

BATH FLUIDS



Did you know there's a convenient source for small quantities of bath fluids for any temperature range? Why buy more than you need?

Hart Scientific carries a full line of bath fluids covering temperature ranges from -100°C to 550°C.

Viscosity, volatility, and other properties that change with temperature affect the performance of fluids in controlled baths and circulators. Hart has tested and used each of the fluids we sell. Over the ranges recommended in the following table, each fluid remains at a low enough viscosity to be adequately pumped or stirred. Whether your application is industrial or critical lab calibration work, Hart fluids give you top performance and stability.

For temperature ranges too high for oils, we have a bath salt with a viscosity in the molten state similar to the viscosity of water. For your convenience, it is shipped in a granular form, making it easy to fill your bath.

Between 180°C and 550°C, this salt has the highest temperature stability and uniformity available in a bath fluid. It does not smoke like oils or give off dust like "sand" or fluidized alumina baths. Check with your bath manufacturer before using this salt to make sure your equipment is compatible. Hart offers three standard bath models and custom-designed units for use with this salt.

Fluid Specifications

It's important to understand a few specifications before selecting a bath fluid. We've seen bath fluids advertised with a temperature range that spans from the freezing point to the flash point or beyond.

For example, type 710 silicone oil has a freezing point of -22°C, but freezing point has nothing to do with the point at which the oil becomes so thick it cannot be properly stirred. Type 710 oil should really only be used down to about 80°C. It's a viscosity issue, not a freezing-point issue. Usable range is the question. Suitability for calibration work is the specification that counts.

The usable viscosity range is determined by your bath's stirring or pumping design. Hart baths can be operated using fluids with up to 50 centistokes viscosity, which gives you additional usable range in the lower temperature levels of the fluid.

Some baths advertised as calibration baths require fluids with 10 centistokes or less viscosity to operate properly. The usable ranges in our table on the previous page assume the use of a Hart bath.

In addition to range and viscosity issues, there are a number of other issues to consider when choosing a bath fluid. The other considerations are:

- Thermal characteristics
- Lifetime
- Change in characteristics due to temperature cycling
- Absorption of water from the air
- Vaporization—fumes and fume hood requirements
- Expansion due to heat
- Contamination—mixing oils or introducing contamination with unclean probes
- Conductivity properties
- Effects of using fluids outside of their range—fire, explosion, polymerization
- Effects of altitude on boiling point

Call us and we'll discuss your fluid requirements for your operating needs.

Ordering Information

Model #	Fluid	Usable Range ^s	FlashPoint ^t
5019	Halocarbon 0.8 Cold Bath Fluid	-100°C to 70°C	n/a
5022	Dynalene HF/LO*	-65°C to 58°C	60°C
5023	HFE Cold Bath Fluid	-75°C to 100°C	n/a
5020	Ethylene Glycol (Mix 1:1 with water)	-30°C to 90°C	n/a
5010	Silicone Oil Type 200.05	-40°C to 130°C	133°C
5012	Silicone Oil Type 200.10	-30°C to 209°C	211°C
5013	Silicone Oil Type 200.20	10°C to 230°C	232°C
5014	Silicone Oil Type 200.50	30°C to 278°C	280°C
5017	Silicone Oil Type 710	80°C to 300°C	302°C
5011	Mineral Oil	10°C to 175°C	177°C
5001	Bath Salt, 125 lb. ^t Potassium Nitrate 53% Sodium Nitrite 40% Sodium Nitrate 7%	180°C to 550°C	n/a

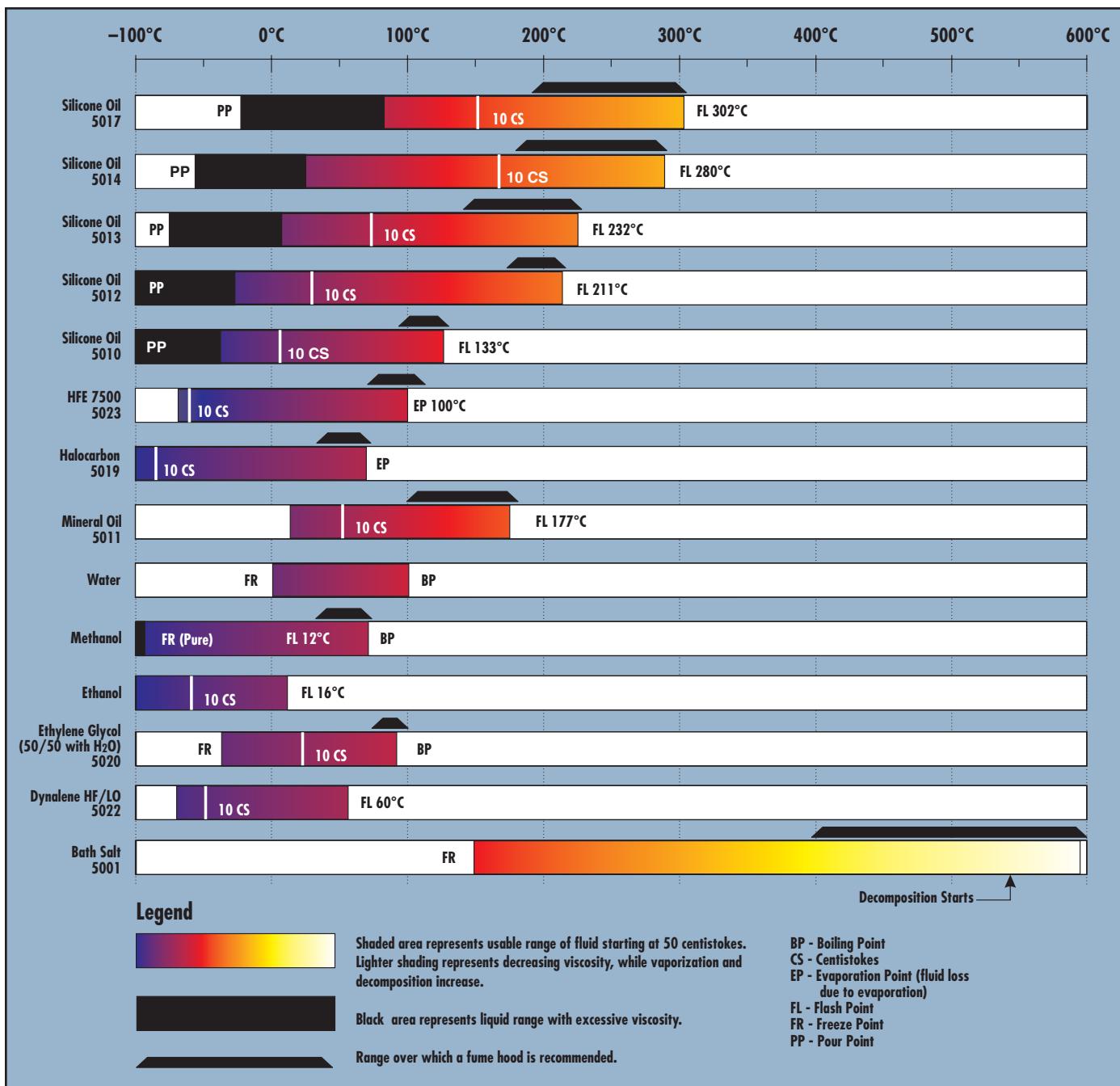
^sAtmospheric pressure affects the usable ranges of some fluids. The temperatures quoted are at sea level.

^tFlash point is the temperature at which a vapor (not the fluid) will ignite if exposed to an open flame. When the flame is removed, the vapor will stop burning. (Open cup method.)

*Electrical resistivity is greater than 20 MΩ·cm.

^t125 lb. bath salt fills a 7.9-gallon tank.

MSDS available at www.hartsientific.com

**Technical Tip****Can't a Single Fluid Cover My Bath's Entire Range?**

So, you want to cover the entire temperature range of your bath with one fluid? That would be nice. Unfortunately for all of us, this is often not possible.

All fluids have temperature range limits for a variety of reasons. The properties of certain fluids just don't hold still over temperature. Not only do you have problems with freezing and boiling, but viscosity changes,

evaporation, and flash points create limits for a fluid's useful temperature range.

The result is that one fluid may not cover the range you need within a single bath, leaving you with a choice between inconvenient fluid changes or multiple temperature-dedicated baths.



Read about our calibration training courses on page 153.

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