USER GUIDE

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resDNASEQ® Quantitative CHO DNA Kit

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Product Information

IMPORTANT! Before using this product, read and understand the information the "Safety" appendix in this document.

Product overview

The resDNASEQ® Quantitative CHO DNA Kit is used to quantitate host-cell residual DNA from Chinese hamster ovary (CHO) cells, a widely used cell line for production of biopharmaceutical products. Use the kit after you extract host-cell DNA from test samples. For extraction information, refer to the *PrepSEQ® Residual DNA Sample Preparation Kit User Guide* (Pub. no. 4415259).

The resDNASEQ® Quantitative CHO DNA Kit uses TaqMan® quantitative PCR to perform rapid, specific quantitation of sub-picogram levels of residual CHO host-cell DNA. The assay is accurate and reliable across a broad range of sample types, from in-process samples to final product.

Purified CHO DNA control is included in the kit to generate the standard curve used to quantitate the DNA in test samples. In addition, the kit contains an internal positive control (IPC) to evaluate the performance of every PCR in the assay.

Required materials

Kit contents and storage

The resDNASEQ® Quantitative CHO DNA Kit (Cat. nos. 4402085 and 4442731) components are shown in the following table.

Reagent	Description	Storage
resDNASEQ® CHO DNA Control		
CHO DNA Control	1 tube, 40 µL	Store at –15 to –25°C.
DNA Dilution Buffer (DDB)	1 bottle, 7 mL	Store at –15 to –25°C before first use. Store at 2–8°C after first use.
resDNASEQ® CHO Real-Time PCR Reagents		
2X Environmental Master Mix	2 tubes, 0.75 mL/tube	Store at –15 to –25°C before first use, protected from light. Store at 2–8°C after first use.
10X CHO DNA Real-Time PCR Assay Mix	1 tube, 300 µL	Store at –15 to –25°C, protected from light.
Negative Control	1 tube, 1.0 mL	Store at –15 to –25°C before first use. Store at 2–8°C after first use.
Instructions (only included with Cat. no. 4442731)		
User Guide (this document)	Pub. no. 4415260	
Quick Reference Card	Pub. no. 4415257	

The resDNASEQ® Quantitative CHO DNA Kit can also be purchased along with the PrepSEQ® Residual DNA Sample Preparation Kit (Cat. nos. 4413713 [kits] and 4415413 [kits with protocols and quick reference cards]).

Materials required but not included

Use of the resDNASEQ® Quantitative CHO DNA Kit requires the following materials.

Instruments and software	Cat. no.
Applied Biosystems® 7500 Fast Real-Time PCR System, with Dell Notebook *or*	4365464
Applied Biosystems® 7500 Fast Real-Time PCR System, with Dell Tower	4365463

Plates and plate consumables	Cat. no.
MicroAmp® Fast Optical 96-Well Reaction Plate with Barcode, 20 plates, 0.1-mL wells; for use with Applied Biosystems® 7500 Fast Real-Time PCR System	4346906
MicroAmp® Optical Adhesive Film Kit, 20 covers, 1 applicator, 1 optical cover compression pad	4313663
MicroAmp® Optical Adhesive Film Kit, 25 covers	4360954

Miscellaneous items	Source or Cat. no.
Disposable gloves	Major lab supplier (MLS)
Pipettes	MLS
Aerosol-resistant micropipette tips	MLS
Centrifuge for PCR plate	MLS
1.5-mL nonstick tubes	AM12450

resDNASEQ® Quantitative CHO DNA Kit

resDNASEQ® kit workflows

The resDNASEQ® Kit workflow is shown on the following pages. For details, go to page 12.

Workflow to prepare the serial dilutions and the standard curve

Prepare CHO DNA serial dilutions for the standard curve

Step 1: Label 7 Ambion® nonstick 1.5-mL tubes: **SD1**, **SD2**, **SD3**, **SD4**, **SD5**, **SD6**, and **NTC**‡.

Step 2: Add 990 µL of DNA dilution Buffer (DDB) to tube SD1.

Step 3: Add 450 µL of DDB to tubes SD2, SD3, SD4, SD5, SD6, and NTC.

Step 4: Remove the tube of CHO DNA Control (30 ng/µL) from the freezer.

Step 5: Thaw on ice, vortex gently for 2 sec, and quick-spin.

Step 6: Add 10 µL of CHO DNA Control to the tube that is labeled SD1, then vortex thoroughly.

Step 7: Transfer 50 µL of the DNA from tube SD1 to tube SD2.

Step 8: Transfer 50 µL of DNA from the previous dilution tube to the next dilution tube, until you add DNA to tube SD6. After each transfer, vortex thoroughly.

Step 9: Store the CHO DNA dilution tube at 4°C for use on the day of preparation. Otherwise, store the tubes at –20°C and use within 1 week.

Optional: Prepare extraction/recovery control (ERC) on selected samples

Step 1: For each sample, label three 2-mL safe-lock tubes "ERC."

Step 2: Add appropriate volume of test sample to each tube.

Step 3: Add 16.7 µL of DNA from tube SD3 to each ERC tube, then gently vortex.

Prepare the reaction master mix

Step 1: Determine the number of controls and test samples to quantify.

Step 2: Thaw all kit reagents completely at room temperature.

Step 3: Prepare a PCR mix (see table on page 14.

Add the master mix to the test and standard curve samples

Step 1: Prepare tubes for the CHO DNA standard curve (page 14).

Step 2: Prepare the negative control samples (1 tube labeled NEG) (page 15).

Step 3: Prepare the test samples (page 15).

Step 4: Prepare the No Template Control samples (1 tube labeled NTC) (page 15).

Prepare the reaction master mix

Step 1: Set up a 96-well PCR plate (page 15).

Step 2: Seal the plate with optical film, then quick-spin with a centrifuge rotor that is compatible with 96-well plates.

‡ SD = serial dilution, NTC = no template control.

Workflow to create the plate document, run the plate, and analyze the results

On the 7500 Fast instrument:

Create a plate document

Step 1: Select **Absolute Quantification** from the Template Assay drop-down list, and select **Standard 7500** from the Run Mode drop-down list.

Step 2: Enter **resDNAassay** in the Plate name field, then click **Next**.

Step 3: Click **New Detector** and enter/select variables (name = **CHO**, report dye = **FAM**, quencher dye = **none**, select detector color), then click **Create Another** (page 16).

Step 4: Click **New Detector** and enter/select variables (name = **IPC**, report dye = **VIC**, quencher dye = **none**, select detector color) (page 16).

Step 5: Select the applicable set of wells for the samples, then select FAM/IPC detectors for each well.

Step 6: Set up the standard curve (select the wells, assign the tasks, and label the appropriate wells) (page 17).

Step 7: Set up the test and controls (select the wells, assign the tasks, and label the appropriate wells), then click **Finish** (page 17).

Step 8: In the **Instrument** tab, set thermal-cycling conditions (reaction volume = **30 µL**, reaction = **standard**, set temperature and time) (page 17).

Step 9: Select **File** ▸ **Save as** and confirm that the file is named "resDNAassay", then select **SDS Templates (*.sdt)** in the "Save as type" drop-down list and close the plate document (template).

Run the plate

Step 1: In the SDS software, select **File** ▸ **New**, then navigate to the SDS Documents folder.

Step 2: Select the **resDNAassay** template file, then click **Open**.

Step 3: In the Plate Name field, **enter ResDNA_date of assay**, then click **Finish** in the New Document Wizard.

Step 4: Make necessary changes to the test sample labels.

Step 5: Load the plate on the instrument.

Step 6: Select the **Instrument** tab, save the document, then click **Start** to start the real-time qPCR run.

Analyze the results

Step 1: Select **Analysis** ▸ **Analysis Settings** from the **Results** tab.

Step 2: In the Analysis Settings window (page 18):

- Select **Manual Ct**,
- Enter **0.2** in the Threshold field,
- Select **Manual Baseline**,
- Enter **3** for Start (cycle),
- Enter **15** for End (cycle), and
- Click **OK**.

Step 3: Click ▶ in the toolbar to analyze the plate.

Step 4: Select the **Results** tab ▸ **Standard Curve** tab, then verify the Slope, Intercept, and R2 values.

Step 5: Right-click the **Standard Curve**, select **Export as JPEG**, then click **OK**. Alternatively, press **PrintScreen**, then paste the image in a WordPad file.

Step 6: Select **Report** tab ▸ **Report**, then review the mean quantity and standard deviation for each of the samples.

Step 7: Select **File** ▸ **Export** ▸ **Results**. In the "Save as type" drop-down list, select **Results Export Files (*.csv)**, then click **Save**.

Guidelines for resDNASEQ® Kit procedures

When you prepare the serial dilutions of CHO DNA, follow these rules to *avoid carryover contamination* and to ensure proper sample preparation and quantitative PCR (qPCR) of samples:

- Use Ambion® nonstick 1.5-mL tubes.
- Label the top of each tube for identification.
- Use 2 sets of pipettes:
  - For serial dilutions and to create the standard curve
  - For sample preparation or to set up PCRs.
- Prepare the serial dilutions in an area physically separate from the test-sample preparation area.

Prepare CHO DNA serial dilutions and the standard curve

Prepare serial dilutions of CHO DNA control from the same experiment to create a standard curve and to determine sample recovery rate.

IMPORTANT! To assure accurate quantitative results, Life Technologies protocols call for true triplicate sample preparation and analysis. You must extract each test sample in triplicate and perform a single PCR for each extraction. The instrument software then calculates a mean quantity and a standard deviation for the triplicate samples, followed by a percent coefficient of variation from this data (SD/Mean Quantity × 100 = %CV). Based on the method qualification, you can then assign a %CV to ensure accurate results from each sample tested.

Prepare CHO DNA serial dilutions for the standard curve

To prepare the CHO DNA standard curve:

1. Label 7 Ambion nonstick 1.5-mL tubes: **SD1**, **SD2**, **SD3**, **SD4**, **SD5**, **SD6**, and **NTC**, where SD indicates serial dilutions and NTC indicates the no template control.
2. Add 990 µL of DNA Dilution Buffer (DDB) to tube SD1.
3. Add 450 µL of DNA DDB to tubes SD2, SD3, SD4, SD5, SD6, and NTC.
4. Remove the tube of CHO DNA control (30 ng/µl) from the freezer, then thaw on ice.
5. After the DNA thaws, vortex gently for 2 seconds, then quick-spin.
6. Add 10 µL of the CHO DNA control to tube SD1, then vortex thoroughly.
7. Transfer 50 µL of the DNA from tube SD1 to tube SD2 (Table 1), then vortex thoroughly.

8. Continue to transfer 50 µl of DNA from the previous dilution tube to the next dilution tube until you add DNA to tube SD6. Final dilutions are shown in the following table. After each transfer vortex thoroughly.

Table 1 Serial dilution for standard curve.

Tube label	Dilution	pg DNA/reaction (10 µL of the diluted DNA used in final 30 µL of the PCR)
CHO	CHO DNA control tube	300,000
SD1	10 µL CHO DNA control + 990 µL DDB	3000
SD2	50 µL SD1 + 450 µL DDB	300
SD3	50 µL SD2 + 450 µL DDB	30
SD4	50 µL SD3 + 450 µL DDB	3
SD5	50 µL SD4 + 450 µL DDB	0.3
SD6	50 µL SD5 + 450 µL DDB	0.03

9. Store the CHO DNA dilution tubes at 4°C for use on the day of preparation. Otherwise, store the tubes at –20°C and use within 1 week.

Prepare extraction/recovery control on selected samples (optional)

You can use an extraction/recovery control (ERC) to assess the efficiency of DNA extraction, recovery, and quantitation from test samples. Additionally, you can use ERC to verify assay and system performance.

The following procedure describes the preparation of an ERC sample containing 10 pg of CHO DNA control per well for qPCR analysis.

Note: Adjust the amount of CHO DNA control added to the sample for those test samples that contain higher background levels of DNA. To assure accurate results, the amount of CHO DNA control that you add to a test sample should be approximately double the amount of DNA measured in the test sample *without* the addition of the CHO DNA control. To calculate the efficiency of DNA recovery and quantitation from the test samples, subtract the amount of DNA measured in the sample *without* the addition of CHO DNA control from the amount of DNA measured in the ERC sample.

1. For each sample, label three 2-mL safe-lock tubes "ERC".
2. Add the appropriate volume of test sample to each tube.
3. Add 16.7 µL of DNA from tube SD3 to each ERC tube, then vortex gently.

When you finish, extract DNA from the tubes according to the *PrepSEQ® Residual DNA Sample Preparation Kit User Guide* (Pub. no. 4415259), then quantify the extracted DNA in each tube using the resDNASEQ® Quantitative CHO DNA Kit as described in the following section.

Prepare the reaction master mix

Prepare serial dilutions of CHO DNA control from the same experiment to create a standard curve and to determine sample recovery rate.

1. Determine the number of controls and test samples whose DNA content you will quantify.
2. Thaw all kit reagents completely at room temperature.
3. Prepare a PCR mix using the reagents and volumes shown in the following table.
   - Multiply the PCR volume for 1 reaction (30 µL) by the number of reactions that you need to run.
   - Use 10% excess volume to compensate for pipetting losses.

     IMPORTANT! Environmental Master Mix must be from the same lot for all reactions.

Kit reagents	Volume for 1 30-µL reaction (µL)	Volume for 36 30-µL reactions (µL)
Negative control	2	**72**
10X primer/probe mix	3	**108**
2X Environmental Master Mix	15	**540**
DNA template	10	**NA**
Total	**30**	**720**

Add the master mix to the test and standard curve samples

1. Prepare tubes for the CHO DNA standard curve:
   a. Label the tubes as shown in the first column of the following table.

Standard curve (SC) tube	Volume to transfer from indicated serial dilution (SD) tube (µL)	Volume of PCR mix (µL)	Amt. of DNA (pg)
SC1	(SD1) 33	66	3000
SC2	(SD2) 33	66	300
SC3	(SD3) 33	66	30
SC4	(SD4) 33	66	3
SC5	(SD5) 33	66	0.3
SC6	(SD6) 33	66	0.03

   b. To each standard curve (SC) tube, add 33 µL from the corresponding serial dilution (SD) tube that you prepared in the previous section, "Prepare CHO DNA serial dilutions for the standard curve" on page 12.
   c. Add 66 µL of PCR mix to each SC tube shown in the first column; gently vortex, then briefly centrifuge each tube.
   d. Add 30 µL to each of three replicate wells.

2. Prepare the extraction negative control samples (1 tube labeled “NEG”):
   a. Add 33 µL of extraction negative control.
   b. Add 66 µL of PCR mix; gently vortex, then briefly centrifuge each tube.
   c. Add 30 µL to each of 3 replicate wells.
3. Prepare the test samples:
   a. Add 20 µL of PCR mix to each tube with 10 µL of sample DNA that was prepared using the PrepSEQ® DNA extraction procedure. Refer to the *PrepSEQ® Residual DNA Sample Preparation Kit User Guide* (Pub. no. 4415259) for more information.
   b. Centrifuge briefly.
   c. Add the entire 30-µL reaction sample to each well in the reaction plate as appropriate. Refer to step 5 on page 15 for the plate layout.
4. Prepare the No Template Control samples (1 tube labeled “NTC”):
   a. Add 33 µL of DDB.
   b. Add 66 µL of PCR mix.
   c. Vortex the tube gently, then briefly centrifuge.
   d. Add 30 µL to each of 3 replicate wells.
5. Set up a 96-well PCR plate using the example plate layout shown in the following table (36 reactions for the standard curve and 3 test samples):

	1	2	3	4	5	6	7	8	9	10	11	12
										Standard Curve (pg)		
A	NTC‡	NTC	NTC							**3000**	**3000**	**3000**
B	NEG§	NEG	NEG							**300**	**300**	**300**
C										**30**	**30**	**30**
D										**3**	**3**	**3**
E	TS#-1	TS-1	TS-1							**0.3**	**0.3**	**0.3**
F	TS-2	TS-2	TS-2							**0.03**	**0.03**	**0.03**
G	TS-3	TS-3	TS-3									
H												

‡ NTC = no template control
§ NEG = negative control
# TS = test sample

Note: The plate layout is a suggested plate layout. Adjust the layout according to the number of test samples to be run.

6. Seal the plate with an optical film, then quick-spin with a centrifuge rotor that is compatible with 96-well plates.

Create the plate document, run the plate, and analyze results

Create a plate document

The following instructions apply only to the 7500 Fast instrument. If you use a different instrument, refer to the applicable instrument guide for setup guidelines.

1. In the Template Assay drop-down list, select **Absolute Quantification**.
2. In the Run Mode drop-down list, select **Standard 7500**.
3. Enter **resDNAassay** in the Plate name field, then click **Next**.
4. Click **New Detector**:
   a. Enter **CHO** in the Name field.
   b. Select **FAM** in the Report Dye drop-down list.
   c. Select **(none)** in the Quencher Dye drop-down list.
   d. Select a color for the detector, then click **Create Another**.
5. Click **New Detector**:
   a. Enter **IPC** in the Name field.
   b. Select **VIC** in the Report Dye drop-down list.
   c. Select **(none)** in the Quencher Dye drop-down list.
   d. Select a color for the detector, then click **OK**.
6. Select the applicable set of wells for the samples, then select CHO and IPC detectors for each well. The following figure shows an example plate layout:

	1	2	3	4	5	6	7	8	9	10	11	12
										Standard Curve (pg)		
A	NTC	NTC	NTC							**3000**	**3000**	**3000**
B	NEG	NEG	NEG							**300**	**300**	**300**
C										**30**	**30**	**30**
D										**3**	**3**	**3**
E	TS-1	TS-1	TS-1							**0.3**	**0.3**	**0.3**
F	TS-2	TS-2	TS-2							**0.03**	**0.03**	**0.03**
G	TS-3	TS-3	TS-3									
H												

7. Set tasks for each sample type by clicking on the Task Column drop-down list:
   a. NTC: CHO detector task = **NTC**
   b. Negative and samples wells: CHO detector task = **Unknown**
   c. IPC = **Unknown** for all wells

8. Set up the standard curve as shown in the following table:
   a. Select the wells.
   b. Assign the tasks (CHO = Standard) and enter the appropriate Quantity for each set of triplicates.

Tube label	Row-wells	Task	Quantity	Label (pg)
SC1	A-10, 11, 12	Standard	3000	3000
SC2	B-10, 11, 12	Standard	300	300
SC3	C-10, 11, 12	Standard	30	30
SC4	D-10, 11, 12	Standard	3	3
SC5	E-10, 11, 12	Standard	0.3	0.3
SC6	F-10, 11, 12	Standard	0.03	0.03

9. Set up the test and controls as shown in the table:
   a. Highlight each group of triplicates.
   b. Right-click to open the Well Inspector.
   c. Verify the tasks and label the sample by typing a unique identifier (for example, “Sample 1”) in the Sample Name Box, then click **Finish**.

Tube label	Row-wells	Task	Quantity (pg)	Label
NTC	A-1, 2, 3	NTC	NA	NTC
NEG	B-1, 2, 3	NTC	NA	NEG
TS-1	E-1, 2, 3	Unknown	NA	Sample-1
TS-2	F-1, 2, 3	Unknown	NA	Sample-2
TS-3	G-1, 2, 3	Unknown	NA	Sample-3

10. Select the **Instrument** tab, then set thermal-cycling conditions:
    - Set the thermal cycling reaction volume to **30 µL**.
    - For the 7500 Fast system, set the reaction to **Standard**.
    - Set the temperature and the time as shown in the following table.

Step	AmpliTaq Gold® enzyme activation	PCR	
	Hold	Cycle (40 Cycles)	
		Denature	Anneal/extend
Temp (°C)	95	95	60
Time (mm:sec)	10:00	0:15	1:00

Refer to the applicable 7500 Fast Real-Time PCR Systems instrument manual for additional information.

11. Select **File ▸ Save as**, confirm that the file is named “resDNAassay”, then select **SDS Templates (*.sdt)** in the “Save as type” drop-down list and close the template plate document.

    Note: You can reuse the plate document whenever you run the assay.

Run the plate

1. In the SDS software, select **File ▸ New**, then navigate to the SDS Documents folder.
2. Select the **resDNAassay** template file, then click **Open**.
3. In the Plate Name field, enter **ResDNA_ *date of Assay***, then click **Finish** in the New Document Wizard page.
4. Make any necessary changes to the test sample labels.
5. Load the plate on the instrument.
6. Select the **Instrument** tab, save the document, then click **Start** to start the real-time qPCR run.

Analyze the results

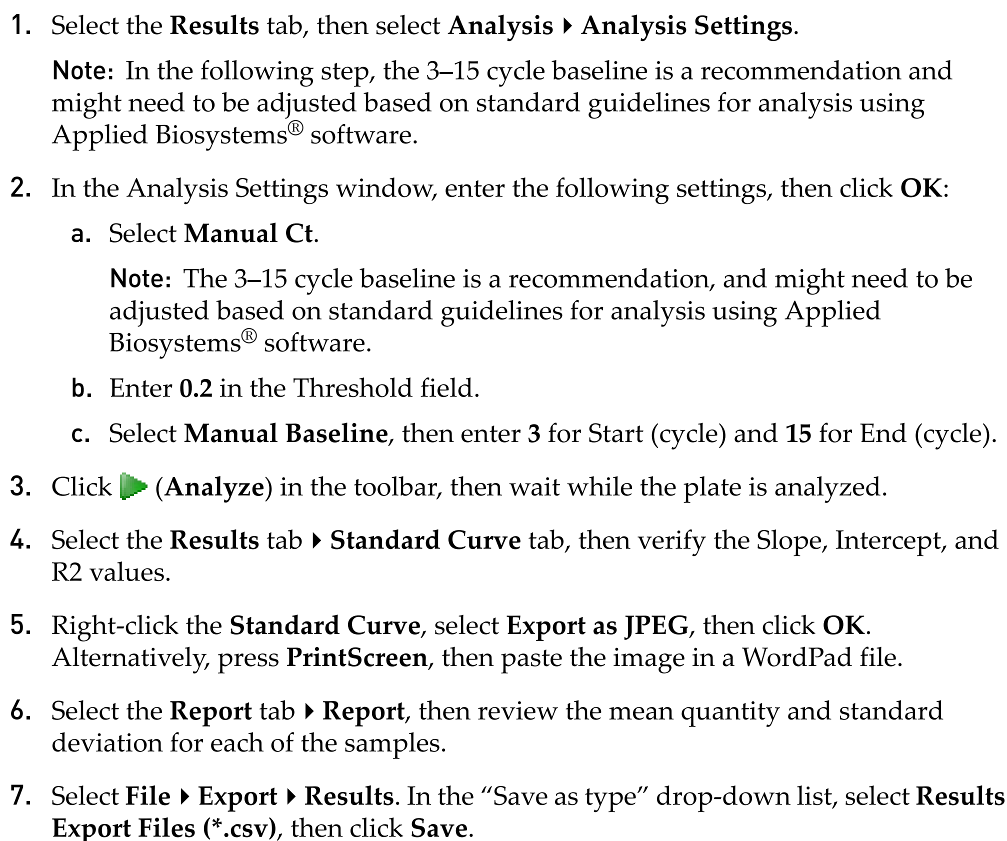
After the qPCR run is finished, use the following general procedure to analyze the results. For more information, refer the Getting Started Guide that is supplied with the specific analysis software.

1. Select the **Results** tab, then select **Analysis ▸ Analysis Settings**.

   Note: In the following step, the 3–15 cycle baseline is a recommendation and might need to be adjusted based on standard guidelines for analysis using Applied Biosystems® software.

2. In the Analysis Settings window, enter the following settings, then click **OK**:
   a. Select **Manual Ct**.

      Note: The 3–15 cycle baseline is a recommendation, and might need to be adjusted based on standard guidelines for analysis using Applied Biosystems® software.

   b. Enter **0.2** in the Threshold field.
   c. Select **Manual Baseline**, then enter **3** for Start (cycle) and **15** for End (cycle).
3. Click  (**Analyze**) in the toolbar, then wait while the plate is analyzed.
4. Select the **Results** tab ▸ **Standard Curve** tab, then verify the Slope, Intercept, and R2 values.
5. Right-click the **Standard Curve**, select **Export as JPEG**, then click **OK**. Alternatively, press **PrintScreen**, then paste the image in a WordPad file.
6. Select the **Report** tab ▸ **Report**, then review the mean quantity and standard deviation for each of the samples.
7. Select **File ▸ Export ▸ Results**. In the “Save as type” drop-down list, select **Results Export Files (*.csv)**, then click **Save**.

Troubleshooting

Observation	Possible cause	Action
Slope for the standard curve is outside the typical range, or R_2 value is significantly <0.98	When applying detectors for standards, the Task and Quantity were applied to the wrong detector. *Or* The incorrect Quantity was entered.	1. From the plate document, double-click a well containing a CHO DNA standard to view the Well Inspector. 2. Ensure that the correct Task and Quantity are applied to the correct detector, then reanalyze.
ΔR_n and C_T values are inconsistent with replicates	Evaporation of reaction mixture from some wells occurred because the optical adhesive cover was not correctly sealed to the reaction plate. *Or* The compression pad was not used during the run.	1. Select the **Component** tab. Confirm that affected wells generated significantly less fluorescence than unaffected replicates. 2. Check the amount of solution in each well of the reaction plate. Confirm that the wells affected by evaporation contained less solution than unaffected wells, and corresponded with the inconsistent results. 3. For subsequent runs, ensure that the optical adhesive cover is correctly sealed to the reaction plate.
	Incorrect volume of CHO PCR Mix was added to some reactions.	1. Select the **Component** tab. Confirm that affected wells generated significantly less fluorescence than unaffected replicates. 2. Select the **Spectra** tab. Confirm that the wells with the incorrect volume of CHO PCR Mix generated significantly different amounts of fluorescence than the unaffected wells. 3. For subsequent runs, ensure the correct volume of CHO PCR Mix.
Jagged amplification plots	Weak lamp or incorrect replacement.	Replace the lamp or make sure that the existing replacement is correct.
No defined amplification plots	An incorrect detector was selected on the amplification plot. *Or* An incorrect detector was applied to the reactions when setting up the plate document.	1. Confirm that the correct detector was selected on the amplification plot. 2. If the correct detector was not selected, then in the plate document, double-click a well to view the Well Inspector, verify that the detector settings are correct, and reanalyze.
Abnormal ΔR_n values or negative ΔR_n values.	Incorrect passive reference was selected when setting up the plate document.	1. From the plate document, double-click a well to view the Well Inspector. 2. Ensure that ROX™ dye was selected as the Passive Reference.

Safety

WARNING! GENERAL SAFETY. Using this product in a manner not specified in the user documentation may result in personal injury or damage to the instrument or device. Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.

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

Chemical safety

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

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the “Documentation and Support” section in this document.
- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).
- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood).
- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended in the SDS.
- Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.
- **IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Specific chemical handling

CAS	Chemical	Guidelines
26628-22-8	Sodium Azide	Sodium azide may react with lead and copper plumbing to form highly explosive metal azides.

Biological hazard safety

WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. All work should be conducted in properly equipped facilities using the appropriate safety equipment (for example, physical containment devices). Safety equipment also may include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, Biosafety in Microbiological and Biomedical Laboratories (BMBL), 5th Edition, HHS Publication No. (CDC) 21-1112, Revised December 2009; found at: **www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf**.
- World Health Organization, Laboratory Biosafety Manual, 3rd Edition, WHO/CDS/CSR/LYO/2004.11; found at: **www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf**.

Documentation and Support

Related documents

For additional documentation, see "Obtaining support" on page 24.

- For information on preparing samples for extraction, refer to the *PrepSEQ® Residual DNA Sample Preparation Kit User Guide* (Pub. no. 4415259).
- For information on the Applied Biosystems® 7500 Fast instrument, refer to the *Getting Started Guide, Absolute Quantification Assays* (Cat. no. 4347825).

Portable document format (PDF) versions of this guide and the documents listed above are available at **www.lifetechnologies.com.**

Obtaining SDSs

Safety Data Sheets (SDSs) are available from **www.lifetechnologies.com/support**.

Note: For the SDSs of chemicals not distributed by Life Technologies, contact the chemical manufacturer.

Obtaining Certificates of Analysis

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

Obtaining support

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

www.lifetechnologies.com/support

At the website, you can:

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

Limited product warranty

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