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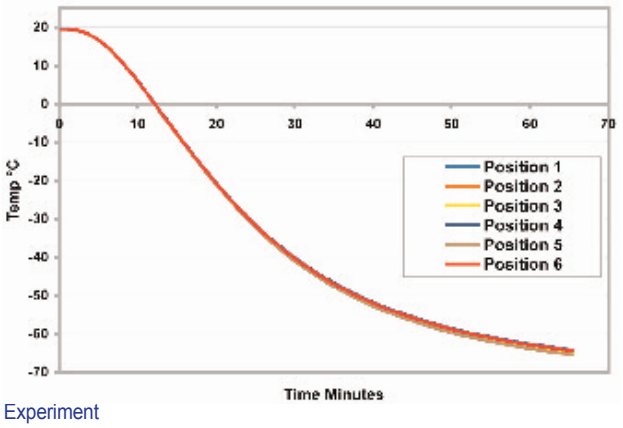
Technical Data
Storm and Breeze

Storm™ and Breeze™

Storm™ and Breeze™ are both heating and cooling workstations, however due to their differences in design they are suitable for different applications.

There are many factors that can affect the performance of these temperature modules; however most influential is the power and temperature range of the thermoregulator you choose. The following information is a sample of the capabilities and applications for these products.

Storm Surface Temperature Uniformity Data using Fluoropolymer Insulation Plate

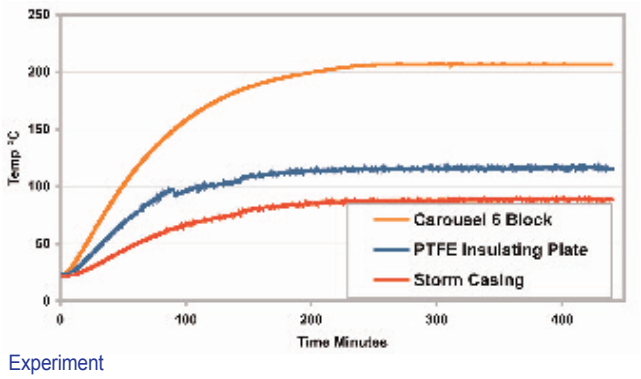


Experiment
Storm was attached to a Huber 385 (2kW) and set to -85˚C. The fluoroplymer plate was fixed on top of the Carousel 6 Place and temperature probes attached in the centre of each well without the presence of flasks.

Results
Minimal surface temperature variation well to well, (+/-0.5˚C).

Conclusion
Storms integral design coupled with the fluoropolymer insulation plate results in a temperature stable module with minimal surface temperature variation, ideal for parallel synthesis.

Storm Insulation Temperature Data

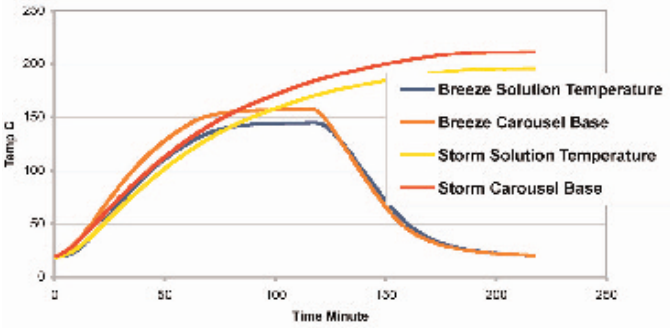


Experiment
Storm was attached to a Huber 705 (1.5kW) and set to +235˚C. The fluoroplymer plate was fixed on top of the Carousel 6 Plus and temperature probes attached to the Carousel base surface, the fluoropolymer plate and outer Storm casing.

Results
Both the fluoropolymer plate and the insulation inside Storm were highly effective; the fluoropolymer plate reduced the outer surface temperature by over 90˚C. Integral insulation and lagging inside Storm reduced the outer surface temperature by over 115˚C.

Conclusion
The fluoropolymer plate and lagging reduce the thermal loss from Storm and the Carousel 6 Plus, increasing the energy efficiency and reducing the outer surface temperatures, helping protect the user.

Storm and Breeze Heating Comparison



Experiment
Storm and Breeze were both attached to a Huber 385 (3kW) and set to +235˚C. The Carousel 6 Plus had 6x250ml reaction flasks filled with 100ml of tetraethylene glycol.

Results
The maximum obtainable base and solution temperatures are significantly higher in Storm than Breeze. Breeze initially heats up faster than Storm.

Conclusion
Storm can reach significantly higher base and solution temperatures due to its energy efficient design and insulation. Breeze responds quickly, but less thermal energy is transferred to the Carousel 6 Plus base due to its reduced surface area contact and lack of insulation.

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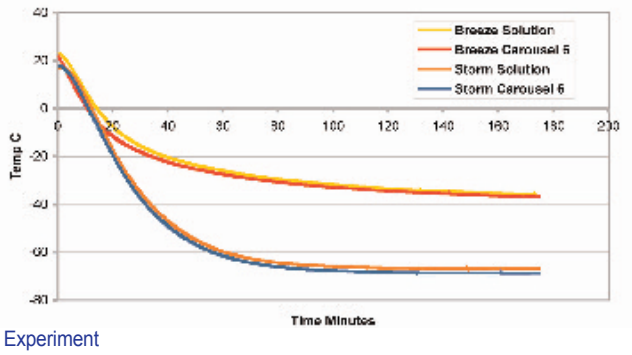
Storm and Breeze Cooling Comparison

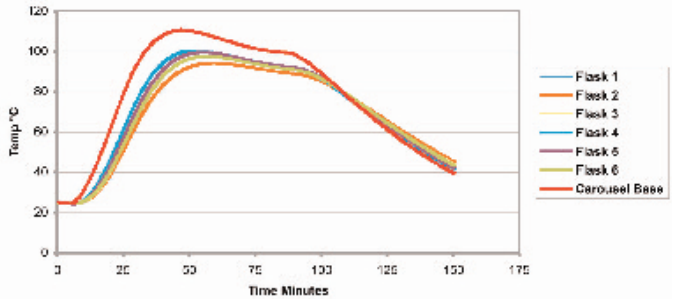


Experiment
Storm and Breeze were both attached to a Huber 385 (2kW) and set to -85˚C. The Carousel 6 Plus had 6x250ml reaction flasks filled with 100ml of acetone.

Results
The minimum obtainable base and solution temperatures are significantly lower in Storm than Breeze. The difference between base and solution temperature in Breeze and Storm are comparable.

Conclusion
Storm can reach significantly lower base and solution temperatures due to its energy efficient design and insulation. In Breeze and Storm the difference between solution temperature and base temperature mimic each other very closely, even though Breeze has less insulation.

Uniformity of Solution Temperature, Flask to Flask with Breeze

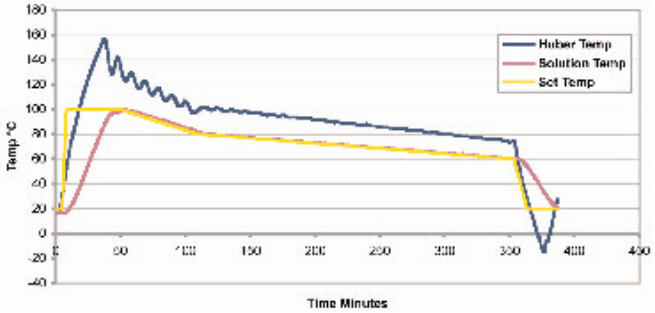


Experiment
Breeze was attached to a Huber 230 (2kW) and set to 100˚C (solution control). The fluoropolymer insulation plate was added and a temperature probe inserted into each 250ml Reaction Flask containing 150ml of water to measure solution temperature.

Results
Results show a variation of +/- 4˚C between flasks.

Conclusion
Storm shows acceptable variation in solution temperature between the 6 flasks.

Solution Controlled Cooling using Breeze and Carousel 6



Experiment
Breeze was attached to a Huber 230 (2kW) with a fluoropolymer coated 1L Heat-On Block secured on top, filled with 350ml of water. Huber set to 100˚C then ramped to 80˚C over 60 minutes, then ramped down to 60˚C over an additional 120 minutes. Temperature probes measured the solution temperature.

Results
Breeze is capable of following temperature ramps accurately provided they are not too fast. Breeze shows minimal overshoot when controlled by solution temperature.

Conclusion
Breeze is suitable for applications that require solution control such as crystallisations.

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