

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE**

A. 510(k) Number:

K033471

B. Analyte:

Activated Partial Thromboplastin Time

C. Type of Test:

Qualitative, partial thromboplastin time

D. Applicant:

R2 Diagnostics, Inc.

E. Proprietary and Established Names:

Phospholin ES and Calcium Chloride

F. Regulatory Information:

1. Regulation section:
21 CFR 864.7925
2. Classification:
Class II
3. Product Code:
GGW
4. Panel:
Hematology (81)

G. Intended Use:

1. Intended Use:
Phospholin ES APTT reagent is an ellagic acid based reagent with soybean phospholipids, buffers, stabilizers and preservatives. Phospholin ES is intended for use as an activated partial thromboplastin time (APTT) reagent. The APTT test is a qualitative assay used in the routine coagulation screening of patient plasma to detect deficiencies in the intrinsic pathway. It is also used to monitor heparin therapy and in the detection of Lupus Anticoagulants. Phospholin ES APTT reagent should be used in an approved clinical setting by trained and qualified laboratory personnel.
2. Indication for use:
The Phospholin ES Activated Partial Thromboplastin Time reagent is a liquid activated reagent with phospholipids derived from soybean lecithin for use in the determination of activated partial thromboplastin time (APTT) and related coagulation procedures. Phospholin ES is to be used as an APTT reagent (qualitative assay) on patient plasma for the routine screening in the general

patient population for deficiencies involving the intrinsic pathway of coagulation. Phospholin ES is sensitive to lupus-like inhibitors.

3. Special condition for use statement(s):
Not applicable
4. Special instrument Requirements:
Not applicable

H. Device Description:

The Phospholin ES Activated Partial Thromboplastin Time reagent is a liquid activated reagent with phospholipids derived from soybean lecithin. The reagent also contains buffer, stabilizers, and preservatives.

I. Substantial Equivalence Information:

1. Predicate device name(s):
Dade Behring Actin FSL
2. Predicate K number(s):
K863594
3. Comparison with predicate:

Similarities		
Item	Device	Predicate
	<i>Phospholin ES</i>	<i>Actin FSL</i>
Intended Use	APTT reagent with increased sensitivity to lupus anticoagulants	same
Performance	Normal range: Photo-optical: 23.3-36.4 Mechanical; 27.1-3 36.5 Total precision: %CV <3% Lupus sensitivity: yes Interference substances; Hemolyzed, Lipemic, icteric	Normal range: Photo optical 24.8-32.4 Mechanical 27.7-3 34.1 Total precision: same Lupus sensitivity: yes Interference substances: same
Differences		
Item	Device	Predicate
Materials	Activator: ellagic acid Phospholipid: Soy	Activator: ellagic acid Phospholipid: soy, rabbit brain

J. Standard/Guidance Document Referenced (if applicable):

EP9-A2 *Method Comparison and Bias Estimation Using Patient Samples*, Approved Standard-Second Edition, NCCLS

EP15A *User Demonstration of Performance for Precision and Accuracy*, NCCLS

EP7-P *Interference Testing in Clinical Chemistry*, NCCLS

H47-A *One Stage Prothrombin Time (PT) Test and Activated Partial Activated Thromboplastin (APTT) Test; Approved Guideline*, NCCLS

Exner, T. et al (1991) Guidelines for testing revised criteria for lupus anticoagulation's, SSC Subcommittee for Standardization of Lupus Anticoagulants. *Throb. Heamost.* Mar 4:65(3) 320-322

K. Test Principle:

In the basic screening test, the activated partial thromboplastin time indirectly measures the formation of thrombin by its action on fibrinogen resulting in a fibrin clot. In the test, citrated plasma is mixed with APTT reagent for a specified period of time (3-5minutes) at 37°C followed by the addition of prewarmed (37°C) calcium chloride (0.02-0.025M). The clotting time is initiated by the addition of the calcium chloride and the time required for clot formation is the APTT time. Clot detection can be made by manual, electro-mechanical, or photo-optical measurement.

L. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. *Precision/Reproducibility:*

The within-run precision was measured using three levels of lyophilized control, 10 vials of each control, tested in triplicate.

Photo-optical

Sample	Number	Mean (secs.)	SD	%CV
Normal	30	29.3	0.2	0.8
Mid Range Abnormal	30	61.7	0.4	0.7
High Range Abnormal	30	88.6	0.5	0.6

Mechanical

Sample	Number	Mean (secs.)	SD	%CV
Normal	30	32.7	0.3	0.9
Mid Range Abnormal	30	66.3	0.8	1.2
High Range Abnormal	30	91.5	0.9	1.0

The between-run precision was measured using three levels of lyophilized control, 2 vials of each control, tested in triplicate for 5 days.

Photo-optical

Sample	Number	Mean (secs.)	SD	%CV
Normal	15	30.6	0.68	2.24
Mid Range Abnormal	15	65.2	1.81	2.78
High Range Abnormal	15	91.4	2.61	2.85

Mechanical

Sample	Number	Mean (secs.)	SD	%CV
Normal	15	33.4	0.80	2.4
Mid Range Abnormal	15	66.2	0.50	0.75
High Range Abnormal	15	90.0	1.23	1.37

- b. *Linearity/assay reportable range:*
Not provided
- c. *Traceability (controls, calibrators, or method):*
Not provided
- d. *Detection limit:*
Not provided
- e. *Analytical specificity:*
Data was collected from 10 hemolyzed, 10 Icteric and 10 Lipemic samples run in triplicate and analyzed according to NCCLS EP7-A Approved Guidelines. The results showed possible interference from hemolyzed, icteric and lipemic samples.
- f. *Assay cut-off:*
Not Applicable

2. Comparison studies:

- a. *Method comparison with predicate device:*
Data was collected in triplicate from 140 normal and abnormal samples and analyzed using NCCLS EP9-A2 Approved Guidelines. Linear regression analysis yielded:
 Photo-optical $y=0.864x + 6.8433$ $R=0.92$
 Mechanical $y=1.0929x - 2.8217$ $R=0.93$
- b. *Matrix comparison:*
Not applicable

3. Clinical studies:

- a. *Clinical sensitivity:*
Not Provided
- b. *Clinical specificity:*
Not Provided
- c. *Other clinical supportive data (when a and b are not applicable):*

4. Clinical cut-off:

Not provided

5. Expected values/Reference range:

A reference study was conducted using frozen plasma samples from 40 normal healthy adult males and females. The APTT results were as follows:

	Mean (secs.)	Reference Range
Photo-optical	29.8	23.2-36.4
Mechanical	31.8	27.1-36.5

These values should serve only as guidelines. It is recommended that each laboratory establish its own expected APTT values.

M. Conclusion:

Based on the review of the information provided, Phospholin ES and Calcium Chloride reagent appears to be substantially equivalent (SE) to the other devices regulated under 21 CFR 864.7925, partial thromboplastin time test, product code GGW.