

Plastic Part Sterilization

Sterilization

Depending on the requirements and application, sterilization of plastic parts is often required to kill microorganisms such as Bioburden and pyrogens.

Effective decontamination through sterilization techniques is critical to preventing the transmission of organisms.



There are seven standard sterilization techniques:

- Autoclave/Steam Sterilization
- Ethylene Oxide (EtO)
- Gamma
- Dry Heat
- Electron Beam
- Irradiation/Radiation
- Plasma

Sterilization Techniques

Autoclave/Steam Sterilization

- Forced saturated steam in a pressure chamber
- Allows lower temperature and shorter times than dry heat deep penetration
- High heat-resistant plastic must be used in this process
- Temperature and times may vary
- Some materials can lose integrity by releasing molded-in stresses

Dry Heat

- Not generally used in plastic parts
- Low heat transmission and degradation due to time exposure

Plastic Part Sterilization

Sterilization Techniques

Ethylene Oxide

- Uses EtO gas
- Low temp method
- Monitoring is difficult and time-consuming
- Regulated by EPA as toxic
- When mixed with air, it is flammable and can be explosive
- Tight containment vessel

Irradiation/Radiation

- Can be ionizing or non-ionizing
- Ionizing uses Gamma or x-rays
- Non-ionizing uses longer wavelength

Gamma

- Exposure to gamma rays
- Cobalt 60 is common
- Widely used in single-use medical devices
- Changes in properties can occur; some medical materials are labeled Gamma Resistant

Electron Beam

- Utilizes the beam to administer a uniform dose of radiation
- Higher dose rates than Gamma and much lower penetrating power

Plasma

- Ionized gas chemical reaction
- Low temp process