

AFIAS

D-Dimer Neo

INTENDED USE

AFIAS D-Dimer Neo is a fluorescence immunoassay (FIA) for the quantitative determination of D-Dimer in human whole blood/plasma. It is useful as an aid in management and monitoring of therapeutic evaluation of thromboembolic disease patients.

For *in vitro* diagnostic use only.

INTRODUCTION

D-dimer, a degradation product of cross-linked fibrin formed during activation of the coagulation system, is commonly used to exclude thromboembolic disease in outpatients suspected of having deep venous thrombosis (DVT) and pulmonary embolism (PE).^[1] DVT and PE is relatively common and can cause sudden, fatal embolic events in the pulmonary arteries and other regions.^[2-3]

Measurement of the D-Dimer level in plasma has been used as a screening strategy for subclinical DVT. A systematic review reported that a normal range of a highly sensitive D-dimer level accurately ruled out DVT in patients classified as having a low or moderate clinical probability of DVT. The DVT is a high-risk factor for the stroke because of advanced age, hemiplegia, and coagulation disorders, and DVT can cause paradoxical embolic stroke via a right-to-left shunt. Thus, it is important to monitor the level of D-Dimer the incidence and characteristics of DVT in acute stroke patients.^[4-7] The Plasma D-dimer level has proven to be useful for DVT screening in chronic stroke patients undergoing rehabilitation.^[8-10] National and international scientific organizations have suggested the use of these markers when implementing new diagnostic strategies in patients with coronary syndrome. Since D-Dimer is well known to be an important prognostic indicator of heart diseases, its most definitive role is on monitoring post-treatment clinical status and the post therapeutic evaluation of patients.

PRINCIPLE

The test uses a sandwich immunodetection method.

The detector antibodies in buffer binds to antigen in the sample, forming antigen-antibody complexes, and migrates onto nitrocellulose matrix to be captured by the other immobilized-antibodies on a test strip.

More antigens in the sample will form more antigen-antibody complexes which lead to stronger fluorescence signal by detector antibodies, which is processed by the instrument for AFIAS tests to show D-Dimer concentration in the sample.

COMPONENTS

AFIAS D-Dimer Neo consists of 'cartridges'.

- Each sealed aluminum pouch contains two cartridges.
- Each cartridge packaged in an aluminum pouch has three components including a cartridge part, a detector part and a diluent part.

- The cartridge part contains the membrane called a test strip which has anti human D-Dimer at the test line and streptavidin at the control line.
- The detector part contains anti human D-Dimer-fluorescence conjugate, biotin-BSA-fluorescence conjugate, bovine serum albumin (BSA) as a stabilizer and sodium azide as a preservative in phosphate buffered saline (PBS).
- The diluent part contains tween 20 and sodium azide as a preservative in phosphate buffered saline (PBS).

WARNINGS AND PRECAUTIONS

- For *in vitro* diagnostic use only.
- Follow instructions and procedures described in this 'Instructions for use'.
- Use only fresh samples and avoid direct sunlight.
- Lot numbers of all the test components (cartridge and ID chip) must match each other.
- Do not interchange the test components between different lots or use the test components after the expiration date, either of which might yield incorrect test result(s).
- Do not reuse cartridges. A cartridge should be used for testing one sample only.
- The cartridge should remain sealed in its original pouch until just before use. Do not use the cartridge if pouch is damaged or has already been opened.
- Do not keep the sample in a freezer, which could affect the test value of D-Dimer.
- Frozen sample should be thawed only once. For shipping, samples must be packed in accordance with local regulations. Sample with severe hemolysis and/or hyperlipidemia must not be used.
- If test components and/or sample are stored in refrigerator, then allow cartridge and sample to be at room temperature for approximately 30 minutes before use.
- The instrument for AFIAS tests may generate slight vibration during use.
- Used cartridges and pipette tips should be handled carefully and discarded by an appropriate method in accordance with relevant local regulations.
- The cartridge contains sodium azide (NaN₃), and they may cause certain health issues like convulsions, low blood pressure and heart rate, loss of consciousness, lung injury and respiratory failure. Avoid contact with skin, eyes, and clothing. In case of contact, rinse immediately with running water.
- No Biotin interference was observed in **AFIAS D-Dimer Neo** when biotin concentration in the sample was below 250 ng/mL. If a patient has been taking biotin at dosage of more than 0.03 mg a day, it is recommended to test again 24 hours after discontinuation of biotin intake.
- AFIAS D-Dimer Neo** will provide accurate and reliable results subject to the below conditions.
 - **AFIAS D-Dimer Neo** should be used only in conjunction with the instrument for AFIAS tests.
 - Have to use recommended anticoagulant.

Recommended anticoagulant

Sodium citrate

LIMITATIONS OF THE TEST SYSTEM

- The test may yield false positive result(s) due to the cross-reactions and/or non-specific adhesion of certain sample components to the capture/detector antibodies.
- The test may yield false negative result(s) due to the non-responsiveness of the antigen to the antibodies which is the most common if the epitope is masked by some unknown components, so therefore not being able to be detected or captured by the antibodies. The instability or degradation of the antigen with time and/or temperature may also cause false negative result as it makes antigen unrecognizable by the antigens
- Other factors may interfere with the test and cause erroneous results, such as technical/procedural errors, degradation of the test components/reagents or presence of interfering substances in the test samples.
- Any clinical diagnosis based on the test result must be supported by a comprehensive judgment of the concerned physician in conjunction with clinical symptoms and other relevant test results.

STORAGE AND STABILITY

Storage condition			
Component	Storage Temperature	Shelf life	Note
Cartridge	2 - 30 °C	20 months	Unopened
		1 month	Resealed

- Return an unused cartridge to the spare cartridge zipper bag containing the desiccant pack. Reseal along entire edge of zip-seal.

MATERIALS SUPPLIED

REF SMFP-129

Components of **AFIAS D-Dimer Neo**

- Cartridge box:
 - Cartridge 24
 - Pipette tip (zipper bag) 24
 - Spare cartridge zipper bag 1
 - ID chip 1
 - Instructions for use 1

MATERIALS REQUIRED BUT SUPPLIED ON DEMAND

Following items can be purchased separately from **AFIAS D-Dimer Neo**.

Please contact our sales division for more information.

- Instrument for AFIAS tests
 - **AFIAS-1** REF FPRR019
 - **AFIAS-3** REF FPRR040
 - **AFIAS-6** REF FPRR020
 - **AFIAS-10** REF FPRR038
- Boditech D-Dimer Control** REF CFPO-101
- Boditech D-Dimer Calibrator** REF CFPO-113

SAMPLE COLLECTION AND PROCESSING

The sample type for **AFIAS D-Dimer Neo** is human whole blood/plasma.

- It is recommended to test the sample within 24 hours after collection.

- The plasma should be separated from the clot by centrifugation within 3 hours after the collection of whole blood.
- If testing will be delayed more than 24 hours, the plasma should be frozen at -20 °C. The plasma stored frozen at -20 °C for 3 months showed no performance difference.
- However, the whole blood sample should not be kept in a freezer in any case.
- As a repeated freeze-thaw cycle may affect the test result, do not refreeze previously frozen samples.

TEST SETUP

- Check the components of the **AFIAS D-Dimer Neo** as described below: Cartridges, pipette tips, an ID chip, a spare cartridge zipper bag and an instructions for use.
- If the sealed cartridge has been stored in a refrigerator, place them on a clean and flat surface at room temperature for at least 30 minutes before testing.
- Turn on the instrument for AFIAS tests.
- Empty the tip box.
- Insert the ID chip into the "ID chip port".

✗ Please refer to the instrument for AFIAS tests operation manual for complete information and operating instructions.

TEST PROCEDURE

▶ AFIAS-1, AFIAS-3, AFIAS-6

- Insert the cartridge into the cartridge holder
- Insert a tip into the tip hole of the cartridge.
- Select the 'General mode' in the instrument for AFIAS tests.
- Take 100 µL of the sample (whole blood/plasma/control) using a pipette and dispense it into the sample well of the cartridge.
- Tap the 'Start' button on the screen.
- The test result will be displayed on the screen after 12 minutes.

▶ AFIAS-10

Normal mode

- Insert a cartridge into the cartridge holder.
- Insert a tip into the tip hole of the cartridge.
- Tap the "Load" button of the bay that holds the cartridge with the tip to read the barcode of the cartridge and please confirm the item name written on the cartridge.
- Insert the sample tube into the tube rack.
- Insert the tube rack into the loading part of the sampling station.
- Tap the 'Start' button on the screen.
- The test result will be displayed on the screen after 12 minutes.

Emergency mode

- The test procedure is same with the "Normal mode 1) – 3)".
- Convert the 'Emergency mode' in AFIAS-10.
- Select the tip type (general tip) on the screen.
- Select the sample type (whole blood/serum/plasma) on the screen.
- Take 100 µL of the sample with a pipette and dispense it into the sample well of the cartridge.
- Tap the 'Start' button on the screen.
- The test result will be displayed on the screen after 12 minutes.

INTERPRETATION OF TEST RESULT

- The instrument for AFIAS tests calculate the test result automatically and displays D-Dimer concentration of the test sample in terms of ng/mL (FEU, Fibrinogen equivalent units).
- Cut-off (reference value): 500 ng/mL
- Working range: 50 - 10,000 ng/mL
- Unit Conversion: DDU x 2 = FEU
 ex) 1 ng/mL (DDU) = 2 ng/mL (FEU)

QUALITY CONTROL

- Quality control tests are a part of the good testing practice to confirm the expected results and validity of the assay and should be performed at regular intervals.
- Quality control tests should also be performed whenever there is any question concerning the validity of the test results.
- Control materials are provided on demand with **AFIAS D-Dimer Neo**. For more information regarding obtaining the control materials, contact [Boditech Med Inc.'s Sales Division for assistance](#).
 (Please refer to the instructions for use of control material.)

PERFORMANCE CHARACTERISTICS

- Analytical sensitivity**
 - Limit of Blank (LoB) 8.23 ng/mL
 - Limit of Detection (LoD) 17.5 ng/mL
 - Limit of Quantitation (LoQ) 50.0 ng/mL

- Analytical Specificity**

Cross-reactivity
 Biomolecules such as below the ones in the table were added to the test sample(s) at concentrations much higher than their normal physiological levels in the blood. **AFIAS D-Dimer Neo** test results did not show any significant cross-reactivity with these biomolecules.

Cross reactivity substance	Concentration
Fibrinogen	10 g/L
Troponin Complex	1,000 ng/ml
CK-MB	1,000 ng/ml
NT-proBNP	100 ng/ml
Myoglobin	3,000 ng/ml

- Interference**

Interferent such as below the ones in the table were added to the test sample(s) the same as the below concentrations. **AFIAS D-Dimer Neo** test results did not show any significant interference with these materials.

Interferent	Concentration
Bilirubin (unconjugated)	700 µmol/L
Cholesterol	13 mmol/L
D-Glucose	55 mmol/L
Hemoglobin	10 g/L
Ascorbic acid	300 µmol/L
Triglyceride, total	37 mmol/L
Sodium citrate	2 mg/mL
Biotin	250 ng/mL

- Precision**

- Single-site study**

Three lots of **AFIAS D-Dimer Neo** was tested for 20 days at one site by one person. Each standard material was tested 2 runs per day. For each test, each standard material was tested in duplicate. (20 x 2 x 2)

D-Dimer [ng/mL]	Repeatability				Within-laboratory precision			
	N	Mean [ng/mL]	SD	CV (%)	N	Mean [ng/mL]	SD	CV (%)
400	40	378.88	23.33	6.2	80	381.17	25.03	6.6
1600	40	1542.28	77.57	5.0	80	1545.56	84.18	5.4
5000	40	4809.80	252.65	5.3	80	4836.66	254.16	5.3

D-Dimer [ng/mL]	Lot to Lot precision			
	N	Mean [ng/mL]	SD	CV (%)
400	240	385.64	21.54	5.6
1600	240	1533.36	84.80	5.5
5000	240	4845.10	253.24	5.2

- Multi-site study**

One lot of **AFIAS D-Dimer Neo** was tested for 5 days at three sites (each site by one tester person, one analyzer). Each standard material was tested in 5 replicates per day. (3 x 5 x 5 x 1)

D-Dimer [ng/mL]	Reproducibility			
	N	Mean [ng/mL]	SD	CV (%)
400	75	393.84	19.44	4.9
1600	75	1603.59	85.65	5.3
5000	75	5009.30	298.37	6.0

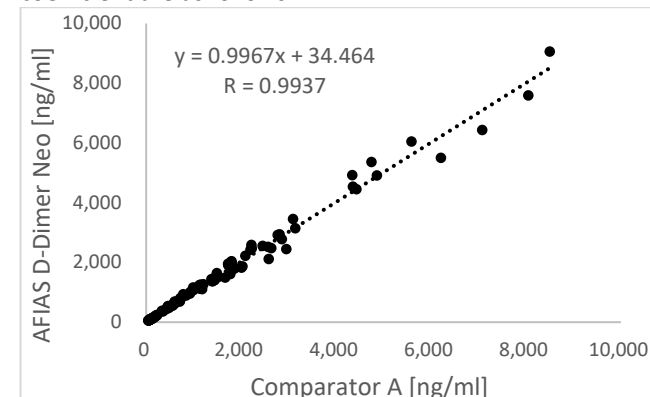
- Accuracy**

The accuracy was confirmed by testing with 3 different lots of **AFIAS D-Dimer Neo**. The tests were repeated 10 times at each concentration of the control standard.

D-Dimer [ng/mL]	Lot 1	Lot 2	Lot 3	AVG	Recovery (%)
5000	5134.53	5278.38	5095.18	5169.36	103.4
3850	3947.43	4003.08	3843.07	3934.23	102.2
1933	1985.22	1991.22	1999.34	1992.21	103.0
1320	1337.34	1383.60	1292.41	1340.15	101.5
860	891.77	877.39	854.34	876.60	101.9
400	408.67	427.93	410.01	416.24	104.1

- Comparability**

D-Dimer concentration of 100 clinical samples were quantified independently with **AFIAS D-Dimer Neo (AFIAS-6)** and **comparator A** as per prescribed test procedures. Test results were compared, and their comparability was investigated with linear regression and correlation coefficient (R). The regression equation and correlation coefficient are as follows.



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Note: Please refer to the table below to identify various symbols.

	Sufficient for <n> tests
	Read instruction for use
	Use by Date
	Batch code
	Catalog number
	Caution
	Manufacturer
	Authorized representative of the European Community
	In vitro diagnostic medical device
	Temperature limit
	Do not reuse
	This product fulfills the requirements of the Directive 98/79/EC on in vitro diagnostic medical devices

For technical assistance, please contact:

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