

# Thermo Scientific National Advanced Vial Closure System for Screw Thread Chromatography Vials

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## Key Words

Screw thread chromatography vials, Target DP 9 mm screw thread closures, evaporation, Fluorocarbon Free, PTFE Free, 2 mL Storage Vial Closure.

## Goal

New Thermo Scientific National Target DP® 9 mm screw thread closures, utilizing Advanced Vial Closure System (AVCS) technology, remove obstacles to highly reliable and efficient analysis of samples by offering a complete sample handling solution for chromatography applications in 12 x 32 mm vials.

## Product Highlights

Remove the obstacles to highly reliable and efficient analysis of samples ranging from a few microliters up to 2 mL.

Open top closures accommodate a wide variety of resealable septa and are compatible with nearly all chromatography autosamplers fitted with 12 x 32 mm vial trays. New one-piece, single-use molded integral membrane closures are economical and offer a solution for applications where fluoropolymer seals are not suitable. Solid top closures offer effective performance for long term storage of samples including storage at low temperatures. The new closures are fully compatible with all Thermo Scientific Target DP screw thread vials. Pre-assembled closures feature all of the previously available Target DP® septa formulations assuring compatibility with existing assays and methods. A new septum formulation has been added in both non-slit and pre-slit configurations for applications where a soft, easy to penetrate septum featuring very low background extractables is preferred.

## Superior Push-through Resistance

AVCS technology allows open top closures to exhibit superior push-through resistance allowing for a wide choice of septum and without the limitations and expense of cap/septum bonding. The AVCS technology design maintains the optimal septum position through a wide range of conditions.



## Increased Opening Diameter

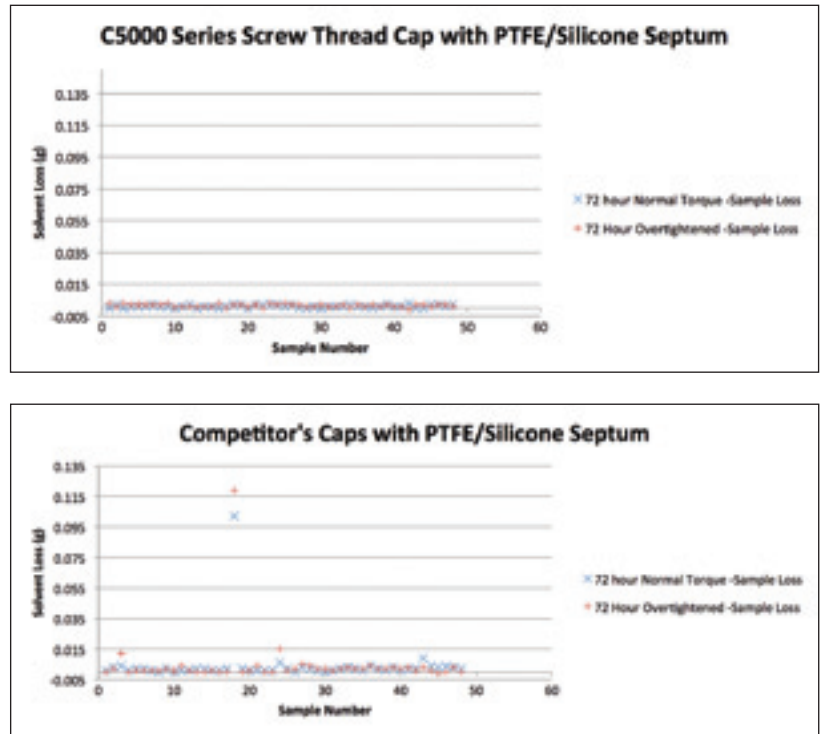
A wide opening vial deserves a wide opening closure. The National C5000 series wide opening closures increases the vial opening by over 7% providing greater area for injection needle penetration. This provides an extra margin of protection to avoid needle bends and stalls for older autosamplers where alignment might be compromised.



### Effective Sealing Consistently Achieved

A major contributor to evaporative sample loss is the tendency to overtighten a screw thread closure. Uneven compression of the septum provides routes for evaporation of volatile sample components. AVCS technology assures that the new Target DP 9 mm closures will maintain an effective seal when used with matching Target DP vials even when overtightening occurs. The septum retention features prevent dislodging of the septum. The effectiveness of this design can be seen from the evaporation data in Figure 1. A series of vials were filled with 100% methanol, sealed at the optimal torque with matching closures and incubated at 40 °C. Methanol loss was measured after 72 hours. The caps were then further tightened to the maximum extent that might be expected in severe use and again incubated. Methanol loss was measured after 72 hours in the over tightened state. It can be seen that the new Target DP 9 mm closures prevented evaporation even under these severe conditions. The performance of some other commercially available closures was inconsistent. See evaporation data in Figure 1.

Figure 1: Evaporation Data for C5000 Series Closures versus Competitor's Caps



### Improved Comfort and Safety

Ergonomics – The C5000 series National Target 9 mm DP cap has improved ergonomics. The new design improves comfort for the fingers while reducing potential glove damage due to the roughness found on many screw thread caps. In addition, fine texturing and evenly spaced ribbing allows the Target DP cap to be handled even with poorly fitting gloves.



### Maximum Sample Protection

The C5000-series solid top closure also benefits from the AVCS technology by providing maximum protection of samples during long term storage. A protective top prevents accidental puncture of the septum and resulting sample loss. Suitable for low temperature storage of samples.

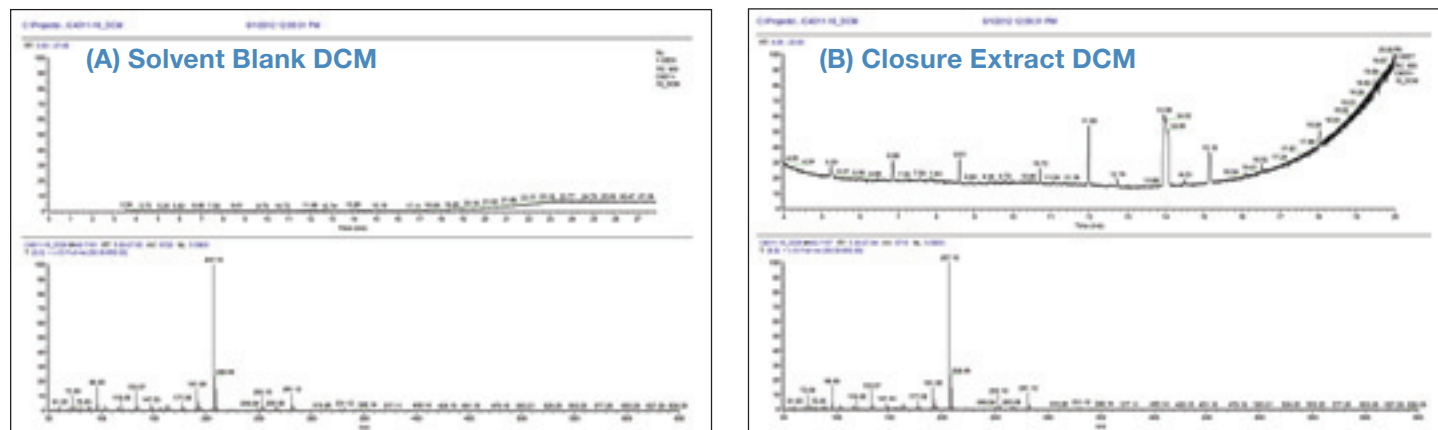


## PTFE-free Samples

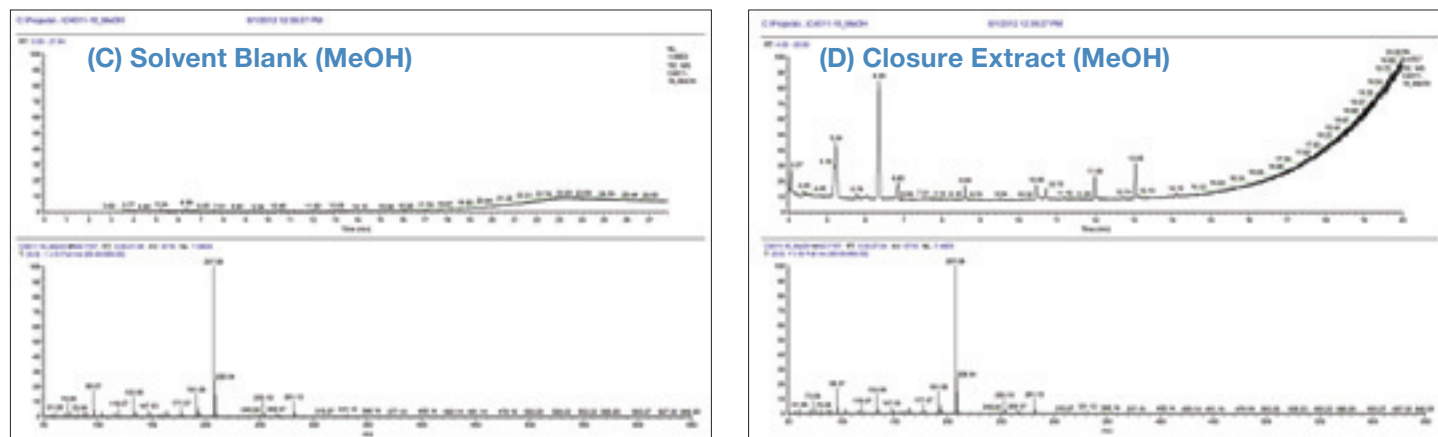
Integral Membrane Closure - Our best value integral membrane cap is also part of the new C5000 series closure platform. With the AVCS technology design aspects of the open-cap built-in, the integral membrane closure also provides a PTFE-free sample handling environment for HPLC applications or applications where fluoropolymers are not suitable. Polypropylene has long been accepted for use in manufacturing chromatography vials for applications where the extractable components found in all polymeric materials does not interfere with analysis. Proprietary resins and manufacturing methods used in the production of the integral membrane caps result in a closure with excellent piercing characteristics and low background extractables. Integral membrane closures are suitable for use with a broad range of HPLC autosamplers. See analysis of extractables in Figure 2.



Figure 2: GC/MS analysis of extractables. (A) shows solvent blank for dichloromethane and (B) shows closure extract into dichloromethane.



GC/MS analysis of extractables. (C) shows solvent blank for methanol and (D) shows closure extract into methanol.



## Conclusion

The C5000 series Target DP closures offer effective sealing independent of user differences, maximum flexibility in selection of resealable septa, a new option for PTFE-free requirements, and a solution to the need for long term storage of samples. Ease of penetration for fragile needles, and nearly universal autosampler compatibility make the Target DP the preferred choice for all applications where a 9 mm screw thread vial is selected. AVCS technology sets the Target DP C5000 series closures apart from all other products previously available. Solid top caps open the way for new uses for 9 mm vials where long term sample integrity is important. The first easy to pierce integral membrane caps open new opportunities for economical sample handling on recently introduced autosamplers and when paired with Target DP polypropylene vials, an all plastic sample container with minimized extractables and broad instrument compatibility.

## Ordering Information

All products in quantity of 100/PK.

Description	Part Number
Target DP Blue 9 mm Screw Thread Cap with PTFE/Red Rubber Septum	C5000-51B
Target DP Blue 9 mm Screw Thread Cap with PTFE/Silicone/PTFE Septum	C5000-53B
Target DP Blue 9 mm Screw Thread Cap with PTFE/Silicone Septum	C5000-54B
Target DP Blue 9 mm Screw Thread Cap with Soft, High Purity T/S Septum	C5000-44B
Target DP Blue 9 mm Screw Thread Cap with PTFE/Silicone Septum, Preslit	C5000-55B
Target DP Blue 9 mm Screw Thread Cap with Soft, High Purity T/S Septum, Pre-slit	C5000-45B
Target DP Clear 9 mm Screw Thread Cap with Integral Polypropylene Membrane	C5000-50
Target DP Blue 9 mm Screw Thread Cap with Integral Polypropylene Membrane	C5000-50B
Target DP Blue 9 mm Screw Thread Closed Top Cap with PTFE/Red Rubber Septum	C5000-99B
Convenience Kit, Clear Glass, Blue DP Cap w/ PTFE/RR Septum	C5000-80
Convenience Kit, Clear Glass w/I-D Patch, Blue DP Cap w/ PTFE/RR Septum	C5000-80W
Convenience Kit, Clear Glass w/I-D Patch, Blue DP Cap w/ T/S/T Septum	C5000-86W
Convenience Kit, Clear Glass, Blue DP Cap w/ T/S Septum	C5000-92
Convenience Kit, Clear Glass w/I-D Patch, Blue DP Cap w/ T/S Septum	C5000-92W
Convenience Kit, Clear Glass, Blue DP Cap w/ T/S pre-slit Septum	C5000-95W
Assembled Vial Kit, Clear Glass, PTFE/RR Septum, Blue DP Cap	C5000-180
Assembled Vial Kit, Clear Glass w/I-D Patch, PTFE/RR Septum, Blue DP Cap	C5000-180W
Assembled Vial Kit, Clear Glass w/I-D Patch, T/S/T Septum, Blue DP Cap	C5000-186W
Assembled Vial Kit, Clear Glass w/I-D Patch, T/S Septum, Blue DP Cap	C5000-192W

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