Your Power for Health

greiner bio-one

VACUETTE® Blood Collection System

Handling Recommendations

www.gbo.com/preanalytics

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Foreword

Austrian headquarters of Greiner Bio-One Kremsmünster

VACUETTE® - "Take the ORIGINAL"

For decades glass was the raw material used for the production of evacuated blood collection tubes. However, in the mid 1980s, Greiner Bio-One recognized the safety risks for medical personnel that are associated with the use of glass, and was the **first producer** with the technical competence to make an innovative specimen collection system manufactured from PET, a virtually unbreakable highly transparent plastic.

See for yourself the advantages that "The ORIGINAL" can offer:

- Worldwide technological leadership in the production of specimen collection systems made of plastic
- Special thick-walled tube design to guarantee a longer shelf-life
- Innovative safety products to protect your health
- Complete product range made of virtually unbreakable plastic
- Flexibility for custom-made solutions with highest quality standards

"ONE STEP AHEAD"

VACUETTE® users profit from one of the most modern and highly efficient production facilities in the world. The continual development of new technologies and the state of the art production facilities demonstrate the innovative strengths of the company.

An ingenious quality management system guarantees the high standards of Greiner Bio-One. The use of **VACUETTE®** products ensures the safety of the user as well as the health and wellbeing of a magnitude of healthcare workers and patients.

Preparing for Blood Collection

a) Patient identification

This is performed by a comparison between the patient´s test order form and the patient identification number, barcode, wristband number or other objective criteria.

b) Position

The patient should be suitably positioned for venipuncture (either sitting or recumbent), the position should be maintained for a minimum of 15 minutes prior to performing the venipuncture.

c) Preparation of the Collection Material

Prior to performing the venipuncture, the following items must be prepared:

- **VACUETTE®** Blood Collection System (consists of **VACUETTE®** Multiple Use Drawing Needles/VISIO Plus needles, **VACUETTE®** QUICKSHIELD Safety Tube Holder or standard tube holder and **VACUETTE®** Blood Collection Tubes)
- Sterile disposable gloves
- Sterile swab
- Disinfectant or alcohol solution
- Adhesive bandages
- **VACUETTE®** Tourniquet
- **VACUETTE®** Sharps Disposal Container
- Label for patient identification (timing of labelling varies from country to country)

Selection of a Puncture Site

Priority list:

1 Blood collection from the antecubital area of the arm

2 Blood collecton from the dorsal side of the hand

3 Blood collection from the dorsal surface of the foot

Prior to making the final selection of a site for venipuncture, an inspection of the proposed area is necessary. The selection sequence should correspond to the priority list; whereby 1) and 2) are suitable in 95% of cases and provide a satisfactory outcome.

Venipuncture

1 Palpate the vein.

2 Vein stasis with a tourniquet – maximum duration 1 minute.

3 Disinfect the puncture site (allow the disinfectant to thoroughly dry).

4 Venipuncture – perform venipuncture according to instructions. The patient arm should be inclined in a downward position.

5 With the second hand, the vacuum tube should be inserted into the holder (the tube cap must point upwards and kept in position). Ensure that the rubber stopper is fully penetrated. Release tourniquet as soon as blood begins to flow.

Venipuncture

For patients with prominent veins it is recommended to use the following **VACUETTE®** standard blood collection products:

VACUETTE® Multiple Use Drawing Needle

with uniquely sharpened faceting (three needle gauges available in 20, 21 and 22 G) for a patient friendly, pain free blood collection.

VACUETTE® QUICKSHIELD Safety Tube Holder

especially safe as the fingers remain behind the needle tip at all times. The protective cap is pre-attached to the holder, remaining stable. Once activated, there is no chance of the protective cap coming off.

VACUETTE® Standard Tube Holder

with ergonomic design. The specially adjusted surface area allows for improved handling of the holder during blood collection.

VACUETTE® Blood Collection Tubes

available exclusively in PET plastic. All tubes are available with a safety cap. The use of a vacuum system eliminates the possibility of back flow occuring during blood collection.

Venipuncture

For patients with difficult veins and respectively patients presenting an increased infection risk, it is recommended to use the following **VACUETTE®** products:

VACUETTE® Safety Blood Collection Set

to protect your health. The simple to use safety mechanism provides reliable protection against needlestick injuries. The Safety Blood Collection Set is available as a standard version or as two pre-assembled versions (with Luer adapter and with tube holder).

VACUETTE® QUICKSHIELD Complete PLUS

The practical Safety Tube Holder with pre-assembled VISIO PLUS needle for optical control of correct venipuncture. The needle protection cap is activated outside of the vein with the aid of a solid support or with the thumb.

VACUETTE HOLDEX® Single-Use Holder

with eccentric nozzle. This holder is especially suitable for difficult vein conditions. The puncture is guaranteed through the off-centre cannula connection providing an optimal puncture angle for a patient friendly blood collection. The HOLDEX® Single-Use Holder can be used together with a Luer needle or with a blood collection set.

Recommended Order of Draw for Multiple Specimen Collection

- Blood Culture Tube
- Coagulation Tube*
- Serum
- Heparin
- EDTA
- Glucose
- All others

* Coagulation tubes may be the first tube to be drawn for routine testing only (PT and aPTT).

Note:
Always follow your facility´s protocol for order of draw.

Trouble Shooter

No blood flows into the tube

Possible cause	Solution
The bevel of the needle tip is sucked against the wall of the vein	Gently rotate the needle within the lumen of the vein
The needle penetrated the vein wall	Gently pull both the tube holder and the needle backwards
The needle is not fully within the vein	Gently push the needle forwards
The tourniquet was too tight or in place too long	Loosen the tourniquet
The tube was already used, or was previously opened	Dispose of and select a new tube

Blood flow ceases midway through the collection

Possible cause	Solution
The tube was removed from the holder too soon	Reinsert the tube into the holder until the vacuum is totally depleted
Suction is too strong for the vein (collapsed vein)	Pull the tube out of the holder for a second and then reinsert it
The needle position has altered during the procedure, or the needle is outside the vein	Repeat venipuncture at different site when haemotoma occurs

Trouble Shooter

Haemolytical sample material

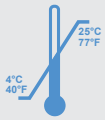
Possible cause	Solution
Too long stasis of the vein (longer than 1 minute)	Exact control of stasis time (maximum 1 minute)
Transfer from a syringe into a tube	For safe blood transfer, use the **VACUETTE®** Blood Transfer Unit
Too intense mixing of the sample	Gently invert the tube 8 times (Coagulation tubes 4 times)
Tubes, that are not adequately filled	Ensure that the tube is correctly filled to the fill mark on the tube label

Mixing of Specimen Material and Labelling of Tubes

Following blood collection, all tubes should be gently inverted 8 times (coagulation tubes 4 times). Thorough mixing is necessary to ensure adequate performance of the tube contents (additive) with the blood sample. A full inversion is when the air bubble moves from one end of the tube to the other.

In order to ensure unique identification of the specimens, it is necessary to use a barcode system to label the tubes or write on the tube labels.

Transport



The recommended transport and storage temperature for tubes prior to use is 4-25 °C (40-77 °F). Exceeding the recommended storage temperature may lead to impairment of the tube quality.

Avoid direct exposure to sunlight in storage and during transportation of samples, especially light-sensitive analytes such as Bilirubin.

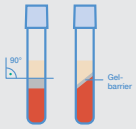
For safe transport, it is recommended that the **VACUETTE®** Transport Boxes - especially developed for this purpose - be used in combination with the appropriate transport carton or transport bag.

Centrifugation

Centrifugation recommendations for **VACUETTE®** Blood Collection Tubes

	Centrifuge speed	Time
Coagulation tubes		
Platelet rich plasma (PRP)	150 g	5 min.
Platelet poor plasma (PPP)	1500 - 2000 g	10 min.
Platelet free plasma (PFP)	2500 - 3000 g	20 min.
Serum tubes Serum Sep Clot Activator Serum Beads Clot Activator	min. 1500 g 1800 g 1800 g	10 min. 10 min. 10 min.
Heparin tubes Heparin Sep	2000 - 3000 g 2200 g	15 min. 15 min.
EDTA Sep **Homocysteine tubes**	1800 - 2200 g 2000 - 2200 g	10 min. 10 min.

Serum tubes should be centrifuged 30 minutes after blood collection. In certain blood samples, the clotting speed in serum tubes may be clearly delayed (i.e. anticoagulant therapy, missing coagulation factor, …) the waiting period prior to centrifugation may be correspondingly delayed.



Important:
The type of centrifuge being used can influence the properties of the gel barrier. Through the use of a swing-out rotor centrifuge in comparison to a fixed-angle centrifuge, a more solid gel barrier will be achieved. Centrifugation should be performed in a cooled centrifuge (15-24 °C).

Opening **VACUETTE®** Blood Collection Tubes

1 Hold the tube firmly in one hand (use a solid base to support the arm).

2 Twist the safety cap with the other hand so the cap is loosened.

3 Carefully open Non-ridged tubes with a gentle pull motion. **VACUETTE®** PREMIUM Tubes are opened with a short twist movement.

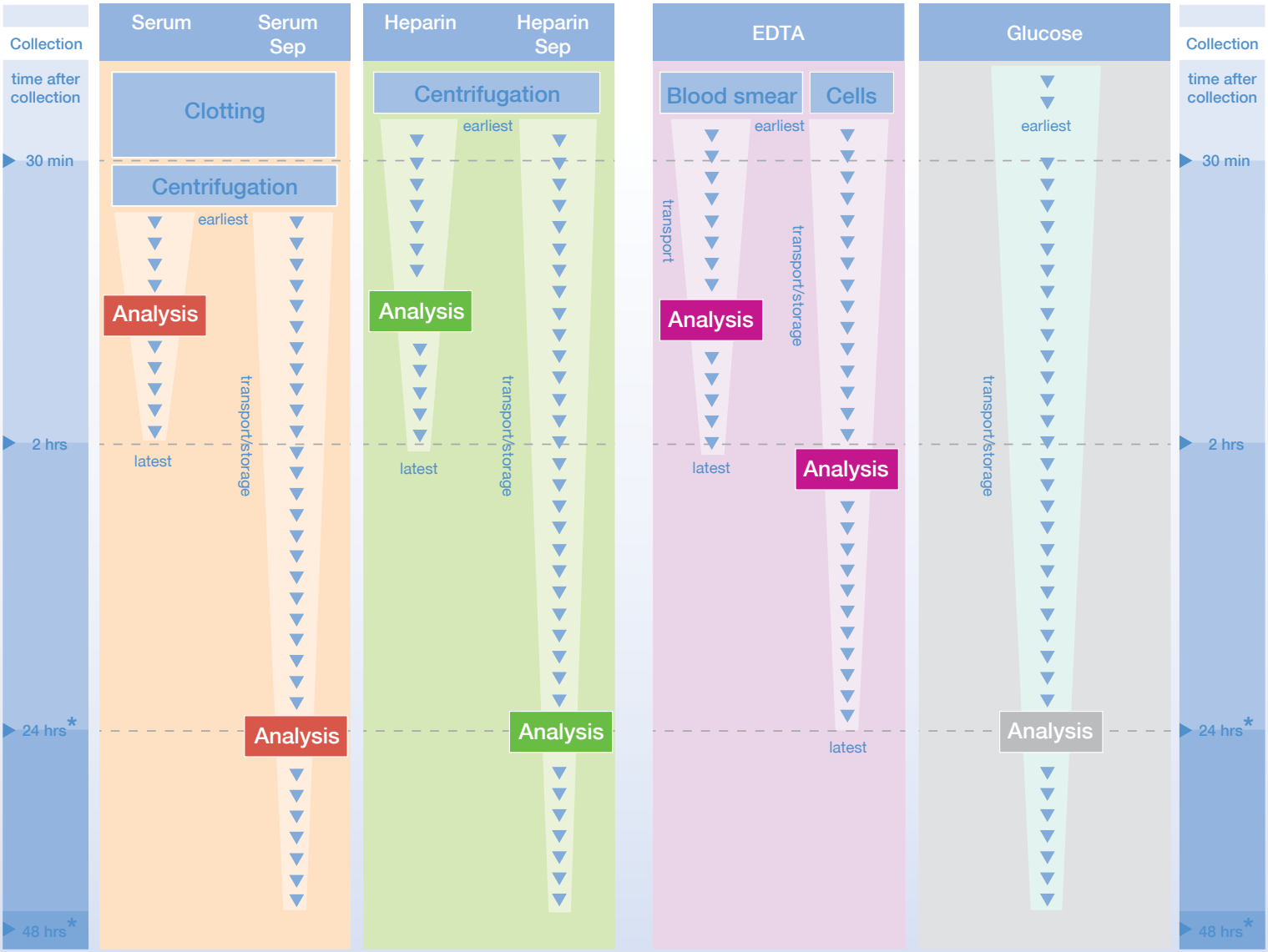
Note: Too long storage of opened tubes can lead to evaporation and therefore false analysis results!

Closing **VACUETTE®** Blood Collection Tubes

1 Place the safety cap on the tube.

2 Press the cap onto the tube with the thumb (so it is firmly seated). **VACUETTE®** PREMIUM Tubes are closed with a short twist movement.

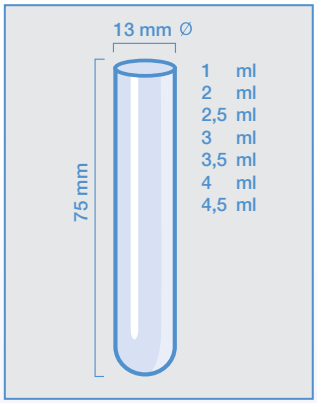
VACUETTE® Handling of Testing Material



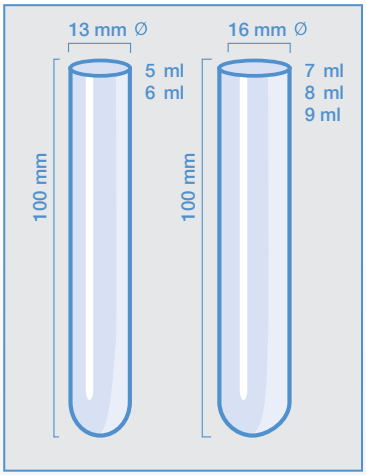
* Please note, analyte stability depends on storage temperature and biological half-life.

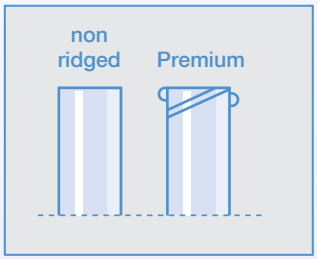
Tube Dimensions

75 mm tubes
specimen volumes



100 mm tubes
specimen volumes





VACUETTE® Safety Caps

Standard cap

16 mm 13 mm

Snap cap

for re-capping
13 mm tubes

- Prevents aerosol effect
- Absolute transport security
- Simple re-capping
- Prevent contact with patient blood

Application Areas for VACUETTE® Tubes

VACUETTE® tube type	Colour-coding of cap	Additive	Intended purpose
Serum		Clot Activator	Determinations in serum for clinical chemistry, microbiological serology, immunology, TDM
Serum Gel		Clot Activator and gel	Determinations in serum for clinical chemistry, microbiological serology, immunology, TDM
Serum Beads		Clot Activator and Beads	Determinations in serum for clinical chemistry, microbiological serology, immunology
Serum Crossmatch		Clot Activator	Determinations in serum for crossmatch testing
Plasma		Sodium Heparin	Determinations in heparinised plasma for clinical chemistry
Plasma		Lithium Heparin Ammonium Heparin	Determinations in heparinised plasma for clinical chemistry
Plasma Gel		Lithium Heparin and gel	Determinations in heparinised plasma for clinical chemistry
EDTA		K2 EDTA K3 EDTA	Determinations in EDTA whole blood for haematology
EDTA Crossmatch		K3 EDTA	Determinations in EDTA whole blood for crossmatch testing
EDTA Gel		K2 EDTA / gel	Determinations in EDTA plasma for molecular biological identification of viruses, parasites and bacteria
Coagulation		Citrate Solution (3.2%) Citrate Solution (3.8%)	Determinations in citrated plasma for coagulation testing
CTAD		CTAD (3.2%)	Determinations in citrated plasma for coagulation testing where the artificial entry of platelet factors into the plasma is avoided
Glucose		Anticoagulant Glycolysis inhibitor	Determinations in stabilised anticoagulated whole blood or plasma for glucose and lactate testing
Trace Elements		Clot Activator Sodium Heparin	Determinations in serum / heparinised plasma for trace elements testing
Blood Grouping		ACD-A ACD-B CPDA	Determinations in ACD / CPDA whole blood for blood grouping

Education and training material

VACUETTE® offers a wide variety of supportive education and training material for the sample collection procedure. Amongst others, these include:

- **VACUETTE®** Tube Summary Chart ..... Art. No. 980015
- **VACUETTE®** Hygiene Compendium ..... Art. No. 980056
- **VACUETTE®** Blood Collection Techniques Booklet ..... Art. No. 980063
- **VACUETTE®** Safety Brochure ..... Art. No. 980124
- **VACUETTE®** Preanalytics Manual ..... Art. No. 980183
- **VACUETTE®** Analyte Chart ..... Art. No. 980196
- **VACUETTE®** GBO Company Product Presentation DVD ..... Art. No. 980434

VACUETTE® Tube Summary Chart

VACUETTE® Hygiene Compendium

VACUETTE® Blood Collection Techniques Booklet

VACUETTE® Safety Brochure

VACUETTE® Preanalytics Manual

VACUETTE® Analyte Chart

VACUETTE® GBO Company Product Presentation DVD

For further information please contact your nearest **VACUETTE®** distributor or visit us on our website **www.gbo.com**

VACUETTE® Blood Collection System An Overview of the Essential Points

Checklist:

Storage conditions in storeroom	4 – 25 °C, protected from direct sunlight
Expiry Date	Not exceeding end of month stated on tube and packaging
Blood collection	According to Instructions for Use
Inversion of tubes immediately after blood collection	**Gently** 8 times (coagulation tubes 4 times)
Waiting period prior to centrifugation of serum tubes	Minimum 30 min.
Visual control of complete coagulation of serum tubes prior to centrifugation	In certain blood samples, the clotting speed in serum tubes may be clearly delayed (i.e. anticoagulant therapy, missing coagulation factor, …) the waiting period prior to centrifugation may be correspondingly delayed
Centrifugation	According to Instructions for Use
Recentrifugation of Sep tubes	Avoid absolutely! Could lead to a change in the analysis results (i.e. potassium)

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980102 rev 08, 01.2012 e