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For Professional Use Only

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP**  
**PCR kit**  
**Instruction Manual**

**AmpliSens<sup>®</sup>**



Ecoli s.r.o., Studenohorska 12  
841 03 Bratislava 47  
Slovak Republic  
Tel.: +421 2 6478 9336  
Fax: +421 2 6478 9040



Federal Budget Institute of  
Science "Central Research  
Institute for Epidemiology"  
3A Novogireevskaya Street  
Moscow 111123 Russia

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## 1. INTENDED USE

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit** is an *in vitro* nucleic acid amplification test for qualitative detection of *Trichomonas vaginalis* DNA in clinical materials (urogenital swabs, urine, and prostate gland secretion) by means of end-point hybridization-fluorescence detection of amplified products.



The results of PCR analysis are taken into account in complex diagnostics of disease.

## 2. PRINCIPLE OF PCR DETECTION

*Trichomonas vaginalis* detection by the polymerase chain reaction (PCR) is based on the amplification of pathogen genome special region using specific primers. In end-point PCR, the amplified product is detected using fluorescent dyes. These dyes are linked to oligonucleotide probes, which bind specifically to the amplified product during thermocycling. A multichannel rotor-type fluorometer is specially designed to detect fluorescence emission from the fluorophores in the reaction mixture after PCR. **Fluorescent End-Point PCR (FEP-PCR)** allows the detection of the accumulating product without re-opening the reaction tubes after the PCR run. **AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit** is a qualitative test that contains the Internal Control (IC). It must be used in the extraction procedure in order to control the extraction of each individual sample and to identify possible reaction inhibition. **AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit** uses “hot-start,” which greatly reduces the frequency of nonspecifically primed reactions. “Hot-start” is guaranteed by separation of nucleotides and Taq-polymerase by using a wax layer. Wax melts and reaction components mix only at 95 °C.

## 3. CONTENT

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit** is produced in 2 forms:

AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit (0.5-ml tubes),

**REF** B6-100-R0,5-FEP-CE.

AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit (0.2-ml tubes),

**REF** B6-100-R0,2-FEP-CE.

AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP PCR kit variant FEP includes:

<b>Reagent</b>	<b>Description</b>	<b>Volume (ml)</b>	<b>Amount</b>
<b>PCR-mix-1-FL <i>Trichomonas vaginalis</i></b> ready-to-use single-dose test tubes ( <i>under wax</i> )	colorless clear liquid	0.01	110 tubes of 0.5 or 0.2 ml
<b>PCR-mix-2-FL-red</b>	red clear liquid	1.1	1 tube
<b>PCR-mix-Background-red*</b>	red clear liquid	0.6	1 tube
<b>Mineral oil for PCR**</b>	colorless viscous liquid	4.0	1 tube
<b>Positive Control complex (C+)</b>	colorless clear liquid	0.2	1 tube
<b>DNA-buffer</b>	colorless clear liquid	0.5	1 tube
<b>Negative Control (C-)**</b>	colorless clear liquid	1.2	1 tube
<b>Internal Control-FL (IC)****</b>	colorless clear liquid	1.0	1 tube

\* is used to analyze DNA samples extracted with DNA-sorb-AM and DNA-sorb-B extraction kits.

\*\* is be used for thermocyclers without constant-temperature lid (for example, Terzik (DNA-Technology)).

\*\*\* must be used in the extraction procedure as Negative Control of Extraction.

\*\*\*\* add 10 µl of Internal Control during the DNA extraction procedure directly to the sample/lysis mixture (see DNA-sorb-AM **REF** K1-12-100-CE protocol).

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP** PCR kit variant FEP is intended for 110 reactions, including controls.

#### 4. ADDITIONAL REQUIREMENTS

- DNA extraction kit.
- Transport medium.
- Disposable powder-free gloves and laboratory coat.
- Pipettes (adjustable).
- Sterile pipette tips with aerosol filters (up to 200 µl).
- Tube racks.
- Vortex mixer.
- Desktop centrifuge with a rotor for 2-ml tubes.
- PCR box.
- Personal thermocyclers (for example, Gradient Palm Cyclor (Corbett Research, Australia), GeneAmp PCR System 2700 (Applied Biosystems, USA), MxyGene (Axygen,

USA), Terzik (DNA-Technology, Russia) or equivalent).

- Fluorometer (for example, ALA-1/4 (Biosan, Latvia) or equivalent).
- Personal computer.
- Disposable polypropylene microtubes for PCR (0.5- or 0.2-ml; for example, Axygen, USA).
- Refrigerator for 2 – 8 °C.
- Deep-freezer for  $\leq -16$  °C.
- Waste bin for used tips.

## 5. GENERAL PRECAUTIONS

The user should always pay attention to the following:

- Use sterile pipette tips with aerosol barriers and use new tip for every procedure.
- Store and handle amplicons away from all other reagents.
- Thaw all components thoroughly at room temperature before starting detection.
- When thawed, mix the components and centrifuge briefly.
- Use disposable gloves, laboratory coats, and protect eyes while samples and reagents handling. Thoroughly wash hands afterwards.
- Do not eat, drink, smoke, apply cosmetics, or handle contact lenses in laboratory work areas.
- Do not use a kit after its expiration date.
- Dispose of all samples and unused reagents in compliance with local authorities' requirements.
- Samples should be considered potentially infectious and handled in a biological cabinet in accordance with appropriate biosafety practices.
- Clean and disinfect all sample or reagent spills using a disinfectant such as 0.5 % sodium hypochlorite, or other suitable disinfectant.
- Avoid contact with the skin, eyes and mucosa. If skin, eyes and mucosa contact immediately flush with water, seek medical attention.
- Material Safety Data Sheets (MSDS) are available on request.
- Use of this product should be limited to personnel trained in the techniques of DNA amplification.
- The laboratory process must be one-directional, it should begin in the Extraction Area and then move to the Amplification and Detection Areas. Do not return samples, equipment, and reagents to the area in which the previous step was performed.



Some components of this kit contain sodium azide as a preservative. Do not use metal tubing for reagent transfer.

## 6. SAMPLING AND HANDLING



Obtaining samples of biological materials for PCR-analysis, transportation, and storage are described in manufacturer's handbook [1]. It is recommended that this handbook is read before starting work.

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP** PCR kit is intended to analyze DNA extracted with DNA extraction kits from:

- *urogenital swabs*,
- *urine (a sediment of the first portion of the morning specimen)*,
- *prostate gland secretion*.

## 7. WORKING CONDITIONS

**AmpliSens<sup>®</sup> *Trichomonas vaginalis*-FEP** PCR kit should be used at 18–25 °C.

## 8. PROTOCOL

### 8.1. DNA extraction

It is recommended that the following nucleic acid extraction kits are used:

- DNA-sorb-AM, **REF** K1-12-100-CE.
- Other nucleic acid extraction kits recommended by FBIS CRIE.



Please carry out the DNA extraction according to the instructions provided by the manufacturer.

### 8.2. Preparing the PCR

Total reaction volume is **30 µl**, volume of DNA sample is **10 µl**.

#### 8.2.1 Preparing tubes for PCR

1. Prepare the required number of the tubes with **PCR-mix-1-FL *Trichomonas vaginalis*** and wax for amplification of DNA from clinical and control samples.
2. Add **10 µl** of **PCR-mix-2-FL-red** to the surface of wax layer of each tube, ensuring that it does not fall under the wax and mix with **PCR-mix-1-FL *Trichomonas vaginalis***.
3. Add above **1** drop of **mineral oil for PCR** (about **25 µl**) if a thermocycler without a constant-temperature cover is used.
4. Prepare one **Background** sample. To do this, mark a tube with **PCR-mix-1-FL *Trichomonas vaginalis*** as **Background** and add **20 µl** of **PCR-mix-Background-red** above the wax layer surface. Ensure that **PCR-mix-Background-red** does not fall under the wax and mix with **PCR-mix-1-FL *Trichomonas vaginalis***. Add above **1** drop of

**mineral oil for PCR** if a thermocycler without a constant-temperature lid is used.



**PCR-mix-Background-red** is used if DNA was extracted with DNA-sorb-AM or DNA-sorb-B kits. If any other nucleic acid extraction kits (recommended by FBIS CRIE) were used, follow the instructions provided by the manufacturer.

5. Add **10 µl** of **DNA samples** obtained from clinical or control samples at the DNA extraction stage using tips with aerosol barrier.

6. Carry out control reactions:

NCA -Add **10 µl** of **DNA-buffer** to the tube labeled NCA (Negative Control of Amplification).

C+ -Add **10 µl** of **Positive Control complex** (to the tube labeled C+ (Positive Control of Amplification).

C- -Add **10 µl** of a sample extracted from the **Negative Control** to the tube labeled C- (Negative Control of Extraction).

### 8.2.2 Amplification

Run the following program in the thermocycler (see Table 1). When the temperature reaches 95 °C (pause mode), insert the tubes into the cells of the thermocycler and press the button to continue.

It is recommended that drops are removed from walls of the tubes by short centrifugation (1–3 s) before inserting them in the thermocycler.

Table 1

**AmpliSens-1-FEP amplification program**

Step	Terzik			GeneAmp PCR System 2700			Gradient Palm Cycler, MaxyGene		
	Temperature, °C	Time	Cycles	Temperature, °C	Time	Cycles	Temperature, °C	Time	Cycles
0	95	Pause		95	Pause		95	Pause	
1	95	5 min	1	95	5 min	1	95	5 min	1
2	95	2 s	35	95	20 s	20	95	2 s	24
	65	5 s		65	25 s		65	10 s	
	72	5 s		72	30 s		72	10 s	
3	95	2 s	9	95	20 s	24	95	2 s	20
	60	10 s		60	30 s		60	15 s	
	72	5 s		72	30 s		72	10 s	
4	95	2 s	1	95	20 s	1	95	2 s	1
	60	10 s		60	30 s		60	15 s	
5	10	Storage		10	Storage		10	Storage	

Amplification programs for different thermocycler models are described in Guidelines [2]

## 9. DATA ANALYSIS

Detection is conducted using a fluorescence detector.



Please read the fluorescence detector Operating Manual before use of this kit.

Program the detector according to the manufacturer's manual, Guidelines [2], and Important Product Information Bulletin enclosed to the PCR kit.



Detection can be conducted within 1 day after completion of amplification only if the tubes with the amplified product have been stored at 2–8 °C in a light-free area.

The fluorescent signal intensity is detected in two channels:

- The signal from the *Trichomonas vaginalis* DNA amplification product is detected in the FAM channel (or analogous, depending on the detector model);
- The signal from the Internal Control amplification product is detected in the HEX channel (or analogous, depending on the detector model).

### Result interpretation

Principle of interpretation:

- *Trichomonas vaginalis* DNA is **detected** in a sample if its signal in the FAM channel is greater than the specified threshold value of the positive result.
- *Trichomonas vaginalis* DNA is **not detected** in a sample if its signal in the FAM channel is less than the specified threshold value of the negative result whereas the signal in the HEX channel is greater than the specified threshold value.
- The result is **invalid** if the signal of a sample in the FAM channel is less than the specified threshold value of the negative result and the signal in the HEX channel is less than the specified threshold value.
- The result is **equivocal** if the signal of a sample in the FAM channel is greater than the specified threshold value of the negative result but less than the threshold value of the positive result (the signal is between thresholds).



If the result is **invalid or equivocal**, the PCR should be repeated once again

The results of analysis are considered reliable only if the results obtained for Positive and Negative Controls of Amplification as well as Negative Control of extraction are correct (Table 2).

Table 2

#### Results for controls

Control	Stage for control	Signal in the channel		Interpretation
		FAM	HEX	
C–	DNA extraction	< threshold of negative result	> threshold	“–” or OK
NCA	Amplification	< threshold of negative result	< threshold	“nd”
C+	Amplification	> threshold of positive result	> threshold	“+” or OK



## 10. TROUBLESHOOTING

Results of analysis are not taken into account in the following cases:

1. No positive signal in the positive control of amplification (C+) may indicate incorrect programming of the temperature profile of the thermocycler, incorrect configuration of PCR, noncompliance of the storage conditions for kit components with the manufacturer's instruction, or the expiration of the reagent kit. Check programming of the thermocycler (see 8.2.2.), storage conditions, and the expiration date of the reagents and repeat PCR once again for all samples.
2. If no signal was detected either in the channel for detection of the pathogen DNA or in the channel for detection of the Internal Control, the sample should be examined once again (PCR and detection). The same applies to the samples with equivocal results, because the fact that the specific signal does not exceed the threshold value is not sufficient to consider a sample as positive. If equivocal results are obtained in the second run, the analysis should be repeated starting from the DNA extraction stage.
3. Positive signal in negative controls (C– and NCA) indicates reagent or sample contamination. In this case, the results of analysis must be considered as invalid. The analyses must be repeated and measures for detecting and eliminating the contamination source must be taken.

If you have any further questions or if encounter problems, please contact our Authorized representative in the European Community.

## 11. TRANSPORTATION

**AmpliSens® *Trichomonas vaginalis*-FEP** PCR kit should be transported at 2–8 °C for no longer than 5 days.

## 12. STABILITY AND STORAGE

All components of the **AmpliSens® *Trichomonas vaginalis*-FEP** PCR kit are to be stored at 2–8 °C when not in use and are stable until the expiration date on the label. The shelf life of opened reagents is the same as that of unopened reagents, unless otherwise stated.



PCR-mix-1-FL *Trichomonas vaginalis* should be kept away from light.

## 13. SPECIFICATIONS

### 13.1. Sensitivity

The analytical sensitivity of **AmpliSens® *Trichomonas vaginalis*-FEP** PCR kit is specified in the table below.

Clinical material	Transport medium	DNA extraction kit	Analytical sensitivity, GE/ml
Urogenital swabs	Transport medium for swabs (REF 956-CE, REF 987-CE) or Transport medium with mucolytic (REF 952-CE, REF 953-CE)	DNA-sorb-AM	5 x 10 <sup>2*</sup>
Urine (pretreatment is required)	–	DNA-sorb-AM	1 x 10 <sup>3</sup>

\* Genome equivalents (GE) of the microorganism per 1 ml of a clinical sample placed in the transport medium specified.

### 13.2. Specificity

The analytical specificity of **AmpliSens® *Trichomonas vaginalis*-FEP** PCR kit is ensured by selection of specific primers and probes as well as by selection of strict reaction conditions. The primers and probes were checked for possible homologies to all sequences published in gene banks by sequence comparison analysis. There were not nonspecific test responses during examination of a human DNA as well as a DNA panel of the following microorganisms: *Gardnerella vaginalis*, *Lactobacillus* spp., *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Streptococcus agalactiae*, *Candida albicans*, *Mycoplasma hominis*, *Ureaplasma urealyticum*, *Ureaplasma parvum*, *Neisseria flava*, *Neisseria subflava*, *Neisseria sicca*, *Neisseria mucosa*, *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Treponema pallidum*, *Toxoplasma gondii*, HSV 1 and 2, CMV, HPV.

The clinical specificity of **AmpliSens® *Trichomonas vaginalis*-FEP** PCR kit was confirmed in laboratory clinical trials.














### 14. REFERENCES

1. Handbook "Sampling, Transportation, and Storage of Clinical Material for PCR Diagnostics", developed by Federal Budget Institute of Science "Central Research Institute for Epidemiology" of Federal Service for Surveillance on Consumers' Rights Protection and Human Well-Being, Moscow, 2008.
2. Guidelines "End-Point PCR Detection of STIs and Other Reproductive Tract Infections" developed by Federal Budget Institute of Science "Central Research Institute for Epidemiology" of Federal Service for Surveillance on Consumers' Rights Protection and Human Well-Being, Moscow.

## 15. QUALITY CONTROL

In accordance with Federal Budget Institute of Science “Central Research Institute for Epidemiology” ISO 13485-Certified Quality Management System, each lot of **AmpliSens®** *Trichomonas vaginalis-FEP* PCR kit has been tested against predetermined specifications to ensure consistent product quality.

## 16. KEY TO SYMBOLS USED

	Catalogue number		Caution
	Batch code		Sufficient for
	<i>In vitro</i> diagnostic medical device		Expiration Date
	Version		Consult instructions for use
	Temperature limitation		Keep away from sunlight
	Manufacturer	<b>NCA</b>	Negative control of amplification
	Date of manufacture	<b>C-</b>	Negative control of extraction
	Authorised representative in the European Community	<b>C+</b>	Positive control of amplification
<b>FBIS CRIE</b>	Federal Budget Institute of Science “Central Research Institute for Epidemiology”	<b>IC</b>	Internal control

### List of Changes Made in the Instruction Manual

<b>VER</b>	<b>Location of changes</b>	<b>Essence of changes</b>
23.06.11 RT	Cover page, text	The name of Institute was changed to Federal Budget Institute of Science "Central Research Institute for Epidemiology"