# S-Monovette® – Freezing Conditions

## Freezing below 0°C

- As a matter of principle, the suitability of S-Monovette® tubes for freezing in temperatures below zero must be tested under actual conditions. The stress to which the tubes are exposed may vary significantly depending on the medium to be frozen and the routine conditions applied (see chapter on Material Properties in the General Catalogue).
- The design strength values of plastic materials generally decrease in temperatures below 0°C. Therefore, particular care must be taken not to subject frozen tubes to mechanical strain
- The freezing conditions must enable the contents of the S-Monovette® to freeze evenly, i.e. starting in the lower section and freezing upwards. Racks or storage boxes should be sufficiently sized to allow the S-Monovette® tubes to expand. Styrofoam or metal racks are not suited as these materials may cause expansion cracks in the tubes.

## Freezing to -20°C - Check before freezing:

- **Interferences:** Ensure that freezing does not have any adverse effect on the blood sample or analysis (e. g. hemolysis, parameter stability).
- **Centrifugation:** As may be required depending on the respective analysis. Observe the centrifugation conditions on inner boxes and ensure visual sample inspection.
- **Hemolysis:** Whole blood is known to hemolyze while freezing. To exclude hemolysis, select an S-Monovette® Gel tube, use a Seraplas® valve separator after centrifugation, or transfer the sample into a secondary tube.

## Freezing to -20°C - Procedure:

- **Cooling:** Store S-Monovettes in a vertical position for 45 to 60 min. to cool down the tubes from room temperature to +4°C before freezing at -20°C.
- **Thawing**: Allow the tubes to thaw standing in an upright position at room temperature for at least 45 min. Do not expose tubes to mechanical stress. Rapid thawing may adversely affect analysis results.

## Freezing and deep-freezing below -20°C

- S-Monovettes are not tested for deep freezing below -20°C. In view of the multitude of possible adverse effects, we recommend that users conduct freezing tests under the facility's routine conditions.

## Freezing S-Monovettes with Gel:

- Freeze S-Monovettes as described under *Freezing to -20°C* above.
- It is an established fact that the gel layer is likely to change as a result of the freezing process.
- In view of the multitude of possible adverse effects, we recommend that users conduct freezing tests under the facility's routine conditions.
- **Thawing**: Allow the sample to thaw while standing in an upright position.
  **After thawing,** transfer the sample material **by pipetting** (rather than pouring away the supernatant) down to **abt. 2 mm above the gel layer** from the primary receptacle into a secondary tube. Discard any remaining blood sample.



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