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 **TRAJAN**



Septa, caps and liners



Septa, caps and liners play a key role in the storage and preparation of samples. They securely seal samples from the external environment while simultaneously allowing injection by sampling needles. There are a wide array of factors that determine which septa are most suited to your application. Important considerations include:

- Type of sample
- Temperature range used in application
- Number of injections required for application
- Requirements for automation

Taking these factors into account allows selection of the best septa material, thickness, slit, and cap to most effectively preserve the integrity of your sample, as well as the most suitable cap for your application and automation requirements.

Trajan Scientific and Medical (Trajan) is an expert in the analytical industry, supplying products to clients in Europe, the Americas, Asia and Australia. We offer one of the largest ranges of septa, caps and liners, allowing you to tailor your selection of septa and caps to the specific needs of your application, maximizing the security and integrity of your samples.

Visit us at www.trajanscimed.com or contact your regional Trajan representative for assistance and further information.

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Analytical | Septa, caps and liners

Superior quality, expertly engineered



Septa

Septa must be chemically compatible with your sample and solvent to ensure they provide an effective seal. The table below summarizes the suitability of each septa material with a range of chemicals, this can vary based on factors such as temperature, molecular weight and solvent concentration.

Trajan septa undergo conditioning (thermal and chemical) to reduce siloxane bleed. Siloxane bleed can occur during heating, solvent interaction or piercing by the autosampler needle causing the material to become stressed.

Septa suitability with chemicals

	PTFE	PTFE/ silicone	PTFE/ silicone/ PTFE	Viton®	Silicone	Silicone/FEP	Silicone/ polyimide	Butyl	Foam (PTFE/ polyethene foam)
Acetonitrile	✓	✓	✓		✓	✓	✓		✓
Hydrocarbons	✓		✓		✓	✓	✓		✓
Methanol	✓	✓	✓	✓		✓	✓	✓	✓
Benzene	✓		✓	✓		✓	✓		✓
THF	✓		✓			✓	✓		✓
Toluene	✓		✓			✓	✓		✓
DMF	✓	✓	✓		✓	✓	✓	✓	✓
DMSO	✓	✓	✓		✓	✓			✓
Ether	✓	✓	✓			✓	✓		✓
DCM	✓		✓	✓		✓	✓		✓
Alcohols (ethanol)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acetic acid	✓	✓	✓		✓	✓	✓	✓	✓
Acetone	✓	✓	✓	✓		✓	✓	✓	✓
Phenol	✓	✓	✓			✓	✓	✓	✓
Cyclohexane	✓		✓			✓	✓		✓

Septa materials available from Trajan

- Silicone
 - Highly inert.
 - Excellent resealing.
 - Recommended for HPLC and GC, where purity and resealability are critical.
 - Max temperature of 250°C.
 - Not recommended for use with lipids due to siloxane bleeding caused by stress on the material.
- Silicone with PTFE film
 - PTFE has superior chemical inertness and lower permeability which ensures protection of the silicone from harsh chemicals.
 - Recommended for aggressive solvents.
 - Increases resistance to coring.
 - Can have PTFE film on one or both sides.
- Silicone with polyimide film
 - Polyimide has a 300°C temperature tolerance, ideal for methods requiring high temperatures.
 - Good resealability, recommended for methods involving multiple injections or long run times.
- Silicone with FEP film
 - FEP has high chemical resistance, used when the sample is sensitive to PTFE exposure, making it the recommended material for corrosive or chlorinated samples.
- Butyl
 - High density and intrinsic hardness provides an improved barrier between the sample and atmosphere.
 - Recommended for use with volatiles and inorganic gases.
 - Susceptible to coring, depending on needle type and size.
 - Intrinsic hardness can be challenging for automation.
 - Best needle penetration force compared to silicone rubber.
- Foam
 - Long term storage in closed top cap.
 - Not used for needle penetration.



- Viton

- High chemical resistance, recommended for use with chlorinated solvents.
- Has an intrinsic hardness, making it unsuitable for 23 gauge needles or high injection speeds.
- Maximum temperature of 260°C.



Expert tip:

Septa are often laminated with a layer of high chemical resistance material such as PTFE or FEP. This provides a protective barrier unless punctured, such as with an autosampler syringe needle. Please contact Trajan to discuss specific compatibility requirements.

Septa compatibility with applications

This table provides a summary of the suitability of our septa materials to a variety of applications.

	PTFE	PTFE/silicone	PTFE/silicone/PTFE	Viton	Silicone	Silicone/FEP	Silicone/polyimide	Butyl	Natural rubber
Temperature range	Up to 260°C	-40°C to 250°C	-40°C to 250°C	-40°C to 260°C	-40°C to 250°C	-40°C to 250°C	-40°C to 300°C	-50°C to 150°C	0°C to 90°C
Multiple injections	No	Yes	Yes	No	Yes	Yes	Yes	No	No
Price	Very economical	Economical	Most expensive	Economical	Very economical	Economical	Expensive	Economical	Most economical
Suitable for storage	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Best for	<ul style="list-style-type: none"> • Superior chemical inertness • Single injections • Short cycle times 	<ul style="list-style-type: none"> • Most common HPLC and GC analyses • Not suitable for chlorosilanes 	<ul style="list-style-type: none"> • Ultra analysis • Repeat injections • Internal standards 	<ul style="list-style-type: none"> • Chlorinated solvents • High temperatures • Limited resealing, not suitable for multiple injections 	<ul style="list-style-type: none"> • General purpose 	<ul style="list-style-type: none"> • Highest chemical compatibility 	<ul style="list-style-type: none"> • Sample sensitive to PTFE exposure • High temperature 	<ul style="list-style-type: none"> • Organic solvents • Acetic acids • Impermeable to gases 	<ul style="list-style-type: none"> • General GC applications • Limited resealability

Septa thickness

Thicker septa give improved resealability, for methods which involve multiple injections or long running times.



Trajan septa are available in a range of thicknesses from 0.25 mm to 4 mm.



Expert tip:

Make sure the septa is the correct thickness so the cap can securely fit on the vial.

Septa configurations available

- Non slit
 - Non slit septa typically have resealing capabilities, but only for a limited number of needle punctures.
 - Recommended for long-term storage of samples.
 - Help reduce carryover between vials as the septa wipes solution from the outside of the needle as it exits the vial.
- Slit
 - Pre-cut slits reduce the pressure required for penetration by the autosampler, reducing the number of bent or broken needles.
 - Help to avoid suction when drawing large volumes of sample from the vial.
 - Recommended for use in LC because they prevent the injector from becoming blocked.
 - Reduces coring.
 - Solvents in LC evaporate slowly so they will not leak from the pre-slit septa.
 - Reduces needle bending during solid phase micro-extraction (SPME).
 - Holes added for direct insertion SPME. These do not need to be added for headspace SPME.



Non slit



Slit



Star



Cross



Y-cut



Step slit



Washer

Caps

Cap types

- Crimp caps

- Crimp caps provide extra security for studies where it is important to avoid contamination or sample tampering.
- Can become rounded when crimped onto a vial, resulting in less surface area for magnets to stick to during automation.
- Require crimper/decrimper, can cause septa distortion if overcrimped.



- Screw caps

- Often used for LC and LC/MS.
- Provide an airtight seal.
- For automation, magnetic screw caps are advantageous because they are less likely to become rounded over time, providing increased surface area for the magnets used to move the vials. This decreases the risk of any vials falling from the magnet.



- Snap caps

- Simple snap design when crimping tool is not available.
- Easy removal without special tools.



Cap materials

- Polypropylene

- Melts at 130°C and becomes brittle at freezing temperatures, therefore is not suited to procedures requiring large temperature ranges.

- Aluminum

- Metal caps have the highest ranging temperature tolerance and are resistant to impact.
- Aluminum is used for crimp seals.

- Tin/steel/nickel coated

- Magnetic so recommended for use with autosamplers and other forms of automation.
- Tolerant of both high and low temperatures.

- Bimetal

- Two layers of separate metals joined together.
- Excellent temperature tolerance.
- Magnetic pick up.

- Phenolic

- Maximum temperature of 220°C, starts to decompose at higher temperatures.
- Non-reactive, making phenolic finishes beneficial when using corrosive or harmful chemicals.

Product information

- Pre-assembled caps and septa reduce handling and therefore contamination.
- Custom color combinations, materials, and geometries available upon request.
- Aluminum crimp caps provide a leak-resistant seal.
- Use of a crimping tool is required for aluminum seals.
- Magnetic crimp seals for use with autosamplers.
- Snap caps are easy to apply and remove without tools, eliminating the need for crimping tools.

Color key	
White	White
Black	Black
Clear	Clear
Tan	Tan
Natural	Natural/virgin
Amber	Amber
Red	Red
Blue	Blue/royal blue
Yellow	Yellow
Green	Green
Silver	Silver
Gold	Gold

Assemblies (caps and liners) part numbers

8 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
8 mm	Screw	Ribbed	Polypropylene	Black	Non slit	Silicone	White	PTFE	Red	1 mm	100	J208-1201193100
8 mm	Screw	Ribbed	Polypropylene	Black	Non slit	Silicone	White	PTFE	Red	1 mm	1000	J208-1201193101
8 mm	Screw	Ribbed	Polypropylene	Black	Straight	Silicone	White	PTFE	Red	1 mm	100	J208-1211193100
8 mm	Screw	Ribbed	Polypropylene	Black	Straight	Silicone	White	PTFE	Red	1 mm	1000	J208-1211193101

9 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
9 mm	Screw	Smooth	Polypropylene	Blue	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-1401193100
9 mm	Screw	Smooth	Polypropylene	Black	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-1201493100
9 mm	Screw	Smooth	Polypropylene	Red	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-1301193100
9 mm	Screw	Smooth	Polypropylene	Green	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-1701193100
9 mm	Screw	Smooth	Polypropylene	Yellow	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-1601193100
9 mm	Screw	Ribbed	Polypropylene	Blue	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-2401193100
9 mm	Screw	Ribbed	Polypropylene	Black	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-2201193100
9 mm	Screw	Ribbed	Polypropylene	Red	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-2301193100
9 mm	Screw	Ribbed	Polypropylene	Green	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-2701193100
9 mm	Screw	Ribbed	Polypropylene	Yellow	Non slit	Silicone	White	PTFE	Red	1 mm	100	J209-2601193100
9 mm	Screw	Ribbed	Polypropylene	Blue	Non slit	Silicone	White	PTFE	Blue	1 mm	100	J209-2401194100
9 mm	Screw	Ribbed	Polypropylene	Black	Straight	Silicone	White	PTFE	Blue	1 mm	100	J209-2211194100
9 mm	Screw	Ribbed	Polypropylene	Blue	Straight	Silicone	White	PTFE	Blue	1 mm	100	J209-2411194100
9 mm	Screw	Ribbed	Polypropylene	Black	Cross	Silicone	White	PTFE	Blue	1 mm	100	J209-2231194100
9 mm	Screw	Ribbed	Polypropylene	Black	Cross	Silicone	White	PTFE	Blue	1 mm	100	J209-2431194100
9 mm	Screw	Ribbed	Polypropylene	Blue	Non slit	Silicone	White	PTFE	Tan	1 mm	100	J209-2401195100
9 mm	Screw	Ribbed	Polypropylene	Blue	Straight	Silicone	White	PTFE	Tan	1 mm	100	J209-2411195100
9 mm	Screw	Ribbed	Polypropylene	Blue	Non slit	-	-	PTFE	Natural	0.25 mm	100	J209-2400096030
9 mm	Screw	Ribbed	Polypropylene	Blue	Non slit	Silicone	White	Polyimide	Amber	0.9 mm	100	J209-2401177090

10 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
10 mm	Screw	Ribbed	Polypropylene	Black	Cross	Silicone	White	PTFE	Tan	1.5 mm	1000	J210-1231195151
10 mm	Screw	Ribbed	Polypropylene	Blue	Cross	Silicone	White	PTFE	Tan	1.5 mm	1000	J210-1431195151
10 mm	Screw	Ribbed	Polypropylene	Black	No slit	Silicone	White	PTFE	Tan	1.5 mm	1000	J210-1201195151

11 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
11 mm	Crimp	Smooth	Aluminum	Silver	Straight	Silicone	White	PTFE	Red	1 mm	100	J211-4811193100
11 mm	Crimp	Smooth	Aluminum	Gold	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-4901193100
11 mm	Crimp	Smooth	Aluminum	Silver	Cross	Silicone	White	PTFE	Red	1 mm	1000	J211-4831193101
11 mm	Snap	Smooth	Polyethylene	Blue	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-5401193100
11 mm	Snap	Smooth	Polyethylene	Clear	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-5001193100
11 mm	Snap	Smooth	Polyethylene	Green	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-5701193100
11 mm	Snap	Smooth	Polyethylene	Red	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-5301193100
11 mm	Snap	Smooth	Polyethylene	Yellow	No slit	Silicone	White	PTFE	Red	1 mm	100	J211-5601193100
11 mm	Snap	Smooth	Polyethylene	Black	Cross	Silicone	White	PTFE	Red	1 mm	100	J211-5231193100
11 mm	Snap	Smooth	Polyethylene	Blue	Cross	Silicone	White	PTFE	Red	1 mm	100	J211-5431193100
11 mm	Snap	Smooth	Polyethylene	Green	Cross	Silicone	White	PTFE	Red	1 mm	100	J211-5731193100
11 mm	Snap	Smooth	Polyethylene	Red	Cross	Silicone	White	PTFE	Red	1 mm	100	J211-5331193100
11 mm	Snap	Smooth	Polyethylene	Yellow	Cross	Silicone	White	PTFE	Red	1 mm	100	J211-5631193100
11 mm	Snap	Smooth	Polyethylene	Blue	Cross	Silicone	White	PTFE	Blue	1 mm	100	J211-5431194100
11 mm	Snap	Smooth	Polyethylene	Clear	Cross	Silicone	White	PTFE	Blue	1 mm	100	J211-5031194100
11 mm	Snap	Smooth	Polyethylene	Blue	No slit	Silicone	Red	FEP	Clear	1 mm	100	J211-5401380100
11 mm	Snap	Smooth	Polyethylene	Clear	No slit	Silicone	Red	FEP	Clear	1 mm	100	J211-5001380100
11 mm	Snap	Smooth	Polyethylene	Green	No slit	Silicone	Red	FEP	Clear	1 mm	100	J211-5701380100
11 mm	Snap	Smooth	Polyethylene	Red	No slit	Silicone	Red	FEP	Clear	1 mm	100	J211-5301380100
11 mm	Snap	Smooth	Polyethylene	Yellow	No slit	Silicone	Red	FEP	Clear	1 mm	100	J211-5601380100

13 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
13 mm	Screw	Ribbed	Polypropylene	Black	No slit	Foam	Natural	PTFE	Natural	1.3 mm	100	J213-3202696130
13 mm	Screw	Ribbed	Polypropylene	White	No slit	Foam	Natural	PTFE	Natural	1.3 mm	100	J213-3102696130
13 mm	Screw	Ribbed	Polypropylene	Black	No slit	Silicone	White	PTFE	Red	1.3 mm	100	J213-3201193130
13 mm	Screw	Ribbed	Polypropylene	White	No slit	Silicone	White	PTFE	Red	1.3 mm	100	J213-3101193130
13 mm	Screw	Ribbed	Polypropylene	White	Cross	Silicone	White	PTFE	Blue	1.5 mm	1000	J213-1131194151
13 mm	Screw	Ribbed	Polypropylene	Black	No slit	Silicone	Red	FEP	Clear	1.5 mm	100	J213-3201380150

15 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
15 mm	Screw	Ribbed	Polypropylene	White	Non slit	Foam	Natural	PTFE	Natural	1.3 mm	100	J215-3102696130

18 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
18 mm	Screw	Smooth	Magnetic	Silver	Non slit	Silicone	White	PTFE	Blue	1.5 mm	100	J218-6801194150
18 mm	Screw	Smooth	Magnetic	Silver	Non slit	Silicone	Blue	PTFE	Tan	1.3 mm	100	J218-6801495130
18 mm	Screw	Smooth	Magnetic	Silver	Non slit	Silicone	White	PTFE	Red	1.3 mm	100	J218-6801193130
18 mm	Screw	Ribbed	Polypropylene	White	Non slit	Foam	Natural	PTFE	Natural	1.3 mm	100	J218-3102696130

20 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
20 mm	Crimp	Smooth	Bimetal magnetic	Red	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-7301195300
20 mm	Crimp	Smooth	Bimetal magnetic	Blue	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-7401195300
20 mm	Crimp	Smooth	Aluminum	Gold	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-4901195300
20 mm	Crimp	Smooth	Bimetal magnetic	Green	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-7701195300
20 mm	Crimp	Smooth	Aluminum	Silver	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-4801195300
20 mm	Screw	Ribbed	Polypropylene	Black	Non slit	Silicone	White	PTFE	Tan	1.9 mm	100	J220-1201195190

24 mm assemblies

Cap size	Cap type	Cap texture	Cap material	Cap color	Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
24 mm	Screw	Ribbed	Polypropylene	Black	Non slit	Silicone	White	PTFE	Tan	3 mm	100	J224-3201195300
24 mm	Screw	Ribbed	Polypropylene	White	Non slit	Foam	Natural	PTFE	Natural	1.3 mm	100	J224-3102696130

Septa part numbers

8 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Red	1.5 mm	100	J208-0001193150

12 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Red	1.5 mm	100	J212-0001193150
Non slit	Silicone	White	PTFE	Tan	1.5 mm	100	J212-0001195150

16 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Tan	2.3 mm	100	J216-0001195230

17 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Blue	1.5 mm	100	J217-0001194150

18 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Tan	1.5 mm	100	J218-0001195150

20 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	White	PTFE	Tan	3 mm	100	J220-0001195300

22 mm septa

Slit type/ Non slit	Liner material	Liner color	Film material	Film color	Liner thickness	Qty	Part number
Non slit	Silicone	Clear	PTFE	Clear	2.5 mm	100	J222-0001090250

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