

## GeneProof Mycobacterium tuberculosis PCR Kit



*In vitro* diagnostic medical device

The kit has been manufactured according to EC Directive 98/79/EC as an *in vitro* diagnostic medical device and it has been designed for professional use in specialized clinical and research laboratories.

### KIT CONTENT

REF	ISIN Version IS included in the MasterMix			ISEX Version IS supplied in a separate tube Nucleic acid isolation and PCR inhibition control		
	MT/ISIN/025	MT/ISIN/050	MT/ISIN/100	MT/ISEX/025	MT/ISEX/050	MT/ISEX/100
	25 rxn	50 rxn	100 rxn	25 rxn	50 rxn	100 rxn
<b>MasterMix</b> <i>Mycobacterium tuberculosis</i>	1x750 µl	2x750 µl	4x750 µl	1x750 µl	2x750 µl	4x750 µl
<b>Positive Control</b> <i>Mycobacterium tuberculosis</i>	1x200 µl	1x200 µl	2x200 µl	1x200 µl	1x200 µl	2x200 µl
<b>Internal Standard</b> <i>Bordetella</i> <i>Chlamydia pneumoniae</i> <i>Mycobacterium tuberculosis</i> <i>Mycoplasma pneumoniae</i>	-	-	-	1x1000 µl	1x1000 µl	2x1000 µl

### STORAGE AND TRANSPORTATION CONDITIONS

The kits should be transported and stored at temperatures between -85 °C and -10 °C. The kit will remain stable at least until the expiry date printed on the package, if the storage temperature is kept. Repeated freezing and thawing of the kit components may result in lower detection quality.

### TECHNICAL SPECIFICATION

<b>Target sequence</b>	specific multi-copy insertion sequence ITS6110 DNA
<b>Specificity</b>	<i>Mycobacterium tuberculosis</i> complex ( <i>M. tuberculosis</i> , <i>M. bovis</i> , <i>M. africanum</i> , <i>M. microti</i> and vaccine strain BCG)
<b>Sensitivity (LOD)</b>	reaches 0.06 genome/µl with the probability of 95 %
<b>Sample types</b>	Pulmonary form of TBC (sputum, bronchoalveolar lavage), extrapulmonary TBC (cerebrospinal fluid, tissues, lymphatic nodes, bone marrow, stool, gastric lavage)
<b>Quality Control</b>	regularly tested by QCMD and Instand e.V. External Quality Assessment Panels

## METHOD PRINCIPLES

The PCR kit is designed for *Mycobacterium tuberculosis* detection by the real-time Polymerase Chain Reaction (PCR) method. The *M. tuberculosis* detection is based on the amplification of a specific multi-copy insertion sequence IS 6110 and measuring the amplification product concentration using the PCR process and fluorescence labelled probes. The kit specifically detects strains of the *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum* and *M. microti*) and also vaccination strains (e.g. BCG). *M. tuberculosis* presence is indicated by FAM fluorophore fluorescence growth. An Internal Standard (IS) is included in the reaction mix, controlling the possible inhibition of the PCR reaction (ISIN version) and possibly also the DNA extraction process quality (ISEX version). IS positive amplification is detected in the HEX fluorophore fluorescence channel. The detection kit takes advantage of the "hot start" technology, minimizing non-specific reactions and assuring maximum sensitivity. Ready to Use MasterMix contains uracil-DNA-glycosylase (UDG), eliminating possible contamination of the PCR reaction by amplification products. Using the multi-copy insertion sequence IS6110 for mycobacterial detection enables 16 times higher examination sensitivity in comparison to conventional single-copy genes detection methods. The kit performs very sensitive *M. tuberculosis* detection in clinical material (pulmonary form of TBC - sputum, bronchoalveolar lavage; extrapulmonary TBC - cerebrospinal fluid, tissues, lymphatic nodes, bone marrow, stool, gastric lavage). The kit is designed for *in vitro* diagnostics and provides qualitative detection.

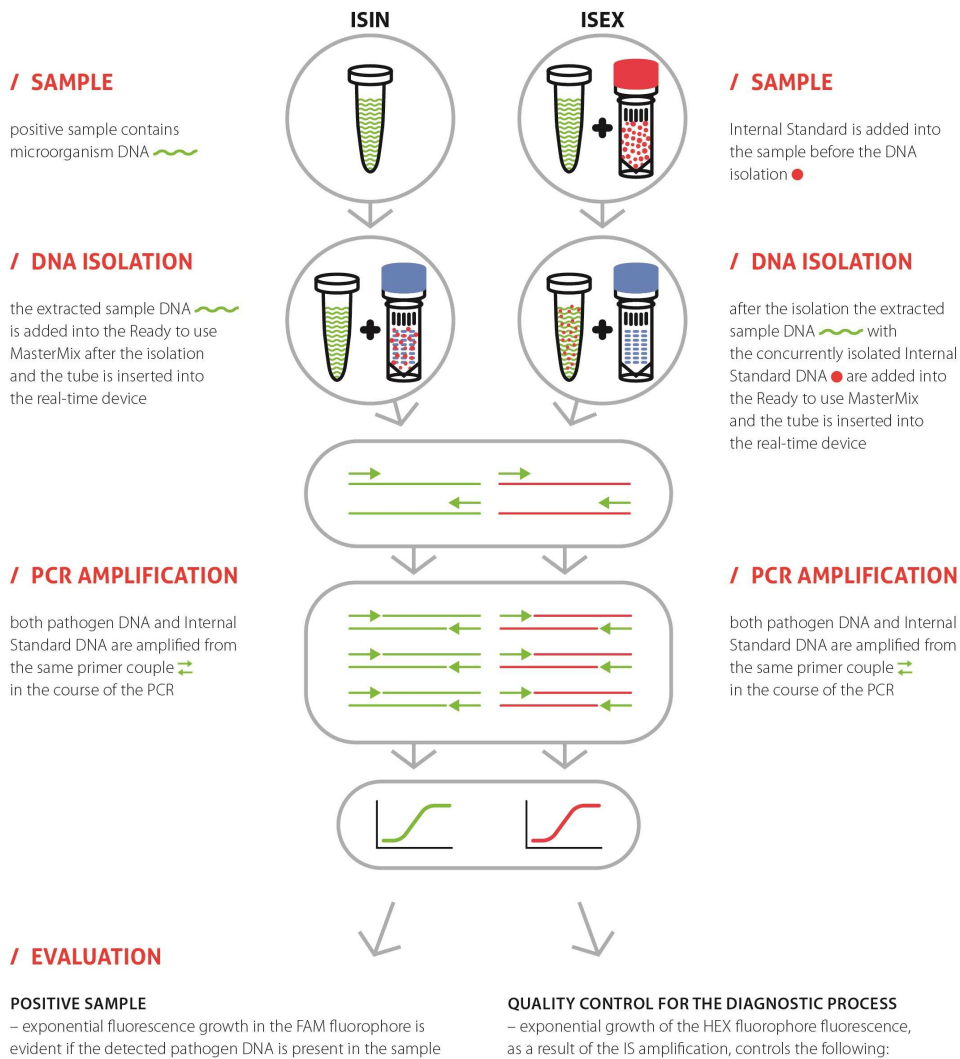
### ISIN version

Internal Standard is included in the MasterMix tube. This PCR kit version enables PCR inhibition control.

### ISEX version

Internal Standard is provided as independent item within the package. This PCR kit version enables both PCR inhibition control and nucleic acid purification process efficiency control.

## MICROBIOLOGICAL DNA DETECTION TECHNOLOGY



1. Inhibition and efficiency of the PCR amplification – ISIN version
2. DNA extraction quality, inhibition and efficiency of the PCR amplification – ISEX version



## USER MANUAL

### SAMPLING AND SAMPLE STORAGE

Samples are usually taken from the respiratory tract for the purpose of *M. tuberculosis* demonstration. Infection is usually not disseminated; therefore a demonstration in peripheral blood samples is usually not valuable for the diagnosis purposes. Samples of sputum, bronchoalveolar lavages, bronchial and tracheal aspirates must be sampled in a sterile way and inserted into a tube without any transportation media. Store or transport at a temperature between +2 °C and +8 °C within 48 hours. If longer storage period is required, freeze to a temperature between -85 °C and -10 °C.

### NUCLEIC ACID PURIFICATION

Nucleic acid isolation should be performed by isolation kits available at the market according to protocols for the particular clinical material isolation. The manufacturer recommends the following isolation kits:

GeneProof PathogenFree DNA Isolation Kit  
croBEE NA16 Nucleid Acid Extraction System

When using the ISEX versions of the PCR kits the IS should be added directly into the sample at the beginning of the isolation process so that in the end 1 µl of the resulting elution volume contains 0.1 µl of the IS:

Elution volume	25 µl	50 µl	100 µl	200 µl
Internal Standard	2,5 µl	5 µl	10 µl	20 µl

### PCR SETUP

1. Add 30 µl of MasterMix into PCR tubes.

2. Add 10 µl of the isolated nucleic acid sample or 10 µl of Positive Control into the individual PCR tubes. The final reaction mix volume will be 40 µl.

*It is necessary to keep all components at +2°C to +8°C during the PCR preparation.*

3. Close the tubes, centrifuge shortly, insert them into the device and let them amplify according to the following PCR profile.

*Be very careful when handling the Positive Control or the clinical material, incorrect handling could result in contamination and the consequent impairment of the kit components or the MasterMix! The manufacturer is not responsible for the kit impairment due to incorrect handling.*

### AMPLIFICATION PROFILE

Step	Temperature	Time	Data collection	Cycles
1. Hold	37 °C	2 min		1
2. Hold	95 °C	10 min		1
3. PCR	95 °C	5 s		45
	60 °C	40 s	FAM+HEX	
	72 °C	20 s		

### VALIDATED INSTRUMENTS

GeneProof PCR kits are designed for use with real-time devices from various manufacturers. This PCR kit has been validated with the following devices:

Applied Biosystems 7300/7500 Real-Time PCR System  
AriaMx Real-Time PCR System  
Dx/CFX96™/CFX Connect™ Real-Time PCR Detection System  
LightCycler® 2.0, LightCycler® 480  
LineGene 9600  
Mx3000P/3005P QPCR System  
Rotor-Gene 3000, Rotor-Gene 6000, Rotor-Gene Q  
SLAN® Real-Time PCR System  
StepOne™ Real-Time PCR System

GeneProof diagnostic kits are continually validated with various types of devices. Please request the current list at support@geneproof.com.



## CLINICAL SAMPLES ANALYSIS EVALUATION

Channel FAM	Channel HEX	Result	Interpretation	
		Valid	<i>Mycobacterium tuberculosis</i>	<b>positive</b>
		Valid	<i>Mycobacterium tuberculosis</i>	<b>positive</b>
		Valid	<i>Mycobacterium tuberculosis</i>	<b>negative</b>
		Invalid		
		Invalid		

## CONTROL ANALYSIS EVALUATION

	Channel FAM	Channel HEX	Result
Positive Control		or	Valid
Negative Control		or	Valid
Positive Control		or	Invalid
Negative Control		or	Invalid

## WARNING


A single valid package insert for a specific kit is included in the package or to be requested for the particular lot from the manufacturer. The kit should be disposed of after use according to the current legal regulations considering the fact that the kit doesn't contain any dangerous, infectious or toxic components that would be subject to special safety regulations, and the packaging materials are made of paper and polypropylene. If you have any questions please contact our Customer Service.

### Customer care and technical support

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