



**Gordon Brush** Mfg. Co., Inc.  
BIGGER BETTER BRUSH IDEAS



## Cleaning, Disinfecting and Sterilizing Plastics

**General Cleaning:** Washing Plastics with a Mild Detergent is sufficient for most general applications. Be sure to rinse with tap water, and then rinse again with distilled water. Most plastics, particularly the polyolefins (PPCO, PP, PMP, LDPE, and HDPE), have non-wetting surfaces that resist attack and are easy to clean. Do not use abrasive cleaners or scouring pads on any plastic. Do not use strong alkaline cleaning agents with polycarbonate (PC).

In considering methods for sterilization procedures, it is important to differentiate between sterilization and disinfection. Sterilization kills all viable microorganisms. Disinfection only reduces the number of viable microorganisms. Commonly used disinfectants include alcohol, iodophors, quaternary ammonium.

A quick and effective method of disinfecting plastic material is to:

- Wash the container with anti-bacterial dish soap and hot water. The soap will immediately kill surface bacteria but may not guarantee complete sterilization; combining this with another method below is more effective.
- Use a non-diluted alcohol rinse. Both rubbing alcohol and grain alcohol kill bacteria on plastic surfaces.
- Soak the plastic container in a bleach-water solution of about 5 to 10 percent bleach. Bleach will not take long to disinfect, so the soaking time is minimal.
- Heat plastic. This can be done in a hot dishwasher rinse, but more effective is the microwave. Wet the plastic container first, as the interaction between the microwave's heat and water is what causes sterilization. Place the container in a microwave on high power for approximately two minutes. Both the dishwasher and microwave can melt plastic, however. Polypropylene plastics are strong and withstand high heat.
- Place plastics under a UV lamp. Ultraviolet sterilization is a safe, non-heated method used widely in food processing, laboratories and water treatment. Although a UV lamp is not the most common kitchen or garden tool, UV lamps are commercially available.

Sterilizing plastic is meant to reduce or eliminate the bioburden to a safe level. Bioburden refers to the number of microorganisms present, including bacteria, virus, and fungi. Microbiologists can test for the number and kinds that are present, including pyrogens, remnants of bacteria that carry endotoxins and cause fevers. An item may be sterile, but still contain pyrogens. When plastic is glass-reinforced, it can withstand higher temperatures and be sterilized and depyrogenated at the same time. Exposure to temperatures of 600°F or higher kills microorganisms and burns endotoxins. The higher the temperature, the shorter the exposure time needed for depyrogenation. Unfortunately, most plastic won't survive the additional depyrogenation temperatures, so it is frequently sterilized and then washed with pyrogen-free water.



Resin	Chemical Name	Max use temp °F	Max use temp °C	Sterilization							Water absorption (%)
				Autoclave	Gas	Dry heat	Gamma Radiation	E-beam	Microwave	Cold or Chemical	
ABS	Acrylonitrile butadiene styrene	180	82	No	No	Yes	100 Mrad	100 Mrad	Yes	Yes	0.3
ECTFE	Ethylenechlorotrifluoroethylene [Halar]	302	150	Yes	Yes	Yes <sup>R</sup>	100 Mrad	100 Mrad	Yes	Yes	<0.03
FEP	Fluorinated ethylene propylene [Teflon®]	401	205	Yes	Yes	Yes <sup>R</sup>	10 - 20 Mrad	10 - 20 Mrad	Marginal	Yes	<0.01
HDPE	High-density polyethylene	248	120	No	Yes	No	100 Mrad	100 Mrad	No	Yes	<0.01
LDPE	Low-density polyethylene	176	80	No	Yes	No	100 Mrad	100 Mrad	Yes	Yes	<0.01
PA	Polyamides [nylon]	194	90	No <sup>1</sup>	Yes	No	No	No	Yes	Some	1.3
PC	Polycarbonate	275	135	Yes	Yes	No	100 Mrad	100 Mrad	Marginal	Yes	0.35
PEEK	Polyetheretherketone	480	249	Yes	Yes	Yes	1000 Mrad	5000 Mrad	Yes	Yes	0.15
PET / PBT	Polyethylene terephthalate	239	115	No	Yes	Yes	100 Mrad	100 Mrad	Yes	Yes	0.7
PETG	Polyethylene terephthalate Glycol-modified	158	70	No	Yes	No	100 Mrad	100 Mrad	Yes	Yes	0.15
PFA	Perfluoroalkoxy	482	250	Yes	Yes	Yes <sup>R</sup>	No	No	Yes	Yes	<0.03
PK	Polyketone	220	121	Yes	Yes	Yes	Yes	Yes	Yes	Some	0.45
PMMA	Polymethyl Methacrylate	122	50	Yes	Yes	No	5- 10 Mrad	5 -10 Mrad	No	Some	0.35
PMP	Polymethylpentene	347	175	Yes	Yes	Yes <sup>R</sup>	No	No	Yes <sup>R</sup>	Yes	0.01
POM	Polyoxymethylene [Delrin®]	219	104	Yes	Yes	Yes	No	No	Yes	Yes	0.27
PP	Polypropylene	275	135	Yes	Yes	No	No	No	Yes	Yes	<0.02
PPCO	Polypropylene Copolymer	250	121	Yes	Yes	No	No	No	Marginal	Yes	<0.02
PPS	Polyphenylene Sulfide	392	200	Yes	Yes	Yes	5000 Mrad	5000 Mrad	Yes	Some	<0.02
PS	Polystyrene	194	90	No	Yes	No	1000 Mrad	1000 Mrad	No	Some	0.05
PPSF/PPSU	Polyphenylsulfone [Radel®]	392	200	Yes <sup>R</sup>	Yes	Yes	Yes	Yes	Yes	Yes	0.37
PSU/PSF	Polysulfone	320	160	Yes*	Yes	Yes <sup>R</sup>	1000 Mrad	1000 Mrad	Yes	Yes	0.3
PTFE	Polytetrafluoroethylene [Teflon®]	500	260	Yes	Yes	Yes	No	No	Yes	Yes	0.01
PUR	Polyurethane	180	82	No	Yes	No	Yes	Yes	No	Yes	0.03
PVC	Polyvinyl chloride	158	70	No <sup>2</sup>	Yes	No	50 Mrad	50 Mrad	Yes	Yes	0.15-0.75
PVDF	Polyvinylidene Fluoride	230	110	No	Yes	No	No	No	Yes	Yes	0.05

<sup>R</sup> Recommended

<sup>1</sup> Nylon begins deteriorating rapidly after 100 autoclave cycles

<sup>2</sup> Some PVC tubing may be autoclaved; see specific product information. Do not use PC vessels for vacuum applications if they have been autoclaved