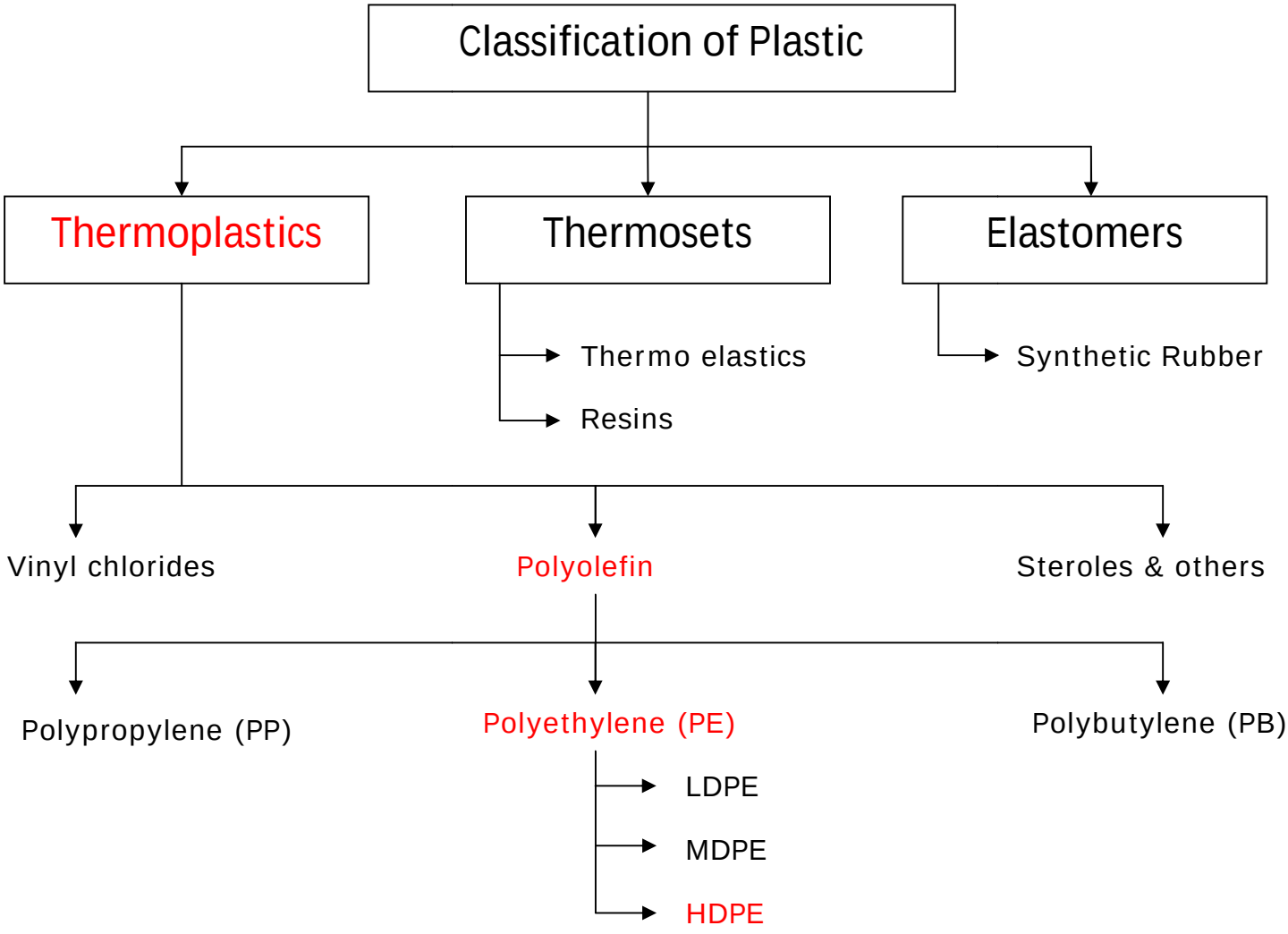
High-density polyethylene (HDPE)

High-density polyethylene (HDPE) or polyethylene high-density (PEHD) is a polyethylene thermoplastic made from petroleum. It is sometimes called "alkathene" or "polythene" when used for pipes.With a high strength-to-density ratio, HDPE is used in the production of plastic bottles, corrosion-resistant piping, geomembranes, and plastic lumber.



HDPE is commonly recycled, and has the number "2" as its resin identification code.

HDPE is known for its large strength-to-density ratio.

The density of HDPE can range from 0.93 to 0.97 g/cm^3 or 970 kg/m^3. Although the density of HDPE is only marginally higher than that of low-density polyethylene, HDPE has little branching, giving it stronger intermolecular forces and tensile strength than LDPE.

The difference in strength exceeds the difference in density, giving HDPE a higher specific strength. It is also harder and more opaque and can withstand somewhat higher temperatures (120 °C/ 248 °F for short periods).

High-density polyethylene, unlike polypropylene, cannot withstand normally required autoclaving conditions.

HDPE is not only versatile, it's popular. Why so popular? Here's why:

- It's lightweight yet super-strong. That's why an HDPE milk jug that weighs 2 ounces can carry a gallon of milk. And why many carmakers use HDPE fuel tanks—lighter weight car parts can help increase fuel efficiency.
- It's impact resistant. Drop the toy truck down the stairs and it bounces.
- It's long lasting and weather resistant, so that plastic lumber deck in the backyard can entertain generations of families.
- It resists mold, mildew, rotting, and insects, so it's great for underground pipes used to deliver water.
- And it's easily molded into nearly any shape, providing one of the primary benefits of most plastics: malleability.

Like many other plastics, HDPE often replaces heavier materials, in part because our society and many companies are pursuing sustainability goals, such as reducing the amount of material used in packaging and products.