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About this guide

Revision history

<table>
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<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>March 2014</td>
<td>• Updated recommended DNA isolation methods section for general use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated instructions for use of recent models of real-time PCR instruments.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated protocol organization and some number formatting (e.g., temperature and time ranges) to align with the current style guide.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated user guide template with associated updates to the covers, legal, document support, and safety sections.</td>
</tr>
<tr>
<td>B</td>
<td>June 2010</td>
<td>Baseline for revision history.</td>
</tr>
</tbody>
</table>
Product information

Product description

TaqMan® Pathogen Detection Kits provide a simple, reliable, and rapid method for the detection of contaminants in food and environmental samples. The assay uses the polymerase chain reaction (PCR) to amplify unique microorganism-specific DNA target sequences and TaqMan® probes to detect the amplified sequences.

The TaqMan® Pathogen Detection Kits include an internal positive control (IPC) to monitor for PCR inhibition. The IPC also demonstrates whether or not PCR reagents are working and amplifying properly. This IPC minimizes the need for a positive control, and reduces the risk of cross-contamination in unknown samples. The detection of the IPC provides greater confidence in negative samples.

Note: We recommend that the user perform validation with their unique sample matrices/types to determine appropriate analysis settings (ISO 22174, 2005). Life Technologies offers fee-based method validation and verification services; contact foodsafety@lifetech.com for more information.

Kit contents and storage

Sufficient reagents are supplied for 100 reactions (30-µL reaction volume).

Table 1  The TaqMan® Staphylococcus aureus Detection Kit (Cat. no. 4368606).

<table>
<thead>
<tr>
<th>Components</th>
<th>Cap color</th>
<th>Volume</th>
<th>Storage[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative control, 1 tube</td>
<td>White</td>
<td>1000 µL</td>
<td>5±3°C</td>
</tr>
</tbody>
</table>
### Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Cap color</th>
<th>Volume</th>
<th>Storage[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X Environmental Master Mix, 2 tubes</td>
<td>Yellow/Gold</td>
<td>2 x 750 µL</td>
<td>5±3°C</td>
</tr>
</tbody>
</table>

[1] Refer to the product label for expiration date.

[2] Contains primers and probes for amplification and detection of target [FAM™-dye labeled probe] and IPC [VIC®-dye labeled probe]

[3] Excessive exposure to light may affect the fluorescent probes.

**Note:** Kit components may ship separately depending on configuration and storage conditions.

---

## Required materials not included with the kit

Unless otherwise indicated, all materials are available from Life Technologies. MLS: major laboratory supplier.

<table>
<thead>
<tr>
<th>Item</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instrument and equipment</strong></td>
<td></td>
</tr>
<tr>
<td>One of the following real-time PCR systems:</td>
<td></td>
</tr>
<tr>
<td>• Applied Biosystems® 7500 Fast Real-Time PCR System</td>
<td>Contact your local Life Technologies representative.</td>
</tr>
<tr>
<td>• Applied Biosystems® StepOnePlus™ Real-Time PCR System</td>
<td></td>
</tr>
<tr>
<td>• Applied Biosystems® StepOne™ Real-Time PCR System</td>
<td></td>
</tr>
<tr>
<td>Benchtop microcentrifuge</td>
<td>MLS</td>
</tr>
<tr>
<td>Pipettors:</td>
<td>MLS</td>
</tr>
<tr>
<td>• Positive-displacement</td>
<td></td>
</tr>
<tr>
<td>• Air-displacement</td>
<td></td>
</tr>
<tr>
<td>• Multichannel</td>
<td></td>
</tr>
<tr>
<td><strong>Precision Plate Holder for 7500 Fast System, as appropriate for your experiment</strong></td>
<td></td>
</tr>
<tr>
<td>For plates</td>
<td>Cat. no. 4403809</td>
</tr>
<tr>
<td>For 0.1-mL tube strips</td>
<td>Cat. no. 4359652</td>
</tr>
<tr>
<td><strong>Optical reaction plates and covers, or optical PCR tubes and caps, as appropriate for your instrument</strong></td>
<td></td>
</tr>
<tr>
<td>Plates for use with the StepOne™ Real-Time PCR System:</td>
<td></td>
</tr>
<tr>
<td>MicroAmp® Fast Optical 48-Well Reaction Plate</td>
<td>Cat. no. 4375816</td>
</tr>
<tr>
<td>MicroAmp® 48-Well Optical Adhesive Film</td>
<td>Cat. no. 4375928</td>
</tr>
</tbody>
</table>
### Item | Source
---|---
| Plates for use with the StepOnePlus™ Real-Time PCR System or 7500 Fast Real-Time PCR System: |  
| MicroAmp® Fast Optical 96-Well Reaction Plate | Cat. no. 4346907 (no barcode)  
| | Cat. no. 4366932 (with barcode)  
| MicroAmp® Optical Adhesive Film | Cat. no. 4311971  
| |  
| Tubes for use with all specified real-time PCR systems: |  
| MicroAmp® Fast 8-Tube Strip | Cat. no. 4358293  
| MicroAmp® Optical 8-Cap Strips | Cat. no. 4323032  
|  
| Other consumables |  
| Aerosol-resistant pipette tips | MLS  
| Disposable gloves | MLS  
| MicroAmp® Splash-free Support Base | Cat. no. 4312063  
| Sterile microcentrifuge tubes | MLS  
|  
| Reagent |  
| Nuclease-free Water | Cat. no. AM9938  

### Additional materials for enrichment and DNA isolation

**General recommendations for enrichment**

Depending on your sample type, enrichment (that is, growing the specific pathogen from the sample matrix) may be the first step in using the TaqMan® Staphylococcus aureus Detection Kit. You will need enrichment reagents and a protocol appropriate for the matrix and pathogen of interest.

We recommend that you validate your matrices with the most current USDA FSIS MLG or FDA BAM enrichment methods. For most food types, enrichment time for this PCR-based pathogen detection kit can be reduced significantly from standard microbiology enrichment protocols. We recommend that you optimize the time needed to enrich your specific sample.

**Recommended DNA isolation methods**

For most food or environmental sample types, we recommend using one of the following sample preparation options:

<table>
<thead>
<tr>
<th>Nucleic acid isolation workflow</th>
<th>Kit</th>
<th>Cat. no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automated, magnetic bead-based</td>
<td>PrepSEQ® Nucleic Acid Extraction Kit for Food and Environmental Testing</td>
<td>4480466, 4428176</td>
</tr>
<tr>
<td>Spin columns</td>
<td>PrepSEQ® Rapid Spin Sample Preparation Kit with Protease K</td>
<td>4426714</td>
</tr>
</tbody>
</table>
### Workflow

<table>
<thead>
<tr>
<th>Nucleic acid isolation workflow</th>
<th>Kit</th>
<th>Cat. no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spin columns</td>
<td>PrepSEQ® Rapid Spin Sample Preparation Kit – Extra Clean with Proteinase K</td>
<td>4426715</td>
</tr>
<tr>
<td>Spin columns</td>
<td>PrepSEQ® Rapid Spin Sample Preparation Kit</td>
<td>4407760</td>
</tr>
<tr>
<td>Direct lysis</td>
<td>Lysis Buffer, FS and Proteinase K, FS</td>
<td>4480724 and 4480715</td>
</tr>
</tbody>
</table>

**Start with PCR-ready DNA from enriched food or environmental sample**

- **Real-time PCR**

- Create a run file

- Prepare the Target Premix Solution

- Set up the PCR reactions

- Load and run the reactions

- View results and data analysis
Important procedural guidelines

**Note:** All TaqMan® Pathogen Detection Kits run with a single, standard PCR protocol, allowing them to be combined on the same plate. This feature allows screening for multiple pathogens in the same PCR run.

- Use new tips when pipetting the Environmental Master Mix, Target Assay Mix, Target Premix Solution, and each unknown sample.
- Use at least one no-template control per target organism tested.
- During PCR set up, mix very gently with the pipette tip at the bottom of the tube to minimize aerosol formation and cross-contamination.
- To maintain strip orientation when transferring tubes to the instrument tray, mark or label one end of the strip cap (but not over a cap).
- For 8-tube strips with seven or fewer reactions, add additional empty tubes as needed so that each strip contains a full set of 8 tubes. The empty, capped tubes evenly distribute the clamping load that is applied to the sample tube strips during processing, thereby minimizing the risk of collapsing any tubes.
- Follow the recommendations in “Good laboratory practices for PCR and RT-PCR” on page 20, including “Plate layout suggestions” on page 20.
Create a run file

For detailed instructions on setup and programming the Applied Biosystems® 7500 Fast Real-Time PCR Instrument, refer to the guide accompanying your instrument or to the 7300/7500/7500 Fast Real-Time PCR System Absolute Quantitation Using Standard Curve Getting Started Guide (Pub. no. 4347825).

1. Select Standard Curve (Absolute Quantification) from the Assay drop-down list.

2. Select FAM and VIC dye detectors with the Quencher Dye set to None or Non-Fluorescent.

3. Associate dyes with each reaction.

4. Name each reaction as desired.

5. Set thermal cycling conditions for the 7500 Fast Real-Time PCR Instrument according to the following table.

<table>
<thead>
<tr>
<th>Settings</th>
<th>Stage 1 Enzyme activation</th>
<th>Stage 2 PCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cycles</td>
<td>1 (Hold)</td>
<td>40 cycles</td>
</tr>
<tr>
<td>Temperature</td>
<td>95°C</td>
<td>95°C</td>
</tr>
<tr>
<td>Time</td>
<td>10 min</td>
<td>15 sec</td>
</tr>
</tbody>
</table>

6. Set Sample Volume to 30 μL.

7. Select Standard Run Mode.
Set up the PCR reactions

1. Thaw all reagents completely.

2. Prepare the Target Premix Solution: combine the following components for the number of reactions (positive and negative controls) plus 10% overage, and pipet up and down gently to mix.

<table>
<thead>
<tr>
<th>Component</th>
<th>Vol. for one 30-µL reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X Environmental Master Mix</td>
<td>15.0 µL</td>
</tr>
<tr>
<td>10X Target Assay Mix</td>
<td>3.0 µL</td>
</tr>
<tr>
<td><strong>Total volume</strong></td>
<td><strong>18.0 µL</strong></td>
</tr>
</tbody>
</table>

3. Transfer 18 µL of Target Premix Solution into each well to be used, gently pipetting at the bottom of the well.

4. Add 12 µL of unknown samples and negative controls to each well as appropriate. Gently pipet up and down to mix the solution.

5. Close the tubes or apply an optical cover to the plate. See “How to seal plates for the PCR run” on page 21 or “How to seal tubes for the PCR run” on page 22.

6. Make sure that the reagents are in the bottom of the wells. If available, use a centrifuge with a plate adapter to briefly centrifuge the plate.

Load and run the reactions

1. Load the reactions into the instrument with the appropriate 7500 Fast Precision Plate Holder on the block:
   - For reactions prepared using plates, place the plate on the sample block.
   - For reactions prepared using 8-tube strips, load the strips vertically in the center of the block.
     If columns 1 and 12 are not used, fill them with empty strips. This will balance the block to avoid damage of tubes.

2. Close the instrument loading block and start the run.
General process for viewing results

Refer to the instrument user guide for instructions on how to analyze data and view your results.

1. View the amplification plots for all samples.

2. Set the baseline and threshold values.

3. Check each sample for a FAM™ dye (target-specific) signal and a VIC® dye (IPC) signal.

The following table provides a basic guide for interpreting the results:

<table>
<thead>
<tr>
<th>FAM™ dye signal (target)</th>
<th>VIC® dye signal (IPC)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+, –</td>
<td>Positive</td>
</tr>
<tr>
<td>–</td>
<td>+</td>
<td>Negative</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>See Chapter 4, “Troubleshooting”</td>
</tr>
</tbody>
</table>
Create a run file

The following instructions apply to use of the StepOne™ software on the StepOne™ or StepOnePlus™ Real-Time PCR System. For detailed instructions on setup and programming the instrument, refer to the StepOne™ and StepOnePlus™ Real-Time PCR System User Guide (Pub. no. 4379704).

1. Go to File  New experiment, and select Advanced Setup.

2. In the Experimental Properties page, select the following settings:

<table>
<thead>
<tr>
<th>For...</th>
<th>Select...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument</td>
<td>StepOne™ Instrument – (48 Wells)</td>
</tr>
<tr>
<td></td>
<td>or StepOnePlus™ Instrument – (96 Wells)</td>
</tr>
<tr>
<td>Type of experiment</td>
<td>Quantitation – Standard Curve</td>
</tr>
<tr>
<td>Type of reagents</td>
<td>TaqMan® Reagents</td>
</tr>
<tr>
<td>Ramp speed</td>
<td>Standard</td>
</tr>
</tbody>
</table>

3. In the Plate Setup page, do the following:

<table>
<thead>
<tr>
<th>Tab</th>
<th>Create or select...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define Targets and Samples</td>
<td>• Create 2 targets with quenchers set to None.</td>
</tr>
<tr>
<td></td>
<td>• Select FAM™ and VIC® dyes as the reporters.[1]</td>
</tr>
<tr>
<td>Assign Targets and Samples</td>
<td>Associate the FAM™ and VIC® dyes with each reaction.</td>
</tr>
</tbody>
</table>

[1] FAM™ dye is used to detect the targets, and VIC® dye is used to detect the IPC.

4. In the Run Method page, set the thermal cycling conditions according to the following table:
5. Set Reaction Volume to 30 μL.

6. Under File, save the run file as a .eds document in the appropriate folder.

**Set up the PCR reaction**

1. Thaw all reagents completely.

2. Prepare the Target Premix Solution: combine the following components for the number of reactions (positive and negative controls) plus 10% overage, and pipet up and down gently to mix.

<table>
<thead>
<tr>
<th>Component</th>
<th>Vol. for one 30-μL reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X Environmental Master Mix</td>
<td>15.0 μL</td>
</tr>
<tr>
<td>10X Target Assay Mix</td>
<td>3.0 μL</td>
</tr>
<tr>
<td><strong>Total volume</strong></td>
<td><strong>18.0 μL</strong></td>
</tr>
</tbody>
</table>

3. Transfer 18 μL of Target Premix Solution into each well to be used, gently pipetting at the bottom of the well.

4. Add 12 μL of unknown samples and negative controls to each well as appropriate, and gently pipet up and down to mix the solution.

5. Close the tubes or apply an optical cover to the plate. See “How to seal plates for the PCR run” on page 21 or “How to seal tubes for the PCR run” on page 22.

6. Make sure that the reagents are in the bottom of the wells. If available, use a centrifuge with a plate adapter to briefly centrifuge the plate.
Load and run the instrument

For the StepOne™ Real-Time PCR System

1. Load reactions into the instrument:
   • For reactions prepared using the MicroAmp® Fast 48-Well Tray, place tray on the sample block.

   • For reactions prepared using 8-tube strips, load the strips horizontally. For example, in Row C, load an 8-tube strip across columns 1 through 8. A minimum of one 8-tube strip is recommended. It is not necessary to balance the tube strips on the tray.

2. Open the run file document that corresponds to the reaction plate that you created in “Create a run file” on page 14.

3. Start the run.

   IMPORTANT! To avoid false positives due to amplified material in your work area, do not open tubes after amplification.

For the StepOnePlus™ Real-Time PCR System

1. Load reactions into the instrument:
   • For reactions prepared using the MicroAmp® 96-Well Tray for VeriFlex™ Blocks, place the tray on the sample block.

   • For reactions prepared using 8-tube strips, load the strips vertically. The minimum recommended load is two 8-tube strips (16 tubes), which should be placed in adjacent columns, for example in columns 1 and 2. It is not necessary to balance the tube strips on the tray.
2. Open the run file document that corresponds to the reaction plate that you created in “Create a run file” on page 14.

3. Start the run.

**IMPORTANT!** To avoid false positives due to amplified material in your work area, do not open tubes after amplification.

**General process for viewing results**

The procedure to view results varies depending on the instrument used. Refer to the instrument user guide for instructions on how to analyze data and view your results.

1. View the amplification plots for all the samples.

2. Set the baseline and threshold values.

3. Check each sample for a FAM™ dye (target-specific) signal and a VIC® dye (IPC) signal.

The following table provides a basic guide for interpreting the results:

<table>
<thead>
<tr>
<th>FAM™ dye signal (target)</th>
<th>VIC® dye signal (IPC)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+, –</td>
<td>Positive</td>
</tr>
<tr>
<td>–</td>
<td>+</td>
<td>Negative</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>See Chapter 4, “Troubleshooting”</td>
</tr>
</tbody>
</table>
## Troubleshooting

<table>
<thead>
<tr>
<th>Observation</th>
<th>Possible cause</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>In unknown wells, no IPC or target-specific signal is detected.</td>
<td>Inhibition of PCR occurred.</td>
<td>Dilute the sample 1:5 with Nuclease-free Water, to dilute PCR inhibitors, and repeat the assay. If PCR remains inhibited, repeat the sample preparation. Alternatively, use a Bacterial Genomic DNA Purification Kit [Major Laboratory Supplier] to remove inhibitors.</td>
</tr>
<tr>
<td></td>
<td>• Environmental Master Mix not stored properly.</td>
<td>Repeat the assay using properly stored assay components. Avoid freezing and thawing assay components. Protect the Target Assay Mix from light.</td>
</tr>
<tr>
<td></td>
<td>• 10X Target Assay Mix not stored properly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pipetting error (no premix solution added).</td>
<td>Repeat the assay. Make sure to pipette premix solution into all wells.</td>
</tr>
<tr>
<td>In unknown wells, no IPC signal is detected, but target-specific signal is</td>
<td>A high copy number of target DNA exists in samples, resulting in preferential</td>
<td>No action is required. The result is considered positive.</td>
</tr>
<tr>
<td>detected.</td>
<td>amplification of the target-specific DNA.</td>
<td></td>
</tr>
<tr>
<td>In positive control wells, no IPC or target signal detected</td>
<td>• Environmental Master Mix not stored properly.</td>
<td>Repeat the assay using properly stored assay components. Avoid freezing and thawing assay components. Protect the Target Assay Mix from light.</td>
</tr>
<tr>
<td></td>
<td>• 10X Target Assay Mix not stored properly.</td>
<td></td>
</tr>
<tr>
<td>In positive control wells, no IPC signal is detected, but target-</td>
<td>A high copy number of target DNA exists in samples, resulting in preferential</td>
<td>No action is required. The result is considered positive.</td>
</tr>
<tr>
<td>specific signal is detected.</td>
<td>amplification of the target-specific DNA.</td>
<td></td>
</tr>
<tr>
<td>In positive control wells, no target-specific signal is detected.</td>
<td>Positive control was omitted (pipetting error).</td>
<td>Repeat the assay. Make sure to pipet the positive control into all positive-control wells.</td>
</tr>
<tr>
<td>Observation</td>
<td>Possible cause</td>
<td>Recommended action</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>In negative control wells, no IPC signal is detected, but a target-specific signal is detected.</td>
<td>Carryover contamination caused target signal in negative control wells. Additionally, no IPC signal in negative control wells can be caused by: - A high copy number of target DNA exists in samples, resulting in preferential amplification of the target-specific DNA. - A problem occurred with IPC amplification.</td>
<td>To correct carryover contamination, repeat the assay using fresh aliquots of all reagents and clean pipetting equipment. To determine whether IPC amplification is a problem, examine unknown wells for an IPC signal. If an IPC signal is present, IPC amplification is not a problem.</td>
</tr>
<tr>
<td>In negative control wells, target-specific signal is detected.</td>
<td>Carryover contamination occurred.</td>
<td>1. Repeat the assay using fresh aliquots of all reagents and clean pipetting equipment. 2. If the negative control continues to show contamination, repeat the assay using a new kit. 3. If the negative control continues to show contamination, contact Technical Support.</td>
</tr>
<tr>
<td>Replicate results for a sample are inconsistent.</td>
<td>All replicate wells for a sample do not have the same result.</td>
<td>If more than two replicates yield the same result (for example, 2 of 3 replicates are negative, but 1 replicate is positive), refer to your laboratory protocol to determine whether to repeat the assay using fresh samples and reagents. If only 2 replicates were run and the results are not consistent, repeat the assay using fresh samples and reagents.</td>
</tr>
</tbody>
</table>
Supplemental information

Good laboratory practices for PCR and RT-PCR

When preparing samples for PCR or RT-PCR amplification:
- Wear clean gloves and a clean lab coat (not previously worn while handling amplified products or used during sample preparation).
- Change gloves whenever you suspect that they are contaminated.
- Maintain separate areas and dedicated equipment and supplies for:
  - Sample preparation and reaction setup.
  - Amplification and analysis of products.
- Do not bring amplified products into the reaction setup area.
- Open and close all sample tubes carefully. Avoid splashing or spraying samples.
- Keep reactions and components capped as much as possible.
- Use a positive-displacement pipettor or aerosol-resistant barrier pipette tips.
- Clean lab benches and equipment periodically with 10% bleach solution or DNAZap™ Solutions (Cat. no. AM9890).

For additional information, refer to ISO 22174 (2005).

Plate layout suggestions

- Separate different targets by a row if enough space is available.
- Put at least one well between unknown samples and controls if possible.
- Separate negative and positive controls by one well if possible.
- Place replicates of one sample for the same target next to each other.
- Start with the unknown samples and put controls at the end of the row or column.
- Put positive controls in one of the outer rows or columns if possible.
- Consider that caps for PCR tubes come in strips of 8 or 12.
How to seal plates for the PCR run

**IMPORTANT!** Apply significant downward pressure on the applicator in all steps to form a complete seal on top of the wells. Pressure is required to activate the adhesive on the optical cover.

1. Place an optical adhesive cover on the plate, then rub the flat edge of the applicator back and forth along the long edge of the plate.

   ![Applicator rubbing along long edge](image1)

2. Rub the flat edge of the applicator back and forth along the short edge (width) of the plate.

   ![Applicator rubbing along short edge](image2)

3. Rub the end of the applicator horizontally and vertically between all wells.

4. Rub the end of the applicator around all outside edges of the plate using small back and forth motions to form a complete seal around the outside wells.

   ![Applicator rubbing around outside edges](image3)
How to seal tubes for the PCR run

IMPORTANT! Apply significant downward pressure on the sealing tool in all steps to form a complete seal on top of the tubes.

1. Place strip caps on the tubes.

2. Seal the tubes using one of the following methods:
   • If you are using the rolling capping tool:
     a. Roll the capping tool across all strips of caps on the short edge, then the long edge, of the plate.
     b. Roll the capping tool around all outer rows of strips of caps.
   • If you are using the rocking capping tool:
     a. Slip your fingers through the handle with the holes in the tool facing down.
     b. Place the holes in the tool over the first eight caps in a row.
     c. Rock the tool back and forth a few times to seal the caps.
     d. Repeat for remaining caps in the row, then for all remaining rows.
WARNING! GENERAL SAFETY. Using this product in a manner not specified in the user documentation may result in personal injury or damage to the instrument or device. Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.

- Before using an instrument or device, read and understand the safety information provided in the user documentation provided by the manufacturer of the instrument or device.
- Before handling chemicals, read and understand all applicable Safety Data Sheets (SDSs) and use appropriate personal protective equipment (gloves, gowns, eye protection, etc). To obtain SDSs, see the “Documentation and Support” section in this document.
Chemical safety

WARNING! GENERAL CHEMICAL HANDLING. To minimize hazards, ensure laboratory personnel read and practice the general safety guidelines for chemical usage, storage, and waste provided below, and consult the relevant SDS for specific precautions and instructions:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the “Documentation and Support” section in this document.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood).
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer’s cleanup procedures as recommended in the SDS.
- Handle chemical wastes in a fume hood.
- Ensure use of primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)
- After emptying a waste container, seal it with the cap provided.
- Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.
- Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.
- IMPORTANT! Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.
WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. All work should be conducted in properly equipped facilities using the appropriate safety equipment (for example, physical containment devices). Safety equipment also may include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, 5th Edition, HHS Publication No. (CDC) 21-1112, Revised December 2009; found at: 
  
  www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf

  
  www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf
Documentation and support

**Obtaining SDSs**

Safety Data Sheets (SDSs) are available from [www.lifetechnologies.com/support](http://www.lifetechnologies.com/support).

*Note:* For the SDSs of chemicals not distributed by Thermo Fisher Scientific, contact the chemical manufacturer.

**Obtaining Certificates of Analysis**

The Certificate of Analysis provides detailed quality control and product qualification information for each product. Certificates of Analysis are available on our website. Go to [www.lifetechnologies.com/support](http://www.lifetechnologies.com/support) and search for the Certificate of Analysis by product lot number, which is printed on the box.

**Obtaining support**

For the latest services and support information for all locations, go to:

[www.lifetechnologies.com/support](http://www.lifetechnologies.com/support)

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents
- Obtain information about customer training
- Download software updates and patches

**Food Safety support**

Website: [www.lifetechnologies.com/foodsafty](http://www.lifetechnologies.com/foodsafty)

Support email: foodsafty@liftech.com

Phone number in North America: 1-800-500-6855
Phone number outside of North America: Visit www.lifetechnologies.com/support, select the link for phone support, and select the appropriate country from the dropdown menu.

**Limited product warranty**

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