molding or they may use molds supplied by their customers. Repairing molds is included in this classification.

**Processes used include:**

• Injection molding - Plastic pellets are placed in a dryer to remove any moisture, then fed through a hopper on the injection molding machine into an air-free chamber where they are melted at high temperatures, then forced with an auger-type screw, ram piston or similar device, into the mold. A coolant to allow the plastic to solidify rapidly cools the mold. When solidified, the item is ejected from the mold by air pressure, hydraulics, or a mechanical ram. Items may be trimmed, polished, assembled, plated, or otherwise finished.

**Products manufactured include, but are not limited to:**

- Cargo baskets for industrial use;
- Combs;
- Key chain holders;
- Medicine bottles;
- Novelty items;
- Sporting goods;
- Writing pens.

Raw materials, usually in the form of plastic beads, arrive in barrels, drums, or rail cars.

**Materials used include, but are not limited to:**

- Plastic beads;
- Pellets.

**Equipment includes, but is not limited to:**

- Conveyors;
- Delivery trucks;
- Eye protection;
- Face masks;
- Forklifts;
- Hearing protection;
- Injection molding machines;

- Molds;
- Respirators;
- Sanders.

**Exclusions:**

- Worker hours engaged in any other method of manufacturing plastics are reported separately in the appropriate classification.
- Manufacturing graphite composite goods is classified in 3510-07.
- Worker hours or businesses engaged in fiberglass goods manufacturing are reported separately in classification 3511.

**3510-07 Plastics manufacture, N.O.C.**

**Applies to:**

Businesses engaged in all other forms of plastics manufacturing including, but not limited to:

- Artificial marble manufacture;
- Extrusion, blow molding manufacture;
- Graphite composite goods manufacture;
- Vacuum forming manufacture;
- Plastics manufacturing using multiple methods, but foam molding, liquid molding, rotary molding, or injection molding are not the primary method.

**Products manufactured include, but are not limited to:**

- Boat paddles;
- Clock cases;
- Counter tops;
- Display stands;
- Fiber reinforced plastic goods such as:
  - Auto parts;
  - Bicycle frames;
  - Fishing poles;
  - Garden carts;
  - Golf club shafts;
  - Hose reels;
  - Rod blanks;
  - Snow skies;
  - Tennis racquets;
  - Wind board sail masts.
- Novelty items;
- Plastic bags;
- Plastic bleach containers;
- Plastic film;
- Plastic feed stock from recyclable plastic goods;
- Plastic gutters;
- Plastic milk containers;
- Plastic motor oil containers;
- Plastic pipe;
- Plastic window frames;
- Signs;
- Sinks;
- Skylight windows;
- Soap dishes;
- Statues;
- Trays for packing food or other items;
- Windshields for boats and motorcycles.

These businesses:

- Materials processed to resemble marble, to manufacture plastic articles through the blow molding or extrusion process, to manufacture plastic articles through the vacuum form process, or to manufacture fiber-reinforced goods or to manufacture through a fiberglass resin process.

- Mold a (for example calcium carbonate) material mixed with feed stock.

- Processes vary but all use the heating and melting of feed stock.

- Some processes involve the addition of additives.

**Processes include, but are not limited to:**

- Artificial marble manufacturing - Molding calcium carbonate material is mixed with feedstock, catalyst, and dyes to resemble marble when it solidifies. A release agent is sprayed into empty molds to allow the release of the item. Raw materials are mixed in large mixers. The mixture is poured directly into molds, placed into molds by hand, or forced into molds under pressure. The materials harden at room temperature. Items are removed from the molds and sanded, trimmed, or finished.

- Blow molding - Plastic feedstock is melted and mixed with other additives. A bubble of molten plastic is blown into a mold and expanded to the shape of the mold with compressed air. The mold is kept cool with a liquid coolant that circulates through its cavities. When hot plastic is pressed against the mold, it cools and hardens in seconds. Blow molding is usually a fast, high-volume operation.

- Extrusion molding - Plastic feedstock is melted and mixed with other additives and then extruded through dies. Sheets of plastic film are usually made by extruding a tube of hot plastic, expanding it with air pressure, then passing it through a series of rollers and cutters, which roll it flat and cut it into two separate sheets. Plastic film is used for making plastic bags and other products.

- Fiberglass molding using lay-up method - In the lay-up method, fabric is fitted over molds, then layers of fiberglass resins, hardeners, and fillers are applied over the fabric with a brush or trowel. In some applications, a thin foam material is fitted into a mold, and covered with fiberglass resins and hardeners. When the product is removed from the mold, the other side is coated, producing an exceptionally strong, lightweight product. Once removed from the molds, items are heated in ovens to harden and set.

- Fiber reinforced plastic goods - The processes used to produce the product are similar regardless of the product made. For example: The making of tube-like products consist of cutting a fabric-like material, which is purchased from others. It is cut to the specified dimension needed to make the product. The process rolls the material onto a mandrel (rod) or wraps the material around a mold, secures the fabric material with a plastic (cellophane) tape. The product cures in an oven. The cellophane wrap and mold or mandrel are removed. The product sanded to remove the lines left by the cellophane wrap and the finish applied.

- Making feedstock from recyclable plastic goods - Scraps or recyclable goods are ground or pulverized and formed into pellets. The pellets can be used again in manufacturing or further processed into oil by other manufacturers.

- Vacuum forming - Sheet goods are heated in an oven or in the molding area, and a vacuum is pulled on the mold, sucking the plastic in to conform to the shape of the mold. Items produced by this method

harden and cool in a few minutes. In another technique, liquid plastic poured into a mold, a seal of plastic placed over the item, and a vacuum pulled on the mold forming the liquid to the mold. This method produces a smooth, glossy surface. For either method, once the plastic material hardens, the "flashing" (excess plastic) is trimmed from the formed article. This process is "deflashing." It is done with a hand-held knife, a router, or a lathe. There is some assembly in certain manufacturing operations such as attaching components with screws, rivets, bolts, or glue, which is incidental to the manufacturing process and is included in the classification.

**Special note:** The painting or lettering of signs is included within the vacuum forming industry when done by employees of the employer assigned this classification. Businesses within this classification who purchase premanufactured signs from others, then paint lettering or designs or who then attach vinyl lettering within their own shops report separately in classification 4101 for their shop operations.

**Materials used include, but are not limited to:**

- Calcium carbonate;
- Catalysts;
- Dyes;
- Fiberglass resins;
- Liquid hardeners;
- Plastic feed stock;
- Plastic sheets;
- Recyclable plastic goods;
- Reinforcement fabrics;
- Release agents.

**Equipment includes, but is not limited to:**

- Conveyors;
- Delivery trucks;
- Eye protection;
- Face masks;
- Forklifts;
- Hearing protection;
- Molds;
- Respirators;
- Sanders.

**Exclusions:**

• Worker hours engaged in any other method of manufacturing plastics are reported separately in the appropriate classification.

• Plastic manufacturing through the foam molding, rotary molding, or liquid molding processes, classified in 3510-05.

• Plastic manufacturing through the injection molding process classified in 3510-06.

• Worker hours or businesses engaged in fiberglass goods manufacturing are reported separately in classification 3511. Any fiberglass application of the spraying technique using a chopper gun requires the entire business is reported separately within classification 3511. Incidental hand brushing or troweling of fiberglass resins or laying of epoxy over fabric occurs among other manufacturing industries. There should be a complete review of the manufacturing process in assigning the correct classification.

[Statutory Authority: RCW 51.04.020 and 51.16.035. WSR 21-22-090, § 296-17A-3510, filed 11/2/21, effective 1/1/22. WSR 07-01-014, recodified as § 296-17A-3510, filed 12/8/06, effective 12/8/06. Statutory Authority: RCW 51.16.035. WSR 98-18-042, § 296-17-59202, filed 8/28/98, effective 10/1/98; WSR 96-12-039, § 296-17-59202, filed 5/31/96, effective 7/1/96. Statutory Authority: RCW 51.04.020(1) and 51.16.035. WSR 91-12-014, § 296-17-59202, filed 5/31/91, effective 7/1/91; WSR 90-13-018, § 296-17-59202, filed 6/8/90, effective 7/9/90.]