

PolyScience® **Temperature Control Solutions**

LOW TEMPERATURE BATH FLUIDS

Select a fluid that satisfies your operating conditions, including safety, flash point, and freezing point. Pick the lowest possible viscosity. The more viscous the fluid, the more difficult it will be to circulate, particularly if the circulating bath is being used to cool an external device, as fluid viscosity increases as temperature decreases.

Avoid synthetic fluids that are hygroscopic. This will help prevent ice from forming in the reservoir. Minimize the use of mixtures that may change concentration due to evaporation. Some mixtures may change from non-flammable to flammable if a volatile component is randomly added to keep the freezing point depressed.

Selecting a fluid with the proper freezing point helps eliminate the need for additives.



A FEW WORDS ON PUMP SPEED

The pump speed on PolyScience circulating water baths is either selectable (two or more fixed speeds) or adjustable (continuously variable). Here are some things to keep in mind when as you decide which pump speed is best for your application:

Operational Sound Levels — In general, circulating baths operate more quietly at lower pump speeds. It should be noted that while pump noise may be a consideration with heated circulating baths, it is of minimal concern with refrigerated circulating baths due to the operational sound of the fan and condenser.

Bath Turbulence — Just as sound levels diminish as pump speed slows, so does bath turbulence. Slower pump speeds may be more suitable when working with delicate samples or materials.

Friction Heating — A small amount of heat is generated as bath fluid flows through the pump. The faster the pump speed, the greater the heat gain. Too much heat gain may affect on the temperature stability of heated circulators, particularly when operating at the low or high end of the bath's temperature range.

The Number of External Devices Being Controlled — Higher pump speeds are more suitable for applications in which multiple external devices are connected to a single circulating bath. Faster pump speeds decrease both response time and heat gain/loss through fluid lines.

External Tubing Size — Faster pump speeds provide better flow through small tubing, reducing response time and improving temperature stability.

Fluid Viscosity — When using viscous bath fluids, faster pump speeds provide better temperature uniformity than slower speeds. Remember to keep in mind that fluid viscosity will change as temperature changes.

Response Time to Temperature Changes — When a circulating bath is being used to control the temperature of an external device, there is usually some lag time between the need for increased heating/cooling and the delivery of fluid at the proper temperature. The faster the pump speed, the shorter that lag time. Remote temperature control capability, such as that found on PolyScience Circulating Baths with Programmable Controllers, enables you to control temperature at the point of application, virtually eliminating temperature fluctuations.



Lomb Scientific Pty Ltd
26 Atkinson Rd (PO Box 2223) Taren Point 2229 NSW
Australia Wide Offices in Sydney, Melbourne, Brisbane, Perth and Adelaide
Phone: 1300 725 973 Fax 1300 30 30 25