

OCT 29 2009

**510(k) Summary for  
INNOVANCE® D-Dimer Assay**

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

The assigned 510(k) number is:           K091916          

**1. Manufacturer's Name, Address, Telephone, and Contact Person, Date of Preparation:**

Manufacturer: Siemens Healthcare Diagnostics  
Products GmbH  
Emil-von-Behring Str. 76  
D-35001, Marburg Germany

Contact Information: Siemens Healthcare Diagnostics  
Glasgow Site  
P.O. Box 6101  
Newark, Delaware 19714  
Attn: Kathleen Dray-Lyons  
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Preparation date: September 22, 2009

**2. Device Name/ Classification: INNOVANCE® D-Dimer**

**Class:** Fibrinogen and Fibrin Split Product, Antigen, Antiserum  
and controls, Class II  
21 CFR 864.7320  
**Panel:** Hematology (HE)  
**Product Code:** DAP

**3. Identification of the Legally Marketed Device:**

VIDAS® D-Dimer Exclusion™ – k040882

**4. Device Description:**

Polystyrene particles covalently coated with a monoclonal antibody (8D3) are aggregated when mixed with samples containing D-dimer. The D-dimer cross-linkage region has a stereosymmetrical structure, i.e. the epitope for the monoclonal antibody occurs twice. Consequently, one antibody suffices in order to trigger an aggregation reaction, which is then detected turbidimetrically via the increase in turbidity.

**5. Device Intended Use:**

INNOVANCE® D-Dimer:

For the quantitative determination of cross-linked fibrin degradation products (D-dimers) in human plasma on Siemens Healthcare Diagnostics and Sysmex® Coagulation Systems. The INNOVANCE® D-Dimer assay is intended for use in conjunction with a non-high clinical pretest probability (PTP) assessment model to exclude pulmonary embolism (PE) disease and as an aid in the diagnosis of venous thromboembolism (VTE) [deep vein thrombosis (DVT) or pulmonary embolism (PE)].

**6. Medical device to which equivalence is claimed and comparison information:**

The INNOVANCE® D-Dimer is substantially equivalent to the VIDAS® D-Dimer Exclusion™ (k040882) assay. The INNOVANCE® D-Dimer method, like the VIDAS® D-Dimer Exclusion™ method, is intended for use in conjunction with a clinical pretest probability (PTP) assessment model to exclude pulmonary embolism (PE) disease.

**7. Device Performance Characteristics:**

Comparative Method	Slope	Regression Statistics		n
		Intercept (mg/L FEU)	Correlation Coefficient	
VIDAS® D-Dimer Exclusion™	1.11	-0.075	0.96	265

The range of D-dimer values in the correlation studies was 0.17 to 4.17 mg/L FEU.

**Clinical Study Summary**

The INNOVANCE® D-Dimer assay was evaluated on the BCS® / BCS® XP System in a multi-center study to validate the exclusion of PE using fresh specimens collected from 701 consecutive patients presenting to the emergency department with suspected PE. Of these 701 patients, 54 were excluded for a total of 647 patients available for final analysis.

All patients were evaluated using the Wells' rules to estimate a high, moderate or low pre-test probability (PTP) of PE. Patient specimens were tested with the INNOVANCE® D-Dimer assay and results were compared to a cutoff value of 0.5 mg/L (FEU). A D-dimer result <0.5 mg/L (FEU) was considered negative and a D-dimer result ≥0.5 mg/L (FEU) was considered positive.

Patients with a positive D-dimer result and/or a high PTP were evaluated by imaging methods, e.g. spiral CT and/or VQ scan. Patients with a negative D-dimer result and a low or moderate PTP (these patients underwent imaging at the physician's discretion), and patients with negative imaging results, were followed for three months to evaluate potential development of PE.

The overall prevalence of PE in those patients available for final analysis was 13.8% (89/647). The following instrument-specific sensitivity, specificity and negative predictive value (NPV) with upper and lower 95% confidence limits (CL) were obtained with the INNOVANCE® D-Dimer clinical cutoff of 0.5 mg/L (FEU).

**All Patients**

<b>Instrument</b>	<b>PE Patients (n)</b>	<b>Cutoff mg/L FEU</b>	<b>Sensitivity (CL) %</b>	<b>Specificity (CL) %</b>	<b>NPV (CL) %</b>
BCS <sup>®</sup> /BCS <sup>®</sup> XP System	647	0.5	98.9 (93.9 – 100.0)	39.6 (35.5 – 43.8)	99.6 (97.5 – 100.0)

**Patients with low and moderate pre-test probability**

<b>Instrument</b>	<b>PE Patients (n)</b>	<b>Cutoff mg/L FEU</b>	<b>Sensitivity (CL) %</b>	<b>Specificity (CL) %</b>	<b>NPV (CL) %</b>
BCS <sup>®</sup> /BCS <sup>®</sup> XP System	616	0.5	98.6 (92.5 – 100.0)	40.4 (36.3 – 44.7)	99.6 (97.5 – 100.0)

CL = lower and upper 95 % confidence limits



DEPARTMENT OF HEALTH & HUMAN SERVICES

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Siemens Healthcare Diagnostics  
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Manager, Regulatory Affairs  
500 GBC Drive  
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Newark, Delaware 19714

OCT 29 2009

Re: k091916

Trade/Device Name: INNOVANCE<sup>®</sup> D-Dimer  
Regulation Number: 21 CFR 864.7320  
Regulation Name: Fibrinogen/fibrin degradation product assays  
Regulatory Class: Class II  
Product Code: DAP  
Dated: October 28, 2009  
Received: October 29, 2009

Dear Ms. Dray-Lyons:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice

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requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm> for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address <http://www.fda.gov/cdrh/industry/support/index.html>.

Sincerely yours,



Maria M. Chan, Ph.D  
Director  
Division of Immunology and Hematology Devices  
Office of *In Vitro* Diagnostic Device Evaluation and Safety  
Center for Devices and Radiological Health

Enclosure

