

Eastman Spectar™ copolyester

Chemical resistance

Eastman Spectar™ copolyester is a clear, amorphous polymer based on polyethylene terephthalate and 1,4-cyclohexanedimethanol with a number average molecular weight (M_n) of approximately 26,000. The expected effects of various chemicals and reagents on Spectar are listed in the table on the following pages.

The data shown in the table was obtained during a previous study involving the chemical resistance of Eastman Eastar™ copolyester 6763. Sections on unstressed Eastar injection molded tensile bars 3.2-mm (0.125-in.) thick were weighed and measured. They were immersed in the chemical or reagent shown and stored at 23°C (73°F) for a period of 1 year. At the end of the test period, each sample was removed from the jar in which it was immersed, wiped dry, and quickly weighed and measured again. The changes in weight and thickness were calculated. The appearance of the sample after exposure to the test medium was also recorded.

Ordinarily, a plastic would not be suggested for continuous immersion in a reagent that causes an increase of 5% or more in weight or thickness. This does not imply that a change in weight or thickness of less than 5% necessarily indicates suitability for immersion.

These results give a general indication of chemical compatibility and are not intended for performance specifications. When Eastman Spectar™ copolyester is exposed to chemicals in environmental conditions different from those used in these tests or used in particular container or packaging designs, the results of exposure may differ significantly from those reported here.

Since Eastman Spectar™ copolyester and Eastar™ copolyester 6763 are chemically similar, these two materials were evaluated in a parallel test in contact with some of the same chemicals. Both materials were immersed in the liquids for 1 month at 23°C (73°F) and then evaluated as in the previous study. Results from these two plastics were within experimental error of each other, and they were similar to the 1-year data from the previous study on Eastar™ copolyester 6763. Therefore, the data listed in the following table can be used as a general guide for the chemical resistance of Spectar.

Users of Eastman Spectar™ copolyester should make and be guided by their own tests under conditions equivalent to or representative of those to which the plastic will be subjected in service.

Reagent	% Change ^a		Appearance of plastic after exposure
	Weight	Thickness	
Acetic acid, 5%	<1	<1	Very slight yellowing
Acetic acid, conc.	19	18	Discolored, swollen
Acetone	16	23	Discolored (brown), swollen, rubberlike
Ammonium hydroxide, conc.	229	220	Turned white, outside crumbling off
Ammonium hydroxide, 10%	4	4	Discolored (pink), surface has blisters
Antifreeze, automotive ethylene glycol type	<1	<1	No change
Benzene	34	43	Discolored, rubberlike
Brake fluid, DOT 3	2	2	No change
Brake fluid	6	6	Turned yellow, surface attacked, flaking off
Carbon tetrachloride	27	18	Discolored, swollen
Chromic acid, 40%	<1	<1	Slightly discolored
Citric acid, 10%	<1	<1	Slight yellowing
Cottonseed oil	<1	<1	Very slight yellowing
Deionized water	<1	<1	Slight yellowing
Detergent, Alconox™ (0.25%)	<1	<1	Slight yellowing
Di(2-ethylhexyl) phthalate	<1	<1	Very slight yellowing
Dibutyl sebacate	<1	1	Slight yellowing
Diesel fuel	<1	2	Discolored
Dimethyl formamide	22	39	Badly discolored and distorted
Ethanol, 50%	<1	<1	Slight yellowing
Ethanol, 100%	<1	<1	Very slight yellowing
Ethyl acetate	20	24	Badly discolored and swollen, softened
Ethylene dichloride	—	—	Completely deteriorated after 1 week
Gasohol, 10% ethanol	9	8	Cloudy, slight yellowing
Gasohol, 10% methanol	11	10	Cloudy, yellowed
Gasoline, base for gasohol	6	6	Slight yellowing
Gasoline, premium unleaded	2	3	Discolored
Gasoline, regular	<1	<1	Slight yellowing
Gasoline, regular unleaded	2	2	Discolored
Grease, automotive	<1	<1	No change
Hand cleaner, waterless, Jergens™ SBS30	<1	2	No change
Hexane	<1	<1	Slight yellowing

Reagent	% Change ^a		Appearance of plastic after exposure
	Weight	Thickness	
Hydrochloric acid, conc.	1	<1	Badly discolored, blisters under surface
Hydrochloric acid, 10%	<1	<1	Slight yellowing
Hydrogen peroxide, 3%	<1	<1	Slight yellowing
Hydrogen peroxide, 28%	<1	<1	Slight yellowing
Isooctane	<1	<1	Very slight yellowing
Kerosene	<1	<1	Very slight yellowing
Lacquer thinner	7	6	Cloudy, white
Methyl alcohol	<1	<1	Very slight yellowing, crazing
Mineral oil	<1	<1	Very slight yellowing
Motor oil	<1	<1	No change
Nitric acid, conc.	—	—	Completely deteriorated after 1 week
Nitric acid, 10%	<1	<1	Slight yellowing
Nitric acid, 40%	1	<1	Turned white
Oleic acid, 83%	<1	<1	Very slight yellowing
Olive oil	<1	<1	Very slight yellowing
Penetrating oil, Liquid Wrench™ #1	10	11	Discolored
Phenol, 5%	13	14	Turned black
Silicone spray lubricant	67	34	White, swollen
Soap solution, 1%	<1	<1	Slight yellowing
Sodium carbonate, 2%	<1	<1	Slight yellowing
Sodium carbonate, 20%	<1	<1	Slight yellowing
Sodium chloride, 10%	<1	<1	Slight yellowing
Sodium hydroxide, 1%	<1	<1	Slight yellowing
Sodium hydroxide, 10%	8	6	Slight yellowing
Sodium hypochlorite, 3.5%	<1	<1	Slight yellowing
Sulfuric acid, conc.	—	—	Completely deteriorated after 1 week
Sulfuric acid, 3%	<1	<1	Slight yellowing
Sulfuric acid, 30%	<1	<1	Slight yellowing
Tapping oil	<1	1	No change
Toluene	26	31	Turned white, softened
Transformer oil	<1	<1	Very slight yellowing
Transmission fluid, auto	<1	<1	No change

^a Changes shown are increases unless the figure is preceded by a negative sign.



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