THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH

TANZANIA MEDICINES AND MEDICAL DEVICES AUTHORITY

PUBLIC ASSESSMENT REPORT FOR KAS HEPATITIS C (HCV) RAPID TEST

Version number 0.1, 29/03/2024

TMDA Headquarters, Plot No. 56/1, Block E, Kisasa B Centre, Hombolo Road, P. O. Box 1253, Dodoma – Tanzania, Telephone: +255 (26) 2961989/2061990/+255 (22) 2450512/2450751/2452108, Email: info@tmda.go.tz, Website: **www.tmda.go.tz**

Toll free: 0800110084

1. Introduction

KAS HEPATITIS C (HCV) Rapid Test is a class D in-vitro diagnostic device belonging to the microbiology specialty category. KAS HEPATITIS C (HCV) Rapid Test is approved in Tanzania as a kit by healthcare professionals.

1.1. Administrative Information

Registration number	TAN 23 MDR 0118
Brand (if relevant)	KAS HEPATITIS C (HCV) Rapid Test
Common name	Hepatitis C (HCV) Rapid Test
Class of the device and rule applied	Class D according to classification rule 1 for Classification Rules for In Vitro Diagnostic Devices
GMDN code and term	30829 Hepatitis C virus total antibody IVD, kit, rapid ICT, Clinical
Name and complete address of the Market Authorization Holder	Kas Biotech Limited, Gf 09, Plot No. 11, Umoja Complex, Vingunguti, Area Along Nyerere Road, P.O BOX 7856, Dar Es Salaam, Tanzania. Contact person: Jaykumar Kamli Email: kasregulatory2@artemislife.com,
Name and address(es) of local responsible person (LRP).	Kas Biotech Limited, Gf 09, Plot No. 11, Umoja Complex, Vingunguti, Area Along Nyerere Road, P.O BOX 7856, Dar Es Salaam, Tanzania. Contact person: Jaykumar Kamli Email: kasregulatory2@artemislife.com,

1.2. Assessment Procedure

The application for registration of KAS HEPATITIS C (HCV) Rapid Test was submitted on 13/07/2022. The product underwent full registration procedure assessment. Assessment was completed in 3 rounds of evaluation. KAS HEPATITIS C (HCV) Rapid Test was registered on 13/07/2023.

2. Technical information

2.1. Intended use

The intended use of KAS HEPATITIS C (HCV) Rapid Test as declared by the manufacturer and approved by TMDA for detection of antibodies to Hepatitis C Virus in human serum or plasma. KAS HEPATITIS C (HCV) Rapid Test is approved for use in healthcare settings by trained professionals only.

2.2. Device details and features

KAS HEPATITIS C (HCV) Rapid Test has been registered as a kit which consists of Test strip, desiccant, aluminum pouch, buffer solution, swabs, lancet and specimen transfer device.

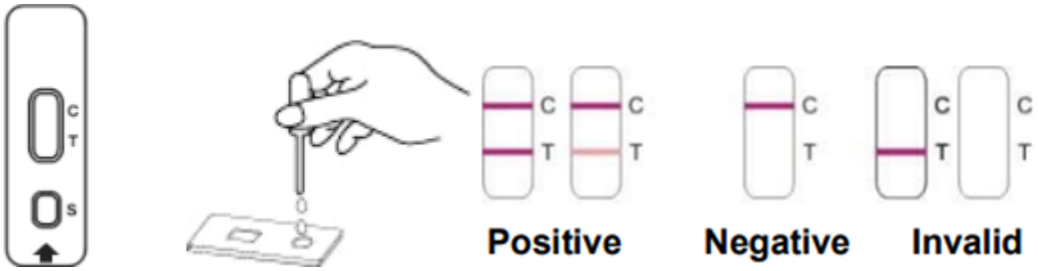
KAS HEPATITIS C (HCV) Rapid Test is an in vitro diagnostic device. It is used for aiding diagnosis and screening of Hepatitis C. KAS HEPATITIS C (HCV) Rapid Test operates by the principle of the double antigen-sandwich technique. The test out-put is qualitative.

The type of specimen used is whole blood, serum or plasma and is collected by venous blood collection and capillary blood specimen collection.

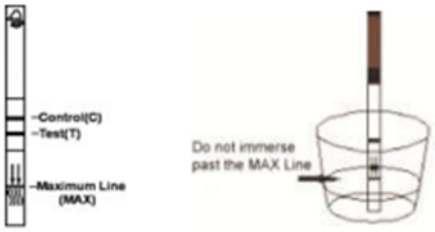
Device description
The test cassette/strip contains a membrane strip coated with recombinant HCV antigen on the test line, a rabbit antibody on the control line, and a dye pad which contains colloidal gold coupled with recombinant HCV antigen. The quantity of tests was printed on the labeling.

Pictorial diagram

For Cassette



For strips



2.3. Commercial presentation

There is 1 approved commercial presentation as follows:1 test cassette with desiccant in an aluminium pouch. 25 sealed aluminium pouches are placed in a carton box.

Additional contents include
a) Package insert
b) 25 Specimen transfer device (dropper)

2.4. Items required but not submitted

a) Specimen collection container
b) Timer

3. Storage instructions

3.1.1. Shelf-life

The approved shelf-life is 24 months.

3.1.2. Storage conditions

The recommended storage conditions are 4-30℃ or 40- 86℉
3.1.3. Shipping conditions

The recommended shipping conditions is 45℃

4. Manufacturing site audit

The manufacturer of the device is Kas Biotech Limited 09, Plot No. 11, Umoja Complex, Vingunguti, Area Along Nyerere Road, P.O BOX 7856, Dar Es Salaam, Tanzania.

Quality audit of the manufacturing facility was conducted through site visit on 17/01/2024. The site was found to be compliant to ISO 13485 requirements.

5. Performance Evaluation

5.1. Analytical Performance

The analytical performance characteristics of the device was established through the following test parameters:(repeatability and reproducibility), analytical sensitivity, analytical specificity.

5.2. Clinical Performance

Clinical performance was conducted at Muhimbili National Hospital Central Pathology P.O Box 65000; Dar es Salaam. Telephone: +**255-22-2151367-9**; Email: info@mnh.or.tz, The following parameters were tested specificity and sensitivity.

Based on results of the performance studies conducted at the Muhimbili National Hospital, it was concluded that the test sensitivity and specificity is 98% and 100% respectively. The studies further concluded that KAS HEPATITIS C (HCV) Rapid Test is capable of consistently producing accurate and reliable test output.

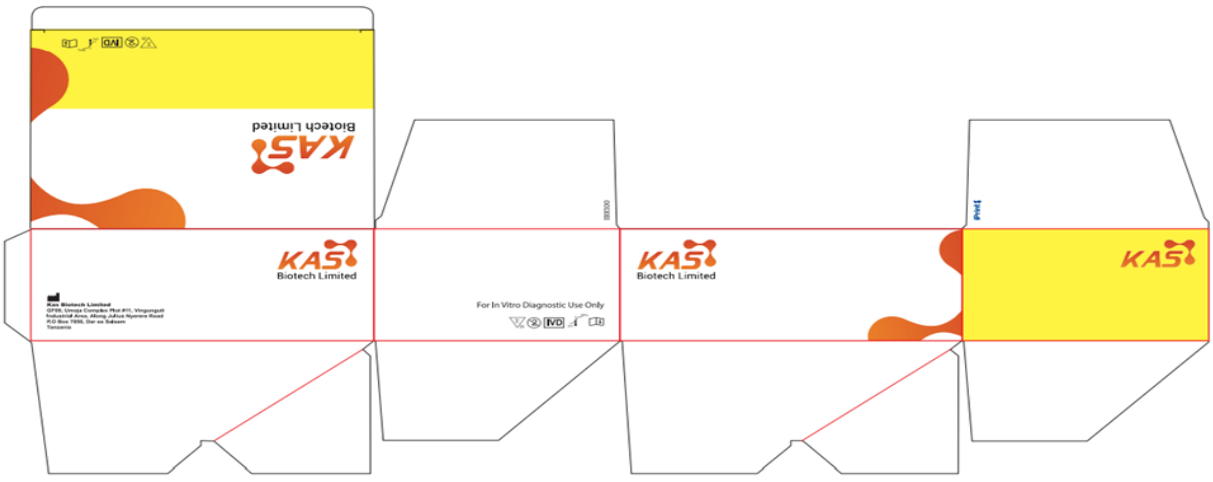
6. Product label and instructions for use

The content of the primary and secondary labels is in line with TMDA labeling requirements in terms of content, layout, and design. The label contains sufficient information for proper identification of the device and post marketing follow up of the product.

The *instructions for use* include all the relevant information to ensure correct and safe use of the device by *healthcare provide.*

6.1. Primary pack

6.2. Secondary pack



6.3 Instructions for use/Package insert

Instructions for use can be accessed by clicking at KAS HEPATITIS C (HCV) Rapid Test Instruction for use link.

7. Risk – Benefit Analysis

On basis of the data submitted, the current state of knowledge and compliance of the manufacturer to ISO 13485, the benefit of the product outweighs the risks associated with its use when used in accordance to the manufacturer's instruction. KAS HEPATITIS C (HCV) Rapid Test was recommended for registration.

8. Post-approval updates

8.1. Variation applications

Reference number	Date submitted	Change requested	Recommendation	Granting date
NA	NA	NA	NA	NA

8.2. Feedback from pharmacovigilance, post marketing surveillance and enforcement activities

Type of feedback	Impact	Response
No any recorded Adverse Event	NA	NA

8.3. Re-registration applications

NA

CHANGE HISTORY

Version number	Date	Description of update	Section(s) Modified	Approval date

KAS Biotech Limited **HCV Rapid Test Cassette/Strip (S/P)**

English

For professional and in vitro diagnostic use only.

[INTENDED USE]

The HCV Rapid Test Cassette/Strip is a lateral flow chromatographic immunoassay for the qualitative detection of antibodies to Hepatitis C Virus in human serum or plasma. It provides an aid in the diagnosis of infection with Hepatitis C Virus.

[SUMMARY]

Hepatitis C virus (HCV) is a single stranded RNA virus of the Flaviviridae family and is the causative agent of Hepatitis C. Hepatitis C is a chronic disease affecting approximately 130-170 million people worldwide. According to the WHO, annually, more than 350,000 people die from hepatitis C-related liver diseases and 3-4 million people are infected with HCV. Approximately 3% of the world's population is estimated to be infected with HCV. More than 80% of HCV-infected individuals develop chronic liver diseases, 20-30% develop cirrhosis after 20-30 yr, and 1-4% die from cirrhosis or liver cancer. Individuals infected with HCV produce antibodies to the virus and the presence of these antibodies in the blood indicates present or past infection with HCV.
Conventional methods fail to isolate the virus in cell culture or visualize it by electron microscope. Cloning the viral genome has made it possible to develop serologic assays that use recombinant antigens. Compared to the first generation HCV EIAs using single recombinant antigen, multiple antigens using recombinant protein and/or synthetic peptides have been added in new serologic tests to avoid nonspecific cross-reactivity and to increase the sensitivity of the HCV antibody tests. The HCV Rapid Test Cassette/Strip detects antibodies to HCV infection in human serum or plasma. The test utilizes a combination of protein A coated particles and recombinant HCV proteins to selectively detect antibodies to HCV. The recombinant HCV proteins used in the test are encoded by the genes for both structural (nucleocapsid) and non-structural proteins.

[PRINCIPLE]

The HCV Rapid Test Cassette/Strip is an immunoassay based on the principle of the double antigen-sandwich technique. During testing, a serum or plasma specimen migrates upward by capillary action. The antibodies to HCV if present in the specimen will bind to the HCV conjugates. The immune complex is then captured on the membrane by the pre-coated recombinant HCV antigens, and a visible colored line will show up in the test line region indicating a positive result. If antibodies to HCV are not present or are present below the detectable level, a colored line will not form in the test line region indicating a negative result.
To serve as a procedural control, a colored line will always appear at the control line region, indicating that proper volume of specimen has been added and membrane wicking has occurred.

[WARNINGS AND PRECAUTIONS]

- For in vitro diagnostic use only.
- For healthcare professionals and professionals at point of care sites.
- Do not use after the expiration date.
- Please read all the information in this leaflet before performing the test.
- The test cassette/strip should remain in the sealed pouch until use.
- All specimens should be considered potentially hazardous and handled in the same manner as an infectious agent.
- The used test cassette/strip should be discarded according to federal, state and local regulations.

[COMPOSITION]

The test cassette/strip contains a membrane strip coated with recombinant HCV antigen on the test line, a rabbit antibody on the control line, and a dye pad which contains colloidal gold coupled with recombinant HCV antigen. The quantity of tests was printed on the labeling.

Materials Provided

•Test cassette/strip •Package insert

Materials Required But Not Provided

•Specimen collection container •Timer

[STORAGE AND STABILITY]

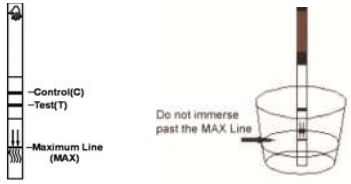
- Store as packaged in the sealed pouch at temperature (4-30℃ or 40-86℉). The kit is stable within the expiration date printed on the labeling.
- Once open the pouch, the test should be used within one hour. Prolonged exposure to hot and humid environment will cause product deterioration.
- The LOT and the expiration date were printed on the labeling.

[SPECIMEN]

- The test can be used to test serum or plasma specimens.
- Collect blood specimen (containing EDTA, citrate or heparin) by vein puncture following standard laboratory procedures.
- Separate the serum or plasma as soon as possible by centrifugation after collecting.
- Store specimens at 2-8℃ (36-46℉) if not tested immediately. Store specimens at 2-8℃ up to 7 days. The specimens should be frozen at -20℃ (-4℉) for longer storage.
- Avoid multiple freeze-thaw cycles. Prior to testing, bring frozen specimens to room temperature slowly and mix gently. Specimens containing visible particulate matter should be clarified by centrifugation before testing.
- Do not use samples demonstrating gross lipemia, gross hemolysis or turbidity in order to avoid interference on result interpretation.

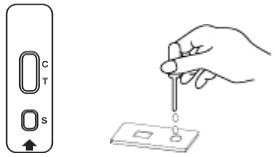
[TEST PROCEDURE]

Allow the test device and specimens to equilibrate to temperature (15-30℃or 59-86℉) prior to testing.
[For Strip]
1. Remove the test strip from the sealed pouch and use it as soon as possible.
2. Immerse the strip vertically into the specimen with the arrow end pointing towards the specimen. Do not immerse the strip past the Max Line. See the illustration below.
3. Remove the strip after 10 seconds and lay the strip flat on a clean, dry, non-absorbent surface, and then begin timing.
4. Wait for colored lines to appear. Interpret the test results in 15 minutes. Do not read results after 20 minutes.



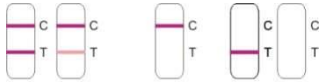
(The picture is for reference only, please refer to the material object.)

[For Cassette]
1. Remove the test cassette from the sealed pouch.
2. Hold the dropper vertically and transfer 3 full drops (approx. 100μl) of specimen to the "S" well of the test cassette, and then begin timing. See the illustration below.
3. Wait for colored lines to appear. Interpret the test results in 15 minutes. Do not read results after 20 minutes.



(The picture is for reference only, please refer to the material object.)

[INTERPRETATION OF RESULTS]



Positive Negative Invalid

(The picture is for reference only, please refer to the material object.)
Positive:*Two lines appear. One colored line should be in the control region (C), and another apparent colored line adjacent should be in the test region (T). This positive result indicates the presence of antibodies to HCV.
Negative: One colored line appears in the control region (C). No line appears in the test region (T). This negative result indicates the absence of antibodies to HCV.
Invalid: Control line fails to appear. Insufficient specimen volume or incorrect procedural techniques are the most likely reasons for control line failure. Review the procedure and repeat the test using a new test cassette/strip. If the problem persists, discontinue using the lot immediately and contact your local distributor.

[QUALITY CONTROL]

A procedural control is included in the test. A colored line appearing in the control region (C) is considered an internal procedural control. It confirms sufficient specimen volume, adequate membrane wicking and correct procedural technique.
Control standards are not supplied with this kit. However, it is recommended that positive and negative controls be tested as good laboratory practice to confirm the test procedure and to verify proper test performance.

[LIMITATIONS]

- The HCV Rapid Test Cassette/Strip is limited to provide a qualitative detection. The intensity of the test line does not necessarily correlate to the concentration of the antibody in the blood.
- The results obtained from this test are intended to be an aid in diagnosis only. Each physician must interpret the results in conjunction with the patient's history, physical findings, and other diagnostic procedures.
- A negative test result indicates that antibodies to HCV are either not present or at levels undetectable by the test.

[PERFORMANCE CHARACTERISTICS]

Accuracy

Agreement with Commercial HCV Rapid Test

A side-by-side comparison was conducted using the HCV Rapid Test and commercially available HCV rapid tests. 1035 clinical specimens from three hospitals were evaluated with the HCV Rapid Test and the commercial kit.

The specimens were checked with RIBA to confirm the presence of HCV antibody in the specimens. The following results are tabulated from these clinical studies:

		Commercial HCV Rapid Test		Total
		Positive	Negative	
	Positive	314	0	314
	Negative	0	721	721
Total		314	721	1035

The agreement between these two devices is 100% for positive specimens, and 100% for negative specimens. This study demonstrated that the HCV Rapid Test is substantially equivalent to the commercial device.

Agreement with RIBA

300 clinical serum or plasma specimens were evaluated with the HCV Rapid Test and the Anti-HCV RIBA kit. The following results are tabulated from these clinical studies:

		RIBA		Total
		Positive	Negative	
	Positive	98	0	98
	Negative	2	200	202
Total		100	200	300

A statistical comparison was made between the results yielding a clinical sensitivity of 98%, a clinical specificity of 100% and an accuracy of 99.3%.

Cross-Reactivity and Interference

1. Other common causative agents of infectious diseases were evaluated for cross reactivity with the test. Some positive serum specimens of other common infectious diseases were spiked into the HCV positive and negative specimens and tested separately. None of the causative agents affected the test results.

Analytes	Specimens	
	Positive	Negative
HIV positive	+	-
HAV positive	+	-
HBsAg positive	+	-
HEV positive	+	-
HGV positive	+	-
TP-Ab positive	+	-
HP positive	+	-
RF positive	+	-
SLE positive	+	-

2. Potentially cross-reactive endogenous substances including common serum components, such as lipids, hemoglobin, bilirubin, were spiked at high concentrations into the HCV positive and negative specimens and tested, separately. No cross reactivity or interference was observed to the device.

Analytes	Conc.	Specimens	
		Positive	Negative
Albumin	20mg/ml	+	-
Bilirubin	20µg/ml	+	-
Hemoglobin	15mg/ml	+	-
Glucose	20mg/ml	+	-
Uric Acid	200µg/ml	+	-
Lipids	20mg/ml	+	-

3. Some other common biological analytes were spiked into the HCV positive and negative specimens and tested separately. No significant interference was observed at the levels listed in the table below.

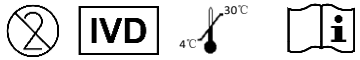
Analytes	Conc. (µg/ml)	Specimens	
		Positive	Negative
Acetaminophen	200	+	-
Acetoacetic Acid	200	+	-
Acetylsalicylic Acid	200	+	-
Ampicillin	200	+	-
Ascorbic Acid	200	+	-
Atropine	200	+	-
Benzoylecgonine	100	+	-
Caffeine	200	+	-
EDTA	800	+	-
Ethanol	1.0%	+	-
Gentisic Acid	200	+	-
β - Hydroxybutyrate	20,000	+	-
Methanol	10.0%	+	-
Phenothiazine	200	+	-
Phenylpropanolamine	200	+	-
Salicylic Acid	200	+	-
Tetracycline	200	+	-

Reproducibility

Reproducibility studies were performed for the HCV Rapid Test at three physician office laboratories (POL). Sixty (60) clinical serum specimens, 20 negative, 20 nos. of borderline positive and 20 positive, were used in this study. Each specimen was run in triplicate for three days at each POL. The intra-assay agreements were 99.4% at two sites, and 100% at one site. The inter-site agreement was 99.6%.

[Bibliography]

1. Hepatitis C. Fact sheet No. 164. World Health Organization. http://www.who.int/mediacentre/factsheets/fs164/en/index.html. (Update on Jun 2011).
2. Lauer GM, Walker BD. Hepatitis C virus infection. N Engl J Med, 2001, 345: 41-52.
3. Choo, Q.L., G. Kuo, A.J. Weiner, L.R. Overby, D.W. Bradley, and M. Houghton. Isolation of a cDNA clone derived from a blood-borne non-A, non-B viral hepatitis genome. Science 1989: 244:359.
4. Kuo, G., Q.L. Choo, H.J. Alter, and M. Houghton. An assay for circulating antibodies to a major etiologic Virus of human non-A, non-B hepatitis. Science 1989: 244:362.
5. Van der poel, C. L., H.T.M. Cuypers, H.W. Reesink, and P.N.Lelie. Confirmation of hepatitis C Virus infection by new four-antigen recombinant immunoblot assay. Lancet 1991; 337:317.
6. Wilber, J.C. Development and use of laboratory tests for hepatitis C infection: a review. J. Clin. Immunoassay 1993; 16:204.



Index of Symbol

Do not reuse

IVD For in vitro diagnostic use only

Store between 4-30℃

Consult instructions for use

Caution

LOT Lot number

Use by

Contains sufficient for <n> tests

Keep away from sunlight

Keep dry

Manufacturer

Do not use if package is damaged

Version No.: 00

Kas Biotech Limited
Plot# 11, GF09, Umoja Complex,
Vinguguti Industrial Area,
P.O Box 7856
Dar Es Salaam, Tanzania