



Sealing technology

Can Matrix ScrewTop tubes be sealed using Matrix SepraSeal caps?

Yes. Thermo Scientific™ [Matrix™ ScrewTop tubes](#) can be sealed with Thermo Scientific™ [Matrix™ SepraSeal™ caps](#). Customers who wish to use Thermo Scientific™ Matrix™ Open-Top and ScrewTop tubes interchangeably can enjoy a more resilient supply chain, streamline their use of laboratory consumables, and potentially improve efficiency.

Background

SARS-CoV-2 has had devastating impacts around the world over the last three years. Every industry has been adversely affected by supply chain uncertainty, including biopharmaceutical and laboratory product sectors. Throughout these challenging times, customers have depended on Thermo Fisher Scientific for a stable supply of laboratory products to meet their evolving needs. We have made significant investments in expanding our production capacity for Matrix Open-Top tubes, Matrix ScrewTop tubes, and Matrix SepraSeal caps to help minimize supply chain disruptions and deliver products that are critical to our customers' success.

Matrix SepraSeal caps are made of an advanced thermoplastic elastomer that has been extensively tested for chemical compatibility with stored samples at temperatures down to -20°C . The sealing performance of the elastomer will not degrade, even after piercing. Matrix SepraSeal caps offer several other advantages, including easy access to tube contents via syringe and some pipette tips. Matrix SepraSeal caps do not need to be removed or changed, so they reduce the risk of contamination and can help streamline your laboratory workflows.

Matrix SepraSeal caps also provide flexibility. Laboratories regularly use them to seal Matrix Open-Top and ScrewTop tubes, and they can effortlessly switch between tube options to avoid work interruptions. This can be immensely valuable in times of uncertainty due to global supply chain disruptions and variable lead times for product delivery. Customers working on drug discovery will particularly benefit from using Matrix SepraSeal caps and ScrewTop tubes in automated high-throughput systems with integrated septum capping and removal capability.

How was the performance of SepraSeal caps on Matrix ScrewTop tubes tested?

We performed a design assessment and conducted vacuum tests to validate Matrix SepraSeal caps with Matrix ScrewTop tubes. The dimensions and designs of Matrix 1.0 mL ScrewTop and 1.4 mL Open-Top tubes were compared, and the fit of Matrix SepraSeal caps on both tubes was evaluated. The threads on Matrix ScrewTop tubes did not interfere with the fit of the caps in any way. To confirm sealing functionality, we tested the performance of Matrix SepraSeal caps on Matrix ScrewTop and Open-Top tubes in the following configurations:

- 3 racks (96 tubes per rack) of [1.0 mL Matrix ScrewTop tubes](#) filled with 0.6 mL colored water
- 3 racks (96 tubes per rack) of [1.4 mL Matrix Open-Top tubes](#) filled with 0.9 mL colored water

The tubes were placed in a freezer and stored overnight at -20°C . They were removed from the freezer the next day and visually inspected for leakage. After thawing, the tubes were tested for leakage under vacuum. Each rack of tubes was placed upside down on a paper towel in a conventional vacuum chamber. All tubes were tested at pressures down to 127 Torr (0.169 bar) to simulate storage conditions typically encountered during air transport approximately 40,000 feet above sea level.

Table 1. Performance of Matrix SepraSeal caps on Matrix ScrewTop and Open-Top tubes.

Tube	Number of tubes tested	Visual inspection after freeze/thaw cycle	Passed vacuum chamber leak test
1.0 mL Matrix ScrewTop	288	Pass	100%
1.4 mL Matrix Open-Top	288	Pass	100%

Tubes sealed with Matrix SepraSeal caps did not leak

There was no difference between the performance of Matrix SepraSeal caps on Matrix Open-Top and ScrewTop tubes under the testing conditions. None of the 288 Matrix ScrewTop tubes sealed with Matrix SepraSeal caps showed visible signs of leakage after the freeze/thaw cycle and vacuum test (Table 1).

Summary

Our data confirm:

- Matrix SepraSeal caps effectively seal Matrix ScrewTop tubes.
- There is no risk of leakage due to the threads on Matrix ScrewTop tubes.

We still recommend sealing Matrix Open-Top tubes with Matrix SepraSeal caps to obtain the strongest seal and using storage racks that are optimized for tubes with this type of closure. However, the ability to use Matrix SepraSeal caps with both Matrix Open-Top and ScrewTop tubes gives customers flexibility and supply chain reliability. Matrix SepraSeal caps are supplied as mats with 96 caps each. Tubes can be capped using the [Thermo Scientific™ SuperSealer™](#), which applies optimal pressure to consistently provide a secure seal.



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