

Polypropylene Vials: An Alternative to Glass

Ron Shawley

ron.shawley@sial.com

Vials manufactured from plastics, such as polypropylene and polymethylpentane (TPX®), are a sensible alternative to consider when glass vial weight, breakage, surface inertness, and/or disposal costs are concerns.

Glass vials are the most commonly used vessel for storing analytical samples in the lab. Their relatively inert surface makes them compatible with many different solvent systems and they are available in a wide variety of styles and sizes, including clear and amber glass. Glass vials can withstand temperatures up to 500 °C for autoclaving and derivatization applications.

However, plastic vials are also available in a wide range of volumes and configurations. Breakage is not an issue with plastic vials, and they are non-reactive with most sample chemistries.

Plastics are also:

- compatible with many solvents (see Table 1)
- optimal choice when working with proteins
- ideal for IC applications
- suitable for insert-free microsampling
- an excellent choice for storing pH sensitive samples
- economical to purchase

Plastic's maximum temperature range (135 °C - 175 °C) and smaller volume capacity make them well-suited for many laboratory applications. When glass vials are not required, laboratory personnel should consider the advantages of plastic when selecting vials.

Following is a list of popular vials offered in both glass and plastic. Make your choice based on your application and the solvent used. For a more comprehensive listing go to sigma-aldrich.com/vials

Table 1. Polypropylene and TPX Solvent Compatibility (Tested at 50 °C)

Solvent	Polypropylene	PMP (TPX)
Acetone	Little damage	No damage
Acetonitrile	Not Recommended	Not recommended
Benzene	Some effect	Some effect
Butanol-2	No damage	Little or no damage
Carbon Tetrachloride	Some effect	Not recommended
Chloroform	Some effect	Not recommended
Cyclohexane	Not recommended	Not recommended
Cyclopentane	Immediate damage	Immediate damage
Ethanol	Little or no damage	Little or no damage
Ethyl acetate	Immediate damage	Immediate damage
Heptane	Some effect	Some effect
Hexane	Some effect	Not recommended
Isopropanol	No damage	No damage
MTBE	Immediate damage	No damage
Methanol	No damage	No damage
Methylene Chloride	Not recommended	Not recommended
Propanol-1	No damage	No damage
Propanol-2	No damage	No damage
Tetrahydrofuran	Some effect	Some effect
Toluene	Some effect	Some effect
Water	No damage	No damage

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Description	Glass	Polypropylene
Shell Vials, Limited Volume (15 x 45 mm) with Snap Plug		
Waters 48 Autosampler	–	27538 (3 mL)
Waters 96 Autosampler	33321-U (1 mL)	27537 (0.7 mL)
Screw Thread, 15 x 45 mm		
Waters 48 Autosampler	27111 (4 mL)	27435 (2.5 mL)
Standard Opening Vials		
Screw thread, 12 x 32 mm	27078 (2 mL)	24709 (0.75 mL)
	33206-U (0.1 mL)	24712 (0.1 mL)
Inserts	24707 (0.15 mL)	24708 (0.15 mL)
Large Opening vials		
R.A.M. vials, 9 mm thread	29000-U (2 mL)	29016-U (0.1 mL)
	–	29018-U (0.5 mL)
Screw thread, 12 x 32 mm	27265 (2 mL)	27410 (0.5 mL)
	–	27411 (0.75 mL)
	–	27269 (1.0 mL)
Snap top vial, 12 x 32 mm,	24750-U (2 mL)	27423 (0.1 mL)
	–	27422 (0.5 mL)
	–	27253 (0.75 mL)
Inserts for Large Opening vials		
with bottom spring	24721 (0.2 mL)	24722 (0.2 mL)
with top flange	–	27409 (0.2 mL)
Crimp top		
Std opening crimp top vials	33208 (0.1 mL)	27075-U (0.1 mL)

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