

WHO Prequalification of In Vitro Diagnostics Programme PUBLIC REPORT

Product: SD BIOLINE HIV-1/2 3.0
Number: PQDx 0027-012-00

Abstract

SD BIOLINE HIV-1/2 3.0 with product codes **03FK10** and **03FK16**, manufactured by **Standard Diagnostics, Inc.**, “rest of the world” regulatory version was accepted for the WHO list of prequalified in vitro diagnostics and was listed on 20 May 2013. This public report was amended on 24 May 2017 to reflect addition of a new product code **03FK17**.

Intended use:

SD BIOLINE HIV 1/2 3.0 kit is a rapid, qualitative test for the detection of antibodies to certain isotypes (IgG, IgM, IgA) specific to HIV-1 including subtype-O and HIV-2 simultaneously in human serum, plasma or whole blood.

Assay description:

SD BIOLINE HIV-1/2 3.0 contains a membrane strip, which is pre-coated with recombinant HIV-1 capture antigen (gp41, p24) on test line “1” region and with recombinant HIV-2 capture antigen (gp36) on test line “2” region, respectively. The mixture (recombinant HIV-1/2 antigen (gp41, p24 and gp36) - colloid gold conjugate and the specimen moves upward on the membrane chromatographically to the test region (T) and form a visible line as the antigen antibody-antigen gold particle complex forms with high degree of sensitivity and specificity. This test device has the letter of 1, 2 and C as Test Line 1 (HIV-1), Test Line 2 (HIV-2) and Control Line on the surface of the device. All test lines and the control line in the result window should not be visible before applying any sample. The control line is used as a procedural control for the addition of reagents and may still appear if no specimen is added to the test device.

SD BIOLINE HIV-1/2 3.0 is intended as an aid in the diagnosis of infection with HIV-1/2.

Test kit contents:

	30T/kit (product code 03FK10)	25T/kit (product code 03FK16)	25T/kit (product code 03FK17)
Test cassettes individually packed in foil pouch with a desiccant	30 test devices	25 test devices	25 test devices

Assay diluent dispensed in plastic bottle	1 x 4ml/bottle	1 x 4ml/bottle	1 x 4ml/bottle
Specimen transfer devices Disposable (20µl)	N/A	25 units of 20 µl	25 units of 20 µl
Lancets Disposable, sterilized	N/A	25 units	25 units (safety lancet)
Alcohol swabs Disposable	N/A	25 units	25 units
Instructions for use	1 copy	1 copy	1 copy

Storage:

The test kit should be stored at 1 - 30 °C.

Shelf-life:

24 months.

Warnings/limitations:

1. The reading time for this product was changed, the revised instructions for use now state: "Time to result is 10 to 20 minutes. After adding the diluent, read the result after 10 minutes but not more than 20 minutes."
2. If the test result is not legible after 10 minutes due to high background colour, read again later but within 20 minutes of adding the diluent. Do not read after 20 minutes.
3. Dual infection of HIV-1 and HIV-2 within one individual is quite rare. Dual reactivity observed in SD BIOLINE HIV-1/2 3.0, i.e. HIV-1 line and HIV-2 line both reactive, is more likely to be caused by cross-reactivity given certain homology in the amino acid sequences of HIV-1 and HIV-2. To determine the virus type or diagnose a co-infection, confirmatory testing must be performed.

Summary of prequalification status for SD BIOLINE HIV-1/2 3.0

	Initial acceptance	
	Date	Outcome
PQ status amended	24 May 2017	
Status on PQ list	20 May 2013	listed
Dossier assessment	11 August 2011	MR
Inspection status	19 February 2013	MR
Laboratory evaluation	05 April 2013	MR

MR: Meets Requirements

NA: Not Applicable

Prioritization for prequalification

Based the established prioritization criteria, SD BIOLINE HIV-1/2 3.0 was given priority for prequalification.

Product dossier assessment

Standard Diagnostics, Inc. submitted a product dossier for SD BIOLINE HIV-1/2 3.0 as per the “Instructions for compilation of a product dossier” (PQDx_018 v1). The information submitted in the product dossier was reviewed by WHO staff and external experts (assessors) appointed by WHO.

The manufacturer’s response to the nonconformities found during the dossier assessment were accepted on 23 November 2011.

Commitments for prequalification:

1. Analytical performance studies
2. Clinical performance studies
3. Stability studies
4. A new version of the labels and instructions for use.

Based on the product dossier assessment findings, the product dossier for SD BIOLINE HIV-1/2 3.0 meets WHO prequalification requirements.

Manufacturing site inspection

A comprehensive second re-inspection was performed at the sites of the legal manufacturer of SD BIOLINE HIV 1/2 3.0 at 156-68 Hagal-dong Giheung-gu, Yongin-si, Kyonggi-do 446-930, Republic of Korea and 473-4 Bora-dong Giheung-gu, Yongin-si, Kyonggi-do, 446-904, Republic of Korea in November 2012¹, as per “Information for manufacturers on prequalification inspection procedures for the sites of manufacture of diagnostics.” (PQDx_014 v1).

Note: the inspection team were not able to review the batch manufacturing records of the lots submitted for the repeat WHO laboratory evaluation for the SD BIOLINE HIV 1/2 3.0. The lots for retesting had not been requested at the time of the inspection (November 2012) and were submitted subsequent to the inspection.

The manufacturer's responses to the nonconformities found at the time of the inspection were accepted 19 February 2013.

Commitments for prequalification:

¹ A subsequent inspection took place at Production: 65, Borahagal-ro, Giheung-gu, Yongin-si, Gyeonggi-do 17099 Republic of Korea and 46, Hagalro 15 beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do 17099 Republic of Korea and Warehouse: 19-22, Dongtansandan 3-gil, Dongtan-myeon, Hwaseong-si, Gyeonggi-do 18487, Republic of Korea on 6 to 8 May 2015.

1. The manufacturer has committed to continuing improvements in the quality management system particularly in the areas of clear lines of authority, identification and traceability, warehousing and clarity of work instructions and batch manufacturing records.
2. The manufacturer has committed to continuing close supervision of the lot release procedures together with ongoing communication over time to finalize any outstanding issues noted in the WHO responses to the inspection findings.

Based on the site inspection and corrective action plan review, the quality management system for SD BIOLINE HIV-1/2 3.0 meets WHO prequalification requirements

Laboratory evaluation

SD BIOLINE HIV-1/2 3.0 was evaluated by WHO in the last quarter of 2012 using serum/plasma specimens. From this evaluation, we drew the following conclusions:

SD BIOLINE HIV-1/2 3.0 is a lateral flow immunochromatographic assay for the discriminatory detection HIV-1 and HIV-2 antibodies in human serum/plasma and whole blood. A volume of 10µL of serum/plasma or 20µl of whole blood is required to perform the assay. This type of assay requires no sophisticated equipment and can therefore be performed in laboratories with limited facilities and non-laboratory settings. Reading of the results is performed visually i.e. subjectively read.

In this limited evaluation on a panel of 1118 clinically-derived specimens, we found an initial sensitivity (95% CI) of 99.8% (98.8% - 100%) and an initial specificity (95% CI) of 99.9% (99.2% - 100%) compared to the reference assays. The final sensitivity (95% CI) was 100% (99.2% - 100%) and the final specificity (95% CI) was 99.9% (99.2% - 100%) compared to the reference assays. Lot to lot variation observed was within the acceptance criteria.

SD BIOLINE HIV-1/2 3.0 was unable to discriminate between HIV-1 and HIV-2 for seven HIV-2 specimens, and 22 HIV-1 specimens (6.3% of 460 HIV positive specimens), as two test bands of equal intensity were observed.

For eight seroconversion panels, SD BIOLINE HIV-1/2 3.0 detected on average 0.125 specimens later than the benchmark assay (Enzygnost Anti-HIV 1/2 Plus [Siemens Healthcare Diagnostics]).

For the mixed titer panel, SD BIOLINE HIV-1/2 3.0 correctly classified all specimens. For the 1st International Reference Panel for anti-HIV [NIBSC code 02/210], SD BIOLINE HIV-1/2 3.0 detected all HIV-1 subtypes tested (HIV-1 A, HIV-1 B, HIV-C, HIV-1 CRF01_AE, and HIV-2).

In this study, 0% of the results were recorded as indeterminate. Results were interpreted independently by three technicians; the overall inter-reader variability was 1.9% (0.2% for HIV-1 band, 1.8% for HIV-2 band). The invalid rate was 0%.

Change notification

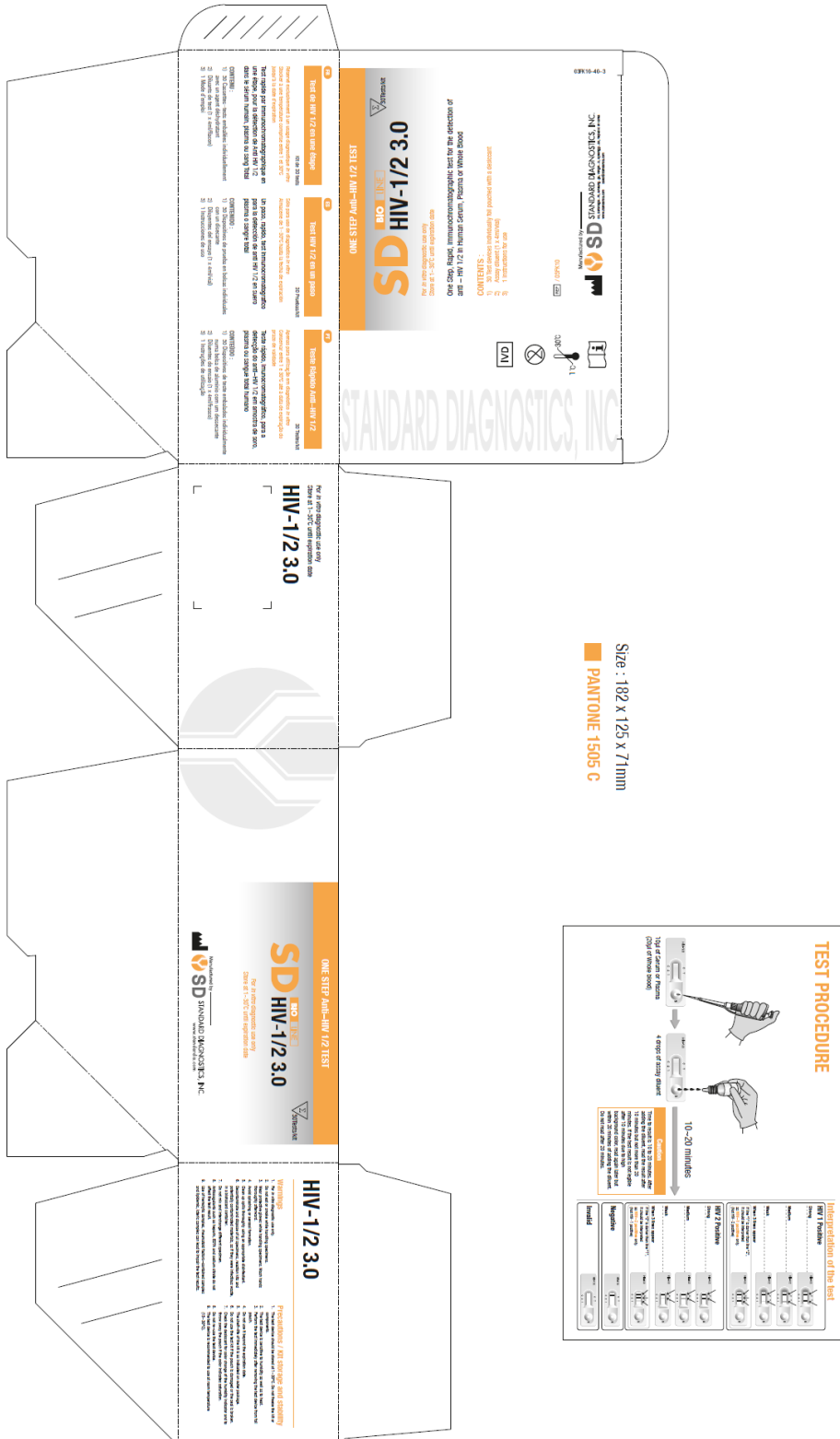
In 2016, Standard Diagnostics, Inc., submitted a change notifications related to addition of a new product code that includes safety lancets. This change notification was assessed and was found to meet WHO prequalification requirements.

Labelling

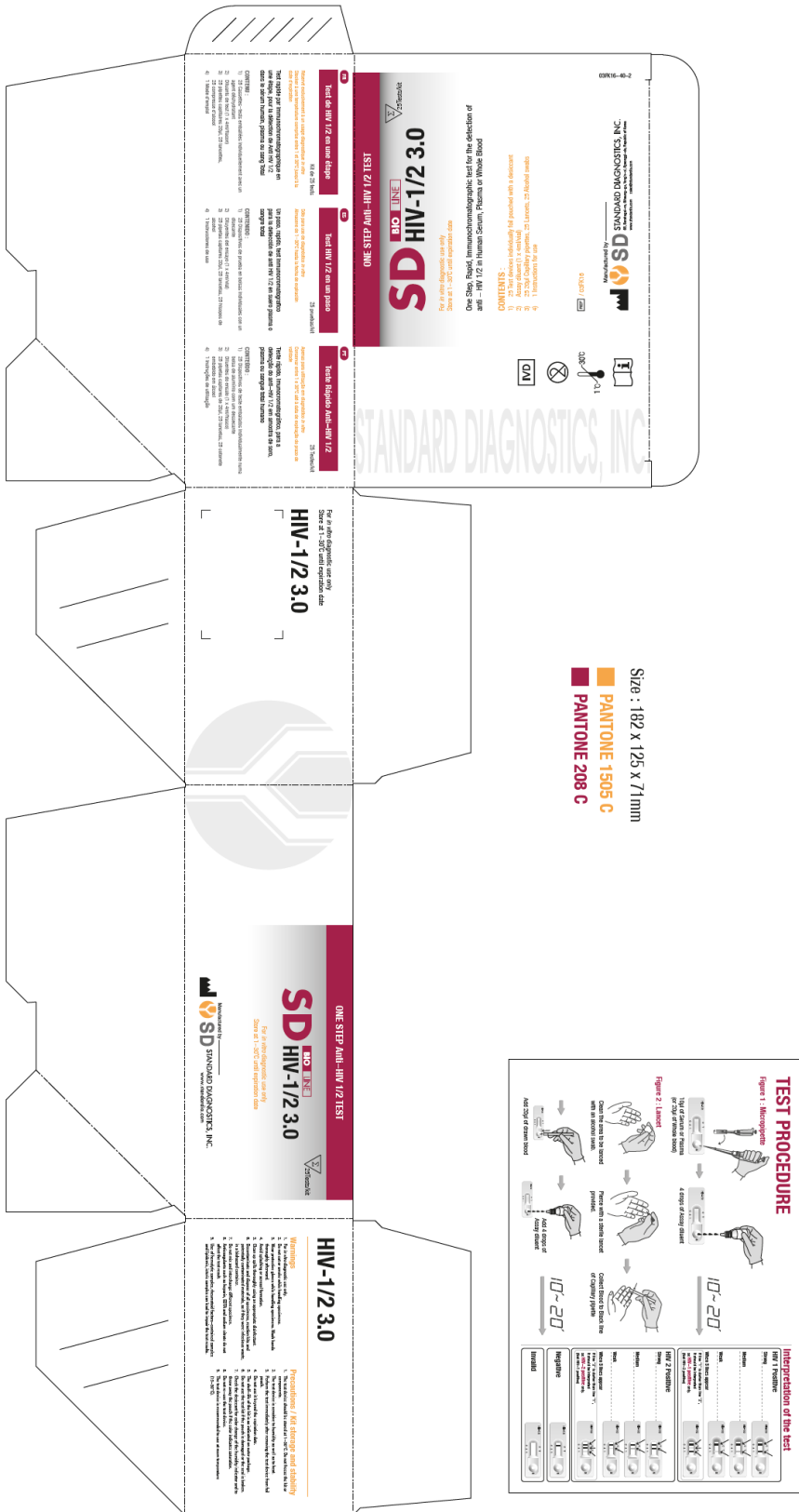
- 1. Labels**
- 2. Instructions for use**

1. Labels

1.1 Package box for 03FK10



1.2 Package box for 03FK16



1.3 Package box for 03FK17

2. Instructions for use

2.1 IFU for 03FK10 and 03FK16

The 3rd Generation of ONE STEP™ antibodies to HIV-1/HIV-2 Test

SD HIV-1/2 3.0

(OBRF10, OBRF16)

Test Procedure

Procédure du test rapide

Procedimiento de Prueba Rápida

Procedimento de teste rápido

1. **1** New, open the package and look for the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
2. **2** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
3. **3** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



- Including only for Cat. No. OBRF16/16, compris seulement pour Cat. No. OBRF16, incluído sólo para o Cat. No. OBRF16
1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

4. **4** Open the package and look for the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
5. **5** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



6. **6** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

7. **7** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
8. **8** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



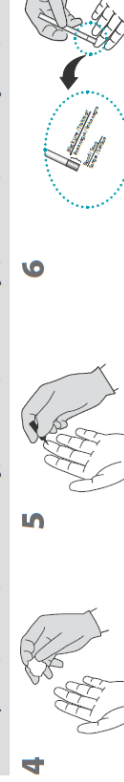
9. **9** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

I. Blood (by venipuncture), Plasma or Serum specimen / Echantillon de sang (par ponction veineuse), de sérum, ou de plasma / Muestra de sangre (por punción venosa), Plasma o suero / Sangue (por venipunctão), plasma ou soro

4. **4** Wash hands with soap and water.



5. **5** Add 4 drops of blood to the sample well.



6. **6** Wait 10 minutes for the result.



7. **7** Interpret the result.

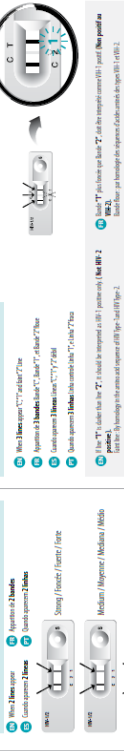


II. Blood specimen (with a lancet) / Echantillon de sang (avec la lancette) / Muestra de sangre total (con lanceta)

4. **4** Wash hands with soap and water.



5. **5** Add 4 drops of blood to the sample well.



6. **6** Wait 10 minutes for the result.



7. **7** Interpret the result.



8. **8** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
9. **9** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



10. **10** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

11. **11** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
12. **12** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



13. **13** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

14. **14** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
15. **15** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



16. **16** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

17. **17** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
18. **18** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



19. **19** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

20. **20** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
21. **21** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein



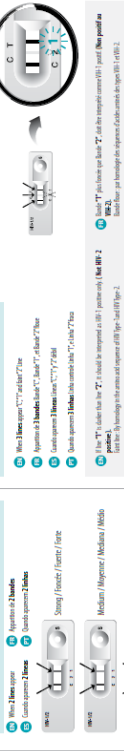
22. **22** Also check the following:
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein
 1. 2x Anticardiac protein

Interpretation / Interpretación / Interpretação

1. **1** Positive result: Two lines appear in the result window.



2. **2** Negative result: No lines appear in the result window.



3. **3** Invalid result: One line appears in the result window.



4. **4** Invalid result: No lines appear in the result window.



5. **5** Invalid result: One line appears in the result window.



6. **6** Invalid result: No lines appear in the result window.

7. **7** Invalid result: One line appears in the result window.



8. **8** Invalid result: No lines appear in the result window.

9. **9** Invalid result: One line appears in the result window.



10. **10** Invalid result: No lines appear in the result window.

2.2 IFU for 03FK17

The 3rd Generation of ONE STEP antibodies to HIV-1/2 Test

SD HIV-1/2 3.0 (03FK17)

Test HIV 1/2 en un paso
Test de HIV 1/2 en una etapa
Teste Rapido Anti-HIV 1/2

English

4. Mantener todo el material dentro de sus envoltorios estériles, hasta el momento de su uso. No utilizar material que haya sido manipulado o que haya estado en contacto con el suero de un paciente. No utilizar material que se haya almacenado a temperatura ambiente por más de 24 horas. No utilizar material que se haya almacenado a temperatura ambiente por más de 24 horas. No utilizar material que se haya almacenado a temperatura ambiente por más de 24 horas.

Interpretación de los resultados (Ver la figura)

1. Línea roja en la zona de control (C) y una línea roja en la zona de prueba (T): resultado positivo. Se debe repetir el ensayo con un suero nuevo para confirmar el resultado.

Material Provided

1. 100 pruebas individuales para el ensayo rápido. Cada prueba incluye: 1.1. Una tira de ensayo rápida. 1.2. Una tira de ensayo rápida con el suero de control.

Precauciones / All storage and stability

1. El material de prueba debe almacenarse a temperatura ambiente (15-30°C) hasta el momento de su uso.

Warnings

1. No utilizar el material de prueba si el envoltorio está dañado o si el material ha sido manipulado.

Interventions of the test

1. Aplicar 2 gotas de suero de muestra a la zona de prueba (T) y 2 gotas de suero de control a la zona de control (C).

Interventions of the test (Vigilance)

1. Evitar el contacto directo con la muestra de sangre.

Performance characteristics

1. Sensitivity: 99.9%. 2. Specificity: 99.9%. 3. Reproducibility: 99.9%. 4. Accuracy: 99.9%.

Especificidad (%)	SD HIV-1/2 3.0 (03FK17)		Total HIV-1/2
	Negativa	Positiva	
99.9	337	511	848
Especificidad (95% CI)		99.9 (99.8 - 100.0)	

Principe du test

1. Ce test rapide est un test sérologique basé sur la capture de anticorps anti-HIV-1/2.

Interpretation des résultats (Voir l'illustration)

1. Une bande rouge dans la zone de contrôle (C) et une bande rouge dans la zone de test (T) : résultat positif. Le test doit être répété avec un nouveau sérum pour confirmer le résultat.

Matériel fourni

1. 100 tests individuels pour le test rapide. Chaque test comprend : 1.1. Une bande de test rapide. 1.2. Une bande de test rapide avec le sérum de contrôle.

Précautions / Conservation et stabilité de la bande

1. Le matériel de test doit être conservé à température ambiante (15-30°C) jusqu'à son utilisation.

Alertes

1. Ne pas utiliser le matériel de test si l'emballage est endommagé ou si le matériel a été manipulé.

Précautions / All storage and stability

1. Le matériel de test doit être conservé à température ambiante (15-30°C) jusqu'à son utilisation.

Warnings

1. Ne pas utiliser le matériel de test si l'emballage est endommagé ou si le matériel a été manipulé.

Interventions of the test (Vigilance)

1. Éviter le contact direct avec l'échantillon de sang.

Caractéristiques des performances

1. Sensibilité : 99,9%. 2. Spécificité : 99,9%. 3. Répétabilité : 99,9%. 4. Précision : 99,9%.

Especificidad (%)	SD HIV-1/2 3.0 (03FK17)		Total HIV-1/2
	Negativa	Positiva	
99.9	337	511	848
Especificidad (95% CI)		99.9 (99.8 - 100.0)	

Explicación de los resultados

1. Una línea roja en la zona de control (C) y una línea roja en la zona de prueba (T): resultado positivo. Se debe repetir el ensayo con un suero nuevo para confirmar el resultado.

Interpretación de los resultados (Consulte la figura)

1. Línea roja en la zona de control (C) y una línea roja en la zona de prueba (T): resultado positivo. Se debe repetir el ensayo con un suero nuevo para confirmar el resultado.

Material suministrado

1. 100 pruebas individuales para el ensayo rápido. Cada prueba incluye: 1.1. Una tira de ensayo rápida. 1.2. Una tira de ensayo rápida con el suero de control.

Precauciones / Conservación y estabilidad de la banda

1. El material de prueba debe almacenarse a temperatura ambiente (15-30°C) hasta el momento de su uso.

Advertencias

1. No utilizar el material de prueba si el envoltorio está dañado o si el material ha sido manipulado.

Intervenciones de la prueba

1. Aplicar 2 gotas de suero de muestra a la zona de prueba (T) y 2 gotas de suero de control a la zona de control (C).

Características de desempeño

1. Sensibilidad: 99.9%. 2. Especificidad: 99.9%. 3. Repetibilidad: 99.9%. 4. Precisión: 99.9%.

Especificidad (%)	SD HIV-1/2 3.0 (03FK17)		Total HIV-1/2
	Negativa	Positiva	
99.9	337	511	848
Especificidad (95% CI)		99.9 (99.8 - 100.0)	

Explicação de resultados

1. Uma linha vermelha na zona de controlo (C) e uma linha vermelha na zona de teste (T): resultado positivo. Deve repetir o teste com um soro novo para confirmar o resultado.

Interpretação dos resultados (Ver a figura)

1. Linha vermelha na zona de controlo (C) e uma linha vermelha na zona de teste (T): resultado positivo. Deve repetir o teste com um soro novo para confirmar o resultado.

Material fornecido

1. 100 testes individuais para o teste rápido. Cada teste inclui: 1.1. Uma tira de teste rápido. 1.2. Uma tira de teste rápido com o soro de controlo.

Precações / Conservação e estabilidade da faixa

1. O material de teste deve ser armazenado à temperatura ambiente (15-30°C) até ao momento do uso.

Alertas

1. Não utilizar o material de teste se o envoltório estiver danificado ou se o material tiver sido manipulado.

Intervenções da prova

1. Aplicar 2 gotas de soro de amostra na zona de teste (T) e 2 gotas de soro de controlo na zona de controlo (C).

Características de desempenho

1. Sensibilidade: 99.9%. 2. Especificidade: 99.9%. 3. Repetibilidade: 99.9%. 4. Precisão: 99.9%.

Especificidad (%)	SD HIV-1/2 3.0 (03FK17)		Total HIV-1/2
	Negativa	Positiva	
99.9	337	511	848
Especificidad (95% CI)		99.9 (99.8 - 100.0)	

3. Este ensayo requiere capacitación.

Características de desempeño

1. Sensibilidad: 99.9%. 2. Especificidad: 99.9%. 3. Repetibilidad: 99.9%. 4. Precisión: 99.9%.

Intervenciones de la prueba (Vigilancia)

1. Evitar el contacto directo con la muestra de sangre.

Características de desempeño

1. Sensibilidad: 99.9%. 2. Especificidad: 99.9%. 3. Repetibilidad: 99.9%. 4. Precisión: 99.9%.

Intervenciones de la prueba

1. Aplicar 2 gotas de suero de muestra a la zona de prueba (T) y 2 gotas de suero de control a la zona de control (C).

Características de desempeño

1. Sensibilidad: 99.9%. 2. Especificidad: 99.9%. 3. Repetibilidad: 99.9%. 4. Precisión: 99.9%.

Intervenciones de la prueba (Vigilancia)

1. Evitar el contacto directo con la muestra de sangre.

Especificidad (%)	SD HIV-1/2 3.0 (03FK17)		Total HIV-1/2
	Negativa	Positiva	
99.9	337	511	848
Especificidad (95% CI)		99.9 (99.8 - 100.0)	

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Bibliografía de referencias (Bibliography of references)

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