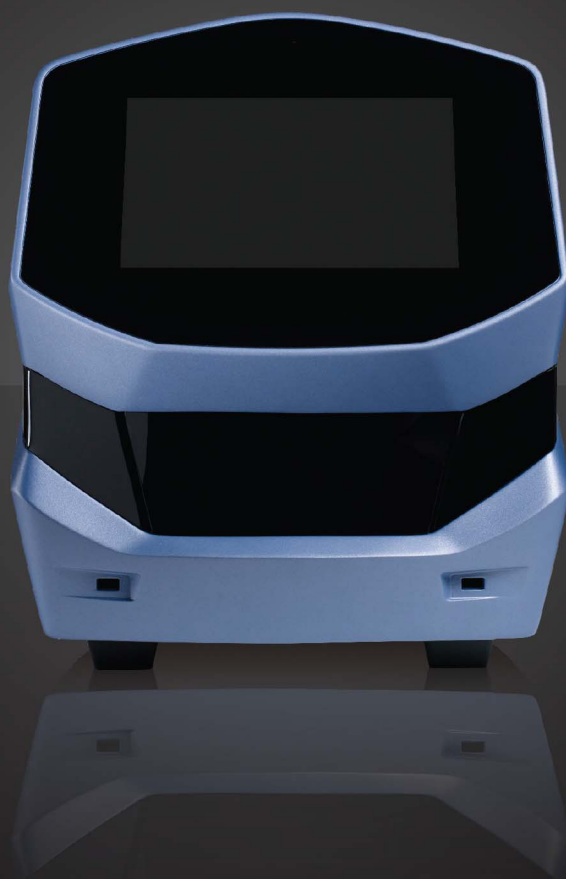


C1 System

SITE REQUIREMENTS GUIDE



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About this Guide



CAUTION ABBREVIATED SAFETY ALERTS. Hazard symbols and hazard types specified in procedures may be abbreviated in this document. For complete safety information, see the safety appendix on [page 20](#).

For more information on instrument operation and safety, see the C1 System User Guide (PN 100-4977). For related documentation, go to fluidigm.com/documents.

Safety Alert Conventions

This guide uses specific conventions for presenting information that may require your attention. Refer to the following safety alert conventions.

Safety Alerts for Chemicals

Fluidigm follows the United Nations Globally Harmonized System (GHS) for communicating chemical hazard information. GHS provides a common means of classifying chemical hazards and a standardized approach to chemical label elements and safety data sheets (SDSs). Key elements include:

- Pictograms that consist of a symbol on a white background within a red diamond-shaped frame. Refer to the individual SDS for the applicable pictograms and warnings pertaining to the chemicals being used.



- Signal words that alert the user to a potential hazard and indicate the severity level. The signal words used for chemical hazards under GHS:

DANGER Indicates more severe hazards.

WARNING Indicates less severe hazards.

Safety Alerts for Instruments

For hazards associated with instruments, this guide uses the following indicators:

- Pictograms that consist of a symbol on a white background within a black triangle-shaped frame.



- Signal words that alert the user to a potential hazard and indicate the severity level. The signal words used for instrument hazards:

DANGER Indicates an imminent hazard that will result in severe injury or death if not avoided.

WARNING Indicates a potentially hazardous situation that could result in serious injury or death.

CAUTION Indicates a potentially hazardous situation that could result in minor or moderate personal injury.

IMPORTANT Indicates information necessary for proper use of products or successful outcome of experiments.

Safety Data Sheets

Read and understand the SDSs before handling chemicals. To obtain SDSs for chemicals ordered from Fluidigm Corporation, either alone or as part of this system, go to fluidigm.com/sds and search for the SDS using either the product name or the part number.

Some chemicals referred to in this user guide may not have been provided with your system. Obtain the SDSs for chemicals provided by other manufacturers from those manufacturers.

Site Requirements

Introduction

Fluidigm technical support will schedule a time to install the system at your site and train your staff to use the system. Before a Fluidigm service representative arrives to install the system, you need to choose and prepare your site according to the instructions in this document.

Notify your Fluidigm representative if special shipping arrangements are necessary at your site, or if you need assistance in placing the C1 system.

Site Preparation Workflow

Perform the following six steps to choose and prepare your site:

Site Prep Workflow

- 1** Review this guide.
- 2** Review required and ancillary equipment lists.
- 3** Select a site for the C1 system that meets Fluidigm requirements.
- 4** Stock the site with the required safety equipment.
- 5** Receive the C1 system and perform a visual check of the crate and containers. If damage is apparent, contact Fluidigm technical support.
- 6** Place the crated and boxed components at their final destination.

Step 1: Review This Guide

Use this guide for information on all C1 system site requirements, including safety, environmental, electrical, and space requirements.

Step 2: Review the Equipment Lists

Review the following lists of required equipment based on your application of interest.

Required Equipment for All Applications

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	96-well PCR plate thermal cycler	Major laboratory supplier (MLS)	—
<input type="checkbox"/>	C1 system with latest software*	Fluidigm	Inquire
<input type="checkbox"/>	Three centrifuges: one picofuge, one for 1.5 mL microtubes and one for 96-well PCR plates	MLS	—
<input type="checkbox"/>	Two hoods: DNA and DNA-free	MLS	—
<input type="checkbox"/>	Vortexer	MLS	—

* See the C1 System User Guide (PN 100-4977).

Required Equipment for Targeted Pre-amplification

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Biomark™ or Biomark HD system with latest software for gene expression analysis*	Fluidigm	Inquire
<input type="checkbox"/>	Pipette capable of measuring 0.1–2 µL or 0.1–3 µL in 0.002 µL increments†	MLS	—

* See the Biomark HD Data Collection Software User Guide (PN 100-2451).

† Recommended: Rainin® Pipet-Lite® XLS model.

Required Equipment for mRNA Sequencing

Equipment for mRNA Seq

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Agilent 2100 Bioanalyzer®	Agilent Technologies	G2940CA
<input type="checkbox"/>	Fluorometer for Quant-IT™ PicoGreen assay	MLS	—
<input type="checkbox"/>	Magnetic stand for microtubes*	MLS	—

* Recommended: DynaMag™-2 magnet, Thermo Fisher Scientific (PN 12321D).

Equipment for mRNA Seq HT

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Agilent® 2100 Bioanalyzer*	Agilent Technologies	G2940CA
<input type="checkbox"/>	Qubit® 3.0 Fluorometer	Thermo Fisher Scientific	Q33216
<input type="checkbox"/>	Magnetic stand for microtubes†	MLS	—
<input type="checkbox"/>	Select the appropriate magnet for your 96-well PCR plate: <ul style="list-style-type: none"> • DynaMag™-96 Side Magnet (recommended) – for use with semi-skirted plates and with non-skirted plates • DynaMag™-96 Side Skirted Magnet – for use with full-skirted plates 	Thermo Fisher Scientific	<ul style="list-style-type: none"> • 12331D or • 12027

NOTE PCR plates may vary. Make sure to test your plate for compatibility before use.

* Recommended: At least two Bioanalyzers to minimize the time required to complete this protocol.

† Recommended: DynaMag-2 magnet, Thermo Fisher Scientific (PN 12321D).

Required Equipment for DNA Sequencing

Equipment for Targeted Sequencing

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Access Array™ system with latest software*	Fluidigm	Inquire
<input type="checkbox"/>	Agilent 2100 Bioanalyzer	Agilent Technologies	G2940CA
<input type="checkbox"/>	Fluorometer for Quant-IT PicoGreen® assay	MLS	—
<input type="checkbox"/>	Magnetic stand for microtubes†	MLS	—
<input type="checkbox"/>	Water bath at 37 °C‡	MLS	—

* See the Fluidigm Access Array System for Illumina Sequencing Systems User Guide (PN 100-3770).

† Recommended: DynaMag-2 magnet, Thermo Fisher Scientific (PN 12321D).

‡ Required only if you use frozen cells.

Equipment for Whole Genome Sequencing (WGS)

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Agilent 2100 Bioanalyzer	Agilent Technologies	G2940CA
<input type="checkbox"/>	Fluorometer for Quant-IT PicoGreen assay	MLS	—
<input type="checkbox"/>	Magnetic stand for 96-well PCR plate	MLS	—
<input type="checkbox"/>	Magnetic stand for microtubes*	MLS	—

* Recommended: DynaMag-2 magnet, Thermo Fisher Scientific (PN 12321D).

Equipment for Whole Exome Sequencing (WES)

<input checked="" type="checkbox"/>	Product	Source	Part Number
<input type="checkbox"/>	Agilent 2100 Bioanalyzer	Agilent Technologies	G2940CA
<input type="checkbox"/>	Fluorometer for Quant-IT PicoGreen assay	MLS	—
<input type="checkbox"/>	Laboratory rotator	MLS	—
<input type="checkbox"/>	Magnetic stand for 96-well PCR plate	MLS	—
<input type="checkbox"/>	Magnetic stand for microtubes*	MLS	—
<input type="checkbox"/>	Thermoshaker	MLS	—

* Recommended: DynaMag-2 magnet, Thermo Fisher Scientific (PN 12321D).

Ancillary Equipment

For a complete list of reagents, consumables, and ancillary equipment for your application, see the following protocols:

Application	Protocol	Part Number
Targeted preamplification	Using the C1 System to Capture Cells from Cell Culture and Perform Preamplification Using Delta Gene™ Assays	100-4904
	Using the C1 System to Capture Cells from Cell Culture and Perform Preamplification Using TaqMan® Assays	100-6117
	Using the C1 System to Capture Cells from Cell Culture and Perform Preamplification of MicroRNA Species with TaqMan Assays	100-6667
mRNA sequencing	Using the C1 System to Generate Single-Cell cDNA Libraries for mRNA Sequencing	100-7168
	Generate cDNA Libraries with the C1 Single-Cell mRNA Seq HT IFC and Reagent Kit v2	101-4964
DNA sequencing	Using the C1 System to Generate Single-Cell Libraries for DNA Sequencing	100-7135

Step 3: Select a Site for C1

When considering a site, keep in mind these requirements:

- Harmonized standards
- Environmental conditions
- Laboratory bench requirements
- Electrical requirements
- (Optional) In-house air supply



WARNING The installation location **cannot** be done at a site designated BioSafety Level 3 (BSL-3) or BioSafety Level 4 (BSL-4). Fluidigm does not install, service, or repair the C1 System in areas designated BSL-3 or BSL-4.

Harmonized Standards

The C1 system conforms with the provisions of the following harmonized standards:

- EN 61010-1
- EN 61010-2-010
- EN 61010-2-081
- EN 61326-1: Electrical equipment for measurement, control, and laboratory use. EMC requirements. General requirements.
- UL Std. No. 61010-1:2001 (second edition)
- CAN/CSA-C22.2 No. 61010-1-04

Environmental Conditions

Altitudes

The C1 system is for use in altitudes not exceeding 8,202 ft (2,500 m) above sea level. If your facility is located above this elevation, call technical support.

Humidity and Temperature

Ensure that the following requirements are maintained:

Condition	Acceptable Range
Humidity	20–80% relative humidity, non-condensing
Temperature	15–28 °C (59–82 °F), stable

Also, do not locate the system next to heat sources or cooling ducts, or in direct sunlight or extreme ambient lighting. Temperature extremes can cause system instability. The C1 system is designed to be used indoors only.

Pollution

The C1 system conforms to standard laboratory environments. Do not install the system where conductive pollutants are present.

Ventilation Requirements

The C1 system produces only hot air exhaust (no fumes or vapors). The C1 system has an exhaust grill exit. Four inches (10.2 cm) of clearance must be maintained at the exhaust grill exit.

The air intake is on the bottom of the instrument.

IMPORTANT Do not place paper or any object underneath the instrument.

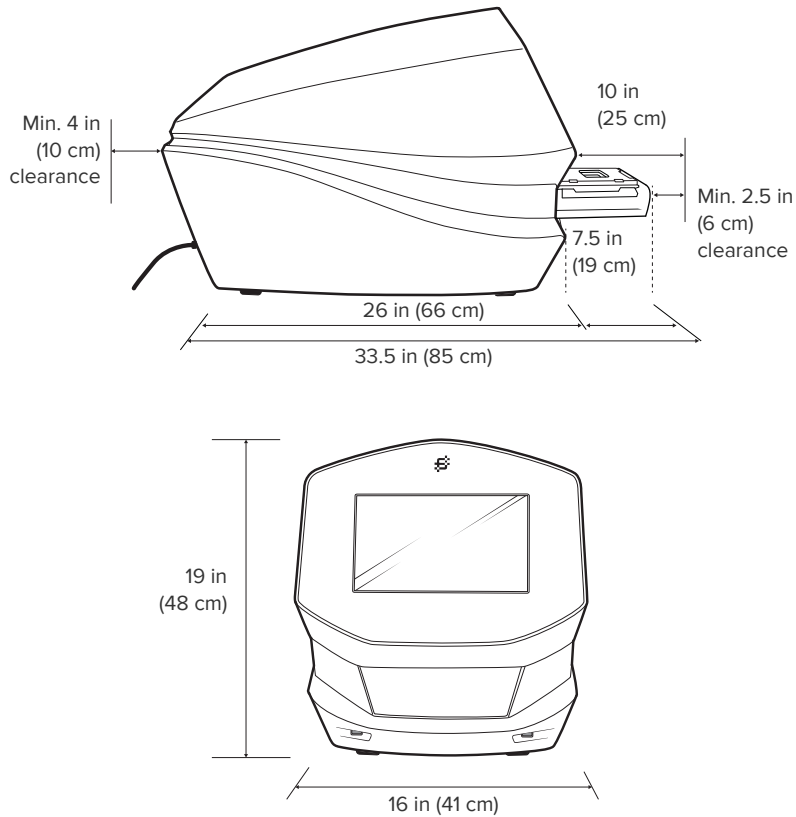
Ensure your lab space is ventilated using non-recirculating air exchanges.

Laboratory Bench Requirements

IMPORTANT WEIGHT. Your laboratory bench must support at least 200 lb (91 kg).

Depending on your configuration, you'll need to consider the following dimensions:

C1 system, 19 in high x 16 in wide x 26 in deep (48 x 41 x 66 cm)



Electrical Requirements

This section applies to the C1 system. For the electrical requirements of other Fluidigm equipment, see respective equipment documentation.

Electrical Installation

Category II

C1 Electrical Requirements

The C1 system requires one electrical power outlet. The system operates through 100-240 V AC power at 50–60 Hz, (8.0 A):

Customer Location	Voltage (VAC)	Frequency (Hz)	Maximum Current (A)	Typical Average Power Consumption (W)
Japan	100 ±10%	50–60 ±1%	8.0	Idle: 40 Operating: 175
U.S., Canada	115 ±10%	50–60 ±1%	8.0	Idle: 40 Operating: 175
Europe, Australia	230 ±10%	50–60 ±1%	3.7	Idle: 40 Operating: 175

Power Cord Requirements

Fluidigm will provide a country-specific power cord.

Customer Location	Minimum Wire Gauge (AWG)	Maximum Length (m)	Instrument End Plug	Receptacle End Plug
Japan, U.S., Canada	14	2	IEC C13	Country-specific
Europe, Australia	16	2	IEC C13	Country-specific

Receptacle Requirements

When connecting this instrument to a receptacle, check with your facilities manager to make sure the circuit will not be overloaded. If you are connecting multiple instruments to the same electrical receptacle or circuit, be sure the sum of all the instruments' maximum current draw is within the circuit's current limit. Receptacles must be grounded.

IMPORTANT Do not use extension cords.

Uninterruptible Power Supply Recommendation

If your C1 system is installed in a region that has electrical voltage fluctuations exceeding $\pm 10\%$ of the normal value, protect the system with an uninterruptible power supply (UPS). Fluctuating voltage can compromise the C1 system. The minimum requirements for the UPS to maintain power for one system are:

Conditions	Requirements
Output Power Capacity	300 W (400 VA)
Backup Time (Run Time)	2 hr
Power Draw (Load)	175 W

Disconnecting Power

In case of emergency, you must be able to immediately disconnect the main power supply to the instrument.

(Optional) In-House Air Supply

The C1 system has an internal compressor to generate compressed air and draws in ambient air by default. To use in-house compressed air, attach 1/4-inch tubing into the air inlet on the back of the system. The allowable pressure input is listed on the back of the instrument.

For detailed instructions on enabling use of in-house air, see the C1 System User Guide (PN 100-4977).

Step 4: Stock the Site

IMPORTANT Safety personnel at your company must ensure that:

- Safety policies to protect laboratory personnel from potential harm are established and are followed by personnel.
- All necessary safety devices and equipment are in the laboratory or in close proximity.

Required Safety Equipment

Fluidigm expects your laboratory to have safety policies in place to protect laboratory personnel from potential harm. We expect that appropriate safety practices are followed at all times.

Safety equipment that must be at the installation location includes:

- Adequate ventilation, including vent line/fume hood, if applicable
- Safety shower
- Eyewash station
- Biohazard waste container, if applicable
- Applicable SDSs
- Protection from potentially infectious biological material, hazardous chemicals, and radiation that may be present in the area where the Fluidigm service representative will be working
- Spill cleanup equipment
- First-aid equipment
- Eye and hand protection
- Fire extinguisher
 - You are responsible for providing an appropriate fire extinguisher for use on or near the C1 system.
 - The fire extinguishers must be appropriate for use on chemical and electrical fires and be approved by your local fire marshal or other authority having jurisdiction in your area.

Step 5: Receive the System

Because the C1 system weighs approximately 103 lb/47 kg (160 lb/73 kg crated), consider where it is going to be delivered and how to get it to and into your laboratory.

Delivery and System Inspection

For new C1 system installations, you can anticipate receiving:

- C1 system, crated
- Instrument accessories, boxed
- Reagent kit (if ordered)

Use this checklist to perform a check of all delivered components:

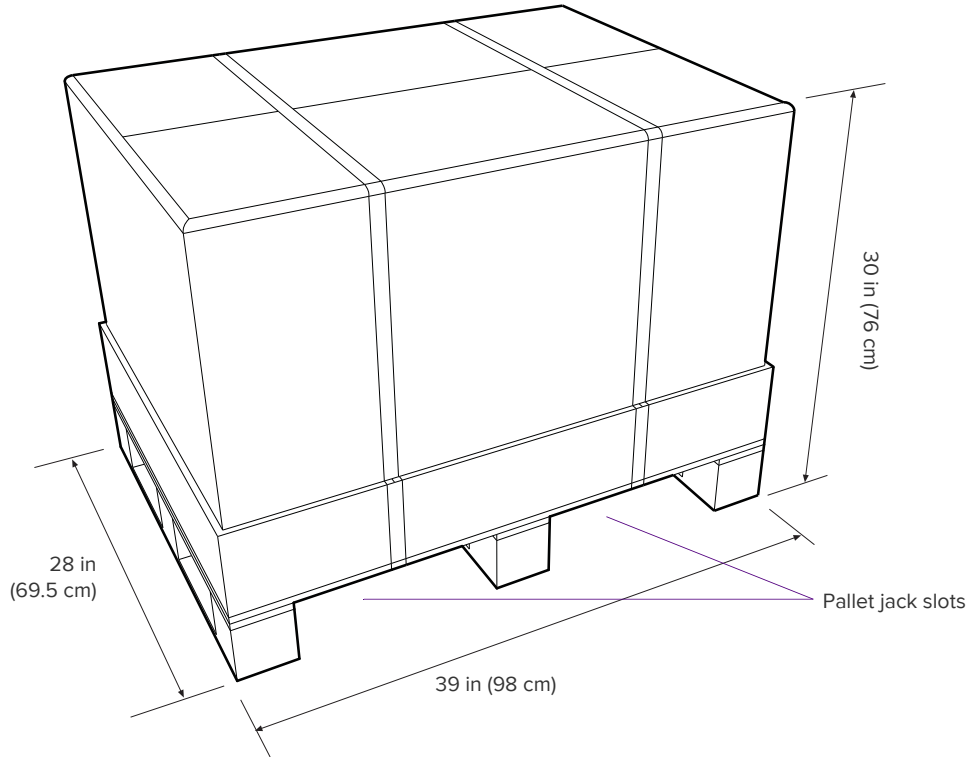
- Check the packing list against the original order.
- Check all boxes and crates for damage.
- Note any damage and report it to the Fluidigm service representative.
- Locate the reagent kit (if ordered) and unpack immediately.
- Store each component at the appropriate temperature according to the instructions.

C1 Size and Weight Specifications

Specifications	C1 system
Packaged	
Weight	160 lb (73 kg)
Dimensions	39 in L x 28 in W x 30 in H (98 cm L x 69.5 cm W x 76 cm H)
Unpackaged	
Weight	103 lb (46.7 kg)
Dimensions	19 in L x 16 in W x 26 in H (48 cm L x 41 cm W x 66 cm H)



WARNING PHYSICAL INJURY HAZARD. Do not attempt to lift or move this instrument and/or crates without the use of appropriate moving/lifting equipment.



Path Clearances

IMPORTANT A clear path from the loading dock to the laboratory bench must be established. The path must accommodate the dimensions of the crate.

Make sure the path to the installation site has the following minimum clearances:

Crate Dimension	Minimum Clearance
Height	33 in (84 cm)
Width	42 in (107 cm)

Step 6: Place the System at the Site

Remove all unnecessary materials from the proposed installation site prior to the arrival of the Fluidigm field service engineer.

Have the crated C1 system at its permanent location prior to the arrival of a field service engineer. Wait for the engineer to arrive before unpacking the crate.

System Weight



WARNING PHYSICAL INJURY HAZARD! Do not attempt to lift or move any boxed or crated items unless you use proper lifting techniques. The crated C1 system weighs ~160 lb (~73 kg).



If you choose to lift or move the C1 system after it has been installed, do not attempt to do so without the assistance of others. Use appropriate moving equipment and proper lifting techniques to minimize the chance of physical injury.

IMPORTANT Do not tip the C1 system on end. Tipping damages the instrument hardware and electronics.

Installation

Before the installation date, make sure you have done the following:

- 1 Removed all unnecessary materials from the proposed final installation site
- 2 Received the system and performed a visual check of the crate and containers
- 3 Moved the crated and boxed equipment from the receiving location to the installation area

Contact your Fluidigm representative if you require assistance with any of these steps.

Installation Time Estimate

Installation of the C1 system is estimated to take one day. Site issues and other factors may delay or extend the installation time.

Appendix: Safety

General Safety

In addition to your site-specific safety requirements, Fluidigm recommends the following general safety guidelines in all laboratory and manufacturing areas:

- Use personal protective equipment (PPE): safety glasses, fully enclosed shoes, lab coats, and gloves.
- Know the locations of all safety equipment (fire extinguishers, spill kits, eyewashes/showers, first-aid kits, safety data sheets, etc.), emergency exit locations, and emergency/injury reporting procedures.
- Do not eat, drink, or smoke in lab areas.
- Maintain clean work areas.
- Wash hands before leaving the lab.

Instrument Safety



WARNING Do not modify this device. Unauthorized modifications may create a safety hazard.



CAUTION HOT SURFACE The C1 system thermal cycler chuck gets hot and can burn your skin. Use caution when working near the chuck.



CAUTION PINCH HAZARD. The C1 door and tray can pinch your hand. Make sure your fingers, hand, shirtsleeve, etc., are clear of the door and tray when loading or ejecting an integrated fluidic circuit (IFC).



WARNING BIOHAZARD. If you are putting biohazardous material on the instrument, use appropriate personal protective equipment and adhere to *Biosafety in Microbiological and Biomedical Laboratories* (BMBL) from the Centers for Disease Control and Prevention and to your lab's safety protocol to limit biohazard risks. If biohazardous materials are used, properly label the equipment as a biohazard. For more information, see the BMBL guidelines online at: [cdc.gov/biosafety/publications/index.htm](https://www.cdc.gov/biosafety/publications/index.htm)

Electrical Safety



WARNING ELECTRICAL HAZARD. Electrical shock can result if the C1 instrument is operated without its protective covers.



WARNING ELECTRICAL HAZARD. Plug the system into a properly grounded receptacle with adequate current capacity.

Chemical Safety

Read and comprehend all safety data sheets (SDSs) by chemical manufacturers before you use, store, or handle any chemicals or hazardous materials.

Wear personal protective equipment (gloves, safety glasses, fully enclosed shoes, lab coats) when handling chemicals.

Do not inhale fumes from chemicals. Use adequate ventilation, and return caps to bottles immediately after use.

Check regularly for chemical spills or leaks. Follow SDS recommendations for cleaning up spills or leaks.



For technical support visit fluidigm.com/support