TECHNICAL MANUAL

Maxwell® FSC DNA IQ™ Casework Kit

Instructions for Use of Products
AS1550 and DC6745

Note: To use the Maxwell® FSC DNA IQ™ Casework Kit, you must have the "DNA IQ Casework" method loaded on the Maxwell® Instrument.

Caution: Handle cartridges with care; seal edges may be sharp.

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TM499

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Maxwell® FSC DNA IQ™ Casework Kit

All technical literature is available at: www.promega.com/protocols/
Visit the web site to verify that you are using the most current version of this Technical Manual.
E-mail Promega Technical Services if you have questions on use of this system: techserv@promega.com

1. Description

The Maxwell® FSC DNA IQ™ Casework Kit[a] is used with the Maxwell® Instruments specified below and is specifically designed for optimal DNA extraction from forensic casework samples. These samples include blood stains, semen stains, hair, cigarette butts, tissue samples and "touch" DNA samples regularly encountered in forensic DNA analysis.

Extraction from certain sample types (e.g., sperm cells) traditionally requires the use of dithiothreitol (DTT) as part of the extraction method. The Casework Extraction Kit (Cat.# DC6745) includes 1-Thioglycerol, which, unlike DTT, can be stored at 2–10°C, and provides extraction performance comparable to that with DTT. This Technical Manual provides instructions to use 1-Thioglycerol for sample preprocessing.

Supported Instruments

Instrument	Cat.#	Technical Manual
Maxwell® RSC	AS4500	TM411
Maxwell® RSC 48	AS8500	TM510
Maxwell® FSC	AS4600	TM462
Maxprep™ Liquid Handler	AS9100, AS9101, AS9200, AS9201	TM509

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1. Description (continued)

Maxwell® Instruments are designed for use with predispensed reagent cartridges and elute DNA samples in small volumes. Maxwell® methods for the FSC DNA IQ™ Casework Kit can process from one to the maximum sample number in about 25 minutes.

The Maxwell® FSC DNA IQ™ Casework Kit uses the DNA IQ™ Resin to purify DNA, maximizing DNA yield and purity for use in STR analysis. The Maxwell® Instruments are magnetic-particle-handling instruments that efficiently transport the DNA IQ™ Resin through purification reagents in prefilled cartridges, mixing the resin with the reagents during processing. The paramagnetic particle-based methodology avoids common problems experienced with other automated systems, such as clogged tips or partial reagent transfers, which can lead to suboptimal DNA purification.

Prior to extraction, samples can be preprocessed manually or using the Maxprep™ Liquid Handler. The Maxprep™ Liquid Handler will prepare samples for extraction and can add preprocessed samples to Maxwell® FSC cartridges, transfer plungers to Maxwell® FSC cartridges and dispense elution buffer to elution tubes. Follow the instruction set specific to the preprocessing option used.

2. Product Components and Storage Conditions

PRODUCT	SIZE	CAT.#
Maxwell® FSC DNA IQ™ Casework Kit	**48 preps**	**AS1550**

Not for Medical Diagnostic Use. Sufficient for 48 automated isolations from forensic casework samples. Includes:

- 48 Maxwell® FSC Cartridges
- 1 Maxwell® FSC Plunger Pack (48 plungers)
- 50 Elution Tubes, 0.5ml
- 20ml Elution Buffer
- 32ml Lysis Buffer

PRODUCT	SIZE	CAT.#
Casework Extraction Kit	**100 reactions**	**DC6745**

Not for Medical Diagnostic Use. Sufficient for 100 extractions of 400µl each. Includes:

- 50ml Casework Extraction Buffer
- 2 × 10mg Proteinase K
- 900µl 1-Thioglycerol
- 1.25ml Nuclease-Free Water

Storage Conditions: Store the Maxwell® FSC DNA IQ™ Casework Kit and Casework Extraction Buffer at 15–30°C. Store 1-Thioglycerol at 2–10°C. Store Proteinase K at –30°C to –10°C. Store Nuclease-Free Water at less than 30°C.

Safety Information: The Maxwell® FSC Cartridges contain flammable substances ethanol and isopropanol, and the harmful substance guanidine thiocyanate. 1-Thioglycerol is a toxic substance. We highly recommend the use of gloves and aerosol-resistant pipette tips.

Maxwell® FSC Cartridges are designed to be used with potentially infectious substances. Wear appropriate protection (e.g., gloves and goggles) when handling infectious substances. Adhere to your institutional guidelines for the handling and disposal of all infectious substances when used with this system.

3. Sample Preprocessing

The instructions below indicate the manual steps necessary for preprocessing of samples in individual tubes. Perform the preprocessing steps appropriate to the sample type whether using the Maxprep™ Liquid Handler with samples in individual tubes or prior to extraction on the Maxwell® Instrument.

To maximize the amount of DNA purified from forensic casework materials, use the protocol appropriate for your sample type. Protocols include:

1. Samples on a Solid Support (Section 3.A)
2. Liquid Samples (Section 3.B)
3. Differential Extraction Samples (Section 3.C).

All protocols involve a Proteinase K treatment, which is required to maximize recovery and yield from a variety of sample types, including small amounts of sample on a solid matrix, such as a swab or fabric. DNA samples extracted using a Proteinase K treatment generally exhibit better locus-to-locus balance in downstream STR analysis.

Note: These preprocessing protocols use the Casework Extraction Buffer included in the Casework Extraction Kit (Cat.# DC6745) for the Proteinase K digestion. If another proteinase K digestion buffer is used for comparison, the concentration of SDS must be below 0.5% or a precipitate may form when the Lysis Buffer is added.

3.A. Samples on a Solid Support

This preprocessing protocol allows optimal DNA extraction from samples on a solid support, such as swabs or fabric, using a Proteinase K incubation. Two different protocols are listed (Option 1 and 2), depending on which spin baskets and microtubes are selected.

Materials to Be Supplied by the User

- 56°C heat block or water bath
- aerosol-resistant pipette tips
- Casework Extraction Kit (Cat.# DC6745)
- preprocessing spin baskets and tubes (use option 1 or 2 listed below)
    1. DNA IQ™ Spin Baskets (Cat.# V1225) with ClickFit Microtube, 1.5ml (Cat.# V4745)
    2. CW Spin Baskets (Cat.# AS8101) with CW Microfuge Tubes, 1.5ml (Cat.# AS8201)

Preparation of Stock Proteinase K Solution for Sample Preprocessing

Add 556µl of Nuclease-Free Water to one tube of lyophilized Proteinase K, and gently invert to dissolve. The final concentration of Proteinase K will be 18mg/ml. Store Proteinase K Solution at –30°C to –10°C.

3.A. Samples on a Solid Support (continued)

Option 1: Extraction of Samples on a Solid Support with DNA IQ™ Spin Basket

1. Place solid substrate (e.g., fabric or swab head) at the bottom of a labeled ClickFit Microtube, 1.5ml.
2. Prepare the Extraction Mix by adding the final volume of each reagent listed in Table 1 to a clean tube.

Table 1. Extraction Mix for Solid Support Samples with DNA IQ™ Spin Basket.

Extraction Mix Component	Volume Per Extraction	×	Number of Extractions	=	Final Volume
Casework Extraction Buffer	386µl	×		=	
Proteinase K (18mg/ml)	10µl	×		=	
1-Thioglycerol	4µl	×		=	
Total Reaction Volume	400µl	×		=	

Note: 1-Thioglycerol is viscous. Pipet slowly.

3. Briefly vortex the Extraction Mix, and dispense 400µl to each ClickFit Microtube containing solid substrate.
4. Close the tube lid, vortex sample at high speed for 5 seconds, and incubate the sample at 56°C for 30 minutes.
5. Place a DNA IQ™ Spin Basket into a clean labeled ClickFit Microtube, 1.5ml. Transfer the sample to the DNA IQ™ Spin Basket with forceps, being sure to orient the swab or fabric toward the bottom of the spin basket. Transfer the lysate from the incubation tube to the spin basket, and close the tube.
6. Centrifuge at room temperature for 2 minutes at maximum speed in a microcentrifuge. Carefully remove the DNA IQ™ Spin Basket.
7. Add 200µl of Lysis Buffer to the tube containing extract.

   Note: The sample is now ready for Maxprep™ Liquid Handler preprocessing when using the Maxwell™ FSC DNA IQ™-Tubes method. Proceed to the instructions in *Maxwell® FSC DNA IQ™ Casework Kit Preprocessing of Sample in Tubes for the Maxprep™ Liquid Handler Technical Manual* #TM592 for use of the Maxprep™ Liquid Handler with samples in tubes.
8. Close the lid of the tube, and vortex the sample for 5–10 seconds.
9. The sample is now ready for automated DNA extraction using the Maxwell® Instrument. Proceed to Section 4 for Maxwell® cartridge preparation and instrument setup.

   Note: Store preprocessed sample at room temperature (15–30°C) overnight, if necessary.

Option 2: Extraction of Samples on a Solid Support with CW Spin Basket

1. Place a CW Spin Basket into a labeled CW Microfuge Tube, 1.5ml.
2. Place solid substrate (e.g., fabric or swab head) at the bottom of a CW Spin Basket.
3. Prepare the Extraction Mix by adding the final volume of each reagent listed in Table 2 to a clean tube.

Table 2. Extraction Mix for Solid Support Samples with CW Spin Basket.

Extraction Mix Component	Volume Per Extraction	×	Number of Extractions	=	Final Volume
Casework Extraction Buffer	286µl	×		=	
Proteinase K (18mg/ml)	10µl	×		=	
1-Thioglycerol	4µl	×		=	
Total Reaction Volume	300µl	×		=	

Note: 1-Thioglycerol is viscous. Pipet slowly.

4. Briefly vortex the Extraction Mix, and dispense 300µl to each CW Spin Basket containing solid substrate.
5. Close the tube lid, vortex sample at high speed for 5 seconds, and incubate the sample at 56°C for 30 minutes.
6. Centrifuge at room temperature for 2 minutes at maximum speed in a microcentrifuge. Carefully remove the CW Spin Basket.
7. Add 200µl of Lysis Buffer to the tube containing extract.

   Note: The sample is now ready for Maxprep™ Liquid Handler preprocessing when using the Maxwell™ FSC DNA IQ™-Tubes method. Proceed to the instructions in *Maxwell® FSC DNA IQ™ Casework Kit Preprocessing of Sample in Tubes for the Maxprep™ Liquid Handler Technical Manual* #TM592 for use of the Maxprep™ Liquid Handler with samples in tubes.
8. Close the lid of the tube, and vortex the sample for 5–10 seconds.
9. The sample is now ready for automated DNA extraction using the Maxwell® Instrument. Proceed to Section 4 for Maxwell® cartridge preparation and instrument setup.

   Note: Store preprocessed sample at room temperature (15–30°C) overnight, if necessary.

3.B. Liquid Samples

This preprocessing protocol results in optimal lysis from samples in an aqueous solution using a Proteinase K treatment.

Materials to Be Supplied by the User

- 56°C heat block or water bath
- aerosol-resistant pipette tips
- Casework Extraction Kit (Cat.# DC6745)
- ClickFit Microtubes, 1.5ml (Cat.# V4745) or CW Microfuge Tubes, 1.5ml (Cat.# AS8201)

Note: The ClickFit Microtube or CW Microfuge Tube lid will remain closed during heated incubation.

Preparation of Stock Proteinase K Solution for Sample Preprocessing

Add 556µl of Nuclease-Free Water to one tube of lyophilized Proteinase K, and gently invert to dissolve. The final concentration of Proteinase K will be 18mg/ml. Store Proteinase K Solution at –30°C to –10°C.

3.B. Liquid Samples (continued)

Extraction of Liquid Samples

1. Pipet liquid sample into the bottom of a labeled ClickFit Microtube or CW Microfuge Tube, 1.5ml.
2. Add 10µl of Proteinase K Solution, 4µl of 1-Thioglycerol and Casework Extraction Buffer to a total volume of 400µl.

   Do not exceed a final volume of 400µl.

   Note: 1-Thioglycerol is viscous. Pipet slowly.
3. Close the tube lid, vortex sample at high speed for 5 seconds, and incubate the sample at 56°C for 30 minutes.
4. Add 200µl of Lysis Buffer to each sample.

   Note: The sample is now ready for Maxprep™ Liquid Handler preprocessing when using the Maxwell™ FSC DNA IQ™-Tubes method. Proceed to the instructions in *Maxwell® FSC DNA IQ™ Casework Kit Preprocessing of Sample in Tubes for the Maxprep™ Liquid Handler Technical Manual* #TM592 for use of the Maxprep™ Liquid Handler with samples in tubes.
5. Close the lid of the tube, and vortex the sample for 5–10 seconds.
6. The sample is now ready for automated DNA extraction using the Maxwell® Instrument. Proceed to Section 4 for Maxwell® cartridge preparation and instrument setup.

   Note: Store preprocessed sample at room temperature (15–30°C) overnight, if necessary.

3.C. Differential Extraction Samples

Differential extraction is a method of separating a forensic sample into two fractions: sperm and epithelial. Epithelial cells are lysed using Proteinase K in the absence of a reducing agent (e.g., DTT) to prevent the lysis of spermatozoa. The Differex™ System (Cat.# DC6801, DC6800) can be used to quickly and efficiently separate male and female sample fractions. See the *Differex™ System Technical Manual* #TM331 for a protocol to separate sperm and epithelial fractions, available at: **www.promega.com/protocols**

Materials to Be Supplied by the User

- 56°C heat block or water bath
- aerosol-resistant pipette tips
- Casework Extraction Kit (Cat.# DC6745)
- ClickFit Microtubes, 1.5ml (Cat.# V4745) or CW Microfuge Tubes, 1.5ml (Cat.# AS8201)

Note: The ClickFit Microtube or CW Microfuge Tube lid will remain closed during heated incubation.

Preparation of Stock Proteinase K Solution for Sample Preprocessing

Add 556µl of Nuclease-Free Water to one tube of lyophilized Proteinase K, and gently invert to dissolve. The final concentration of Proteinase K will be 18mg/ml. Store Proteinase K Solution at –30°C to –10°C.

DNA Extraction from Sperm Fraction

1. Prepare the Extraction Mix by adding the final volume of each reagent listed in Table 4 to a clean tube.

Table 4. Extraction Mix for Sperm Samples.

Extraction Mix Component	Volume Per Extraction	×	Number of Extractions	=	Final Volume
Casework Extraction Buffer	386µl	×		=	
Proteinase K (18mg/ml)	10µl	×		=	
1-Thioglycerol	4µl	×		=	
Total Reaction Volume	400µl	×		=	

Note: 1-Thioglycerol is viscous. Pipet slowly.

2. Briefly vortex the Extraction Mix, and dispense 400µl to the sperm fraction (generally a pellet or liquid volume less than 100µl) into a labeled ClickFit Microtube or CW Microfuge Tube, 1.5ml.
3. Close the lid of the tube, vortex the sample for 5 seconds, and incubate the sample at 56°C for 30 minutes.
4. Add 200µl of Lysis Buffer to each sample.

   Note: The sample is now ready for Maxprep™ Liquid Handler preprocessing when using the Maxwell™ FSC DNA IQ™-Tubes method. Proceed to the instructions in *Maxwell® FSC DNA IQ™ Casework Kit Preprocessing of Sample in Tubes for the Maxprep™ Liquid Handler Technical Manual* #TM592 for use of the Maxprep™ Liquid Handler with samples in tubes.
5. Close the lid of the tube, and vortex the sample for 5–10 seconds.
6. The sample is now ready for automated DNA extraction using the Maxwell® Instrument. Proceed to Section 4 for Maxwell® cartridge preparation and instrument setup.

   Note: Store preprocessed sample at room temperature (15–30°C) overnight, if necessary.

DNA Extraction from Epithelial Fraction

1. To an epithelial fraction of up to 400µl, add 200µl of Lysis Buffer.

   Note: Epithelial fraction samples require no further preparation before they are ready for Maxprep™ Liquid Handler preprocessing when using the Maxwell™ FSC DNA IQ™-Tubes method. Proceed to the instructions in *Maxwell® FSC DNA IQ™ Casework Kit Preprocessing of Sample in Tubes for the Maxprep™ Liquid Handler Technical Manual* #TM592 for use of the Maxprep™ Liquid Handler with samples in tubes.
2. Close the lid of the tube, and vortex the sample for 5–10 seconds.
3. The sample is now ready for automated DNA extraction using the Maxwell® Instrument. Proceed to Section 4 for Maxwell® cartridge preparation and instrument setup.

   Note: Store preprocessed sample at room temperature (15–30°C) overnight, if necessary.

4. Maxwell® FSC DNA IQ™ Casework Cartridge Preparation

1. Change gloves before handling Maxwell® FSC Cartridges, FSC Plungers and Elution Tubes. Place the cartridges to be used in the deck tray(s). Use the Maxwell® Deck Trays appropriate to the Maxwell® Instrument. Place each cartridge in the deck tray with well #1 (the largest well) facing away from the elution tubes. Press down on the cartridge to snap it into position. Carefully peel back the seal so that all plastic comes off the top of the cartridge. Ensure that all sealing tape and any residual adhesive are removed before placing cartridges in the instrument.

   Note: Clean sample or reagent spills on any part of the deck tray with a detergent-water solution, followed by 70% ethanol and then water. Do not use bleach on any instrument parts.

2. Transfer each preprocessed sample to well #1 (the largest well) of each cartridge.

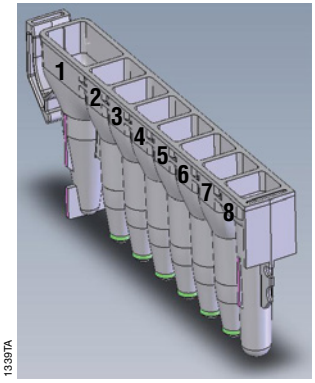
3. Mix the sample in well #1 using the pipette tip to ensure that all sample has been transferred. Change pipette tips between samples.

4. Place one plunger into well #8 of each cartridge.

5. Place an empty elution tube into the elution tube position for each cartridge in the deck tray. Add 50µl of Elution Buffer to the bottom of each elution tube.

   Notes:

   1. Ensure that the Elution Buffer is in the bottom of the tube. If Elution Buffer is on the side of the tube, the elution may be suboptimal.
   2. Use only the Elution Tubes provided with the kit; other tubes may not work with the Maxwell® Instrument.
   3. Use only the Elution Buffer supplied with the Maxwell® FSC DNA IQ™ Casework Kit; other buffers can negatively affect downstream analysis (e.g., poor-quality STR profiles).



User Adds to Wells
1. Preprocessed Sample Lysate
8. FSC Plungers

Figure 1. Maxwell® FSC Cartridge. Preprocessed sample is added to well #1, and a plunger is added to well #8.

Figure 2. Setup and configuration of the deck tray. Elution Buffer is added to the elution tubes as shown. Plungers are in well #8 of the cartridge.

5. Maxprep™ Preprocessing

The Maxprep™ Liquid Handler provides methods for preprocessing of samples prior to extraction using Maxwell® Instruments. Separate, short technical manuals provide instructions for setting up the Maxprep™ Liquid Handler for these methods (available at **www.promega.com/resources/protocols**). Refer to these short technical manuals for information about the methods and how to set up the Maxprep™ Liquid Handler to perform preprocessing of samples prior to extraction using the Maxwell® FSC DNA IQ™ Casework Extraction Kit.

6. Maxwell® Instrument Setup and Run

For detailed information, refer to the technical manual specific to your Maxwell® Instrument.

Instrument	Technical Manual
Maxwell® RSC	TM411
Maxwell® RSC 48	TM510
Maxwell® FSC	TM462

1. Turn on the Maxwell® Instrument and Tablet PC. Sign in to the Tablet PC, and start the Maxwell® software on the Tablet PC. The instrument will proceed through a self-check and home all moving parts.
2. Touch **Start** to begin the process of running a method.
3. Depending on your Maxwell® Instrument model, use one of the following options to select a method:
    a. When running in **Portal** mode, scan the bar code(s) on the deck tray(s). After data has been returned from the Portal software, touch **Continue** to use the sample tracking information for the deck tray(s) or touch **New** to start a run and enter new sample tracking information.
    b. Scan or enter the 2D bar code information on the kit box to automatically select the appropriate method.
    c. Touch the **DNA IQ Casework** method.

6. Maxwell® Instrument Setup and Run (continued)

4. If applicable to your Maxwell® Instrument model, verify that the DNA IQ Casework method has been selected, and touch the **Proceed** button. If requested by the software, scan or enter kit lot and expiration information as required by the Administrator.

5. On the 'Cartridge Setup' screen, touch the cartridge positions to select/deselect the positions that will be used during this extraction run. Enter any required sample tracking information, and touch the **Proceed** button to continue.

   Note: When using 48-position Maxwell® Instruments, touch the **Front** and **Back** buttons to select/deselect cartridge positions on each deck tray.

6. After the door has been opened, confirm that all Extraction Checklist items have been performed. Verify that samples were added to well #1 of the cartridges, cartridges are loaded on the instrument, uncapped elution tubes are present with Elution Buffer and plungers are in well #8. Transfer the deck tray(s) containing the prepared cartridges onto the Maxwell® Instrument platform.

   Inserting the Maxwell® deck tray(s): Hold the deck tray by the sides to avoid dislodging cartridges from the deck tray. Ensure that the deck tray is placed in the Maxwell® Instrument with the elution tubes closest to the door. Angle the back of the deck tray downward and place into the instrument so that the back of the deck tray is against the back of the instrument platform. Press down on the front of the deck tray to firmly seat the deck tray on the instrument platform. If you have difficulty fitting the deck tray on the platform, check that the deck tray is in the correct orientation. Ensure the deck tray is level on the instrument platform and fully seated.

   Notes:

   1. Check the identifier on 24-position Maxwell® deck trays to determine whether they should be placed in the front or back of the instrument.
   2. Make sure elution tubes are open and contain elution buffer before starting a purification run.

7. Touch the **Start** button to begin the extraction run. The platform will retract, and the door will close.

   Warning: Pinch point hazard.

   The Maxwell® Instrument will immediately begin the purification run. The screen will display information including the user who started the run, the current method step being performed, and the approximate time remaining in the run.

   Notes:

   1. When using a 48-position Maxwell® Instrument, if the Vision System has been enabled, the deck trays will be scanned as the door retracts. Any errors in deck tray setup (e.g., plungers not in well #8, elution tubes not present and open) will cause the software to return to the 'Cartridge Setup' screen and problem positions will be marked with an exclamation point in a red circle. Resolve all error states, and touch the **Start** button again to repeat deck tray scanning and begin the extraction run.
   2. Pressing the **Abort** button will abandon the run.
   3. If the run is abandoned before completion, you will be prompted to check whether plungers are still loaded on the plunger bar. If plungers are present on the plunger bar, perform **Clean Up** when requested. If plungers are not present on the plunger bar, you can choose to skip **Clean Up** when requested. The samples will be lost.

8. Follow on-screen instructions at the end of the method to open the door. Verify that plungers are located in well #8 of the cartridge at the end of the run. If plungers are not removed from the plunger bar, follow the instructions in the technical manual appropriate to your Maxwell® Instrument (see table above) to perform a **Clean Up** process to attempt to unload the plungers.

9. Remove the deck tray(s) from the instrument. Remove elution tubes containing DNA, and cap the tubes. After the run has been completed, the extraction run report will be displayed. From the report screen, you can print or export this report or both.

Note: Following the automated purification procedure, the deck tray will be warm. It will not be too hot to touch. To remove the deck tray from the instrument platform, hold the sides of the deck tray.

10. Specimen or reagent spills on any part of the deck tray should be cleaned with a detergent-water solution, followed by a bacteriocidal spray or wipe and then water. All cartridges and tubes should be removed before cleaning. Do not use bleach on any instrument parts.

11. Remove the cartridges and plungers from the deck tray.

Discard the cartridges and plungers as hazardous waste following your institution's recommended guidelines. Do not reuse reagent cartridges, plungers or elution tubes.

Ensure samples are removed before performing any required UV light treatment to avoid damage to the nucleic acid.

7. Storing Eluted DNA

If DNA is not analyzed immediately, store the eluted DNA on ice or at 2–10°C for up to 24 hours. For longer term storage, consult laboratory guidelines. Freezing samples at –30°C to –10°C or below –65°C has been shown to preserve DNA for longer periods of time.

8. Troubleshooting

For questions not addressed here, please contact your local Promega Branch Office or Distributor. Contact information available at: **www.promega.com**. E-mail: **techserv@promega.com**

Symptoms	Causes and Comments
Low DNA yield	Insufficient sample was processed. Add more starting material for preprocessing to increase yield.
	Too much sample volume was processed. DNA isolation using the Maxwell® FSC Cartridge is most efficient when there is <800µl in well #1. Larger volumes can be processed but may reduce isolation efficiency.
	Insufficient Lysis Buffer. Dispense an equal volume of Lysis Buffer to sample volume during the binding step in well #1. A minimum of 200µl of Lysis Buffer should be used.
Instrument overrun or underrun errors	Verify nothing is physically blocking the movement of the platform, plunger bar or magnetic rod assembly.
	Perform a Self Test from the Settings menu. The instrument will rehome itself. If the error recurs, contact Promega for service.
	The cartridges were not completely seated on the platform. Ensure the cartridges are pressed firmly into place.
	Incorrect elution tube was used. To prevent a Z-axis collision, use only the 0.5ml Elution Tube provided with the Maxwell® FSC DNA IQ™ Casework Kit. Other tubes may have different dimensions.
Resin carryover during elution	The presence of a small amount of resin particles in the Elution Tube will not affect the final DNA concentration or downstream applications. If desired, final elution tubes can be centrifuged to pellet resin and eluates can be transferred to a clean tube or an additional resin capture step may be performed using the 0.5ml MagneSphere® Technology Magnetic Separation Stand (Cat.# Z5341).
Instrument unable to pick up plungers	Make sure you are using the plungers in the Maxwell® FSC DNA IQ™ Casework Kit; the plungers for the Maxwell® FSC reagent kits are different than those of other Maxwell® reagent kits.

Symptoms	Causes and Comments
Instrument calibration error	The cartridges were not completely seated in the deck tray. Ensure the cartridges are pressed firmly into place.
	Verify nothing is physically blocking the movement of the platform, plunger bar or magnet bar.
	Confirm that you are using the Maxwell® FSC DNA IQ™ Casework Kit (Cat.# AS1550) with FSC plungers.
	Turn the machine off then on to cycle the power. The instrument will rehome itself. If the calibration error occurs again after power cycling, contact Promega for service.
	Turn the machine off then on to cycle the power. After cycling power, run the DNA IQ Casework method without a cartridge in the machine. If another calibration error occurs during the run, contact Promega for service.
	Incorrect elution tube was used. Use only the 0.5ml Elution Tube provided with the Maxwell® FSC DNA IQ™ Casework Kit. Other tubes may have different dimensions.

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9. Related Products

Instrument and Accessories

Product	Size	Cat.#
Maxprep™ Liquid Handler, RSC Carriers	1 each	AS9100
Maxprep™ Liquid Handler, RSC Carriers w/ UV Light	1 each	AS9101
Maxprep™ Liquid Handler, RSC 48 Carriers	1 each	AS9200
Maxprep™ Liquid Handler, RSC 48 Carriers w/UV Light	1 each	AS9201
Maxprep™ Carrier, Maxwell® RSC	1 each	AS9402
Maxprep™ Carrier, Maxwell® RSC 48 Front	1 each	AS9403
Maxprep™ Carrier, Maxwell® RSC 48 Back	1 each	AS9404
Nunc™ 2.0ml Deep Well Plates	60/pack	AS9307
Maxprep™ 1000ul Conductive Disposable Tips, Filtered	40 racks of 96 tips/box	AS9303
Maxprep™ 300ul Conductive Disposable Tips, Filtered	60 racks of 96 tips/box	AS9302
Maxprep™ Reagent Reservoir, 50ml	28/pack	AS9304
Maxprep™ Waste Bags, Clear	100/box	AS9305
Maxprep™ Plunger Holder	1 each	AS9408
Maxprep™ 3-Position Reagent Tube Holder	1 each	AS9409
Maxwell® FSC Instrument	1 each	AS4600
Maxwell® FSC Deck Tray	1 each	AS4016
Differex™ System	50 samples	DC6801
	200 samples	DC6800
Proteinase K	100mg	V3021
ClickFit Microtube, 1.5ml	100/pack	V4745
DNA IQ™ Spin Baskets	50/pack	V1225
CW Spin Baskets	50/pack	AS8101
CW Microfuge Tubes, 1.5ml	50/pack	AS8201
Nuclease-Free Water	150ml	P1196
Maxwell® RSC 48 Instrument	1 each	AS8500
Maxwell® RSC/CSC 48 Front Deck Tray	1 each	AS8401
Maxwell® RSC/CSC 48 Back Deck Tray	1 each	AS8402

10. Summary of Changes

The following changes were made to the 7/20 revision of this document:

1. Updated to include new instrument software and functionality.
2. Replaced FSC Plungers with Maxwell® FSC Plunger Pack.
3. Updated product names in Section 9.

[a]European Pat. No. 1 204 741 and Japanese Pat. No. 4425513.