



Blood Sample Handling

Collection Tubes and Fill Order

BLUE Top Tube

Sodium Citrate

Coagulation

Whole blood sample with sodium citrate anticoagulant, or plasma (contains clotting factors).

Primarily used for coagulation testing (whole blood), fibrinogen testing (plasma).

Fill sodium citrate tubes exactly to fill line.

RED Top Tube

No Anticoagulant

Serum

After centrifugation, serum remains after the blood has clotted (without clotting factors).

Primarily used for blood chemistry, immunology, and serology testing.

Collect whole blood 2.5 times required volume of serum.

GREEN Top Tube

Lithium Heparin

Plasma

After centrifugation, plasma remains when clotting is prevented with a lithium heparin anticoagulant (contains clotting factors).

Primarily used for blood chemistry and other point-of-care tests.

Fill to minimum line for proper anticoagulation and follow analyzer recommendations for minimum volume needed for analysis.

PURPLE Top Tube

Potassium EDTA

Plasma

Whole blood sample with EDTA* anticoagulant, OR after centrifugation, plasma remains when clotting is prevented with EDTA* anticoagant.

Primarily used for hematology (CBC) analysis, blood films/smear.

Purple Top Tubes are used for the Heska® Nu.Q® test.

Fill to minimum fill line.

HESKA DRI-CHEM® Tubes



Non-heparinized Red Top Tubes (0.5 mL & 1.5 mL)

IMPORTANT: Always fill blood tubes in the correct order to avoid contamination.

*EDTA cross-contamination can affect Ca²+ and K+ chemistry results.

Serum or plasma is collected from other, non-Heska tubes or a Heska Green Top Tube and syringed into Red Top Tube. It is NOT recommended to use this tube for whole blood centrifugation.

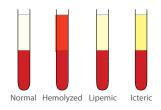
NOTE: Also used for Heska Electrolyte Reference Fluid and Heska Chemistry Control Solution.



Lithium Heparin Green Top Tubes (0.5 mL & 1.5 mL)

Whole blood is collected from patient, syringed into tube, properly inverted, centrifuged and can then be placed directly into analyzer (no clotting or pipetting required).

Sample Types



Normal plasma/serum samples are straw-colored, and do not have a yellow, red, or pink tinge.

Hemolyzed plasma/serum samples have a pink/red tinge due to broken blood cells.

Lipemic plasma/serum samples have a milky appearance due to a high concentration of fat in blood.

Icteric plasma/serum samples have a yellow color due to a disease or condition that causes excess bilirubin in blood.

Best Practices

General

- Minimize micro-clot formation with swift/atraumatic venipuncture and by immediately transferring blood from syringe into collection tubes in recommended order (see above).
- $\bullet\,$ Use a 22-gauge or larger needle for venipuncture to minimize hemolysis.
- Avoid repositioning and/or excessive suction on the syringe.
- Remove needle from syringe to fill tubes, unless using a closed vacuum/vacutainer blood collection system.
 - If using vacutainer, let blood sample flow naturally into tube (do not force).
- All blood collection tubes should be filled to recommended levels to avoid over-dilution of the sample with anticoagulant.
- Serum Separator Tubes (aka Tiger Top or Gold Top Tubes) can interfere with some drug or hormone assays on chemistry and immunodiagnostic platforms.

Chemistry

- Whole blood samples in Green Top Tubes must be inverted 5–10 times immediately after collection (prior to centrifugation).
- For serum samples, allow whole blood to clot at room temperature, prior to centrifugation (approx.15–20 minutes for small animals, 30–45 minutes for equine/ ruminants). Prior to centrifugation, visually inspect the sample to ensure there is a fully-formed solid clot.
 - If clot is not fully formed, wait an additional 5–10 minutes. If centrifugation occurs prior to full clot formation, there will be fibrin admixed in the serum, which can affect results.
- For both plasma and serum samples, best practice includes checking sample for fibrin. After centrifugation, remove any fibrin by gently swirling two clean wooden applicator sticks for a few seconds in the plasma/serum layer only.

Hematology

NOTE: Purple Top Tubes are available in a variety of sizes. The Element HT5® analyzer accepts samples from any size Purple Top Tube, if filled and handled appropriately. Follow manufacturer's recommendations to ensure proper ratio and mixing of EDTA to blood; generally this means filling the EDTA tube until it is at least 1/2 way full with blood.

- After adding blood sample, immediately invert Purple Top Tube 8–10 times to mix blood and EDTA anticoagulant.
- Allow sample to stabilize 1–2 minutes before analysis (recommended that blood tubes be placed on a mixing device for this interval), and re-invert just prior to use.
- Check sample for micro-clots and/or fibrin (small dark red or white translucent particles).
- Immerse two wooden applicator sticks into the blood and swirl gently, remove sticks and examine.

IMPORTANT: If clots or fibrin are present, discard and obtain new sample.

Coagulation

- For the Element COAG+® Immunodiagnostic Analyzer, use fresh whole blood, or citrated whole blood (Blue Top Tube).
- For fresh whole blood, discard first drop before adding sample to test strip. Sample must be added to test strip within 30 seconds of blood draw.

Citrated Whole Blood Samples

- Fill Blue Top Tube exactly to the fill line and invert at least 10 times to mix thoroughly.
- Allow sample to sit at room temperature for at least one minute, and then follow steps for re-calcification.
- With 100 μL pipette, aspirate 100 μL of citrated blood sample.
- Pierce the foil lid on top of re-calcification tube with pipette tip containing sample and expel sample into the calcification tube. Mix well by pipetting 6–8 times.
- Place one drop of blood sample onto test strip for analysis.
- When using a Blue Top Tube, store sample at room temperature and test within 4 hrs.



For further assistance, please call Heska's Technical Support Services

US 800 464 3752 www.heska.com CA 866 382 6937 www.heskavet.ca

AU 1300 437 522 www.heska.com.au