Components of the BD Vacutainer® SST™ Tube

The gel exhibits thixotropic properties (such that it is semi-solid under static conditions and becomes less viscous when a force is applied), enabling it to flow during centrifugation. Separator gels are designed with a specific density that falls between those of the serum and cells, thus determining the location of the interface. Complete and adequate barrier formation is time, temperature, and g-force dependent. Uniformity of the barrier is time dependent.

- An incomplete barrier could result from shortened centrifugation times.
- For a horizontal (swing-bucket) centrifuge, the recommended spin time is 10 minutes.
- For a fixed-angle centrifuge, the recommended spin time is 15 minutes.

A minimum g-force is required to get the gel moving, thus the recommendation is 1000 g. During the centrifugation process, centrifugal forces are applied to the gel in the tube. As comparable g-force settings, the horizontal centrifuge is more efficient at gel barrier formation than a fixed angle centrifuge, due to a higher axial force setting on the gel.

- The quality of the barrier formed from fixed-angle centrifugation also depends upon the angle of the centrifuge head. Barriers formed in fixed-angle centrifuges contain a bias angle relative to the angle of the head. These barriers are typically thinner than horizontal barriers, because the gel must cover a greater cross-sectional area in the tube.

- Gel flow may be impeded if chilled before or during centrifugation. To optimize flow and prevent heating during centrifugation, set refrigerated centrifuges to 25°C (77°F).

TUBE TYPES
- Plus Plastic – Polyethylene Terephthalate (PET); Glass – Soda Lime Glass

CLOSEURE TYPES
- BD Hemogard™ Closure; Conventional Stopper

ADDITIVES
- Clot Activator – Micronized Silica Particles; Barrier – Polymer Gel; Silicone Coating

In general, glass is a natural clotting agent. The blood will clot due to contact activation causing the initiation of the clotting mechanism. Plastic tubes require the clot activator, which helps accelerate the blood clotting mechanism. Silicone and clot activator are applied to the interior surface of the tube.

- A silicone coating on the walls of most serum tubes reduces the adherence of red cells to the tube wall.
- The clot activator helps accelerate the blood clotting mechanism.
- The density of the polymer gel causes it to move upward during centrifugation to the serum-clot interface, where it forms a barrier separating serum from the clot.

The Importance of Proper Handling and Processing of the BD Vacutainer® SST™ Tube

POSTCENTRIFUGATION

Analytes from cellular leakage/exchange, accentuated by clot retraction, will then be centrifuged into the serum and are used for testing. If re-centrifugation is required for improved serum quality, then aspirate serum into a properly labeled clean test tube.

PRE-CENTRIFUGATION

FILL tubes to the stated draw volume to ensure the proper blood-to-additive ratio. Allow the tube to fill until the vacuum is exhausted and blood flow stops. Most BD SST tubes have a 12-month shelf life.

PRE-CENTRIFUGATION

- Mixing facilitates dispersion of the silica into the blood, assisting the clotting mechanism.
- Inadequate mixing may result in incomplete clotting.

For a fixed-angle centrifuge, the recommended spin time is 15 minutes. A minimum g-force is required to get the gel moving, thus the recommendation is 1000 g.

- During the centrifugation process, centrifugal forces are applied to the gel in the tube.

- The quality of the barrier formed from fixed-angle centrifugation also depends upon the angle of the centrifuge head. Barriers formed in fixed-angle centrifuges contain a bias angle relative to the angle of the head. These barriers are typically thinner than horizontal barriers, because the gel must cover a greater cross-sectional area in the tube.

- Gel flow may be impeded if chilled before or during centrifugation. To optimize flow and prevent heating during centrifugation, set refrigerated centrifuges to 25°C (77°F).

- The flow properties of the barrier material are temperature dependent.

- The density of the polymer gel causes it to move upward during centrifugation to the serum-clot interface, where it forms a barrier separating serum from the clot.

Centrifugation recommendations:

<table>
<thead>
<tr>
<th>Product</th>
<th>RCF (g force)</th>
<th>Time (min) Swing-Bucket</th>
<th>Time (min) Fixed-Angle Bucket</th>
</tr>
</thead>
<tbody>
<tr>
<td>BD SST™ Glass Tube</td>
<td>1000-1200</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>BD SST™ Plus - 13 mm</td>
<td>1100-1200</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>BD SST™ Plus - 16 mm</td>
<td>1200-1300</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>BD SST™ Transport Tubes</td>
<td>1700-1200</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

Conversion of RCF to RPM (radius in centimeters):

<table>
<thead>
<tr>
<th>Radius (cm)</th>
<th>Speed–RPM Max.</th>
<th>Speed–RPM Min.</th>
<th>Centrifuge Force (g)</th>
<th>Radius (cm)</th>
<th>Speed–RPM Max.</th>
<th>Speed–RPM Min.</th>
</tr>
</thead>
</table>