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Instructions for Use
TPP Tissue Culture Flasks

The tissue culture flasks are specifically designed for manual cell culture. Only the growth surface has been opto-mechanically activated to ensure optimal cell adhesion and improved cell growth. This activation promotes the efficient cultivation of adherent cells and thereby supports the performance of accurate and reproducible experiments.

The design features an angled neck that serves a dual purpose: it minimizes the risk of media contamination by preventing contact with the inside of the screw cap and offers excellent maneuverability for serological pipettes and cell scrapers.

The cell culture flasks are available with either filter (Fig. 1) or VENT screw caps (Fig. 2).

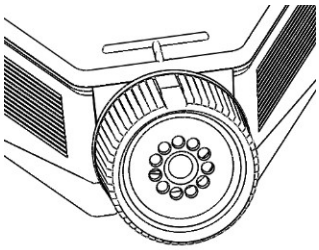


Figure 1. Filter cap

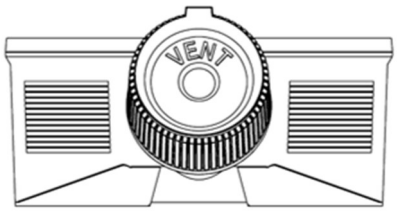


Figure 2. VENT cap

The tissue culture flask is for single use only. Re-use disclaims all warranties.

Safety instructions

- Handling and Safety
  Handling of biological materials shall be performed in full compliance with all applicable national and international regulations. Activities must conform to the laboratory's assigned biological safety level, the relevant Safety Data Sheets (SDS), and the manufacturer's Instructions for Use (IFU).
  Appropriate personal protective equipment (PPE) shall be always worn during handling.
- Risk of Contamination
  All operations shall be conducted in accordance with aseptic techniques and established Good Laboratory Practices (GLP). Packaging shall be opened immediately prior to use. Only products that are visually intact and free from defects shall be utilized. Products exhibiting visible damage, contamination, or any other irregularities shall be disposed of in accordance with applicable regulations.
- Storage
  TPP products shall be stored under the following conditions:
  - Temperature: 10 °C to 30 °C (50 °F to 86 °F).
  - Light exposure: Products shall be protected from direct ultraviolet (UV) radiation.
  - Relative humidity: ≤ 60 %, with a recommended control range of 50 – 60 %.

Storage conditions shall be monitored and recorded to ensure compliance with these requirements. Any deviations shall be documented, evaluated, and managed in accordance with the applicable quality.

Instruction

- Check the expiration date (EXP) on the label and packaging. Only use products with a valid EXP date.
- Before use, verify that the packaging is intact, as the consumable is only considered sterile if the packaging is undamaged.
- Open the flask and fill it with the medium and inoculum according to your laboratory routine. Please refer to the optimal fill volume, see Technical Data.
- Avoid touching the treated bottom with sharp objects.
- Close the filter screw cap with ventilation holes. Continuous gas exchange is provided through the integrated 0.22 µm hydrophobic membrane. Note: If the PTFE membrane becomes wet, gas exchange may be temporarily reduced

Handling the VENT Screw Cap

- Activating gas exchange (Fig. 1): To enable controlled gas exchange, turn the VENT screw cap until you hear an audible “click” confirming that the cap has locked into the ventilation position.
- Interrupting gas exchange / Closing (Fig. 2): To stop gas exchange, turn the cap beyond the ventilation position by a quarter turn (1/4) clockwise. This creates a hermetic seal that prevents further interaction with the atmosphere.
- When transporting tubes and bottles with VENT screw caps within the laboratory, the cap must be turned firmly into the fully closed position to prevent leakage or contamination.
- Before incubation, check the position of the cap to ensure that the VENT screw cap is in the venting position.

Figure 1. Position ventilation

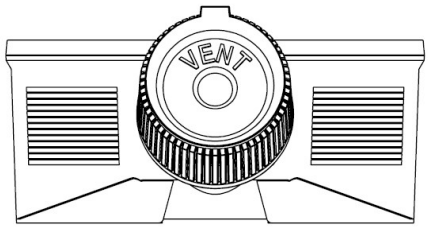
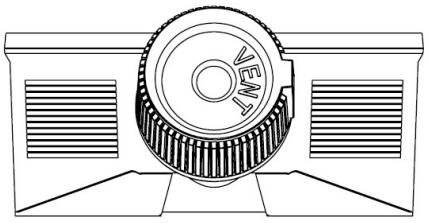


Figure 2. Position gastight



- Do not tilt the flask excessively to prevent medium contacting the cap or neck.
- Use cell scrapers or serological pipettes through the angled neck for harvesting or medium changes.

Optimization of Adherent Cell Growth

To achieve optimal proliferation of adherent cells on the surface, observe the following guidelines:

- Cells must be fully and gently resuspended to obtain a true single-cell suspension. Residual aggregates lead to heterogeneous settling and nonuniform attachment.
- Prevention of foam formation: Foam should be minimized during resuspension and seeding, as protein denaturation and trapped air bubbles can impair cell viability and gas exchange.
- Immediately after seeding, the culture vessel should be gently rocked in an orthogonal (cross-shaped) pattern to ensure homogeneous distribution of cells across the growth surface and to prevent central or peripheral accumulation ("bullseye effect").
- The seeding density must be selected according to cell line specific recommendations. Excessively high densities accelerate contact inhibition, increase metabolic stress, and promote overcrowding artifacts.
- Incubator shelves must be precisely leveled to ensure uniform medium depth across the growth area. Tilted surfaces promote media pooling and cause heterogeneous attachment.
- Follow the vessel's specified fill volume. Too little medium increases meniscus effects, leading to cell accumulation at the edges. Adjust medium volume and culture duration according to the specific requirements of the cell line.
  Use 0.2–0.5 mL of medium per cm^2 of growth surface, corresponding to a medium height of approximately 2–5 mm [1]. Medium height, and therefore total volume, is a key factor for oxygen supply and influences the Oxygen Transfer Rate (OTR) (Gstraunthaler et al., 1999).
- Vibrations in or around the incubator must be avoided, particularly during the initial attachment period, to maintain reproducible attachment patterns.
- Cultures shall be maintained under controlled environmental conditions (temperature, humidity, and CO_2 concentration). Maintenance of high relative humidity is critical to prevent evaporative loss, which induces a detrimental increase in medium osmolarity.

Sub-Zero Storage

- The TPP Tissue culture flask is not intended for sub-zero storage. Polystyrene (PS) exhibits significantly increased brittleness at temperatures below 0 °C (32 °F). Storage of PS products below this temperature shall not be performed, as the material is prone to spontaneous cracking and shattering, which may result in product failure and potential safety hazards.

General Handling and Limitations

- Graduations are for reference only and serve as approximate guidelines for fill volume. For precise measurements, use calibrated pipettes or volumetric instruments.
- Avoid exposing the white labeling area to 90% alcohol in combination with mechanical stress (e.g., rubbing or wiping), as this may cause the ink to dissolve or smear.
- These devices are stackable. Air vents on the top of the chambers ensure optimal heat distribution between stacked units.
- *Filter Screw Cap:* Continuous gas exchange occurs through the integrated 0.22 µm hydrophobic membrane. If the membrane becomes wet, gas exchange is temporarily reduced.
- Air vents in the bottom rim ensure optimum heat distribution in the incubator when several flasks are stacked on top of each other.

Technical Data

Component	Material
Cap	Polyethylene (PE)
Membrane	Polytetrafluoroethylene (PTFE), Pore size 0.22 µm
Flask	Polystyrene (PS)

Measurement	90025	90026	90075	90076	90150	90151	90300	90301
Cap	VENT		VENT		VENT		VENT	
Cap		Filter		Filter		Filter		Filter
Membrane µm		0.22		0.22		0.22		0.22
Heights mm	29		40		50		50	
Width mm	51		87		122		140	
Length mm	92		155		210		275	
Growth area cm^2	25		75		150		300	
Rec. volume mL [1]	3 – 8		8 – 22		15 – 45		30 – 85	
Max. volume mL	15		65		165		410	

Additional Information:

Instructions for use, chemical resistance lists, and quality certificates for individual products can be downloaded from the TPP website at www.tpp.ch.

Literature

[1] Amanda Capes-Davis, R. Ian Freshney (2010) Freshney's Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications (8th Ed.) - Wiley (p.180)

Disclaimer

TPP products are intended for Research Use Only (RUO) and are not approved for clinical, diagnostic, or in vitro fertilization (IVF) applications. The full Terms & Conditions, including limitations of warranty and liability, intended use, and reseller obligations, are available at: https://www.tpp.ch/page/qualitaets_sicherung/index.php

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