



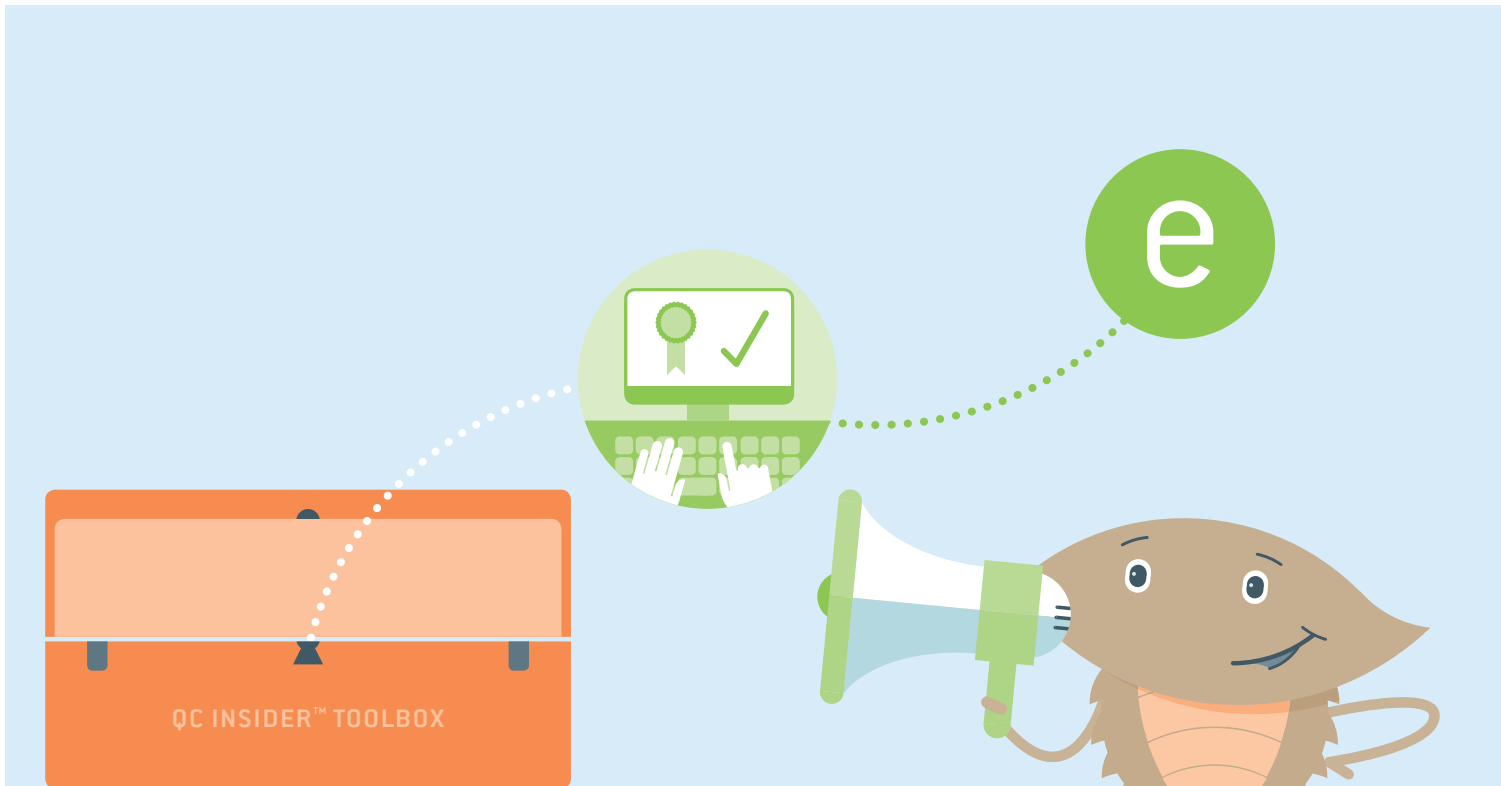
Bioscience Solutions

**Lonza**

## QC Testing Catalog 2018



# QC Insider™ e-Learning



## Endotoxin Training at Your Own Pace with Your Chosen Content

Seminars and workshops are great ways to transfer knowledge but at the same time require significant dedication of time. Participants may also find that with pre-defined course content, their individual training needs are not fully met by these types of programs.

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- Learning at your own pace as your schedule permits
- No travel costs
- Creating customized training packages targeted to your training needs
- An integrated test and certification

**TRAINING**

Turn your endotoxin testing team into QC Insider™ experts today.

[www.lonza.com/elearning](http://www.lonza.com/elearning)

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## How to Use this Catalog

This section explains some tools and hints we have included in this catalog to help you find the information you need at a glance.

### Icons

The icons below refer to additional product-related information, how to reach Customer Service or Scientific Support and additional purchase details.

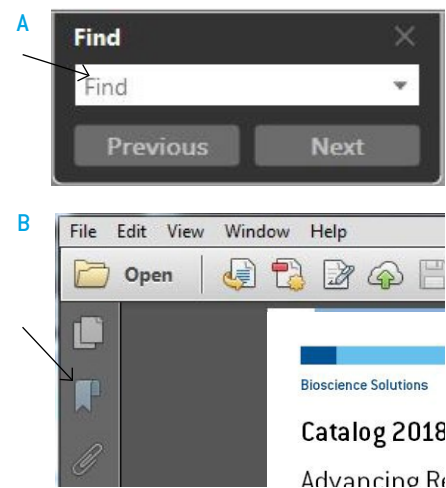
-  Great additions to our expanding products portfolio
-  Additional product or technical information available online
-  Contact our Customer Service or Scientific Support Representatives for additional information or ordering assistance
-  Ordering information and instructions
-  Product related scientific references
-  Storage conditions

### How to Search the Digital Version of the Catalog

A PDF can be searched in different ways:

1. Press “Control + F” (or Command + F” on a Mac), a search field will become available in the upper right corner, (A). Enter a product number or other term and click “Enter”, by clicking “Enter” again or the Previous/Next buttons you will jump to the next listing of your search.
2. Use the “Bookmark” feature either in the upper right corner or by selecting the ribbon icon, (B) in the left menu in order to jump to a specific section of the catalog.

In addition, you will find links on the “Table of Contents” at the front of the catalog as well as at the beginning of each chapter and on the “About Lonza” page.



## How to Order

There are several ways to order your products of choice with Lonza: via our online shop, e-mail, phone, fax or mail.

### Online Ordering

Our website encompasses an extensive product portfolio. Along with the essential tools needed to manage your electronic purchases, you will find the process simple, secure and reliable.

Our website offers:

- Highest security standards
- Ordering available 24 hours, 7 days a week
- Latest technical, application, and safety information for our products
- Sales tax, shipping charges, and expected shipping dates displayed before order is placed
- Certificates of Analysis

To order, you need a valid credit card (MasterCard®, VISA® or American Express®) or purchase order, and a shipping address. Our system will always inform you of inventory availability as you add items to your shopping basket on the top center of the website.

Go to: <http://www.lonza.com> to access our online shop. To find your product of interest, please enter the Catalog Number into the search field in the center of the webpage.

Enter catalog number here

### Quick Order Form

It's easy and saves time.

If you already know the Catalog Numbers and quantities of the products you would like to purchase in our online shop, you may use the Quick Order Form (see screenshot) available at <http://www.lonza.com/quickorder>

### Ordering via Ariba® or Other Third Party Providers

We support Ariba® and other third party purchasing systems through secure cXML communications. You have the choice of purchasing via a pricelist (CIF electronic catalog) or using a punch-out catalog system. We also accept and support EDI standards 850 (purchase order) and 810 (sales invoice), if your company conducts electronic transactions using EDI protocols.

Please contact us if you would like to purchase products using any of these types of electronic transmissions.

### Direct Ordering via cXML

If you have developed your own internal purchasing system, you can link directly to our order entry systems via secure cXML communications protocols. Please contact us if you would like to discuss using this type of system to place your orders.

For prompt response to your e-commerce questions, please e-mail us at [ecommerce@lonza.com](mailto:ecommerce@lonza.com).

## How to Order

Continued

### Ordering via E-mail, Phone, Fax or Mail

Please include all of the following information on all of your orders:

- Purchase order number
- Shipping address and billing address
- Contact name and telephone number
- Name and department of end user
- Quote or reserve lot information
- Catalog Number, size, quantity, and name of products ordered

To place an order with our Customer Service, please use any of the following convenient options:

#### North America

Hours: Monday through Friday, 8:00am to 6:00pm EST

E-mail: [order.us@lonza.com](mailto:order.us@lonza.com)

Phone: 800 638 8174

Fax: 301 845 8338

#### Mail

Lonza Walkersville, Inc.  
Customer Service Department  
8830 Biggs Ford Road  
Walkersville, MD 21793 USA

#### Europe

Hours: Monday through Friday, 8:30am to 5:30pm CET

E-mail: [order.europe@lonza.com](mailto:order.europe@lonza.com)

#### Customer Service European Office Numbers

|                 | Phone          | Fax            |
|-----------------|----------------|----------------|
| Austria         | 0800 201 538   | 0800 201 536   |
| Belgium         | +32 87 321 611 | +32 87 321 634 |
| Denmark         | 808 83 159     | 808 83 178     |
| France          | 0800 91 19 81  | 0800 91 19 80  |
| Germany         | 0800 182 52 87 | 0800 182 52 78 |
| Ireland         | 1 800 654 253  | 1 800 654 259  |
| Italy           | 800 789 888    | 800 789 889    |
| Spain           | 900 963 298    | 900 963 299    |
| Sweden          | 020 790 220    | 020 797 710    |
| Switzerland     | 0800 83 86 20  | 0800 83 86 19  |
| The Netherlands | 0800 022 4525  | 0800 022 4942  |
| United Kingdom  | 0808 2349 788  | 0808 2349 778  |

#### Mail

Lonza Verviers, S.p.r.l.  
Parc Industriel de Petit-Rechain  
4800 Verviers, Belgium

#### Ordering Information – Outside the U.S. and Europe

|           | Phone  | Fax               |
|-----------|--|-------------------|
| Argentina | +54 34 8442 4343   | +54 34 8442 4343  |
|           | E-mail: <a href="mailto:argentina.info@lonza.com">argentina.info@lonza.com</a>                   |                   |
| Australia | +61 3 9550 0883  | +61 3 9550 0890   |
|           | E-mail: <a href="mailto:bioscience.australia@lonza.com">bioscience.australia@lonza.com</a>       |                   |
| China     | +86 21 6340 3488   | +86 21 6340 3308  |
|           | E-mail: <a href="mailto:lbs.china@lonza.com">lbs.china@lonza.com</a>                             |                   |
| Brazil    | +55 11 5641 3325   | +55 11 2274 00 51 |
|           | E-mail: <a href="mailto:contact.br@lonza.com">contact.br@lonza.com</a>                           |                   |
| India     | +91 22 4342 4000   | +91 22 4342 4050  |
|           | E-mail: <a href="mailto:scientificsupport.india@lonza.com">scientificsupport.india@lonza.com</a> |                   |
| Japan     | +81 3 5566 0612  | +81 3 5566 0619   |
|           | E-mail: <a href="mailto:scientific.support.jp@lonza.com">scientific.support.jp@lonza.com</a>     |                   |
| Singapore | +65 6521 4379  | +65 6521 4378     |
|           | E-mail: <a href="mailto:bioscience.asia@lonza.com">bioscience.asia@lonza.com</a>                 |                   |

If your country is not listed above, please check the current list of Lonza global distributors on our website:

[www.lonza.com/dist](http://www.lonza.com/dist)

In the event that you do not find an authorized distributor for your country in the list, please contact:

#### Lonza Walkersville, Inc.

Customer Service Department  
8830 Biggs Ford Road  
Walkersville, MD 21793 USA  
Phone: +1 301 898 7025  
Fax: +1 301 845 8338

or

#### Lonza Verviers, S.p.r.l.

Verviers, Belgium  
Phone: +32 87 321 611  
Fax: +32 87 351 967  
E-mail: [info.europe@lonza.com](mailto:info.europe@lonza.com)


## Terms and Conditions

Please visit our website to find the current terms and conditions:

[www.lonza.com/termsandconditions](http://www.lonza.com/termsandconditions)

## How to Get Scientific Support

Providing world-class technical support for our products is a top priority. Valuable information is available to you around the clock in our QC Insider™ Toolbox, which contains comprehensive support tools that help users perform the bacterial endotoxins test. The QC Insider™ Toolbox puts support right at your fingertips and is designed for novices and experts alike: [www.lonza.com/qcinsider](http://www.lonza.com/qcinsider).

 [www.lonza.com/coa](http://www.lonza.com/coa)

To access Certificates of Analysis

### – Safety Data Sheets

They can be accessed via the specific product page and are available after log-in.

Our Scientific Support Representatives rely on years of laboratory experience to assist with product selection and help you maximize product performance. Do you need advice on which products suit your projects? Do you need support on a challenging experiment?

## Get in Touch with Our Scientific Support Team by Phone or E-mail:

### Scientific Support North America

Hours: Monday through Friday, 8:00am to 6:00pm EST

Phone: 800 521 0390

Fax: 301 845 8338

E-mail: [scientific.support@lonza.com](mailto:scientific.support@lonza.com)

Phone from outside the US: +1 301 898 7025

### Scientific Support International

Hours: Monday through Friday; 9:00am and 6:00pm CET

Phone: +32 87 321 611

E-mail: [scientific.support.eu@lonza.com](mailto:scientific.support.eu@lonza.com)

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|                            |             |
|----------------------------|-------------|
| Endotoxin Challenge Vials™ | PyroTec™    |
| Kinetic-QCL™               | PyroWave™   |
| Kinectic SmartStop™        | QC Insider™ |
| PyroGene™                  | QCL-1000™   |
| PYROGENT™                  | SpeedFill™  |
| PYROSPERSE™                | WinKQCL™    |

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Various components of PyroGene™ are protected under the following patents: Israel 71,906; Japan 2,129,487 & 2,644,447; Korea 51,077; Mexico 164,250; Norway 173,944; New Zealand 208,259; Philippines 25,395; South Africa 843,914; Spain 532,825; Taiwan 50,740. Additional Patents Pending.

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## QC Insider™ Toolbox

Endotoxin Expertise At Your Fingertips™

The QC Insider™ Toolbox has been designed for endotoxin testing novices as well as experts to provide endotoxin testing expertise at any level. The online portal contains a comprehensive offering of beginner and advanced support tools, a wide range of training resources, and a library of information that can be accessed at any time and from anywhere with internet access. The QC Insider™ Toolbox is organized into three categories so that users can easily navigate directly to the support tool they need.



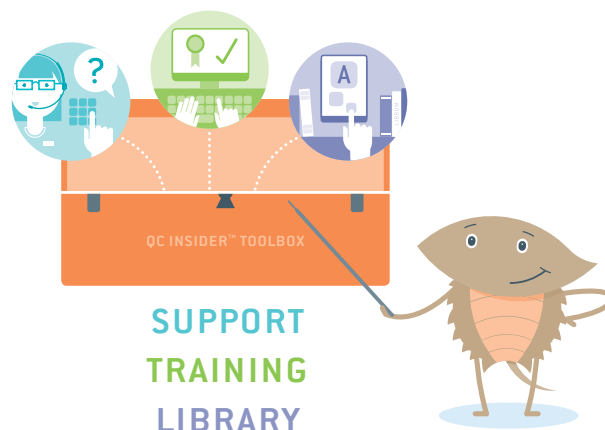
The **QC Insider™ Support** offers one-on-one guidance, detailed information about software support, recertification and testing services, reader installation and maintenance, and workflow optimization.



The **QC Insider™ Training** contains self-directed training resources that will help users increase their endotoxin testing expertise, including a series of how-to videos that demonstrate different assay procedures.



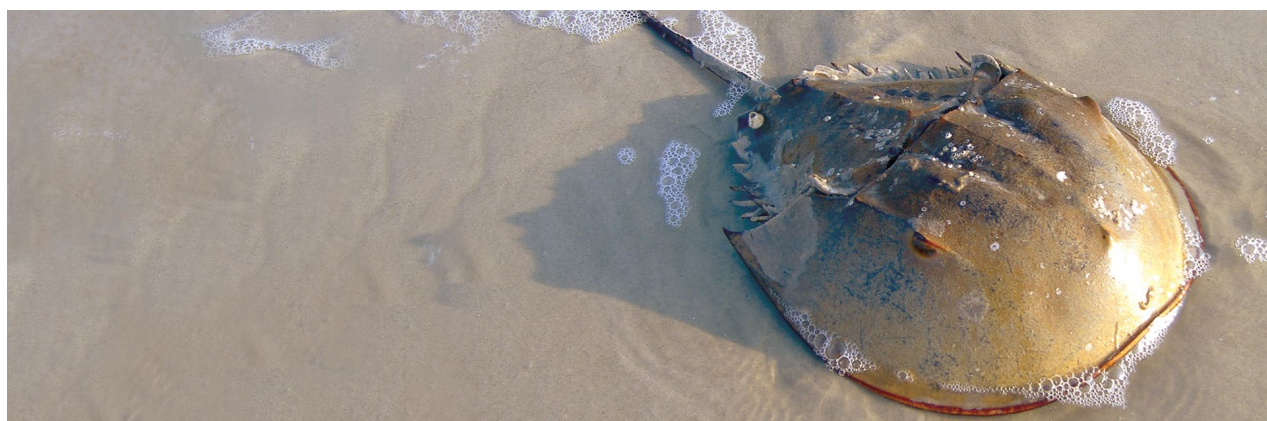
The **QC Insider™ Library** consists of technical resources such as package inserts, quick guides, and technical tips that will help lead to success with endotoxin testing.



Become a QC Insider™ Expert today and ensure the support you need is always within reach.

 [www.lonza.com/qcinsider](http://www.lonza.com/qcinsider)





## Endotoxin Detection Assays

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## Introduction

1

### Endotoxin Detection: A Brief History

Ever since the pharmaceutical industry began manufacturing injectables, pyrogen detection tests have been an absolute necessity. Pyrogens are substances that can cause fever, shock, and even death if high levels are introduced into the body. Endotoxins are natural compounds found in the outer cell membrane of Gram-negative bacteria and are released upon cell lysis. Endotoxins are a type of pyrogen. Today, endotoxin detection tests are performed on raw materials, in-process materials, and for the final release of pharmaceutical and medical device products.

For most of the 20th century the rabbit pyrogen test was the standard method of testing for pyrogenicity. This test, which takes approximately four hours, is accomplished by injecting the drug being analyzed into a rabbit's ear. If the animal develops a fever it confirms the presence of pyrogens.


The LAL (Limulus Amebocyte Lysate) test was commercially introduced in the 1970s. LAL is derived from the blood cells, or amebocytes, of the Atlantic horseshoe crab (Limulus polyphemus). LAL was developed into a test for endotoxin after Frederick Bang and Jack Levin observed that the amebocytes of the horseshoe crab contain a clotting agent that forms in the presence of Gram-negative bacteria. They recognized that this clotting agent could be used as a definitive way to test pharmaceutical drugs for the presence of Gram-negative bacteria and their endotoxins. In a notice published in the Federal Register on November 4, 1977, the FDA described conditions for the use of LAL as an end-product test for endotoxin in human biological products and medical devices. The FDA widely recognizes that the LAL test is much faster, more economical, and more efficient than the rabbit pyrogen test. In addition, the LAL test is less labor intensive than the rabbit test, which makes it possible to perform many tests in a single day.

To obtain the lysate required for the LAL test, horseshoe crabs are taken from the ocean floor and a small amount of their blood is drawn. The animals are then returned to the sea unharmed. The crab's blood cells, or amebocytes, are then separated and lysed to obtain the cellular proteins.

As LAL became the preferred endotoxin detection test, different methods were developed, each method with its own unique benefits. For example, Gel Clot LAL (PYROGENT™) provides a simple positive/negative result and is mentioned in most pharmacopeial monographs as the official referee test. The kinetic turbidimetric LAL assay (PYROGENT™-5000) gives a quantitative result and offers an economical choice for water or large volume parenterals. The endpoint chromogenic LAL test (QCL-1000™) offers a quantitative result and exhibits less product interference than LAL methods utilizing the clotting protein. Our most sensitive LAL assay, the kinetic chromogenic LAL assay (Kinetic-QCL™), provides the benefit of less product interference for proteins, vaccines, LAL, and other biologicals while also being able to detect as low as 0.005 EU/mL.

Currently the FDA, the United States Pharmacopeia (USP), the European Pharmacopeia (EP), and the Japanese Pharmacopeia (JP) accept all of the above LAL methods, as do most individual country pharmacopeias.

More recently, Lonza scientists have developed a reliable and sustainable endotoxin detection test method that is not derived from horseshoe crab blood. The PyroGene™ Assay is based on the recombinantly expressed Factor C, which is the first component in the LAL clotting cascade activated by endotoxin. It is specific for endotoxin and offers a reliable alternative for endotoxin release testing. The PyroGene™ Assay promises to reduce the dependence on animal-based endotoxin assays. In 2009, the FDA approved 510(K) applications that included the PyroGene™ Assay as the final release test. The latest FDA Guidance for Industry document on "Pyrogen and Endotoxins Testing: Questions and Answers" from 2012 accepts the use of PyroGene™ as an alternative method. Please refer to page 20 for further information.

 [www.lonza.com/lal](http://www.lonza.com/lal)

## Overview of LAL Testing Procedures

There are four basic types of assays, each of which is designed to perform a different aspect of LAL testing. Our WinKQCL™ Software supports all of these assay types and is the ideal tool to accompany your quantitative endotoxin assays. It offers a fully integrated and compliant solution for reporting and analyzing your endotoxin assay results.

### Routine

A routine assay calculates the concentration of endotoxin in unknowns by comparison to the performance of a series of endotoxin standards. As part of a routine assay, the user has the option to include a Positive Product Control (PPC) as a monitor for product inhibition or enhancement. A PPC is a sample of product to which a known amount of endotoxin has been added. For quantitative assays, our WinKQCL™ Software automatically calculates the amount of endotoxin recovered in the PPC and compares it to the known amount of the endotoxin in the well to give the user a percentage of recovery.

### Inhibition/Enhancement

The Limulus Amebocyte Lysate reaction is enzyme mediated and, as such, has an optimal pH range, specific salt concentrations, and divalent cation requirements. Occasionally, test samples may alter these optimal conditions to an extent that the lysate is rendered insensitive to endotoxin. Negative results with samples that inhibit the LAL test do not necessarily indicate the absence of endotoxin.

An inhibition/enhancement assay is designed to determine what level of product dilution or other treatment overcomes inhibition or enhancement. Each product dilution must be accompanied by a Positive Product Control (PPC). For quantitative assays, our WinKQCL™ Software calculates the amount of endotoxin recovered in the PPC for comparison to the known amount of endotoxin spike. In this manner it can

be determined which product dilutions are non-interfering.

### RSE/CSE

An RSE/CSE assay is designed to determine the potency of a Control Standard Endotoxin (CSE) in terms of the concentration units of the Reference Standard Endotoxin (RSE). The assay requires a single series of RSE dilutions and one or more sets of dilutions of the CSE. If you buy matched reagents, Lonza has already performed this test for you. Our CSE is matched against the USP RSE. Matched CSE is either part of the kit or is available separately.

### Initial Qualification

An Initial Qualification assay is required as part of the validation of the LAL assay and is also to be performed with each new lot of reagents. It serves to confirm reagent performance and assure reproducibility. In addition, it shows analyst qualification. For this assay, a series of endotoxin standards is prepared and tested in at least triplicate. To confirm sensitivity/linearity, the test result must meet regulatory requirements as defined by the pharmacopeia. For gel clot assays, the determined end-point must fall between 2  $\lambda$  and 0.5  $\lambda$  of the labeled sensitivity. For the quantitative assays, the results are used to generate a standard curve which must have a correlation coefficient of  $\geq |0.980|$ . The Initial Qualification assay does not provide for the inclusion of any samples.

## Overview of Endotoxin Detection Methods

1

### Endotoxin Detection Methods

**Qualitative**  
(Yes/No Answer)

**Product: PYROGENT™ Gel Clot LAL Assay**

- **Method** – Visual inspection of gel formation
- **Maximum sensitivity** – 0.03 EU/mL
- **Instrument required** – A dry heat block or water bath
- **Benefits**
  - Simple LAL test not requiring sophisticated instrumentation and software



# Overview of Endotoxin Detection Methods

Continued

## Quantitative

(Results calculated from standard curve)

### Product: Kinetic-QCL™ Kinetic Chromogenic LAL Assay

- **Method** – Kinetic measurement of color development
- **Maximum sensitivity** – 0.005 EU/mL
- **Instrument required** – Incubating absorbance reader

#### ■ Benefits

- Our most sensitive LAL-based method
- Less sensitive to product inhibition
- Ideal for biological products such as vaccines and antibiotics

### Product: QCL-1000™ Endpoint Chromogenic LAL Assay

- **Method** – Endpoint measurement of color development
- **Maximum sensitivity** – 0.1 EU/mL
- **Instrument required** – Spectrophotometer or absorbance reader, dry heat block

#### ■ Benefits

- Results in 16 minutes

### Product: PYROGENT™-5000 Kinetic Turbidimetric LAL Assay

- **Method** – Kinetic measurement of turbidity development
- **Maximum sensitivity** – 0.01 EU/mL
- **Instrument required** – Incubating absorbance reader

#### ■ Benefits

- Cost-effective method for water and large volume parenterals

### Product: PyroGene™ Recombinant Factor C Assay

- **Method** – Endpoint measurement of fluorescence
- **Maximum sensitivity** – 0.005 EU/mL
- **Instrument required** – Incubating fluorescence reader

#### ■ Benefits

- Elimination of false positive glucan reactions
- Less lot-to-lot variability
- Animal-free source and security of supply
- FDA acknowledged alternative to LAL

## Kinetic Chromogenic LAL Assay Overview

1

The Kinetic-QCL™ Kinetic Chromogenic Assay is a quantitative, kinetic assay for the detection of Gram-negative bacterial endotoxin. A sample is mixed with the reconstituted LAL reagent in a 96-well plate and placed in an incubating absorbance plate reader that measures absorbance at 405nm. The reaction is automatically monitored over time for the appearance of a yellow color.

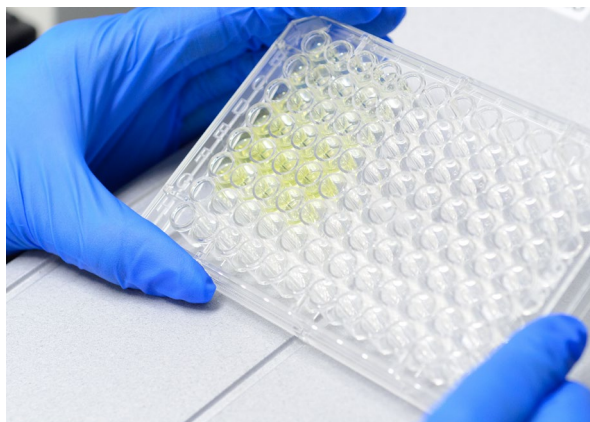
In the presence of endotoxin the lysate will begin to cleave the chromogenic substrate, causing the solution to become yellow. The time required for the change is inversely proportional to the amount of endotoxin present. The concentration in unknown samples can be calculated from a standard curve. Due to the nature of this assay, the Kinetic-QCL™ Assay is less impacted by inhibitory products that may interfere with the clotting mechanism in turbidimetric and gel clot assays. This feature, along with the sensitivity range of 0.005 to 50 EU/mL, makes this assay optimal for biological products such as vaccines and antibiotics.

Using our extensive experience and practical expertise with endotoxin detection and its regulatory requirements, Lonza has developed an integrated system to support quantitative endotoxin detection. Each system component has been validated and can be verified. This all leads to reliable, reproducible, and accurate quantitative results.

Each quantitative system incorporates three elements:

- Kinetic-QCL™ Kinetic Chromogenic LAL Assay
- WinKQCL™ Endotoxin Detection and Analysis Software
- Incubating Absorbance Plate Reader

These elements integrate seamlessly to meet your testing requirements, providing meaningful results that allow you to be confident in your critical decisions.



### ■ Benefits

- Sensitivity range from 0.005 to 50 EU/mL

### ■ Applications

- Ideal for biological products such as vaccines and antibiotics

### ■ Requirements

- Incubating Absorbance Plate Reader
- WinKQCL™ Software
- LAL Reagent Water (for larger kits)
- Pyrogen-free Test Tubes
- LAL Reagent Grade Multi-well Plates

## Kinetic-QCL™ Kinetic Chromogenic LAL Assay

The Kinetic-QCL™ Kinetic Chromogenic Assay kit contains co-lyophilized lysate/substrate and matched control standard endotoxin (Cat. No. 50-650U also contains LAL Reagent Water).


Kinetic Chromogenic LAL and matched control standard endotoxin are packaged separately but should be ordered together. These bulk configurations are made to order and therefore require a lead time. **Bulk kit configurations are also available\***.

Please contact Customer Service for more information.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/kqcl](http://www.lonza.com/kqcl)

 2° C to 8°C



### ■ Benefits

- Sensitivity range from 0.005 to 50 EU/mL
- Less sensitive to product inhibition than assays requiring gel formation
- Available in 192-, 2040-, and 2400-test kit and bulk configurations

### Ordering Information – Kinetic-QCL™ Kinetic Chromogenic LAL Assay

| Cat. No. NA | Cat. No. EU | Product Name                                    | Product Description   | Size        | Sensitivity (EU/mL) |
|-------------|-------------|---|---|-------------|---------------------|
| 50-650U     | 50-650U     | Kinetic-QCL™ Kinetic Chromogenic LAL Assay      | 8 × 24 tests/vial Lysate, 2 vials endotoxin, 3 × 30 mL vial LAL Reagent Water | 192 tests   | 0.005 to 50         |
| 50-650NV    | 50-650NV    | Kinetic-QCL™ Kinetic Chromogenic LAL Assay      | 85 × 24 tests/vial Lysate, 15 vials endotoxin                                 | 2,040 tests | 0.005 to 50         |
| 50-650H     | 50-650H     | Kinetic-QCL™ Kinetic Chromogenic LAL Assay      | 100 × 24 tests/vial Lysate, 10 vials endotoxin                                | 2,400 tests | 0.005 to 50         |
| *K50-643L   | *K50-643L   | Kinetic-QCL™ Bulk Kinetic Chromogenic LAL Assay | 25 × 24 tests/vial Lysate   | 600 tests   | 0.005 to 50         |
| *K50-643U   | *K50-643U   | Kinetic-QCL™ Bulk Kinetic Chromogenic LAL Assay | 100 × 24 tests/vial Lysate  | 2,400 tests | 0.005 to 50         |

\*LAL and CSE are packaged separately but must be ordered together. this requires E50-643L

## Control Standard Endotoxin for Kinetic-QCL™ Bulk Kinetic Chromogenic LAL

The Control Standard Endotoxin, derived from *E. coli* 055:B5, is referenced against the USP Reference Standard Endotoxin.

### Ordering Information – Control Standard Endotoxin for Kinetic-QCL™ Bulk Kinetic Chromogenic LAL

| Cat. No. NA | Cat. No. EU | Product Name   | Product Description | Size     |
|-------------|-------------|--|---------------------|----------|
| E50-643L    | E50-643L    | Control Standard Endotoxin for Kinetic-QCL™ Bulk Kinetic Chromogenic LAL, <i>E. coli</i> Strain 055:B5 | 50 EU/mL            | 25 vials |

Control Standard Endotoxin, (E50-643L), for use with K50-643L/U


| Related Products                                   | Page |
|--|------|
| WinKQCL™ Endotoxin Detection and Analysis Software | 34   |
| ELx808™ Incubating Absorbance Plate Reader         | 381  |
| LAL Reagent Grade Multi-well Plates                | 388  |
| LAL Reagent Water (LRW)                            | 390  |
| Pyrogen-free Test Tubes                            | 387  |
| Pipette Tips and Reagent Reservoirs                | 389  |

## QCL-1000™ Endpoint Chromogenic LAL Assay

1

The QCL-1000™ Endpoint Chromogenic LAL Assay is the most rapid of the LAL tests. This chromogenic LAL method is based on the formation of a yellow color and is measured photometrically at 405–410 nm. With the QCL-1000™ Assay, a multichannel pipette, a dry heat block and a 96-well plate, you can run a quantitative endotoxin assay in 16 minutes. This assay can also be run in tubes.

For your convenience, Certificates of Analysis are available online:


 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/qcl1000](http://www.lonza.com/qcl1000)

### ■ Benefits

- Less sensitive to product inhibition than assays requiring gel formation
- Sensitivity from 0.1 to 1 EU/mL
- Quantitative results in 16 minutes
- Flexible format - use test tubes or 96-well plates
- Can be run with a simple spectrophotometer, no need for incubating absorbance plate reader



 2°C to 8°C

### Ordering Information – QCL-1000™ Endpoint Chromogenic LAL Assay

| Cat. No. NA | Cat. No. EU | Product Name                             | Product Description  | Size      | Sensitivity (EU/mL) |
|-------------|-------------|--|--|-----------|---------------------|
| 50-647U     | 50-647U     | QCL-1000™ Endpoint Chromogenic LAL Assay | 5 × 24 tests/vial Lysate, 1 × 1 mL vial endotoxin, 2 × 6.5 mL vial chromogenic substrate, 2 × 30 mL vial LAL Reagent Water | 120 tests | 0.1 to 1            |
| 50-648U     | 50-648U     | QCL-1000™ Endpoint Chromogenic LAL Assay | 5 × 60 tests/vial Lysate, 2 × 1 mL vial endotoxin, 5 × 6.5 mL vial chromogenic substrate                                   | 300 tests | 0.1 to 1            |

### Ordering Information – Control Standard Endotoxin for QCL-1000™ Endpoint Chromogenic LAL

| Cat. No. NA | Cat. No. EU | Product Name   | Product Description       | Size   | Sensitivity (EU/mL) |
|-------------|-------------|--|---------------------------|--------|---------------------|
| E50-640     | E50-640     | Control Standard Endotoxin for QCL-1000™ Endpoint Chromogenic LAL, <i>E. coli</i> Strain 0111:B4 | Endotoxin, 15 to 40 EU/mL | 1 vial | n/a                 |

E50-640 requires matched LAL

| Related Products                           | Page |
|--|------|
| LAL Reagent Water (LRW)                    | 390  |
| Pyrogen-free Test Tubes                    | 387  |
| LAL Reagent Grade Multi-well Plates        | 388  |
| LAL Reagent Reservoirs                     | 389  |
| Eppendorf® 2–200 µL Biopur® Pipette tips   | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips | 389  |
| Heat Block and Adaptor                     | 390  |



## Kinetic Turbidimetric LAL Assay Overview

The PYROGENT™-5000 Assay is a quantitative, kinetic assay for the detection of Gram-negative bacterial endotoxin. A sample is mixed with the reconstituted LAL reagent in a 96-well plate and placed in an incubating absorbance plate reader that measures absorbance at 340 nm. The reaction is automatically monitored over time for the appearance of turbidity.

In the presence of endotoxin the lysate will begin to gel, causing the solution to become cloudy or turbid. The time required for this change is inversely proportional to the amount of endotoxin present. The concentration in unknown samples can be calculated from a standard curve.

The PYROGENT™-5000 Assay is perfect for laboratories needing to process a large number of samples. It is ideal for water samples, large volume parenterals, and the water rinse from medical devices.

Using our extensive experience and technical expertise with endotoxin detection and its regulatory requirements, Lonza has developed an integrated system to support quantitative endotoxin detection. Each system component has been validated and can be verified. This all leads to reliable, reproducible, and accurate quantitative results.

Each quantitative system incorporates three elements:

- PYROGENT™-5000 Kinetic Turbidimetric LAL Assay
- WinKQCL™ Endotoxin Detection and Analysis Software
- Incubating Absorbance Plate Reader

These elements integrate seamlessly to meet your testing requirements, providing meaningful results that allow you to be confident in your critical decisions.



### ■ Benefits

- Sensitivity range from 0.01 to 100 EU/mL
- Select from a wide range of kit sizes

### ■ Applications

- Cost-effective method for water and large volume parenterals

### ■ Requirements

- Incubating Absorbance Plate Reader
- WinKQCL™ Software
- LAL Reagent Water
- Pyrogen-free Test Tubes
- LAL Reagent Grade Multi-well Plates


## PYROGENT™-5000 Kinetic Turbidimetric LAL Assay

The PYROGENT™-5000 kit contains turbidimetric lysate, reconstitution buffer for the lysate, and matched control standard endotoxin. Bulk kit configurations are available with the three assay components packaged separately. The kinetic turbidimetric LAL, reconstitution buffer, and matched Control Standard Endotoxin should be ordered together. These bulk configurations are made to order and therefore require a lead time. Please contact Customer Service for more information.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/turb](http://www.lonza.com/turb)

 2°C to 8°C



### ■ Benefits

- Sensitivity range from 0.01 to 100 EU/mL
- Available in 100-, 200-, 2250-, and 4500-test kit and bulk configurations

### Ordering Information –PYROGENT™-5000 Kinetic Turbidimetric LAL Assay

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description  | Size         | Sensitivity (EU/mL) |
|-------------|-------------|---|--|--------------|---------------------|
| N383        | N383        | PYROGENT™-5000 Kinetic Turbidimetric LAL Assay      | 2 × 50 tests/vial Lysate, 2 vials reconstitution buffer, 1 vial endotoxin      | 100 tests    | 0.01 to 100         |
| N384        | N384        | PYROGENT™-5000 Kinetic Turbidimetric LAL Assay      | 2 × 100 tests/vial Lysate, 2 vials reconstitution buffer, 1 vial endotoxin     | 200 tests    | 0.01 to 100         |
| N588        | N588        | PYROGENT™-5000 Kinetic Turbidimetric LAL Assay      | 45 × 50 tests/vial Lysate, 45 vials reconstitution buffer, 10 vials endotoxin  | 2,250 tests  | 0.01 to 100         |
| N688        | N688        | PYROGENT™-5000 Kinetic Turbidimetric LAL Assay      | 45 × 100 tests/vial Lysate, 45 vials reconstitution buffer, 10 vials endotoxin | 4,500 tests  | 0.01 to 100         |
| T50-300L    | T50-300L    | PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL Assay | 25 × 50 tests/vial Lysate  | 1,250 tests  | 0.01 to 100         |
| T50-300U    | T50-300U    | PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL Assay | 100 × 50 tests/vial Lysate   | 5,000 tests  | 0.01 to 100         |
| T50-600L    | T50-600L    | PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL Assay | 25 × 100 tests/vial Lysate   | 2,500 tests  | 0.01 to 100         |
| T50-600U    | T50-600U    | PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL Assay | 100 × 100 tests/vial Lysate  | 10,000 tests | 0.01 to 100         |

Bulk Assay require matched endotoxin

## Reconstitution Buffer for PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL

The reconstitution buffer is provided for rehydration of the PYROGENT™-5000 LAL Reagent.

### Ordering Information –PYROGENT™-5000 Bulk Kinetic Turbidimetric Reconstitution Buffer

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description                | Size      |
|-------------|-------------|---|------------------------------------|-----------|
| B50-300L    | B50-300L    | PYROGENT™-5000 Bulk Kinetic Turbidimetric Reconstitution Buffer | Reconstitution buffer for T50-300L | 25 vials  |
| B50-300U    | B50-300U    | PYROGENT™-5000 Bulk Kinetic Turbidimetric Reconstitution Buffer | Reconstitution buffer for T50-300U | 100 vials |
| B50-600L    | B50-600L    | PYROGENT™-5000 Bulk Kinetic Turbidimetric Reconstitution Buffer | Reconstitution buffer for T50-600L | 25 vials  |
| B50-600U    | B50-600U    | PYROGENT™-5000 Bulk Kinetic Turbidimetric Reconstitution Buffer | Reconstitution buffer for T50-600U | 100 vials |

## Control Standard Endotoxin for PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL

The Control Standard Endotoxin, derived from *E. coli* 055:B5, is referenced against the USP Reference Standard Endotoxin.

### Ordering Information – Control Standard Endotoxin for PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL

| Cat. No. NA | Cat. No. EU | Product Name   | Product Description | Size     | Sensitivity |
|-------------|-------------|--|---------------------|----------|-------------|
| 7460L       | 7460L       | Control Standard Endotoxin for PYROGENT™-5000 Bulk Kinetic Turbidimetric LAL, <i>E. coli</i> Strain 055:B5 | 100 EU/mL           | 25 vials | n/a         |

Matched LAL required

| Related Products                                   | Page |
|--|------|
| WinKQCL™ Endotoxin Detection and Analysis Software | 34   |
| ELx808™ Incubating Absorbance Plate Reader         | 381  |
| LAL Reagent Grade Multi-well Plates                | 388  |
| LAL Reagent Water (LRW)                            | 390  |
| Pyrogen-free Test Tubes                            | 387  |
| Pipette Tips and Reagent Reservoirs                | 389  |

# PyroGene™ Recombinant Factor C Assay

1

Endotoxin Detection Assays

The PyroGene™ Recombinant Factor C Assay is an animal-free alternative to LAL that has been accepted by the FDA as an alternative method.\* It is based on a recombinantly produced form of Factor C (rFC), the first component in the horseshoe crab clotting cascade. It is activated by endotoxin binding. The active moiety created then acts to cleave a synthetic substrate, which results in the release of a fluorophore. The reaction is run in a 96-well microplate and measured at time zero and again after a one-hour incubation in a fluorescence microplate reader using excitation/emission wavelengths of 380/440 nm.

A global, multi-center study demonstrated that the recovery of endotoxin from water and other tested products using the PyroGene™ Recombinant Factor C Assay was comparable to that of LAL-based methods. The results of the assay validation were published in the Pharmacopeial Forum Vol. 36(1) (Jan. – Feb. 2010).

In June 2012, the FDA issued the document “Guidance for Industry - Pyrogen and Endotoxins Testing: Questions and Answers” which allows for the use of a recombinant Factor C based assay as an alternative to Limulus Amebocyte Lysate (LAL)-based assays. In July 2016, rFC became officially recognized by the European Pharmacopoeia (Ph. Eur.) as an alternative endotoxin detection methodology to the LAL and Rabbit Pyrogen Tests in the new draft of Chapter 5.1.10.

USP 28–NF 33 General Notices allows alternative methods if they provide advantages regarding accuracy, sensitivity, precision, selectivity, or adaptability to automation. However, to use these alternative methods for final release testing, one may need to validate the test method on their products as described in the general chapter “Validation of Compendial Procedures” <1225> and it must be shown to give equivalent or better results.

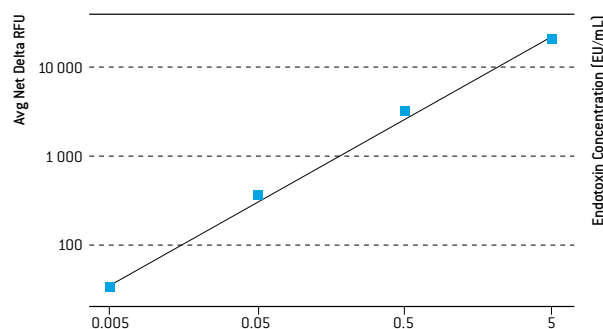
Each quantitative system incorporates three elements:

- PyroGene™ Recombinant Factor C Assay
- WinKQCL™ Endotoxin Detection and Analysis Software
- Fluorescence Plate Reader

These elements integrate seamlessly to meet your testing requirements, providing meaningful results that allow you to be confident in your critical decisions.

## ■ Applications

- Water testing
- In-process testing
- Final release testing
- Testing plant-based material



Standard curve illustrating assay range from 0.005 to 5 EU/mL

## ■ Benefits

- Sensitivity range from 0.005 to 5 EU/mL
- Higher endotoxin specificity
- Elimination of false positive glucan reactions
- Less lot-to-lot variability
- Animal-free
- Security of supply
- FDA acknowledged alternative to LAL

## ■ Requirements

- Incubating fluorescence reader
- WinKQCL™ Software
- Pyrogen-free test tubes
- LAL reagent grade multi-well plates
- LAL Reagent Water (for larger kits)

For your convenience, Certificates of Analysis are available online:

[www.lonza.com/coa](http://www.lonza.com/coa)

[www.lonza.com/pyrogene](http://www.lonza.com/pyrogene)

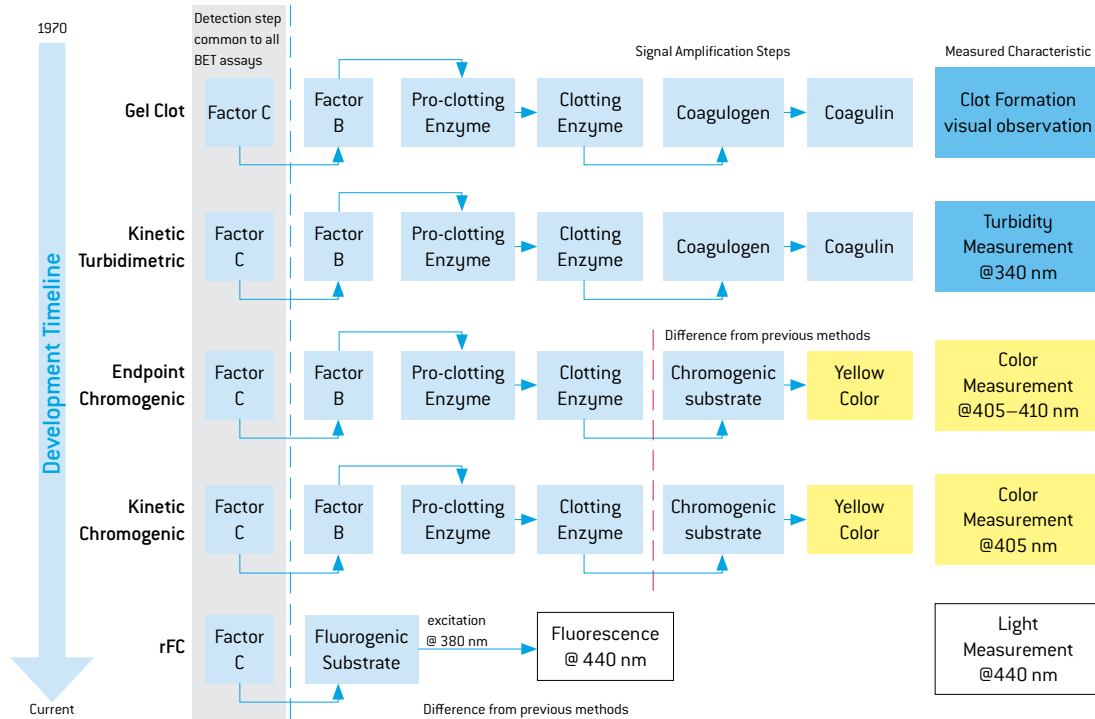
2°C to 8°C

\* According to the FDA “Guidance for Industry - Pyrogen and Endotoxins Testing: Questions and Answers” document from June 2012, alternative assays should be validated as described in the USP General Chapter <1225>, “Validation of Compendial Procedures”.

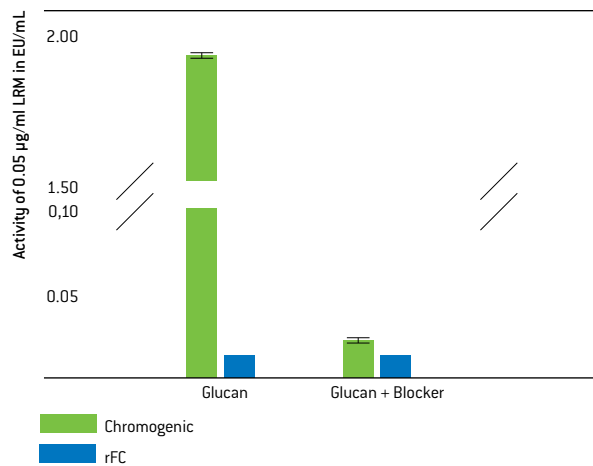
# PyroGene™ Recombinant Factor C Assay

Continued

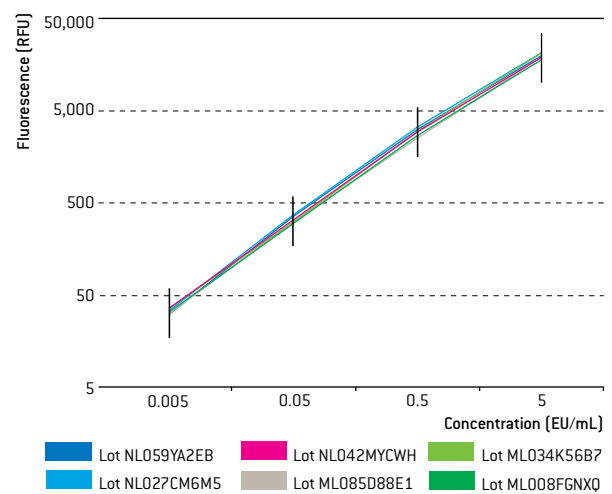
## Comparison of Amplification Methods in Bacterial Endotoxin Detection Assays



rFC is the same binding protein operating in the LAL assay. The activated recombinant Factor C enzyme cleaves a substrate directly instead of activating another enzyme in a series (the LAL cascade). The substrate has a fluorescent tag, which gives a wide dynamic range with better resolution.



Comparison of reactivity towards glucans between kinetic chromogenic LAL and rFC. The false positive signal from the LAL assay is reduced in the presence of a glucan blocker. rFC does not detect any glucan activity; it is endotoxin-specific.

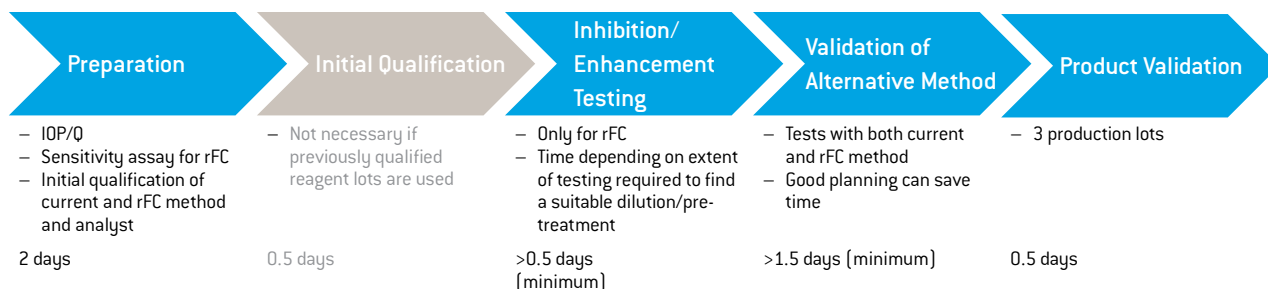


Endotoxin standard curves using 6 different lots of rFC. The log net fluorescence is proportional to the log endotoxin concentration and is linear in the 0.005 - 5 EU/mL range. Lot-to-lot standard curves exhibit excellent reproducibility.

## PyroGene™ Validation Timeline

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A possible validation scheme is outlined below. One validation can be accomplished in as little as 5 days, assuming that the product has been previously validated with a quantitative LAL method. The validation scheme is identical to that which would be needed for any LAL-based method with just the addition of one extra step— "Validation of alternative method". Lonza offers a full validation protocol that can be followed for your convenience. For further information, please contact Scientific Support or your local sales representative.



### Ordering Information – PyroGene™ Recombinant Factor C Endpoint Fluorescent Assay

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description   | Size        | Sensitivity (EU/mL) |
|-------------|-------------|---|---|-------------|---------------------|
| 50-658U     | 50-658U     | PyroGene™ Recombinant Factor C Endpoint Fluorescent Assay | 2 × 96 tests/vial rFC enzyme solution, 2 × 6 mL vial fluorogenic substrate, 2 × 5 mL vial rFC assay buffer, 2 vials endotoxin, 2 × 30 mL vial LAL Reagent Water | 192 tests   | 0.005 to 5          |
| 50-658NV    | 50-658NV    | PyroGene™ Recombinant Factor C Endpoint Fluorescent Assay | 30 × 96 tests/vial rFC enzyme solution, 30 × 6 mL/vial fluorogenic substrate, 30 × 5 mL/vial rFC assay buffer, 10 vials endotoxin                               | 2,880 tests | 0.005 to 5          |

| Related Products                           | Page |
|--|------|
| Pyrogen-free Test Tubes                    | 387  |
| LAL Reagent Grade Multi-well Plates        | 388  |
| LAL Reagent Reservoirs                     | 389  |
| Eppendorf® 2–200 µL Biopur® Pipette tips   | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips | 389  |
| PyroWave™ XM Fluorescence Plate Reader     | 382  |

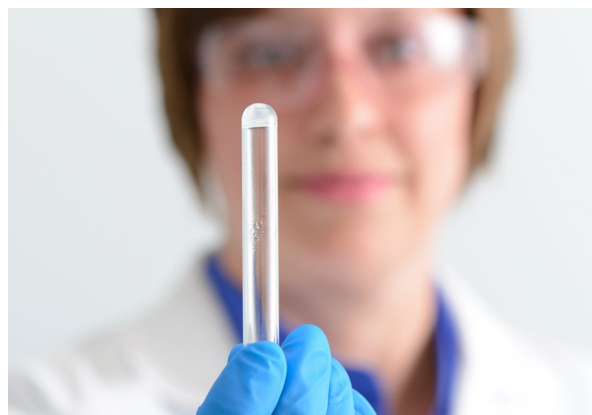
## PYROGENT™ Gel Clot LAL Assay Overview

The PYROGENT™ Gel Clot LAL Assay is a qualitative LAL test for Gram-negative bacterial endotoxin. The gel clot assay is performed in tubes that are placed in a water bath or dry heat block at 37°C. After a one-hour incubation period, the tubes are inverted 180°. A firm clot that stays in the bottom of the tube indicates a positive reaction. If liquid flows down the side of the tube, the result is negative for endotoxin.

Like other enzymatic reactions, the LAL assay is pH dependent. The PYROGENT™ lysate formulation contains a buffer to help with these adjustments. As a result, many products will not require pH adjustments prior to testing.

PYROGENT™ Gel Clot LAL kits are available in two formats:

|                             | Lysate | Matched Endotoxin |
|-----------------------------|--------|-------------------|
| PYROGENT™ Gel Clot LAL      | ■      |                   |
| PYROGENT™ Plus Gel Clot LAL | ■      | ■                 |



### ■ Benefits

- Easy-to-read qualitative results
- Simple LAL test not requiring sophisticated instrumentation and software
- Select from a wide range of kit sizes and sensitivities

### ■ Applications

- Water testing
- In-process testing
- Final release testing
- Testing plant-based material
- Testing acidic/basic material

### ■ Requirements

- A water bath or dry heat block
- LAL Reagent Water (LRW)
- Pyrogen-free test tubes

## PYROGENT™ Gel Clot LAL Assay

1


PYROGENT™ Gel Clot LAL Assay standard kit sizes include 250 tests and 80 tests. Both the 250- and 80-test kits require depyrogenated 10 × 75 mm glass reaction tubes to run the assay.


These kits do not include a matched control standard endotoxin. However, the standard can be purchased separately [Control Standard Endotoxin, page 377].


### ■ Benefits

- Sensitivities of 0.03, 0.06, 0.125, and 0.25 EU/mL available
- Easy-to-read qualitative results
- Also available as bulk kits

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/gelclot](http://www.lonza.com/gelclot)

 2°C to 8°C



### Ordering Information – PYROGENT™ Gel Clot LAL Assay (without endotoxin)

| Cat. No. NA | Cat. No. EU | Product Name                                     | Product Description      | Size      | Sensitivity (EU/mL) |
|-------------|-------------|--|--------------------------|-----------|---------------------|
| N183-06     | N183-06     | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 16 tests/vial Lysate | 80 tests  | 0.06                |
| N183-125    | N183-125    | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 16 tests/vial Lysate | 80 tests  | 0.125               |
| N194-03     | N194-03     | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 50 tests/vial Lysate | 250 tests | 0.03                |
| N194-06     | N194-06     | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 50 tests/vial Lysate | 250 tests | 0.06                |
| N194-125    | N194-125    | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 50 tests/vial Lysate | 250 tests | 0.125               |
| N184-25     | N184-25     | PYROGENT™ Gel Clot LAL Assay (without endotoxin) | 5 × 50 tests/vial Lysate | 250 tests | 0.25                |

Control Standard Endotoxin (CSE), must be purchased separately


| Related Products                            | Page |
|---|------|
| Control Standard Endotoxin for Gel Clot LAL | 377  |
| Bulk kits                                   | 376  |
| LAL Reagent Water (LRW)                     | 390  |
| Pyrogen-free Test Tubes                     | 387  |
| Eppendorf® 2–200 µL Biopur® Pipette tips    | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips  | 389  |




## PYROGENT™ Plus Gel Clot LAL Assay

The PYROGENT™ Plus Gel Clot LAL Assay combines PYROGENT™ LAL with a matched control standard endotoxin together in one kit box. Standard kit sizes include 4,000 tests, 200 tests, or 64 tests. These kits require depyrogenated 10 × 75 mm glass reaction tubes to run the assay.

These kits do include a matched control standard endotoxin. For your convenience, the Certificate of Analysis documenting the FDA and USP required RSE/CSE correlation is available online:


 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/gelclot](http://www.lonza.com/gelclot)



### ■ Benefits

- Sensitivities of 0.03, 0.06, 0.125 and 0.25 EU/mL available
- No need to purchase CSE separately
- Also available as bulk kits

 2°C to 8°C

### Ordering Information – PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description                           | Size        | Sensitivity [EU/mL] |
|-------------|-------------|---|---|-------------|---------------------|
| N283-06     | N283-06     | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 16 tests/vial Lysate, 1 vial endotoxin    | 64 tests    | 0.06                |
| N283-125    | N283-125    | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 16 tests/vial Lysate, 1 vial endotoxin    | 64 tests    | 0.125               |
| N294-03     | N294-03     | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 50 tests/vial Lysate, 1 vial endotoxin    | 200 tests   | 0.03                |
| N294-06     | N294-06     | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 50 tests/vial Lysate, 1 vial endotoxin    | 200 tests   | 0.06                |
| N294-125    | N294-125    | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 50 tests/vial Lysate, 1 vial endotoxin    | 200 tests   | 0.125               |
| N284-25     | N284-25     | PYROGENT™ Plus Gel Clot LAL Assay (with endotoxin)      | 4 × 50 tests/vial Lysate, 1 vial endotoxin    | 200 tests   | 0.25                |
| N494-03     | N494-03     | PYROGENT™ Plus Bulk Gel Clot LAL Assay (with endotoxin) | 80 × 50 tests/vial Lysate, 20 vials endotoxin | 4,000 tests | 0.03                |
| N494-06     | N494-06     | PYROGENT™ Plus Bulk Gel Clot LAL Assay (with endotoxin) | 80 × 50 tests/vial Lysate, 20 vials endotoxin | 4,000 tests | 0.06                |
| N494-125    | N494-125    | PYROGENT™ Plus Bulk Gel Clot LAL Assay (with endotoxin) | 80 × 50 tests/vial Lysate, 20 vials endotoxin | 4,000 tests | 0.125               |
| N288-25     | N288-25     | PYROGENT™ Plus Bulk Gel Clot LAL Assay (with endotoxin) | 80 × 50 tests/vial Lysate, 20 vials endotoxin | 4,000 tests | 0.25                |

### Related Products

| Related Products                           | Page |
|--|------|
| Bulk kits                                  | 376  |
| LAL Reagent Water (LRW)                    | 390  |
| Pyrogen-free Test Tubes                    | 387  |
| Eppendorf® 2–200 µL Biopur® Pipette tips   | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips | 389  |

## PYROGENT™ Bulk Gel Clot LAL Assay

1

Bulk kit configurations of PYROGENT™ Gel Clot LAL are available for laboratories using large volumes of reagents. These configurations are made to order and production lead times are required. Please inquire with your sales representative for more information.


### ■ Benefits

- Bulk configurations for large volume use
- Bulk kits with and without endotoxin standard available
- Sensitivities of 0.03, 0.06, 0.125, and 0.25 EU/mL available

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/gelclot](http://www.lonza.com/gelclot)

 2°C to 8°C



### Ordering Information –PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin)

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description        | Size        | Sensitivity (EU/mL) |
|-------------|-------------|---|----------------------------|-------------|---------------------|
| E194L-03    | E194L-03    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 25 × 50 tests/vial Lysate  | 1,250 tests | 0.03                |
| E194L-06    | E194L-06    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 25 × 50 tests/vial Lysate  | 1,250 tests | 0.06                |
| E194L-125   | E194L-125   | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 25 × 50 tests/vial Lysate  | 1,250 tests | 0.125               |
| E209L-25    | E209L-25    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 25 × 50 tests/vial Lysate  | 1,250 tests | 0.25                |
| F245U-06    | F245U-06    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 16 tests/vial Lysate | 1,600 tests | 0.06                |
| F245U-125   | F245U-125   | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 16 tests/vial Lysate | 1,600 tests | 0.125               |
| E194U-03    | E194U-03    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 50 tests/vial Lysate | 5,000 tests | 0.03                |
| E194U-06    | E194U-06    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 50 tests/vial Lysate | 5,000 tests | 0.06                |
| E194U-125   | E194U-125   | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 50 tests/vial Lysate | 5,000 tests | 0.125               |
| E209U-25    | E209U-25    | PYROGENT™ Bulk Gel Clot LAL Assay (without endotoxin) | 100 × 50 tests/vial Lysate | 5,000 tests | 0.25                |


Bulk kits require separate bulk CSE kit. Bulk kits do not include endotoxin.


| Related Products                                      | Page |
|---|------|
| LAL Reagent Water (LRW)                               | 390  |
| Pyrogen-free Test Tubes                               | 387  |
| Eppendorf® 2–200 µL Biopur® Pipette tips              | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips            | 389  |
| Control Standard Endotoxin for PYROGENT™ Gel Clot LAL | 377  |

## Control Standard Endotoxin for PYROGENT™ Gel Clot LAL

Lonza's Control Standard Endotoxin is referenced against the USP Reference Standard Endotoxin.

Certificates of Analysis showing potency are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 2°C to 8°C



### Ordering Information – Control Standard Endotoxin for PYROGENT™ Gel Clot LAL

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description              | Size     | Sensitivity (EU/mL) |
|-------------|-------------|---|----------------------------------|----------|---------------------|
| N186        | N186        | Control Standard Endotoxin for PYROGENT™ Gel Clot LAL Assays      | Endotoxin, <i>E. coli</i> O55:B5 | 5 vials  | n/a                 |
| 7360L       | 7360L       | Bulk Control Standard Endotoxin for PYROGENT™ Gel Clot LAL Assays | Endotoxin, <i>E. coli</i> O55:B5 | 25 vials | n/a                 |

Bulk CSE Required with bulk LAL

| Related Products                           | Page |
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| Gel Clot LAL Assays                        | 374  |
| LAL Reagent Water (LRW)                    | 390  |
| Pyrogen-free Test Tubes                    | 387  |
| Eppendorf® 2–200 µL Biopur® Pipette tips   | 389  |
| Eppendorf® 50–1000 µL Biopur® Pipette tips | 389  |

## QC Insider™ Toolbox

Endotoxin Expertise At Your Fingertips™

1

Endotoxin Detection Assays

The QC Insider™ Toolbox has been designed for endotoxin testing novices as well as experts to provide endotoxin testing expertise at any level. The online portal contains a comprehensive offering of beginner and advanced support tools, a wide range of training resources, and a library of information that can be accessed at any time and from anywhere with internet access. The QC Insider™ Toolbox is organized into three categories so that users can easily navigate directly to the support tool they need.



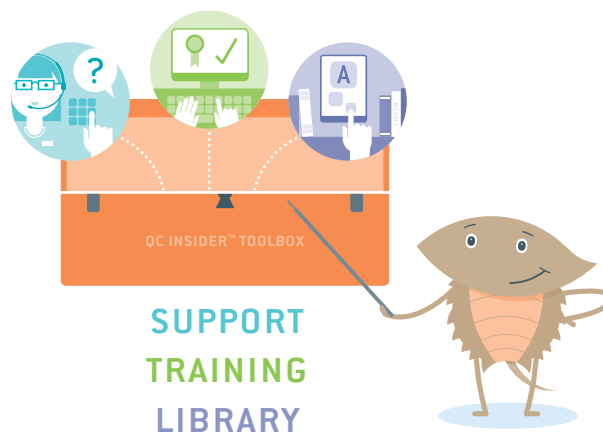
The **QC Insider™ Support** offers one-on-one guidance, detailed information about software support, recertification and testing services, reader installation and maintenance, and workflow optimization.



The **QC Insider™ Training** contains self-directed training resources that will help users increase their endotoxin testing expertise, including a series of how-to videos that demonstrate different assay procedures.



The **QC Insider™ Library** consists of technical resources such as package inserts, quick guides, and technical tips that will help lead to success with endotoxin testing.



Become a QC Insider™ Expert today and ensure the support you need is always within reach.

 [www.lonza.com/qcinsider](http://www.lonza.com/qcinsider)

## QC Insider™ e-Learning Modules

The e-Learning Modules are a series of interactive, online training courses designed to deliver technical knowledge you and your team need without interrupting your daily workflow. These training programs can be purchased and taken at your convenience, when your schedule permits.

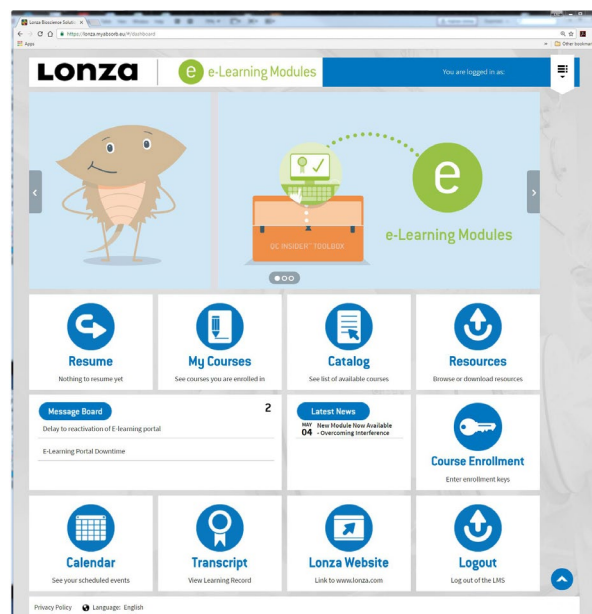
Each course concludes with a Knowledge Test, which is a series of questions covering the content delivered during the module. Upon successful completion of the test, a Certificate of Completion is issued, which then becomes part of the learner's training records.

### ■ Benefits

- Learning at your own pace as your schedule permits
- No travel costs
- Creating customized training packages targeted to your training needs
- An integrated test and certification

### ■ Who should participate?

- QC professionals
- QA specialists
- Researchers
- Production/Manufacturing personnel



[www.lonza.com/elearning](http://www.lonza.com/elearning)

### Ordering Information – QC Insider™ e-Learning Modules

| Cat. No. NA | Cat. No. EU | Product Name                                | Product Description   |
|-------------|-------------|---|---|
| LAL-EL-1    | LAL-EL-1    | An Introduction to Endotoxin Testing        | This module introduces the learner to the basics of endotoxin, the effects endotoxin can cause to the body, regulatory compliance and calculating acceptable endotoxin limits.  |
| LAL-EL-2    | LAL-EL-2    | Understanding the Bacterial Endotoxins Test | This introductory module introduces assay mechanisms, the basic assay requirements, the need for endotoxin controls and how Limulus Amebocyte Lysate (LAL) is made.   |
| LAL-EL-3    | LAL-EL-3    | Working with the Gel Clot Assay             | This module describes how to work with the gel clot assay including calculation of the Maximum Valid Dilution (MVD), product validation and the Initial Qualification (IQ) assay.   |
| LAL-EL-4    | LAL-EL-4    | Working with Photometric Assays             | This module covers the basic principles of working with photometric methods including an assay demonstration video and sections dealing with calculating the MVD, product characterization, product validation and routine testing. |
| LAL-EL-5    | LAL-EL-5    | Overcoming Interference                     | This module covers causes of interference by stage and type, inhibition vs. enhancement and proposes some solutions for the different categories of interfering products.   |

## Instrumentation and Software



### Instrumentation and Software

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| ELx808™ Incubating Absorbance Plate Reader         | 31 |
| PyroWave™ XM Fluorescence Reader                   | 32 |
| PyroTec™ Liquid Handling System                    | 33 |
| WinKQCL™ Endotoxin Detection and Analysis Software | 34 |

## ELx808™ Incubating Absorbance Plate Reader

For Kinetic-QCL™ and PYROGENT™-5000 Kinetic LAL Assays

The ELx808™ Incubating Absorbance Plate Reader has been validated as part of our quantitative endotoxin detection systems. This 96-well microplate reader features 4 insulated incubating zones, providing the best well-to-well temperature uniformity available on the market. Utilizing interference filters instead of monochromators, the reader is optimized for the LAL-based endotoxin tests and comes pre-configured with the following interference filters: 340nm, 405nm, 450nm, 490nm, and 630nm. The ELx808™ Reader seamlessly interfaces with Lonza's WinKQCL™ Endotoxin Detection and Analysis Software.

For the kinetic and endpoint LAL assays, the ELx808™ Reader is highly reliable and easy to use. It features fully-automated kinetic reads of the 96-well plate via the WinKQCL™ Software. This reader can also be used as a standard spectrophotometer and results can be read from the QCL-1000™ Endpoint Chromogenic LAL Assay and ELISA Assays.

On-site service and preventive maintenance contracts are available to help ensure that your instrument is working properly.

### ■ Benefits

- Excellent temperature uniformity
- Precise and accurate
- Cost effective filter-based reader
- Special reader configuration optimized for LAL testing
- Vendor QC release testing specific for endotoxin detection
- Three year warranty



### ELx808™ Absorbance Reader Specifications

|                     |  |
|---------------------|--|
| Wavelength Range    | 340 to 900 nm  |
| Filters Supplied    | 340, 405, 450, 490 and 630 nm  |
| Absorbance Range    | 0.000 to 4.000 OD @ 400 to 900 nm<br>0.000 to 3.000 OD @ 340 to 400 nm             |
| Temperature Control | 4°C above ambient to 50°C  |
| Read Method         | Kinetic or endpoint under WinKQCL™ Control   |
| Light Source        | Tungsten halogen bulb  |
| Dimensions          | 16-inches deep × 15.5-inches wide × 8.75-inches high (40.6 cm × 39.4 cm × 22.2 cm) |
| Weight              | 35 lb (15.9 kg)  |

### Ordering Information –ELx808™ Reader

| Cat. No. NA | Cat. No. EU | Product Name                                 | Product Description   |
|-------------|-------------|--|---|
| 25-315S     | 25-315S     | ELx808™ Reader                               | Incubating Absorbance Reader  |
| 25-342      | 25-342      | Stepped Neutral Density Plate*               | For optical density validation across eight channels, recertification service |
| 7260522     | 7260522     | BioTek™ Absorbance Test Plate                | For alignment, repeatability, and accuracy validation                         |
| 05105       | LAL3400508  | Replacement Bulb for ELx808™ Reader          |   |
| 196171      | 75053       | Computer Connection Cable for ELx808™ Reader | 9 pin female to 25 pin female RS232 cable                                     |
| 196004      |             | UPS-APC 1500VA                               | Uninterruptible power supply with LCD, 120 V output (US edition)              |
|             | BE00196004  | UPS-APC 1500VA                               | Uninterruptible power supply with LCD, 230 V output (European edition)        |
| 196005      | 196005      | 4-Port Serial PCI Card                       | Standard/low profile PCI card   |
| 25-361      | 25-361      | USB to Serial Port Converter                 | 10 cm cable with LED communication indicator lights                           |

\*Recertification service is available (see Recertification Services, page 406)

## PyroWave™ XM Fluorescence Reader

For the PyroGene™ Recombinant Factor C Assay

The PyroWave™ XM Fluorescence Reader is a part of the quantitative endotoxin detection system that supports the PyroGene™ Recombinant Factor C Assay. This reader replaces the Lonza FLx800™ LBS reader, bringing a new generation in fluorescence technology to users of the PyroGene™ Assay. Optimized specifically for Lonza's PyroGene™ Assay, this reader brings new and improved technology to the laboratory. The PyroWave™ XM Reader offers numerous enhancements in incubation, optics, automation compatibility, and overall reader maintenance and robustness. Controlled by Lonza's WinKQCL™ Endotoxin Detection and Analysis Software, version 5.3 and higher, Lonza delivers a high performance and easy-to-use system for users interested in an alternative to the horseshoe crab-based endotoxin detection test methods.

On-site service and preventive maintenance contracts are available to help ensure that your instrument is working properly.

### ■ Benefits

- Improved PyroGene™ Assay performance
- Reduced reader maintenance
- Automation compatible
- High performance optics
- 4-Zone™ Incubation at 37°C
- Three year warranty



### PyroWave™ XM Fluorescence Reader Specifications

| Read capabilities        | Fluorescence, luminescence**, TRF**, FP**  |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
|--------------------------|--|----------------------|------------------------|----------------------|----------------------|-----------|--------|--------|-----|-------------|--------|--------|-----|
| Read position            | Top read   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Light source             | Xenon flash lamp   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Detection                | High performance photo multiplier tube   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Fluorescence sensitivity | Fluorescein @ 1 pM/well in a 96-well plate   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Wavelength range         | 200 to 850 nm**  |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Filters                  | One easy-to-swap filter cube with the following filter configuration:  |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
|                          | <table border="1"> <thead> <tr> <th>Assay Type</th> <th>Excitation Filter (nm)</th> <th>Emission Filter (nm)</th> <th>Dichroic Mirror (nm)</th> </tr> </thead> <tbody> <tr> <td>PyroGene™</td> <td>380/20</td> <td>440/30</td> <td>400</td> </tr> <tr> <td>Fluorescein</td> <td>485/20</td> <td>528/20</td> <td>510</td> </tr> </tbody> </table> | Assay Type           | Excitation Filter (nm) | Emission Filter (nm) | Dichroic Mirror (nm) | PyroGene™ | 380/20 | 440/30 | 400 | Fluorescein | 485/20 | 528/20 | 510 |
| Assay Type               | Excitation Filter (nm)   | Emission Filter (nm) | Dichroic Mirror (nm)   |                      |                      |           |        |        |     |             |        |        |     |
| PyroGene™                | 380/20   | 440/30               | 400                    |                      |                      |           |        |        |     |             |        |        |     |
| Fluorescein              | 485/20   | 528/20               | 510                    |                      |                      |           |        |        |     |             |        |        |     |
|                          | **Additional filter cubes and filters must be purchased from reader manufacturer for additional wavelengths and read capabilities  |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Temperature control      | ±0.2 °C at 37 °C   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Power                    | 100 – 240 Volts AC 50/60 Hz  |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Dimensions               | 39.1 cm W x 47.2 cm D x 32.8 cm H<br>(15.4" W x 18.6" D x 12.9" H)   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |
| Weight                   | 22.5 kg (50 lbs)   |                      |                        |                      |                      |           |        |        |     |             |        |        |     |

### Ordering Information – PyroWave™ XM Reader

| Cat. No. NA | Cat. No. EU | Product Name                     | Product Description  |
|-------------|-------------|----------------------------------|--|
| 25-345S     | 25-345S     | PyroWave™ XM Fluorescence Reader | Incubating fluorescence reader   |
| 196004      |             | UPS-APC 1500VA                   | Uninterruptible power supply with LCD, 120 V output (US edition)       |
|             | BE00196004  | UPS-APC 1500VA                   | Uninterruptible power supply with LCD, 230 V output (European edition) |
| 196005      | 196005      | 4-Port Serial PCI Card           | Standard/low profile PCI card  |
| 204511      | 7160013     | Fluorescent Liquid Test Kit      | Sodium fluorescein test kit for FLx800™ Reader validation              |

### Related Products

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| WinKQCL™ Endotoxin Detection and Analysis Software | 34   |
| PyroGene™ Recombinant Factor C Assay               | 20   |



## PyroTec™ Liquid Handling System

The PyroTec™ Liquid Handling System is a robotic workstation to help automate endotoxin detection testing. The system includes a user-defined platform size to accommodate tips, reagent troughs and 96-well plates. The robotic arm picks up tips and dispenses samples and reagents into 96-well plates. Heating units can incubate plates prior to delivery into plate readers.

WinKQCL™ Software is fully integrated with the Tecan® Freedom EVOware® Software, allowing assay templates to be executed using robotic scripts for the PyroTec™ Liquid Handling System.

The PyroTec™ System can be tailored to your testing needs. Contact your local Lonza sales representative or scientific support for additional information.

On-site service and preventive maintenance contracts are available to help ensure that your instrument is working properly.

### ■ Benefits

- Flexible platform to automate filling of assay plates
- Help high throughput labs manage their large daily sample requirements



### Ordering Information – PyroTec™ Liquid Handling System

| Cat. No. NA | Cat. No. EU | Product Name                        | Product Description  |
|-------------|-------------|-------------------------------------|--|
| 25-601      | 25-601      | PyroTec™ 200 Liquid Handling System | Robotic workstation for filling nine 96-well plates at one time  |
| 25-602      | 25-602      | PyroTec™ 150 Liquid Handling System | Robotic workstation for filling three 96-well plates at one time |
| 25-603      | 25-603      | PyroTec™ 150 Positive ID System     | Robotic barcode scanner  |

| Related Products                                   | Page |
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| WinKQCL™ Endotoxin Detection and Analysis Software | 34   |
| Kinetic-QCL™ Kinetic Chromogenic LAL Assay         | 365  |
| PYROGENT™-5000 Kinetic Turbidimetric LAL Assay     | 368  |
| Pyrogene™ Recombinant Factor C Assay               | 20   |

## WinKQCL™ Endotoxin Detection and Analysis Software

Quantitative methods such as the Kinetic-QCL™ Assay generate significant amounts of raw data that require careful analysis before reporting can take place. The WinKQCL™ Software offers a fully integrated solution for your quantitative endotoxin detection testing, data management, and reporting needs.

WinKQCL™ 5 Software meets 21 CFR Part 11 technical requirements for electronic records, signatures, audit trails, and database archiving. Reader validation tests can be run from the WinKQCL™ Software and are stored in the same database. The built-in database backup and maintenance scheduler makes it easy to maintain the system.

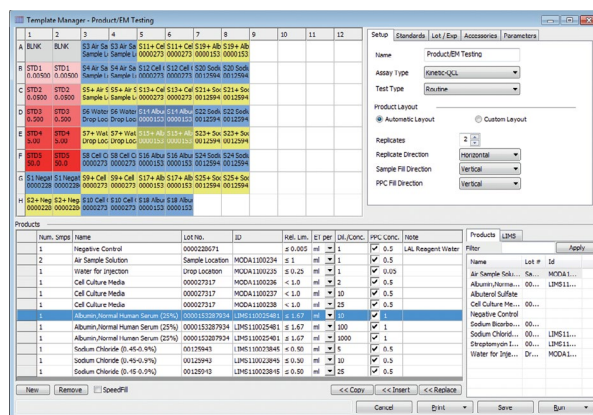
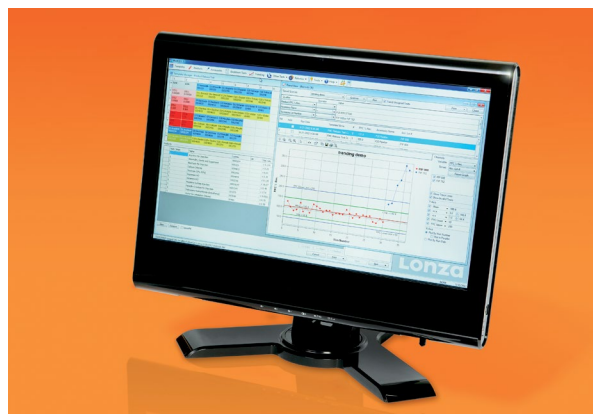
### ■ Benefits

- Kinetic SmartStop™ monitoring feature to address split pair and other reaction conditions, without sacrificing time waiting for a fixed number of reads
- Enterprise level IT features including wide area network support, ability to work across time zones, application virtualization, Active Directory® integration, and data segregation by lab
- Bi-directional interface with 3rd party database systems
- Customizable endotoxin test reports
- Multi-language user interface: English, French, German, Italian, Japanese, Spanish, Portuguese, Simplified Chinese and Traditional Chinese

### ■ Applications

- For use with the PyroWave™ XM, ELx808™, and FLx800™ Readers. Extended reader integration now includes Molecular Devices® SpectraMax®, Gemini™ and VersaMax™ Readers; and the BioTek® Eon™ and Synergy™ 2 Readers. The software is also interfaced with the Tecan® Sunrise™ Reader
- Tecan® EVOware® interface integration for PyroTec™ Liquid Handling System
- Supports all quantitative endotoxin detection assays from Lonza including QCL-1000™ Endpoint Chromogenic LAL, Kinetic-QCL™ Kinetic Chromogenic LAL, PYROGENT™-5000 Kinetic Turbidimetric LAL and Pyrogene™ Recombinant Factor C Assays
- Installation as a simple standalone system or as an interface with multiple robots and readers in multiple labs around the world, all storing data in a single database

The user-friendly and flexible Template Manager allows you to customize plate layout with a click of a mouse using the SpeedFill™ and drag 'n drop features. The enhanced trending tools provide meaningful results on demand, helping you easily detect drift and enabling you to make proactive decisions.



The endotoxin detection instruments and software from Lonza are available fully supported with Installation, Operational and Performance Qualification (IOPQ) manuals and a WinKQCL™ 5 Software Validation Package. In addition, a trained specialist from Lonza can perform the IOPQ of the complete system to help you with your system validation process. Please inquire with your local sales representative for further details.

## WinKQCL™ Endotoxin Detection and Analysis Software

Continued

### Ordering Information – WinKQCL™ Endotoxin Detection and Analysis Software

| Cat. No. NA | Cat. No. EU | Product Name                                | Product Description                                 |
|-------------|-------------|---|---|
| 25-501      | 25-501      | WinKQCL™ 5 Software Package                 | Installation DVD, workgroup license, reader license |
| 25-502      | 25-502      | WinKQCL™ 5 Workgroup License                | Additional workgroup license                        |
| 25-503      | 25-503      | WinKQCL™ 5 Reader License                   | Additional reader license                           |
| 25-504      | 25-504      | WinKQCL™ 5 Qualification Manual             | DVD containing IOPQ files for software and readers  |
| 25-505      | 25-505      | WinKQCL™ 5 Validation Package               | DVD containing software validation information      |
| 25-339S     | 25-339S     | System Qualification Service                | IQ/OQ/PQ validation on site, labor only             |
| 25-501SUP   | 25-501SUP   | Annual WinKQCL™ Support for Cat. No. 25-501 | Advanced IT/software support for WinKQCL            |
| 25-502SUP   | 25-502SUP   | Annual WinKQCL™ Support for Cat. No. 25-502 | Advanced IT/software support for data management    |
| 25-503SUP   | 25-503SUP   | Annual WinKQCL™ Support for Cat. No. 25-503 | Advanced IT/software support for instrument control |

### Ordering Information – WinKQCL™ Software Delivered Immediately by Email

| Cat. No. NA | Cat. No. EU | Product Name                                | Product Description                                   |
|-------------|-------------|---|---|
| 25-501E     | 25-501E     | E-Delivered WinKQCL™ 5 Software Package     | Installation files, workgroup license, reader license |
| 25-502E     | 25-502E     | E-Delivered WinKQCL™ 5 Workgroup License    | Additional workgroup license                          |
| 25-503E     | 25-503E     | E-Delivered WinKQCL™ 5 Reader License       | Additional reader license                             |
| 25-504E     | 25-504E     | E-Delivered WinKQCL™ 5 Qualification Manual | IOPQ files for software and readers                   |
| 25-505E     | 25-505E     | E-Delivered WinKQCL™ 5 Validation Package   | File containing software validation information       |

| Related Products                               | Page |
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| Kinetic-QCL™ Kinetic Chromogenic LAL Assay     | 365  |
| PYROGENT™-5000 Kinetic Turbidimetric LAL Assay | 368  |
| Pyrogene™ Recombinant Factor C Assay           | 20   |
| ELx808™ Incubating Absorbance Reader           | 381  |
| PyroWave™ XM Incubating Fluorescence Reader    | 382  |

## Accessory Products



### Accessory Products

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## Introduction

In addition to the endotoxin detection kits, instruments, and software, Lonza offers many of the accessory items necessary to run endotoxin detection assays. Many of the items have been tested with the Kinetic-QCL™ Kinetic Chromogenic LAL Assay to help ensure their compatibility with our endotoxin detection methods. We also offer products such as the Endotoxin Challenge Vials™ to help with your oven depyrogenation validations.



3

Accessory Products

## Test Tubes


All test tubes are made from USP Type I flint borosilicate glass.

Both products N201 and N205 are recommended for use as reaction tubes in gel clot assays. N201 are provided with polypropylene screw caps. Product number N207 is recommended for dilution of endotoxin standards and test samples for all endotoxin detection assays.

### ■ Benefits

- Certified to contain less than 0.005 EU/mL endotoxin

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)



### Ordering Information – Test Tubes

| Cat. No. NA | Cat. No. EU | Product Name            | Product Description       | Size         |
|-------------|-------------|-------------------------|---------------------------|--------------|
| N207        | N207        | Pyrogen-free Test Tubes | Without caps, 13 × 100 mm | 30/foil pack |
| N201        | N201        | Pyrogen-free Test Tubes | With caps, 10 × 75 mm     | 50/box       |
| N205        | N205        | Pyrogen-free Test Tubes | Without caps, 10 × 75 mm  | 50/foil pack |

## Sample Containers

Sample containers are intended for transporting product samples for endotoxin analysis or sample storage. Proper container and storage conditions need to be validated for each individual sample.

Products 80-507L and 80-507U contain 10 mL glass vials with screw caps. Products BE2098 and BE2099 are plastic sample containers that offer greater capacity at a reduced cost.



### ■ Benefits

- Certified to contain less than 0.005 EU/mL endotoxin

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### Ordering Information – Sample Containers

| Cat. No. NA | Cat. No. EU | Product Name                    | Product Description                              | Size    |
|-------------|-------------|---------------------------------|--|---------|
| 80-507L     | 80-507L     | Sample Containers               | Depyrogenated, 10 mL glass bottle with screw cap | 25/box  |
| 80-507U     | 80-507U     | Sample Containers               | Depyrogenated, 10 mL glass bottle with screw cap | 100/box |
|             | BE2098      | Polypropylene Sample Containers | Endotoxin tested, 50 mL tubes                    | 50/pack |
|             | BE2099      | Polystyrene Sample Containers   | Endotoxin tested, 15 mL tubes                    | 50/pack |

## Plates

96-well plates can be used with the QCL-1000™ Endpoint Chromogenic LAL Assay, Kinetic-QCL™ Kinetic Chromogenic LAL Assay, PYROGENT™-5000 Kinetic Turbidimetric LAL Assay and Pyrogene™ Recombinant Factor C Assay. Each case contains individually wrapped plates.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### ■ Benefits

- Certified to contain less than 0.0005 EU/well endotoxin
- Certified for compatibility with the endotoxin detection assays
- Certified to be free from inhibition

### Ordering Information – Plates

| Cat. No. NA | Cat. No. EU | Product Name                        | Product Description                                | Size    |
|-------------|-------------|-------------------------------------|--|---------|
| 25-340      | BE25-340    | LAL Reagent Grade Multi-well Plates | 96-well plates, endotoxin-tested (<0.0005 EU/well) | 50/case |


## Pipette Tips

Pyrogen-free pipette tips are to be used when testing with any of our endotoxin detection systems. Eppendorf® Biopur® pipette tips are certified to contain <0.001 EU/mL endotoxin. The new design of the tips allows compatibility with different pipettors. Catalog Number 25-416 is for use with multi-channel pipettes. Products BE25-413 and BE25-414 are certified to contain <0.005 EU/mL endotoxin. They can be used with pipettes from different manufacturers. Eppendorf® Combitips® are for use with a multi-step pipette.

### ■ Benefits

- Endotoxin tested
- Broad offering for various pipette types

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)


### Ordering Information – Pipette Tips

| Cat. No. NA | Cat. No. EU  | Product Name                               | Product Description                        | Size                      |
|-------------|--------------|--|--|---------------------------|
| 25-415      | BE25-415     | Eppendorf® 2–200 µL Biopur™ Pipette Tips   | < 0.001 EU/mL                              | 5 trays/pkg; 96 tips/tray |
| 25-416      | BE25-416     | Eppendorf® 2–300 µL Biopur™ Pipette Tips   | < 0.001 EU/mL, for multi-channel pipettors | 5 trays/pkg; 96 tips/tray |
| 25-417      | BE25-417     | Eppendorf® 50–1000 µL Biopur™ Pipette Tips | < 0.001 EU/mL                              | 5 trays/pkg; 96 tips/tray |
|             | 89634        | Eppendorf® Combitips®, 0.5 mL              | Single packed                              | 100                       |
|             | BE4910000026 | Eppendorf Pipette 2-20 µL                  |  | 1 each                    |
|             | BE3114000158 | Eppendorf Pipette Multichannel 30-300 µL   |  | 1 each                    |
|             | BE3111000149 | Eppendorf Pipette Research 10-100 µL       |  | 1 each                    |
|             | BE3111000165 | Eppendorf Pipette Research 100-1000 µL     |  | 1 each                    |
|             | 89650        | Eppendorf® Combitips®, 2.5 mL              | Single packed                              | 100                       |
|             | 89669        | Eppendorf® Combitips®, 5 mL                | Single packed                              | 100                       |
|             | 89677        | Eppendorf® Combitips®, 10 mL               | Single packed                              | 100                       |
|             | BE10035      | Eppendorf® Pipette Tips, 2–200 µL          | Endotoxin tested, single packed            | 100/box                   |
|             | BE10051      | Eppendorf® Pipette Tips, 50–1000 µL        | Endotoxin tested, single packed            | 100/box                   |
|             | BE25-413     | LAL Reagent Grade Pipette Tips, 2–200 µL   | <0.005 EU/mL                               | 10 × 96 tips              |
|             | BE25-414     | LAL Reagent Grade Pipette Tips, 50–1250 µL | <0.005 EU/mL                               | 10 × 96 tips              |
|             | BE7521       | Pipette BD Falcon™, 1 mL                   | Endotoxin tested, single packed            | 100                       |
|             | BE7507       | Pipette BD Falcon™, 2 mL                   | Endotoxin tested, single packed            | 100                       |
|             | BE7543       | Pipette BD Falcon™, 5 mL                   | Endotoxin tested, single packed            | 200                       |
|             | BE7551       | Pipette BD Falcon™, 10 mL                  | Endotoxin tested, single packed            | 200                       |

## Reservoirs

The LAL Reagent Reservoirs are for use with multi-channel pipettes when adding reagents to a 96-well plate. The reservoirs are provided in a zip closure bag enabling you to conveniently store unused reservoirs for later use.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### ■ Benefits

- Certified to contain less than 0.005 EU/mL endotoxin

### Ordering Information – LAL Reagent Reservoirs

| Cat. No. NA | Cat. No. EU | Product Name           | Product Description | Size    |
|-------------|-------------|------------------------|---------------------|---------|
| 190035      | 190035      | LAL Reagent Reservoirs | <0.005 EU/mL        | 10/pack |

## Dry Heat Block, Inserts and Vortex Mixer

The dry heat block is used for incubation of LAL gel clot assays. The aluminum block with lid adaptor for a dry heat block allows a 96-well plate to be incubated at 37°C for use with the QCL-1000™ Endpoint Chromogenic LAL Assay.

 [www.lonza.com/accessories](http://www.lonza.com/accessories)



### Ordering Information – Dry Heat Block, Inserts and Vortex Mixer

| Cat. No. NA | Cat. No. EU | Product Name                                    | Product Description                               | Size         |
|-------------|-------------|---|---|--------------|
| 25-038A     | 25-038A     | Aluminum Block with Lid                         | Heat block insert for 96-well plate               | Each         |
| BEF3503     | BEF3503     | Aluminum Insert Block for Techne Dry Heat Block |   | For 20 tubes |
| FDB03DD     | FDB03DD     | Techne Dry Heat Block                           | Digital, from 25°C to 100°C, requires 3 × BEF3503 | For 60 tubes |
|             | BENP5051    | Vortex Genie® 2                                 |   |              |


## LAL Reagent Water

LAL Reagent Water is recommended for reconstituting LAL reagents, as well as for the dilution of control standard endotoxin and test samples for endotoxin testing. LAL Reagent Water is equivalent to Water for Bacterial Endotoxins Test (BET). In addition to USP-required WFI tests, Lonza tests LAL Reagent Water for compatibility with our endotoxin detection assays.

### ■ Benefits

- Certified to contain less than 0.005 EU/mL endotoxin
- Available in a variety of sizes
- Certified for Positive Product Control Recovery within 75 to 150%

 2°C to 8°C (W50-640)

 15°C to 30°C (W50-100, W50-500, W50-1000)



For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### Ordering Information – LAL Reagent Water


| Cat. No. NA | Cat. No. EU | Product Name      | Product Description   | Size     |
|-------------|-------------|-------------------|-----------------------|----------|
| W50-640     | W50-640     | LAL Reagent Water | <0.005 EU/mL, 30 mL   | 1 bottle |
| W50-100     | W50-100     | LAL Reagent Water | <0.005 EU/mL, 100 mL  | 1 bottle |
| W50-500     | W50-500     | LAL Reagent Water | <0.005 EU/mL, 500 mL  | 1 bottle |
| W50-1000    | W50-1000    | LAL Reagent Water | <0.005 EU/mL, 1000 mL | 1 bottle |



## $\beta$ -G-Blocker

$\beta$ -D-glucans can produce false positive results in LAL assays. Some examples of glucan sources include yeast and cellulosic materials such as hemodialysis filters.  $\beta$ -G-Blocker may be used with any of our LAL assays.


For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### ■ Benefits

- Certified to contain less than 0.005 EU/mL endotoxin
- Functionality tested to demonstrate a reduction of enhancement caused by  $\beta$ -D-glucans

 2°C to 8°C




### Ordering Information – $\beta$ -G-Blocker

| Cat. No. NA | Cat. No. EU | Product Name       | Product Description       | Size    |
|-------------|-------------|--------------------|---------------------------|---------|
| N190        | N190        | $\beta$ -G-Blocker | Glucan blocker, 5 mL/vial | 5 vials |

## PYROSPERSE™ Dispensing Agent

PYROSPERSE™ Dispensing Agent, helps eliminate endotoxin binding or masking in some samples – solving problems of inhibitory behavior. Examples of samples that may show endotoxin binding behavior include plasma protein fractions, electrolyte solutions, and lipid emulsions. PYROSPERSE™ Dispensing Agent may be used with any of our LAL kits.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### ■ Benefits

- Endotoxin and functionality tested



 2°C to 30°C (unopened)


### Ordering Information – PYROSPERSE™ Dispensing Agent

| Cat. No. NA | Cat. No. EU | Product Name                 | Product Description | Size    |
|-------------|-------------|------------------------------|---------------------|---------|
| N188        | N188        | PYROSPERSE™ Dispensing Agent | 5 mL/vial           | 5 vials |

## MgCl<sub>2</sub>

MgCl<sub>2</sub> can be used as the sample diluent when attempting to overcome inhibitory chelation effects. Examples of samples that chelate divalent cations include heparin and EDTA. MgCl<sub>2</sub> may be used to prepare samples for any endotoxin detection assay.

For your convenience, Certificates of Analysis are available online:

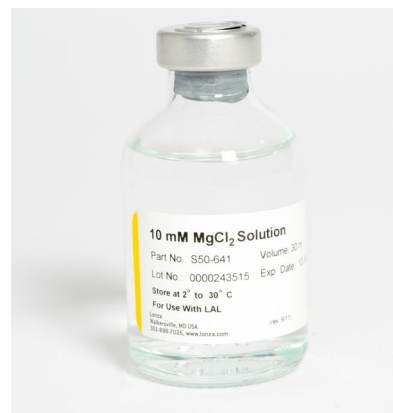
 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### Benefits

– Certified to contain less than 0.005 EU/mL endotoxin

 2°C to 30°C (unopened)




### Ordering Information – MgCl<sub>2</sub> 10 mM Solution

| Cat. No. NA | Cat. No. EU | Product Name                     | Product Description | Size   |
|-------------|-------------|----------------------------------|---------------------|--------|
| S50-641     | S50-641     | MgCl <sub>2</sub> 10 mM Solution | 30 mL/vial          | 1 vial |

## Tris Buffer

Tris Buffer can be used in place of water as the sample diluent for highly acidic or basic samples (for endotoxin testing, sample test dilutions should be between pH 6–8 after lysate addition). Tris Buffer may be used to prepare samples for any of our endotoxin detection assays.

For your convenience, Certificates of Analysis are available online:

 [www.lonza.com/coa](http://www.lonza.com/coa)


 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### Benefits

– Certified to contain less than 0.005 EU/mL endotoxin

– Certified pH range from 7.0 to 7.4 @ 25°C

– Certified to ensure good buffering performance

 2°C to 8°C



### Ordering Information – Tris Buffer 50 mM

| Cat. No. NA | Cat. No. EU | Product Name      | Product Description | Size   |
|-------------|-------------|-------------------|---------------------|--------|
| S50-642     | S50-642     | Tris Buffer 50 mM | 30 mL/vial          | 1 vial |

## Endotoxin and Endotoxin Challenge Vials™

Endotoxin (*E. coli*) Challenge Vials™ are for use in oven validation studies. Each vial contains >1,000 EU/vial. The vials may be tested using any of our endotoxin detection kits. Product 193783 contains high potency endotoxin and is intended for use in endotoxin removal system challenges, i.e. depyrogenation ovens, and other spiking studies. Each vial contains >1,250,000 EU/vial. E700 is the USP Reference Standard Endotoxin. Each vial contains 10,000 EU/vial.


For your convenience, Certificates of Analysis are available online:


 [www.lonza.com/coa](http://www.lonza.com/coa)

 [www.lonza.com/accessories](http://www.lonza.com/accessories)

### ■ Benefits

– Products 192568 and 193783 are devoid of fillers

 192568 and 193783 are stored at 2°C to 8°C

 E700 storage conditions are -20°C



### Ordering Information – Endotoxin and Endotoxin Challenge Vials™

| Cat. No. NA | Cat. No. EU | Product Name                     | Product Description    | Size     |
|-------------|-------------|----------------------------------|------------------------|----------|
| 193783      | 193783      | Endotoxin, <i>E. coli</i> 055:B5 | > 1.25 million EU/vial | 5 vials  |
| 192568      | 192568      | Endotoxin Challenge Vials™       | >1,000 EU/vial         | 25 vials |
| E700        | E700        | USP Reference Standard Endotoxin | 10,000 EU/vial         | 1 vial   |

## Notes

## Testing Services



|                                      |    |
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| Recertification Services             | 50 |

## QC Testing Solutions Services

Another means by which Lonza continues to strive to meet the needs of our QC microbiology customers is by providing complementary contract testing services for many of our QC microbiology related products.

### QC Testing Solutions Services offered:

- Endotoxin Testing Services
- Recertification Services


QC Testing Solutions Services are presently operated out of two global Lonza facilities to provide our customers with worldwide access to our current service capabilities\*:

- Lonza Walkersville, Maryland, USA
- Lonza Verviers, Belgium (Pre-paid Testing only)

\*Not all testing services are offered in both locations.

Please contact your local sales representative or Customer Service for more information about where and how to submit samples to one of our service locations above.

Register for our QC Testing Solutions e-newsletter to stay up to date on the latest endotoxin detection products and services. Featured content includes technical tips, white papers and webinar events.

 [www.lonza.com/hsc](http://www.lonza.com/hsc)

## Endotoxin Detection Testing Services

Lonza's Endotoxin Detection Testing Services offer you routine as well as customized endotoxin testing. Our facilities provide expertise in gel clot, kinetic chromogenic, and kinetic turbidimetric LAL methods, as well as the Pyrogene™ Recombinant Factor C Assay.

### USP, EP and FDA Compliant

All pharmaceutical grade endotoxin testing is performed in accordance with current regulatory documents such as the U.S. and European Pharmacopeia (USP and EP) Bacterial Endotoxins Test (BET), the 2012 U.S. Food and Drug Administration (USFDA) Guidance for Industry, and the USP monograph for medical device testing. These documents originate from or are acceptable to the major Pharmacopeia and their regulatory authorities.

Whether you are from a university, research laboratory or a Quality Control laboratory in a major pharmaceutical company, Lonza has the capabilities you need for reliable, accurate and confidential results.

### ■ Benefits

- Market leader in endotoxin detection testing systems
- Technical expertise and full service reporting
- USP and EP compliant

### STAT Testing Available\*

For customers who may need faster turn-around times, Lonza offers an expedited testing service for preliminary screening, endotoxin determination, and the Endotoxin Challenge Vial™ test. Our STAT service delivers preliminary results in 4 days or less via email. STAT requests require prior approval from Lonza's Endotoxin Testing Services.

\*STAT testing is only available in the US.

 [www.lonza.com/endotestserv](http://www.lonza.com/endotestserv)

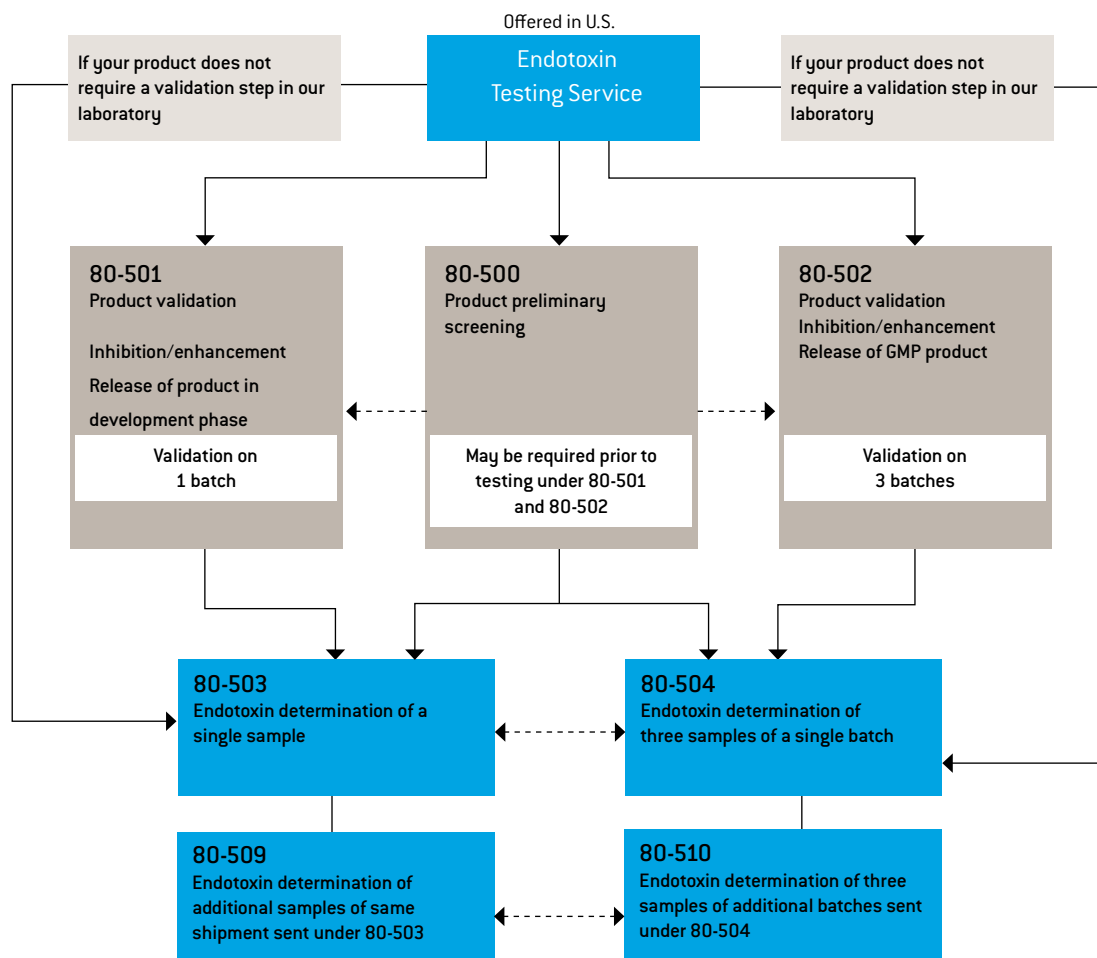


Figure 1. Endotoxin Testing Service.

## Endotoxin Detection Testing Services

Continued

### Pre-paid, Mail-in Anytime Testing Service

Available in Europe, the Endotoxin Testing Service offers a low cost mail-in anytime service for users who do not require testing according to pharmaceutical or medical device regulations.

This type of endotoxin testing is suitable for a wide range of non-standard tests such as:

- Samples from cell culture materials
- Samples of DNA plasmids
- Water samples from autoclaves or dialysis machines
- Dialysis water or fluids
- Research samples

Samples received using this service will be tested at the dilutions indicated in the Pre-paid Endotoxin Testing Service diagram below.

### Benefits

- Low cost, convenient and quick endotoxin testing using Kinetic-QCL™ LAL Assay
- Quick, easy ordering process via web, phone, or fax
- Pre-addressed packaging for smooth delivery to Lonza's Endotoxin Testing Service

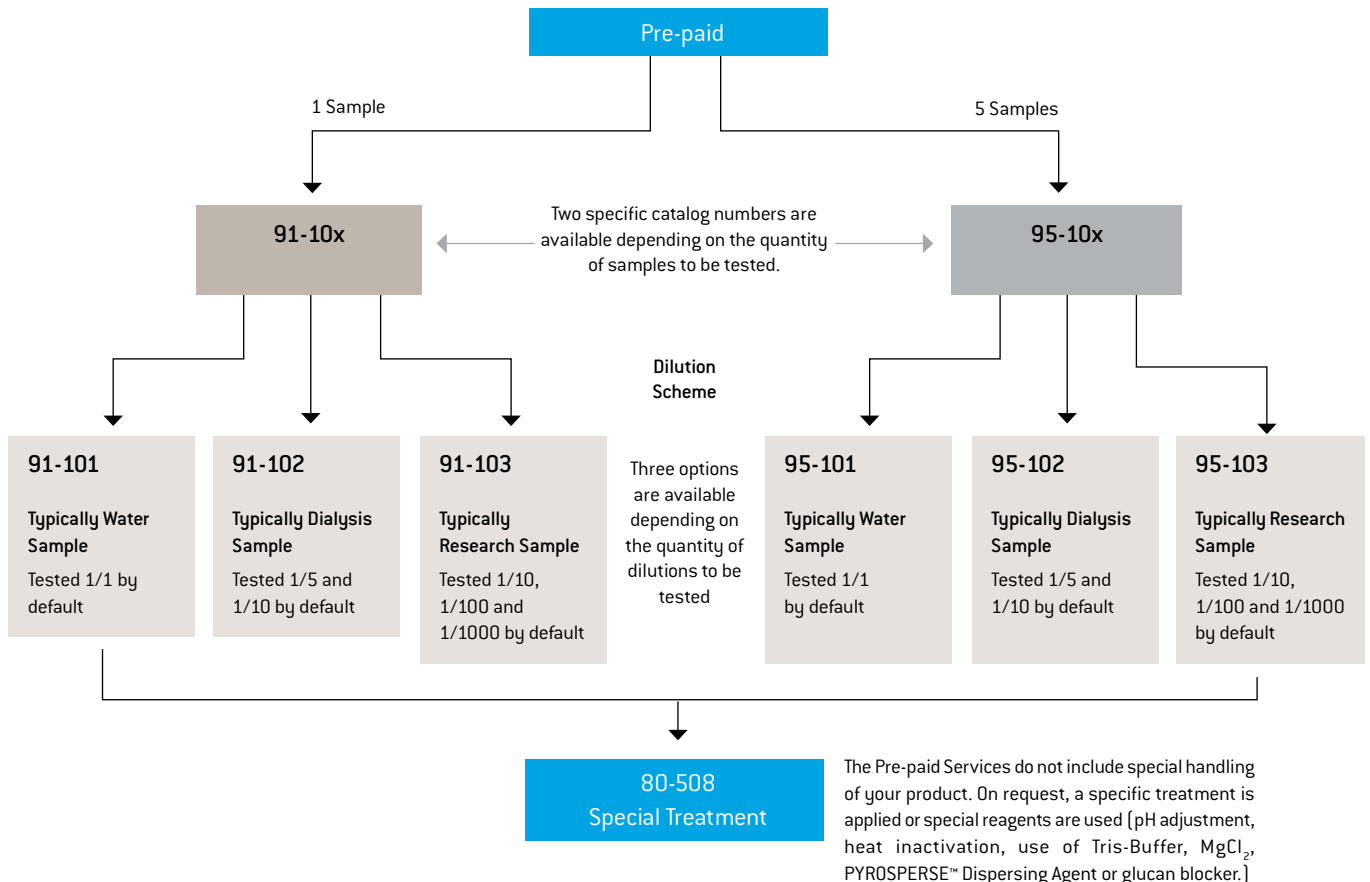
To utilize the Pre-paid Service, simply order one or more of the Rapid Endotest packs, place your sample in the sample containers provided, and mail the pre-addressed envelope back to Lonza.

Samples will be tested and results sent to the customer within 5 days of receipt.

[www.lonza.com/endotestserv](http://www.lonza.com/endotestserv)

4

Testing Services



**Figure 2.** Pre-paid Testing Service, available in Europe. This service is not available in the US.



## Endotoxin Detection Testing Services

Continued

### Ordering Information – Endotoxin Detection Testing Services (US only)

| Cat. No. NA | Cat. No. EU | Product Name   | Product Description   |
|-------------|-------------|--|---|
| 80-500      |             | Product Preliminary Screening  |   |
| 80-501      |             | Product Validation Inhibition/Enhancement  | Release of product in development phase. Validation of one batch. |
| 80-502      |             | Product Validation Inhibition/Enhancement  | Release of GMP product. Validation of three batches.              |
| 80-503      |             | Endotoxin Determination of single sample   |   |
| 80-509      |             | Additional samples of same shipment sent under 80-503                                  |   |
| 80-504      |             | Endotoxin Determination of three samples of a single batch                             |   |
| 80-510      |             | Endotoxin determination of three samples of additional batches sent under 80-504       |   |
| 80-508      |             | Unusual sample treatment or handling charge (per hour)                                 |   |
| 80-514      |             | Exclusion of $\beta$ -D-glucan activity testing  |   |
| 80-535      |             | Depyrogenation Endotoxin Challenge Vial™ Test  |   |
| 80-544      |             | Sample container screening   |   |
| 80-500S     |             | STAT: Product preliminary screening of one batch                                       |   |
| 80-503S     |             | STAT: Endotoxin determination of single sample   |   |
| 80-509S     |             | STAT: Additional samples of same shipment sent under 80-503                            |   |
| 80-504S     |             | STAT: Endotoxin determination of three samples of a single batch                       |   |
| 80-510S     |             | STAT: Endotoxin determination of three samples of additional batches sent under 80-504 |   |
| 80-514S     |             | STAT: Exclusion of $\beta$ -D-glucan activity testing                                  |   |
| 80-535S     |             | STAT: Depyrogenation Endotoxin Challenge Vial™ Test                                    |   |

### Ordering Information – Pre-paid Endotoxin Detection Testing Services (Europe only)

| Cat. No. NA | Cat. No. EU | Product Name                                | Product Description |
|-------------|-------------|---|---------------------|
|             | BE91-101    | Rapid-Endotest Single Water Sample          |                     |
|             | BE91-102    | Rapid-Endotest Single Dialysis Fluid Sample |                     |
|             | BE91-103    | Rapid-Endotest Single Research Sample       |                     |
|             | BE95-101    | Rapid-Endotest Five Water Samples           |                     |
|             | BE95-102    | Rapid-Endotest Five Dialysis Fluid Samples  |                     |
|             | BE95-103    | Rapid-Endotest Five Research Samples        |                     |

Please contact your local Customer Service Team to obtain general information and the appropriate sample submission forms.

#### U.S. Endotoxin Testing Services

E-mail: [scientific.support@lonza.com](mailto:scientific.support@lonza.com)

#### European Endotoxin Testing Services

E-mail: [scientific.support.eu@lonza.com](mailto:scientific.support.eu@lonza.com)

## Recertification Services

### Recertification Service for Stepped Neutral Density Test Plates

The Stepped Neutral Density (SND) and Absorbance (Universal) Test plates provide the ELx808™ Microplate Reader user with the ability to manage risk and help assure the reader is functioning properly between the recommended six-month preventive maintenance visits.

The ELx808™ Readers are robust instruments designed to provide years of reliable performance for endotoxin detection and other absorbance-based assays. In following current Good Manufacturing Practices (cGMP), the reader's performance should be verified and documented at regular intervals.



In order to properly assess the reader performance, the plates used in the testing must be shown to be acceptable. Plate manufacturers recommend the SND plate be recertified at least once per year.

#### ■ Benefits

- Manages risk and helps ensure optimal performance of the ELx808™ Readers
- cGMP compliant processes, including testing of multiple parameters
- NIST-traceable testing conducted in an ISO 9001 certified facility

#### ■ Parameters tested

- Absorbance accuracy (linearity and slope)
- Precision (reproducibility of results)
- Wavelength accuracy
- Optical alignment
- Detailed physical inspection

#### ■ Reports include

- Physical inspection observations
- Coefficient of variation (%CV) for each plate standard filter
- Slope, R-value and Y-intercept linearity data
- Reader and plate uncertainty values
- Approval by a Quality Assurance representative
- Recertification due date (default is 12 months)

Please refer to the table below for additional details and ordering information. For testing parameters, reports and pricing, please contact your local sales representative.

 [www.lonza.com/recert](http://www.lonza.com/recert)

### Ordering Information – Recertification Services

| Cat. No. NA | Cat. No. EU | Product Name  | Product Description  |
|-------------|-------------|---|--|
| 85-011-SND  | 85-011-SND  | Stepped Neutral Density Plate Recertification Service | Two filter wavelengths, 405 nm and 340 nm                                |
| 85-012-SND  | 85-012-SND  | Stepped Neutral Density Plate Recertification Service | Each additional filter wavelength  |
| 85-011BA    | 85-011BA    | Stepped Neutral Density Plate Recertification Service | As Found and As Left testing at two filter wavelengths 405 nm and 340 nm |
|             | 85-013      | Absorbance (Universal) Test Plate                     | Recertification Service*   |

SND plate recertification services offered for Lonza plate part number 25-342 only.  
\*Recertification services for BioTek® Instruments, Inc., plate part number 7260522 (Absorbance Test Plate) are only available in Europe.



## QC Testing e-Newsletter

Subscribe and stay up to date on the latest information about endotoxin detection products, services and software.

Our featured content includes:

- Technical tips
- White papers
- Exclusive news items
- Special events
- Webinars

At Lonza, we are aware of the importance of the horseshoe crab for its contribution to the safety of drugs and medical devices but also its ecological role.

For each subscription, a \$1.00 donation will be made to ERDG, the Ecological Research & Development Group, a non-profit wildlife conservation organization whose primary focus is the conservation of the world's four remaining horseshoe crab species.

Stay informed: [www.lonza.com/enews](http://www.lonza.com/enews)

- Endotoxin Detection Assays
- Instrumentation and Software
- Accessory Products
- Testing Services

## Contact Information

### North America

Customer Service: 800 638 8174 (toll free)  
order.us@lonza.com  
Scientific Support: 800 521 0390 (toll free)  
scientific.support@lonza.com

### Europe

Customer Service: +32 87 321 611  
order.europe@lonza.com  
Scientific Support: +32 87 321 611  
scientific.support.eu@lonza.com

### International

Contact your local Lonza distributor  
Customer Service: +1 301 898 7025  
Fax: +1 301 845 8291  
scientific.support@lonza.com

### International Offices

|                 |                            |
|-----------------|----------------------------|
| Australia       | + 61 3 9550 0883           |
| Belgium         | + 32 87 321 611            |
| Brazil          | + 55 11 2069 8800          |
| China           | + 86 21 6340 3488          |
| France          | 0800 91 19 81 (toll free)  |
| Germany         | 0800 182 52 87 (toll free) |
| India           | +91 22 4342 4000           |
| Japan           | + 81 3 6264 0660           |
| Luxemburg       | +32 87 321 611             |
| Singapore       | + 65 6521 4379             |
| The Netherlands | 0800 022 4525 (toll free)  |
| United Kingdom  | 0808 234 97 88 (toll free) |

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[www.lonza.com](http://www.lonza.com)

[www.lonza.com/lal](http://www.lonza.com/lal)

