VIDAS® HBs Ag Ultra (HBS)

IVD

VIDAS HBs Ag Ultra (HBS) is an automated qualitative test for use on the VIDAS family instruments for the detection of hepatitis B surface antigen (HBs Ag) in human serum or plasma, using the ELFA technique (Enzyme Linked Fluorescent Assay).

SUMMARY AND EXPLANATION

The hepatitis B virus is responsible for acute and chronic hepatitis infections. Acute hepatitis can be asymptomatic or present symptoms of varying severity which may progress to fulminant hepatitis in 0.1 to 0.5% of cases. Chronicity occurs in 5 to 10% of cases in adults, but up to 90% of cases in infants following perinatal transmission. Currently, approximately 350 million people worldwide are chronic carriers of the virus (1). Chronic hepatitis may be asymptomatic and lead to liver lesions of varying severity, possibly evolving to cirrhosis, with an evolution in 5% of cases to hepatocellular carcinoma (2). The hepatitis B virus can be transmitted by parenteral or perinatal pathways or through sexual contact. Persons most at risk are health workers, drug addicts, those with multiple sexual partners, multiple transfusion or hemodialysis patients, as well as close friends and family of an infected subject, and newborns of an infected mother (2).

The discovery of the Australia antigen in 1965 – later known as HBs antigen - combined with viral hepatitis (3, 4) was a major breakthrough in the diagnosis of hepatitis B.

HBs antigen appears several days to several weeks after contact with the virus and can persist for several months. Persistence of HBs antigen for more than 6 months serologically defines chronic HBV infection. Disappearance of the HBs antigen is normally followed by the appearance of anti-HBs antibodies, which is a sign of recovery. The anti-HBs antibody assay is performed to confirm efficacy of the HBV vaccine. Anti-HBc antibodies are normally detected at the onset of the disease (2). Anti-HBc IgM titers are elevated (> 100 UPEI/ml) during acute hepatitis, then their titer decreases or disappears. However, during chronic hepatitis, the appearance of low IgM titers, reflecting hepatic cytolysis, confirms the active phase of the disease (5). Total anti-HBc antibodies, mainly IgG, are detected during acute and chronic hepatitis and persist after recovery.

HBe antigen is a circulating protein with a sequence very similar to that of HBc antigen, but with distinct antigenicity. During acute or chronic hepatitis, the presence of HBe antigen is generally associated with intense viral replication. Its disappearance coincides with the appearance of anti-HBe antibodies. Anti-HBe seroconversion is generally an indicator of a favorable prognosis of recovery (6). Nevertheless, the possible selection of a mutant strain incapable of synthesizing Hbe antigen may also lead to anti-HBe seroconversion, thereby limiting the prognostic value of HBe and anti-HBe markers (7). In this case, only the viral DNA assay is capable of directly detecting viral replication.

PRINCIPLE

The VIDAS HBs Ag test is an enzyme-linked fluorescent immunoassay (ELFA) that is performed in the automated VIDAS system (see User's Manual). This assay can be performed according to 2 protocols: HBL long protocol (90 minutes), HBS short protocol (60 minutes).

The Solid Phase Receptacle (SPR®) serves as the solid phase as well as the pipetting device for the assay. Reagents for the assay are ready to use and pre-dispensed in the sealed reagent strips.

All of the assay steps are performed automatically by the instrument. The reaction medium is cycled in and out of the SPR several times.

After a preliminary washing step, the antigen present in the sample will bind simultaneously to the monoclonal antibody (8) coating the interior of the SPR and to the antibody conjugated with biotin. Unbound sample components are washed away. The antigen bound to the solid phase and to the biotynilated antibody is in contact with streptavidine conjugated with alkaline phosphatase, which will bind with biotin. Another wash step follows and removes unbound components.

During the final detection step, the substrate (4-Methyl-umbelliferyl phosphate) is cycled in and out of the SPR. The conjugate enzyme catalyzes the hydrolysis of this substrate into a fluorescent product (4-Methyl-umbelliferone), the fluorescence of which is measured at 450 nm. The intensity of the fluorescence is proportional to the concentration of antigen present in the sample.

At the end of the assay, results are analyzed automatically by the instrument and are expressed as an index calculated using a standard.

CONTENT OF THE KIT (60 TESTS) - RECONSTITUTION OF REAGENTS:

60 HBS strips	STR	Ready-to-use.
60 HBS SPRs 2 x 30	SPR®	Ready-to-use. Interior of SPRs coated with two monoclonal anti-HBs Ag antibodies (mouse) (5).
HBS standard 3 x 1 ml (lyophilized)	S1	Serum base* supplemented with inactivated human plasma HBs antigen + preservatives. The standard must be reconstituted with 1 ml of sterile distilled water (measured exactly). Allow to dissolve for at least 20 mins, then mix using a vortex. After reconstitution, the standard must be stored in aliquots at -25 ± 6°C for up to 6 months, by freezing within an hour of reconstitution. Avoid successive freezing and thawing.
HBS positive control 1 x 1.5 ml (liquid)	C1	Ready-to-use. Serum base* supplemented with inactivated human plasma HBs antigen + 1 g/l sodium azide. MLE data indicate the index: confidence interval ("Control C1(+) Test Value Range)
Negative control 1 x 1.9 ml (liquid)	C2	Ready-to-use. Phosphate buffer + protein stabilizer of animal origin+ preservatives.
Specifications for the factory master data required to calibrate the test: • MLE data (Master Lot Entry) provided in the kit, or • MLE bar code printed on the box label.		
1 Package insert provided in the kit or downloadable from www.biomerieux.com/techlib		

* This product has been tested and shown to be negative for HBs antigen, antibodies to HIV1, HIV2 and HCV. However, since no existing test method can totally guarantee their absence, this product must be treated as potentially infectious. Therefore, usual safety procedures should be observed when handling.

The SPR

The interior of the SPR is coated during production with monoclonal anti-HBs Ag antibody (mouse). Each SPR is identified by the HBS code. Only remove the required number of SPRs from the pouch and **carefully reseal the pouch after opening**.

The Reagent Strip

The strip consists of 10 wells covered with a labeled, foil seal. The label comprises a bar code which mainly indicates the assay code, kit lot number and expiration date. The foil of the first well is perforated to facilitate the introduction of the sample. The last well of each strip is a cuvette in which the fluorometric reading is performed. The wells in the center section of the strip contain the various reagents required for the assay.

Description of the HBS strip

Wells	Reagents
1	Sample well.
2	Conjugate: buffer containing goat serum + biotin-labeled polyclonal anti-HBs Ag antibodies (goat) + 1 g/l sodium azide (300 µl).
3 - 4 - 7 - 8 - 9	Wash buffer: buffer containing diethanolamine (DEA*: 0.85 mol/l or 9.1%) + Tween 20 + 1 g/l sodium azide (600 µl).
5	Tracer: alkaline phosphatase-labeled streptavidine + 0.9 g/l sodium azide (400 µl).
6	Prewash solution: TRIS buffer (50 mmol/l) (pH = 7.4) + protein and chemical stabilizers + 1 g/l sodium azide (600 µl).
10	Cuvette with substrate: 4-Methyl-umbelliferyl phosphate (0.6 mmol/l) + DEA** (0.62 mol/l or 6.6%) pH 9.2 + 1 g/l sodium azide (300 µl).

* Signal Word: **DANGER**

Hazard statement

H318 : Causes serious eye damage.
H373 : May cause damage to organs through prolonged or repeated exposure.
H315 : Causes skin irritation.
H302 : Harmful if swallowed.

Precautionary statement

P280 :Wear protective gloves/protective clothing/eye protection/face protection.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P311 : IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

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For further information, refer to the Material Safety Data Sheet.

MATERIALS AND DISPOSABLES REQUIRED BUT NOT PROVIDED

- Pipette with disposable tip to dispense 1 ml and 150 µl.
- Powderless, disposable gloves.
- For other specific materials and disposables, please refer to the Instrument User's Manual.
- VIDAS family instrument.

WARNINGS AND PRECAUTIONS

- **For *in vitro* diagnostic use only.**
- **For professional use only.**
- **This kit contains products of human origin. No known analysis method can totally guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious and handled observing the usual safety precautions (see Laboratory biosafety manual - WHO - Geneva - latest edition).**
- This kit contains products of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not totally guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious and handled observing the usual safety precautions (do not ingest or inhale).
- **Sample to sample contamination through contact with gloves: since high concentrations of HBs Ag may be encountered, it is strongly recommended to keep tips on a stand prior to use. It is also recommended to keep one tube of sample aside for testing HBs antigen.**
- Do not use the SPRs if the pouch is pierced.
- Do not use visibly deteriorated STRs (damaged foil or plastic).
- Do not use reagents after the expiration date indicated on the label.
- Do not mix reagents (or disposables) from different lots.
- Use **powderless** gloves, as powder has been reported to cause false results for certain enzyme immunoassay tests.
- Kit reagents contain sodium azide which can react with lead or copper plumbing to form explosive metal azides. If any liquid containing sodium azide is disposed of in the plumbing system, drains should be flushed with water to avoid build-up.
- The wash buffer (wells 3, 4, 7, 8, 9) contains a harmful agent (diethanolamine). Refer to the hazard statements "H" and the precautionary statements "P" above.
- The optical cuvette with substrate (well 10) contains an irritant agent (diethanolamine). Refer to the hazard statements "H" and the precautionary statements "P" above.
- Spills should be wiped up thoroughly after treatment with liquid detergent or a solution of household bleach containing at least 0.5% sodium hypochlorite. See the User's Manual for cleaning spills on or in the instrument. Do not autoclave solutions containing bleach.
- The instrument should be regularly cleaned and decontaminated (see the User's Manual).

STORAGE CONDITIONS

- Store the VIDAS HBs Ag Ultra kit at 2-8°C.
- **Do not freeze reagents, with the exception of S1 standard after reconstitution.**
- Store all unused reagents at 2-8°C, with the exception of S1 standard which must be kept frozen after reconstitution.
- After opening the kit, check that the SPR pouch is correctly sealed and undamaged. If not, do not use the SPRs.
- **Carefully reseal the pouch with the desiccant inside after use to maintain stability of the SPRs and return the complete kit to 2-8°C.**
- If stored according to the recommended conditions, all components are stable until the expiration date indicated on the label. Refer to the kit composition table for special storage conditions.

SPECIMENS

Specimen type and collection

Use sera (plain tube, tube with separator gel, plain tube with beads) or plasmas collected in lithium heparin.
Serum and plasma should be stored separated from the pellet. Samples containing impurities must be clarified by centrifugation.
The results obtained were not found to be influenced by:
icteric samples (bilirubin concentrations up to 500 µmol/l), hemolyzed samples (hemoglobin concentrations up to 270 µmol/l of monomer) and lipemic samples (up to 30 mg/ml).
Do not inactivate specimens.

Specimen stability

Samples can be stored for 5 days in stoppered tubes at 2-8°C. If longer storage is required, freeze the sera or plasma at -25 ± 6°C. A study performed on samples frozen for 2 months, showed that the quality of results is not affected.

INSTRUCTIONS FOR USE

For complete instructions, see the User's Manual.

Reading Master lot data

Before each new lot of reagents is used, enter the specifications (or factory master data) into the instrument using the master lot entry (MLE) data.

If this operation is not performed **before initiating the tests**, the instrument will not be able to print results.

Note: the master lot data need only be entered once for each lot.

It is possible to enter MLE data **manually or automatically** depending on the instrument (refer to the User's Manual).

Calibration

Calibration, using the standard provided in the kit, must be performed upon receipt of a new lot of reagents after the master lot data have been entered. Calibration should then be performed every 14 days. This operation provides instrument-specific calibration curves and compensates for possible minor variations in assay signal throughout the shelf-life of the kit.
The standard, identified by S1, must be tested **in duplicate** (see User's Manual). The standard value must be within the set RFV "Relative Fluorescence Value" range. If this is not the case, recalibrate.

Procedure

1. **Only remove the required reagents from the refrigerator and allow them to come to room temperature for at least 30 minutes.**
2. Use one "HBS" strip and one "HBS" SPR for each sample, control or standard to be tested. **Make sure the storage pouch has been carefully resealed after the required SPRs have been removed.**
3. The test is identified by the "HBS" code on the instrument, or by the "HBL" code for the long protocol. The standard must be identified by "S1", and tested **in duplicate**. If the positive control is to be tested, it should be identified by "C1". If the negative control needs to be tested, it should be identified by C2.
4. Mix the standard, controls and samples using a vortex-type mixer (for serum or plasma separated from the pellet).
5. **For this test, the calibrator, control, and sample test portion is 150 µl.**
6. Insert the "HBS" SPRs and "HBS" strips into the instrument. Check to make sure the color labels with the assay code on the SPRs and the Reagent Strips match.
7. Initiate the assay as directed in the User's Manual. All the assay steps are performed automatically by the instrument.
8. Reclose the vials and return them to the required temperature after pipetting.
9. The assay will be completed within approximately 60 to 90 minutes, depending on the protocol selected. After the assay is completed, remove the SPRs and strips from the instrument.
10. Dispose of the used SPRs and strips into an appropriate recipient.

RESULTS AND INTERPRETATION

Once the assay is completed, results are analyzed automatically by the computer. Fluorescence is measured twice in the Reagent Strip's reading cuvette for each sample tested. The first reading is a background reading of the substrate cuvette before the SPR is introduced into the substrate. The second reading is taken after incubating the substrate with the enzyme remaining on the interior of the SPR. The RFV (Relative Fluorescence Value) is calculated by subtracting the background reading from the final result. This calculation appears on the result sheet. The patient RFV is interpreted by the VIDAS system as follows:

i = test value = patient RFV / standard RFV

The test value and interpretation are also indicated on the result sheet. Interpretation of results according to test values is as follows:

Test value		
Short protocol	Long protocol	Interpretation
i < 0.13	i < 0.10	Negative
i ≥ 0.13	i ≥ 0.10	Positive

If a positive result is obtained for a patient with no previous history, the assay must be repeated and confirmed using a neutralization test (VIDAS HBs Ag Ultra Confirmation ref. 30 317) or other tests.

A positive sample should be confirmed using the same assay protocol (short or long) as was initially used to test the sample.

Before retesting, samples should be centrifuged again so as to eliminate any interference caused by fibrin fragments or cell elements.

Interpretation of test results should be made taking into consideration the patient history, and the results of any other tests performed.

VIDAS HBs Ag Ultra is calibrated against the panel of the Société Française de Transfusion Sanguine (French Blood Transfusion Society) (adw2/ayw3 mixture expressed in ng/ml).

The analytical sensitivity of VIDAS HBs Ag Ultra, which was determined using this panel, is less than 0.20 ng/ml with the short protocol (HBS), and less than 0.15 ng/ml with the long protocol (HBL).

QUALITY CONTROL

One positive control and one negative control are included in each VIDAS HBs Ag Ultra kit.
These controls must be performed immediately after opening a new kit to ensure that reagent performance has not been altered. Each calibration must also be checked using these controls. The instrument will only be able to check the control values if they are identified by C1 and C2.
Results cannot be validated if the control values deviate from the expected values.

Note
It is the responsibility of the user to perform Quality Control in accordance with any local applicable regulations.

LIMITATIONS OF THE METHOD

- As interference (i.e. anti-idiotype antibody) may be encountered with certain sera, the test should only be declared positive after taking into account the patient's history and the results of the other hepatitis B markers.
- A negative Ag HBs result does not allow infection by the hepatitis B virus to be excluded. The Ag HBs serum concentration may be below the analytical sensitivity of the reagent. The presence of a modified HBs antigen (variant) cannot be excluded; the antigen may, in this case, have been incorrectly recognized or not recognized by the antibodies in the reagent.
  The results of this test must be interpreted taking into consideration the patient's history and the results of any other tests performed (confirmation by neutralization, HBV DNA etc.).
- In rare cases it is possible to detect both HBs antigen and anti-HBs antibodies.
- This assay has been validated for serum and plasma and should not be used for other biological fluids such as saliva, CSF or urine.
- This assay should not be used with specimens collected post-mortem.
- Do not use serum pools.

RANGE OF EXPECTED VALUES (9)

The world wide prevalence of hepatitis B varies depending on the countries:

Region of the world	Prevalence of HBs Ag (%)
Europe, North America, Australia	0.2 - 0.5
Eastern Europe, Mediterranean basin, Russia, southwest Asia, South America	2 - 7
Southeast Asia, tropical Africa	8 - 20

PERFORMANCE

The results of the studies, which demonstrated the conformity of VIDAS HBs Ag Ultra to the Common Technical Specifications of Directive 98/79/EC, are as follows:

1. Specificity for blood donor population
5059 blood donor samples from 2 blood transfusion centers were tested using the short protocol and the long protocol. No discrepancies were observed between the two protocols.

	Final interpretation of other EIA techniques	
VIDAS HBs Ag Ultra (HBS/HBL)	Positive	Negative
Positive	0	0
Negative	0	5059

Relative specificity with VIDAS HBs Ag Ultra for this population: 100.00%
(95% confidence interval: 99.87% - 100.00%.)

2. Clinical specificity

a) for hospitalized patients:

200 samples were tested using the short protocol, the long protocol and another EIA technique. No discrepancies were observed between the two protocols and the technique used as reference.

Relative specificity of VIDAS HBs Ag Ultra, with the two protocols (short and long), for this population: 100.00%.

(95% confidence interval: 98.04% - 100.00%.)

b) for outpatients in a screening center:

100 samples were tested using the short protocol, the long protocol and another EIA technique. No discrepancies were observed between the two protocols and the technique used as reference.

Relative specificity of VIDAS HBs Ag Ultra, with the two protocols (short and long), for this population: 100.00%.

(95% confidence interval: 96.38% - 100.00%.)

3. Analytical sensitivity

An external study performed using the panel of the French Blood Transfusion Society, showed a sensitivity of 0.12 ng/ml with the short protocol (HBS) and 0.08 ng/ml with the long protocol (HBL).

The sensitivity of VIDAS HBs Ag Ultra, determined using the international standard NIBSC 00/588, was estimated at 0.05 IU/ml with the long protocol (HBL) and 0.075 IU/ml with the short protocol (HBS).

4. Diagnostic sensitivity

30 fresh samples with a positive status (collection < 24 hours) were tested and found to be positive using VIDAS HBs Ag Ultra with the short protocol (HBS). 30 fresh samples with a negative status (collection < 24 hours) were tested and found to be negative using VIDAS HBs Ag Ultra with the short protocol (HBS).
31 fresh samples with a positive status (collection < 24 hours) were tested and found to be positive using VIDAS HBs Ag Ultra with the long protocol (HBL). 31 fresh samples with a negative status (collection < 24 hours) were tested and found to be negative using VIDAS HBs Ag Ultra with the long protocol (HBL).

5. Detectability

A study was performed using 506 samples characterized as positive, including 28 subtyped or genotyped samples and 46 samples from patients with acute hepatitis. Detectability with the long protocol (threshold of 0.08 ng/ml) and with the short protocol (threshold of 0.12 ng/ml), is 100.00 %.

(95% confidence interval: 99.22% - 100.00%.).

6. Sensitivity of seroconversion panels

During a study, 32 seroconversion panels were tested using the two VIDAS HBs Ag Ultra protocols.
With the short protocol, HBs Ag was detected earlier by the VIDAS HBs Ag Ultra than with the comparison method in 13 out of 32 seroconversion panels (12 panels one specimen collection earlier, 1 panel two specimen collections earlier). HBs Ag was detected in one panel, one specimen collection later.
With the long protocol, 14 of the 32 panels tested were detected earlier than with the comparison method (9 panels one specimen collection earlier, 5 panels two specimen collections earlier).

7. Sensitivity of HBs Ag mutants

A panel of 27 recombinant proteins imitating the most significant mutations in HBs Ag amino acid sequences and 4 native samples harboring HBs Ag mutants were tested successfully (10).

8. Precision

Intra-assay and inter-assay reproducibility were determined at two sites and calculated according to the recommendations of the NCCLS EP5-T2 document, volume 12-4.

Intra-assay reproducibility

The results are expressed as an index:

		Short protocol		**Long protocol**	
Sample	N	Mean	CV (%)	Mean	CV (%)
Positive	72	3.42	3.41	3.07	2.68
Weak positive	72	0.21	4.98	0.15	3.94
Negative	80	0.01	0.00 *	0.02	0.00 *

* since the index value is too low to be used for the calculation of the CV, only the standard deviation is indicated.

Inter-assay reproducibility

The total precision takes into account all the sources of variability.
The results are expressed as an index:

		Short protocol		**Long protocol**	
Sample	N	Mean	CV (%)	Mean	CV (%)
Positive	72	3.42	11.58	3.07	6.17
Weak positive	72	0.21	12.41	0.15	6.75
Negative	80	0.01	0.01 *	0.02	0.01 *

***** since the index value is too low to be used for the calculation of the CV, only the standard deviation is indicated.

9. Cross-reactivity

367 samples from patients whose physiological status is likely to affect the detection of HBs antigen, were tested using both the short and the long protocols. All the samples were found to be negative with another EIA technique. No discrepancies were observed between the two protocols and the technique used as reference.

	VIDAS HBs Ag Ultra positive samples
HCV +	0/20
EBV +	0/10
HIV +	0/10
CMV IgG +	0/10
HAV IgG +	0/10
HSV +	0/10
Syphilis	0/10
Rubella IgG +	0/10
Toxoplasmosis IgG +	0/10
Rheumatoid factor	0/9
Anti-nuclear antibodies	0/9
Non-viral hepatitis	0/5
Dialysis patients	0/10
Children less than 15 years old	0/10
Vaccinated: Anti-HBs +	0/10
Pregnant women*	0/214**

* including 22 multipara

** including 2 false positive results which were not repeated with the long protocol.

WASTE DISPOSAL

Dispose of used or unused reagents as well as any other contaminated disposable materials following procedures for infectious or potentially infectious products.
It is the responsibility of each laboratory to handle waste and effluents produced according to their type and degree of hazardousness and to treat and dispose of them (or have them treated and disposed of) in accordance with any applicable regulations.

LITERATURE REFERENCES

1. LAVANCHY D., Worldwide epidemiology of HBV infection, disease burden, and vaccine prevention. Journal of Clinical Virology 34 suppl. 1 (2005) S1-S3.
2. HOLLINGER F.B., Hepatitis B virus, in Fields Virology, Third Edition, Lippincott-Raven Publishers, Phildelphia, 1996, 2739-2807.
3. BLUMBERG B.S., ALTER H.J., VISNICH S. JAMA, A "New" Antigen in Leukemia Sera, 1965, 191, 541-546.
4. PRINCE A.M., An antigen detected in blood during the incubation period of serum hepatitis, Proc Natl Acad Sci USA, 1968, 60, 814-821.
5. BRUNETTO, M.R., CERENZIA M.T., OLIVERI F., PIANTONI P., RANDONE A., CALVO P., MANZINI P., ROCCA G., GALLI C. and BONINO F., Monitoring the natural course and response to therapy of chronic hepatitis B with an automated semi-quantitative assay for IgM anti-HBc, Journal of Hepatology, 1993, 19, 431-436.
6. ALDERSHVILE J., FRÖSNER G.G., NEILSEN J.O. et al., Hepatitis B e antigen and antibody measured by radioimmunoassay in acute hepatitis B surface antigen-positive hepatitis, Journal of Infections Diseases, 1980, 141, 293-298.
7. TONG S.T. and TREPO C., The HBe-minus mutants of hepatitis B virus in The Molecular Medicine of Viral Hepatitis, Harrison T.J. and Zuckerman A.J. ed., 1997, 89-104.
8. JOLIVET-REYNAUD. C., LESENECHAL. M., O' DONNELL. B. et al.- Localization of hepatitis B surface antigen epitopes present on variants and specifically recognised by anti-hepatitis B surface antigen monoclonal antibodies - Journal of Medical Virology - 2001, vol. 65, p.241-249.
9. ZUCKERMAN AJ., Hepatitis Viruses. In: Baron S, eds. Medical Microbiology, 4th ed. The University of Texas M Branch at Galveston, 1996: 849-863.
10. WEBER B., VAN DER TAELEM-BRULE N., BERGER N. et al. Evaluation of a new automated assay for hepatitis B surface antigen (HBs Ag) detection VIDAS HBs Ag Ultra, Journal of Virological Methods 135, 2006, 109-117.

INDEX OF SYMBOLS

Symbol	Meaning
REF	Catalog number
IVD	*In Vitro* Diagnostic Medical Device
	Manufacturer
	Temperature limit
	Use by date
LOT	Batch code
	Consult Instructions for Use
	Contains sufficient for <n> tests
	Date of manufacture

WARRANTY

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REVISION HISTORY

Change type categories :

N/A	Not applicable (First publication)
Correction	Correction of documentation anomalies
Technical change	Addition, revision and/or removal of information related to the product
Administrative	Implementation of non-technical changes noticeable to the user

Note: *Minor typographical, grammar, and formatting changes are not included in the revision history.*

Release date	Part Number	Change Type	Change Summary
2015/01	11728I	Administrative	INDEX OF SYMBOLS REVISION HISTORY
		Technical	CONTENT OF THE KIT (60 TESTS) - RECONSTITUTION OF REAGENTS WARNINGS AND PRECAUTIONS INSTRUCTIONS FOR USE
2016/05	11728J	Technical	CONTENT OF THE KIT (60 TESTS) – RECONSTITUTION OF REAGENTS

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