

EXHIBIT A

NEW
VACUTAINER BRAND
TUBES
With
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Hematology Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between the specimen and you

Whether you open and close a specimen tube once or several times, use of VACUTAINER Brand Tubes with HEMOGARD Closure virtually eliminates exposure to the specimen:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Enhanced handling features— inherent in the design

Ridges on the outer surface of the HEMOGARD Closure permit a more secure grip. The special closure design encourages safer opening of the tube by discouraging use of the "thumb roll" technique, which can result in blood splattering. And, the "hooded" feature of the closure reduces the possibility of pinching gloves between stopper and tube when reclosing.



NEW
VACUTAINER BRAND TUBES
WITH
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Chemistry Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between you and the specimen — whether it is serum, plasma or whole blood:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Provides enhanced handling features — inherent in the design

- ridges on the outer surface permit a more secure grip
- special shield design encourages safer opening—discourages use of “thumb roll” technique, which can result in splattering of specimen
- “hooded” feature of closure reduces the possibility of catching glove between stopper and tube on reclosing

Dependable performance — inherent in the name

New VACUTAINER Brand Tubes with HEMOGARD Closure are available in a full line and offer the same special features, quality and reliability you have come to expect.



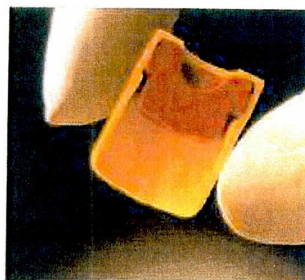
VACUTAINER[®] BRAND TUBES WITH **HEMOGARD[™]** CLOSURE

Your shield against exposure

"All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets."

Engineering control promotes safety

- HEMOGARD[™] Closure puts a splatter barrier between you and the specimen — whether serum, plasma or whole blood
- Shield design is engineered
 - for safer opening, resulting in significantly less splattering of specimen
 - to reduce the possibility of catching glove between stopper and tube when reclosing

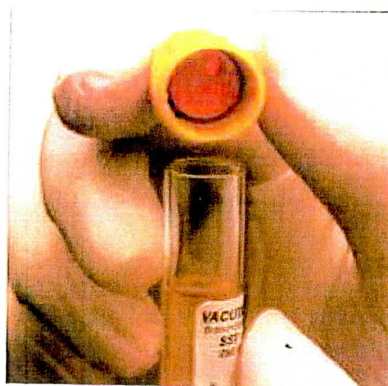


Close-up view illustrates the innovative protective design of the HEMOGARD[™] Closure.

- Ridges on outer surface permit a more secure grip

Greater protection during routine blood-specimen handling

- Reduces contact with blood on the stopper
- Protects against contact with blood around the outer rim of the tube
- Reduces blood splatter when the tube is opened



Greater protection for both chemistry and hematology laboratories



EXHIBIT B



- [Home](#)
- [Company Profile](#)
- [Products](#)
- [Certifications](#)
- [Factory Tour](#)
- [Management](#)
- [Quality Control](#)
- [Services & Support](#)

- [E-mail page](#)
- [Print](#)
- [Bookmark](#)

Frank Healthcare Co. Ltd



Verified
Supplier

[Additional](#)

[Verification Options](#)

Plain and Serum Blood Collection Tubes with Red Color Code



[INQUIRE NOW](#)

[Back to Product Page](#)



- [Home](#)
- [Company Profile](#)
- [Products](#)
- [Certifications](#)
- [Code of Conduct](#)
- [Factory Tour](#)
- [Management](#)
- [Newsroom](#)
- [OEM](#)
- [PDF Catalog \(279k\)](#)
- [Quality Control](#)
- [Services & Support](#)
- [Trade Shows](#)
- [Trading Services](#)
- [Visit Us](#)
- [About us](#)

- [E-mail page](#)
- [Print](#)
- [Bookmark](#)

Jiangyin Liancheng International Trade Co., Ltd.



Verified
Supplier



Credit
Check

[Additional](#)

[Verification Options](#)

Micro Vacuum Blood Collection Tube, Available in Purple, Measuring 10.5 x 45mm



[INQUIRE NOW](#)

[Back to Product Page](#)



[Home](#) > [Products](#) > [Blood collection tubes and serum separator tubes](#)

search:

Products

[Test tubes](#)

[Blood collection tubes and serum separator tubes](#)

[Pipet tips, pasteur pipettes and serology pipettes](#)

[Microbiology products](#)

[Containers](#)

[Instrumentation products](#)

[Slides](#)

[General items for laboratory](#)

Blood collection tubes and serum separator tubes

Blood collection tubes and serum separator tubes are products which must show a high quality and precision in order to be fully effective in phase of analysis. These requirements are obtained thanks to the use of advanced machines and to a finest know-how. Right below, a product overview:



[View all products](#)

Products

[E.S.R. systems](#)

[K2 EDTA tubes](#)

[Automated © tubes with pierceable stopper](#)

[K3 EDTA tubes](#)

[KF+Na2 EDTA tubes \(Potassium Fluoride\)](#)

[Sodium Citrate tubes](#)

[Lithium Heparin tubes](#)

[Sodium Heparin tubes](#)

[Serum separator tubes, with granules](#)

[Serum separator tubes, with gel](#)

[Serum separator tubes, with clot activator](#)

[Print this page](#)



Shanghai Neo-Medical Co. Ltd



Verified
Supplier

[Additional
Verification Options](#)

Vacuum Blood Collection Tubes, Made of Glass or PET, Customer's Specifications are Welcome



[INQUIRE NOW](#)

[Back to Product Page](#)

ecplaza Global
More Trade Chances for You

[Home](#) | [Join now](#) | [Login](#) | [E-mail](#) | [Help](#) | [YES TRUST](#) | [K-Market](#)

[Buy](#)

[Sell](#)

[My Trade Office](#)

[Biz Support](#)

[Trade Mall](#)

[PR News](#)

[Search all suppliers](#) [GO](#)

Ergonomic Pipettes

Ovation BioNatural Pipettes
More Comfort. Less Forces.
www.vistalab.com

Transfer Pipettes

Leading manufacturer of
transfer pipettes & lab products
www.globescientific.com

GenesisBPS

TCD, Tube Sealer, Blood Mixer
Blood Bank & Laboratory
Supplies
www.GenesisBPS.com

GripTips by Viaflo

Easy to attach, Easy to eject
better seal that won't fall off
www.viaflo.com



Ads by Google



Gongdong(China) Medical Plastic Factory

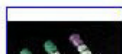
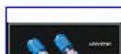
[Inquire Now](#) | [Add to Inquiry Cart](#) | [Trade Leads](#)

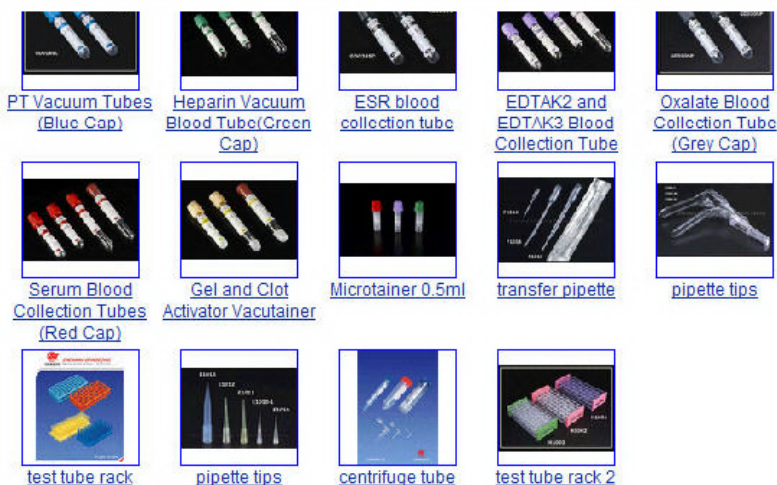
[Company Profile](#) | [Catalog List](#)



With almost 20 years pursuit and unremitting efforts,"Gongdong"as a famous brand for the disposable medical plastic ware, has got sustained, steady, high-speed development. Gongdong have been passed the FDA, CE certification and ISO13485.

 Catalog





Contact Information

Gongdong(China) Medical Plastic Factory

NO.10, Belyuan, Ave., Economic Development Zone, Huangyan, Taizhou, Zhejiang, 318020 China
Taizhou, Zhejiang
China 318020

- **Tel :** 86-576-8408-2906 / 86-576-8425-8000
- **Fax :** 86-576-8405-0789
- **Homepage :** <http://www.china-gongdong.com>

Inquire Now

Contact :

Mr. Handson weiss
, Foreign trading

[Company Profile](#) | [Catalog List](#)

[Inquire Now](#) | [Add to Inquiry Cart](#) | [Trade Leads](#)

[GenesisBPS](#)

TCD, Tube Sealer, Blood Mixer
Blood Bank & Laboratory
Supplies
www.GenesisBPS.com

[Phlebotomy Training](#)

1 Day Hands-On Phlebotomy
Training With National
Certification
www.medtexx.com

[Pipette Calibration](#)

Easy, Powerful, Pipette
Calibration Software for ISO
8655 or ASTM E1154
www.labtronics.com/DI/pipette.html

[Phlebotomy](#)

Move your career forward with
an accredited online degree!
www.CourseAdvisor.com



Powered by EC Plaza

[Home](#) | [Buy](#) | [Sell](#) | [My Trade Office](#) | [Biz Support](#) | [Trade Mall](#) | [PR News](#)
Created by the "Home Page Generator" A free service of [EC PLAZA](#)

Ads by Google

Visitors: **000586**



“ Ultimate
Solutions for
blood collection?
Stop
looking!”

LEN-MED MEDICAL PRODUCTS

Products

Blood tubes | ESR Tubes | Needles | ESR Analyzers | Pregnancy Tests
| Arterial Vein Tubing | AV Fistula | Coagulation

[HOME](#) ■
[ABOUT US](#) ■
[NEWS](#) ■
[CATALOGUE](#) ■
[CONTACT US](#) ■

BLOOD COLLECTION TUBES



Plain Tubes:

The inside wall of the tube has been uniformly coated with a special medicament that will keep the tube clear off sticking substance. This red tube is mainly for serum biochemical test. The function of Coagulating Accelerator is to favor hematopexis. Tube with Coagulating Accelerator can be applied in case that a quick result is preferred.

Cat. No	Type	Volume	Size
---------	------	--------	------

VP9013	Plastic	9ml	16x100mm
VP6012	Plastic	6ml	13x100mm
VP4011	Plastic	4ml	13x75mm



Gel Tubes:

Inside of tubes silicon and activator coated.
Gel forms a barrier between serum and plasma.

Cat. No	Type	Volume	Size
VP8033	Plastic	8ml	16x100mm
VP5032	Plastic	5ml	13x100mm
VP3531	Plastic	3.5ml	13x75mm



EDTA Tubes:

In blood routine examination, EDTA anticoagulant compared with other anticoagulant, exerts a less influence on the agglutination of blood cells and cellular morphology. Therefore EDTA salt (2K, 3K, 2Na) is generally used as anticoagulant. EDTA salt tends to combine with calcium ion in the blood and generate a chelate complex to prevent hematopexis.

3 ml tubes 7.5% (0.18M)

4ml tubes and above 15% (0.369M)

Cat. No	Type	Volume	Size
VP3081	Plastic/Glass	3ml	13x75mm
VP4081	Plastic/Glass	4ml	13x75mm



Sodium Citrate Tubes:

The blue tube contains preset sodium citrate at a concentration of 3.2% or 3.8%, which mainly functions upon fibrinolytic system (thrombinogen time, thrombin time, activated thrombinogen time and fibrinogen). Please see to collecting enough blood to guarantee the

to collecting enough blood to guarantee the accuracy of the testing result. Please invert gently 5 to 8 times after blood collection.

Buffered citrate solution is used as an anticoagulant for coagulation studies.
0.105 M : %3.2 Sodium Citrate + Citric Acid pH=5.2

Cat. No	Type	Volume	Size
VP1871	Plastic/Glass	1.8ml	13x75mm
VP2771	Plastic/Glass	2.7ml	13x75mm



Lithium Heparin and Sodium Heparin Tubes:

The interior of the tube wall is coated with lithium heparin, ammonium heparin or sodium heparin. The anticoagulant heparin activates antithrombins, thus blocking the coagulation cascade and producing a whole blood / plasma sample instead of clotted blood plus serum. Plasma tubes with lithium heparin and gel contain a barrier gel in the tube. The specific gravity of this material lies between that of the blood cells and plasma. During centrifugation the gel barrier moves upwards providing a stable barrier separating the plasma from cells. Plasma may be aspirated directly from the collection tube, eliminating the need for manual transfer to another container. This barrier allows for the stability of certain parameters in the primary tube under the recommended storage conditions for up to 48 hours. Lithium determinations should not be performed in VACUPLUS® Lithium Heparin tubes. Ammonium determinations should not be performed in VACUPLUS® Ammonium Heparin tubes.

Cat. No	Type	Volume	Size
VP9043	Lithium Heparin	9ml	16x100mm
VP6042	Lithium Heparin	6ml	13X100mm
VP4041	Lithium Heparin	4ml	13x75mm
VP8063	Lit.Hep. Gel	8ml	16x100mm
VP5062	Lit.Hep. Gel	5ml	13x100mm

VP3561	Lit.Hep. Gel	3.5ml	13x75mm
VP9053	Sodium Heparin	9ml	16x100mm
VP6052	Sodium Heparin	6ml	13x100mm
VP4051	Sodium Heparin	4ml	13x75mm



Glucose Tubes:

Glucose tubes are available with different additives. The tubes contain an anticoagulant and a stabilizer, i.e. EDTA and sodium fluoride / potassium oxalate and sodium fluoride / sodium heparin and sodium fluoride / lithium heparin and iodoacetate. VACUPLUS® glucose tubes are suitable for the analysis of blood sugar and lactate.

Cat. No	Type	Volume	Size
VP5091	Plastic/Glass	3ml	13x75mm



ESR Tubes:

ESR tubes contain a 3.2% buffered tri-sodium citrate solution (0.129 mol/l). The mixing ratio is 1 part citrate solution to 4 parts blood. VACUPLUS® ESR tubes are used for the collection and transport of venous blood for blood sedimentation rate testing. ESR measurements refer to the Westergren method.

Cat. No	Type	Volume	Size
VP5091	Plastic/Glass	3ml	13x75mm



Trademark Snap Shot Amendment & Mail Processing Stylesheet
(Table presents the data on Amendment & Mail Processing Complete)

OVERVIEW

SERIAL NUMBER	77254637	FILING DATE	08/14/2007
REG NUMBER	0000000	REG DATE	N/A
REGISTER	PRINCIPAL	MARK TYPE	TRADEMARK
INTL REG #	N/A	INTL REG DATE	N/A
TM ATTORNEY	HETU, JENNIFER M	L.O. ASSIGNED	108

PUB INFORMATION

RUN DATE	04/25/2008		
PUB DATE	N/A		
STATUS	661-RESPONSE AFTER NON-FINAL-ACTION-ENTERED		
STATUS DATE	04/24/2008		
LITERAL MARK ELEMENT			
DATE ABANDONED	N/A	DATE CANCELLED	N/A
SECTION 2F	YES	SECTION 2F IN PART	NO
SECTION 8	NO	SECTION 8 IN PART	NO
SECTION 15	NO	REPUB 12C	N/A
RENEWAL FILED	NO	RENEWAL DATE	N/A
DATE AMEND REG	N/A		

FILING BASIS

FILED BASIS		CURRENT BASIS		AMENDED BASIS	
1 (a)	YES	1 (a)	YES	1 (a)	NO
1 (b)	NO	1 (b)	NO	1 (b)	NO
44D	NO	44D	NO	44D	NO
44E	NO	44E	NO	44E	NO
66A	NO	66A	NO		
NO BASIS	NO	NO BASIS	NO		

MARK DATA

STANDARD CHARACTER MARK	NO
LITERAL MARK ELEMENT	

MARK DRAWING CODE	2-AN ILLUSTRATION DRAWING WITHOUT ANY WORD(S)/LETTER(S)/NUMBER(S)
COLOR DRAWING FLAG	NO

CURRENT OWNER INFORMATION

PARTY TYPE	10-ORIGINAL APPLICANT
NAME	Becton, Dickinson and Company
ADDRESS	1 Becton Drive Franklin Lakes, NJ 07417
ENTITY	03-CORPORATION
CITIZENSHIP	New Jersey

GOODS AND SERVICES

INTERNATIONAL CLASS	010
DESCRIPTION TEXT	closures for medical collection tubes

GOODS AND SERVICES CLASSIFICATION

INTERNATIONAL CLASS	010	FIRST USE DATE	09/30/1989	FIRST USE IN COMMERCE DATE	09/30/1989	CLASS STATUS	6-ACTIVE
---------------------	-----	----------------	------------	----------------------------	------------	--------------	----------

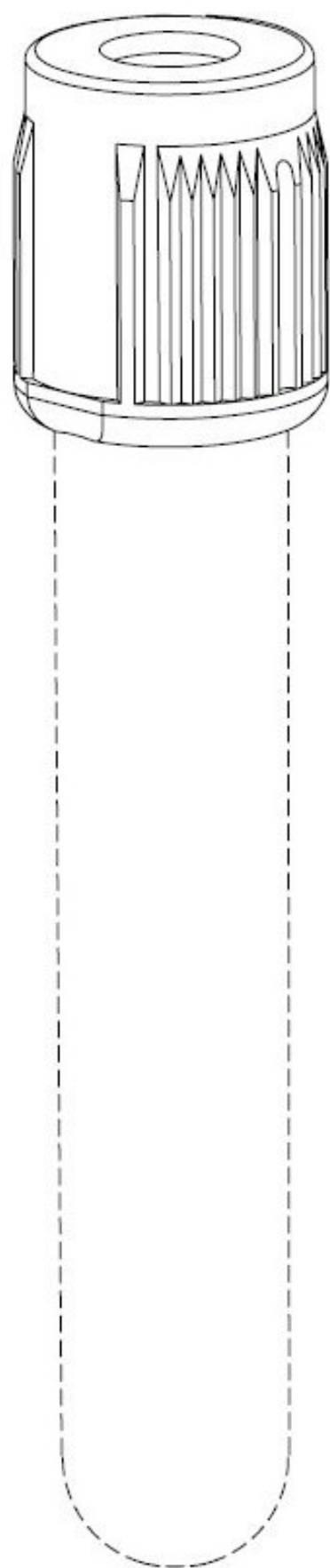
MISCELLANEOUS INFORMATION/STATEMENTS

CHANGE IN REGISTRATION	NO
COLORS CLAIMED STATEMENT	Color is not claimed as a feature of the mark.
DESCRIPTION OF MARK	The mark consists of a configuration of a closure for medical collection tubes. The matter in dotted lines is not claimed as a feature of the mark, but shows the tube on which the closure is positioned.

PROSECUTION HISTORY

DATE	ENT CD	ENT TYPE	DESCRIPTION	ENT NUM
04/24/2008	ACEC	I	AMENDMENT FROM APPLICANT ENTERED	009
04/24/2008	CRFA	I	CORRESPONDENCE RECEIVED IN LAW OFFICE	008
04/24/2008	ALIE	A	ASSIGNED TO LIE	007
04/21/2008	MAIL	I	PAPER RECEIVED	006
10/18/2007	CNRT	F	NON-FINAL ACTION MAILED	005
10/17/2007	CNRT	R	NON-FINAL ACTION WRITTEN	004
10/03/2007	DOCK	D	ASSIGNED TO EXAMINER	003

08/18/2007	MDSC	O	NOTICE OF DESIGN SEARCH CODE MAILED	002
08/17/2007	NWAP	I	NEW APPLICATION ENTERED IN TRAM	001
CURRENT CORRESPONDENCE INFORMATION				
ATTORNEY			Mark D. Engelmann	
CORRESPONDENCE ADDRESS			MARK D. ENGELMANN FROSS ZELNICK LEHRMAN & ZISSU, P.C. 866 UNITED NATIONS PLZ NEW YORK, NY 10017-1822	
DOMESTIC REPRESENTATIVE			NONE	



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Becton, Dickinson and Company :
Serial No: 77/254,637 : Jennifer M. Hetu
Filed: August 14, 2007 : Examining Attorney
Mark: Miscellaneous Design : Law Office 108
Our Ref: BEC 0707220 :

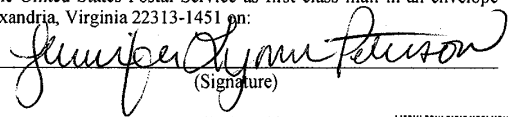
RESPONSE TO OFFICE ACTION

Commissioner for Trademarks
P.O. Box 1451
Alexandria, Virginia 22313-1451

This is in response to the Office Action dated October 18, 2007.

AMENDMENTS

Applicant asserts that its mark, which consists of the external design of a closure for medical collection tubes ("the Mark"), has acquired distinctiveness under Section 2(f) of the Trademark Act, 15 U.S.C. Section 1052(f). Applicant submits herewith a declaration showing actual evidence of acquired distinctiveness (37 C.F.R. §2.41(a), TMEP § 12.12.06), to supplement its prior submission of acquired distinctiveness based on a substantially exclusive and continuous use in commerce for five years (37 C.F.R. § 1.41(b), TMEP §1215.05).

(F0269912.1) Certificate of First Class Mailing	
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Commissioner for Trademarks, P.O. Box 1451, Alexandria, Virginia 22313-1451 on:	
April 18, 2008 (Date of Deposit)	 (Signature)
Jennifer Lynn Peterson (Printed name of person mailing paper or fee)	April 18, 2008 (Date of Signature)



04-21-2008

REMARKS

In the Office Action, the Examining Attorney has refused registration of the Mark on two grounds, namely:

1) Section 2(e)(5) of the Trademark Act, 15 U.S.C. Section 1052(e)(5), based on the contention that Applicant's Mark is *per se* functional and, hence, ineligible for registration; and,

2) Applicant's Mark assertedly represents a non-distinctive configuration of the goods named, and therefore does not function as a trademark under Sections 1, 2 and 45 of the Trademark Act, 15 U.S.C. §§1051, 1052 and 1127.

The Examining Attorney also required that Applicant provide information in the nature of statements or evidence: 1) demonstrating whether the Mark was the subject of a design or utility patent; 2) consisting of advertising concerning the configuration depicted in the Mark; 3) demonstrating whether alternative competitive designs are available; and 4) demonstrating whether the configuration depicted in the Mark represents a simple or inexpensive method of manufacture. Applicant addresses each of these requests for information in its arguments below, and in evidence provided with its response, including evidence in its Section 2(f) declaration.

As to the first ground for rejection, under Section 2(e)(5), Applicant submits that its Mark is not functional. As to the second ground for rejection, under Sections 1, 2 and 45 of the Trademark Act, based on the contention of non-distinctiveness, Applicant asserts, without comment as to the propriety of such rejection, that this basis is mooted by Applicant's amendment to seek registration under Section 2(f) of the Trademark Act,

based on a showing of acquired distinctiveness supported by a signed declaration (“Declaration”), and accompanying materials, to this effect.

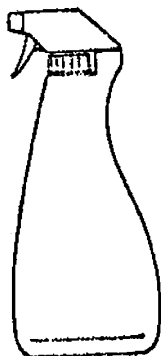
Section 2(e)(5) Rejection Based on Functionality as a Whole

The Examiner has concluded that the mark “appears to be functional for the identified goods due to the fact that Applicant’s goods keep substances within medical collection tubes.” Similarly, the Office Action states, “The particular features of this proposed mark, namely, the circular closure, [are] functional for the goods because the closure is utilitarian – it serves a purpose. More specifically, the closure acts as a lid to keep substances within a medical collection tube.” *Office Action*, pp. 1-2. We respectfully submit that these statements conflate the utilitarian purpose of the product with the non-functional features of the *design* of the product. It is the non-functional design features that Applicant seeks to register. This distinction was made clear by Judge Rich in his seminal decision, *In re Morton-Norwich Products, Inc.*:

We wish to make it clear...that a discussion of ‘functionality’ is always in reference to the design of the thing under consideration (in the sense of its appearance) and not the thing itself. [citations omitted] No doubt, by definition, a dish always functions as a dish and has its utility, but it is the appearance of the dish which is important in a case such as this...

In re Morton-Norwich Products, Inc., 213 U.S.P.Q. 9, 13 (C.C.P.A., 1982).

In *Morton-Norwich*, the CCPA reversed a finding of functionality as to the following container design:



In so doing, Judge Rich said:

[i]n the first place, a molded plastic bottle can have an infinite variety of forms or designs and still function to hold liquid. No one form is necessary or appears to be 'superior.' Many bottles have necks, to be grasped for pouring or holding, and the necks likewise can be in a variety of forms. The PTO has not produced one iota of evidence to show that the shape of appellant's bottle was required to be as it is for any de facto functional reason, which might lead to an affirmative determination of de jure functionality.

In re Morton-Norwich, 213 U.S.P.Q., at 16 (emphasis original).

The spray bottle in the Morton-Norwich case also served a purpose and functioned as a container, but this was irrelevant to the functionality consideration and had no bearing on the registerability of the *particular design* of the spray bottle exhibited by the mark applied for. As there, Applicant here is seeking registration of the design of its cap, i.e., its appearance and the impression created by it, apart from the utilitarian purpose for the product that bears that design.

In evaluating registration of that design under Section 2(e)(5), the above principles and precedent are considered along with the question of whether the design “is essential to the use or purpose of the [product] or if it affects the cost or quality of the [product].” *Inwood Labs, Inc., v. Ives Labs., Inc.*, 456 U.S. 844, 851, n. 10, 214 U.S.P.Q. 1, 4 n. 10 (1982). However, as the Office Action recognizes, when “the specific product

or container configuration at issue provides no real utilitarian advantages to the user, but rather is simply one of many equally feasible, efficient and competitive designs, that the mark may be registerable.” *Office Action*, p. 2. Applicant submits that its design, as a whole¹, provides no real utilitarian advantages to a user and is one of many equally feasible designs. The mark is therefore registerable, and the refusal to register should be withdrawn. *In re Morton-Norwich Products, Inc.* supra.

The factors set out in *Morton-Norwich* are to be considered to determine functionality, and hence, ineligibility for registration. These factors are:

- (1) The existence of a utility patent that discloses the utilitarian advantages of the design sought to be registered;
- (2) Advertising by the applicant that touts the utilitarian advantages of the design;
- (3) Facts pertaining to the availability of alternative designs; and
- (4) Facts pertaining to whether the design results from a comparatively simple or inexpensive method of manufacture

In re Morton-Norwich Products, Inc. supra, at 15-16.

First, Applicant is the owner of three utility patents directed to closure caps. These are enclosed at Exhibit A of this response. None, however, claim any of the surface features depicted in the drawing of the Mark. Indeed, two patents, Patent Nos. 4,741,446 and 4,991,104, illustrate no external features of a closure cap. Similarly, Patent No. 6,602,206, while including drawings that illustrate the external cap (see Figures 1 and 6), does not claim any external design features of the cap depicted in

¹ Under Section 2(e)(5), a mark is functional only if “as a whole” it is functional. 15 U.S.C. Section 1052(e)(5). Thus, a design that has some functional or utilitarian aspects to it, but is not functional “as a whole” is not legally functional under Section 2(e)(5).

Applicant's Mark, but simply claims a "cap body" having an "outer wall surface" and a "top surface" of no particular shape, texture, size or features. A "cap body," an "outer wall surface" and a "top surface," are, moreover, common to every kind of closure cap, regardless of its appearance or design. As such, the claim is to the article, not to the design features Applicant has applied to register here.

As with the earlier patents, the '206 patent and its sole claim are mainly directed to the interior portions of the cap, comprising stopper and body, which are not shown or included in Applicant's drawing of the Mark. In contrast, the Mark consists of a distinctive surface design of its cap, creating an impression separate and apart from the utilitarian advantages of the assembly contained within the cap. The surface design features are not dictated by such utilitarian advantages. In other words, the surface design features do not serve the utilitarian purpose to "keep substances within medical collection tubes." Applicant's patents therefore disclose no utilitarian features or advantages to the Mark.

Moreover, at least three *design* patents owned by Applicant claim and disclose similar closure caps, including ridges, flanged and ringed elements (see Exhibit B). Although these closure caps are somewhat different in their appearance and features from the Mark, the existence of relevant *design* patents is itself a factor that weighs against a finding of functionality, since design patents protect only ornamental and non-functional features. T.M.E.P. Section 1202(a)(v)(A), see also *In re Morton-Norwich Products, Inc.* 213 U.S.P.Q. 9, 17 (CCPA, 1982) ("It is interesting to note that appellant also owns design patent 238,655 for the design at issue, which, at least presumptively, indicates that the design is not de jure functional.") These design patents further demonstrate that

Applicant's caps exhibiting such surface features are, *as a whole*, ornamental and non-functional in nature, resulting from design choices and developments involving customer perception and appeal and were not dictated by functional or utilitarian advantages.

With respect to Applicant's advertising of its closure cap products, the closure caps are typically sold along with the collection tubes as a unit. Samples of product advertising are included with Applicant's Section 2(f) Declaration and further copies are provided here at Exhibit C. It is plain from these advertisements that Applicant's closure cap designs are prominently placed and shown and are readily perceptible to potential customers. This is intentional. Such advertising is meant to be the equivalent of "look for" advertising (see Declaration, ¶ 7), in maximizing the potential exposure of the cap design to potential customers. In this, Applicant extols its immediately identifiable and distinctive cap design and associates this with expectations of quality and superior performance rendered by other attributes of the product, but which are not depicted in the Mark. Thus, the design features of the Mark are not dictated by the use and purpose of the product.

Although Applicant's advertising describes utilitarian advantages of its products, these advantages are all in the internal elements of the cap. In a number of instances, where the advantages of the cap are described, the cap is turned over or shown in cutaway view by the accompanying photos (See Exhibit C). Applicant submits that the interior assemblies of its cap provide a superior method of blood collection but that its promotional materials also clearly market the cap by their non-functional external design features, which create an attractive design and ornamental impression. It is therefore clear that Applicant's advertising does not tout the utilitarian advantages of the specific

design applied for, that the design is not functional and its shape and dimensions are not as a whole dictated by utilitarian purposes. The Mark is therefore capable of registration.

Applicant's designs are highly successful and as a result Applicant has been the victim of attempts by others to closely approximate, if not completely copy, its closure cap design to trade on the fame and goodwill of its distinctive shape and features, and its immediate recognition in the marketplace. Unfortunately, then, the majority of other designs encountered by Applicant tend to reflect, or border on, instances of unfair competition. Such situation has impelled Applicant to seek registration of its closure cap and to file this application.

Nevertheless, over the years since Applicant first offered its design in the marketplace, Applicant has encountered alternative designs for specimen cap closures. For example, printouts of websites (Exhibit D) show closure caps used for blood collection tubes that vary considerably from the Mark in their shapes, sizes, and features. For example, the MICRO VACUUM BLOOD COLLECTION TUBE shown on the website at:

<http://jyliancheng.manufacturer.globalsources.com/si/6008824819398/pdtl/Medical-examination/1005080946/Micro-Vacuum-Blood-Collection-Tube.htm>

clearly shows a squat design, with oval shaped top and large protruding lower flange, above which is a short and continuous band of ridges. This is clearly distinguishable from the Applicant's Mark. A cap on a Safe-T-Fill collection tube from Ram Scientific is likewise squat with a band of ridges extending completely around the periphery, and with a uniformly cylindrical shape. Again, Applicant's design is clearly different and distinguishable. Moreover, the VACUETTE cap on the website at www.bloodtubes.com

exhibits a shorter stature with a thinner flanged ring at the bottom and wider ringed top surface than Applicant's design. Thus, Applicant's Mark is clearly not the only design for a cap closure available.

Moreover, Applicant's Mark does not reflect any simple or inexpensive manufacturing method. Indeed, preparation and development of Applicant's design was done with a painstaking attention to detail and overall form and visibility. Applicant sought to create a distinctive overall look, such that all elements were proportioned and streamlined. Mass production of any product is always a design concern, but Applicant's Mark was not dictated by the objective of cheaper and/or more simple manufacture.

In all, and considering all of the applicable *Morton-Norwich*, factors as well as the standard under Section 2(e)(5) governing its application, applicant respectfully requests the refusal to register be reconsidered and withdrawn.

Rejection Based on Sections 1, 2 and 45

With respect to the refusal to register based on "non-distinctive configuration of goods" under Sections 1, 2 and 45 of the Trademark Act, 15 U.S.C. §§ 1051, 1052 and 1127, Applicant was invited to provide evidence showing that its mark has acquired distinctiveness in order to support registration under Section 2(f) of the Trademark Act, 15 U.S.C. §1052(f). As stated in the Office Action, the following factors are generally considered in assessing Section 2(f) acquired distinctiveness claims insofar as the evidence submitted reflects:

- 1) the length and exclusivity of use by the Applicant;
- 2) the type, expense, and amount of advertising of the mark; and/or

3) Applicant's efforts to associate the mark with the source of the goods identified in the application. *See Office Action, p. 5.*

No single factor is determinative. *In re Steelbuilding.com*, 75 U.S.P.Q.2d 1420, 1424 (Fed Cir 2005).

With the above in mind, Applicant seeks registration of its Mark under Section 2(f) and encloses a Declaration of Acquired Distinctiveness under Section 2(f) and its supporting exhibits. This evidence details Applicant's long use of its Mark (since 1989—see Declaration ¶ 2) and substantial amounts in sales and promotional expenditures, reflecting over five billion units sold. The evidence also shows sales in excess of four hundred million dollars (\$400,000,000), and advertising and promotional expenditures in excess of \$7,500,000 over the past five years (Declaration, ¶ 3-4, sales and promotional expenditures given in yearly averages over five years). The declaration also references and attaches examples of advertisements that each prominently show Applicant's Mark and use it to attract customers and to identify and distinguish Applicant's goods (Declaration, ¶ 5). The declaration also attests to a design excellence award Applicant's cap design received in 1990 reflecting recognition of Applicant's mark by others in the field (Declaration, ¶ 6-7). Applicant submits its acquired distinctiveness evidence is both substantial and sufficient to entitle it to a registration.

Applicant's showing clearly meets the thresholds previously deemed sufficient by the USPTO. In *In re Black & Decker Corp.*, 81 U.S.P.Q.2d 1841 (TTAB, 2006), where registration of a key head design was at issue, the Board reversed the examining attorney and found Applicant had established acquired distinctiveness based on twenty-four years of continuous use and its showing of "substantial" sales and advertising expenditures –

reflecting sales in the hundreds of millions of dollars and advertising expenditures in the millions over five years. As the record here shows, Applicant's acquired distinctiveness showing here is also substantial. Applicant has used its mark continuously for over eighteen years and its sales for the past five years have been in the hundreds of millions of dollars (while averaging over 1.5 million dollars in annual promotional expenditures over that time).

Moreover, Applicant's showing here includes advertising samples vividly illustrating and highlighting its Mark as an appealing and distinctive feature of Applicant's product (Declaration, ¶ 5, and Declaration Exhibit A). The prominent picturing and featuring of Applicant's Mark on these samples ensure that consumers view it in source identifying terms. See *Fabrication Enters. v. Hygenic Corp.* 35 U.S.P.Q.2d 1753 1759 n. 9 (2nd Cir. 1995); see also *In re Days-Ease Home Products Corp.*, 197 U.S.P.Q. 566, 568 (TTAB 1977) (applicant's advertising samples of record "made an effort to thrust the container to the fore...so as to project a commercial image that will remain with the consumer;" refusal based on lack of distinctiveness reversed)

Applicant submits that its substantial showing of acquired distinctiveness, supported by ample evidence, demonstrates that the Mark is registerable under Section 2(f) of the Trademark Act, 15 U.S.C. § 1052(f). The refusal based on non-distinctiveness should therefore be reconsidered and withdrawn.

CONCLUSION

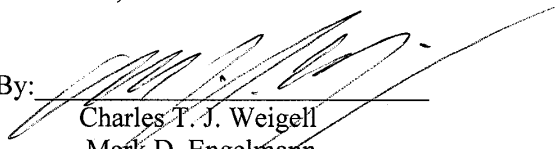
Based on the above, Applicant requests that this application be passed for publication.

Dated: New York, New York
April 18, 2008

Respectfully submitted,

FROSS ZELNICK LEHRMAN
& ZISSU, P.C.

By: _____


Charles T. J. Weigell
Mark D. Engelmann
Richard Z. Lehv
Attorneys for Applicant
866 United Nations Plaza
New York, New York 10017
(212) 813-5900

EXHIBIT

A



(10) **Patent No.:** US 6,602,206 B1
(45) **Date of Patent:** Aug. 5, 2003

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,441,951	A	4/1984	Christinger	156/245
4,741,446	*	5/1988	Miller	215/247
4,967,919	A	11/1990	Earhart	215/247
5,060,659	A	10/1991	Cook et al.	128/764
5,361,921	A	11/1994	Burns	215/320
5,779,924	*	7/1998	Burns	215/247
2001/0020607	A1	9/2001	Chiarin	215/247

* cited by examiner

Primary Examiner—Max F. Hindenburg

Assistant Examiner—Pamela L. Wingood

(74) *Attorney, Agent, or Firm*—Nanette S. Thomas, Esq.;
Scott J. Rittman, Esq.

(57) **ABSTRACT**

The present invention is a stopper and shield closure assembly 16 millimeter (mm) fluid collection tube whereby the 16 millimeter tube is compatible with conventional needle holders.

1 Claim, 9 Drawing Sheets

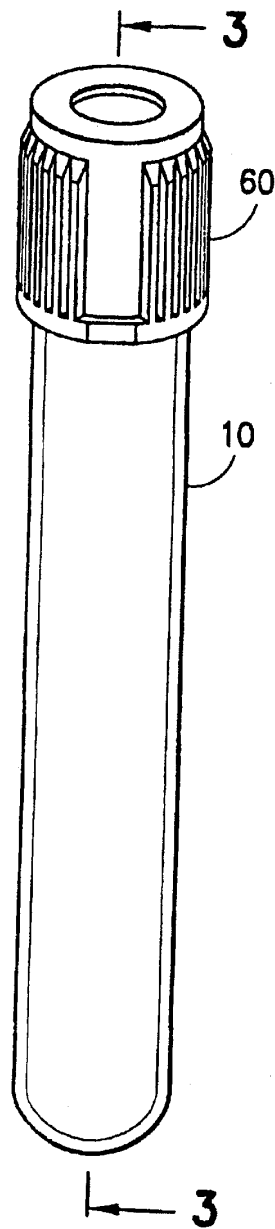


FIG. 1
PRIOR ART

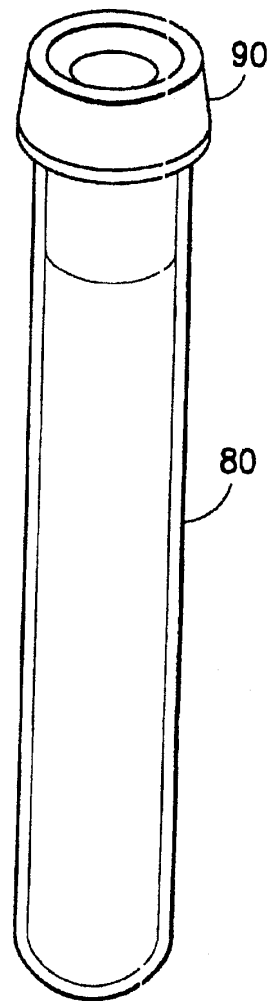


FIG. 2
PRIOR ART

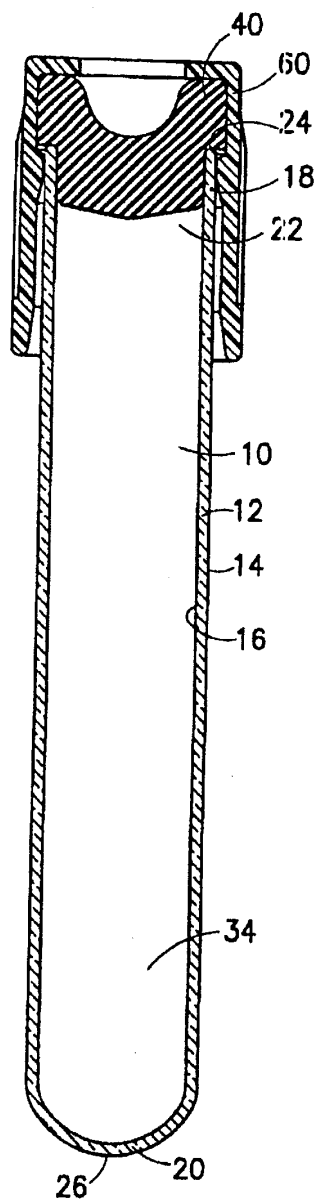


FIG.3
PRIOR ART

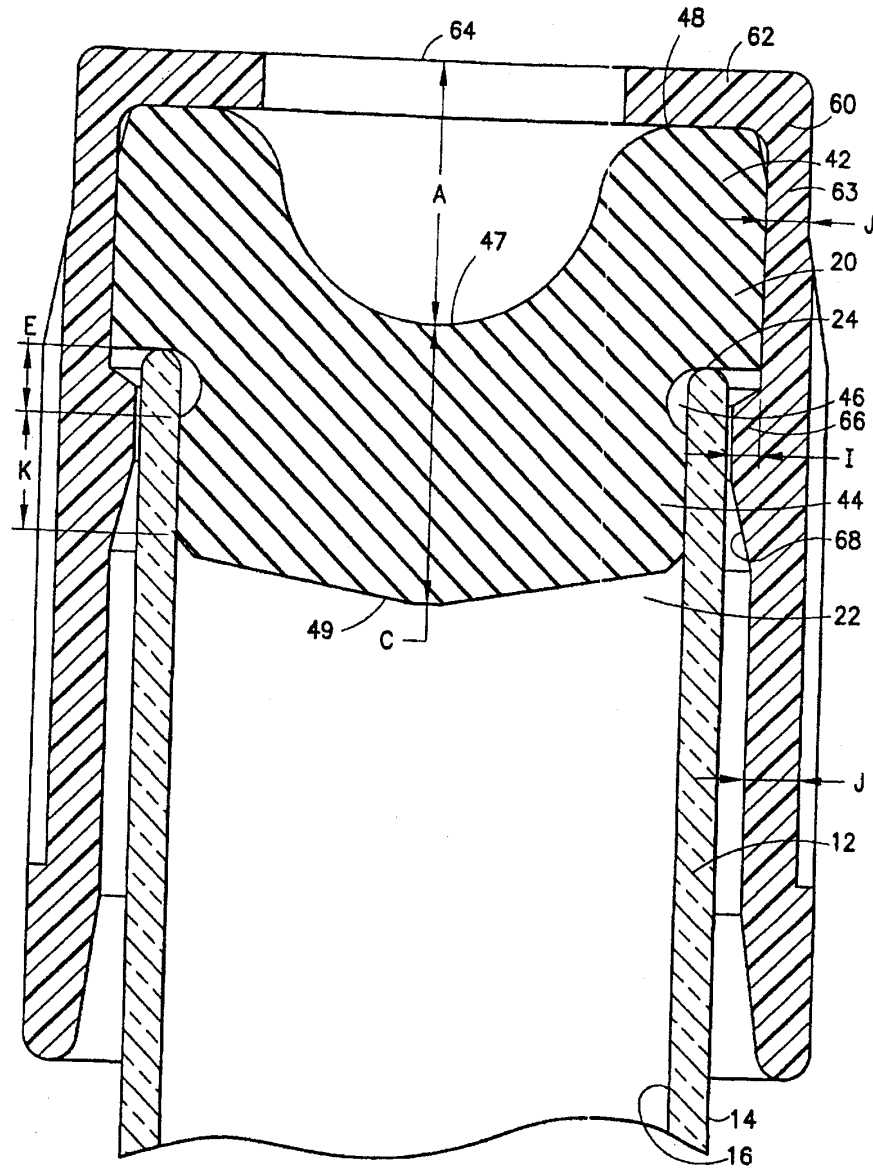


FIG. 4
PRIOR ART

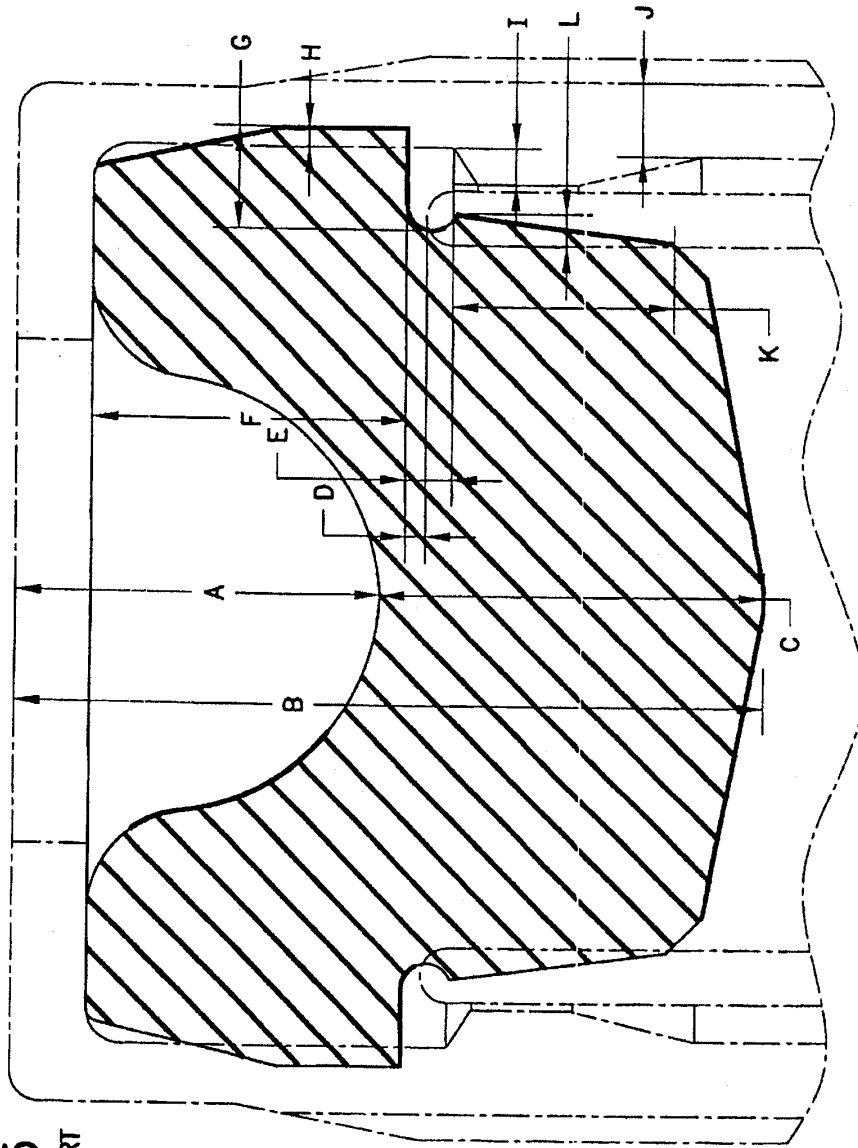


FIG. 5
PRIOR ART

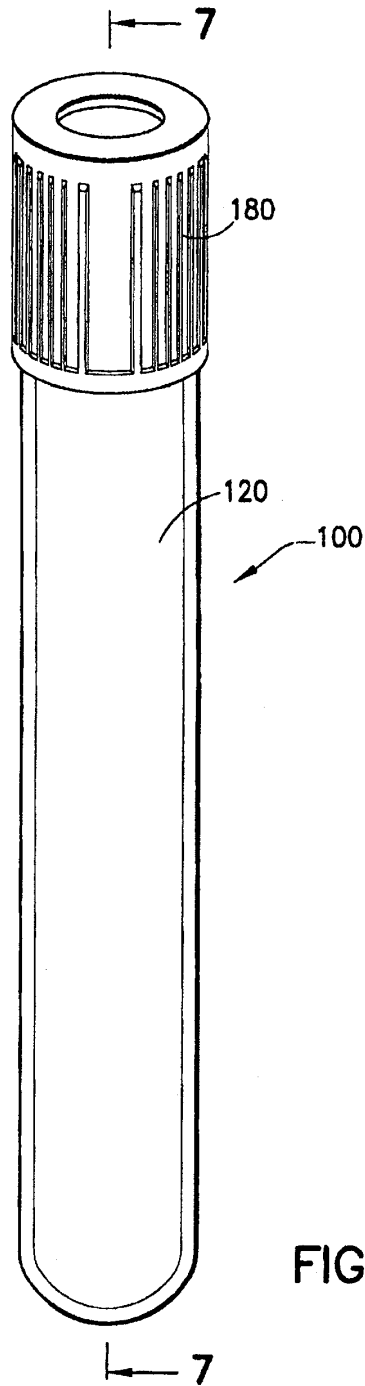


FIG. 6

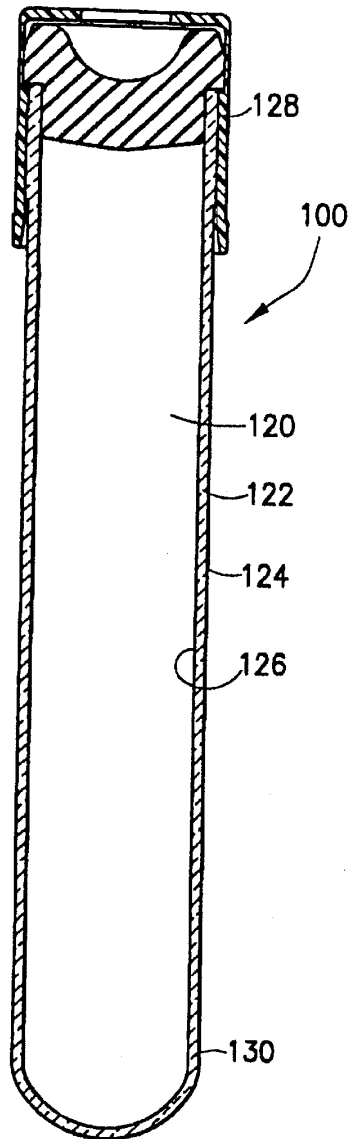


FIG. 7

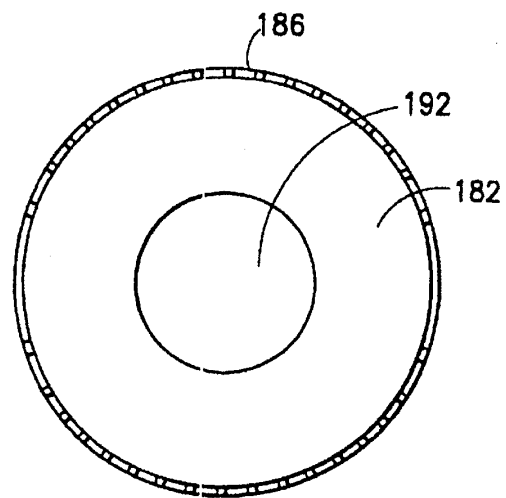


FIG. 8

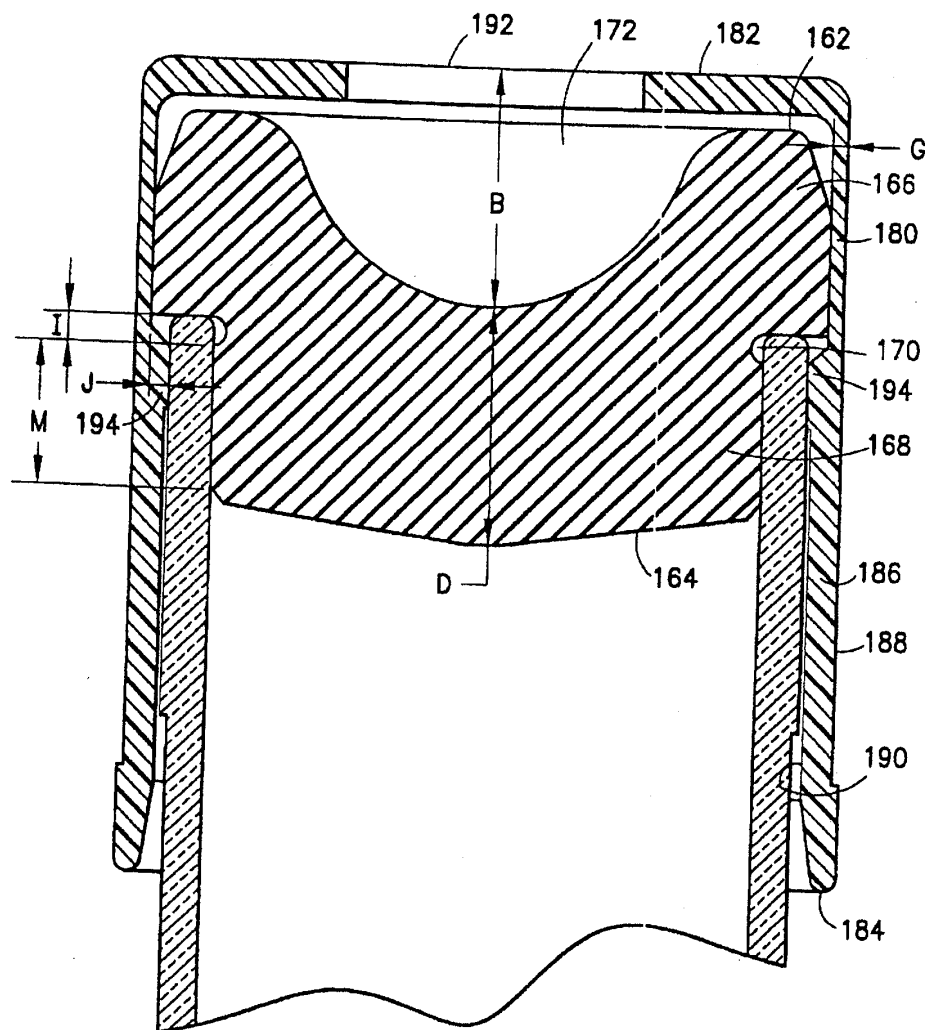


FIG. 9

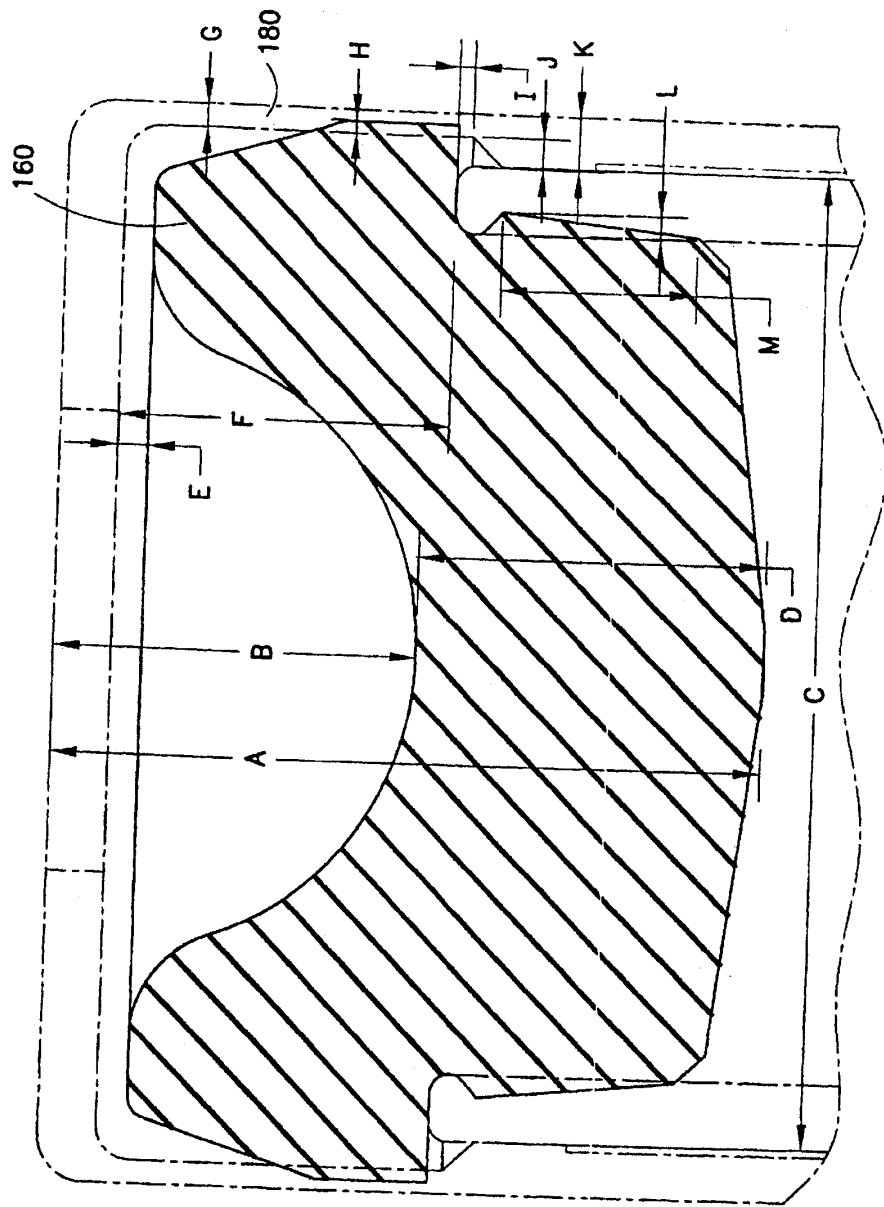


FIG. 10

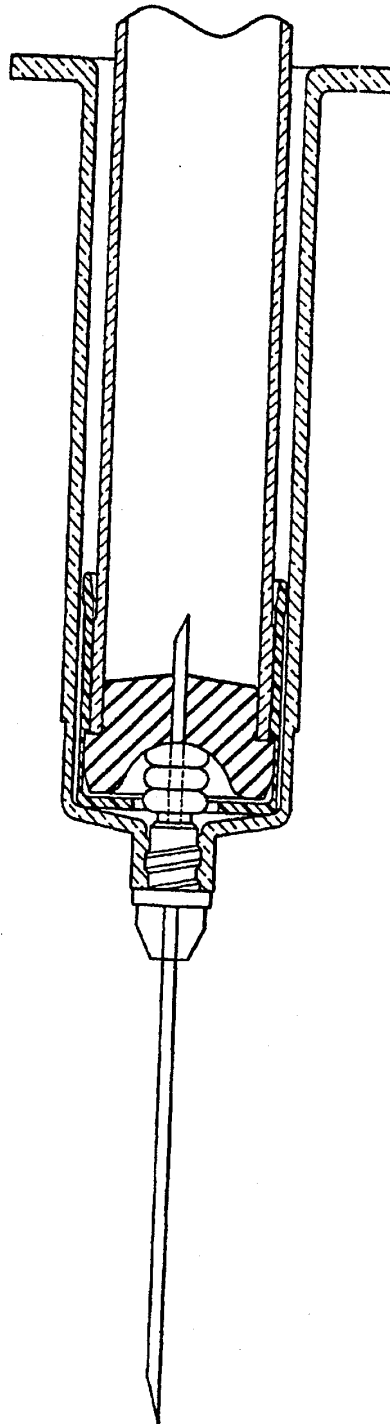


FIG.11

1

STOPPER-SHIELD ASSEMBLY

This application claims benefit of provisional application 60/149,580 filed Aug. 18, 1999.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates to a stopper and shield closure for fluid collection tubes and more particularly to a stopper and shield closure assembly for 16 millimeters (mm) fluid collection tubes.

2. Description of Related Art

An evacuated blood collection tube is commonly used by a doctor, phlebotomist or nurse to draw a sample of body fluids from a patient in a hospital or doctor's office for diagnostic testing. During the use of such a tube, a double-ended needle that is attached to a needle holder, is inserted in a vein of the patient, and the closure end of the evacuated tube is inserted into the open end of the holder until the needle in the holder pierces the tube's closure. The blood collection tube contains a vacuum that then draws a body fluid sample from the patient into the tube. Therefore, it is important for the closure on the tube to fit securely on the open end of the tube and maintain the vacuum in the tube before, during and after the blood collection procedure.

Currently, closures for 13 millimeter or less evacuated blood collection tubes may include plastic shields containing a rubber stopper, wherein the stopper is thick or has an enlarged head to fit snugly within and remain attached to the shield and a plug portion that fits in the open end of the tube. Retention of the stopper in the shield is important when the shield and stopper are being removed from the open end of the tube so that blood within the tube can be tested and when the tube is mated with the end of a double ended needle in a needle holder and body fluid is being obtained from a patient.

Standard needle holders, have a fixed internal diameter and accept 13 millimeter or less evacuated blood collection tubes that have a plastic shield containing a rubber stopper. Standard needle holders will also accept 16 millimeter evacuated blood collection tubes that have a rubber stopper and not a plastic shield. Standard needle holders are not compatible with 16 millimeter evacuated blood collection tubes that have a plastic shield that is scaled up from a 13 millimeter tube because the outside diameter of the plastic shield is greater than the internal diameter of the standard needle holder.

Therefore, there exists a need to provide a stopper and shield closure on a 16 millimeter tube that is compatible with standard needle holders.

SUMMARY OF THE INVENTION

The present invention is a specific stopper-shield assembly comprising a plastic shield that is mounted over a rubber stopper for use with a 16 millimeter evacuated tube and that would be compatible with standard needle holders.

The present invention provides a stopper and shield closure assembly having an overall diameter the same or similar to that of stopper and shield closure used with 13 millimeter tubes.

Most preferably, the stopper-shield assembly of the present invention comprises dimensions whereby use of the stopper-shield assembly with a 16 millimeter plastic tube may be used with a conventional needle holder. The dimensions of the stopper-shield assembly have been minimized to

2

be compatible with conventional needle holders while maintaining the aspects, features and advantages of a stopper-shield assembly that is currently used with 13 millimeter plastic tubes.

Most preferably, the two-piece composite closure of the present invention is for use with 16 millimeter plastic tubes. The two-piece composite closure preferably comprises a plastic shield and a rubber stopper.

Most notably is that the two-piece composite closure of the present invention comprises an outside diameter that is not proportional to the scale up of the stopper and shield closure assembly that is used with a 13 millimeter tube.

An important feature of the stopper and shield closure assembly of the present invention is that the diameter of the assembly allows the closure to fit in conventional needle holders.

Another important feature is that the shield material is more rigid than shields commonly used with tubes of 13 millimeters or less.

A further notable advantage is that the two-piece composite provides a 16 millimeter tube with a closure that can be used with conventional needle holders.

DESCRIPTION OF THE DRAWINGS

FIG. 1 (prior art) perspective view of a 13 millimeter assembly.

FIG. 2 (prior art) perspective view of a 16 millimeter assembly.

FIG. 3 (prior art) cross sectional view of the container and closure of FIG. 1 taken along 3—3 thereof.

FIG. 4 (prior art) enlarged cross-sectional view of the assembly of FIG. 3.

FIG. 5 (prior art) enlarged cross-sectional view of the assembly of FIG. 3.

FIG. 6 is a perspective view of the assembly of the present invention illustrating the container with the closure.

FIG. 7 is a cross sectional view of the assembly of the present invention of FIG. 6 taken along line 7—7 thereof.

FIG. 8 is a top view of the closure of FIG. 6.

FIG. 9 is an enlarged cross sectional view of the assembly of FIG. 7.

FIG. 10 is an enlarged cross sectional view of the assembly of FIG. 7.

FIG. 11 is a cross sectional view of the assembly of the present invention shown in FIG. 7 mounted in a conventional needle holder.

DETAILED DESCRIPTION

Referring to the drawings in which like reference characters refer to like parts throughout the several views thereof, FIGS. 1, 3, 4 and 5, illustrate a standard 13 millimeter tube 10 with a stopper 40 and a shield 60 and FIG. 2 illustrates a standard 16 millimeter tube 80 with a stopper 90.

As shown in FIGS. 3 and 4, tube 10 comprises a sidewall 12 having an outer surface 14 and an inner surface 16. Sidewall 12 extends from an upper portion 18 to a lower portion 20. Upper portion 18 includes an open end 22 and a rim 24. Lower portion 20 comprises a closed bottom end 26. Interior volume 34 extends between top surface 24 and closed bottom end 26.

As shown in FIG. 4, stopper 20 has a radially enlarged upper flange portion 42 and a smaller lower sealing portion

3

44. Positioned between upper portion 42 and lower portion 44 is a radial notch 46. Positioned centrally in the top surface 48 of stopper 20 is a finger well 47. The bottom surface 49 of stopper 20 is convex.

Extending over the top of stopper 20 is a plastic cap or shield 60 which may be comprised of a flexible thermoplastic resin and which includes a radially extending top 62 for extending over the top surface 48 of stopper 20 and an annular skirt 63 extending from top 62. Radially extending top surface defines an opening 64 through which a needle may pass to be inserted into and through stopper 20. An integral annular abutment 66 is provided to engage the stopper. Annular abutment 66 includes a tapered surface for ease of assembly of cap 60 over upper flange 42 of stopper 20.

The dimensions of stopper 20 and cap 60 are illustrated in FIG. 5 and are as follows:

TABLE 1

DIMENSION	INCHES
A	.217
B	.442
C	.225
D	.013
E	.028
F	.215
G	.061
H	.018
I	.019
J	.041
K	.126
L	.021

FIGS. 6 and 7, illustrate the 16 millimeter tube assembly 100 of the present invention. The assembly comprises a tube 120, a stopper 160 and a shield 180.

As shown in FIGS. 6, 7, 8 and 9 assembly 100 of the present invention comprises a tube 120 that comprises a sidewall 122 having an outer surface 124 and an inner surface 126 and extending from an upper portion 128 to a lower portion 130.

Stopper 160 includes a top surface 162, a bottom surface 164, a radially enlarged upper flange portion 166 and a smaller lower annular sealing portion 168. Positioned between upper portion 166 and lower portion 168 is a radial notch 170. Upper portion 166 defines a top surface 162 wherein a finger well 172 is positioned centrally. The bottom surface 174 of stopper 160 is convex. Although it is within the purview of the invention that bottom surface 174 of stopper 160 is concave.

Extending over the top of stopper 160 is a plastic cap or shield 180 which may be comprised of a flexible thermoplastic resin and which includes a top surface 182, a bottom stop ledge 184, an annular outer skirt 186 extending from the top surface to the bottom stop ledge. Annular outer skirt 186 has an outer wall surface 188 and inner wall surface 190. Shield 180 further includes a central opening 192 in top surface 182. An integral annular abutment 194 is provided to engage the tube. Annular abutment includes a tapered surface for ease of assembly of shield 180 over upper flange 166 of stopper 160.

4

The dimensions of stopper 160 and shield 180 are illustrated in FIG. 10 measured with reference to said center-line A axis and are as follows:

TABLE 2

DIMENSION	INCHES
A	.462
B	.235
C	.615
D	.227
E	.018
F	.225
G	.015
H	.013
I	.010
J	.016
	.032
L	.016
M	.129

Most notably is that the dimension H of annular outer skirt 186 of shield 180 is 0.011 to 0.021 and most preferably 0.013, the dimension J of annular abutment 194 of shield 180 is 0.008 to 0.018 and most preferably 0.016, and dimension D of stopper 168 is 0.227 so that a 16 millimeter tube may be used with a conventional needle holder.

Therefore as shown in FIG. 11, the 16 millimeter tube assembly of the present invention of FIG. 7, which includes a stopper and a shield, is compatible with a standard needle holder.

What is claimed:

1. A closure assembly for sealing an open end of a body fluid collection tube comprising:

a stopper comprising an annular stopper body with an integral upper flange portion; a lower integral annular sealing portion on said body; an annular notch in said body at the interface of said upper flange portion and said lower sealing portion; wherein the outer annular surface of said lower portion being the sealing surface with a container and tapered inwardly continuously toward the axis of said body, said taper being from said annular notch to the bottom surface of said lower annular sealing portion; said bottom surface of said annular sealing portion being convex; and

a flexible cap body for mounting on said stopper comprising a top surface, a bottom stop ledge, an annular skirt extending from said top surface to said bottom stop ledge; said annular skirt comprising an outer wall surface and an inner wall surface; a central opening in said top surface; an integral annular abutment on said inner wall surface with a tapered surface;

wherein said integral annular abutment having a width of 0.011 to 0.021 inches and said annular skirt having a width of 0.008 to 0.018 inches with respect to said center-line axis.

* * * * *

United States Patent [19]
Miller

[11] **Patent Number:** 4,741,446
[45] **Date of Patent:** May 3, 1988

[54] **COMPUTER GENERATED STOPPER**

[75] **Inventor:** Henry F. Miller, Clifton, N.J.
[73] **Assignee:** Becton, Dickinson and Company,
Franklin Lakes, N.J.

[21] **Appl. No.:** 947,311

[22] **Filed:** Dec. 29, 1986

[51] **Int. Cl.⁴** B65D 47/36

[52] **U.S. Cl.** 215/247; 215/DIG. 3

[58] **Field of Search** 215/247, 248, 249, 260,
215/270, 355, DIG. 3

[56] **References Cited**

U.S. PATENT DOCUMENTS

1,509,916	9/1924	Waite	215/247
3,136,440	6/1964	Krug et al.	215/247
3,974,930	8/1976	Gizard et al.	215/247
4,111,326	9/1978	Percarpio	215/247
4,136,794	1/1979	Percarpio	215/247
4,186,840	2/1980	Percarpio	215/247
4,187,952	2/1980	Percarpio	215/247
4,301,936	11/1981	Percarpio	215/247

4,465,200 8/1984 Percarpio 215/247

Primary Examiner—Stephen Marcus

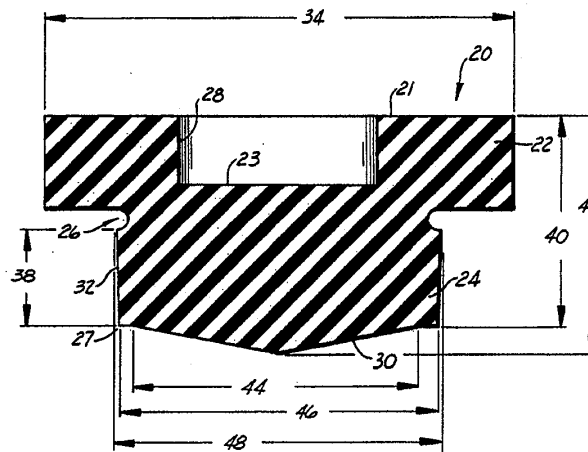
Assistant Examiner—Nova Stucker

Attorney, Agent, or Firm—Robert P. Grindle

[57] **ABSTRACT**

A stopper or closure is provided as a closure for containers in which the stopper profile is computer generated to take into consideration radial stress at the stopper/container interface, and to eliminate tensile stress therealong which tensile stress is an indication that a portion of the stopper wall is not engaging the opposed container surface. The stopper of the invention is particularly appropriate for use in evacuated blood sample collection tubes for eliminating "gray bands" or regions where the stopper and tube do not contact, and "red spots" formed in small cavities generated on the internal surface of the stopper at the withdrawal position of a blood collection needle having been inserted in the stopper.

6 Claims, 7 Drawing Sheets



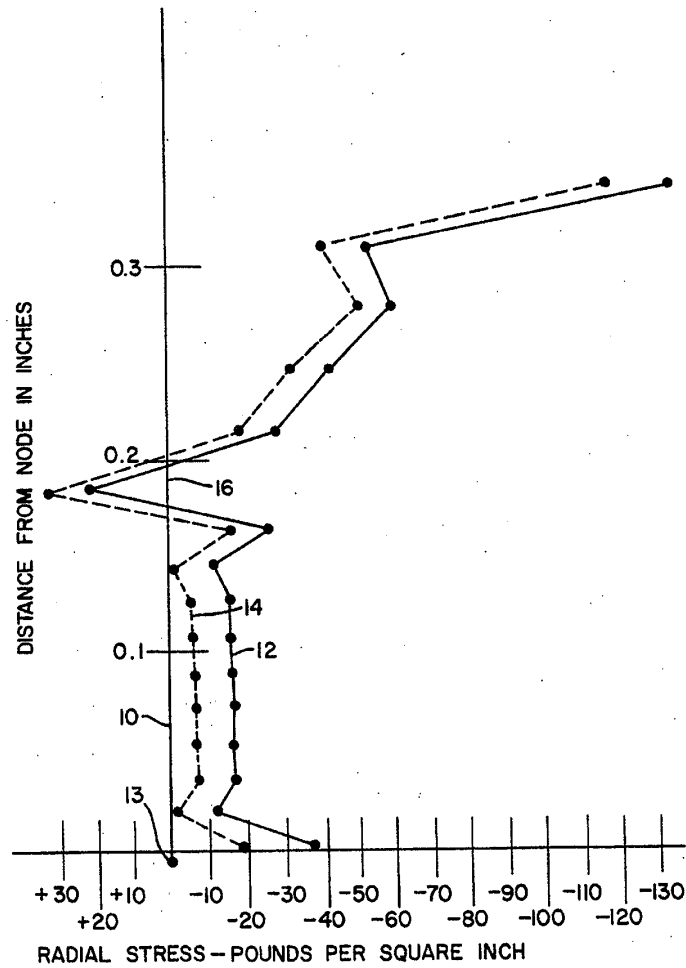


Fig. 1

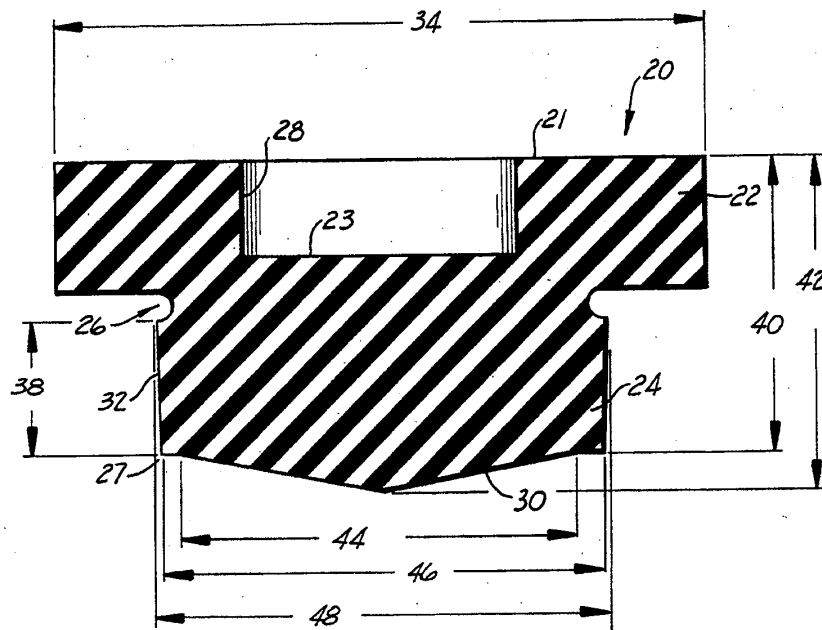


Fig. 2

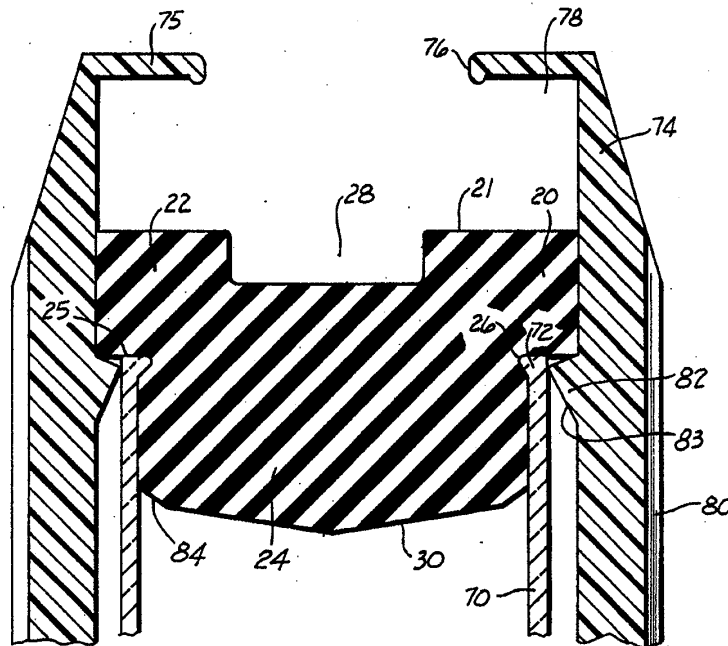


Fig. 3

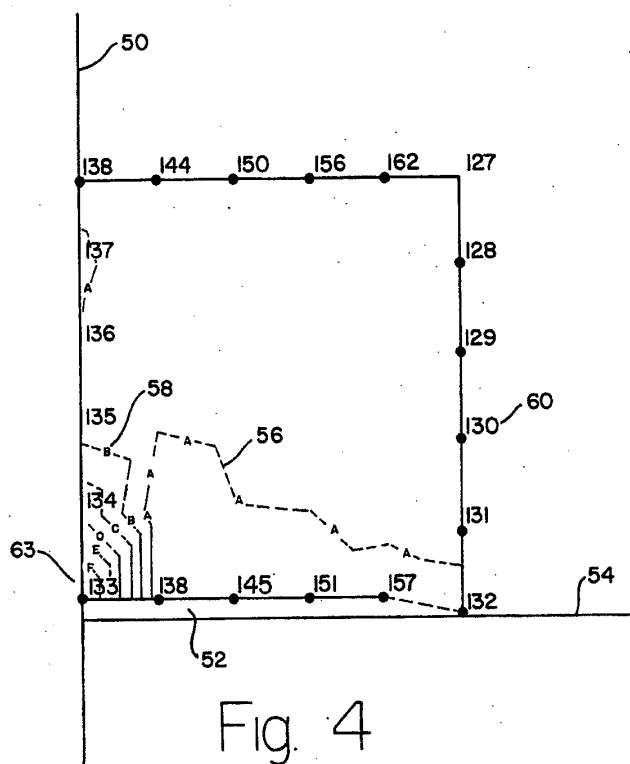


Fig. 4

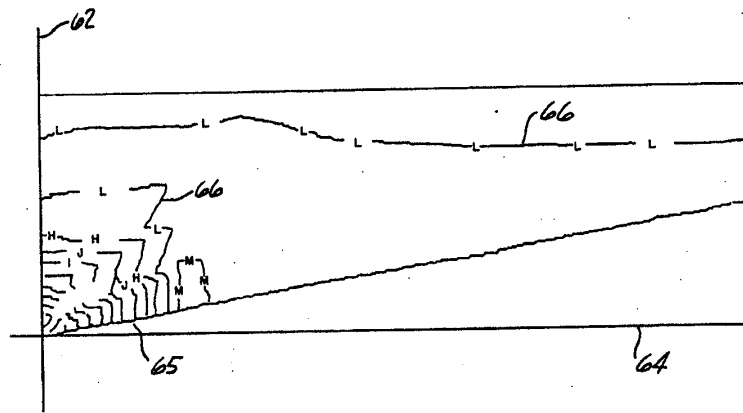


Fig. 5

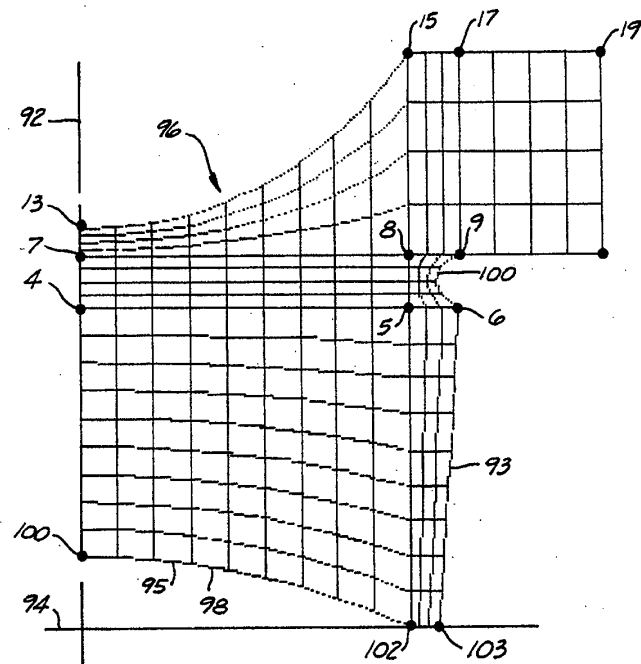


Fig. 6

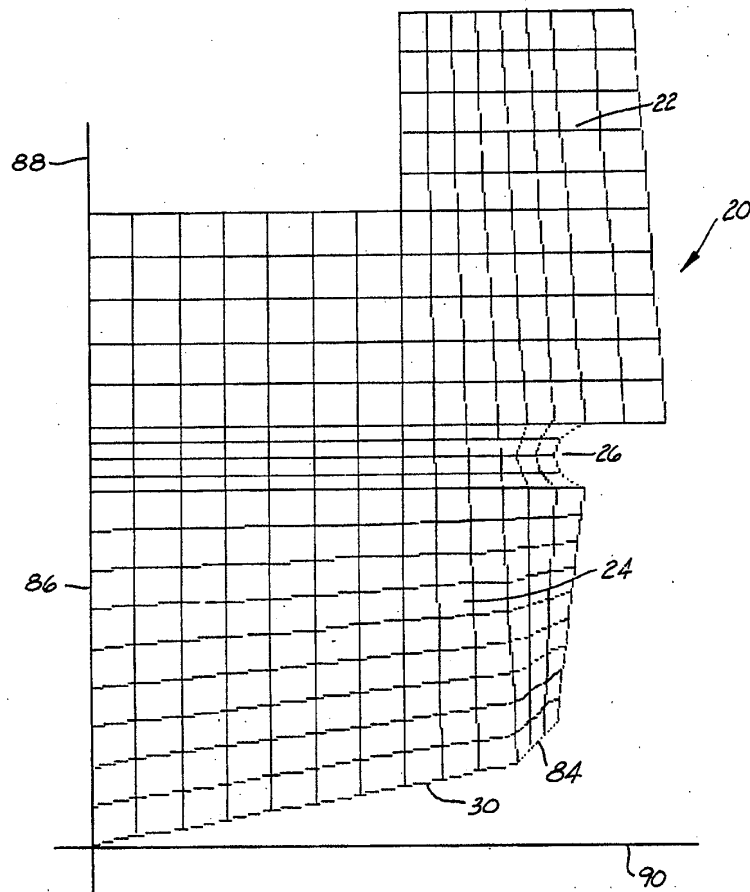


Fig. 7

COMPUTER GENERATED STOPPER

BACKGROUND AND DESCRIPTION OF THE INVENTION

This invention relates generally to a closure assembly for containers and more particularly to such assemblies for use with evacuated blood collection tubes such as VACUTAINER® Brand evacuated tubes. More particularly, this invention relates to such a closure assembly and the deliberate profile formation of the rubber or elastomer stopper portion of the assembly generated from a computer readout in order to eliminate tensile stress along the stopper/container wall interface so as to more clearly define and seal the container with the stopper. The computer generated stopper of the invention is so configured that the forces generated by the insertion of the stopper into the container are utilized in order to improve and develop continuous compressive radial stresses along the entire stopper/container interface.

As is well known in the medical field, both evacuated and non-evacuated tubes are used in large quantities to take blood samples from patients for subsequent testing of the blood for various purposes to determine if a patient has certain diseases or blood problems or other physical health problems of some kind. It is routine for a laboratory technician, for example, to take several such samples from a single tube for various tests. Since the tube may be evacuated, there is a pressure differential across the stopper holding the sample in the tube. Thus, when a needle is inserted through the diaphragm of the stopper, there can be an aerosol of the sample which may spray onto the technician. Moreover, when taking samples, sometimes blood droplets are left on the top and bottom surface of the stopper during the removal of the needle once the sample has been taken from the evacuated tube which creates a contamination problem for anyone handling the stopper subsequently.

A further problem with the use of stoppers of the kind discussed above, is the fact that an improper seal is generated along the stopper/container surface interface. The seal is discontinuous merely because of the stresses generated by the configuration of the stopper itself, and its interaction with the container involved. Such problems have the effect of reducing the shelf-life of evacuated tubes and are referred to by practitioners-in-the-art as "gray band" regions because they look gray when looking at the stopper through a transparent container wall. When one realizes the vast number of such tubes required for daily taking of blood samples in many many hospitals, it becomes important to reduce the cost of such items by increasing the shelf-life thereof. If a vacuum can be maintained at a proper level for a longer period, it follows that the evacuated tubes will have a much longer shelf-life and be in a better condition for use when required.

Attempts have been made in the past to overcome some or all of the above-noted problems. For example, U.S. Pat. No. 3,974,930 to Gizard et al. teaches a stopper with a central hole in the top surface of the diaphragm for protecting personnel from blood droplets on the outside surface of the stopper diaphragm. However, the Gizard et al. stopper uses a flat diaphragm surface on the internal surface facing the inside of the container which will permit "red spot" formation on that surface. This phenomenon is caused by the development of a conical break in the diaphragm bottom wall

upon insertion of a needle. Thus, when the needle is removed, a red spot of blood develops in the break on the internal or bottom surface of the diaphragm. Thus, if a clinician removes the stopper for taking a sample, the bottom surface of the stopper is contaminated and may cause contamination by the clinician touching the bottom surface of the stopper.

E. P. Percarpio, in his U.S. Pat. Nos. 4,301,936; 4,187,952; 4,186,840; 4,136,794; and 4,111,326, teaches a method for reducing the force required to assemble the stopper in the appropriate tube, while achieving, at the same time, a satisfactory sealing characteristic. The patents describe diaphragms in the stopper disclosed comprised of curved upper and lower surfaces with a constant diaphragm thickness of 0.04-0.09 inches, with the point being to reduce the thickness of the diaphragm and reduce the effort required to insert the needle through the diaphragm into the tube. There is no recognition in these patents of generating a stopper profile so as to eliminate any tensile stress along the stopper/container interface and to develop complete compressive radial stress at the stopper/container interface.

With this invention, by contrast, a three-dimensional, axisymmetrical computer model has been developed for a stopper for use in, for example, a conventional 13 millimeter diameter evacuated tube. A linear Young's modulus of 500 p.s.i. was used together with a Poisson's ratio of 0.495. The profile generated, allows for a proper configuration of stopper with appropriate upper and lower surface profiles in order to eliminate any tensile stress along the container/stopper interface.

In connection with generating the desired profile, it is necessary prior to generation to develop the appropriate boundary conditions in order to guide the computer generation. For example, it is important to establish fixed nodal locations in order to identify the region generated. Such positions include for example, points along the bottom surface of the upper annular flange of the stopper which are to remain, in a resulting generated stopper, fixed at the mating top surface of a container. These points do not move in the Z axis direction, and thus define boundaries for the desired profile.

Moreover, loading conditions must be selected for the profile. This is done by selecting a desired container and the desired selected stopper. From this, the nodal points along the tapered surface of the stopper profile which are to meet and conform to a container surface are defined. The distance of the movement of these points of the stopper in the Y axis from the position of the points in the stopper prior to insertion, and the position after insertion in the container are determined for selecting boundary and/or displacement conditions. Thus, a model stopper, so-to-speak, is selected which determines boundary and loading conditions in order to obtain the desired profile.

It should be borne in mind that this invention is directed not only to a stopper for use with blood collection tubes and including both evacuated and non-evacuated blood collection tubes, but also this invention is directed to a stopper cap assembly much like that taught and claimed in U.S. Pat. No. 4,465,700 which is hereby incorporated by reference in its entirety. In that patent, an arrangement is provided for reducing to a minimum the exposure of aerosol or blood droplets which may be evident in removing a blood sample from an evacuated tube on the top surface of the assembly. A cap is provided in combination with the stopper of the

assembly which is mounted over the resilient rubber stopper of the evacuated tube. The cap includes a top portion which extends over the top of the stopper to define between the top surface of the stopper and the bottom surface of the extended top portion of the cap a space which serves to contain any blood droplets or aerosol generated by needle insertion and withdrawal.

This patent, while teaching an assembly which is effective for protecting against blood droplets or aerosol on the top surface of the assembly, has no effect upon any such collection of blood droplets which may form on the bottom surface of the diaphragm of the elastomer stopper of the assembly. Thus, as discussed above, the invention here includes a generated stopper profile which eliminates "red spot" on the bottom surface of the diaphragm thereof as well as developing continuous compressive radial stress along the entire stopper/container interface.

With the foregoing and additional objects in view, this invention will now be described in more detail, and other objects and advantages thereof will be apparent from the following description, the accompanying drawings, and the appended claims.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plot of the radial stress distribution at the stopper/tube interface for a conventional 13 millimeter stopper similar to that disclosed in U.S. Pat. No. 4,465,200;

FIG. 2 is a sectional view of a stopper generated in accordance with this invention;

FIG. 3 is a longitudinal sectional view of the top of a blood sample tube, which may be evacuated, with a composite closure assembly thereon illustrating the invention;

FIG. 4 shows the radial stress distribution at the inside surface of a stopper of the prior art similar to that disclosed in U.S. Pat. No. 4,465,200;

FIG. 5 shows the radial stress distribution at the inside surface of the diaphragm around the center line of a stopper generated according to this invention;

FIG. 6 shows an additional embodiment of computer generated diaphragm design and further illustrating the invention; and

FIG. 7 is a computer generated design similar to that taught and described in FIG. 6 but showing the embodiment of computer generated design of the stopper illustrated in FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in which like reference characters refer to like parts throughout the several views thereof, in FIG. 1, as discussed above, a typical plot of the radial stress distribution at the stopper/tube interface of a conventional 13 millimeter stopper inserted in a conventional blood collection tube having a 13 millimeter internal diameter. In this plot, radial stress is shown in pounds per square inch as the ordinate while the distance from the node 13 is shown in inches as the abscissa. Node 13, as shown, is the innermost contact point between the stopper skirt and the tube wall. Plot 12 is the tube at atmospheric pressure while plot 14 is the tube at evacuated pressure of 26 inches of mercury. As can be seen in FIG. 1, the sealing pressure is negative (i.e., compressive) along the entire stopper/tube interface 10 except for the portion at 0.171-0.204 inches from node 13. This region of tensile stress is known as

the "gray band" region in stoppers inserted in tubes of the kind discussed in this application.

FIG. 2 shows a cross-sectional view of a stopper developed in accordance with the invention herein. This stopper when inserted in an appropriate container exhibits no gray bands and has continuous compressive radial stress along the entire stopper/tube interface. Moreover, the stopper has compressive radial stress along the entire inside surface 30 thereof so as to eliminate "red spot" formation on that surface. In FIG. 2, stopper 20 is shown having a radially enlarged upper flange portion 22 and a smaller lower sealing portion 24. Positioned between upper portion 22 and lower portion 24 is a radial notch 26 which accommodates the bead formed on the upper edge of an evacuated tube into which the lower portion 24 of stopper 20 is inserted. Positioned centrally in the top surface 21 of stopper 20 is a finger well 28. The purpose of such a well is to segregate a clinician's finger from the top surface 23 of well 28 where a blood droplet may form during removal of a needle from the stopper 20 for obtaining a blood sample contained in a container in which stopper 20 is inserted.

As can be seen in FIG. 2, the bottom surface 30 of stopper 20 is convex. Because of this general outline of stopper 20, a compressive radial stress is developed along the entire surface 30, as discussed above, and as will be discussed in more detail below.

As purely illustrative of the dimensions of stopper 20, diameter 34 may be, for example, 0.616 inches while notch 26 may have a radius of 0.015. Dimension 36 may be, for example, 0.12 inches while dimension 40 may be 0.275 inches and dimension 42, 0.31 inches.

As a further indication of representative dimensions of the invention, dimension 38 may be 0.125 inches.

As can be seen further in FIG. 2, the surface 32 of the lower portion 24 of stopper 20 may be tapered slightly toward the axis of stopper 20 in a downward direction from radial notch 26 to the bottom edge 27 of the stopper. As further illustrative of dimensions of stopper 20, dimension 44 may be 0.388 inches while dimension 46 may be 0.424 inches and dimension 48 may be 0.434 inches.

As further illustrative of modifications which may be made relative to stopper 20, reference is made to the following Table I which shows slight modifications in the dimensions 44, 46 and 48, as required for various applications of the embodiment of stopper 20 shown in FIG. 2.

TABLE I

STOPPER	44	46	48
1	0.388	0.424	0.434
2	0.393	0.429	0.439
3	0.398	0.434	0.444
4	0.403	0.439	0.449
5	0.408	0.444	0.454

FIG. 3 shows a composite stopper cap assembly similar to that disclosed in U.S. Pat. No. 4,465,200, but utilizing the particular configuration of stopper generated in accordance with the invention herein. Thus, as can be seen in FIG. 3, stopper 20 is shown positioned in the top 72 of a blood collection tube 70, of which only the top portion is shown. Tube 70, as will be understood by practitioners-in-the-art, may or may not be evacuated, as required, depending upon the purpose to which it is to be used. As can be seen in FIG. 3, the top of tube

70 includes an annular bead 72 inserted in the radial notch 26 of stopper 20. This has the purpose of maintaining stopper 20 firmly inserted in the top of tube 20 until it is to be removed for removing a sample from tube 70, as required.

Extending over the top of stopper 20 is a plastic cap assembly 74 which may be comprised of a flexible thermoplastic resin, and which includes a radially extending top 75 for extending over the top surface 21 of stopper 20. This radially extending top surface 75 defines an opening 76 through which a needle may pass to be inserted into and through stopper 20. This "overhang" 75 of the plastic cap of the assembly of the invention serves to define a compartment or area 78 for receiving and containing any blood droplets or blood aerosol which may develop during the insertion and removal of needles through stopper 20. Also, the top finger well 28 of stopper 20 serves to enhance this containing function of the assembly shown.

As can be seen in FIG. 3, the bottom surface 30 of stopper 20 may have an annular tapered end edge portion 84 for ease of insertion of the lower portion 24 of stopper 20 into the top of tube 70. Formed on the outer surface of the cap 74 are a plurality of circumferentially spaced ribs 80 which serve to provide a gripping surface for the assembly for removing the assembly from tube 70. In this connection, an integral annular abutment 82 is provided which engages the bottom surface 25 of stopper upper annular flange portion 22 so as to grip and remove stopper 20 when the outer surface of cap 74 is gripped and urged outwardly from the opening of tube 70. Also, annular abutment 82 includes a tapered surface 83 for ease of assembly of the plastic cap 74 over the upper annular flange 22 of stopper 20.

FIG. 4 shows a radial stress contour plot of a prior art stopper, while FIG. 5 is a similar plot of radial stress contours for a stopper illustrating this invention. As both FIGS. 4 and 5 show, radial stress lines such as 56, 58 and 66 are generated around the axes 50, 62, respectively, of the stoppers, and particularly adjacent the inside surfaces 52, 65 of the diaphragm of the stopper. If the stresses are tensile, when a needle is inserted in the diaphragm in the vicinity of axis 50 as in FIG. 4, the continuity of surface 52 is broken and an open cavity 63 is formed. This cavity may be filled with blood when the needle is withdrawn. If the stresses are compressive, no red spot is formed.

Thus, when the stopper is removed from the tube, a red spot of blood is evident at this location and serves as a further potential exposure of contamination to the clinician. As further illustrative of the plot shown in FIG. 4, for example, the line designated A has a value of minus 100 pounds per square inch while the line B is zero and line C is plus 100 pounds per square inch. The numbers in the plot shown in FIGS. 4 and 5 designated as, for example, 131, 138 and 60 are merely nodal locations to identify the region for the user on the figures generated. Lines are drawn through these points to provide a coordinate grid to provide dimensions for the figure generated. The remaining values for FIGS. 4 and 5 are as follows.

FIG. 4		FIG. 5	
Values			
A	-100 p.s.i.	A	-240 p.s.i.
B	0 p.s.i.	B	-220 p.s.i.
C	+100 p.s.i.	C	-200 p.s.i.

-continued

FIG. 4		FIG. 5	
Values			
D	+200 p.s.i.	D	-180 p.s.i.
E	+300 p.s.i.	E	-160 p.s.i.
F	+400 p.s.i.	F	-140 p.s.i.
G	+500 p.s.i.	G	-120 p.s.i.
		H	-100 p.s.i.
		I	-80 p.s.i.
		J	-60 p.s.i.
		K	-40 p.s.i.
		L	-20 p.s.i.
		M	0 p.s.i.

With respect to FIGS. 4 and 5, FIG. 4 figures are for a 13 millimeter conventional stopper similar to that disclosed in U.S. Pat. No. 4,465,200 with an evacuated 13 millimeter diameter tube. With respect to FIG. 5, and 0.434 inch diameter tube is used with a composite stopper assembly illustrating this invention.

FIG. 6 shows a further computer generated stopper design embodiment of this invention. The figure shows the geometry of the design and the nature of the compressive radial stress developed on the stopper/tube interface 93. The analysis shows that the radial surface stresses along the entire 0.49044 inch radius 95 are all compressive including those at the center line of the stopper. In referring to FIG. 6, 94 is the Y axis while 92 is the Z axis. The Z axis 92 represents the axis of the annular stopper design. The points shown in FIG. 6 such as 100, 102 and 103 are distances from the Y and Z axis given in rectangular coordinate format. Thus 100 is zero distance from the Z axis 92, while being 0.04 inches from the Y axis, whereas 102 is 0.194 inches from the Z axis while being at zero inches from the Y axis. As further illustrative of these distances, point 15 is 0.199 inches from the Z axis while being 0.335 inches from the Y axis. Radius 100 is 0.015 inches while radius 96 is 0.23172 inches. As noted above, radius 98 is 0.49044 inches.

Thus, the computer study shown in FIG. 6 indicates that there will be no gray bands in the sealing area and no red spot formation on the inside surface 95 of the diaphragm. The diaphragm of the stopper generated is 0.19 inches thick at the center line which provides good vacuum retention while permitting satisfactory needle penetration. The upper radius 96 provides a slightly different configuration of finger well but which still serves to prevent contact of the surface 96 with the user's finger.

As further illustrative of computer plots generated for stopper designs in accordance with the invention herein, one may note the plot shown in FIG. 7 which is the plot of stopper 20 shown in FIG. 3. Thus, stopper 20 has an axis 86 along the Z axis of the configuration with an upper annular portion 22 and a lower portion 24 for insertion in a cooperating tube. The radial notch 26 is, as discussed above, for receiving the top bead of a tube into which the stopper is inserted. Stopper 20 includes the annular tapered edge 84 along the bottom surface 30 thereof for easy insertion of a stopper generated according to the design shown in FIG. 7 into a tube.

Thus, there is provided, in accordance with this invention, a new stopper arrangement for closing containers in which a superior sealing requirement is needed. Also, in accordance with this invention, a new composite closure assembly for blood sample tubes whether evacuated or not is provided. The arrangement of the

invention herein is more hygienic to the user and the patient in that lower contamination from blood is obtained from the structure taught and claimed herein. That is, there is lower contamination within the assembly itself reducing exposure of a technician to aerosol around the top edge or blood droplets accumulating on the bottom surface of the stopper. Moreover, and as will be understood by practitioners-in-the-art, there is a substantial reduction in cost in the stopper of the invention herein in that the entire configuration is precisely generated to reduce any excessive use of elastomer materials, which are expensive, while at the same time obtaining the most appropriate sealing characteristics at the closure/container interface.

As is apparent from the foregoing, the arrangements of apparatus provided in accordance herewith are readily and simply manufactured by mass production techniques in conventional molding procedures and the parts may be simply assembled and mounted on containers with a limited amount of effort.

While the device and method of forming the device as herein disclosed form preferred embodiments of this invention, this invention is not limited to these specific devices and methods, and changes can be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A stopper having increased sealing properties for containers

said stopper comprising

(a) an annular stopper body with an integral upper flange portion;

(b) a lower integral annular sealing portion on said body;

(c) an annular notch in said body at the juncture of said upper flange portion and said lower sealing portion;

(d) the outer annular surface of said lower portion being the sealing surface with a container and tapered inwardly continuously toward the axis of said body, said taper being from said annular notch to the bottom surface of said lower annular sealing portion;

(e) the said bottom surface of said annular sealing portion being conical;

said stopper being obtained by the method characterized by the steps of

(f) generating said stopper from a three-dimensional axisymmetrical computer model;

(g) said three-dimensional axisymmetrical computer model being selected to provide said bottom surface with continuous compressive stresses along the entire extent thereof upon insertion of said stopper body into a container;

(h) said three-dimensional axisymmetrical computer model being selected to provide said tapered outer annular surface of said lower sealing portion with continuous compressive radial stresses along the entire length thereof with a mating container inside wall upon insertion of said stopper body into a container;

(i) said computer model having a pre-selected linear modulus; and

(j) said computer model having a pre-selected poisson's ratio.

2. The stopper of claim 1, further characterized by

(a) a well positioned coaxially in the top surface of said upper annular flange portion.

3. The stopper of claim 1, further characterized by
(a) said linear modulus is 500 pounds per square inch; and

(b) said poisson's ratio is 0.495.

4. A closure assembly for evacuated tubes for receiving samples of body fluids characterized by

(a) an annular stopper body with an upper integral annular flange portion, and a lower integral annular sealing portion;

(b) an upper well in the top surface of said stopper body;

(c) an annular notch in said stopper body at the juncture of said upper flange portion and said lower sealing portion;

(d) the outer annular surface of said lower portion being the sealing surface with a container and tapered inwardly continuously toward the axis of said stopper body, said taper being from said annular notch to the bottom surface of said lower annular sealing portion;

(e) the said bottom surface of said lower annular sealing portion being conical;

(f) a flexible cap body for mounting on said stopper body;

(g) said cap body having an open end and a substantially closed end;

(h) said open end for receiving said stopper body;

(i) said closed end having a needle receiving bore in the top surface thereof;

(j) cooperating opposed annular abutment means on said stopper body and said cap body for maintaining said cap body on said stopper body;

(k) said closed end of said cap body being spaced from the opposed top surface of said stopper body to define a sample containing chamber therein;

(l) said stopper body being generated from a three-dimensional axisymmetrical computer model;

(m) said three-dimensional axisymmetrical computer model being selected to provide said bottom surface with continuous compressive stresses along the entire extent thereof upon insertion of said stopper body into a container;

(n) said three-dimensional axisymmetrical computer model being selected to provide said tapered outer annular surface of said lower sealing portion with continuous compressive radial stresses along the entire length thereof with a mating container inside wall upon insertion of said stopper body into a container; and

(o) said three-dimensional axisymmetrical computer model having

(1) a liner modulus of 500 pounds per square inch; and

(2) a poisson's ratio of 0.495.

5. The assembly of claim 1, further characterized by

(a) an elongated evacuable container having a closed end and an open end;

(b) said open end receiving said lower annular sealing portion of said stopper therein; and

(c) said open end of said cap body extending around and spaced from the said open end of said evacuable container adjacent the open end thereof.

6. The assembly of claim 4, further characterized by

(a) the bottom surface of said lower annular sealing portion being tapered at the juncture thereof with said outer annular surface for easing said sealing portion into said open end of said container.

* * * * *

United States Patent [19]
Miller

[11] **Patent Number:** 4,991,104
[45] **Date of Patent:** Feb. 5, 1991

[54] **COMPUTER GENERATED STOPPER**

[75] **Inventor:** Henry F. Miller, Clifton, N.J.
[73] **Assignee:** Becton, Dickinson and Company,
Franklin Lakes, N.J.
[21] **Appl. No.:** 496,111
[22] **Filed:** Mar. 19, 1990

Related U.S. Application Data

[60] Continuation of Ser. No. 320,915, Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 155,432, Feb. 12, 1988, abandoned, which is a division of Ser. No. 947,311, Dec. 29, 1986, Pat. No. 4,741,446.
[51] **Int. Cl.:** G06F 15/46; B65D 47/36
[52] **U.S. Cl.:** 364/476; 215/247;
364/149; 364/473
[58] **Field of Search:** 364/468, 473, 476, 148-151,
364/191, 496, 500; 215/247-249, 260, 270, 355,
DIG. 3; 604/415; 264/40.1-40.7; 425/135, 140,
141, 149, 162, 163

[56] **References Cited**

U.S. PATENT DOCUMENTS

1,509,916	9/1924	Waite	215/247
3,136,440	6/1964	Krug et al.	215/247
3,974,930	8/1976	Gizard et al.	215/247
4,111,326	9/1978	Percarpio	215/247
4,136,794	1/1979	Percarpio	215/247
4,186,840	2/1980	Percarpio	215/247
4,187,952	2/1980	Percarpio	215/247
4,301,936	11/1981	Percarpio	215/247
4,465,200	8/1984	Percarpio	215/247
4,473,215	9/1984	Rathfon, II et al.	364/476
4,546,438	10/1985	Prewitt et al.	364/473
4,641,270	2/1987	Lalloz et al.	364/476

OTHER PUBLICATIONS

Algor Newsletter, Jul. 1988, "Redesigning Skyscraper

Facades Using Finite Element and Wind Tunnel Analysis Techniques".

Algor Design World, Apr. 1989, "FMC and Algorb—Ten Year Partners in FEA".

Algor Newsletter, May, 1988, "PC-Based Finite Element Analysis Reveals Dangerously Low Resonance in Coastal Tower".

Algor Newsletter, Apr., 1988, "Analysis of the Structure of the Keck Telescope".

Algor Newsletter, Jan. 1988, "PC-Based Finite Element Analysis Helps Sell Crane Assembly Design".

Algor Newsletter, Oct., 1987, "PC-Based Finite Element Analysis Proves Out Oil Production Platform's Riser Tension System".

Algor Newsletter, Nov., 1987, "Turbine Design Optimized in Just Four Days Using Algor Finite Element Analysis on a PC".

Mechanical Engineering, Jul., 1986, "Finite Elements on the PC: No Excuses Left".

Primary Examiner—Joseph Ruggiero

Attorney, Agent, or Firm—Robert P. Grindle

[57] **ABSTRACT**

A stopper or closure is provided as a closure for containers in which the stopper profile is computer generated to take into consideration radial stress at the stopper/container interface, and to eliminate tensile stress therealong which tensile stress is an indication that a portion of the stopper wall is not engaging the opposed container surface. The stopper of the invention is particularly appropriate for use in evacuated blood sample collection tubes for eliminating "gray bands" or regions where the stopper and tube do not contact, and "red spots" formed in small cavities generated on the internal surface of the stopper at the withdrawal position of a blood collection needle having been inserted in the stopper.

3 Claims, 4 Drawing Sheets

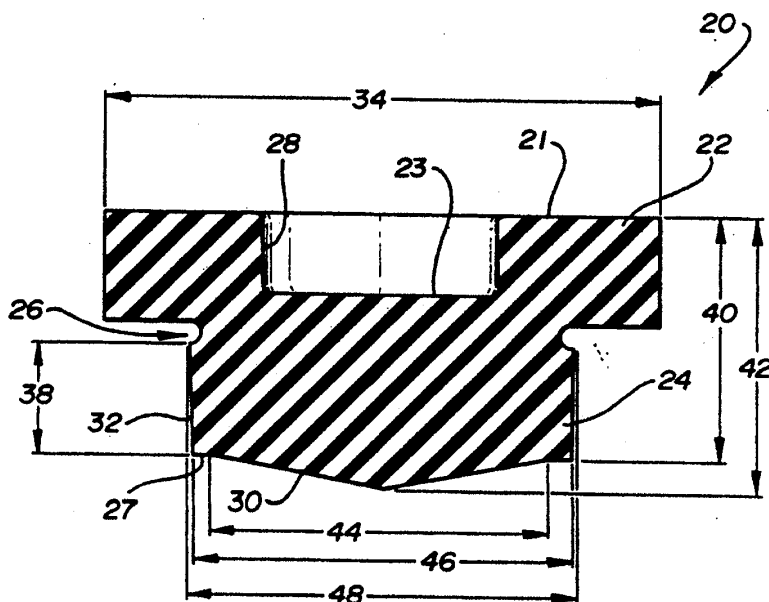


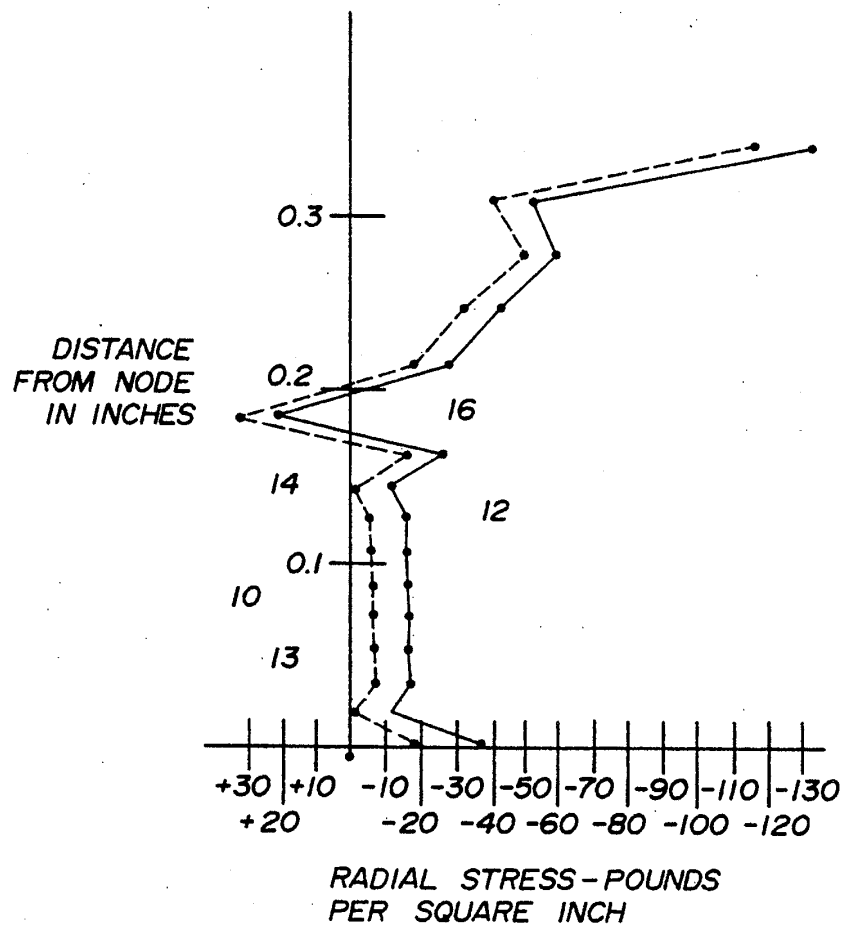
FIG-1 PRIOR ART

FIG-2

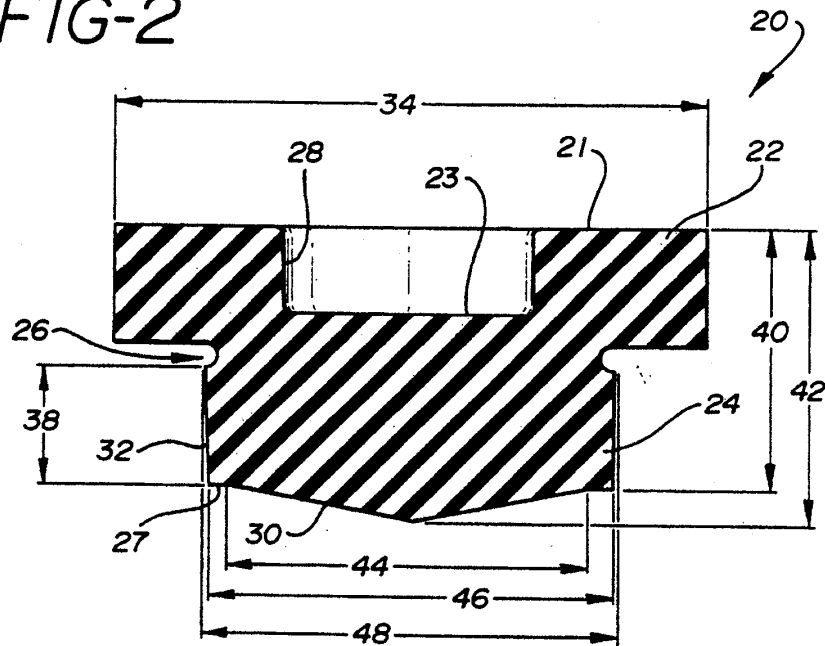


FIG-3

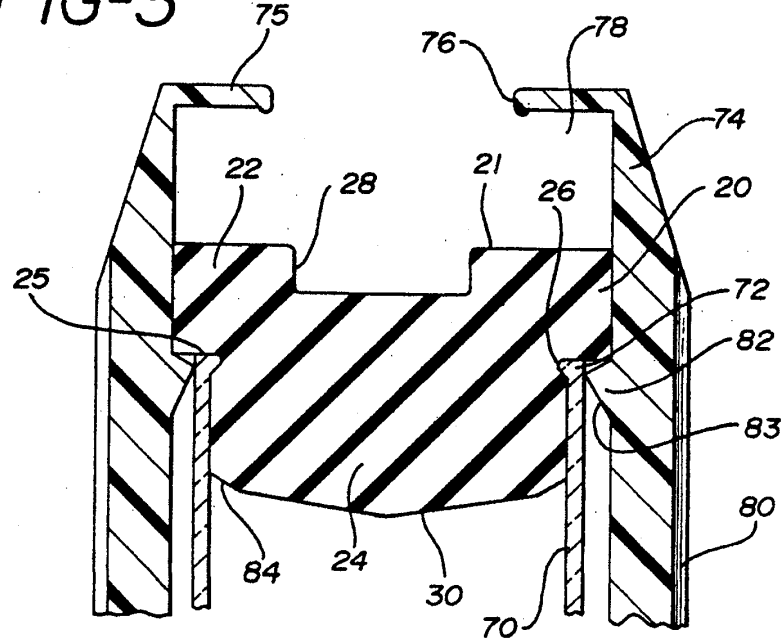


FIG-4 PRIOR ART

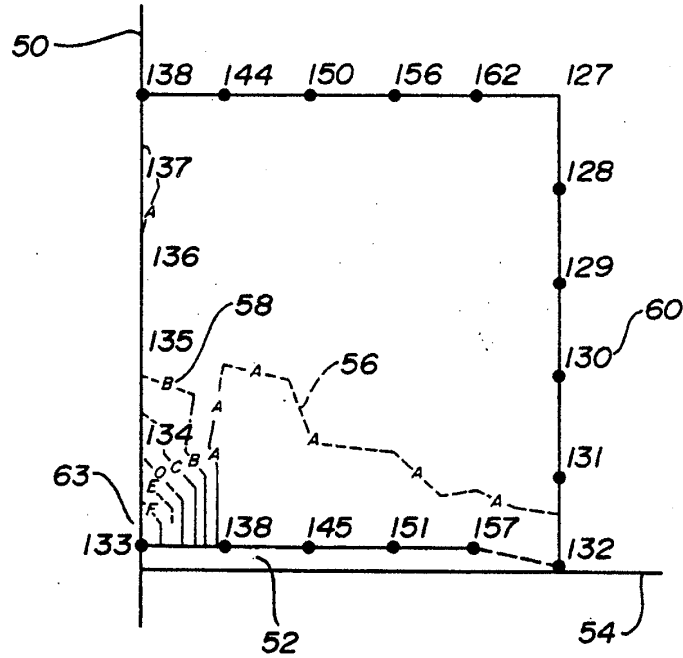
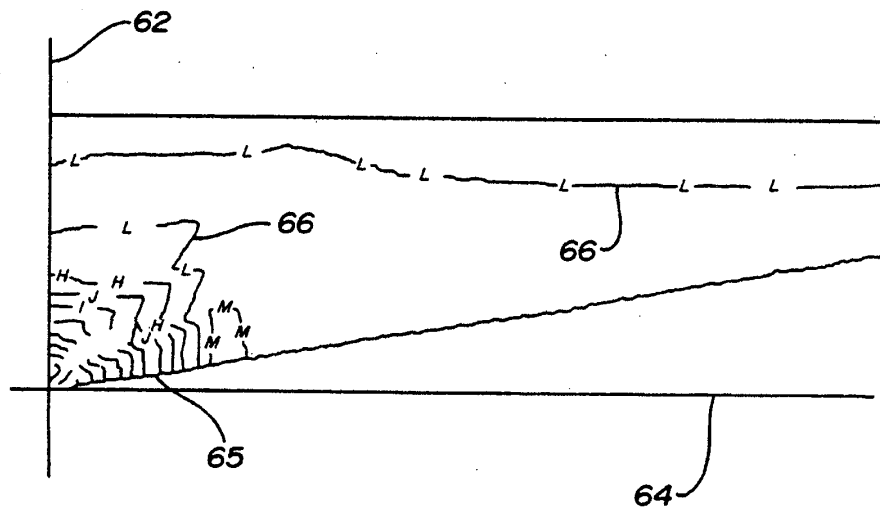


FIG-5





COMPUTER GENERATED STOPPER

This application is a continuation of Ser. No. 07/320,915 filed Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 07/155,432 filed Feb. 12, 1987, abandoned which is a division of Ser. No. 06/947,311, U.S. Pat. No. 4,741,446, filed Dec. 29, 1986.

BACKGROUND AND DESCRIPTION OF THE INVENTION

This invention relates generally to a closure assembly for containers and more particularly to such assemblies for use with evacuated blood collection tubes such as VACUTAINER® Brand evacuated tubes. More particularly, this invention relates to such a closure assembly and the deliberate profile formation of the rubber or elastomer stopper portion of the assembly generated from a computer readout in order to eliminate tensile stress along the stopper/container wall interface so as to more clearly define and seal the container with the stopper. The computer generated stopper of the invention is so configured that the forces generated by the insertion of the stopper into the container are utilized in order to improve and develop continuous compressive radial stresses along the entire stopper/container interface.

As is well known in the medical field, both evacuated and non-evacuated tubes are used in large quantities to take blood samples from patients for subsequent testing of the blood for various purposes to determine if a patient has certain diseases or blood problems or other physical health problems of some kind. It is routine for a laboratory technician, for example, to take several such samples from a single tube for various tests. Since the tube may be evacuated, there is a pressure differential across the stopper holding the sample in the tube. Thus, when a needle is inserted through the diaphragm of the stopper, there can be an aerosol of the sample which may spray onto the technician. Moreover, when taking samples, sometimes blood droplets are left on the top and bottom surface of the stopper during the removal of the needle once the sample has been taken from the evacuated tube which creates a contamination problem for anyone handling the stopper subsequently.

A further problem with the use of stoppers of the kind discussed above, is the fact that an improper seal is generated along the stopper/container surface interface. The seal is discontinuous merely because of the stresses generated by the configuration of the stopper itself, and its interaction with the container involved. Such problems have the effect of reducing the shelf-life of evacuated tubes and are referred to by practitioners-in-the-art as "gray band" regions because they look gray when looking at the stopper through a transparent container wall. When one realizes the vast number of such tubes required for daily taking of blood samples in many many hospitals, it becomes important to reduce the cost of such items by increasing the shelf-life thereof. If a vacuum can be maintained at a proper level for a longer period, it follows that the evacuated tubes will have a much longer shelf-life and be in a better condition for use when required.

Attempts have been made in the past to overcome some or all of the above-noted problems. For example, U.S. Pat. No. 3,974,930 to Gizard et al. teaches a stopper with a central hole in the top surface of the diaphragm for protecting personnel from blood droplets

on the outside surface of the stopper diaphragm. However, the Gizard et al. stopper uses a flat diaphragm surface on the internal surface facing the inside of the container which will permit "red spot" formation on that surface. This phenomenon is caused by the development of a conical break in the diaphragm bottom wall upon insertion of a needle. Thus, when the needle is removed, a red spot of blood develops in the break on the internal or bottom surface of the diaphragm. Thus, if a clinician removes the stopper for taking a sample, the bottom surface of the stopper is contaminated and may cause contamination by the clinician touching the bottom surface of the stopper.

E. P. Percarpio, in his U.S. Pat. Nos. 4,301,936; 4,187,952; 4,186,840; 4,136,794; and 4,111,326, teaches a method for reducing the force required to assemble the stopper in the appropriate tube, while achieving, at the same time, a satisfactory sealing characteristic. The patents describe diaphragms in the stoppers disclosed comprised of curved upper and lower surfaces with a constant diaphragm thickness of 0.04-0.09 inches, with the point being to reduce the thickness of the diaphragm and reduce the effort required to insert the needle through the diaphragm into the tube. There is no recognition in these patents of generating a stopper profile so as to eliminate any tensile stress along the stopper/container interface and to develop complete compressive radial stress at the stopper/container interface.

With this invention, by contrast, a three-dimensional, axisymmetrical computer model has been developed for a stopper for use in, for example, a conventional 13 millimeter diameter evacuated tube. A linear Young's modulus of 500 p.s.i. was used together with a Poisson's ratio of 0.495. The profile generated, allows for a proper configuration of stopper with appropriate upper and lower surface profiles in order to eliminate any tensile stress along the container/stopper interface.

In connection with generating the desired profile, it is necessary prior to generation to develop the appropriate boundary conditions in order to guide the computer generation. For example, it is important to establish fixed nodal locations in order to identify the region generated. Such positions include for example, points along the bottom surface of the upper annular flange of the stopper which are to remain, in a resulting generated stopper, fixed at the mating top surface of a container. These points do not move in the Z axis direction, and thus define boundaries for the desired profile.

Moreover, loading conditions must be selected for the profile. This is done by selecting a desired container and the desired selected stopper. From this, the nodal points along the tapered surface of the stopper profile which are to meet and conform to a container surface are defined. The distance of the movement of these points of the stopper in the Y axis from the position of the points in the stopper prior to insertion, and the position after insertion in the container are determined for selecting boundary and/or displacement conditions. Thus, a model stopper, so-to-speak, is selected which determines boundary and loading conditions in order to obtain the desired profile.

It should be borne in mind that this invention is directed not only to a stopper for use with blood collection tubes and including both evacuated and non-evacuated blood collection tubes, but also this invention is directed to a stopper cap assembly much like that taught and claimed in U.S. Pat. No. 4,465,200 which is hereby incorporated by reference in its entirety. In that

patent, an arrangement is provided for reducing to a minimum the exposure of aerosol or blood droplets which may be evident in removing a blood sample from an evacuated tube on the top surface of the assembly. A cap is provided in combination with the stopper of the assembly which is mounted over the resilient rubber stopper of the evacuated tube. The cap includes a top portion which extends over the top of the stopper to define between the top surface of the stopper and the bottom surface of the extended top portion of the cap a space which serves to contain any blood droplets or aerosol generated by needle insertion and withdrawal.

This patent, while teaching an assembly which is effective for protecting against blood droplets or aerosol on the top surface of the assembly, has no effect upon any such collection of blood droplets which may form on the bottom surface of the diaphragm of the elastomer stopper of the assembly. Thus, as discussed above, the invention here includes a generated stopper profile which eliminates "red spot" on the bottom surface of the diaphragm thereof as well as developing continuous compressive radial stress along the entire stopper/container interface.

With the foregoing and additional objects in view, this invention will now be described in more detail, and other objects and advantages thereof will be apparent from the following description, the accompanying drawings, and the appended claims.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plot of the radial stress distribution at the stopper/tube interface for a conventional 13 millimeter stopper similar to that disclosed in U.S. Pat. No. 4,465,200;

FIG. 2 is a sectional view of a stopper generated in accordance with this invention;

FIG. 3 is a longitudinal sectional view of the top of a blood sample tube, which may be evacuated, with a composite closure assembly thereon illustrating the invention;

FIG. 4 shows the radial stress distribution at the inside surface of a stopper of the prior art similar to that disclosed in U.S. Pat. No. 4,465,200;

FIG. 5 shows the radial stress distribution at the inside surface of the diaphragm around the center line of a stopper generated according to this invention;

FIG. 6 shows an additional embodiment of computer generated diaphragm design and further illustrating the invention; and

FIG. 7 is a computer generated design similar to that taught and described in FIG. 6 but showing the embodiment of computer generated design of the stopper illustrated in FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in which like reference characters refer to like parts throughout the several views thereof, in FIG. 1, as discussed above, a typical plot of the radial stress distribution at the stopper/tube interface of a conventional 13 millimeter stopper inserted in a conventional blood collection tube having a 13 millimeter internal diameter. In this plot, radial stress is shown in pounds per square inch as the ordinate while the distance from the node 13 is shown in inches as the abscissa. Node 13, as shown, is the innermost contact point between the stopper skirt and the tube wall. Plot 12 is the tube at atmospheric pressure while plot 14 is

the tube at evacuated pressure of 26 inches of mercury. As can be seen in FIG. 1, the sealing pressure is negative (i.e., compressive) along the entire stopper/tube interface 10 except for the portion at 0.171-0.204 inches from node 13. This region of tensile stress is known as the "gray band" region in stoppers inserted in tubes of the kind discussed in this application.

FIG. 2 shows a cross-sectional view of a stopper developed in accordance with the invention herein. This stopper when inserted in an appropriate container exhibits no gray bands and has continuous compressive radial stress along the entire stopper/tube interface. Moreover, the stopper has compressive radial stress along the entire inside surface 30 thereof so as to eliminate "red spot" formation on that surface. In FIG. 2, stopper 20 is shown having a radially enlarged upper flange portion 22 and a smaller lower sealing portion 24. Positioned between upper portion 22 and lower portion 24 is a radial notch 26 which accommodates the bead formed on the upper edge of an evacuated tube into which the lower portion 24 of stopper 20 is inserted. Positioned centrally in the top surface 21 of stopper 20 is a finger well 28. The purpose of such a well is to segregate a clinician's finger from the top surface 23 of well 28 where a blood droplet may form during removal of a needle from the stopper 20 for obtaining a blood sample contained in a container in which stopper 20 is inserted.

As can be seen in FIG. 2, the bottom surface 30 of stopper 20 is convex. Because of this general outline of stopper 20, a compressive radial stress is developed along the entire surface 30, as discussed above, and as will be discussed in more detail below.

As purely illustrative of the dimensions of stopper 20, diameter 34 may be, for example, 0.616 inches while notch 26 may have a radius of 0.015. Dimension 36 may be, for example, 0.12 inches while dimension 40 may be 0.275 inches and dimension 42, 0.31 inches.

As a further indication of representative dimensions of the invention, dimension 38 may be 0.125 inches.

As can be seen further in FIG. 2, the surface 32 of the lower portion 24 of stopper 20 may be tapered slightly toward the axis of stopper 20 in a downward direction from radial notch 26 to the bottom edge 27 of the stopper. As further illustrative of dimensions of stopper 20, dimension 44 may be 0.388 inches while dimension 46 may be 0.424 inches and dimension 48 may be 0.434 inches.

As further illustrative of modifications which may be made relative to stopper 20, reference is made to the following Table I which shows slight modifications in the dimensions 44, 46 and 48, as required for various applications of the embodiment of stopper 20 shown in FIG. 2.

TABLE I

STOPPER	44	46	48
1	0.388	0.424	0.434
2	0.393	0.429	0.439
3	0.398	0.434	0.444
4	0.403	0.439	0.449
5	0.408	0.444	0.454

FIG. 3 shows a composite stopper cap assembly similar to that disclosed in U.S. Pat. No. 4,465,200, but utilizing the particular configuration of stopper generated in accordance with the invention herein. Thus, as can be seen in FIG. 3, stopper 20 is shown positioned in

the top 72 of a blood collection tube 70, of which only the top portion is shown. Tube 70, as will be understood by practitioners-in-the-art, may or may not be evacuated, as required, depending upon the purpose to which it is to be used. As can be seen in FIG. 3, the top of tube 70 includes an annular bead 72 inserted in the radial notch 26 of stopper 20. This has the purpose of maintaining stopper 20 firmly inserted in the top of tube 20 until it is to be removed for removing a sample from tube 70, as required.

Extending over the top of stopper 20 is a plastic cap assembly 74 which may be comprised of a flexible thermoplastic resin, and which includes a radially extending top 75 for extending over the top surface 21 of stopper 20. This radially extending top surface 75 defines an opening 76 through which a needle may pass to be inserted into and through stopper 20. This "overhang" 75 of the plastic cap of the assembly of the invention serves to define a compartment or area 78 for receiving and containing any blood droplets or blood aerosol which may develop during the insertion and removal of needles through stopper 20. Also, the top finger well 28 of stopper 20 serves to enhance this containing function of the assembly shown.

As can be seen in FIG. 3, the bottom surface 30 of stopper 20 may have an annular tapered end edge portion 84 for ease of insertion of the lower portion 24 of stopper 20 into the top of tube 70. Formed on the outer surface of the cap 74 are a plurality of circumferentially spaced ribs 80 which serve to provide a gripping surface for the assembly for removing the assembly from tube 70. In this connection, an integral annular abutment 82 is provided which engages the bottom surface 25 of stopper upper annular flange portion 22 so as to grip and remove stopper 20 when the outer surface of cap 74 is gripped and urged outwardly from the opening of tube 70. Also, annular abutment 82 includes a tapered surface 83 for ease of assembly of the plastic cap 74 over the upper annular flange 22 of stopper 20.

FIG. 4 shows a radial stress contour plot of a prior art stopper, while FIG. 5 is a similar plot of radial stress contours for a stopper illustrating this invention. As both FIGS. 4 and 5 show, radial stress lines such as 56, 58 and 66 are generated around the axes 50, 62, respectively, of the stoppers, and particularly adjacent the inside surfaces 52, 65 of the diaphragm of the stopper. If the stresses are tensile, when a needle is inserted in the diaphragm in the vicinity of axis 50 as in FIG. 4, the continuity of surface 52 is broken and an open cavity 63 is formed. This cavity may be filled with blood when the needle is withdrawn. If the stresses are compressive, no red spot is formed.

Thus, when the stopper is removed from the tube, a red spot of blood is evident at this location and serves as a further potential exposure of contamination to the clinician. As further illustrative of the plot shown in FIG. 4, for example, the line designated A has a value of minus 100 pounds per square inch while the line B is zero and line C is plus 100 pounds per square inch. The numbers in the plot shown in FIGS. 4 and 5 designated as, for example, 131, 138 and 60 are merely nodal locations to identify the region for the user on the figures generated. Lines are drawn through these points to provide a coordinate grid to provide dimensions for the figure generated. The remaining values for FIGS. 4 and 5 are as follows.

FIG. 4 Values		FIG. 5	
A	-100 p.s.i.	A	-240 p.s.i.
B	0 p.s.i.	B	-220 p.s.i.
C	+100 p.s.i.	C	-200 p.s.i.
D	+200 p.s.i.	D	-180 p.s.i.
E	+300 p.s.i.	E	-160 p.s.i.
F	+400 p.s.i.	F	-140 p.s.i.
G	+500 p.s.i.	G	-120 p.s.i.
		H	-100 p.s.i.
		I	-80 p.s.i.
		J	-60 p.s.i.
		K	-40 p.s.i.
		L	-20 p.s.i.
		M	p.s.i.

With respect to FIGS. 4 and 5, FIG. 4 figures are for a 13 millimeter conventional stopper similar to that disclosed in U.S. Pat. No. 4,465,200 with an evacuated 13 millimeter diameter tube. With respect to FIG. 5, an 0.434 inch diameter tube is used with a composite stopper assembly illustrating this invention.

FIG. 6 shows a further computer generated stopper design embodiment of this invention. The figure shows the geometry of the design and the nature of the compressive radial stress developed on the stopper/tube interface 93. The analysis shows that the radial surface stresses along the entire 0.49044 inch radius 95 are all compressive including those at the center line of the stopper. In referring to FIG. 6, 94 is the Y axis while 92 is the Z axis. The Z axis 92 represents the axis of the annular stopper design. The points shown in FIG. 6 such as 100, 102 and 103 are distances from the Y and Z axis given in rectangular coordinate format. Thus 100 is zero distance from the Z axis 92, while being 0.04 inches from the Y axis, whereas 102 is 0.194 inches from the Z axis while being at zero inches from the Y axis. As further illustrative of these distances, point 15 is 0.199 inches from the Z axis while being 0.335 inches from the Y axis. Radius 100 is 0.015 inches while radius 96 is 0.23172 inches. As noted above, radius 98 is 0.49044 inches.

Thus, the computer study shown in FIG. 6 indicates that there will be no gray bands in the sealing area and no red spot formation on the inside surface 95 of the diaphragm. The diaphragm of the stopper generated is 0.19 inches thick at the center line which provides good vacuum retention while permitting satisfactory needle penetration. The upper radius 96 provides a slightly different configuration of finger well but which still serves to prevent contact of the surface 96 with the user's finger.

As further illustrative of computer plots generated for stopper designs in accordance with the invention herein, one may note the plot shown in FIG. 7 which is the plot of stopper 20 shown in FIG. 3. Thus, stopper 20 has an axis 86 along the Z axis of the configuration with an upper annular portion 22 and a lower portion 24 for insertion in a cooperating tube. The radial notch 26 is, as discussed above, for receiving the top bead of a tube into which the stopper is inserted. Stopper 20 includes the annular tapered edge 84 along the bottom surface 30 thereof for easy insertion of a stopper generated according to the design shown in FIG. 7 into a tube.

Thus, there is provided, in accordance with this invention, a new stopper arrangement for closing containers in which a superior sealing requirement is needed. Also, in accordance with this invention, a new compos-

ite closure assembly for blood sample tubes whether evacuated or not is provided. The arrangement of the invention herein is more hygienic to the user and the patient in that lower contamination from blood is obtained from the structure taught and claimed herein. That is, there is lower contamination within the assembly itself reducing exposure of a technician to aerosol around the top edge or blood droplets accumulating on the bottom surface of the stopper. Moreover, and as will be understood by practitioners-in-the-art, there is a substantial reduction in cost in the stopper of the invention herein in that the entire configuration is precisely generated to reduce any excessive use of elastomer materials, which are expensive, while at the same time obtaining the most appropriate sealing characteristics at the closure/ container interface.

As is apparent from the foregoing, the arrangements of apparatus provided in accordance herewith are readily and simply manufactured by mass production techniques in conventional molding procedures and the parts may be simply assembled and mounted on containers with a limited amount of effort.

While the device and method of forming the device as herein disclosed form preferred embodiments of this invention, this invention is not limited to these specific devices and methods, and changes can be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A method for generating a stopper profile and for generating stoppers from said profile, for sealing containers, from a three-dimensional axisymmetrical computer model, characterized by

- (a) selecting in a first selecting step an elastomeric material for said profile;
 - (b) selecting in a second selecting step a linear modulus for said profile;
 - (c) selecting in a third selecting step a poissons ratio for said profile;
 - (d) selecting in a fourth selecting step the desired boundary conditions for said profile;
 - (e) selecting in a fifth selecting step the desired loading conditions for said profile, including selecting the bottom surface of said stopper profile to have continuous compressive stresses along the entire extent thereof upon insertion of the resulting stopper into a container, and selecting the outer surface of the resulting stopper which is to be in engagement with the walls of the container into which it is inserted to have continuous compressive radial stresses along the entire length thereof with the container walls;
 - (f) using the information from said five recited selecting steps and generating a three-dimensional axisymmetrical computer model for said profile;
 - (g) utilizing said three-dimensional axisymmetrical computer model from said generating step to generate a stopper profile;
 - (h) utilizing, in a second generating step, said generated stopper profile for making a stopper mold; and
 - (i) utilizing in a third generating step, said mold for forming a plurality of stoppers for sealing containers.
2. The method of claim 1, further characterized by
(a) said linear modulus is 500 pounds per square inch.
3. The method of claim 1 further characterized by
(a) said poissons ratio is 0.495.

* * * * *

40

45

50

55

60

65

EXHIBIT

B



US00D356643S

United States Patent [19]

Burns

[11] **Patent Number:** Des. 356,643[45] **Date of Patent:** ** Mar. 21, 1995[54] **MICROCOLLECTION TUBE**[75] **Inventor:** James A. Burns, Elizabeth, N.J.[73] **Assignee:** Becton Dickinson and Company,
Franklin Lakes, N.J.[**] **Term:** 14 Years[21] **Appl. No.:** 8,868[22] **Filed:** May 27, 1993[52] **U.S. Cl. D24/224**[58] **Field of Search D24/224; 422/102, 61,**
422/58, 215, 103, 104; 436/296, 45, 105, 808,
809; 128/763, 764, 767

[56]

References Cited**U.S. PATENT DOCUMENTS**

3,136,458	6/1964	Ruetz	222/498
3,190,731	6/1965	Weiskopf	422/102
3,252,446	5/1966	Bateman	120/42.01
3,265,296	8/1966	Mitchell	233/26
3,372,834	3/1968	Ayotte et al.	220/60
3,419,179	12/1968	Deuschle et al.	220/38.5
3,430,798	3/1969	Goyet et al.	215/41
3,706,306	12/1972	Berger et al.	422/102 X
3,901,400	8/1975	Westfall	215/221
3,902,477	9/1975	Gerarde	128/2 F
3,910,444	10/1975	Foster	215/295
3,982,651	9/1976	Braun et al.	220/4 B
4,171,057	10/1979	Gach	215/211
4,298,129	11/1981	Stull	215/224
4,335,823	6/1982	Montgomery et al.	215/206

4,390,111	6/1983	Robbins et al.	220/259
4,397,318	8/1983	Burns	128/763
4,399,920	8/1983	Swartzbaugh et al.	215/211
4,411,163	10/1983	White	73/864.02
4,576,185	3/1986	Proud et al.	128/760
4,620,549	11/1986	Nugent	128/763
4,769,335	9/1988	Schmidt et al.	422/102 X
4,799,599	1/1989	Herrmann	215/307
4,804,096	2/1989	Harding	215/228
4,805,635	2/1989	Korf et al.	128/763
5,038,794	8/1991	Van Valkenburg	128/763
5,071,766	12/1991	Barr et al.	422/102 X
5,257,984	11/1993	Kelley	128/764 X
5,288,466	2/1994	Burns	422/102

FOREIGN PATENT DOCUMENTS

2041892 9/1980 United Kingdom 215/295

Primary Examiner—A. Hugo Word*Assistant Examiner*—I. Simmons*Attorney, Agent, or Firm*—Nanette S. Thomas

[57]

CLAIM

The ornamental design for a microcollection tube, as shown and described.

DESCRIPTION

FIG. 1 is a top and front perspective view of a microcollection tube showing my new design;

FIG. 2 is a top plan view thereof;

FIG. 3 is a side elevational view thereof;

FIG. 4 is a front elevational view thereof;

FIG. 5 is a back elevational view thereof; and,

FIG. 6 is a bottom plan view thereof.

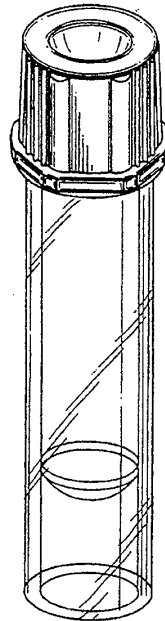


FIG-1

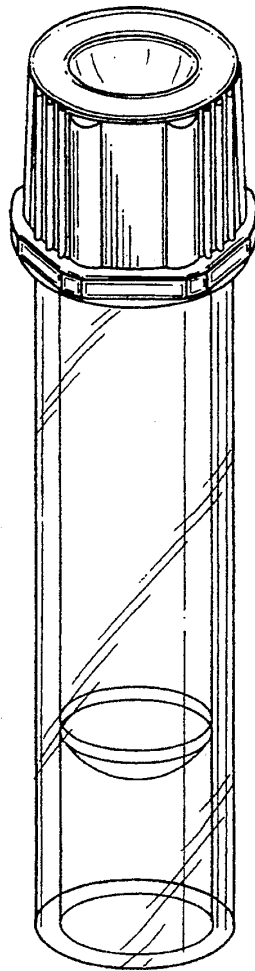


FIG-2

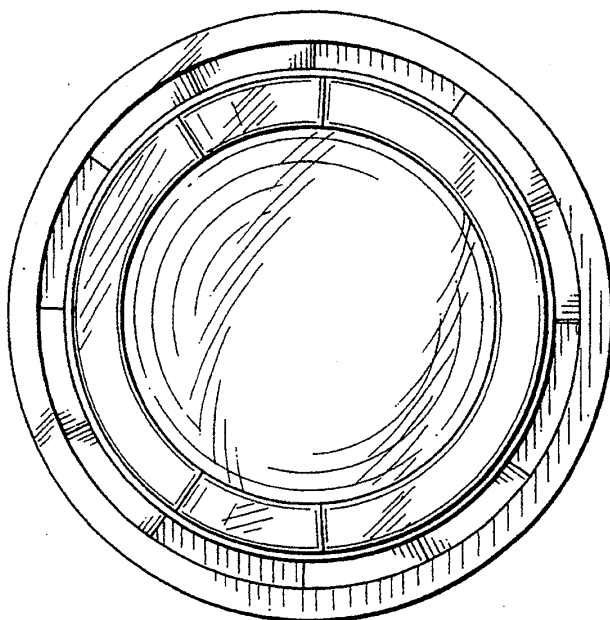


FIG-3

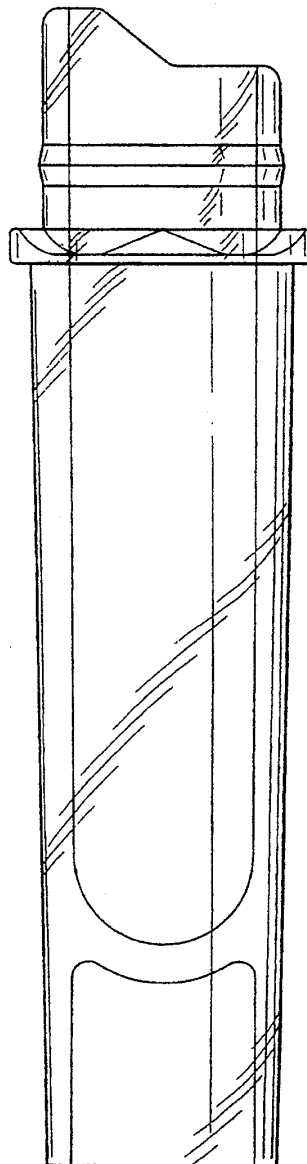


FIG-4

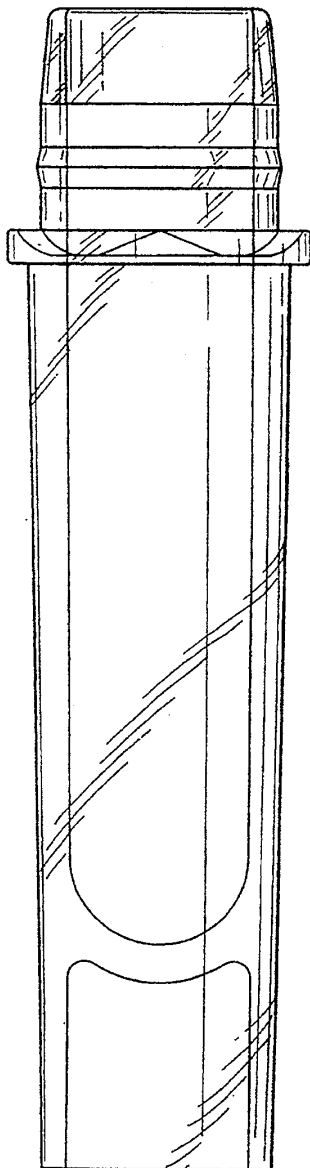


FIG-5

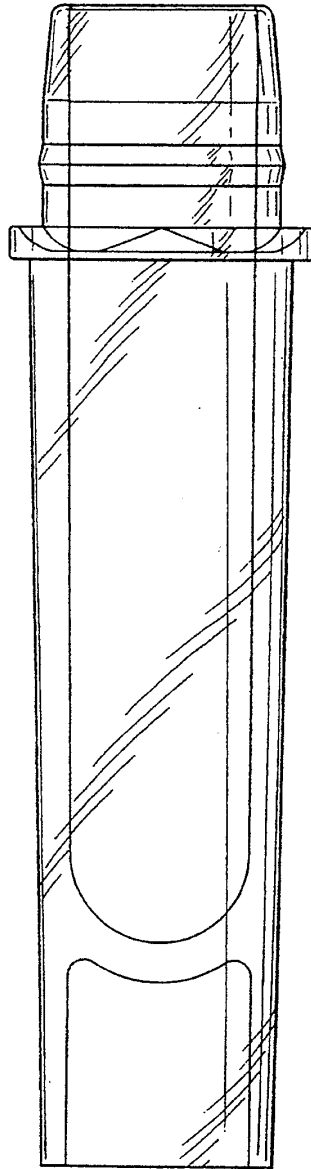
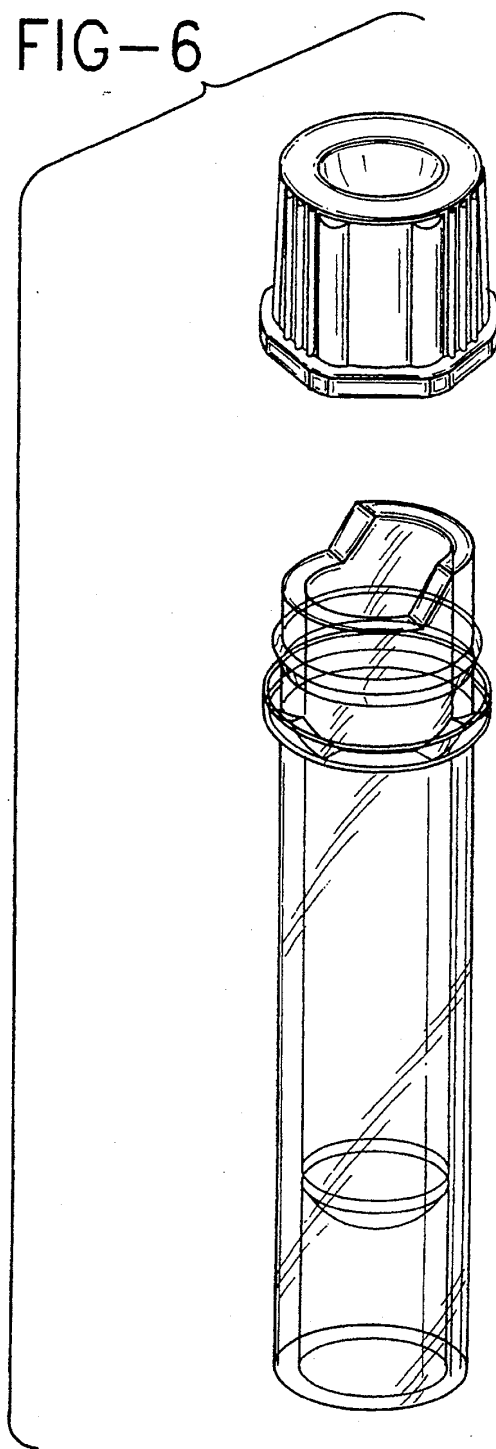


FIG-6





US00D357985S

United States Patent [19][11] **Patent Number:** **Des. 357,985****Burns**[45] **Date of Patent:** **** May 2, 1995**[54] **MICROCOLLECTION TUBE**[75] **Inventor:** **James A. Burns, Elizabeth, N.J.**[73] **Assignee:** **Becton Dickinson and Company,**
Franklin Lakes, N.J.[*] **Notice:** The portion of the term of this patent subsequent to Mar. 21, 2009 has been disclaimed.[**] **Term:** **14 Years**[21] **Appl. No.:** **8,862**[22] **Filed:** **May 27, 1993**[52] **U.S. Cl.:** **D24/224**[58] **Field of Search** **D24/224; 422/102, 61,**
422/58, 215, 103, 104; 436/296, 45, 165, 808,
809; 128/763, 764, 761[56] **References Cited****U.S. PATENT DOCUMENTS**

D. 310,264 8/1990 Leoncavallo et al. D24/224
D. 315,680 3/1991 Baxter D24/224 X
3,190,731 6/1985 Weiskopf 422/102
3,706,306 12/1972 Berger et al. 422/102 X

4,769,335 9/1988 Schmidt et al. 422/102 X
5,038,794 8/1991 Van Valkenburg 128/763
5,038,958 8/1991 Dreier D24/224
5,071,766 12/1991 Barr et al. 422/102 X
5,257,984 11/1993 Kelly 128/764
5,288,466 2/1994 Burns 128/102

Primary Examiner—A. Hugo Word*Assistant Examiner*—I. Simmons*Attorney, Agent, or Firm*—Nanette S. Thomas[57] **CLAIM**

The ornamental design for a microcollection tube, as shown and described.

DESCRIPTION

FIG. 1 is a top and front perspective view of a microcollection tube showing my new design;
FIG. 2 is a top plan view thereof;
FIG. 3 is a front elevational view thereof, the rear elevational view being identical thereto;
FIG. 4 is a side elevational view thereof, the opposite side elevational being identical thereto;
FIG. 5 is a bottom plan view thereof; and,
FIG. 6 is a top and front perspective view thereof, with the cap removed.

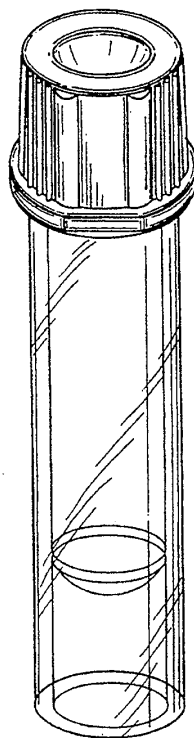


FIG-1

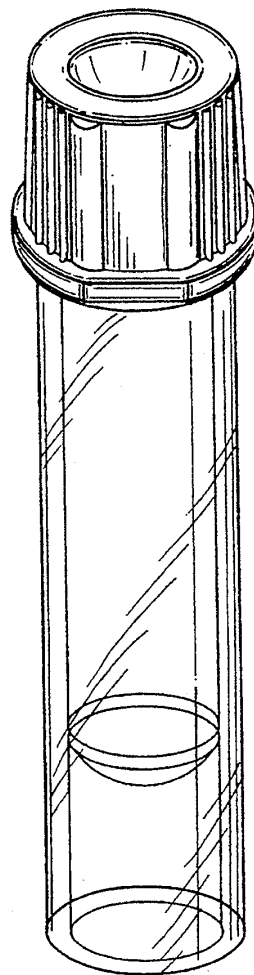


FIG-2

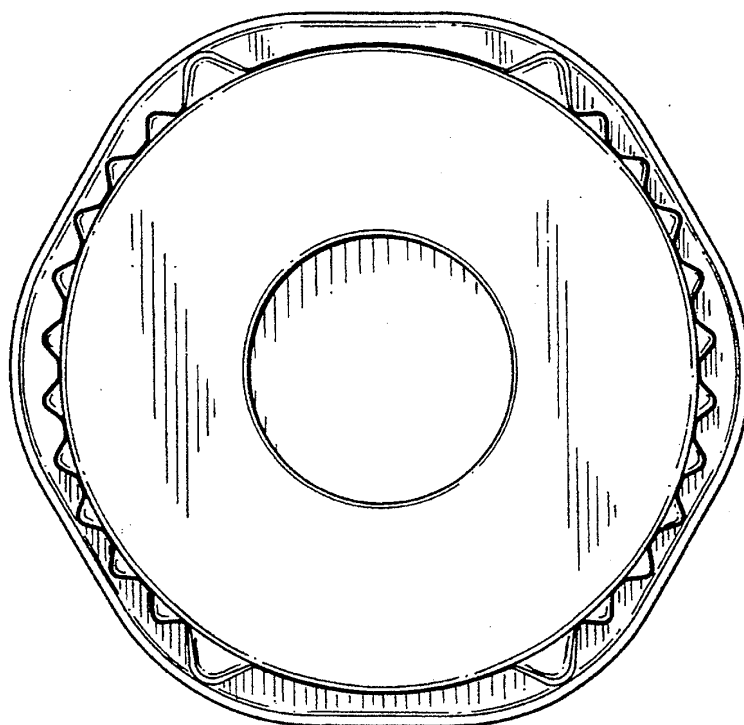


FIG-3

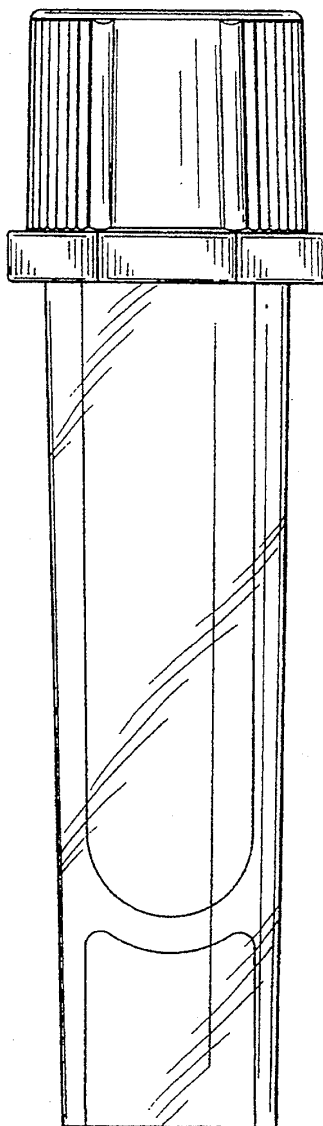


FIG-4

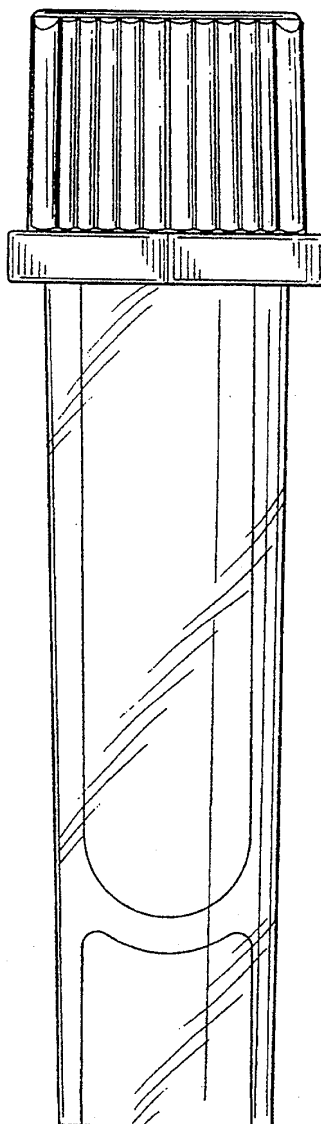


FIG-5

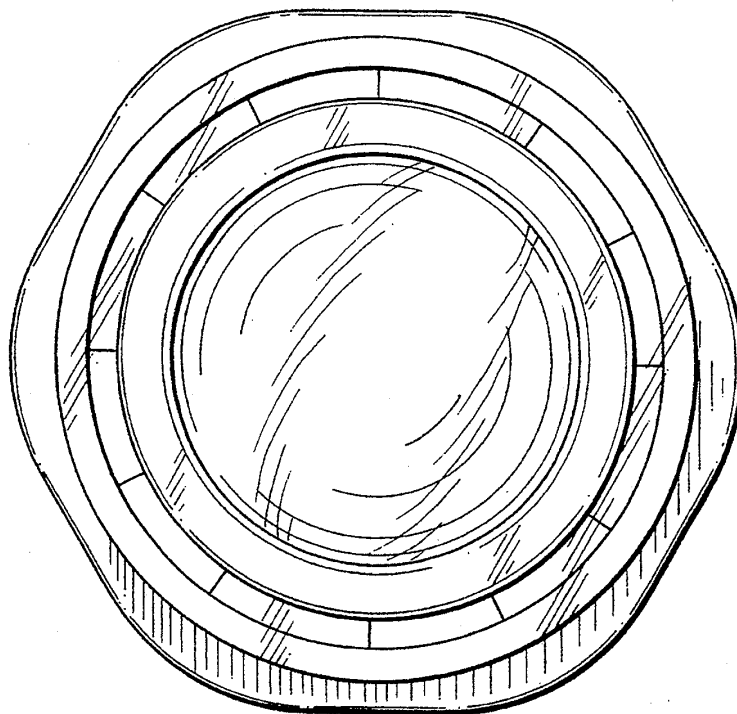
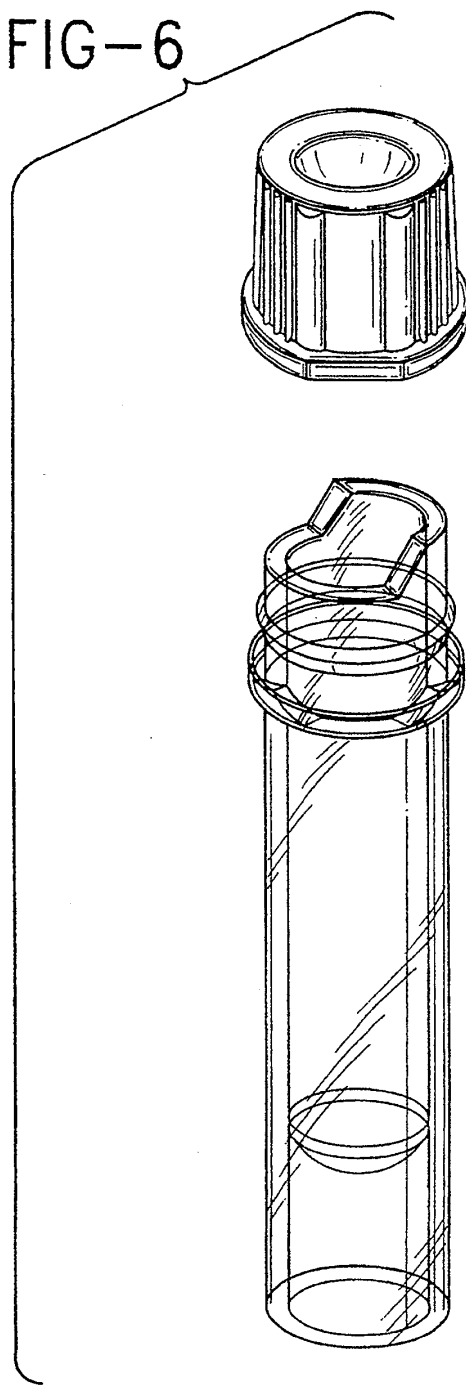


FIG-6





US00D445908S

(12) **United States Design Patent** (10) Patent No.: **US D445,908 S**
Conway (45) Date of Patent: **** Jul. 31, 2001**

(54) **STACKABLE TUBE ASSEMBLY** 4,397,318 8/1983 Burns 128/763
4,830,217 5/1989 Dufresne et al. 220/420
(75) Inventor: **Hugh T. Conway**, Verona, NJ (US) 5,384,096 1/1995 Burns 422/102
5,441,895 8/1995 Jakubowicz et al. 436/518
(73) Assignee: **Becton, Dickinson and Company**, 5,545,375 * 8/1996 Tropsha et al. 422/58
Franklin Lakes, NJ (US) 5,700,429 * 12/1997 Buhler et al. 422/102
5,924,594 * 7/1999 Kelly 422/102
(**) Term: **14 Years** 5,948,365 * 9/1999 Macy et al. 422/102

* cited by examiner

(21) Appl. No.: **29/108,970**

Primary Examiner—Ian Simmons

(22) Filed: **Aug. 6, 1999**

(74) *Attorney, Agent, or Firm*—Nanette S. Thomas

(51) **LOC (7) Cl.** **24-02**

(52) **U.S. Cl.** **D24/224; D24/216**

(58) **Field of Search** **D24/224, 216,**
D24/223; D9/520, 517, 341; 422/102, 104,
103, 100, 61, 58, 215; 430/70, 105, 804;
222/4.21

(57) **CLAIM**

The ornamental design of a stackable tube assembly, as shown.

DESCRIPTION

(56) **References Cited**

U.S. PATENT DOCUMENTS

D. 356,643 * 3/1995 Burns D24/224
3,615,222 10/1971 Mead 23/230 B
3,807,955 4/1974 Note, Jr. et al. 23/230 B
4,140,489 * 2/1979 Lee D24/224

FIG. 1 is a front perspective view of the stackable tube assembly;

FIG. 2 is a top plan view thereof;

FIG. 3 is a bottom plan view thereof; and,

FIG. 4 is a side view thereof.

1 Claim, 3 Drawing Sheets

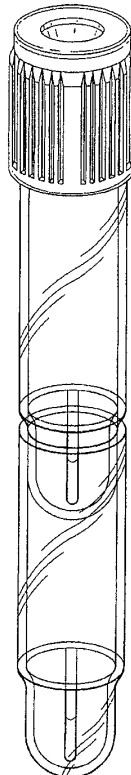


FIG. 1

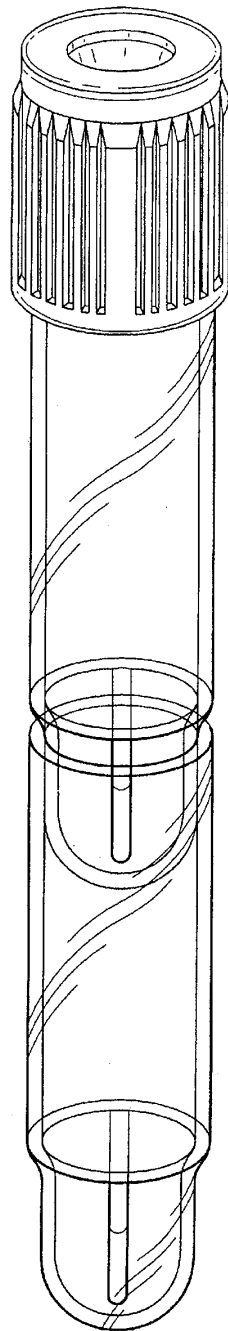


FIG. 2

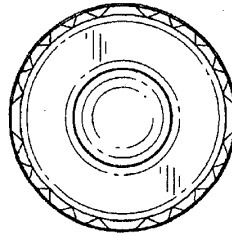


FIG. 3

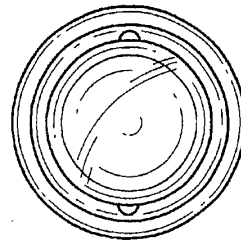
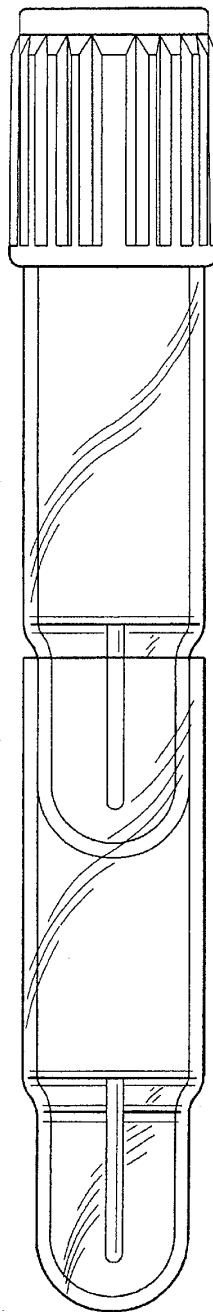


FIG. 4



EXHIBIT

C

***For a new feeling of confidence in
the Hematology Laboratory***



NEW
VACUTAINER BRAND
TUBES
With
HEMOGARDTM
CLOSURE

**VACUTAINER
BRAND
QUALITY
MAKES THE
DIFFERENCE**

**BECTON
DICKINSON**

NEW
VACUTAINER BRAND
TUBES
With
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Hematology Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between the specimen and you

Whether you open and close a specimen tube once or several times, use of VACUTAINER Brand Tubes with HEMOGARD Closure virtually eliminates exposure to the specimen:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Enhanced handling features — inherent in the design

Ridges on the outer surface of the HEMOGARD Closure permit a more secure grip. The special closure design encourages safer opening of the tube by discouraging use of the "thumb roll" technique, which can result in blood splattering. And, the "hooded" feature of the closure reduces the possibility of pinching gloves between stopper and tube when reclosing.



Dependable performance— inherent in the name

New VACUTAINER Brand Tubes with HEMOGARD Closure are compatible with hematology instrumentation and offer the same special features, quality and reliability you have come to expect—including:

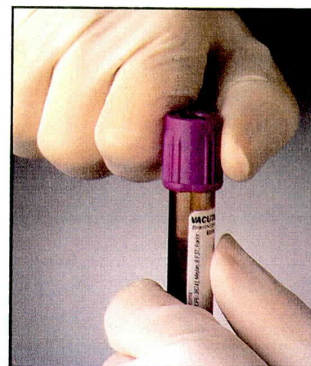
- SeeThru Tubes—to provide maximum specimen visibility that won't interfere with your labeling system
- Your choice of EDTA:
 - Liquid EDTA (K_3)—the preferred anticoagulant—to mix more readily with blood
 - Freeze dried EDTA (Na_2)



Removal and reinsertion of HEMOGARD Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD Closure. Using the other hand, grasp the HEMOGARD Closure as shown in the photo. Twist and pull the closure upward until removed.

Note: One-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.



To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD Closure over the tube and gently push until the closure is fully seated.

For more detailed information, refer to product circular.

NEW VACUTAINER[®] BRAND TUBES **With** HEMOGARD[™] CLOSURE

**For a new feeling of confidence in
the Hematology Laboratory**

Ordering Information

Description	Additive	New Closure Color	New Tube Size (mm)	Draw Volume (mL)	Type of Label	New Reorder Number
Sterile tubes with K₂ EDTA for determinations requiring whole blood	0.05 mL, 7.5% solution	Lavender	13×75	3.0	SeeThru	367650
	0.04 mL, 7.5% solution	Lavender	13×75	2.0	Paper	367651
	0.05 mL, 15% solution	Lavender	13×75	5.0	Paper	367653
	0.05 mL, 15% solution	Lavender	13×75	5.0	SeeThru	367658
	0.05 mL, 7.5% solution	Lavender	13×75	3.0	Paper	367661
	0.05 mL, 15% solution (silicone coated)	Lavender	13×75	5.0	Paper	367662
	0.07 mL, 15% solution	Lavender	13×100	7.0	Paper	367665
	0.07 mL, 15% solution	Lavender	13×100	7.0	SeeThru	367669
Sterile tubes with Na₂ EDTA for determinations requiring whole blood	4.5 mg (freeze dried)	Lavender	13×75	3.0	Paper	367666
	7.5 mg (freeze dried)	Lavender	13×75	5.0	Paper	367667
	10.5 mg (freeze dried)	Lavender	13×100	7.0	Paper	367668
Sterile tubes with buffered sodium citrate, siliconized interior, for coagulation studies	0.2 mL, .129M, 3.8% solution	Lt. blue	13×75	1.8	Paper	367700
	0.3 mL, .129M, 3.8% solution	Lt. blue	13×75	2.7	Paper	367703
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×75	4.5	Paper	367704
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×100	4.5	Paper	367705
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×75	4.5	SeeThru	367706
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×100	4.5	SeeThru	367707
	0.2 mL, .105M, 3.2% solution	Lt. blue	13×75	1.8	Paper	367711
	0.3 mL, .105M, 3.2% solution	Lt. blue	13×75	2.7	Paper	367712
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×75	4.5	Paper	367714
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×100	4.5	Paper	367715
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×75	4.5	SeeThru	367716
Sterile tubes for sedimentation rate determinations (Westergren)	0.6 mL, .129M, 3.8% solution, buffered citrate	Black	13×75	2.4	Paper	367741
Sterile tubes for activated clotting time determinations	12 mg, siliceous earth	Lt. gray	13×75	2.0	SeeThru	367742
Sterile tubes for fibrin degradation product determinations	20 NIH U thrombin 3670 NF U soybean trypsin inhibitor	Lt. blue	13×75	2.0	Paper	367751
Sterile tubes for blood bank studies requiring whole blood	1 mL ACD solution B	Yellow	13×100	6.0	Paper	367756

For more information or to order, contact your Becton Dickinson VACUTAINER Systems representative.

For technical information, call **1-800-631-0174** (in New Jersey, call **1-201-460-2920**).

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company.
© 1989 Printed in USA VSS053
U.S. Pat. No. 4,741,446 and foreign

**For a new feeling of confidence in
the Chemistry Laboratory**



NEW
VACUTAINER BRAND
TUBES
WITH
HEMOGARDTM
CLOSURE

**VACUTAINER
BRAND
QUALITY
MAKES THE
DIFFERENCE**

**BECTON
DICKINSON**

NEW
VACUTAINER BRAND TUBES
WITH
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Chemistry Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between you and the specimen — whether it is serum, plasma or whole blood:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Provides enhanced handling features — inherent in the design

- ridges on the outer surface permit a more secure grip
- special shield design encourages safer opening—discourages use of “thumb roll” technique, which can result in splattering of specimen
- “hooded” feature of closure reduces the possibility of catching glove between stopper and tube on reclosing

Dependable performance — inherent in the name

New VACUTAINER Brand Tubes with HEMOGARD Closure are available in a full line and offer the same special features, quality and reliability you have come to expect.



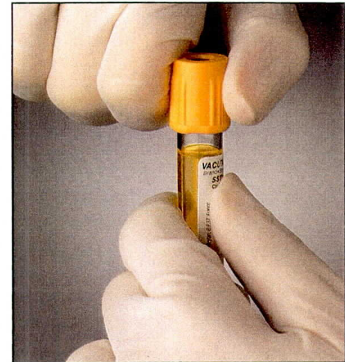
Removal and reinsertion of HEMOGARD Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD Closure. Using the other hand, grasp the HEMOGARD Closure as shown in the photo. Twist and pull the closure upward until removed.

Note: One-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD Closure over the tube and gently push until the closure is fully seated.

For more detailed information, refer to product circular.



Now...

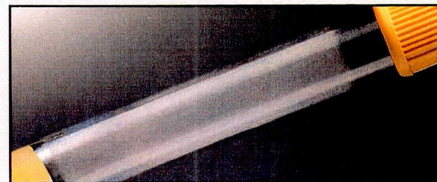
Improved Clot Activator in all VACUTAINER Brand SST Tubes with HEMOGARD™ Closure

**Yields a higher-quality
serum sample**

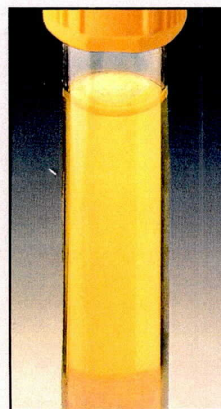
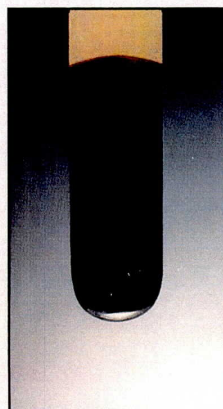
**New clot activator
improves overall performance
of SST tubes**

Now, Chemistry
Lab professionals
can expect:

- More reliable clotting
- More reliable gel barrier performance



You can see the difference



- Reduced fibrin contamination
- Higher-quality serum

**A user-friendly
innovation —**
significantly
improves overall
specimen-handling
efficiencies

NEW VACUTAINER^{BRAND} TUBES *With* HEMOGARDTM CLOSURE

For a new feeling of confidence in the Chemistry Laboratory

Unisized to a single tube diameter to streamline and simplify the specimen-handling process

In keeping pace with technological advances that have reduced sample requirements—allowing less blood to be drawn—Becton Dickinson has unisized its

VACUTAINER Brand Tubes to a single, 13 mm diameter. Available in 75 mm and 100 mm lengths, these single-diameter tubes will significantly improve the efficiencies associated with the use of direct-sampling instruments and increase the overall convenience of specimen handling for Chemistry Lab professionals.

Ordering Information

Description	Additive	New Closure Color	New Tube Size (mm)	Draw Volume (mL)	Type of Label	New Reorder Number
Sterile SST Brand tubes, with clot activator and gel, for serum separation		Gold	13×75	2.5	Paper	367782
		Gold	13×75	4.0	Paper	367783
		Gold	13×100	6.0	Paper	367784
		Gold	13×100	6.0	SeeThru	367789
Sterile PST Brand tubes, with gel, for plasma separation	14 USP units/mL lithium heparin	Lt. green	13×75	4.0	Paper	367793
	14 USP units/mL lithium heparin	Lt. green	13×100	6.0	Paper	367794
Sterile tubes, no additive, for determinations requiring serum	None	Red	13×75	2.0	Paper	367611
	None	Red	13×75	3.0	Paper	367612
	None	Red	13×75	4.0	Paper	367613
	None	Red	13×75	5.0	Paper	367614
	None	Red	13×100	7.0	Paper	367615
	None	Red	13×75	5.0	SeeThru	367618
	None	Red	13×100	7.0	SeeThru	367619
	None (noncoated interior)	Pink	13×100	7.0	Paper	367626
Sterile tubes for determinations requiring plasma — with freeze dried heparin	30 USP units NaHep	Green	13×75	2.0	Paper	367671
	45 USP units NaHep	Green	13×75	3.0	Paper	367672
	72 USP units NaHep	Green	13×75	5.0	Paper	367673
	100 USP units NaHep	Green	13×100	7.0	Paper	367676
	100 USP units NaHep	Green	13×100	7.0	SeeThru	367677
	100 USP units AmHep	Green	13×100	7.0	Paper	367680
	45 USP units LiHep	Green	13×75	3.0	Paper	367682
	72 USP units LiHep	Green	13×75	5.0	Paper	367683
	100 USP units LiHep	Green	13×100	7.0	Paper	367686
	100 USP units LiHep	Green	13×100	7.0	SeeThru	367687
	— with potassium oxalate	Lt. gray	13×100	7.0	Paper	367720
	20.0 mg Pot Ox	Lt. gray	13×100	7.0	Paper	367720
Sterile tubes with glycolytic inhibitor	1.5 mg lithium iodoacetate	Lt. gray	13×75	3.0	Paper	367763
	2.5 mg lithium iodoacetate	Lt. gray	13×75	5.0	Paper	367765
	6.0 mg PotOx/7.5 mg fluoride	Lt. gray	13×75	3.0	Paper	367722
	10.0 mg PotOx/12.5 mg fluoride	Lt. gray	13×75	5.0	SeeThru	367723
	10.0 mg PotOx/12.5 mg fluoride	Lt. gray	13×75	5.0	Paper	367724
	14.0 mg PotOx/17.5 mg fluoride	Lt. gray	13×100	7.0	Paper	367725
	14.0 mg PotOx/17.5 mg fluoride	Lt. gray	13×100	7.0	SeeThru	367726
	50.0 mg sodium fluoride/5.0 mg thymol	Lt. gray	13×100	7.0	Paper	367727
	17.5 mg sodium fluoride/7.0 mg EDTA	Lt. gray	13×100	7.0	Paper	367728
	30.0 mg sodium fluoride	Lt. gray	13×100	7.0	Paper	367729
Sterile tubes for lead determinations	72 USP units sodium heparin, freeze dried	Brown	13×75	5.0	Paper	367734
Sterile tubes for trace element determinations	143 USP units sodium heparin	Royal blue	13×100	7.0	Paper	367735
	10.5 mg Na ₂ EDTA	Royal blue	13×100	7.0	Paper	367736
	None	Royal blue	13×100	7.0	Paper	367737
Sterile tubes for stat chemistry determinations requiring serum	2 NIH units thrombin	Orange	13×100	7.0	Paper	367755
Sterile tubes for microbiology	0.8 mL SPS solution	Yellow	13×100	4.2	Paper	367757

For more information or to order, contact your Becton Dickinson VACUTAINER Systems representative.

For technical information, call **1-800-631-0174** (in New Jersey, call **1-201-460-2920**).

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company.
©1989 Printed in USA VSS054
U.S. Pat. No. 4,741,446 and foreign

A N N O U N C I N G

**A
Significant Advance
in
Blood-Specimen
Handling...**

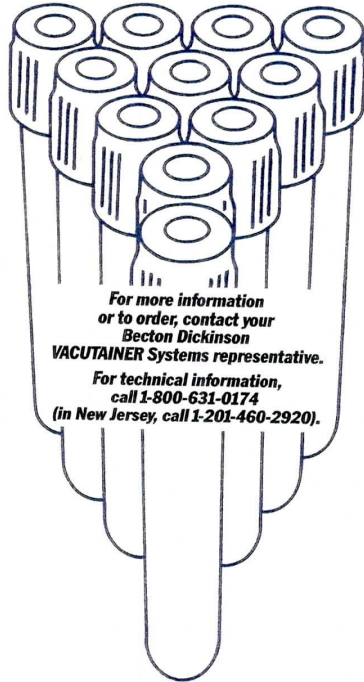


**BECTON
DICKINSON**

**A Shield
Against
Exposure**

The HEMOGARD™ Closure in the above photo has been cut away to clearly demonstrate its unique protective design.

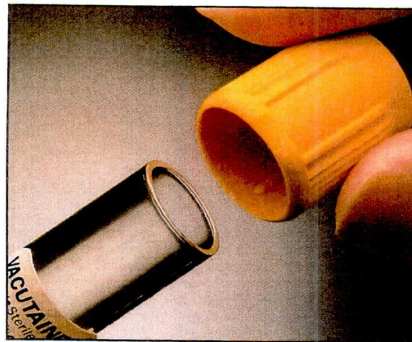
INTRODUCING
VACUTAINER BRAND
 TUBES
 With
HEMOGARDTM
 CLOSURE



For more information
 or to order, contact your
 Becton Dickinson
 VACUTAINER Systems representative.
 For technical information,
 call 1-800-631-0174
 (in New Jersey, call 1-201-460-2920).

**Builds greater
 confidence during
 all phases of blood-
 specimen handling**

Exposure of laboratory professionals to contaminated blood specimens has become a well-documented safety concern. VACUTAINER Brand Tubes with HEMOGARD Closure were specifically created to address this concern. The quality and reliability of the VACUTAINER Brand System are maintained, but with an important innovation: A plastic shield that protects personnel from exposure when handling blood specimens.



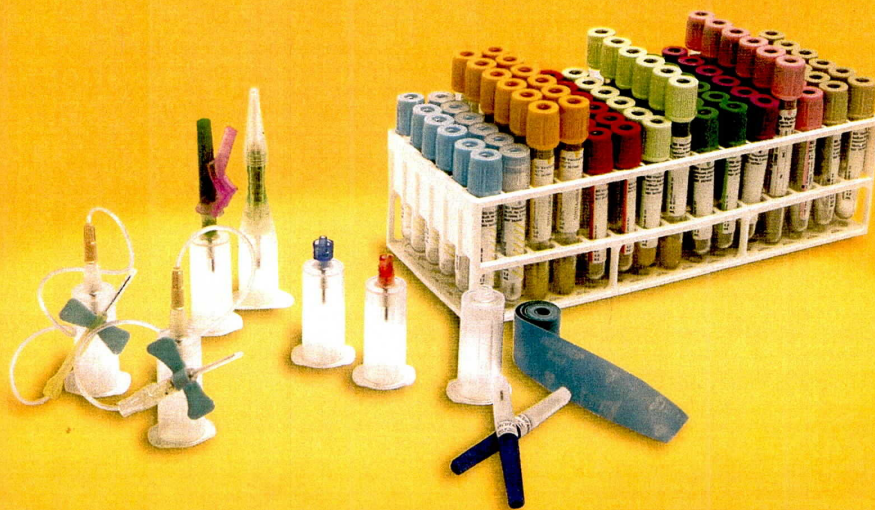
Becton Dickinson VACUTAINER Systems, Becton, New Jersey 07070
 VACUTAINER, SST, SST and HEMOGARD are trademarks of Becton Dickinson and Company.
 © 1989
 U.S. Pat. No. 4,741,446 and foreign
 955054
 Printed in USA

**BECTON
 DICKINSON**

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company
© 1989 Printed in USA VSS052
U.S. Pat. No. 4,741,446 and foreign

BD, We Can Help.





I DEMAND

safety

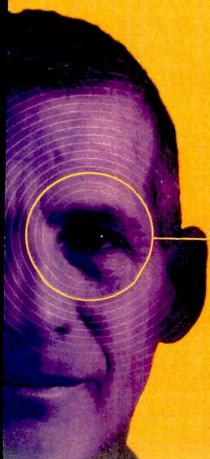


Helping all people
live healthy lives



BD Diagnostics
Preanalytical Systems
1 Becton Drive, MC 304
Franklin Lakes, NJ 07417

Presorted
First Class Mail
US POSTAGE
PAID
BD



DEMAND safety

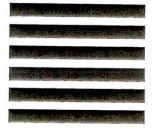


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 319 FRANKLIN LAKES NJ

POSTAGE WILL BE PAID BY ADDRESSEE



BD Diagnostics

Preanalytical Systems

1 Becton Drive, MC 304

Franklin Lakes, NJ 07417-9935



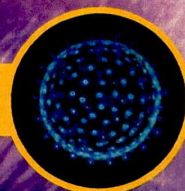
Demand the safest workplace for your employees.

It only takes one hospital-associated injury to change a life.

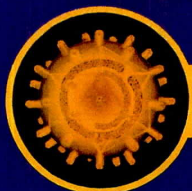
A study conducted at Johns Hopkins Hospital emergency room determined the prevalence of HCV, HIV, and HBV in blood samples from 2,523 patients.*



18% of the patient population was seropositive for HCV



6% of the patient population was seropositive for HIV



5% of the patient population was seropositive for HBV

There are currently 30 known bloodborne pathogens.
Protect your staff with BD's next generation safety-engineered products.

Each hospital-associated needlestick injury or infection can cost your facility dollars.

- The average cost to treat a single exposure incident ranges from \$800 to \$5,000. Costs can skyrocket with chronic cases of occupationally acquired HCV, where lifelong dialysis or organ transplants are necessary. The lifetime cost of care may reach \$1 million.

- The cost of long-term medical complications, disability payments, lost wages, worker's compensation and insurance costs, lost work time, emotional distress suffered by injured workers, and potential legal liability can significantly increase the expense.

BD Can Help!

* References available upon request.

Avoid workplace injuries!

Using safety-engineered devices is a good insurance policy.

Better for you.

Better for your staff.

DEMAND SAFETY. DEMAND BD. Next Generation Safety-Engineered Products.

**The BD Vacutainer® System of safety-engineered products
is designed to significantly increase healthcare worker safety.**

Your BD Vacutainer® Safety Products Starter Kit will contain:

BD Vacutainer®
One Use Holder

BD Vacutainer®
Push Button Blood
Collection Set

BD Vacutainer® Eclipse™
Blood Collection Needle
with Pre-Attached Holder

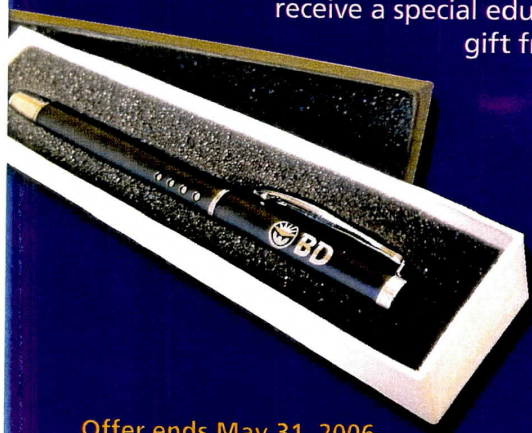
BD Vacutainer®
Plus Plastic Tubes

When you are ready, BD can help support you with
inservicing, technical support, and educational services.



Go to www.bd.com/vacutainer or return the completed card, or call **1.800.817.1702** to receive your complimentary product starter kit containing BD Vacutainer® safety-engineered products and educational materials.

Plus... the first 500 respondents will receive a special educational gift from BD!



Offer ends May 31, 2006

BD, BD Logo, and all other trademarks are the property of Becton, Dickinson and Company.
©2006 BD. 02/06 VS7542

I am interested in learning more about the products and services offered by **BD Diagnostics - Preanalytical Systems.**

Please send me information about (check all that apply):

- ☐ BD Vacutainer® Safety Products Starter Kit (BD Vacutainer® Eclipse™ Blood Collection Needles, BD Vacutainer® Push Button Blood Collection Sets, BD Vacutainer® One Use Holders, and BD Vacutainer® Plus Plastic Tubes).
- ☐ Have my BD Sales Consultant contact me.
My telephone number is: _____
- ☐ Send me news and information related to specimen collection and BD's products, services, and promotions.
My e-mail address is: _____

Name _____

Signature _____

Job Title _____

Facility _____

Street Address _____

City _____

State _____

Zip _____

E-mail _____

For faster results, please call **1.800.817.1702**

An engineering control

***For safer
blood-specimen
handling***



**BECTON
DICKINSON**

Virtually splatter free

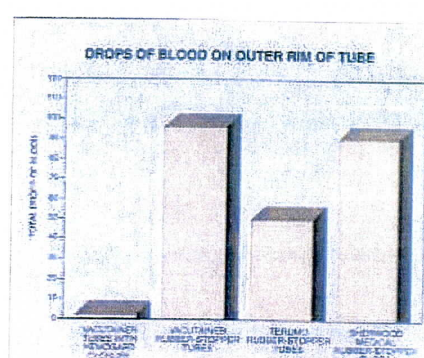
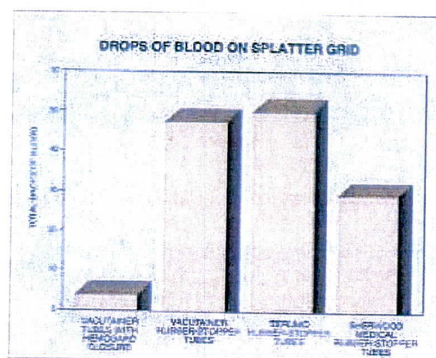
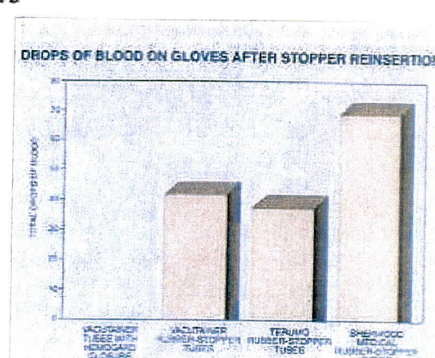
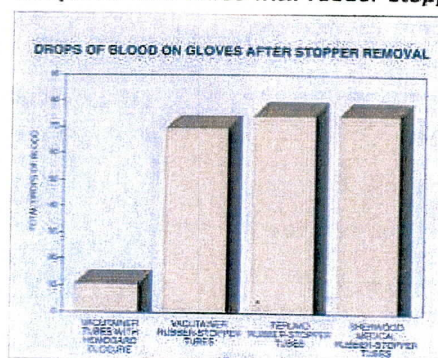
In a recent clinical study, four types of K₂EDTA blood collection tubes were evaluated for splatter and blood contamination during stopper removal, handling, and stopper reinsertion.

For the evaluation, four tubes of blood were collected from each of 20 normal volunteers (total of 80 tubes; 20 of each type). Each tube was opened and closed five times.

Results showed that the HEMOGARD™ Closure caused virtually no splatter and had only a minimal number of blood droplets around the top of the tube—in contrast to the tubes with rubber stoppers.

Superior performance when compared with rubber-stopper tubes²

An evaluation of VACUTAINER Brand Tubes with HEMOGARD™ Closure compared with tubes with rubber stoppers²

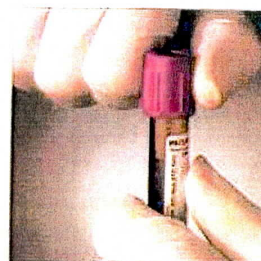


Removal and reinsertion of HEMOGARD™ Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD™ Closure. Using the other hand, grasp the HEMOGARD™ Closure as shown in the photo. Twist and pull the closure upward until removed.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD™ Closure over the tube and gently push until the closure is fully seated and the tube resealed.

Note: A one-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.



Virtually splatter free

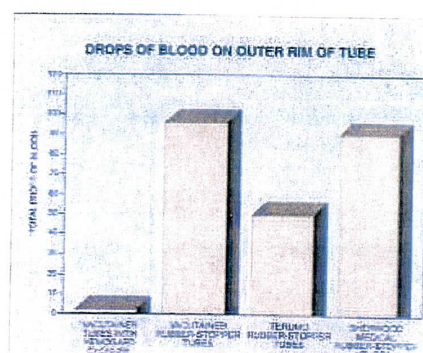
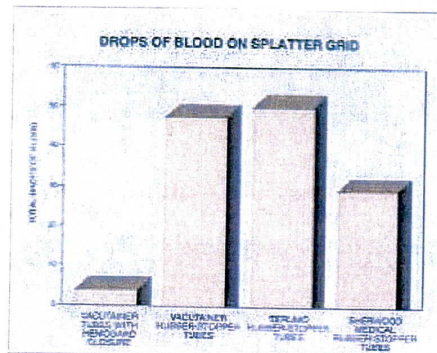
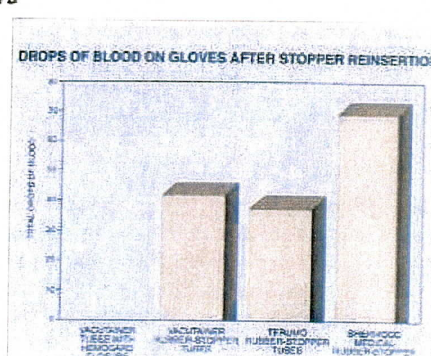
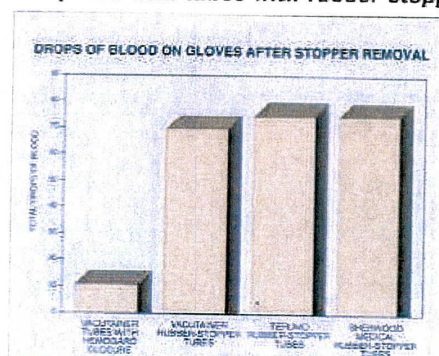
In a recent clinical study four types of K₂ EDTA blood collection tubes were evaluated for splatter and blood contamination during stopper removal, handling and stopper reinsertion.

For the evaluation, four tubes of blood were collected from each of 20 normal volunteers (total of 80 tubes, 20 of each type). Each tube was opened and closed five times.

Results showed that the HEMOGARD™ Closure caused virtually no splatter and had only a minimal number of blood droplets around the rim of the tube, in contrast to the tubes with rubber stoppers.

Superior performance when compared with rubber-stopper tubes²

An evaluation of VACUTAINER Brand Tubes with HEMOGARD™ Closure compared with tubes with rubber stoppers²

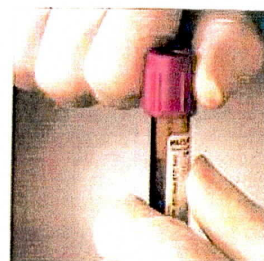


Removal and reinsertion of HEMOGARD™ Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD™ Closure. Using the other hand, grasp the HEMOGARD™ Closure as shown in the photo. Twist and pull the closure upward until removed.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD™ Closure over the tube and gently push until the closure is fully seated and the tube resealed.

Note: A one-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.



VACUTAINER[®] BRAND TUBES **HEMOGARD[™]** CLOSURE

**Standardized to a single tube diameter (13 mm)...
streamlines and simplifies specimen handling...
enhances patient care**

Simplified blood collection

- Only two tube sizes are needed to accommodate all draw volumes
- Only one size needle holder is required for both pediatric and adult draws

Simplified processing

- No need for centrifuge adapters to accommodate pediatric tube diameters
- Accommodates reduced sample volume requirements of analyzers

Reduced blood volume, better patient care*

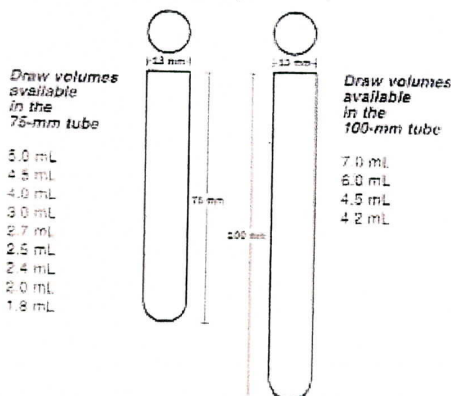
- Minimizes the patient's risk of phlebotomy-induced anemia and the need for transfusion
- Provides sufficient specimen volume for routine and add-on tests, as well as enough for samples to be sent to reference laboratories
- Smaller sample reduces blood waste and associated costs

Compatible with most laboratory systems

- Tubes are compatible with primary tube-sampling modes of most major chemistry and hematology instruments using a single-size rack or adapter

- No special handling is required for lower-volume tubes

A single diameter and two convenient tube lengths offer a variety of volume draws, including those that fulfill pediatric and geriatric requirements.



For more information,
please call **1-800-631-0174**.



Caution: All biologic samples must be handled carefully. Exposure to such samples may transmit HIV (AIDS), HBV (HEPATITIS B), HCV (HEPATITIS C), or other infectious diseases. All samples and containers must be disposed of in accordance with the policies and procedures of your facility. In the event of exposure, appropriate medical attention should be sought.

For more information on better patient care, please refer to the product monograph for 13 mm diameter VACUTAINER[®] Brand Tubes with HEMOGARD[™] Closure.

References

1. Department of Labor, U.S. Occupational Safety and Health Agency. Occupational exposure to blood-borne viruses. Final rule (29 CFR 1910.103). Federal Register, December 8, 1994; 59 (241): 64116.
2. Centers for Disease Control and Prevention. *Principles and Practice of Infection Control*. Atlanta, GA: CDC; 1991.

Becton Dickinson VACUTAINER[®] Brand Tubes with HEMOGARD[™] Closure are manufactured by Becton Dickinson and Company, 36361 Kildaire Avenue, Becton, MD 21218. © 1995 Becton Dickinson and Company.

**BECTON
DICKINSON**

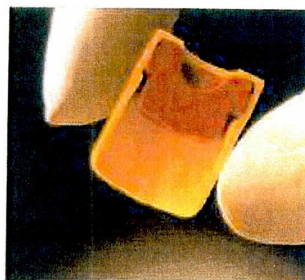
VACUTAINER[®] BRAND TUBES WITH **HEMOGARD[™]** CLOSURE

Your shield against exposure

"All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets."

Engineering control promotes safety

- HEMOGARD[™] Closure puts a splatter barrier between you and the specimen — whether serum, plasma or whole blood
- Shield design is engineered
 - for safer opening, resulting in significantly less splattering of specimen
 - to reduce the possibility of catching glove between stopper and tube when reclosing

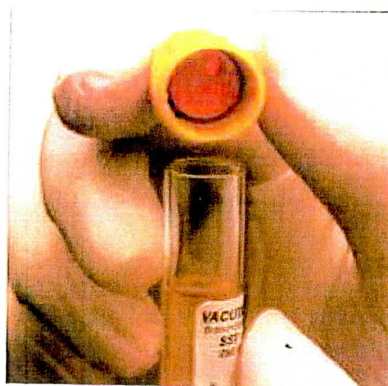


Close-up view illustrates the innovative protective design of the HEMOGARD[™] Closure.

- Ridges on outer surface permit a more secure grip

Greater protection during routine blood-specimen handling

- Reduces contact with blood on the stopper
- Protects against contact with blood around the outer rim of the tube
- Reduces blood splatter when the tube is opened



Greater protection for both chemistry and hematology laboratories



VACUTAINER[®] BRAND TUBES **HEMOGARD[™]** CLOSURE

**Standardized to a single tube diameter (13 mm)...
streamlines and simplifies specimen handling...
enhances patient care**

Simplified blood collection

- Only two tube sizes are needed to accommodate all draw volumes
- Only one size needle holder is required for both pediatric and adult draws

Simplified processing

- No need for centrifuge adapters to accommodate pediatric tube diameters
- Accommodates reduced sample volume requirements of analyzers

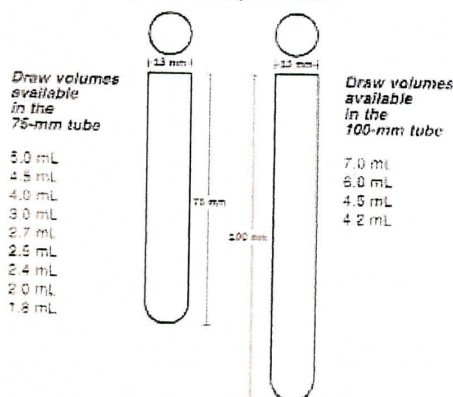
Reduced blood volume, better patient care*

- Minimizes the patient's risk of phlebotomy-induced anemia and the need for transfusion
- Provides sufficient specimen volume for routine and add-on tests, as well as enough for samples to be sent to reference laboratories
- Smaller sample reduces blood waste and associated costs

Compatible with most laboratory systems

- Tubes are compatible with primary tube-sampling modes of most major chemistry and hematology instruments using a single-size rack or adapter
- No special handling is required for lower-volume tubes

A single diameter and two convenient tube lengths offer a variety of volume draws, including those that fulfill pediatric and geriatric requirements.



For more information
please call 1-800-631-0174.



Caution: All biologic samples should be handled carefully. Exposure to such samples may transmit HBV (HEPATITIS B), AIDS, or other infectious diseases. All samples and collection materials must be disposed of in accordance with the policies and procedures of your facility. In the event of exposure, appropriate medical attention should be sought.

For more information on better patient care, please refer to the product monograph for the 250-2500 VACUTAINER Brand Tubes with HEMOGARD[™] Closure.

References

- 1. Department of Labor, Occupational Safety and Health Administration. Occupational exposure to blood-borne pathogens. 29 CFR 1910.103. Code Register, December 8, 1991; 56:247-248.
- 2. OSHA 3090. Blood-Borne Diseases and Other Infectious Diseases. 1991.

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Division, Becton Dickinson Corporation, 377
Wall Street, Becton, NJ 07008-1099. Becton Dickinson and Company
© Becton Dickinson and Company 1992. All rights reserved.

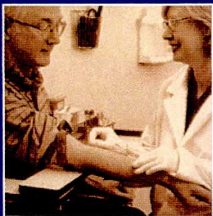


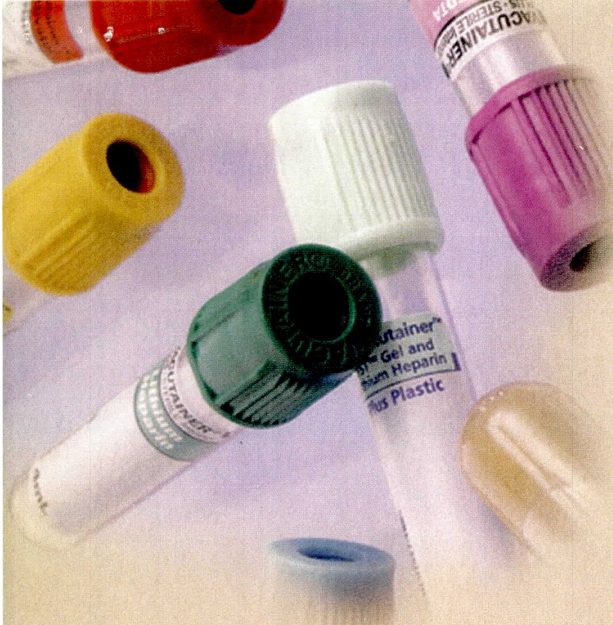
BD

Helping all people
live healthy lives

BD Vacutainer®

Venous Blood Collection Tubes





Why BD Vacutainer® Plus Plastic Tubes?

There has been an increasing customer preference for safety-engineered product solutions and improved clinical performance. These preferences are being driven by marketplace trends. It is the goal of BD to provide customers with the highest quality products that are clinically proven and medically necessary.

- **Clinical Expertise:** The efficacy, performance, and ease of use of **BD Vacutainer® Plus Plastic Tubes** are **clinically proven** and supported by more than 100 clinical studies involving a vast array of analytes and diagnostic instruments. Your BD Sales Consultant can provide further information and documentation from our library of clinical data.
- **Experience:** The BD legacy of innovative medical technology dates back more than a century. Most notable of our early blood collection innovations is the introduction and subsequent patent in 1949 of **the world's first blood collection tube**. The first BD plastic blood collection tube was introduced in 1991. This marked another technological achievement from BD that followed years of design, testing, and clinical trial evaluations.

BD produces in excess of 3.5 billion tubes annually, earning it the designation of the world's largest manufacturer of evacuated blood collection tubes. As a major worldwide medical device manufacturer, BD prides itself in manufacturing operations that maintain the highest standards for quality and efficiency. All BD Diagnostics - Preanalytical Systems manufacturing sites have achieved and maintain ISO 9001:2000 certification.

- **Compatibility:** To ensure that BD Vacutainer® Plus Plastic Tubes are compatible with major diagnostic systems, BD maintains ongoing discussions with the instrument manufacturers who are on the cutting edge of tomorrow's diagnostic technologies.
- **Safety:** BD Vacutainer® Plus Plastic Blood Collection Tubes are proven to be a safer alternative to glass. Our plastic tubes are **virtually break resistant***, thus helping to protect healthcare personnel from injury and exposure to bloodborne pathogens.

The BD Vacutainer® Hemogard™ Closure is a safety-engineered closure, featuring an integrated shield that prevents human contact with blood on the stopper or tube rim and effectively guards against blood splatter and splashing.

- **Cost Effectiveness:** BD Vacutainer® Plus Plastic Tubes can be disposed of safely and efficiently by incineration, thereby **reducing medical waste disposal costs**. The durability and safety of BD Vacutainer® Plus Plastic Tubes help to decrease turnaround time and improve laboratory efficiency by providing a high quality specimen and by helping to minimize risk of bloodborne pathogen infection to the laboratorian.

LEGEND

- ✓ Indicates part of the BD Best Practice Formulary
- G Indicates a glass tube
- P Paper Label
- ST See Thru Label



BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper

▲ BD CLINICAL ADVANTAGE:

▲ What is the BD Best Practice Formulary?

The BD Best Practice Formulary (BPF), as it relates to BD Vacutainer® Blood Collection Tubes, was developed to provide customers with a condensed yet comprehensive array of BD Vacutainer® Blood Collection Tubes for virtually every clinical need. Each tube chosen for inclusion in the BPF meets the demanding requirements of today's complex diagnostic instruments and fits within the current clinical guidelines of the scientific and medical communities.

The BD Best Practice Formulary provides the optimal offering for all of your clinical needs.

SST

BD Vacutainer® SST™ Tubes contain spray-coated silica and a polymer gel for serum separation. They are used for serum determinations in chemistry.

BD Vacutainer® SST™ Tubes provide an efficient means of serum sample preparation and help to improve laboratory workflow.



Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367983 ✓	13x75	3.5			P
367981 ✓	13x75	3.5			P
367977 ✓	13x100	4.0			P
367986 ✓	13x100	5.0			P
367989	13x100	5.0			ST
367974	16x100	6.0			P
367975	16x100	7.0			P
367988 ✓	16x100	8.5			P
367991	16x100	8.5			ST
Transport tube					
367987	16x100	7.5			P
367985	16x125	10.0			P



PST

BD Vacutainer® PST™ Tubes contain spray-coated lithium heparin and a gel for plasma separation. They are used for plasma determinations in chemistry.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367960 ✓	13x75	3.0			P
368056 NEW	13x75	3.0			P
367961	13x100	3.5			P
367962 ✓	13x100	4.5			P
367963	13x100	4.5			ST
367964 ✓	16x100	8.0			P

▲ BD CLINICAL ADVANTAGE:

BD Vacutainer® PST™ Lithium Heparin Tubes eliminate the need to wait for a clot to form, making it an ideal tube for STAT procedures, as well as for patients receiving anticoagulant therapy. The BD Vacutainer® PST™ Tube still provides the convenience of gel separation with the added advantage of improved turnaround times.

EDTA

BD Vacutainer® spray-coated K₂EDTA Tubes are used for whole blood hematology determinations and immunohematology testing.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367842	13x75	2.0			ST
367841 ✓	13x75	2.0			P
367859	13x75	3.0			ST
367856	13x75	3.0			P
367835	13x75	3.0			P
367862	13x75	4.0			ST
367861 ✓	13x75	4.0			P
367844 ✓	13x75	4.0			P
367863	13x100	6.0			P
367899 ✓	13x100	6.0			P
366643 NEW	16x100	10.0			ST

BD Vacutainer® PPT™ Tube - for molecular diagnostic testing

362788 ✓	13x100	5.0		Pearl White	Mylar Label
----------	--------	-----	--	-------------	-------------

▲ BD CLINICAL ADVANTAGE:

K₂EDTA is the "anticoagulant of choice in specimen collection and blood cell counting" according to both NCCLS and the International Council for Standardization in Haematology (ICSH)^{1,2}. It was chosen for the following reasons: 1) K₃EDTA results in greater RBC shrinkage; 2) K₃EDTA produces a larger increase in cell volume on standing; and 3) K₃EDTA is a liquid additive and will result in the dilution of the specimen. Results of directly measured values can be 1-2% lower than results with K₂EDTA. K₂EDTA is sprayed onto the interior of the plastic tube and like K₃EDTA requires 8-10 inversions for thorough mixing of blood with the anticoagulant.

¹ NCCLS, Evacuated Tubes and Additives for Blood Specimen Collection – Fifth Edition; Approved Standard. NCCLS documentation H1-A5, Vol. 23, No. 33, Dec. 2003.

² International Council for Standardization in Haematology Expert Panel on Cytometry. Recommendation of the International Council for Standardization in Haematology for ethylenediaminetetraacetic acid anticoagulation for blood cell counting and sizing. Am J Clin Pathol 1993; 100:371-372.



LEGEND

- ✓ Indicates part of the BD Best Practice Formulary
- G Indicates a glass tube
- P Paper Label
- ST See Thru Label



BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper



Serum

BD Vacutainer® Plus Plastic Serum Tubes have spray-coated silica and are used for serum determinations in chemistry, serology, and immunohematology.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
366668 NEW	13x75	3.0			P
366381 ⁶	10.25x64	3.0			P
367812 ✓	13x75	4.0			P
367814	13x100	5.0			P
367819	13x100	6.0			ST
367815 ✓	13x100	6.0			P
366431 ⁶	13x100	7.0			P
367820 ✓	16x100	10.0			P
366430 ⁶ ✓	16x100	10.0			P
Secondary/Discard tube (No additive)					
366703 NEW	13x75	3.0		Clear	P

Heparin

BD Vacutainer® Heparin Tubes are spray-coated with either lithium heparin or sodium heparin and are used for plasma determinations in chemistry.



Reference #	Additive	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
				Type	Color	
366664 NEW	Lithium Heparin 34 USP	13x75	2.0			P
366667 NEW	Lithium Heparin 51 USP	13x75	3.0			P
367884 ✓	Lithium Heparin 68 USP	13x75	4.0			P
367886	Lithium Heparin 87 USP	13x100	6.0			P
367889	Lithium Heparin 87 USP	13x100	6.0			ST
367880	Lithium Heparin 144 USP	16x100	10.0			P
Sodium Heparin						
367871 ✓	Sodium Heparin 68 USP	13x75	4.0			P
367872	Sodium Heparin 68 USP	13x75	4.0			ST
367878	Sodium Heparin 86 USP	13x100	6.0			P
367879	Sodium Heparin 86 USP	13x100	6.0			ST
367874	Sodium Heparin 143 USP	16x100	10.0			P

Citrate

BD Vacutainer® Citrate Tubes with 3.2% buffered sodium citrate solution are used for routine coagulation studies.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
363080	13x75	1.8		Clear	P
363083 ✓	13x75	2.7			P



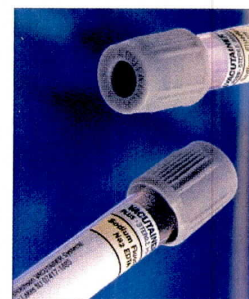
▲ BD CLINICAL ADVANTAGE:

Sodium citrate concentrations can have significant effects on APTT and PT assays especially with patients receiving IV heparin therapy and when responsive reagents are used. For this reason it is very important that laboratories determine their normal range of APTT and PT based on one citrate concentration and consistently use this concentration for all patient samples. BD offers only the 3.2% citrate concentration, as recommended by NCCLS.¹

¹ NCCLS, Collection, Transport and Processing of Blood Specimens for Coagulation Testing and General Performance of Coagulation Assays - Third Edition; Approved Guideline. NCCLS documentation H21-A3, Vol. 18, No. 20, Dec. 1998.

Glucose

BD Vacutainer® Fluoride Tubes contain a glycolytic inhibitor and are used for glucose determinations on plasma.



Reference #	Additives		Tube Size (mm)	Draw Volume (mL)	Closure		Label type
	Potassium oxalate (mg)	Sodium Fluoride (mg)			Type	Color	
367921	4.0	5.0	13x75	2.0			P
367587 ✓	—	3.0 with 6.0 mg Na ₂ EDTA	13x75	2.0			P
367922 ✓	8.0	10.0	13x75	4.0			P
368587 ✓	8.0	10.0	13x75	4.0			P
367925	11.8	14.8	13x100	6.0			P



Specialty Tubes

BD Vacutainer® Specialty Tubes

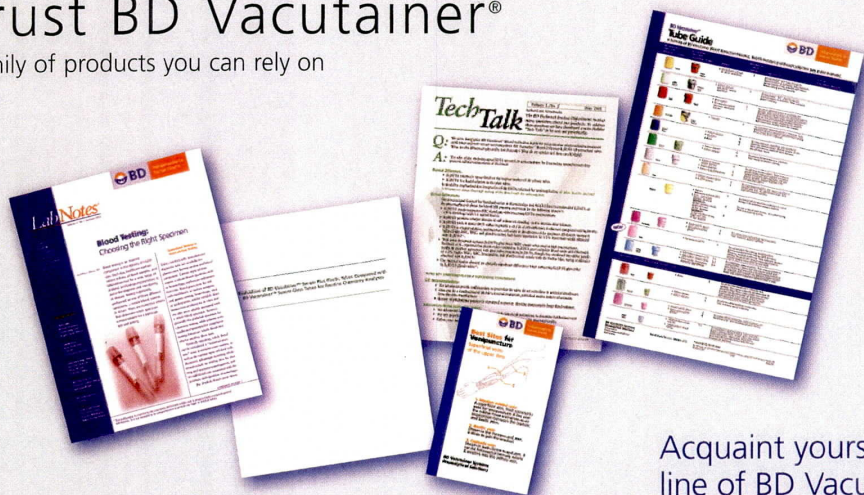
Reference #	Additive	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
				Type	Color	
Blood banking studies, HLA phenotyping, DNA and paternity testing						
364012 ⁶	ACD-B*	10.25x64	3.0			P
364606 ⁶	ACD-A**	16x100	8.5			P
364816 ⁶	ACD-B*	13x100	6.0			P
Serum tubes for stat chemistry determinations with thrombin additive and silicone-coated interiors						
367776 ⁶	1.4 NIH units	13x75	3.0			P
367766 ⁶	1.4 NIH units	13x75	5.3			P
367755 ⁶	1.4 NIH units	13x100	7.0			P
366525 ⁶	2.0 NIH units	16x100	10.0			P
Trace element testing						
368380 NEW	Serum (spray coated silica)	13x100	6.0			P
368381 NEW	K ₂ EDTA 10.8 mg	13x100	6.0			P
369735 ⁶	Sodium Heparin 100 USP units	13x100	7.0			P
369736 ⁶	Na ₂ EDTA 10.5 mg	13x100	7.0			P
369737 ⁶	Serum (no additive)	13x100	7.0			P
Lead testing						
367855	K ₂ EDTA 5.4 mg	13x75	3.0			P
367734 ⁶	Sodium Heparin 72 USP units	13x75	5.0			P
Fibrin Degradation Product (FDP)						
366478 ⁶	Thrombin (20 NIH units)/Soybean trypsin inhibitor (3670 units)	13x75	2.0			P
Whole blood microbiology Sodium Polyanetholesulfonate (SPS)						
366404 ⁶	0.68 mL	10.25 x 82	3.32			P
364960 ⁶	1.7 mL	16x100	8.3			ST
Westergren sedimentation rate determination Buffered Citrate (3.8%)						
369741 ⁶	0.6 mL	13x75	2.4			P
366465 ⁶	1.0 mL	13x100	4.0			P
Sterile Exterior Pouch						
366401 ⁶	Red – silicone-coated	16x100	10.0			P
	Lavender – K ₃ EDTA (0.081mL)	13x100	7.0			P
Whole blood activated clotting time determinations						
366522 ⁶	Silaceous Earth (12 mg)	13x75	2.0			ST
Citrate, Theophylline Adenosine Dipyridamole (CTAD) specialized platelet testing						
367946 ⁶	Buffered Sodium Citrate (0.109M, 3.2%), theophylline, adenosine, dipyridamole (0.3mL)	13x75	2.7			P
367947 ⁶		13x75	4.5			P

* ACD (Acid Citric Dextrose) Solution B consists of trisodium citrate, 13.2 g/L, citric acid, 4.8 g/L, and dextrose, 14.7 g/L.

** ACD Solution A consists of trisodium citrate, 22.0 g/L, citric acid, 8.0 g/L, and dextrose, 24.5 g/L

Trust BD Vacutainer®

Family of products you can rely on



LabNotes – A quarterly newsletter, published by BD Diagnostics - Preanalytical Systems, to keep readers current on safety and efficiency issues in the clinical laboratory.

Clinical Documentation – More than 100 clinical studies on a vast array of analytes document the efficacy, performance characteristics, and ease of use of BD Vacutainer® tubes.

TechTalk – A news bulletin to address frequently asked technical questions with a focus on reducing preanalytical variables.

Blood Collection Pocket Cards – Handy, laminated pocket cards provide easy reference for: order of draw, tube additive guide, troubleshooting hints for blood collection, best sites for venipuncture, and many more.

Blood Education Wall Charts – Instructional wall charts to help educate staff members.

To learn more about the full product offering of BD Vacutainer® Specimen Collection Products or the educational materials and services offered by BD Diagnostics-Preanalytical Systems, please contact your local BD Sales Consultant.

BD Technical Services: **1.800.631.0174**

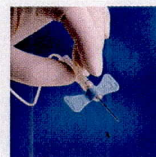
BD Customer Service: **1.888.237.2762**

www.bd.com/vacutainer

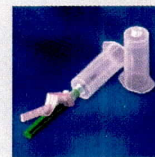
Acquaint yourself with the full line of BD Vacutainer® Specimen Collection Products



BD Vacutainer® Eclipse™ Blood Collection Needle



BD Vacutainer® Push Button Blood Collection Set



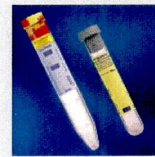
BD Vacutainer® One Use Holder



BD Vacutainer® Blood Transfer Device



BD Vacutainer® Luer-Lok™ Access Device



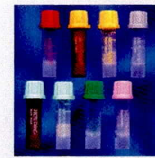
BD Vacutainer® Urine Analysis Preservative Tubes



BD Microtainer® Quikheel™ Lancet



BD Microtainer® Genie™ Lancet



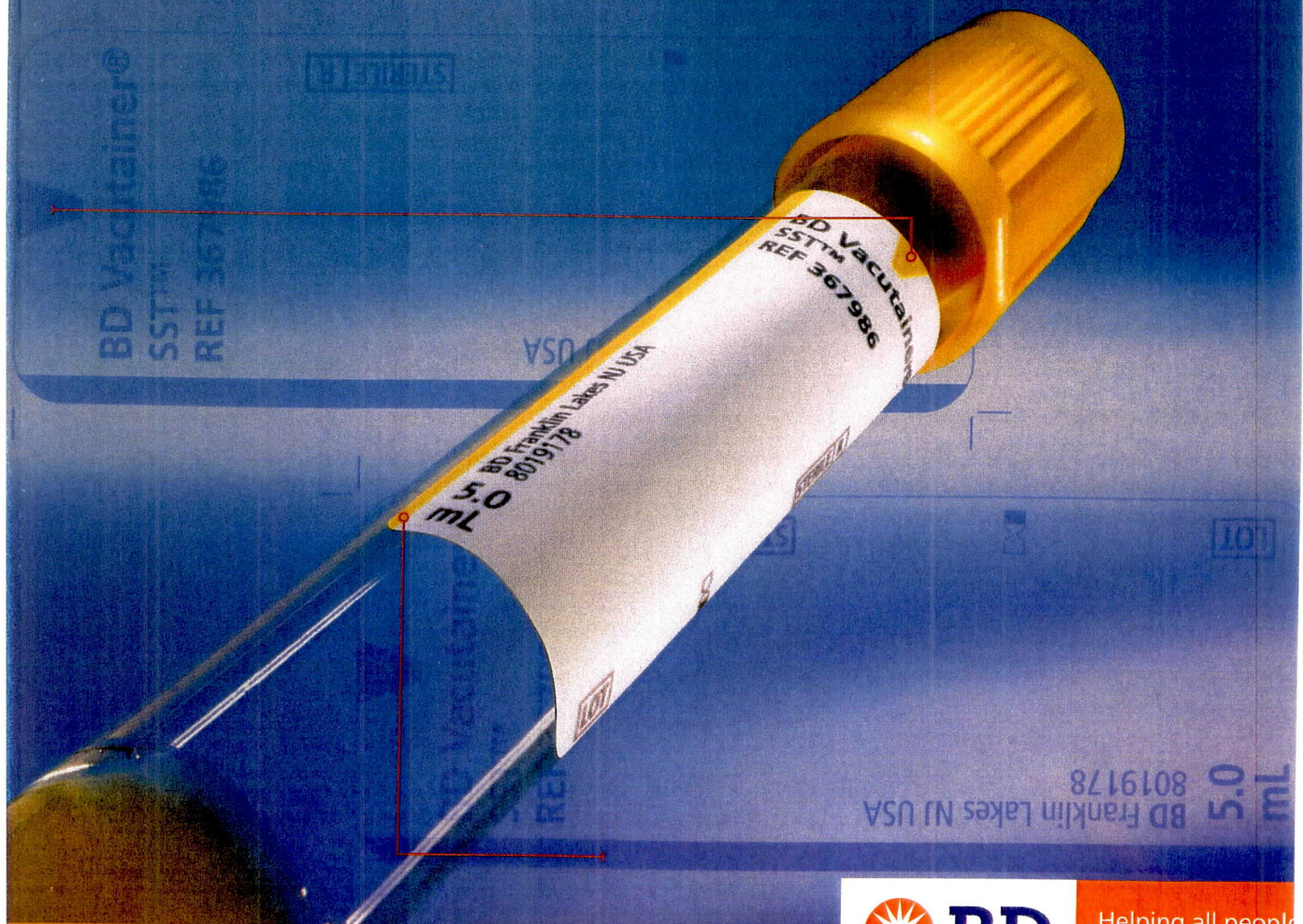
BD Microtainer® Tubes with BD Microgard™ Closure



BD Diagnostics
Preanalytical Systems

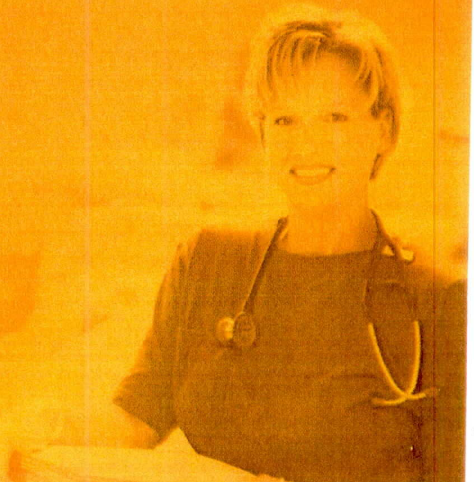
1 Becton Drive
Franklin Lakes, NJ 07417
www.bd.com/vacutainer

BD Vacutainer® Plus Plastic Tubes



Helping all people
live healthy lives

A Fresh
New Look
for 2005



BD Vacutainer® Plus Plastic Tubes

Accuracy Is Our First Priority

... because it's not just a test, it's a patient.

At BD, we understand that misaligned labels can interfere with the reading of bar codes in automated systems, which can lead to system downtime, re-labeling of tubes, and unnecessary delays in specimen processing.

It is our goal to help you improve your lab's efficiency by offering solutions designed to reduce the re-work associated with misaligned secondary labels.

To assist in this effort, all BD Vacutainer® Plus Plastic Tubes have been restyled to include a visual guide for proper placement of secondary labeling. With proper training, the use of these patented label features should help to reduce errors due to label misalignment. In addition, the restyled label offers added space for writing with an easy-to-write-on surface.

This restyling affects the unit label, shelf pack label, and case label.

Unit Label Features

Provides visual guide for proper placement of secondary labeling

- Color-coded notch
- Color-coded sidebar

Tube type & additive concentration (if applicable)

Draw volume



BD reference number

BD sterile symbol

BD lot number & expiration date



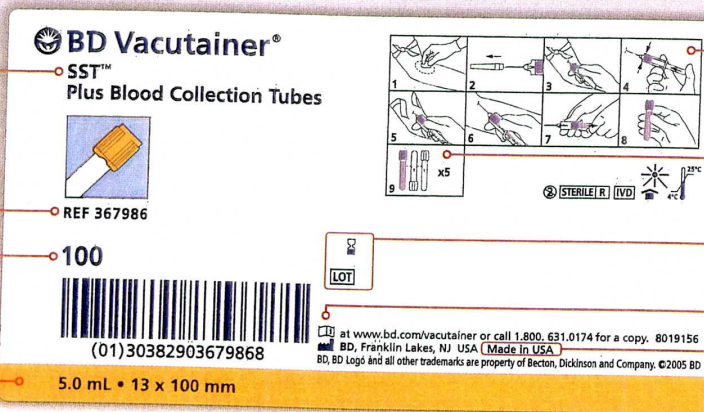
Shelf Pack Label Features

Tube type and additive concentration (if applicable)

BD reference (catalog) number

Shelf pack quantity

Draw volume and tube size



Visual instructions of use

Required number of inversions

BD expiration date and lot number

BD Web site for accessing product inserts

Country of origin

Case Label Features

Tube type and additive concentration (if applicable)

Case quantity

Draw volume and tube size



BD reference (catalog) number

Fill Indicators

Nominal fill indicators are available on the following BD Vacutainer® Plus Plastic Tubes. Tubes are intended to fill approximately to the fill indicator line. It is important to note that label placement can vary slightly from tube to tube. For this reason, fill indicators are approximate indicators of expected fill volume.



EDTA



EDTA



Glucose



Heparin



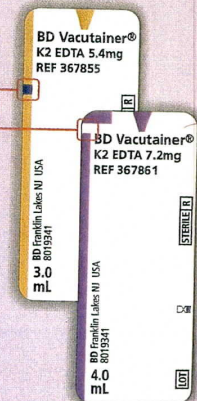
Lead



PST™

Examples

Nominal Fill Indicators



Shelf Pack Changes

Old Label

VACUTAINER® PLUS SST® REORDER NUMBER **367986**
Tubes with HEMOGARD™ Closure

STERILE 13 x 100 mm

INERT BARRIER MATERIAL.
CLOT ACTIVATOR.
TUBE INTERIOR COATING:
SILICONE.
STOPPER LUBRICATION:
SILICONE.

APPROX. DRAW VOL. APPROX. VACIO APROX. VOL. APROX.

5 mL

BARRERA DE MATERIAL INERTE.
ACTIVADOR DEL COÁGULO.
RECUBRIMIENTO INTERIOR:
SILICON.
TAPÓN LUBRICADO CON SILICON.

BARREIRA DE MATERIAL INERTE.
ATIVADOR DE COÁGULO.
TUBO: SILICONIZADO.
ROLHA: SILICONIZADA

EXP:

LOT:

4-25C

(01)30382903679868

New Label

BD Vacutainer®
SST™
Plus Blood Collection Tubes

REF 367986

100

LOT

(01)30382903679868

at www.bd.com/vacutainer or call 1.800.631.0174 for a copy. 8019156
BD, Franklin Lakes, NJ USA Made in USA
BD, BD Logo and all other trademarks are property of Becton, Dickinson and Company. ©2005 BD

5.0 mL • 13 x 100 mm

Case Label Changes

Old Label

VACUTAINER® PLUS SST® REORDER NUMBER **367986**
Tubes with HEMOGARD™ Closure

STERILE 13 x 100 mm

INERT BARRIER MATERIAL.
CLOT ACTIVATOR.
TUBE INTERIOR COATING:
SILICONE.
STOPPER LUBRICATION:
SILICONE.

APPROX. DRAW VOL. APPROX. VACIO APROX. VOL. APROX.

5 mL

BARRERA DE MATERIAL INERTE.
ACTIVADOR DEL COÁGULO.
RECUBRIMIENTO INTERIOR:
SILICON.
TAPÓN LUBRICADO CON SILICON.

BARREIRA DE MATERIAL INERTE.
ATIVADOR DE COÁGULO.
TUBO: SILICONIZADO.
ROLHA: SILICONIZADA

4-25C

1005401()

New Label

BD Vacutainer®
SST™
Plus Blood Collection Tubes

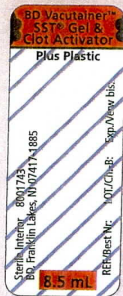
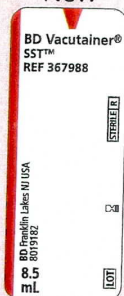
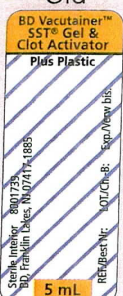
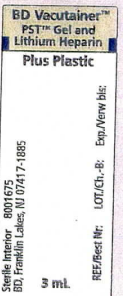
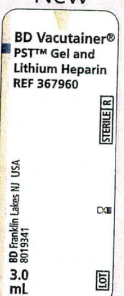
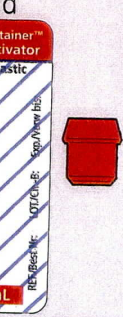
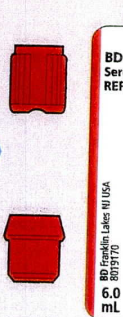
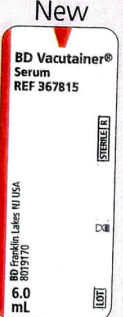
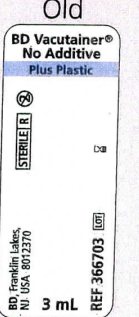
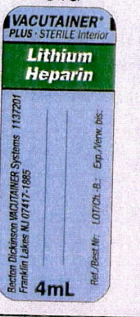
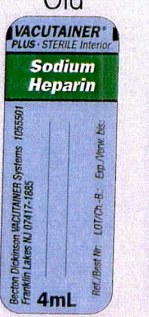
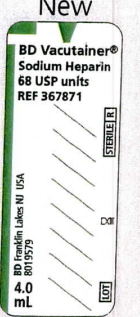
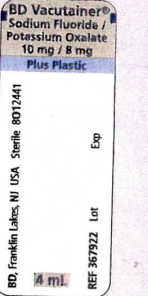
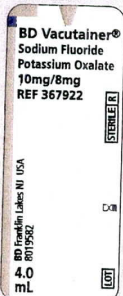
Inert Barrier Material. Clot Activator.
Tube Interior Coating: Silicone.
Stopper Lubrication: Silicone.
Barriere: Gel Inerte. Activateur De Coagulation.
Tube: Silicone. Bouchon Lubrifie Au Silicone.
Barrera De Material Inerte. Activador Del Coagulo.
Recubrimiento Interior: Silicon.
Tapón Lubricado Con Silicon.
Barreira De Material Inerte. Ativador De Coágulo.
Tubo: Siliconizado. Rolha: Siliconizada

REF 367986

1000 (10x100)

at www.bd.com/vacutainer or call 1.800.631.0174 for a copy. 8019165
BD, Franklin Lakes, NJ USA Made in USA
BD, BD Logo and all other trademarks are property of Becton, Dickinson and Company. ©2005 BD

5.0 mL • 13 x 100 mm

SST™	Old   New  	Old   New  
PST™	Old   New  	
Serum	Old   Old   New  	Old   New  
Heparin	Old   New  	Old   New  
Glucose	Old   New  	

EDTA	Old  BD Vacutainer™ K₂ EDTA (7.2mg) Plus Plastic STERILE Interior BD, Lot de Four-MC-Brazil 8002023 REF 367899 4 mL New  BD Vacutainer® K₂ EDTA 7.2mg REF 367861 STERILE R LOT 4.0 mL BD Franklin Lakes NJ USA 8019341	Old  BD VACUTAINER® PLUS • STERILE Interior 6mL K₂ EDTA 10.8mg REF 367899 SUR-NAME FORE-NAME ADDRESS WARD TIME AM PM SIGNED DATE Becton Dickinson, Franklin Lakes, NJ 07417 REF 367899 CROSSMATCH New  BD Vacutainer® K₂ EDTA 10.8 mg REF 367899 SUR-NAME FORE-NAME HOSP NO. DATE TIME SIG. 6.0 mL BD Franklin Lakes NJ USA 8019341
Lead	Old  BD Vacutainer™ K₂ EDTA 5.4mg STERILE Interior BD, Franklin Lakes, NJ 07417 8002023 REF 367899 3 mL New  BD Vacutainer® K₂ EDTA 5.4mg REF 367855 STERILE R LOT 3.0 mL BD Franklin Lakes NJ USA 8019341	
Citrate	Old  BD Vacutainer™ STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M, 3.2% 8003868 Franklin Lakes NJ 07417-1885 REF 363080 1.8 mL New  BD Vacutainer® Buff. Na Citrate .109M, 3.2% REF 363080 STERILE R LOT 1.8 mL BD Franklin Lakes NJ USA 1234567	Old  BD Vacutainer™ STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M, 3.2% 8003869 Franklin Lakes NJ 07417-1885 REF 363083 2.7 mL New  BD Vacutainer® Buff. Na Citrate .109M, 3.2% REF 363083 STERILE R LOT 2.7 mL BD Franklin Lakes NJ USA 1234567
Trace Element	Old  BD Vacutainer® Trace Element Serum Plus STERILE R LOT 6 mL BD Franklin Lakes NJ USA 8012847 REF 368380 New  BD Vacutainer® Trace Element Serum REF 368380 STERILE R LOT 6.0 mL BD Franklin Lakes NJ USA 8014567	Old  BD Vacutainer® Trace Element K₂ EDTA 10.8mg Plus STERILE R LOT 6 mL BD Franklin Lakes NJ USA 8012847 REF 368381 New  BD Vacutainer® Trace Element K₂ EDTA 10.8mg Plus STERILE R LOT 6.0 mL BD Franklin Lakes NJ USA 8014567 REF 368381

Note: Reflected catalog numbers are representative of other catalog numbers within the product family.

Key:



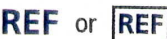
BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper

Relevant Symbols Chart

Handling Symbols

	Use By		In Vitro Diagnostic Medical Device
	Batch Code		Temperature Limitation
	Do Not Reuse		Manufacturer
	Catalog Number		Keep Away From Sunlight
	Method of Sterilization Using Irradiation		This End Up
	Consult Instructions For Use		Fragile, Handle With Care

Additive Symbols

K2E	EDTA - dipotassium salt
9NC	Tri-Sodium Citrate 9:1
FX	Fluoride and Oxalate
FE	Fluoride and EDTA
LH	Lithium Heparin
NH	Sodium Heparin
Z	None (No Additive)

Package Insert Changes

All package inserts for BD products will now be available online at bd.com/vacutainer. This will ensure the most up-to-date information. If you do not have access to the Web, please contact the BD Technical Services Department at 1-800-631-0174.

BD Vacutainer® Evacuated Blood Collection System

For In Vitro Diagnostic Use.

INTENDED USE

BD Vacutainer® Tubes, Heparin and Biotin are used together as a system for the collection of various blood. BD Vacutainer® Tubes are used to transport and protect blood for testing serum, plasma or whole blood in the clinical laboratory.

PRODUCT DESCRIPTION

BD Vacutainer® Tubes are evacuated tubes with color coded tops which indicate the additive or additives in varying concentrations depending upon the amount of vacuum and the required additive to blood ratio for the tube. See each shelf package or case label for specific additive quantity and approximate draw volume. Additive choice depends on the analytic test method. As specified by the manufacturer of the test program, under instrument on which the test is performed. Tube additives are sterile. Tube stoppers are lubricated with silicone gel (silicone free) and each shelf package or case label to facilitate proper insertion.

BD Vacutainer® Tube Closure Color Code Cross Reference

Additive (Cross Reference)	Color/Labeling	BD Vacutainer® Tube
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2E
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED
EDTA (Cross Reference)	Blue/Blue	BD Vacutainer® K2ED

BD Vacutainer® Tubes for Lead Testing Contamination Upper Limits		
Analyte	Whole capillary	Plasma capillary
Lead	10	25

BD Vacutainer® SST® Tubes and Transport Tubes

The interior of the tube wall is coated with microencapsulated silica particles to accelerate clotting. A barrier polymer is present at the tube bottom. The density of this material causes the tube to float during centrifugation, where it forms a barrier separating serum from fibrin and cells. Serum may be aspirated directly from the collection tube, eliminating the need for transfer to another container. BD SST® Transport Tubes contain the same clot activator as BD SST® Tubes with approximately twice the quantity of silica. This additional silica produces a longer barrier between the serum and cells and is more stable for shipping from a phlebotomy site to a testing site. See literature of Special Procedures for Specimen Collection and Handling Section.

BD Vacutainer® PST® Tubes

The interior of the tube wall is coated with lithium heparin to inhibit clotting. Heparin activates antithrombin, thus blocking the enzymatic cascade that produces a cross-fibrinogen complex involved in clot formation. Heparin is present in a layer at the tube bottom. The density of this material causes it to float during centrifugation, separating plasma from cells. Plasma may be aspirated directly from the collection tube, eliminating the need for transfer to another container. BD PST® Tubes contain approximately twice the quantity of heparin. This additional heparin produces a longer barrier between the plasma and cells and is more stable for shipping from a phlebotomy site to a testing site. See literature of Special Procedures for Specimen Collection and Handling Section.

BD Vacutainer® Tubes for Serum Collection

BD Vacutainer® Tubes for Serum Collection are used to collect serum for testing. The interior of the tube wall is coated with microencapsulated silica particles to accelerate clotting. A barrier polymer is present at the tube bottom. The density of this material causes the tube to float during centrifugation, where it forms a barrier separating serum from fibrin and cells. Serum may be aspirated directly from the collection tube, eliminating the need for transfer to another container. BD Vacutainer® Tubes for Serum Collection contain the same clot activator as BD Vacutainer® Tubes for Serum Collection with approximately twice the quantity of silica. This additional silica produces a longer barrier between the serum and cells and is more stable for shipping from a phlebotomy site to a testing site. See literature of Special Procedures for Specimen Collection and Handling Section.

BD Vacutainer® Plus Plastic Tubes Ordering Information

Listed below are those catalog numbers affected by this label change. For a full listing of available BD Vacutainer® Plus Plastic Tubes, please visit our Web site at bd.com/vacutainer.

BD Vacutainer® Plus Plastic Tubes	Reference #	Tube Size (mm)	Draw Volume (mL)	Closure Type
SST™	✓ 367981	13X75	3.5	C
	✓ 367983	13X75	3.5	H
	✓ 367977	13X100	4.0	H
	✓ 367986	13X100	5.0	H
	367974	16X100	6.0	C
	367987	16X100	7.5	C
	✓ 367988	16X100	8.5	C
	367985	16X125	10.0	C
PST™	368056	13X75	3.0	C
	✓ 367960	13X75	3.0	H
	367961	13X100	3.5	H
	✓ 367962	13X100	4.5	H
	✓ 367964	16X100	8.0	C
SERUM	366668	13X75	3.0	C
	✓ 367812	13X75	4.0	H
	367814	13X100	5.0	H
	✓ 367815	13X100	6.0	H
	✓ 367820	16X100	10.0	C
NO ADDITIVE (Z)	366703	13X75	3.0	H
LITHIUM HEPARIN (LH)	366664	13X75	2.0	H
	366667	13X75	3.0	C
	✓ 367884	13X75	4.0	H
	367886	13X100	6.0	H
	367880	16X100	10.0	C
SODIUM HEPARIN (NH)	✓ 367871	13X75	4.0	H
	367878	13X100	6.0	H
	367874	16X100	10.0	C
GLUCOSE	✓ 367587	13X75	2.0	H
	367921	13X75	2.0	H
	✓ 367922	13X75	4.0	H
	✓ 368587	13X75	4.0	C
	367925	13X100	6.0	H
K2EDTA (K2E)	✓ 367841	13X75	2.0	H
	367835	13X75	3.0	C
	367856	13X75	3.0	H
	✓ 367844	13X75	4.0	C
	✓ 367861	13X75	4.0	H
	367863	13X100	6.0	H
K2EDTA (K2E)	✓ 367899	13X100	6.0	H
CITRATE 3.2% (9NC)	363080	13X75	1.8	H
	✓ 363083	13X75	2.7	H
LEAD TESTING	367855	13X75	3.0	H
TRACE ELEMENT K2EDTA (K2E)	368381	13X100	6.0	H
TRACE ELEMENT SERUM	368380	13X100	6.0	H

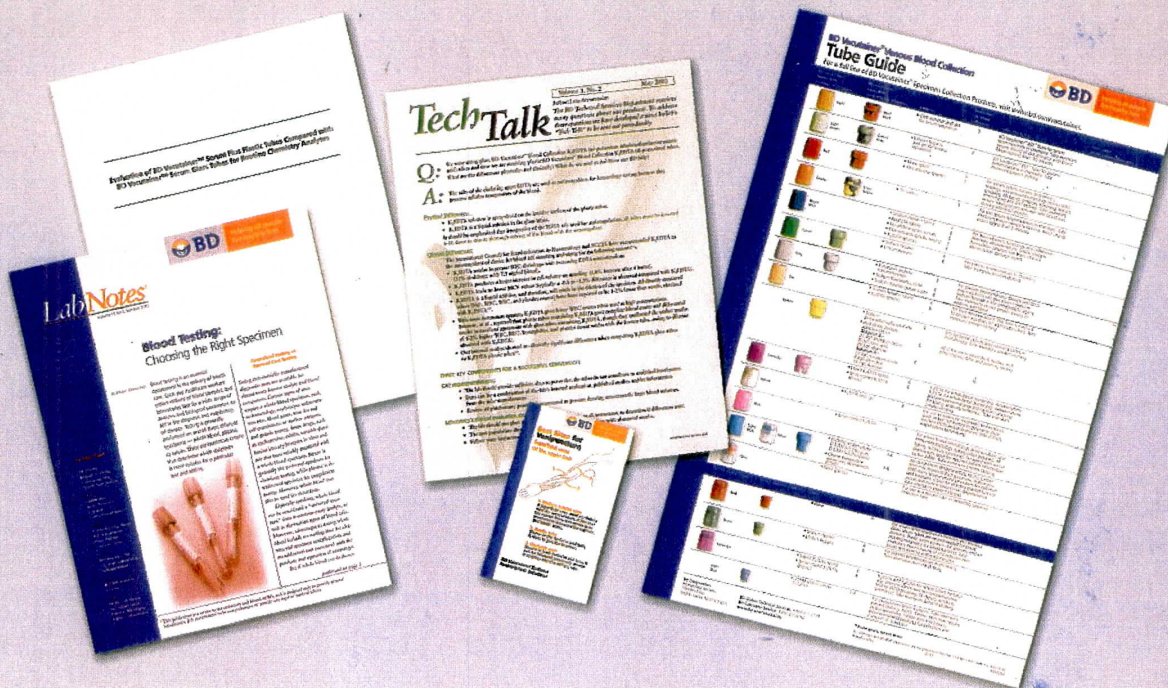
✓ = Indicates part of the BD Best Practice Formulary
The BD Best Practice Formulary provides optimal solutions, based on clinical and diagnostic instrument recommendations.

H = BD Vacutainer®
Hemogard™
Tube Closure

C = Conventional
Tube Stopper

Trust BD Vacutainer®

Family of products you can rely on



LabNotes – A quarterly newsletter, published by BD Diagnostics - Preanalytical Systems, to keep readers current on safety and efficiency issues in the clinical laboratory.

Clinical Documentation – More than 100 clinical studies on a vast array of analytes document the efficacy, performance characteristics and ease of use of BD Vacutainer® tubes.

TechTalk – A news bulletin to address frequently asked technical questions with a focus on reducing preanalytical variables.

Blood Collection Pocket Cards – Handy laminated pocket cards provide easy reference for: order of draw, tube additive guide, troubleshooting hints for blood collection, best sites for venipuncture, and many more.

Blood Education Wall Charts – Instructional wall charts to help educate staff members.

Acquaint yourself with the full line of BD Vacutainer® Specimen Collection Products



BD Vacutainer®
Eclipse™ Blood
Collection Needle



BD Vacutainer®
Push Button Blood
Collection Set



BD Vacutainer®
One Use Holder



BD Vacutainer®
Blood Transfer
Device



BD Vacutainer®
Luer-Lok™ Access
Device



BD Vacutainer®
Urine Analysis
Preservative Tubes



BD Microtainer®
Quikheel™ Lancet



BD Microtainer®
Genie™ Lancet



BD Microtainer®
Tubes with BD
Microgard™ Closure

To learn more about the full product offering of BD Vacutainer® Specimen Collection Products or the educational materials and services offered by BD Diagnostics-Preanalytical Systems, please contact your local BD Sales Consultant.

BD Technical Services: 1.800.631.0174

BD Customer Service: 1.888.237.2762

www.bd.com/vacutainer



BD Diagnostics
Preanalytical Systems
1 Becton Drive
Franklin Lakes, NJ 07417
www.bd.com/vacutainer

EXHIBIT

D



- [Home](#)
- [Company Profile](#)
- [Products](#)
- [Certifications](#)
- [Code of Conduct](#)
- [Factory Tour](#)
- [Management](#)
- [Newsroom](#)
- [OEM](#)
- [PDF Catalog \(279k\)](#)
- [Quality Control](#)
- [Services & Support](#)
- [Trade Shows](#)
- [Trading Services](#)
- [Visit Us](#)
- [About us](#)

-  [E-mail page](#)
-  [Print](#)
-  [Bookmark](#)

Jiangyin Liancheng International Trade Co., Ltd.



Verified
Supplier



Credit
Check

[Additional
Verification Options](#)

Micro Vacuum Blood Collection Tube

Product Details



[Larger photo](#)

Micro Vacuum Blood Collection Tube, Available in Purple 10.5 x 45mm
Model Number: M-MZT10K2E-1-3

[INQUIRE NOW](#)

[ADD TO BASKET](#)

[Request Sample](#)

[View basket](#)

Chat with supplier using: 

Key Specifications/Special Features:

- Color: purple
- Purple color EDTA experiment the tube
- Use: the clinical blood check, various blood cell is an to go together with blood experiment
- Specifications: 10.5 x 45mm
- In common use adopt the amount of blood: 0.5 to 1ml
- Additive category: EDTA.K2, EDTA.K3
- Saves temperature: 4 to 30 degrees Celsius
- An error margin of biggest vacuum: -10%

Country of Origin:

- China (mainland)

Primary Competitive Advantages:

- Country of Origin
- Distributorships Offered
- Experienced Technical Staff
- Guarantee/Warranty
- International Approvals
- Military Specifications
- Packaging
- Price
- Product Features
- Product Performance
- Prompt Delivery
- Quality Approvals
- Reputation
- Service
- Small Orders Accepted
- Sterile by Co-60

Product Certifications:

Certificate Standard: CE
Certificate Number: 2006-OSL-MDD-0133
Issue Date: 25-Apr-2006
Certification Agent: Det Norske Veritas
Expiry Date: 25-Apr-2011
Scope/Range: Vacuum quantification blood sampling needles

Certificate Standard: ISO 9001:2000
Certificate Number: 2006-OSL-AQ-7801
Issue Date: 11-Mar-2006
Certification Agent: Det Norske Veritas
Expiry Date: 11-Mar-2009
Scope/Range: Vacuum quantification blood sampling needles

Main Export Markets:

- Eastern Europe
- North America
- Mid East/Africa
- Central/South America

Certificate Standard: ISO13485:2003
Certificate Number: 2006-OSL-AQ-0463
Issue Date: 11-Mar-2006
Certification Agent: Det Norske Veritas
Expiry Date: 11-Mar-2009

- Asia
- Western Europe
- Australasia

Scope/Range:

Vacuum quantification blood sampl
taking needles

Products

More products from this category



[Micro Vacuum Blood
Collection Tube](#)



[Sterile Vaginal Dilators](#)



[Vaginal Washing Device](#)



[Sterile](#)

Product Categories

[All categories](#) - 94 products
[Aluminum composite panels](#) - 12 products
[Fuel tanks](#) - 1 product
[Gas meters](#) - 4 products
[ID card/badge holders](#) - 2 products
[IV medical supplies](#) - 22 products
[Laminate flooring](#) - 4 products
[MDFs](#) - 1 product

[Medical examination/practitioners' ap](#)
products
[Plastic extrusions](#) - 6 products
[Plastic packaging](#) - 2 products
[Plumbing hoses](#) - 5 products
[Sheet metal](#) - 10 products
[Steel coils](#) - 2 products
[Test tubes](#) - 10 products

Contact Details



Key Contact:

Ms zhang, ice
info@liancheng-international.com

Ms zhang, ice

Jiangyin Liancheng International Trade Co., Ltd.

No.297,zhangjiaqiao village
 shengang town
 jiangyin
 Jiangsu
 China 214443
 Tel: (86 510) 86683806 (86 138) 12116800
 Fax: (86 510) 86683809

jyliancheng@globalsources.com

[INQUIRE NOW](#)

lares@liancheng-international.com

Chat with supplier using:



Homepage Address

<http://www.globalsources.com/jyliancheng.co>

Other Homepage Address

www.liancheng-international.com

Supplier and product information updated March 18, 2008. Global Sources verifies information published here via



This member has been verified by Global Sources. [Learn more](#)

Verified suppliers are visited by Global Sources at least 3 times before their products are listed. This ensures that information on suppliers and products-on-offer is accurate.

Other categories you may find interesting

Worldwide:

[Surgical Instruments](#)

[Sterilization Of Surgical Instrument](#)

[Otoscope](#)

[Medical Tool](#)

[Medical Syringe](#)

[Medical Scissor](#)

[Medical Product](#)

[Medical Examination](#)

[Medical Apparatus](#)

[Dental Instruments](#)

China only:

[China Surgical Instruments](#)

[China Sterilization Of Surgical Instru](#)

[China Otoscope](#)

[China Medical Tool](#)

[China Medical Syringe](#)

[China Medical Scissor](#)

[China Medical Product](#)

[China Medical Examination](#)

[China Medical Apparatus](#)

[China Dental Instruments](#)

Top China Supplier: [0-9](#) [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Copyright © 2008 Trade Media Holdings Ltd. Copyright © 2008 Trade Media Ltd. All rights reserved. [hkweb25.glc](#)
[Terms of Use](#) [Privacy Policy](#) [Security Measures](#) [IP Policy](#) [More manufacturers](#) [China Suppl](#)

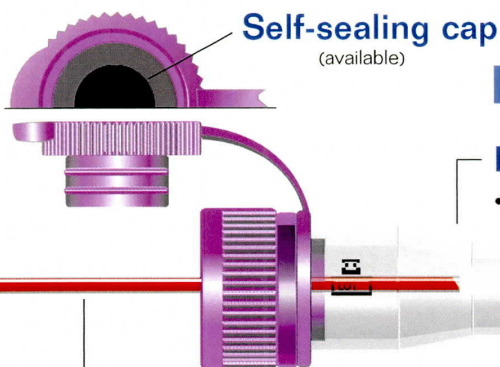
SAFE-T-FILL® Capillary Blood Collection Tubes

Hematology • Chemistry • Pediatrics • Oncology • Point-of-Care • Lead Screening



Attached pierceable cap

- Prevents cross contamination
- Eliminates lost caps
- Pierceable
- Self-sealing available



Pre-assembled

Microtube

- Flat bottom versions available

Capillary "straw"

- Uses capillary action to reduce hemolysis and tissue contamination by avoiding the tendency to scoop
- Anticoagulant (if applicable) in straw immediately mixes with blood during sampling to prevent clotting
- End-to-end filling accurately measures required sample volume

Expiration date and lot number

- Printed on tube for quality control

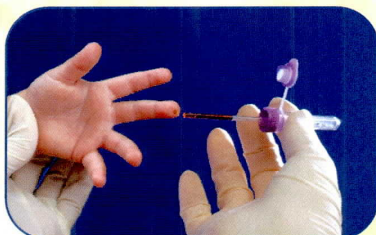


100% Plastic

Optional tube extender

- Allows for easier labeling and handling

Overview



SAFE-T-FILL® Capillary Blood Collection Tubes are used to collect capillary blood samples from finger and heel sticks. Pre-assembled with a capillary straw, attached pierceable cap, and a microtube, SAFE-T-FILL improves the quality of capillary

blood samples. Hemolysis and tissue contamination are avoided by drawing the blood sample into the microtube through capillary action rather than trying to drop the blood into the microtube by milking or scooping. Clotting is prevented by having anticoagulant in both the capillary straw as well as the microtube allowing the blood sample to begin mixing immediately as it is drawn into the tube. Available in a wide variety of sizes and additives and through all major distributors.

About RAM Scientific

Founded in 1990, RAM Scientific provides high quality 100% plastic capillary blood collection devices. As the premiere source of safe micro blood collection systems for clinical and research applications, RAM Scientific is dedicated to pursuing safety in the laboratory. The SAFE-T-FILL product line's proprietary technology gives plastic the same capillary action as glass without the risks. SAFE-T-FILL blood gas tubes, capillary blood collection tubes, and micro hematocrit tubes are available for a wide range of applications.

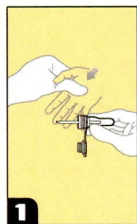


1.800.535.6734
www.ramsci.com
info@ramsci.com

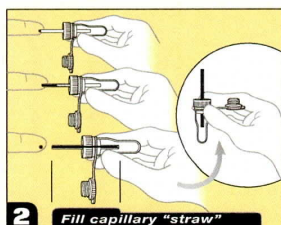
Draw Quality Into Your Lab™

Instructions

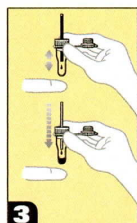
Hold the open end of the SAFE-T-FILL® Capillary Blood Collection Tube close to the puncture site at a horizontal or slight angle so that the end of the capillary "straw" touches only the blood drop.



The blood drop will be pulled into the straw via capillary action. Repeat drawing capillary blood from the puncture site until the capillary straw is filled end-to-end. A complete end-to-end fill of the capillary straw is equal to the stated fill volume. Invert the tube to a vertical position to allow the blood to flow down into the microtube.



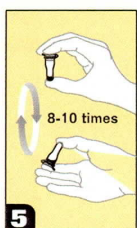
Gently tap the bottom of the microtube on a soft surface (finger or palm) to drop the blood from the capillary straw into the microtube.



Remove the capillary straw together with its colored sleeve from the microtube and properly discard the capillary straw and colored sleeve in a biohazard container.



Close the microtube with attached cap. Mix by holding the tube between thumb and forefinger and inverting 8-10 times. Label the tube and process the sample according to your organization's guidelines.



SAFE-T-FILL Capillary Blood Collection Tubes

CAPILLARY ORDER OF DRAW

Reorder #	Description	
07 6011	EDTA* Mini Capillary Collection 125 µL	
07 6013	EDTA* Mini Capillary Collection 125 µL Self-Sealing	
07 7052	EDTA* Capillary Collection 150 µL	
07 7051	EDTA* Capillary Collection 200 µL	
07 7056	EDTA* Capillary Collection 200 µL Self-Sealing	
07 7058	EDTA* Capillary Collection 200 µL Flat Bottom	
07 7053	EDTA* Capillary Collection 300 µL <i>*Liquid Dipotassium EDTA</i>	
07 6101	Lithium Heparin Mini Capillary Collection 125 µL	
07 7250	Lithium Heparin Capillary Collection 200 µL	
07 7251	Lithium Heparin Capillary Collection 300 µL	
07 7220	Lithium Heparin Gel Capillary Collection 200 µL	
07 7221	Lithium Heparin Gel Capillary Collection 300 µL	
07 7340	Sodium Fluoride Capillary Collection 200 µL	
07 7150	Serum Capillary Collection 200 µL	
07 7151	Serum Capillary Collection 300 µL	
07 7120	Serum Gel Capillary Collection 200 µL	
07 7121	Serum Gel Capillary Collection 300 µL	
07 7450	Serum Bilirubin Capillary Collection 200 µL	
07 7421	Serum Bilirubin Gel Capillary Collection 200 µL	
09 1004	Tube Extender to fit all SAFE-T-FILL Tubes	

Product Notes

- In vitro diagnostic use only
- Single use only
- Non-sterile
- Latex-free

- Storage temp: 4° to 25° C
- 100% Plastic
- Pre-assembled, ready to use
- 50 tubes per bag, 10 bags per case
(except tube extenders)



1.800.535.6734
www.ramsci.com
info@ramsci.com

View our full line of Vacuette Blood Collection tubes

[Coagulation tubes and CTAD tubes](#)

[Serum tubes](#)

[Heparin tubes](#)

[EDTA tubes](#)

[Glucose tubes](#)

[Crossmatch tubes](#)

[Blood grouping tubes](#)

[Trace element tubes](#)

[ESR tubes](#)

[VACUETTE® Coagulation Tubes and VACUETTE® CTAD Tubes](#)

Coagulation tubes are filled with buffered tri-sodium citrate solution. Citrate concentrations of either 0.109 mol/l (3.2%) or 0.129 mol/l (3.8%) are available. The choice of the concentration depends upon the policies of the laboratories. The mixing ratio is 1 part citrate to 9 parts blood.

CTAD tubes contain besides the buffered citrate solution, theophylline, adenosine and dipyridamole.

VACUETTE® Coagulation and CTAD tubes are used for coagulation tests. [Click Here for more information](#)



[VACUETTE® Serum Tubes](#)

Serum tubes are coated with micronised silica particles, which activate clotting when tubes are gently inverted.

Serum tubes with gel contain a barrier gel that is present in the bottom of the tube. The specific gravity of this material lies between the blood clot and the serum. During centrifugation the barrier gel moves upward to the serum - clot interface, where it forms a stable barrier separating the serum from fibrin and cells. Serum may be aspirated directly from the collection tube, eliminating the need for transfer to another container. This barrier allows for the stability of certain parameters in the primary tube under the recommended storage conditions for up to 48 hours.

Serum tubes with beads contain polystyrene beads, which are present in the bottom of the tube. The specific gravity of the beads lies between that of the blood clot and serum. During centrifugation the beads move upwards to form a layer between the serum and blood clot. [Click Here for more information](#)



[VACUETTE® Heparin tubes](#)

The interior of the tube wall is coated with lithium heparin, ammonium heparin or sodium heparin. The anticoagulant heparin activates antithrombins, thus blocking the coagulation cascade and producing a whole blood / plasma sample instead of clotted blood plus serum.

Plasma tubes with lithium heparin and gel contain a barrier gel in the tube. The specific gravity of this material lies between that of the blood cells and plasma. During centrifugation the gel barrier moves upwards providing a stable barrier separating the plasma from cells. Plasma may be aspirated directly from the collection tube, eliminating the need for manual transfer to another container. This barrier allows for the stability of certain parameters in the primary tube under the recommended storage conditions for up to 48 hours.

Lithium determinations should not be performed in VACUETTE® Lithium Heparin tubes. Ammonium determinations should not be performed in VACUETTE® Ammonium Heparin tubes. (Ammonium Heparin tubes are not available in U.S.A.) [Click Here for more information](#)



[VACUETTE® EDTA tubes](#)

The interior of the tube wall is coated with either EDTA K2 or EDTA K3. The tube is also available with an 8% liquid EDTA solution. The EDTA binds calcium ions thus blocking the coagulation cascade. VACUETTE® EDTA tubes can be used in direct sampling analysers without actually being opened. Erythrocytes, leucocytes and thrombocytes are stable in EDTA anticoagulated blood for up to 24 hours. Blood smearing should be done within 3 hours after blood collection. VACUETTE® EDTA tubes are used for testing whole blood in the clinical laboratory. VACUETTE® EDTA K2 tubes are used for testing whole blood in molecular diagnostics. VACUETTE® EDTA K2/gel tubes are used for testing plasma in molecular diagnostics and viral load detection. HIV and HCV are stable for up to 72 hours in a non-centrifuged sample at room temperature (20–25°C). However centrifugation for VACUETTE® EDTA K2/gel tubes should be done within 6 hours after blood collection for best results. Mid-term storage (up to 2 weeks) in primary tubes is recommended at –20°C. For long-term storage (over 2 weeks) at –70°C or at lower temperatures please store aliquots in cryo vials. [Click Here for more information](#)



VACUETTE® Glucose tubes

Glucose tubes are available with different additives. The tubes contain an anticoagulant and a stabilizer, i.e. EDTA and sodium fluoride / potassium oxalate and sodium fluoride / sodium heparin and sodium fluoride / lithium heparin and iodoacetate.

VACUETTE® glucose tubes are suitable for the analysis of blood sugar and lactate. [Click Here for more information](#)



VACUETTE® Crossmatch tubes

Crossmatch tubes are available in two different versions. One tube type contains clotting activator used to make crossmatch tests with serum, while the other type contains EDTA and is used to make crossmatch tests with whole blood. The field of application is crossmatching. [Click Here for more information](#)



VACUETTE® Blood Grouping tubes

Blood grouping tubes are available with ACD (Acid Citrat Dextrose) solutions in two formulations (ACD-A or ACD-B) or with CPDA solution (Citrate Phosphate Dextrose Adenin). VACUETTE® blood grouping tubes are used for blood grouping tests or cell preservation. [Click Here for more information](#)



VACUETTE® Trace Element tubes

Trace element tubes contain either sodium heparin or clot activator and are used to test trace elements such as Cu, Zn, Pb, etc. [Click Here for more information](#)



VACUETTE® ESR tubes

ESR tubes contain a 3.8% buffered tri-sodium citrate solution (0.129 mol/l). The mixing ratio is 1 part citrate solution to 4 parts blood. VACUETTE® ESR tubes are used for the collection and transport of venous blood for blood sedimentation rate testing. ESR measurements refer to the Westergren method. [Click Here for more information](#)



[HOME](#) | [PRODUCTS](#) | [SUPPORT](#) | [COMPANY](#) | [CONTACT US](#) | [WHERE TO BUY](#) | [SITEMAP](#)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Becton, Dickinson and Company	:	
	:	
Serial No.: 77/254,637	:	Jennifer M. Hetu
	:	Examining Attorney
Filed: August 14, 2007	:	Law Office 108
	:	
Mark: Miscellaneous Design	:	
	:	
Our Ref: BEC 0707220	:	

**DECLARATION IN SUPPORT OF ACQUIRED
DISTINCTIVENESS UNDER SECTION 2(f)**

1. I am Vice President and Chief Intellectual Property Counsel of Applicant, Becton, Dickinson and Company. I am authorized to execute this Declaration on behalf of Applicant.

I make this Declaration based on my own personal knowledge and on information provided to me by employees of Applicant who have searched the records of Applicant in connection with this matter.

2. The design that is the subject of the above-referenced mark and application (hereafter "Mark"), has been used in commerce by Applicant for the goods in this application since at least as early as 1989. This use in commerce has been substantially exclusive and continuous.

3. The Mark is embodied in Applicant's HEMOGARD® Closures, which are used with medical collection tubes sold by Applicant under the mark VACUTAINER®. Sales of the VACUTAINER® units featuring the Design have been substantial. Although Applicant's actual sales data is confidential and proprietary, average annual sales over the past five years exceed eighty million dollars (\$80,000,000) and sales have grown more than 40% during this time. For

{P0248507.1 }

the past three years, unit sales of products bearing the design have exceeded one billion per year (1,000,000,000).

4. Applicant extensively promotes and advertises its VACUTAINER® products bearing the Mark to its medical supply and medical institution customers. Although actual promotional figures and expenditures by Applicant are also confidential and proprietary, Applicant's average annual advertising and promotional expenditures for its VACUTAINER® products bearing the Design exceed one and a half million dollars (\$1,500,000) per year for the past five years, with that number being substantially larger over the past two years.

5. Samples of product advertising are attached to this declaration at Exhibit A. Applicant seeks to feature and exhibit the Mark prominently in its VACUTAINER® advertising. These samples vividly illustrate and highlight the Mark and its appearance as an appealing and distinctive feature of Applicant's product.

6. Applicant's Mark consists of the external surface features of a closure cap. The closure cap itself incorporates a rubber stopper and internal assembly that is used to maintain a barrier between the user and any blood or other fluid specimen collected. The internal features of the closure cap are separate from the external appearance of the cap, which is the subject of Applicant's Mark. The closure cap was awarded the Industrial Designers Society of America bronze medal in 1990 (see copy at Exhibit B of a page exhibiting Applicant's Design from the Society's Designing For Humanity book detailing past award recipients).

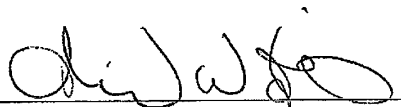
7. This page and award at Exhibit B is characteristic both of the recognition received by Applicant's closure cap and its advertising and promotion by Applicant insofar as each describe the closure cap's internal stopper composition and assembly while promoting and exhibiting the sleek and streamlined external appearance characteristic of the Mark. This has the

effect of cementing association of Applicant's Mark as a trademark among our customers, who recognize the design and associate it with Applicant. This recognition immediately brings to mind the superior quality and reliability associated with Applicant's VACUTAINER® closure product.

8. Based on the foregoing, I believe that the Mark has become a well-known trademark to consumers of the goods covered by this application, and that such persons understand that it as a Mark of Applicant. Hence, the Mark has acquired distinctiveness as a registrable trademark.

9. All statements made herein of my own knowledge are true and all statements made on information and beliefs are believed to be true. Further, these statements have been made with the knowledge that willful false statements or the like are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-identified application or any registration resulting therefrom.

BECTON, DICKINSON AND COMPANY

By: 
[Signature]

Name: DAVID W. HIGHT
[Typed or printed]

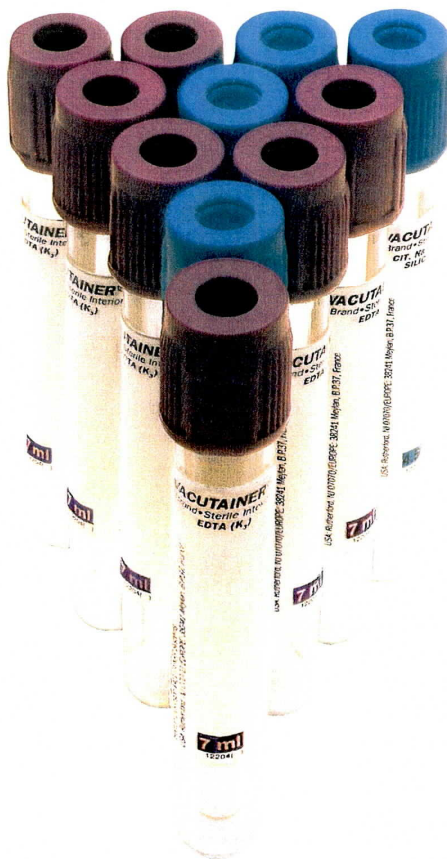
Title: VP + Chief Intellectual Property Officer

Dated: April 17, 2008

EXHIBIT

A

***For a new feeling of confidence in
the Hematology Laboratory***



NEW
VACUTAINER BRAND
TUBES
WITH
HEMOGARD™
CLOSURE

**VACUTAINER
BRAND
QUALITY
MAKES THE
DIFFERENCE**

**BECTON
DICKINSON**

NEW
VACUTAINER BRAND
TUBES
WITH
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Hematology Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between the specimen and you

Whether you open and close a specimen tube once or several times, use of VACUTAINER Brand Tubes with HEMOGARD Closure virtually eliminates exposure to the specimen:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Enhanced handling features — inherent in the design

Ridges on the outer surface of the HEMOGARD Closure permit a more secure grip. The special closure design encourages safer opening of the tube by discouraging use of the "thumb roll" technique, which can result in blood splattering. And, the "hooded" feature of the closure reduces the possibility of pinching gloves between stopper and tube when reclosing.



Dependable performance— inherent in the name

New VACUTAINER Brand Tubes with HEMOGARD Closure are compatible with hematology instrumentation and offer the same special features, quality and reliability you have come to expect—including:

- SeeThru Tubes — to provide maximum specimen visibility that won't interfere with your labeling system
- Your choice of EDTA:
 - Liquid EDTA (K_3) — the preferred anticoagulant—to mix more readily with blood
 - Freeze dried EDTA (Na_2)



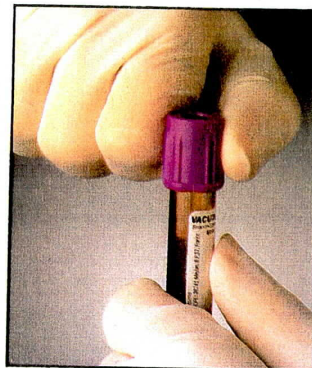
Removal and reinsertion of HEMOGARD Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD Closure. Using the other hand, grasp the HEMOGARD Closure as shown in the photo. Twist and pull the closure upward until removed.

Note: One-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD Closure over the tube and gently push until the closure is fully seated.

For more detailed information, refer to product circular.



NEW VACUTAINER[®] BRAND TUBES **With** HEMOGARD[™] CLOSURE

**For a new feeling of confidence in
the Hematology Laboratory**

Ordering Information

Description	Additive	New Closure Color	New Tube Size (mm)	Draw Volume (mL)	Type of Label	New Reorder Number
Sterile tubes with K₂ EDTA for determinations requiring whole blood	0.05 mL, 7.5% solution	Lavender	13×75	3.0	SeeThru	367650
	0.04 mL, 7.5% solution	Lavender	13×75	2.0	Paper	367651
	0.05 mL, 15% solution	Lavender	13×75	5.0	Paper	367653
	0.05 mL, 15% solution	Lavender	13×75	5.0	SeeThru	367658
	0.05 mL, 7.5% solution	Lavender	13×75	3.0	Paper	367661
	0.05 mL, 15% solution (silicone coated)	Lavender	13×75	5.0	Paper	367662
	0.07 mL, 15% solution	Lavender	13×100	7.0	Paper	367665
	0.07 mL, 15% solution	Lavender	13×100	7.0	SeeThru	367669
Sterile tubes with Na₂ EDTA for determinations requiring whole blood	4.5 mg (freeze dried)	Lavender	13×75	3.0	Paper	367666
	7.5 mg (freeze dried)	Lavender	13×75	5.0	Paper	367667
	10.5 mg (freeze dried)	Lavender	13×100	7.0	Paper	367668
Sterile tubes with buffered sodium citrate, siliconized interior, for coagulation studies	0.2 mL, .129M, 3.8% solution	Lt. blue	13×75	1.8	Paper	367700
	0.3 mL, .129M, 3.8% solution	Lt. blue	13×75	2.7	Paper	367703
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×75	4.5	Paper	367704
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×100	4.5	Paper	367705
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×75	4.5	SeeThru	367706
	0.5 mL, .129M, 3.8% solution	Lt. blue	13×100	4.5	SeeThru	367707
	0.2 mL, .105M, 3.2% solution	Lt. blue	13×75	1.8	Paper	367711
	0.3 mL, .105M, 3.2% solution	Lt. blue	13×75	2.7	Paper	367712
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×75	4.5	Paper	367714
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×100	4.5	Paper	367715
	0.5 mL, .105M, 3.2% solution	Lt. blue	13×75	4.5	SeeThru	367716
Sterile tubes for sedimentation rate determinations (Westergren)	0.6 mL, .129M, 3.8% solution, buffered citrate	Black	13×75	2.4	Paper	367741
Sterile tubes for activated clotting time determinations	12 mg, siliceous earth	Lt. gray	13×75	2.0	SeeThru	367742
Sterile tubes for fibrin degradation product determinations	20 NIH U thrombin 3670 NF U soybean trypsin inhibitor	Lt. blue	13×75	2.0	Paper	367751
Sterile tubes for blood bank studies requiring whole blood	1 mL ACD solution B	Yellow	13×100	6.0	Paper	367756

For more information or to order, contact your Becton Dickinson VACUTAINER Systems representative.

For technical information, call **1-800-631-0174** (in New Jersey, call **1-201-460-2920**).

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company.
© 1989 Printed in USA VSS053
U.S. Pat. No. 4,741,446 and foreign

**For a new feeling of confidence in
the Chemistry Laboratory**



NEW
VACUTAINER BRAND
TUBES
WITH
HEMOGARDTM
CLOSURE

**VACUTAINER
BRAND
QUALITY
MAKES THE
DIFFERENCE**

**BECTON
DICKINSON**

NEW
VACUTAINER BRAND
TUBES
With:
HEMOGARDTM
CLOSURE

Your Shield Against Exposure

Greater protection during routine blood-specimen handling

With the new HEMOGARD Closure, the rubber stopper that seals the tube is covered by a plastic shield—an important design innovation that keeps blood safely contained within the closure and allows Chemistry Lab professionals to handle specimens with a new feeling of confidence.

Puts a barrier between you and the specimen — whether it is serum, plasma or whole blood:

- on the stopper
- around the outer rim of the tube
- in case of splatter

Provides enhanced handling features — inherent in the design

- ridges on the outer surface permit a more secure grip
- special shield design encourages safer opening—discourages use of "thumb roll" technique, which can result in splattering of specimen
- "hooded" feature of closure reduces the possibility of catching glove between stopper and tube on reclosing

Dependable performance — inherent in the name

New VACUTAINER Brand Tubes with HEMOGARD Closure are available in a full line and offer the same special features, quality and reliability you have come to expect.



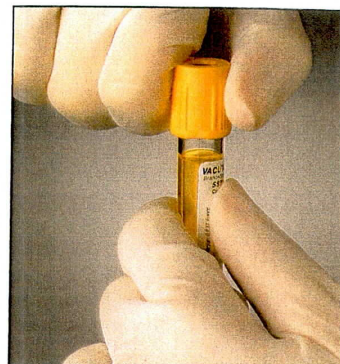
Removal and reinsertion of HEMOGARD Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD Closure. Using the other hand, grasp the HEMOGARD Closure as shown in the photo. Twist and pull the closure upward until removed.

Note: One-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD Closure over the tube and gently push until the closure is fully seated.

For more detailed information, refer to product circular.



Now...

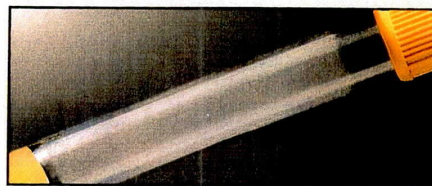
Improved Clot Activator in all VACUTAINER Brand SST Tubes with HEMOGARD™ Closure

**Yields a higher-quality
serum sample**

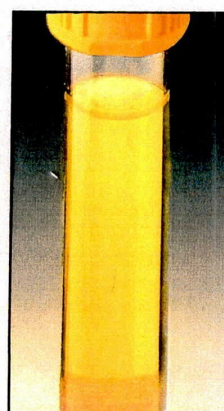
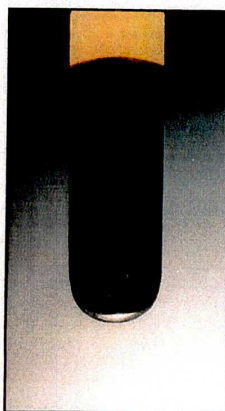
**New clot activator
improves overall performance
of SST tubes**

Now, Chemistry
Lab professionals
can expect:

- More reliable clotting
- More reliable gel barrier performance



You can see the difference



- Reduced fibrin contamination
- Higher-quality serum

**A user-friendly
innovation —
significantly
improves overall
specimen-handling
efficiencies**

NEW VACUTAINER[®] BRAND TUBES *With* HEMOGARD[™] CLOSURE

For a new feeling of confidence in the Chemistry Laboratory

Unisized to a single tube diameter to streamline and simplify the specimen-handling process

In keeping pace with technological advances that have reduced sample requirements—allowing less blood to be drawn—Becton Dickinson has unisized its

VACUTAINER Brand Tubes to a single, 13 mm diameter. Available in 75 mm and 100 mm lengths, these single-diameter tubes will significantly improve the efficiencies associated with the use of direct-sampling instruments and increase the overall convenience of specimen handling for Chemistry Lab professionals.

Ordering Information

Description	Additive	New Closure Color	New Tube Size (mm)	Draw Volume (mL)	Type of Label	New Reorder Number
Sterile SST Brand tubes, with clot activator and gel, for serum separation		Gold	13×75	2.5	Paper	367782
		Gold	13×75	4.0	Paper	367783
		Gold	13×100	6.0	Paper	367784
		Gold	13×100	6.0	SeeThru	367789
Sterile PST Brand tubes, with gel, for plasma separation	14 USP units/mL lithium heparin	Lt. green	13×75	4.0	Paper	367793
	14 USP units/mL lithium heparin	Lt. green	13×100	6.0	Paper	367794
Sterile tubes, no additive, for determinations requiring serum	None	Red	13×75	2.0	Paper	367611
	None	Red	13×75	3.0	Paper	367612
	None	Red	13×75	4.0	Paper	367613
	None	Red	13×75	5.0	Paper	367614
	None	Red	13×100	7.0	Paper	367615
	None	Red	13×75	5.0	SeeThru	367618
	None	Red	13×100	7.0	SeeThru	367619
	None (noncoated interior)	Pink	13×100	7.0	Paper	367626
Sterile tubes for determinations requiring plasma— —with freeze dried heparin	30 USP units NaHep	Green	13×75	2.0	Paper	367671
	45 USP units NaHep	Green	13×75	3.0	Paper	367672
	72 USP units NaHep	Green	13×75	5.0	Paper	367673
	100 USP units NaHep	Green	13×100	7.0	Paper	367676
	100 USP units AmHep	Green	13×100	7.0	SeeThru	367677
	45 USP units LiHep	Green	13×100	7.0	Paper	367680
	72 USP units LiHep	Green	13×75	3.0	Paper	367682
	100 USP units LiHep	Green	13×75	5.0	Paper	367683
	100 USP units LiHep	Green	13×100	7.0	Paper	367686
	100 USP units LiHep	Green	13×100	7.0	SeeThru	367687
	20.0 mg Pot Ox	Lt. gray	13×100	7.0	Paper	367720
	1.5 mg lithium iodoacetate	Lt. gray	13×75	3.0	Paper	367763
	2.5 mg lithium iodoacetate	Lt. gray	13×75	5.0	Paper	367765
Sterile tubes with glycolytic inhibitor	6.0 mg PotOx/7.5 mg fluoride	Lt. gray	13×75	3.0	Paper	367722
	10.0 mg PotOx/12.5 mg fluoride	Lt. gray	13×75	5.0	SeeThru	367723
	10.0 mg PotOx/12.5 mg fluoride	Lt. gray	13×75	5.0	Paper	367724
	14.0 mg PotOx/17.5 mg fluoride	Lt. gray	13×100	7.0	Paper	367725
	50.0 mg sodium fluoride/5.0 mg thymol	Lt. gray	13×100	7.0	SeeThru	367726
	17.5 mg sodium fluoride/7.0 mg EDTA	Lt. gray	13×100	7.0	Paper	367727
	30.0 mg sodium fluoride	Lt. gray	13×100	7.0	Paper	367728
		Lt. gray	13×100	7.0	Paper	367729
	72 USP units sodium heparin, freeze dried	Brown	13×75	5.0	Paper	367734
	143 USP units sodium heparin	Royal blue	13×100	7.0	Paper	367735
	10.5 mg Na ₂ EDTA	Royal blue	13×100	7.0	Paper	367736
	None	Royal blue	13×100	7.0	Paper	367737
	2 NIH units thrombin	Orange	13×100	7.0	Paper	367755
Sterile tubes for stat chemistry determinations requiring serum						
Sterile tubes for microbiology	0.8 mL SPS solution	Yellow	13×100	4.2	Paper	367757

For more information or to order, contact your Becton Dickinson VACUTAINER Systems representative.

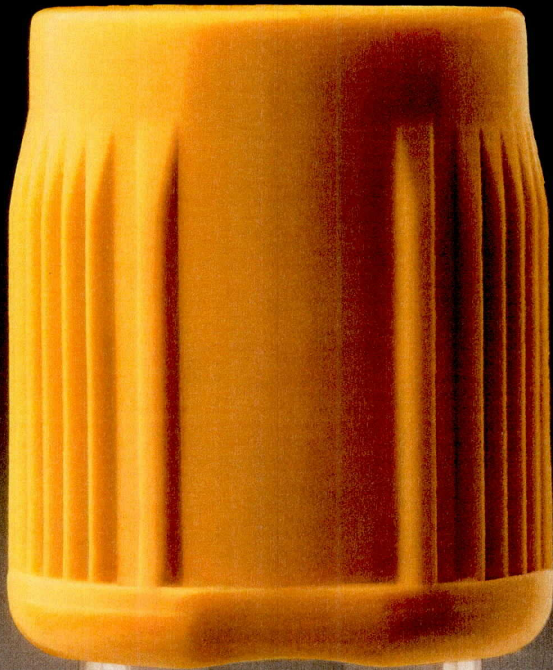
For technical information, call 1-800-631-0174 (in New Jersey, call 1-201-460-2920).

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company.
©1989 Printed in USA V55054
U.S. Pat. No. 4,741,446 and foreign

A N N O U N C I N G

**A
Significant Advance
in
Blood-Specimen
Handling...**



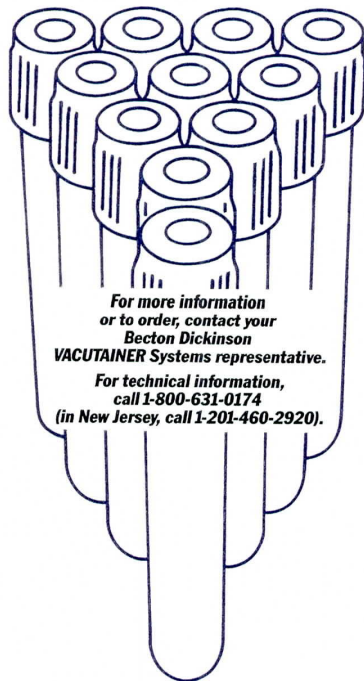
**BECTON
DICKINSON**

**A Shield
Against
Exposure**



The HEMOGARD™ Closure in the above photo has been cut away to clearly demonstrate its unique protective design.

INTRODUCING
VACUTAINER BRAND
TUBES
With
HEMOGARDTM
CLOSURE

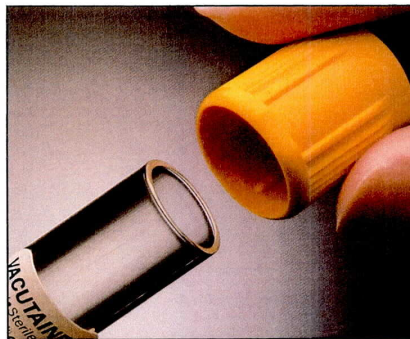


For more information
or to order, contact your
Becton Dickinson
VACUTAINER Systems representative.

For technical information,
call 1-800-631-0174
(in New Jersey, call 1-201-460-2920).

**Builds greater
confidence during
all phases of blood-
specimen handling**

Exposure of laboratory professionals to contaminated blood specimens has become a well-documented safety concern. VACUTAINER Brand Tubes with HEMOGARD Closure were specifically created to address this concern. The quality and reliability of the VACUTAINER Brand System are maintained, but with an important innovation: A plastic shield that protects personnel from exposure when handling blood specimens.



Becton Dickinson VACUTAINER Systems, Becton Dickinson, New Jersey 07090
VACUTAINER, HEMOGARD and HEMOGARD are trademarks of Becton Dickinson and Company
© 1989 U.S. Pat. No. 4,741,448 and foreign
V55054
Printed in USA

**BECTON
DICKINSON**

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER Systems, Rutherford, New Jersey 07070
VACUTAINER, SST, PST and HEMOGARD are trademarks of Becton Dickinson and Company
© 1989 Printed in USA V55032
U.S. Pat. No. 4,741,446 and foreign

BD, We Can Help.





Helping all people
live healthy lives



BD Diagnostics
Preanalytical Systems
1 Becton Drive, MC 304
Franklin Lakes, NJ 07417

Presorted
First Class Mail
US POSTAGE
PAID
BD



I DEMAND safety

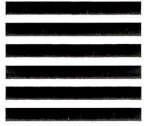


NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 319 FRANKLIN LAKES NJ

POSTAGE WILL BE PAID BY ADDRESSEE



BD Diagnostics

Preanalytical Systems

1 Becton Drive, MC 304

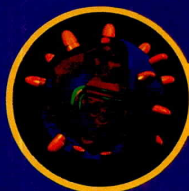
Franklin Lakes, NJ 07417-9935



Demand the safest workplace for your employees.

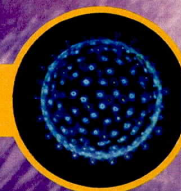
It only takes one hospital-associated injury to change a life.

A study conducted at Johns Hopkins Hospital emergency room determined the prevalence of HCV, HIV, and HBV in blood samples from 2,523 patients.*



18% of the patient population was seropositive for HCV

6% of the patient population was seropositive for HIV



5% of the patient population was seropositive for HBV

There are currently 30 known bloodborne pathogens.
Protect your staff with BD's next generation safety-engineered products.

Each hospital-associated needlestick injury or infection can cost your facility dollars.

- The average cost to treat a single exposure incident ranges from \$800 to \$5,000. Costs can skyrocket with chronic cases of occupationally acquired HCV, where lifelong dialysis or organ transplants are necessary. The lifetime cost of care may exceed \$1 million.*

- The cost of long-term medical complications, disability payments, lost wages, worker's compensation and insurance costs, lost work time, emotional distress suffered by injured workers, and potential legal liability can significantly increase the expense.

BD Can Help!

* References available upon request.

Avoid workplace injuries!

Using safety-engineered devices is a good insurance policy.

Better for you.

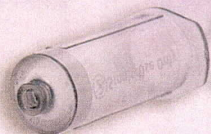
Better for your staff.

DEMAND SAFETY. DEMAND BD. Next Generation Safety-Engineered Products.

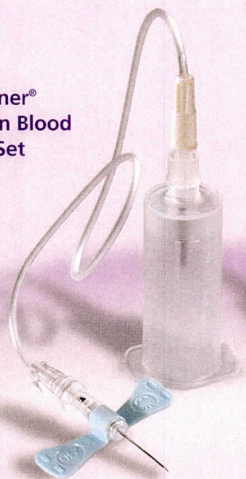
**The BD Vacutainer® System of safety-engineered products
is designed to significantly increase healthcare worker safety.**

Your BD Vacutainer® Safety Products Starter Kit will contain:

BD Vacutainer®
One Use Holder



BD Vacutainer®
Push Button Blood
Collection Set



BD Vacutainer® Eclipse™
Blood Collection Needle
with Pre-Attached Holder



BD Vacutainer®
Plus Plastic Tubes



When you are ready, BD can help support you with
inservicing, technical support, and educational services.



Go to www.bd.com/vacutainer or return the completed card, or call **1.800.817.1702** to receive your complimentary product starter kit containing BD Vacutainer® safety-engineered products and educational materials.

— **Plus...** the first 500 respondents will receive a special educational gift from BD!



Offer ends May 31, 2006

BD, BD Logo, and all other trademarks are the property of Becton, Dickinson and Company.
©2006 BD. 02/06 VS7542

I am interested in learning more about the products and services offered by **BD Diagnostics - Preanalytical Systems.**

Please send me information about (check all that apply):

- ☐ BD Vacutainer® Safety Products Starter Kit (BD Vacutainer® Eclipse™ Blood Collection Needles, BD Vacutainer® Push Button Blood Collection Sets, BD Vacutainer® One Use Holders, and BD Vacutainer® Plus Plastic Tubes).
- ☐ Have my BD Sales Consultant contact me.
My telephone number is: _____
- ☐ Send me news and information related to specimen collection and BD's products, services, and promotions.
My e-mail address is: _____

Name

Signature

Job Title

Facility

Street Address

City State Zip

E-mail

For faster results, please call **1.800.817.1702**

An engineering control

***For safer
blood-specimen
handling***



**BECTON
DICKINSON**

Virtually splatter free

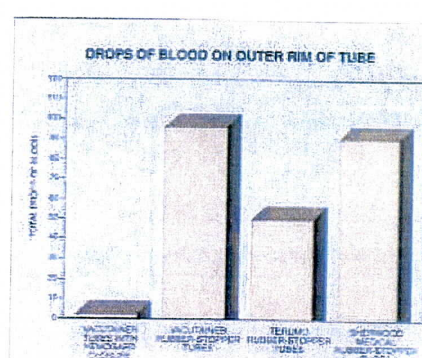
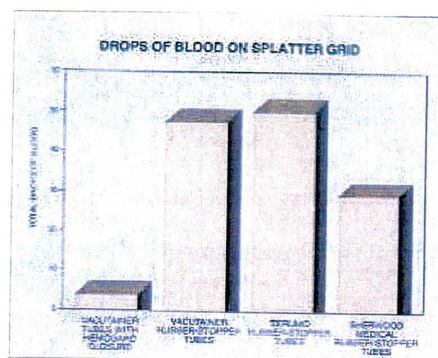
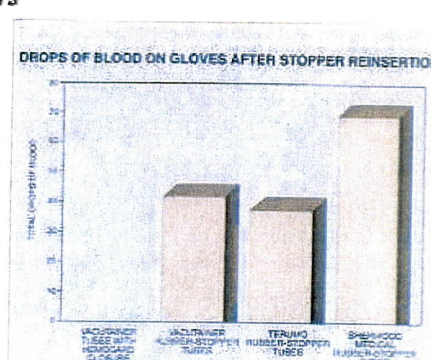
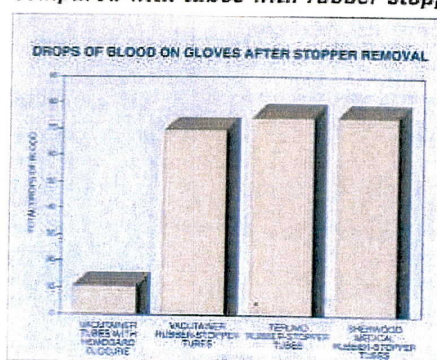
In a recent clinical study, four types of K₂ EDTA blood collection tubes were evaluated for splatter and blood contamination during stopper removal, handling and stopper reinsertion.

For the evaluation, four tubes of blood were collected from each of 20 normal volunteers (total of 80 tubes, 20 of each type). Each tube was opened and closed five times.

Results showed that the HEMOGARD™ Closure caused virtually no splatter and had only a minimal number of blood droplets around the rim of the tube—in contrast to the tubes with rubber stoppers.

Superior performance when compared with rubber-stopper tubes²

An evaluation of VACUTAINER Brand Tubes with HEMOGARD™ Closure compared with tubes with rubber stoppers²



Removal and reinsertion of HEMOGARD™ Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD™ Closure. Using the other hand, grasp the HEMOGARD™ Closure as shown in the photo. Twist and pull the closure upward until removed.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD™ Closure over the tube and gently push until the closure is fully seated and the tube resealed.

Note: A one-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.



Virtually splatter free

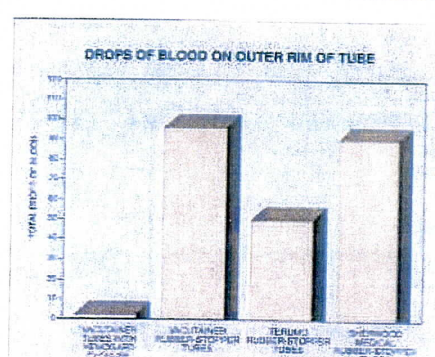
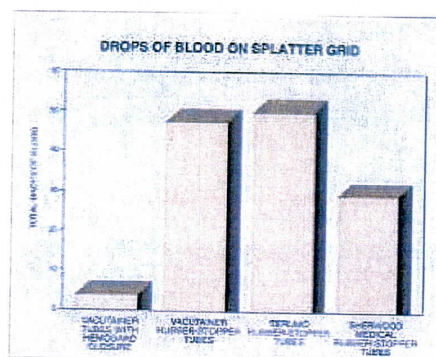
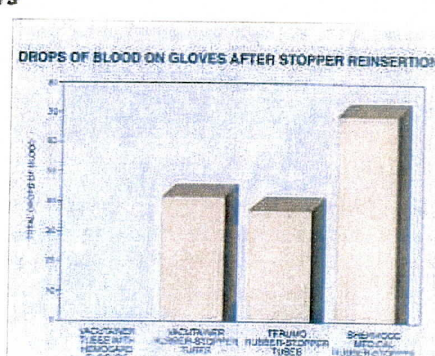
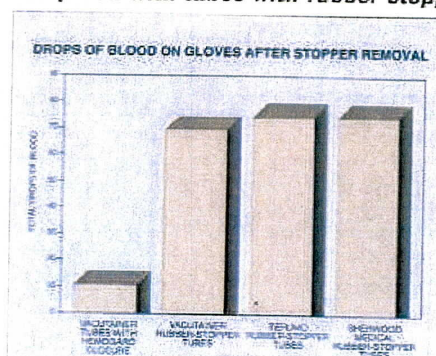
Superior performance when compared with rubber-stopper tubes²

An evaluation of VACUTAINER Brand Tubes with HEMOGARD™ Closure compared with tubes with rubber stoppers²

In a recent clinical study four types of K₂EDTA blood collection tubes were evaluated for splatter and blood contamination during stopper removal, handling and stopper reinsertion.

For the evaluation, four tubes of blood were collected from each of 20 normal volunteers (total of 80 tubes, 20 of each type). Each tube was opened and closed five times.

Results showed that the HEMOGARD™ Closure caused virtually no splatter and had only a minimal number of blood droplets around the rim of the tube. In contrast to the tubes with rubber stoppers



Removal and reinsertion of HEMOGARD™ Closure

To remove: With one hand, firmly grasp specimen tube well below the HEMOGARD™ Closure. Using the other hand, grasp the HEMOGARD™ Closure as shown in the photo. Twist and pull the closure upward until removed.

To reinsert: With one hand, hold the unstoppered tube. Using the other hand, place the HEMOGARD™ Closure over the tube and gently push until the closure is fully seated and the tube resealed.

Note: A one-handed or thumb-roll technique to remove closure is not recommended. All blood specimens and devices used to collect or store blood should be carefully handled and disposed of in conformity with the Universal Precautions recommendations of the CDC and NCCLS.



VACUTAINER[®] BRAND TUBES **HEMOGARD[™]** CLOSURE

**Standardized to a single tube diameter (13 mm)...
streamlines and simplifies specimen handling...
enhances patient care**

Simplified blood collection

- Only two tube sizes are needed to accommodate all draw volumes
- Only one size needle holder is required for both pediatric and adult draws

Simplified processing

- No need for centrifuge adapters to accommodate pediatric tube diameters
- Accommodates reduced sample volume requirements of analyzers

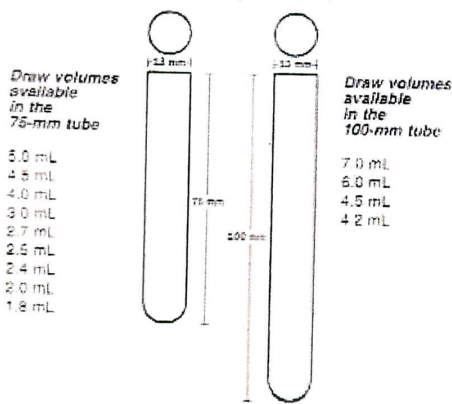
Reduced blood volume, better patient care*

- Minimizes the patient's risk of phlebotomy-induced anemia and the need for transfusion
- Provides sufficient specimen volume for routine and add-on tests, as well as enough for samples to be sent to reference laboratories
- Smaller sample reduces blood waste and associated costs

Compatible with most laboratory systems

- Tubes are compatible with primary tube-sampling modes of most major chemistry and hematology instruments using a single-size rack or adapter
- No special handling is required for lower-volume tubes

A single diameter and two convenient tube lengths offer a variety of volume draws, including those that fulfill pediatric and geriatric requirements.



For more information,
please call **1-800-631-0174**.



Caution: All biologic samples must be handled carefully. Exposure to such samples may transmit HIV (HEPATITIS), AIDS, or other infectious diseases. All samples and contact materials must be disposed of in accordance with the policies and procedures of your facility. In the event of exposure, appropriate medical attention should be sought.

For more information on pediatric use, please refer to the product monograph for 13 mm diameter VACUTAINER Brand Tubes with HEMOGARD Closure.

References

1. Department of Labor, U.S. Bureau of Labor Statistics, Bureau of Census, Occupational exposure to blood-borne pathogens, final rule (29 CFR 1910.103), Federal Register, December 8, 1994, pp. 6241-6241-102.
2. Data on file, Becton Dickinson and Company, Franklin Lakes, NJ.

**BECTON
DICKINSON**

Becton Dickinson VACUTAINER and HEMOGARD are trademarks of Becton Dickinson and Company. © 1995 Becton Dickinson and Company. All rights reserved. Printed in the U.S.A.

VACUTAINER[®] BRAND TUBES

WITH

HEMOGARD[™]

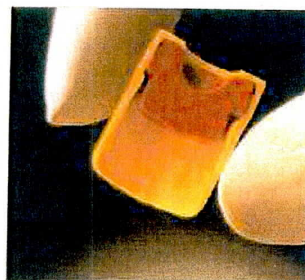
CLOSURE

Your shield against exposure

"All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets."

Engineering control promotes safety

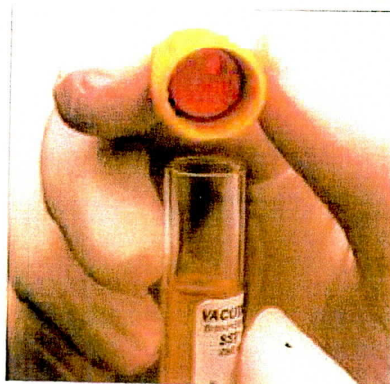
- HEMOGARD[™] Closure puts a splatter barrier between you and the specimen — whether serum, plasma or whole blood
- Shield design is engineered
 - for safer opening, resulting in significantly less splattering of specimen
 - to reduce the possibility of catching glove between stopper and tube when reclosing
- Ridges on outer surface permit a more secure grip



Close-up view illustrates the innovative protective design of the HEMOGARD[™] Closure.

Greater protection during routine blood-specimen handling

- Reduces contact with blood on the stopper
- Protects against contact with blood around the outer rim of the tube
- Reduces blood splatter when the tube is opened



Greater protection for both chemistry and hematology laboratories.



VACUTAINER[®] BRAND TUBES WITH HEMOGARD[™] CLOSURE

**Standardized to a single tube diameter (13 mm)...
streamlines and simplifies specimen handling...
enhances patient care**

Simplified blood collection

- Only two tube sizes are needed to accommodate all draw volumes
- Only one size needle holder is required for both pediatric and adult draws

Simplified processing

- No need for centrifuge adapters to accommodate pediatric tube diameters
- Accommodates reduced sample volume requirements of analyzers

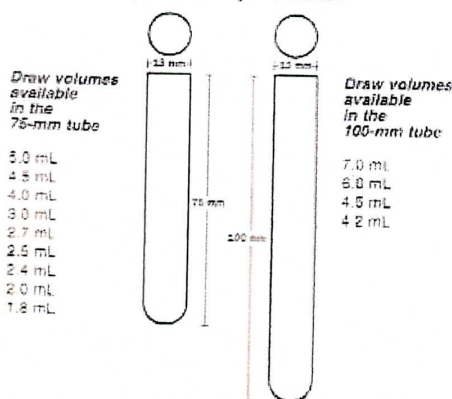
Reduced blood volume, better patient care*

- Minimizes the patient's risk of phlebotomy-induced anemia and the need for transfusion
- Provides sufficient specimen volume for routine and add-on tests, as well as enough for samples to be sent to reference laboratories
- Smaller sample reduces blood waste and associated costs

Compatible with most laboratory systems

- Tubes are compatible with primary tube-sampling modes of most major chemistry and hematology instruments, using a single-size rack or adapter
- No special handling is required for lower-volume tubes

A single diameter and two convenient tube lengths offer a variety of volume draws, including those that fulfill pediatric and geriatric requirements.



For more information
please call **1-800-631-0174**.



Caution: All biologic samples should be handled carefully. Exposure to such samples may transmit HBV (HEPATITIS B), HIV (AIDS) or other infectious diseases. All samples and collection materials must be disposed of in accordance with the policies and procedures of your facility. In the event of exposure, appropriate medical attention should be sought.

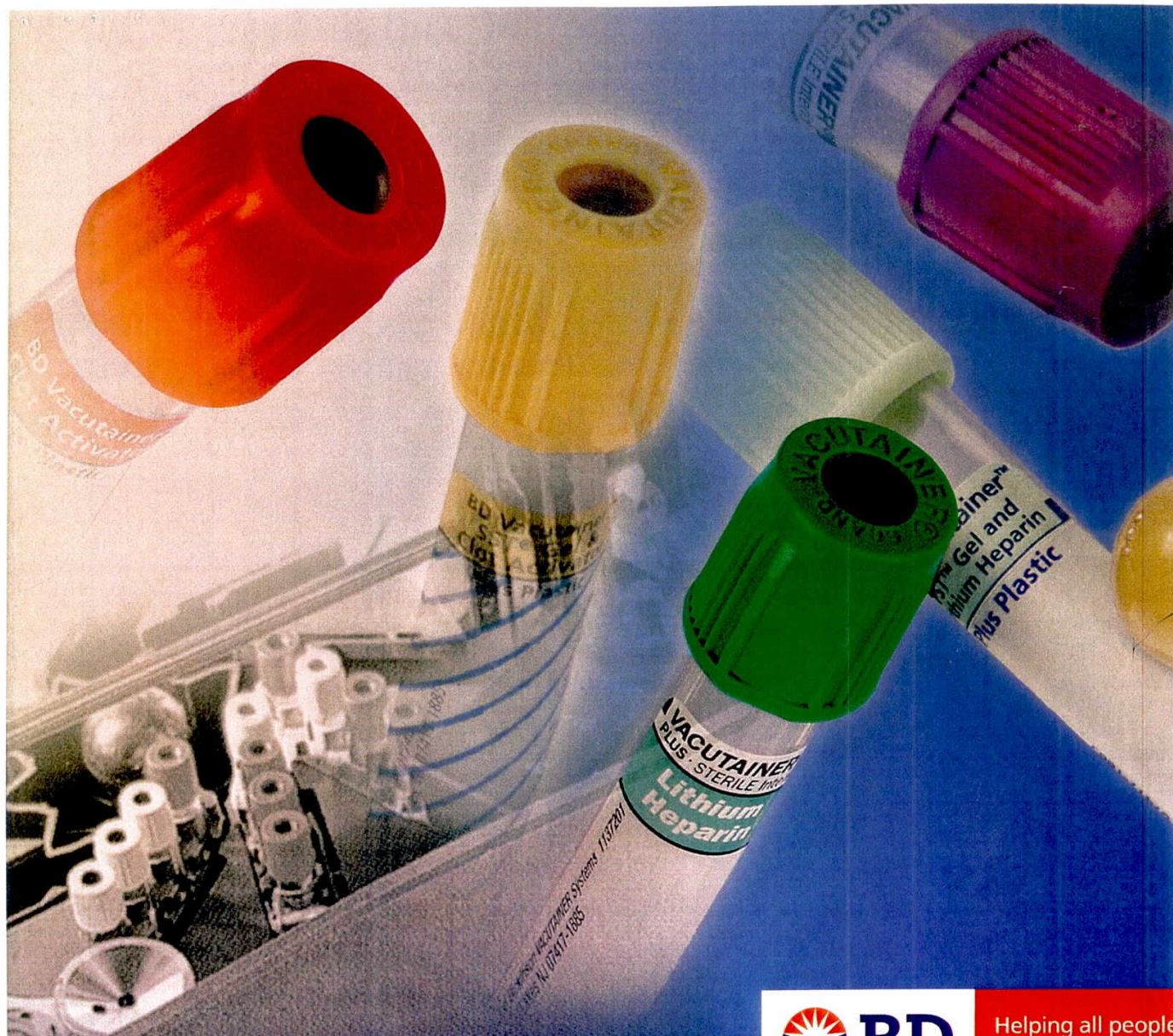
For more information on Becton Dickinson, please refer to the product monograph for the 13 mm diameter VACUTAINER Brand Tubes with HEMOGARD[™] Closure.

References

1. Department of Labor, Occupational Safety and Health Administration, Occupational exposure to blood-borne pathogens, 29 CFR 1910.103, Federal Register, December 6, 1991, 56 FR 62411-62416.
2. Code of the Becton Dickinson and Company, Franklin Lakes, NJ.

Becton Dickinson VACUTAINER[®] Brand Tubes, 13 mm diameter, 75 mm and 100 mm lengths, are trademarks of Becton Dickinson and Company. HEMOGARD[™] is a registered trademark of Becton Dickinson and Company. © 1992 Becton Dickinson and Company. Franklin Lakes, NJ.

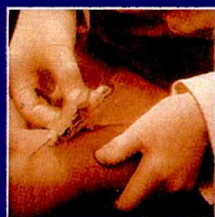
**BECTON
DICKINSON**

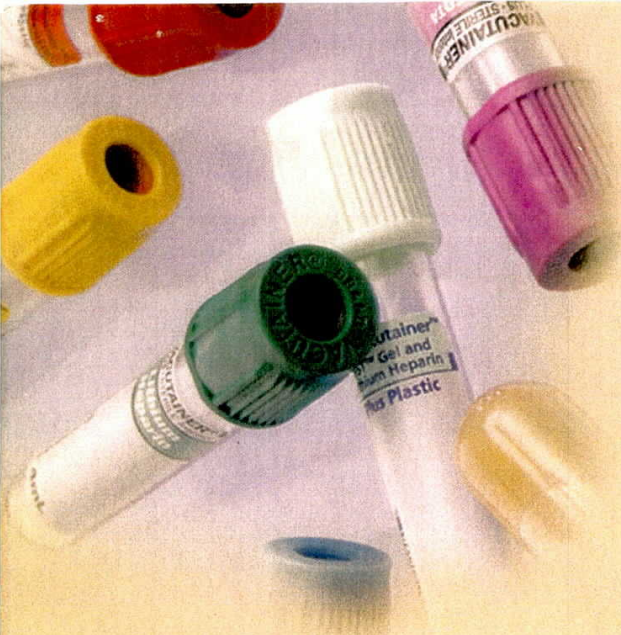


Helping all people
live healthy lives

BD Vacutainer®

Venous Blood Collection Tubes





Why BD Vacutainer® Plus Plastic Tubes?

There has been an increasing customer preference for safety-engineered product solutions and improved clinical performance. These preferences are being driven by marketplace trends. It is the goal of BD to provide customers with the highest quality products that are clinically proven and medically necessary.

- **Clinical Expertise:** The efficacy, performance, and ease of use of **BD Vacutainer® Plus Plastic Tubes** are **clinically proven** and supported by more than 100 clinical studies involving a vast array of analytes and diagnostic instruments. Your BD Sales Consultant can provide further information and documentation from our library of clinical data.
- **Experience:** The BD legacy of innovative medical technology dates back more than a century. Most notable of our early blood collection innovations is the introduction and subsequent patent in 1949 of **the world's first blood collection tube**. The first BD plastic blood collection tube was introduced in 1991. This marked another technological achievement from BD that followed years of design, testing, and clinical trial evaluations.

BD produces in excess of 3.5 billion tubes annually, earning it the designation of the world's largest manufacturer of evacuated blood collection tubes. As a major worldwide medical device manufacturer, BD prides itself in manufacturing operations that maintain the highest standards for quality and efficiency. All BD Diagnostics - Preanalytical Systems manufacturing sites have achieved and maintain ISO 9001:2000 certification.

- **Compatibility:** To ensure that BD Vacutainer® Plus Plastic Tubes are compatible with major diagnostic systems, BD maintains ongoing discussions with the instrument manufacturers who are on the cutting edge of tomorrow's diagnostic technologies.
- **Safety:** BD Vacutainer® Plus Plastic Blood Collection Tubes are proven to be a safer alternative to glass. Our plastic tubes are **virtually break resistant***, thus helping to protect healthcare personnel from injury and exposure to bloodborne pathogens.

The BD Vacutainer® Hemogard™ Closure is a safety-engineered closure, featuring an integrated shield that prevents human contact with blood on the stopper or tube rim and effectively guards against blood splatter and splashing.

- **Cost Effectiveness:** BD Vacutainer® Plus Plastic Tubes can be disposed of safely and efficiently by incineration, thereby **reducing medical waste disposal costs**. The durability and safety of BD Vacutainer® Plus Plastic Tubes help to decrease turnaround time and improve laboratory efficiency by providing a high quality specimen and by helping to minimize risk of bloodborne pathogen infection to the laboratorian.

LEGEND

- ✓ Indicates part of the BD Best Practice Formulary
- G Indicates a glass tube
- P Paper Label
- ST See Thru Label



BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper

▲ BD CLINICAL ADVANTAGE:

▲ What is the BD Best Practice Formulary?

The BD Best Practice Formulary (BPF), as it relates to BD Vacutainer® Blood Collection Tubes, was developed to provide customers with a condensed yet comprehensive array of BD Vacutainer® Blood Collection Tubes for virtually every clinical need. Each tube chosen for inclusion in the BPF meets the demanding requirements of today's complex diagnostic instruments and fits within the current clinical guidelines of the scientific and medical communities.

The BD Best Practice Formulary provides the optimal offering for all of your clinical needs.

SST

BD Vacutainer® SST™ Tubes contain spray-coated silica and a polymer gel for serum separation. They are used for serum determinations in chemistry.

BD Vacutainer® SST™ Tubes provide an efficient means of serum sample preparation and help to improve laboratory workflow.



Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367983 ✓	13x75	3.5			P
367981 ✓	13x75	3.5			P
367977 ✓	13x100	4.0			P
367986 ✓	13x100	5.0			P
367989	13x100	5.0			ST
367974	16x100	6.0			P
367975	16x100	7.0			P
367988 ✓	16x100	8.5			P
367991	16x100	8.5			ST
Transport tube					
367987	16x100	7.5			P
367985	16x125	10.0			P



PST

BD Vacutainer® PST™ Tubes contain spray-coated lithium heparin and a gel for plasma separation. They are used for plasma determinations in chemistry.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367960 ✓	13x75	3.0			P
368056 NEW	13x75	3.0			P
367961	13x100	3.5			P
367962 ✓	13x100	4.5			P
367963	13x100	4.5			ST
367964 ✓	16x100	8.0			P

▲ BD CLINICAL ADVANTAGE:

BD Vacutainer® PST™ Lithium Heparin Tubes eliminate the need to wait for a clot to form, making it an ideal tube for STAT procedures, as well as for patients receiving anticoagulant therapy. The BD Vacutainer® PST™ Tube still provides the convenience of gel separation with the added advantage of improved turnaround times.

EDTA

BD Vacutainer® spray-coated K₂EDTA Tubes are used for whole blood hematology determinations and immunohematology testing.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
367842	13x75	2.0			ST
367841 ✓	13x75	2.0			P
367859	13x75	3.0			ST
367856	13x75	3.0			P
367835	13x75	3.0			P
367862	13x75	4.0			ST
367861 ✓	13x75	4.0			P
367844 ✓	13x75	4.0			P
367863	13x100	6.0			P
367899 ✓	13x100	6.0			P
366643 NEW	16x100	10.0			ST

BD Vacutainer® PPT™ Tube - for molecular diagnostic testing

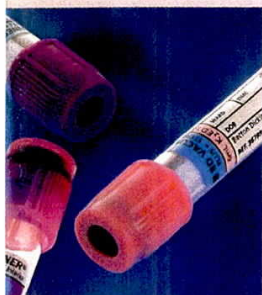
362788 ✓	13x100	5.0		Pearl White	Mylar Label
----------	--------	-----	--	-------------	-------------

▲ BD CLINICAL ADVANTAGE:

K₂EDTA is the "anticoagulant of choice in specimen collection and blood cell counting" according to both NCCLS and the International Council for Standardization in Haematology (ICSH)^{1,2}. It was chosen for the following reasons: 1) K₃EDTA results in greater RBC shrinkage; 2) K₃EDTA produces a larger increase in cell volume on standing; and 3) K₃EDTA is a liquid additive and will result in the dilution of the specimen. Results of directly measured values can be 1-2% lower than results with K₂EDTA. K₂EDTA is sprayed onto the interior of the plastic tube and like K₃EDTA requires 8-10 inversions for thorough mixing of blood with the anticoagulant.

¹ NCCLS, Evacuated Tubes and Additives for Blood Specimen Collection – Fifth Edition; Approved Standard. NCCLS documentation H1-A5, Vol. 23, No. 33, Dec. 2003.

² International Council for Standardization in Haematology Expert Panel on Cytometry. Recommendation of the International Council for Standardization in Haematology for ethylenediaminetetraacetic acid anticoagulation for blood cell counting and sizing. Am J Clin Pathol 1993; 100:371-372.



LEGEND

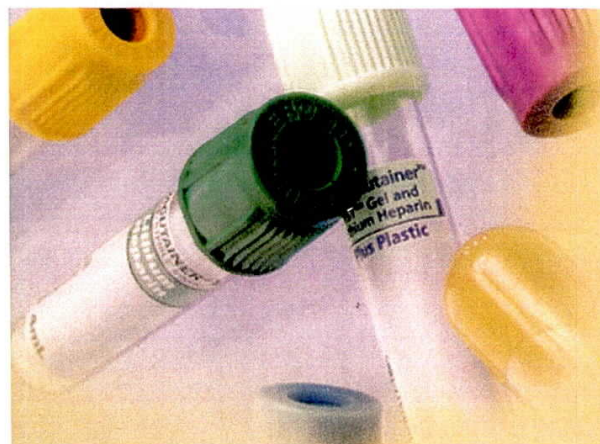
- ✓ Indicates part of the BD Best Practice Formulary
- G Indicates a glass tube
- P Paper Label
- ST See Thru Label



BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper





Serum

BD Vacutainer® Plus Plastic Serum Tubes have spray-coated silica and are used for serum determinations in chemistry, serology, and immunochemistry.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
366668 NEW	13x75	3.0			P
366381 ⁶	10.25x64	3.0			P
367812 ✓	13x75	4.0			P
367814	13x100	5.0			P
367819	13x100	6.0			ST
367815 ✓	13x100	6.0			P
366431 ⁶	13x100	7.0			P
367820 ✓	16x100	10.0			P
366430 ⁶ ✓	16x100	10.0			P
Secondary/Discard tube (No additive)					
366703 NEW	13x75	3.0		Clear	P

Heparin

BD Vacutainer® Heparin Tubes are spray-coated with either lithium heparin or sodium heparin and are used for plasma determinations in chemistry.



Reference #	Additive Lithium Heparin	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
				Type	Color	
366664 NEW	34 USP	13x75	2.0			P
366667 NEW	51 USP	13x75	3.0			P
367884 ✓	68 USP	13x75	4.0			P
367886	87 USP	13x100	6.0			P
367889	87 USP	13x100	6.0			ST
367880	144 USP	16x100	10.0			P
Sodium Heparin						
367871 ✓	68 USP	13x75	4.0			P
367872	68 USP	13x75	4.0			ST
367878	86 USP	13x100	6.0			P
367879	86 USP	13x100	6.0			ST
367874	143 USP	16x100	10.0			P

Citrate

BD Vacutainer® Citrate Tubes with 3.2% buffered sodium citrate solution are used for routine coagulation studies.

Reference #	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
			Type	Color	
363080	13x75	1.8		Clear	P
363083 ✓	13x75	2.7			P



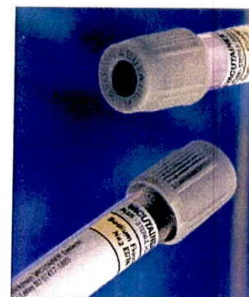
▲ BD CLINICAL ADVANTAGE:

Sodium citrate concentrations can have significant effects on APTT and PT assays especially with patients receiving IV heparin therapy and when responsive reagents are used. For this reason it is very important that laboratories determine their normal range of APTT and PT based on one citrate concentration and consistently use this concentration for all patient samples. BD offers only the 3.2% citrate concentration, as recommended by NCCLS.¹

¹ NCCLS, Collection, Transport and Processing of Blood Specimens for Coagulation Testing and General Performance of Coagulation Assays - Third Edition; Approved Guideline. NCCLS documentation H21-A3, Vol. 18, No. 20, Dec. 1998.

Glucose

BD Vacutainer® Fluoride Tubes contain a glycolytic inhibitor and are used for glucose determinations on plasma.

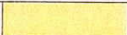
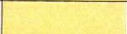
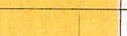
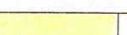
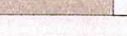


Reference #	Additives		Tube Size (mm)	Draw Volume (mL)	Closure		Label type
	Potassium oxalate (mg)	Sodium Fluoride (mg)			Type	Color	
367921	4.0	5.0	13x75	2.0			P
367587 ✓	—	3.0 with 6.0 mg Na ₂ EDTA	13x75	2.0			P
367922 ✓	8.0	10.0	13x75	4.0			P
368587 ✓	8.0	10.0	13x75	4.0			P
367925	11.8	14.8	13x100	6.0			P



Specialty Tubes

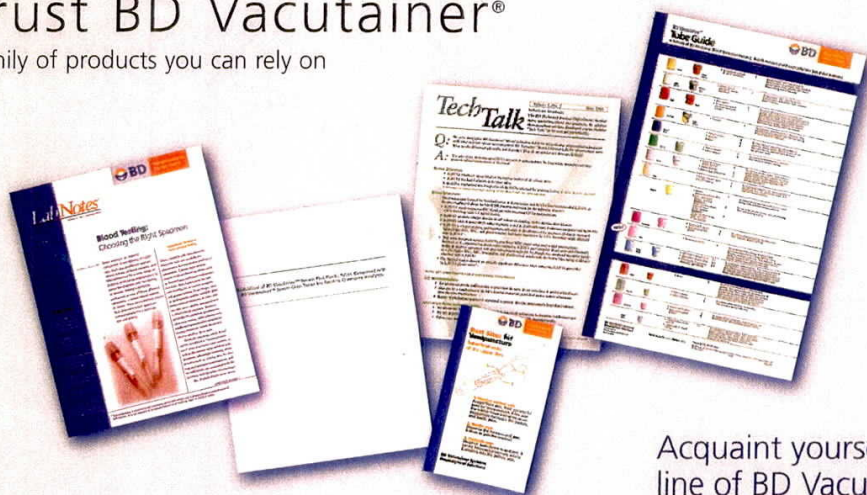
BD Vacutainer® Specialty Tubes

Reference #	Additive	Tube Size (mm)	Draw Volume (mL)	Closure		Label type
				Type	Color	
Blood banking studies, HLA phenotyping, DNA and paternity testing						
364012 ⁶	ACD-B*	10.25x64	3.0			P
364606 ⁶	ACD-A**	16x100	8.5			P
364816 ⁶	ACD-B*	13x100	6.0			P
Serum tubes for stat chemistry determinations with thrombin additive and silicone-coated interiors						
367776 ⁶	1.4 NIH units	13x75	3.0			P
367766 ⁶	1.4 NIH units	13x75	5.3			P
367755 ⁶	1.4 NIH units	13x100	7.0			P
366525 ⁶	2.0 NIH units	16x100	10.0			P
Trace element testing						
368380 NEW	Serum (spray coated silica)	13x100	6.0			P
368381 NEW	K ₂ EDTA 10.8 mg	13x100	6.0			P
369735 ⁶	Sodium Heparin 100 USP units	13x100	7.0			P
369736 ⁶	Na ₂ EDTA 10.5 mg	13x100	7.0			P
369737 ⁶	Serum (no additive)	13x100	7.0			P
Lead testing						
367855	K ₂ EDTA 5.4 mg	13x75	3.0			P
367734 ⁶	Sodium Heparin 72 USP units	13x75	5.0			P
Fibrin Degradation Product (FDP)						
366478 ⁶	Thrombin (20 NIH units)/Soybean trypsin inhibitor (3670 units)	13x75	2.0			P
Whole blood microbiology Sodium Polyanetholesulfonate (SPS)						
366404 ⁶	0.68 mL	10.25 x 82	3.32			P
364960 ⁶	1.7 mL	16x100	8.3			ST
Westergren sedimentation rate determination Buffered Citrate (3.8%)						
369741 ⁶	0.6 mL	13x75	2.4			P
366465 ⁶	1.0 mL	13x100	4.0			P
Sterile Exterior Pouch						
366401 ⁶	Red – silicone-coated	16x100	10.0			P
	Lavender – K ₃ EDTA (0.081mL)	13x100	7.0			P
Whole blood activated clotting time determinations						
366522 ⁶	Silaceous Earth (12 mg)	13x75	2.0			ST
Citrate, Theophylline Adenosine Dipyridamole (CTAD) specialized platelet testing						
367946 ⁶	Buffered Sodium Citrate (0.109M, 3.2%), theophylline, adenosine, dipyridamole (0.3mL)	13x75	2.7			P
367947 ⁶		13x75	4.5			P

* ACD (Acid Citric Dextrose) Solution B consists of trisodium citrate, 13.2 g/L, citric acid, 4.8 g/L, and dextrose, 14.7 g/L.
 ** ACD Solution A consists of trisodium citrate, 22.0 g/L, citric acid, 8.0 g/L, and dextrose, 24.5 g/L.

Trust BD Vacutainer®

Family of products you can rely on



LabNotes – A quarterly newsletter, published by BD Diagnostics - Preanalytical Systems, to keep readers current on safety and efficiency issues in the clinical laboratory.

Clinical Documentation – More than 100 clinical studies on a vast array of analytes document the efficacy, performance characteristics, and ease of use of BD Vacutainer® tubes.

TechTalk – A news bulletin to address frequently asked technical questions with a focus on reducing preanalytical variables.

Blood Collection Pocket Cards – Handy, laminated pocket cards provide easy reference for: order of draw, tube additive guide, troubleshooting hints for blood collection, best sites for venipuncture, and many more.

Blood Education Wall Charts – Instructional wall charts to help educate staff members.

Acquaint yourself with the full line of BD Vacutainer® Specimen Collection Products



BD Vacutainer® Eclipse™ Blood Collection Needle



BD Vacutainer® Push Button Blood Collection Set



BD Vacutainer® One Use Holder



BD Vacutainer® Blood Transfer Device



BD Vacutainer® Luer-Lok™ Access Device



BD Vacutainer® Urine Analysis Preservative Tubes



BD Microtainer® Quikheel™ Lancet



BD Microtainer® Genie™ Lancet



BD Microtainer® Tubes with BD Microgard™ Closure

To learn more about the full product offering of BD Vacutainer® Specimen Collection Products or the educational materials and services offered by BD Diagnostics-Preanalytical Systems, please contact your local BD Sales Consultant.

BD Technical Services: **1.800.631.0174**

BD Customer Service: **1.888.237.2762**

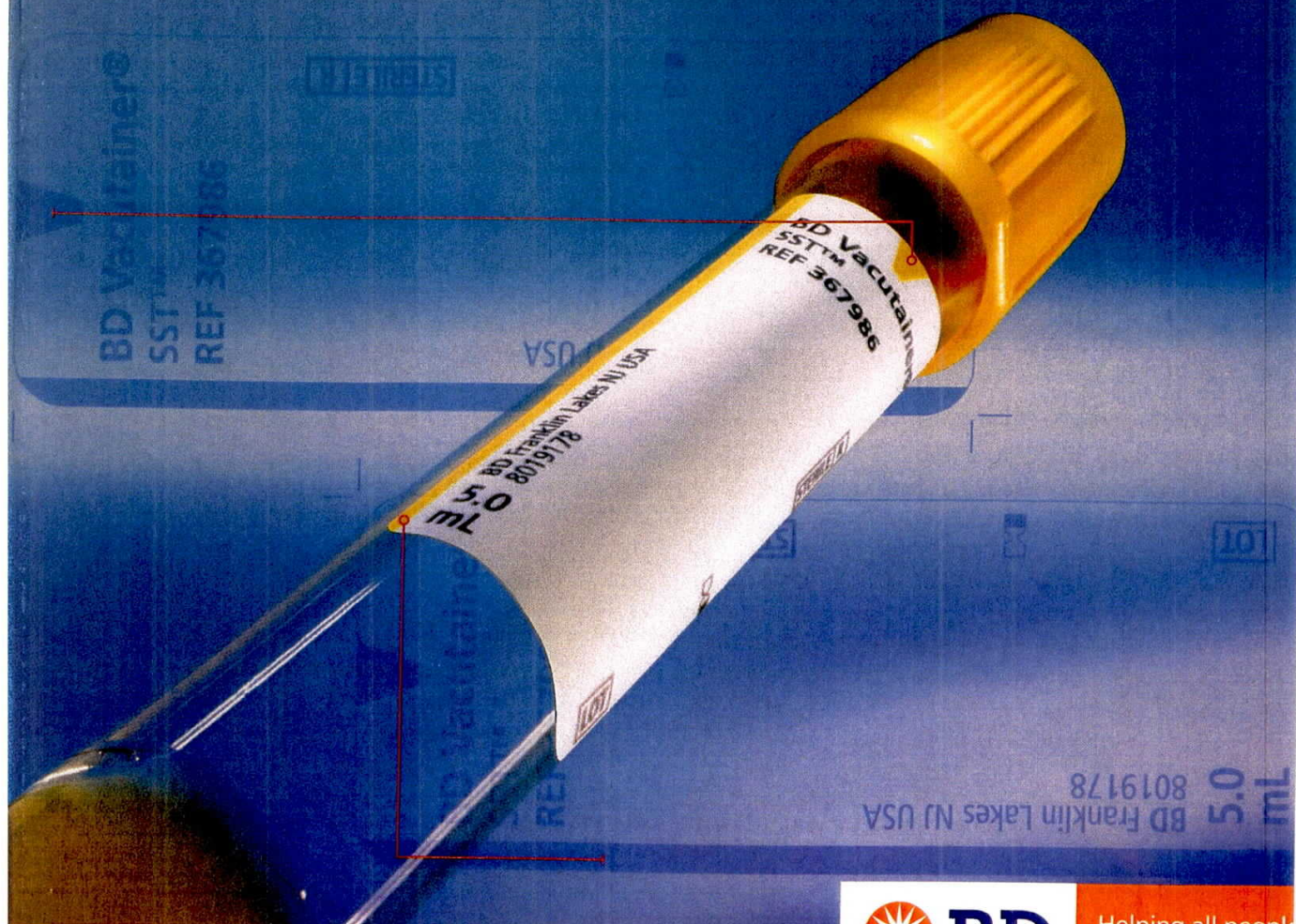
www.bd.com/vacutainer



BD Diagnostics
Preanalytical Systems

1 Becton Drive
Franklin Lakes, NJ 07417
www.bd.com/vacutainer

BD Vacutainer® Plus Plastic Tubes



BD

Helping all people
live healthy lives

A Fresh
New Look
for 2005



BD Vacutainer® Plus Plastic Tubes

Accuracy Is Our First Priority

... because it's not just a test, it's a patient.

At BD, we understand that misaligned labels can interfere with the reading of bar codes in automated systems, which can lead to system downtime, re-labeling of tubes, and unnecessary delays in specimen processing.

It is our goal to help you improve your lab's efficiency by offering solutions designed to reduce the re-work associated with misaligned secondary labels.

To assist in this effort, all BD Vacutainer® Plus Plastic Tubes have been restyled to include a visual guide for proper placement of secondary labeling. With proper training, the use of these patented label features should help to reduce errors due to label misalignment. In addition, the restyled label offers added space for writing with an easy-to-write-on surface.

This restyling affects the unit label, shelf pack label, and case label.

Unit Label Features

Provides visual guide for proper placement of secondary labeling

- Color-coded notch
- Color-coded sidebar

Tube type & additive concentration (if applicable)

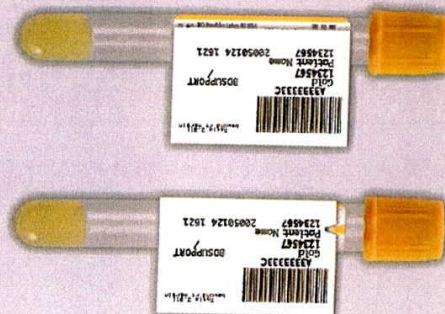
Draw volume



BD reference number

BD sterile symbol

BD lot number & expiration date



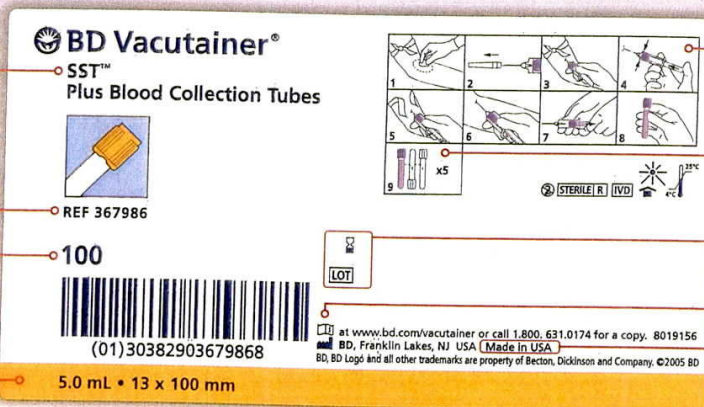
Shelf Pack Label Features

Tube type and additive concentration (if applicable)

BD reference (catalog) number

Shelf pack quantity

Draw volume and tube size



Visual instructions of use

Required number of inversions

BD expiration date and lot number

BD Web site for accessing product inserts

Country of origin

Case Label Features

Tube type and additive concentration (if applicable)

Case quantity

Draw volume and tube size



BD reference (catalog) number

Fill Indicators

Nominal fill indicators are available on the following BD Vacutainer® Plus Plastic Tubes. Tubes are intended to fill approximately to the fill indicator line. It is important to note that label placement can vary slightly from tube to tube. For this reason, fill indicators are approximate indicators of expected fill volume.



EDTA



EDTA



Glucose



Heparin



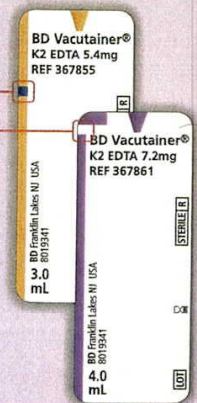
Lead



PST™

Examples

Nominal Fill Indicators



Shelf Pack Changes

Old Label

VACUTAINER® PLUS SST™ REORDER NUMBER **367986**
Tubes with HEMOGARD™ Closure

STERILE 13 x 100 mm

INERT BARRIER MATERIAL. CLOT ACTIVATOR. TUBE INTERIOR COATING: SILICONE. STOPPER LUBRICATION: SILICONE.

APPROX. DRAW VOL. APPROX. VACIO APPROX. VOL. APPROX. **5 mL**

BARRERA DE MATERIAL INERTE. ACTIVADOR DEL COAGULO. RECUBRIMIENTO INTERIOR: SILICON. TAPÓN LUBRICADO CON SILICON.

BARRIERE: GEL INERTE. ACTIVATEUR DE COAGULATION. TUBE: SILICONE. BOUCHON LUBRIFIE AU SILICONE.

EXR:

LOT:

(01)30382903679868

4-25C 1005301()

New Label

BD Vacutainer®
SST™
Plus Blood Collection Tubes

REF 367986

100

(01)30382903679868

5.0 mL • 13 x 100 mm

at www.bd.com/vacutainer or call 1.800.631.0174 for a copy. 8019156
BD, Franklin Lakes, NJ USA Made in USA
BD, BD Logo and all other trademarks are property of Becton, Dickinson and Company. ©2005 BD

Case Label Changes

Old Label

VACUTAINER® PLUS SST™ REORDER NUMBER **367986**
Tubes with HEMOGARD™ Closure

STERILE 13 x 100 mm

INERT BARRIER MATERIAL. CLOT ACTIVATOR. TUBE INTERIOR COATING: SILICONE. STOPPER LUBRICATION: SILICONE.

APPROX. DRAW VOL. APPROX. VACIO APPROX. VOL. APPROX. **5 mL**

BARRERA DE MATERIAL INERTE. ACTIVADOR DEL COAGULO. RECUBRIMIENTO INTERIOR: SILICON. TAPÓN LUBRICADO CON SILICON.

BARRIERE: GEL INERTE. ACTIVATEUR DE COAGULATION. TUBE: SILICONE. BOUCHON LUBRIFIE AU SILICONE.

EXR:

LOT:

(01)30382903679868

4-25C 1005401()

New Label

BD Vacutainer®
SST™
Plus Blood Collection Tubes

REF 367986

1000 (10x100)

5.0 mL • 13 x 100 mm

BD, Franklin Lakes, NJ USA Made in USA www.bd.com
BD, BD Logo and all other trademarks are property of Becton, Dickinson and Company. ©2005 BD

SST™	Old BD Vacutainer® SST™ Gel & Clot Activator Plus Plastic 8.5 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367988 New BD Vacutainer® SST™ 8.5 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367988	Old BD Vacutainer® SST™ Gel & Clot Activator Plus Plastic 5 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367986 New BD Vacutainer® SST™ 5.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367986
PST™	Old BD Vacutainer® PST™ Gel and Lithium Heparin Plus Plastic 3 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367960 New BD Vacutainer® PST™ Gel and Lithium Heparin 3.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367960	Old BD Vacutainer® PST™ Gel and Lithium Heparin Plus Plastic 3 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367960 New BD Vacutainer® PST™ 3.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367960
Serum	Old BD Vacutainer® Clot Activator Plus Plastic 6 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367815 Old BD Vacutainer® Clot Activator Plus Plastic 3 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367815 New BD Vacutainer® Serum 6.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367815	Old BD Vacutainer® No Additive Plus Plastic 3 mL STERILE R LOT BD Franklin Lakes NJ USA REF 366703 New BD Vacutainer® No Additive 3.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 366703
Heparin	Old VACUTAINER® PLUS - STERILE Interior Lithium Heparin 4 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367884 New BD Vacutainer® Lithium Heparin 68 USP units 4.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367884	Old VACUTAINER® PLUS - STERILE Interior Sodium Heparin 4 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367871 New BD Vacutainer® Sodium Heparin 68 USP units 4.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367871
Glucose	Old BD Vacutainer® Sodium Fluoride / Potassium Oxalate 10 mg / 8 mg Plus Plastic 4 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367922 New BD Vacutainer® Sodium Fluoride Potassium Oxalate 10mg/8mg 4.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367922	Old BD Vacutainer® Sodium Fluoride / Potassium Oxalate 10 mg / 8 mg Plus Plastic 4 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367922 New BD Vacutainer® Sodium Fluoride Potassium Oxalate 10mg/8mg 4.0 mL STERILE R LOT BD Franklin Lakes NJ USA REF 367922

EDTA	Old   BD Vacutainer™ K₂ EDTA (7.2mg) Plus Plastic 8002023 LOT: CH-48 Exp. Never Exp. 4 mL New   BD Vacutainer® K₂ EDTA 7.2mg REF 367861 4.0 mL STERILE R	Old   BD VACUTAINER® PLUS • STERILE Interior 6mL K₂ EDTA 10.8mg REF 367899 CROSSMATCH New   BD Vacutainer® K₂ EDTA 10.8 mg REF 367899 6.0 mL DOB: _____ SURNAME: _____ FORENAME: _____ HOSP NO: _____ DATE: _____ TIME: _____ SIG: _____ 8019347 BD Franklin Lakes NJ USA
Lead	Old   BD Vacutainer™ K₂ EDTA 5.4mg 8019341 LOT: CH-48 Exp. Never Exp. 3.0 mL New   BD Vacutainer® K₂ EDTA 5.4mg REF 367855 3.0 mL STERILE R	
Citrate	Old   BD Vacutainer™ STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M 3.2% 8003869 LOT: CH-48 Exp. Never Exp. 1.8 mL New   BD Vacutainer® STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M, 3.2% REF 363080 1.8 mL STERILE R	Old   BD Vacutainer™ STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M 3.2% 8003869 LOT: CH-48 Exp. Never Exp. 2.7 mL New   BD Vacutainer® STERILE Interior Buff. Na Citrate (9:1) Plus Plastic 0.109M, 3.2% REF 363083 2.7 mL STERILE R
Trace Element	Old   BD Vacutainer® Trace Element Serum Plus 8019347 LOT: CH-48 Exp. Never Exp. 6.0 mL New   BD Vacutainer® Trace Element Serum REF 368380 6.0 mL STERILE R	Old   BD Vacutainer® Trace Element K₂ EDTA 10.8mg Plus 8019347 LOT: CH-48 Exp. Never Exp. 6.0 mL New   BD Vacutainer® Trace Element K₂ EDTA 10.8mg REF 368381 6.0 mL STERILE R

Note: Reflected catalog numbers are representative of other catalog numbers within the product family.

Key:



BD Vacutainer®
Hemogard™
Tube Closure



Conventional
Tube Stopper

Relevant Symbols Chart

Handling Symbols

	Use By	 In Vitro Diagnostic Medical Device
	Batch Code	 Temperature Limitation
	Do Not Reuse	 Manufacturer
REF or 	Catalog Number	 Keep Away From Sunlight
	Method of Sterilization Using Irradiation	 This End Up
	Consult Instructions For Use	 Fragile, Handle With Care

Additive Symbols

K2E	EDTA - dipotassium salt
9NC	Tri-Sodium Citrate 9:1
FX	Fluoride and Oxalate
FE	Fluoride and EDTA
LH	Lithium Heparin
NH	Sodium Heparin
Z	None (No Additive)

Package Insert Changes

All package inserts for BD products will now be available online at bd.com/vacutainer. This will ensure the most up-to-date information. If you do not have access to the Web, please contact the BD Technical Services Department at 1-800-631-0174.

BD Vacutainer® Evacuated Blood Collection System

For In Vitro Diagnostic Use.

INTENDED USE
BD Vacutainer® Tubes, Needles and Holders are used together as a system for the collection of venous blood. BD Vacutainer® Tubes are used to transport and process blood for testing serum, plasma or whole blood in the clinical laboratory.

PRODUCT DESCRIPTION

PRODUCT DESCRIPTION
PD Vaccines: Tubes are evacuated tubes with color coded (see table below) conventional stoppers or BD Hemogard™ Closures. **BD Vaccutainers®:** Flat Tubes are plastic tubes. Both tube types contain additives in varying concentrations dependent upon the amount of vacuum and the required additives to blood ratio for the tube. See each shelf package or case label for specific additve quantity and approximate draw volume. Additive choice depends on the analytic test method. As specified by the manufacturer of the test reagents and/or instrument on which the test is performed. Tube interiors are sterile. Tube stoppers are lubricated with silicone or silicone free individual shelf packages or case labels to facilitate insertion/biurction.

BD Vacutainer® Tubes for Lead Testing Contamination Upper Limits		
Analyte	Glucose (ppm)	Fluoride (ppm)
Lead	10	2.5

© 1998 Becton Dickinson and Company

^aValues are means $\pm$ SD.

BD Vacutainer® SST™ Tubes and Transport Tubes

The action of the tube wall is coated with microfilled silica particles to accelerate curing. A barrier polymer is present at the tube bottom. The density of this material causes it to move upward during configurations to the turn-on of intermix, where it forms a barrier separating reagents from flow and cells. Serum may be aspirated directly into the collection tube, eliminating the need for transfer to another container. BD 537™ Transport Tubes contain the same clot activator as BD 537™ Tubes with approximately twice the quantity of kaolin. This additional kaolin produces a larger barrier between the serum and cells. Even more stable for shipping than a phibiotube due to a wetting site. See also literature of type.

BD Vacutainer® PST™ Tubes

Bu vacuolator-23 (Bv23) is a mutant of the *Escherichia coli* bacterium that is unable to produce the vacuole. The vacuole is a large, clear, spherical structure that is found in many cells. It is used to store waste products and to break down old organelles. In the Bv23 mutant, the vacuole is missing, which causes the cell to die. The Bv23 mutant is used to study the function of the vacuole and to develop vaccines against diseases caused by the bacterium.

BD Vacutainer® Tube Closure Color Code Cross Reference			
ANTICIPATE DISCONTINUATION	CONVENTIONAL CLOSURE	BD PERFORMANCE CLOSURE	BD PERFORMANCE CLOSURE
Get Specimens Tested			
On STAT Tubes with Gel and Clot Activator	Red/Gray	Gold	
On STAT Tubes with Gel and Lithium Heparin	Green/Gray	Light Green	
Non-clotting Tubes			
Lithium Clot Activator	Red	Red	
No Additive	Gray	Blue	
Specialty Tubes with Additives			
Heparin	Blue	Blue	
No Additive with Clot Activator	Red/Gray	Gold	
Theoretical: Heparin, Gel and Clot Activator	Red/Gray	Gold	
Other Specialty Tubes			
Leakproof (BD Vacutainer® Tubes)	Red/Gray	Gold	
Leakproof (BD Vacutainer® Tubes)	Red/Gray	Gold	

BD Vacutainer® Plus Plastic Tubes Ordering Information

Listed below are those catalog numbers affected by this label change. For a full listing of available BD Vacutainer® Plus Plastic Tubes, please visit our Web site at bd.com/vacutainer.

BD Vacutainer® Plus Plastic Tubes	Reference #	Tube Size (mm)	Draw Volume (mL)	Closure Type
SST™	✓ 367981	13X75	3.5	C
	✓ 367983	13X75	3.5	H
	✓ 367977	13X100	4.0	H
	✓ 367986	13X100	5.0	H
	367974	16X100	6.0	C
	367987	16X100	7.5	C
	✓ 367988	16X100	8.5	C
	367985	16X125	10.0	C
PST™	368056	13X75	3.0	C
	✓ 367960	13X75	3.0	H
	367961	13X100	3.5	H
	✓ 367962	13X100	4.5	H
	✓ 367964	16X100	8.0	C
SERUM	366668	13X75	3.0	C
	✓ 367812	13X75	4.0	H
	367814	13X100	5.0	H
	✓ 367815	13X100	6.0	H
	✓ 367820	16X100	10.0	C
NO ADDITIVE (Z)	366703	13X75	3.0	H
LITHIUM HEPARIN (LH)	366664	13X75	2.0	H
	366667	13X75	3.0	C
	✓ 367884	13X75	4.0	H
	367886	13X100	6.0	H
	367880	16X100	10.0	C
SODIUM HEPARIN (NH)	✓ 367871	13X75	4.0	H
	367878	13X100	6.0	H
	367874	16X100	10.0	C
GLUCOSE	✓ 367587	13X75	2.0	H
	367921	13X75	2.0	H
	✓ 367922	13X75	4.0	H
	✓ 368587	13X75	4.0	C
	367925	13X100	6.0	H
K2EDTA (K2E)	✓ 367841	13X75	2.0	H
	367835	13X75	3.0	C
	367856	13X75	3.0	H
	✓ 367844	13X75	4.0	C
	✓ 367861	13X75	4.0	H
	367863	13X100	6.0	H
K2EDTA (K2E)	✓ 367899	13X100	6.0	H
CITRATE 3.2% (9NC)	363080	13X75	1.8	H
	✓ 363083	13X75	2.7	H
LEAD TESTING	367855	13X75	3.0	H
TRACE ELEMENT K2EDTA (K2E)	368381	13X100	6.0	H
TRACE ELEMENT SERUM	368380	13X100	6.0	H

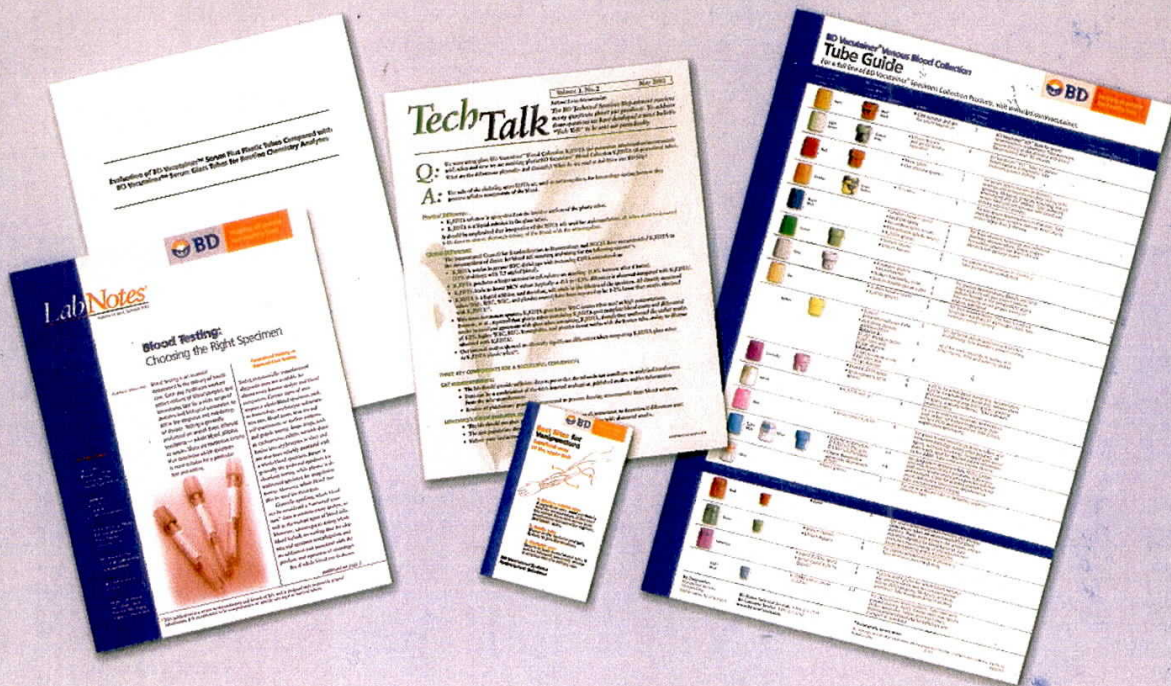
✓ = Indicates part of the BD Best Practice Formulary
The BD Best Practice Formulary provides optimal solutions, based on clinical and diagnostic instrument recommendations.

H = BD Vacutainer®
Hemogard™
Tube Closure

C = Conventional
Tube Stopper

Trust BD Vacutainer®

Family of products you can rely on



LabNotes – A quarterly newsletter, published by BD Diagnostics - Preanalytical Systems, to keep readers current on safety and efficiency issues in the clinical laboratory.

Clinical Documentation – More than 100 clinical studies on a vast array of analytes document the efficacy, performance characteristics and ease of use of BD Vacutainer® tubes.

TechTalk – A news bulletin to address frequently asked technical questions with a focus on reducing preanalytical variables.

Blood Collection Pocket Cards – Handy laminated pocket cards provide easy reference for: order of draw, tube additive guide, troubleshooting hints for blood collection, best sites for venipuncture, and many more.

Blood Education Wall Charts – Instructional wall charts to help educate staff members.

Acquaint yourself with the full line of BD Vacutainer® Specimen Collection Products



BD Vacutainer®
Eclipse® Blood
Collection Needle



BD Vacutainer®
Push Button Blood
Collection Set



BD Vacutainer®
One Use Holder



BD Vacutainer®
Blood Transfer
Device



BD Vacutainer®
Luer-Lok® Access
Device



BD Vacutainer®
Urine Analysis
Preservative Tubes



BD Microtainer®
Quikheel™ Lancet



BD Microtainer®
Genie™ Lancet



BD Microtainer®
Tubes with BD
Microgard™ Closure

To learn more about the full product offering of BD Vacutainer® Specimen Collection Products or the educational materials and services offered by BD Diagnostics-Preanalytical Systems, please contact your local BD Sales Consultant.

BD Technical Services: 1.800.631.0174
BD Customer Service: 1.888.237.2762
www.bd.com/vacutainer



BD Diagnostics
Preanalytical Systems
1 Becton Drive
Franklin Lakes, NJ 07417
www.bd.com/vacutainer

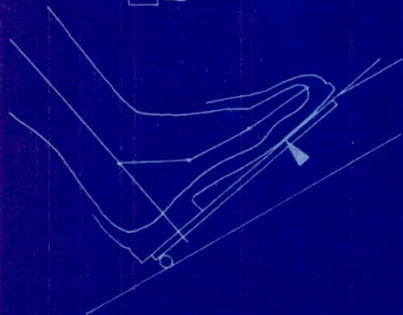
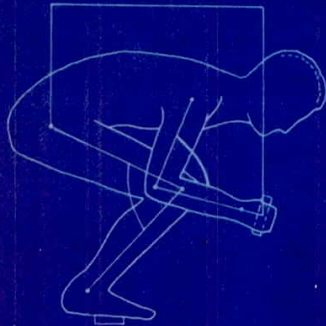
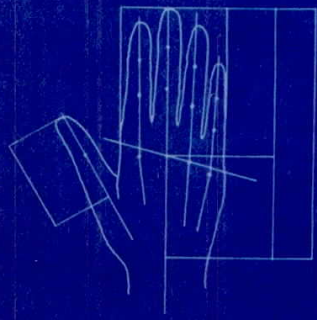
EXHIBIT

B

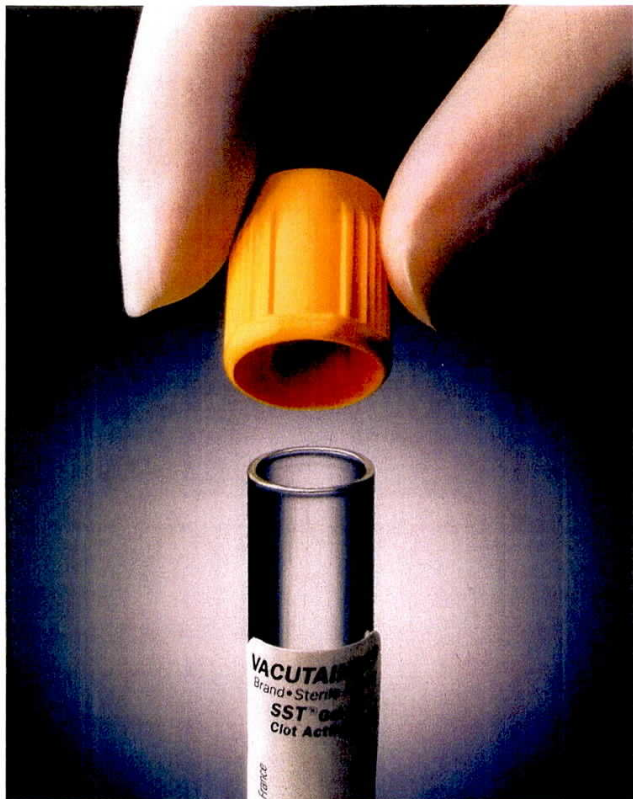
Designing for

HUMANITY

Award-Winning Designs Meeting People's Changing Needs



by the Industrial Designers Society of America



PRODUCT
VACUTAINER Brand Blood
Collection Tubes with Hemogard™
Closure
DESIGNERS
Chris Dufresne, Eric Frankel, Nick
Grippi
DESIGN FIRM
Becton Dickinson VACUTAINER
SYSTEMS
CLIENT/MFR
Becton Dickinson VACUTAINER
SYSTEMS
AWARD
Bronze 1990

The novel closure for VACUTAINER Brand Collection Tubes provides a protective barrier between the user and the blood specimen. The rubber stopper that seals the tube is covered by a plastic shield.

