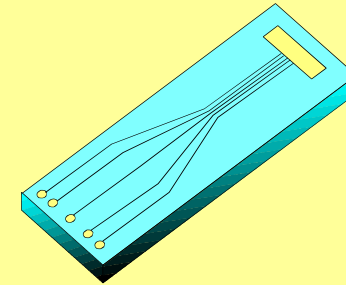


Manufacturing of micro channels on plastics

Bio-chip is a device to extract DNA, amplify and separate genes, determine gene arrangement, etc. with high speed from ultra-small amount of blood or cells by manufacturing micro- to nanometer flow channels on one chip. It is expected to be widely used in various fields like medicine, agriculture, etc. One of the manufacturing method of micro flow channels uses the combination of thermoplastic resin and metallic mold, and this method has advantages of low cost and mass production.

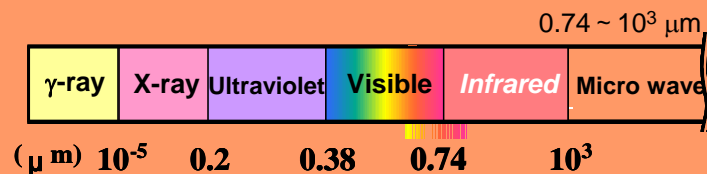


Manufacturing of thermoplastic resin

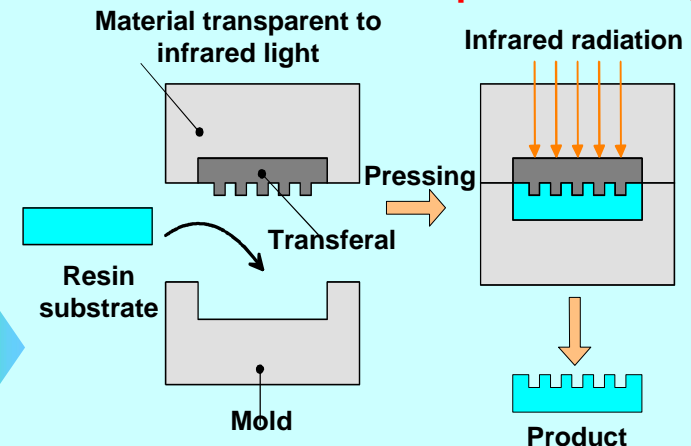
Resins are classified into two groups, thermoplastic (softened by heating) and thermosetting (hardened by heating). Softened thermoplastic resin by heating is injected into a metallic mold to form a product after solidification by cooling. Several molding methods such as injection and press molding are used depending on the shapes or applications of the products.

Technology using infrared light

Rainbow consists of various colors like red, orange, yellow, green, Infrared light has longer wavelength than red light and can heat up materials when absorbed. It is often used to heating test of new materials, cooking, air heating



Infrared radiation assisted press molding



Required size of the micro channels in bio-chip is in the range below 100 μm. Infrared radiation has characteristics of high speed and selective heating, and it can be used as the heat source for micro-fabrication of plastic materials with high accuracy and efficiency requested for use as bio-chips.