

# Thermoconductive Tube Racks

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# Thermoconductive Tube Racks



**Thermoconductive tube modules** eliminate variability which originates from tubes placed directly into ice, dry ice, alcohol baths, water baths and other temperature sources. Place the Thermoconductive Tube Rack module directly onto a temperature source between  $-196^{\circ}\text{C}$  to  $>100^{\circ}\text{C}$  and it will rapidly adapt to that temperature. Thermoconductive Tube Rack modules ensure  $\pm 0.1^{\circ}\text{C}$  temperature uniformity across all tubes when cooling, snap freezing, heating or thawing. Suggested applications include cooling reagents such as restriction enzymes, dNTPs and antibodies, alcohol-free dry ice snap freezing of tissue, virus and bacteria samples and bench top cryogenic tube sorting in liquid nitrogen. All Thermoconductive Tube Rack modules may be autoclaved, high heat sterilized or decontaminated with bleach, alcohol or other disinfectants or lab detergents. Certain Thermoconductive Tube Rack modules are SBS-compatible.

## Problem: Samples in Ice

- Non-uniform ice contact results in variable sample temperature
- Disorganized samples, wet labels
- Shifting, sinking tubes; contamination risk
- Non-reproducible method



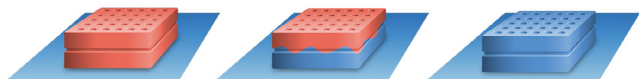
## Solution: Samples in Thermoconductive Tube Rack Module

- All samples  $<4^{\circ}\text{C}$  and uniform in temperature ( $\pm 0.1^{\circ}\text{C}$ )
- Samples organized, secure and dry
- All tubes upright and indexed
- Reproducible method



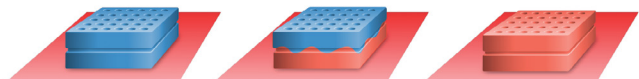
## How It Works

### Cooling

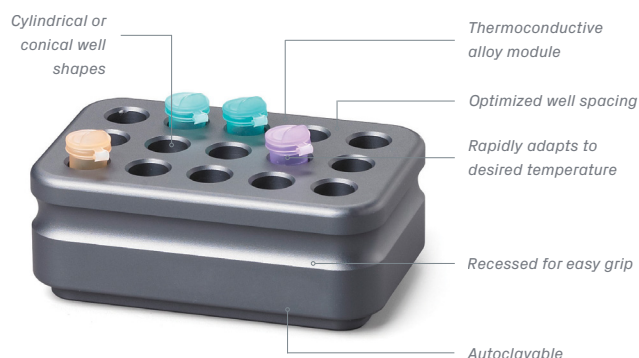


**Thermoconductive Tube Rack on Ice:** Heat from the relatively warmer Thermoconductive Tube Rack module is transferred to cooling source (wet or dry ice, cartridge,  $\text{LN}_2$ ) until equilibrium is reached.

### Heating



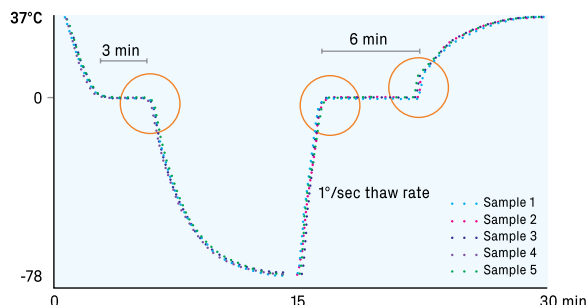
**Thermoconductive Tube Rack in Water Bath:** Heat is transferred from water bath toward relatively cooler Thermoconductive Tube Rack until equilibrium is reached.



Thermoconductive Tube Racks and Sinks are precision-engineered sample modules manufactured from a novel thermo-conductive alloy material. Thermoconductivity is the transfer of heat energy from a higher temperature region to a lower temperature region. Tube Rack modules evenly distribute the temperature across all wells providing very uniform and consistent temperature to all samples ( $\pm 0.1^{\circ}\text{C}$ ).

## Thermoconductive Tube Racks

### Thermoconductive Tube Rack Reproducibility



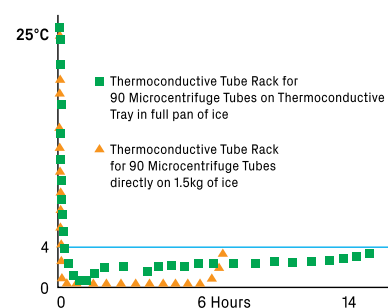
**Performance test:** A temperature probe was placed into a 2.0 mL cryogenic vial containing 1.0 mL of water. The tube was inserted into a Thermoconductive Tube Rack for 45 Cryo or FACS Tubes module. The module was placed onto a Thermoconductive Tray platform in a 37°C water bath and allowed to equilibrate. The Tube Rack for 45 Cryo or FACS Tubes module was then removed and placed onto dry ice and equilibrated to -78°C (0 - 15 minutes) and then returned to the water bath to re-equilibrate to 37°C (15 - 30 minutes). This experiment was repeated five consecutive times and temperature profiles were recorded.

**Conclusion:** The Thermoconductive Tube Rack for 45 Cryo or FACS Tubes module showed identical cooling profiles and phase transition (orange circles) over five consecutive freeze-thaw cycles.

### Thermoconductive Tube Rack Versatility and Performance

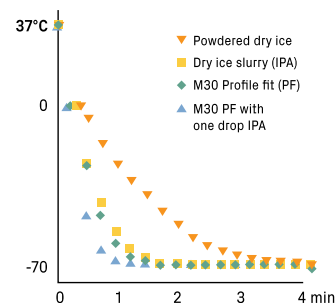
#### On Ice

- Adapts from ambient (25°C) to <4°C in 60-90 seconds\*
- Samples and labels stay dry, organized
- Hours of ice cooling without direct ice contact
- Reproducible method



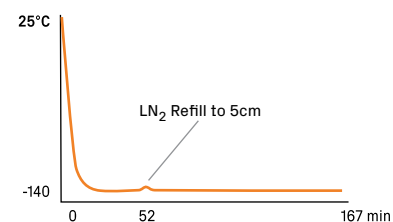
#### On Dry Ice

- Adapts from ambient (25°C) to -78°C in approximately 5-7 minutes\*
- Eliminates ethanol from snap freezing
- Samples are upright and organized as they freeze
- Equal or better freezing rate as compared to direct immersion into dry ice or alcohol slurry
- Reproducible method



#### In Liquid Nitrogen (LN<sub>2</sub>)

- Adapts from ambient (25°C) to approximately -150°C in approximately 12-14 minutes\*
- Vapor barrier protects from ambient air
- Samples are upright and organized as they freeze
- No direct contact between samples and LN<sub>2</sub>
- Reproducible method



#### With Heat Sources

- Use with water baths, hot plates, incubators and other heat sources to keep samples warm

\* Average cooling rate from room temperature



Thermoconductive Tube Racks

Thermoconductive Tube Rack Modules

Thermoconductive Tube Racks  
for Microcentrifuge Tubes



Ordering Information

BCS-163	Thermoconductive Tube Rack, holds 6 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, gray
BCS-165	Thermoconductive Tube Rack, holds 6 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, orange
BCS-164	Thermoconductive Tube Rack, holds 6 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, green
BCS-125	Thermoconductive Tube Rack, holds 15 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, gray
BCS-125G	Thermoconductive Tube Rack, holds 15 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, green
BCS-125O	Thermoconductive Tube Rack, holds 15 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, orange
BCS-127	Thermoconductive Tube Rack, holds 15 x 1.5 conical tubes, conical wells, gray
BCS-535	Thermoconductive Tube Rack, holds 24 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells,SBS compatible, gray*
BCS-539	Thermoconductive Tube Rack, holds 12 x 5ml microcentrifuge tubes, conical wells, SBS compatible, gray*
BCS-108	Thermoconductive Tube Rack, holds 30 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, gray
BCS-108G	Thermoconductive Tube Rack, holds 30 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, green
BCS-108O	Thermoconductive Tube Rack, holds 30 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, orange
BCS-128	Thermoconductive Tube Rack, holds 30 x 1.5 conical tubes, conical wells, gray
BCS-137	Thermoconductive Tube Rack, holds 30 x 500ul microcentrifuge tubes, conical wells, gray
BCS-102	Thermoconductive Tube Rack, holds 90 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, gray
BCS-116	Thermoconductive Tube Rack, holds 96 x 1.5 or 2ml microcentrifuge tubes, cylindrical wells, SBS compatible, row and column indexing, gray**

\* SBS-compatible    \*\* Thermoconductive Tube Rack for 96 Microcentrifuge Tubes has A-H and 1-12 row and column indexing

Thermoconductive Tube Racks  
for Cryo or FACS Tubes



Ordering Information

BCS-126	Thermoconductive Tube Rack, holds 15 cryo tubes or FACS tube modules, cylindrical wells, gray
BCS-534	Thermoconductive Tube Rack, holds 24 cryo tubes or FACS tube modules, cylindrical "gripping" wells for one-hand opening/closing vials, SBS compatible, gray*†
BCS-138	Thermoconductive Tube Rack, holds 30 cryo tubes or FACS tube modules, cylindrical "gripping" wells for one-hand opening/closing vials, gray†
BCS-105	Thermoconductive Tube Rack, holds 45 cryo tubes or FACS tube modules, cylindrical wells, gray

\* SBS-compatible    † "gripping" wells for one-hand vial opening/closing

Thermoconductive Tube Racks

Thermoconductive Tube Racks for  
PCR Plate, Strip Well or Tubes



Ordering Information

BCS-529	Thermoconductive Tube Rack, holds one 96-well PCR plate, 12 x strip wells or 96 tubes, tapered wells, SBS compatible, gray*
BCS-523	Thermoconductive Tube Rack, holds 6 strips wells and 12 x 1.5 or 2ml microcentrifuge tubes, 48 tapered wells for strips and 12 cylindrical wells, SBS compatible, gray*
BCS-538	Thermoconductive Tube Rack, holds one 384-well PCR plate, tapered wells, SBS compatible, gray*

\* SBS-compatible

Thermoconductive Tube Racks for  
96-Well 2D Coded Storage Tubes



Ordering Information

BCS-231	Thermoconductive Tube Rack, holds 96 x 0.5ml 2D storage tubes, cylindrical wells, gray
BCS-149	Thermoconductive Tube Rack, holds 96 x 1ml 2D storage tubes, cylindrical wells, gray

Thermoconductive Tube Racks for  
Cell Therapy Injectable Ampules



Ordering Information

BCS-266	Thermoconductive Tube Rack, holds 12 x 10ml injectable cell therapy ampules, cylindrical wells, gray
BCS-265	Thermoconductive Tube Rack, holds 12 x 2ml injectable cell therapy ampules, cylindrical wells, gray



Thermoconductive Tube Racks

Tall Tube Modules

Thermoconductive Tube Racks for 15mL,  
50mL and 250mL Centrifuge Tubes



Ordering Information

BCS-232	Thermoconductive Tube Rack, holds 12 x 15ml centrifuge tubes, cylindrical wells, with thermoconductive base and insulative exterior, <b>purple*</b>
BCS-153	Thermoconductive Tube Rack, holds 9 x 15ml centrifuge tubes, cylindrical wells, <b>gray</b>
BCS-154	Thermoconductive Tube Rack, holds 4 x 50ml centrifuge tubes, cylindrical wells, <b>gray</b>
BCS-532	Thermoconductive Tube Rack, holds one 250ml centrifuge tube, conical well, <b>gray</b>
BCS-533	Thermoconductive Tube Rack, holds one 250ml centrifuge tube, cylindrical well, <b>gray</b>

\* Thermo-conductive base and insulative exterior

Thermoconductive Tube Rack  
for Blood Collection Tubes



Ordering Information

BCS-235	Thermoconductive Tube Rack, holds 12 x13mm or 16mm blood tubes, cylindrical wells, with thermoconductive base and insulative exterior, <b>purple</b>
BCS-157	Thermoconductive Tube Rack, holds 9 13x75mm blood tubes, cylindrical wells, <b>gray</b>
BCS-155	Thermoconductive Tube Rack, holds 9 13x100mm blood tubes, cylindrical wells, <b>gray</b>
BCS-156	Thermoconductive Tube Rack, holds 9 16x100mm blood tubes, cylindrical wells, <b>gray</b>

\* Thermo-conductive base and insulative exterior

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