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S-COS-B18B
#2021 Issue

Shimadzu Consumables Catalogue

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Appendix I

Septa

Septa Selection Guide

Septum Material	Description	Temperature (°C)
PTFE/Red Rubber	Most popular and economical choice for general GC and HPLC applications. Used for routine analysis in GC with FID, TCD and FPD detectors or HPLC with UV/Vis and RI detectors. They offer moderate resealability and excellent chemical inertness prior puncture. Low durometer of rubber allows ease of needle penetration. PTFE/Red Rubber septa are not recommended for multiple injections or storage of samples.	-40 to 110
PTFE/Silicone	Ideal for use in GC and HPLC applications for its high resealability even after repeated punctures. Good for sensitive analysis (lower background) and storage of samples. PTFE/Silicone septa are soft and more easily punctured, and protects the needle in autosampler.	-60 to 200
PTFE/Silicone, pre-slit	Share the same chromatographic characteristics, physical and chemical property as non-slit PTFE/Silicone septa. The cross-slit aid in needle penetration for low coring, and prevent formation of vacuum when multiple injection or large volume of sample is withdrawal from vial. However, the pre-slit septa are not recommended for storage of samples due to evaporation of volatile organic solvents through the slit.	-60 to 200
PTFE/Silicone/PTFE	Recommended for ultra trace analysis, or where there is a longer time between injections. PTFE liners on both sides of Silicone resist coring during penetration, and protects Silicone from chemical attacks.	-60 to 200
Butyl/PTFE	The PTFE barrier provides excellent chemical resistance to most solvents. Butyl/PTFE septa has good resealability and suitable for gas sampling due to low permeability.	-40 to 120

Physical Characteristic and Solvent Compatibility of Materials used for Caps and Septa.

The chart below displayed the physical characteristic and solvent compatibility of materials used for caps and septa. You might want to test your product under actual conditions of use as there are many factors that can affect chemical resistance.

Physical Characteristic of Caps and Septa

Code	Description	Appearance	Temp. MAX °C	Temp. MIN °C	Autoclavable	Dry Heat	Gamma	Microwavable	Ethylene Oxide	Analytical Purity	Fragmentation*	Hardness†	Resealability‡
PP	Polypropylene	Translucent	135	-20	Yes	No	No	Yes	Yes	Method Dependent	Low	Medium hard	No resealability
PTFE	Polytetra-fluorethylene	White	260	-200	Yes	Yes	Yes	Yes	Yes	Very high	Low	Very hard (Very thin)	No resealability
RR	Synthetic Red Rubber/PTFE	Red/beige	110	-30	No	No	No	No	No	Medium	Medium	Medium hard	Medium
Butyl	Grey Butyl	Opaque grey	125	-20	Yes	No	Yes	Yes	Yes	Method Dependent	Low to Medium	Soft to medium	Highly resealable
T/S	Silicone/PTFE	White/Red	200	-60	Yes	Yes	Yes	Yes	Yes	High	Low to Medium	Soft	Highly resealable
T/S/T	PTFE/Silicone/PTFE	Red/White/Red	200	-60	Yes	Yes	Yes	Yes	Yes	High	Very low	Soft	Good

* Due to hardness and molecular structure (coring)
† Needle penetration
‡ In case of multiple injection

Chemical Resistance of Vials and Caps

Chemical	Glass	PP	Chemical	Glass	PP	Chemical	Glass	PP
1,2-Dichloroethane	EE	NN	Diacetone	EE	GF	n-Amyl Acetate	EE	GF
1,2,4-Trichlorobenzene	EE	NN	Diacetone Alcohol	EE	EF	n-Butanol	EE	EE
1,4-Dioxane	EE	GF	Dibutylphthalate	EE	NN	n-Butyl Acetate	EE	GF
2,2,4-Trimethylpentane	EE	FN	Diethyl Benzene	EE	NN	n-Decane	EE	FN
2,4 Dichlorophenol	EE	NN	Diethyl Ether	EE	NN	n-Heptane	EE	FF
2-Butanol	EE	EE	Diethyl Ketone	EE	GG	Nitric Acid, 10%	EE	EE
2-Methoxyethanol	EE	EE	Diethyl Malonate	EE	EE	Nitric Acid, 20%	EE	FF
2-Propanol	EE	EE	Diethylamine	EE	GN	Nitric Acid, 50%	EE	FN
Acetaldehyde	EE	GN	Diethylene Dioxide	EE	GF	Nitric Acid, 70%	EE	NN