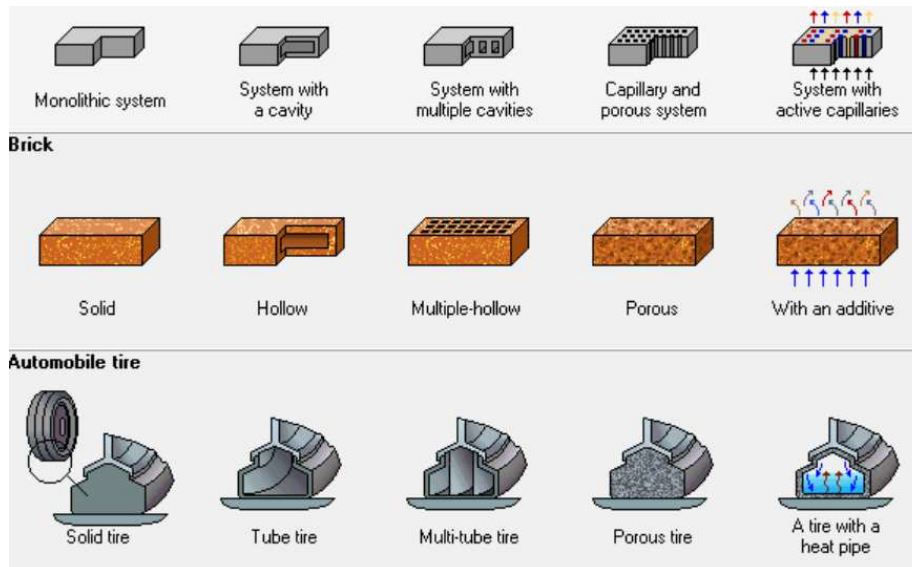
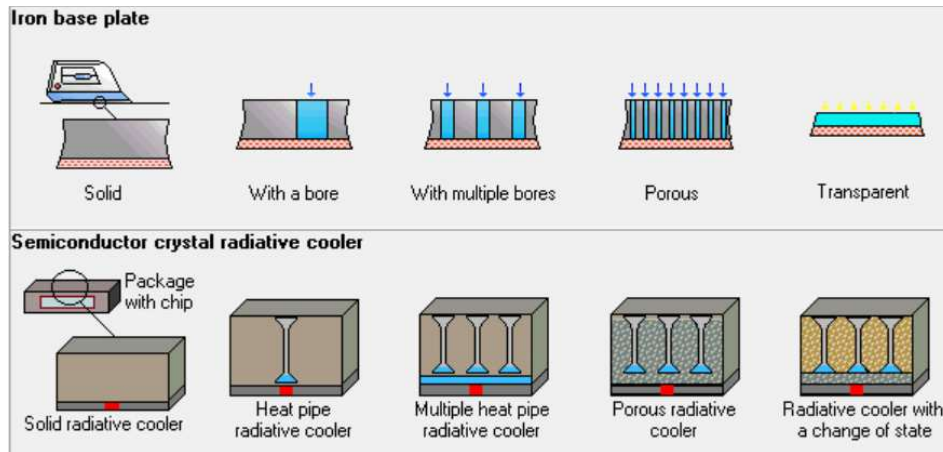


New engineering systems are developed in such a way so that the volume their element occupy could be efficiently used. Other materials or hollows are introduced into monolithic materials which then are split into several parts. Number of hollows grows, their size decreases. Active substances and fields are injected into the as-produced pores.



- A solid brick has no cavities inside. Although it is sufficiently rigid, it is a poor heat insulator. It uses much material.
- A hollow brick has an air-filled cavity. Since air is a poor heat conductor, such a brick is an efficient heat insulator. Although it requires less material, it is less rigid.
- A multiple-hollow brick has many air-filled cavities. Such a brick is light, rigid, and has good heat insulating properties.
- A porous brick has multiple, small air-filled cavities. Such a brick is sufficiently rigid and is a good heat insulator. Less material is needed.
- A brick with additives has different, special substances introduced into the brick pores. Such bricks are used in steel smelting. Alloying additives are introduced into the pores of these bricks. Then the brick is put into the melt. The brick gradually burns and releases additives into the steel melt.

- Solid tires do not have hollows in them. Such tires are reliable, but heavy, and are not easily damped. Much material is needed for their fabrication.
- A cavity is provided inside the tire filled with a compressed air. They feature good damping capability. Less material is used for their fabrication. A high speed is reached using a pneumatic tires.
- Several separate tubes are provided inside a tire filled with a compressed air. When one of the tubes is punctured the vehicle moves on the remaining ones. Such tires are reliable, but difficult to fabricate.
- A porous tire is made of the foamed material. Such a tire features good damping properties and is puncture-proof.
- An inner surface of a tire is made porous, the pores contain a readily evaporating liquid. The liquid evaporates and removes heat from the tire tread. Tire durability and reliability increases.



- The base plate of an iron is a solid, smooth metal surface that is heated with an electric coil. The heated base presses on the fabric to iron the fabric.
- The base with a bore has a hole that feeds water to the fabric. The water evaporates into steam, which moistens the fabric. Ironing efficiency improves.
- The base with multiple bores is given many holes that feed water to the fabric. More steam can be generated. Thus, the fabric is more efficiently steamed and pressed.
- A porous base plate has many small holes, through which water is supplied. This supplies water to the entire base surface. Fabric is efficiently steamed and better pressed.
- A transparent base plate uses a bulb to heat the fabric through the plate. The fabric no longer adheres to the base plate, and the fabric is heated more. Such a base plate reduces energy losses, and the fabric is efficiently pressed.

- Integrated circuit chips are fixed to the walls of a package. During the operation of the chip, the package heats up. Heat is poorly removed through the package walls.
- A heat pipe radiative cooler has a cavity near the chip that is filled with a readily evaporating liquid. As the package heats up during operation, the liquid evaporates. This removes heat from the chip.
- A multiple heat pipe radiative cooler has several cavities in the wall that are filled with a readily evaporating liquid. Heat removal efficiency increases.
- A porous radiative cooler has many cavities that are filled with a readily evaporating liquid. These cavities are connected to capillaries. The capillaries draw the heated liquid to the cavities. This improves the removal of heat from the chip.
- The porous radiative cooler has walls that are made from a material that can undergo a phase transition. At high temperatures, the material converts to another state. This conversion absorbs heat. Thus, the heat from the chip operation is efficiently absorbed, and the chip does not overheat.