June 2022

QIAcard® FTA Elute Buffer Handbook

For elution of nucleic acids from QIAcard FTA Elute formats

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Sample to Insight

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Kit Contents

QIAcard FTA Elute Buffer	
Catalog no.	**WB120100**
Buffer volume	**40 ml**
QIAcard FTA Elute Buffer (40 ml)	1 bottle

Shipping and Storage

The QIAcard FTA Elute Buffer is shipped at room temperature (15–25°C) and should be stored at 2–8°C upon arrival. Stored properly, the QIAcard FTA Elute Buffer is stable until the expiration date indicated on the product.

Samples on QIAcard FTA Elute formats can be stored in a multi-barrier pouch with desiccant for long term storage.

Intended Use

The QIAcard FTA Elute Buffer enables improved recovery of nucleic acids from QIAcard FTA Elute formats. The buffer improves the elution efficiency of nucleic acids from various inputs, including purified DNA, blood and saliva, applied to QIAcard Elute formats. This product is not intended for the diagnosis, prevention or treatment of a disease.

Handling: Always wear gloves to avoid contamination of QIAcard FTA Elute formats. Follow standard precautions when handling biological specimens.

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Safety Information

When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate safety data sheets (SDSs). These are available online in convenient and compact PDF format at **www.qiagen.com/safety**, where you can find, view and print the SDS for each QIAGEN® kit and kit component.

Quality Control

In accordance with QIAGEN's ISO-certified Quality Management System, each lot of the QIAcard FTA Elute Buffer is tested against predetermined specifications to ensure consistent product quality.

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Introduction

Flinders Technology Associates (FTA) is a chemically coated cellulose matrix that is capable of lysing cells upon contact and denaturing proteins.

Normal QIAcard FTA formats are not intended for elution of nucleic acids and are regularly used during a direct PCR analysis process. If nucleic acids need to be released from FTA cards, we recommend using QIAcard FTA Elute formats:

- QIAcard FTA Elute Indicating Micro (cat. no. WB120411 or WB120412) for clear biological fluids or purified DNA
- QIAcard FTA Elute Micro (cat. no. WB120401 or WB120410) for colored biological fluids

QIAcard FTA Elute formats are designed for room temperature (15–25°C) shipment, preservation and subsequent elution of previously released nucleic acids from biological samples. Sample material, such as cells, bacteria and blood, are lysed upon contact with the cards. By using the QIAcard FTA Elute Buffer, nucleic acids can be eluted from the card.

Extracted DNA or several other sample materials are routinely stored frozen for sample archiving. QIAcard FTA Elute can be used to stabilize and protect nucleic acids for long-term storage at room temperature. This procedure describes how to apply, store and elute nucleic acids on the above-described cards using QIAcard FTA Elute Buffer.

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Equipment and Reagents to Be Supplied by User

When working with chemicals, always wear a suitable lab coat, disposable gloves and protective goggles. For more information, consult the appropriate safety data sheets (SDSs), available from the product supplier.

- QIAcard FTA Elute buffer
- TE^{-4} buffer (10 mM Tris·Cl, 0.1 mM EDTA)
- **Recommended**: QIAshredder (cat. no. 79656)
- UniCore Punches 3.00 mm (cat. no. WB100078 or WB100039)
- **Optional**: UniCore Punches 6.00 mm (cat. no. WB100082 or WB100040)
- Cutting Mat 6.0" x 8.0" or 2.5" x 3.0" (cat. no. WB100020 or WB100088)
- Heated mixer or shaker
- 2 ml microcentrifuge tubes

Additional material required for "Procedure for QIAcard FTA Elute formats spotted with biological fluids"

- QIAGEN Proteinase K (cat. no. 19131)

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Protocol: Procedure for QIAcard FTA Elute Formats Spotted with Extracted DNA

This protocol is for elution of DNA from QIAcard FTA Elute cards that are spotted with previously extracted DNA using QIAcard FTA Elute Buffer. For clear biological fluids or extracted DNA, we recommend using QIAcard FTA Elute Indicating Micro (cat. no. WB120411 or WB120412) as the included purple dye turns white when liquid sample material is applied. The color change enables an efficient sample visualization for subsequent sample punching.

Applying DNA extract to QIAcard FTA Elute Indicating Micro

1. Label the QIAcard FTA Elute Indicating Micro with the appropriate sample identification.
2. Pipette a volume of up to 75 µl DNA extract onto the card within the printed circle.
3. Allow the sample to air dry at least 3 h at room temperature until dry.
4. Samples applied to QIAcard FTA Elute Indicating Micro should be archived at room temperature (15–25°C) in a Multi-Barrier Pouch (cat. no. WB100036) with an Indicating Desiccant Pack (cat. no. WB100003) or stored in a humidity-controlled, cool, dry environment.

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Elution of DNA from QIAcard FTA Elute Indicating Micro

1. Place the QIAcard FTA Elute Indicating Micro on a cutting mat.
2. Remove up to four 3 mm punches from the FTA Elute Card, and place the punches into a single 2 ml microcentrifuge tube. To prevent contamination, we recommend using a clean punch (remove and discard a punch from an unused QIAcard FTA Elute card) between card-to-card sample punching.

   Note: One to four 3 mm punches can be used based on known sample concentration and DNA input required for amplification. A volume of 25 µl spotted DNA is sufficient for four 3 mm punches. As an alternative, a volume of 75 µl spotted DNA is sufficient for seven 6 mm punches.

   Note: Representative examples for 25 µl and 75 µl fluid spotted on QIAcard FTA Elute cards are shown in Figure 1.

   Optional: If 3 mm punches are used, the punches can alternatively be washed within a QIAshredder basket. For 6 mm punches, up to four punches can be handled this way. Place the punches into QIAshredder baskets.

   IMPORTANT: Before continuing with the next step, read the instruction below carefully:

   If the punches are left in TE^{-4} buffer too long, the sample can potentially be compromised. Therefore, when processing more than two samples, we recommend processing only two samples at a time for step 3–6: process only the first two samples, and then process the next batch of two samples and continue processing samples in sets of two. Once the first wash is completed for all samples, proceed with the next wash (step 7) in sets of two samples until all samples are ready for step 8.
3. Pipette 500 µl TE^{-4} buffer into the microcentrifuge tube containing the punches.

   Optional: If the punches are washed within a QIAshredder basket, pipette 500 µl TE^{-4} buffer into the QIAshredder basket containing the punches.

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4. Close the microcentrifuge tube and vortex for 5 s. Ensure the punches move up into the center of the microcentrifuge tube when they are vortexed.

   Optional: If the punches are washed within a QIAshredder basket, close the basket and ensure the punches move up into the center of the basket when they are vortexed.

5. Briefly centrifuge the microcentrifuge tubes to remove any excess liquid from the cap.

   Optional: If the punches are washed within a QIAshredder basket, centrifuge at 2000 rpm for 1 min to separate the wash liquid from the punches.

6. Remove excess TE^{-4} buffer and discard.

   Optional: If the punches are washed within a QIAshredder basket, remove the TE^{-4} buffer flowthrough from the microcentrifuge tube.

7. Repeat steps 3–6 once or twice (for a total of two to three washes with TE^{-4} buffer).

   Note: If high concentration of inhibitors is expected, we recommend washing three times.

   Optional: If the punches were washed within a QIAshredder basket, transfer the punches into a fresh 2 ml microcentrifuge tube. Retain the QIAshredder basket inside the original microcentrifuge tube.

8. Pipette an appropriate amount of QIAcard FTA Elute Buffer into the microcentrifuge tube containing the sample punches based on the number of punches and suggested volumes in Table 1.

   Note: The QIAcard FTA Elute Buffer serves as the elution buffer.

   Note: Seven 6 mm punches require a volume of 400 µl QIAcard FTA Elute Buffer.

9. Place the microcentrifuge tube on a heated mixer or shaker at 95°C for 20 min at 1000 rpm.

10. After incubation, briefly centrifuge the microcentrifuge tube to remove any excess liquid from the cap.

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11. Place a clean spin basket into a new microcentrifuge tube. Transfer the punches and eluate to the spin basket and spin at maximum speed for 2 min. Remove the spin basket, discard the punches, and proceed with quantification and/or amplification.

    Recommended: To obtain the best results, we recommend transferring the punches and the eluate to a QIAshredder basket. Place the basket back into the tube that was used for elution on the heated mixer or shaker. Close the basket and spin at maximum speed for 2 min. Remove the QIAshredder basket, discard the punches, and proceed with quantification and/or amplification.

    Optional: If the punches were washed within a QIAshredder basket, the same QIAshredder basket can be used for step 11.

    Note: If there is still liquid in the basket, use a clean pipette tip to move the punches away from the filter of the QIAshredder basket and repeat centrifugation.

    Note: Concentration using a suitable method, such as using filtration devices, may be required for any combination of punches and elution volumes, depending on the initial amount of the sample.. Concentrating the eluate by evaporation is strongly discouraged.

12. Store extracts according to your laboratory protocols.

Table 1. Recommended elution volume (QIAcard FTA Elute Buffer) for different numbers of 3 mm or 6mm card punches.

Number of punches	QIAcard FTA Elute Buffer for Ø 3 mm punches	QIAcard FTA Elute Buffer for Ø 6 mm punches
1	≥50 µl	≥100 µl
2	≥75 µl	≥160 µl
3	≥100 µl	≥200 µl
4	≥125 µl	≥260 µl
5	≥150 µl	≥320 µl
6	≥175 µl	≥360 µl
7	≥200 µl	≥400 µl

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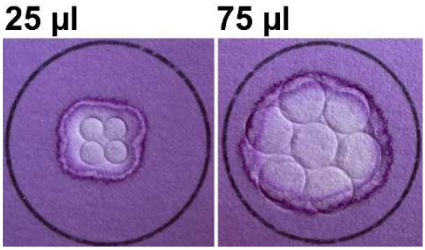


Figure 1. Representative examples for 25 µl and 75 µl DNA spotted on QIAcard FTA Elute cards. When applying 25 µl, up 4 x 3 mm punches can be removed from the application area of the card. When applying 75 µl, up 7 x 6 mm punches can be removed from the application area of the card.

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Protocol: Procedure for QIAcard FTA Elute Formats Spotted with Biological Fluids

This protocol is for elution of nucleic acids from QIAcard FTA Elute cards that are spotted with biological fluids (e.g., blood, saliva) using QIAcard FTA Elute Buffer.

For clear biological fluids, such as saliva, we recommend using QIAcard FTA Elute Indicating Micro (cat. no. WB120411 or WB120412) as the included pink dye turns white when liquid sample material is applied. The color change enables an efficient sample recognition for subsequent sample punching.

For colored biological fluids, such as blood, we recommend using the non-indicating QIAcard FTA Elute Micro (cat. no. WB120401 or WB120410).

Applying biological fluids to QIAcard FTA Elute cards

1. Label the QIAcard FTA Elute format with the appropriate sample identification.
2. Pipette a volume of up to 75 µl biological fluids onto the card within the printed circle.
3. Allow the sample to air dry at least 3 h at room temperature until dry.
   Samples applied to QIAcard FTA Elute Micro formats should be archived at room temperature (15–25°C) in a Multi-Barrier Pouch (cat. no. WB100036) with an Indicating Desiccant Pack (cat. no. WB100003) or stored in a humidity-controlled, cool, dry environment.

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Elution of nucleic acids derived from biological fluids from QIAcard FTA Elute formats

1. Place the QIAcard FTA Elute card on a cutting mat.
2. Remove the desired number of punches (see Table 2) from the FTA Elute Card and place the punches into a single 2 ml microcentrifuge tube. To prevent contamination, we recommend using a clean punch (remove and discard a punch from an unused QIAcard FTA Elute card) between card-to-card sample punching.

   Note: Representative examples for 25 µl and 75 µl fluid spotted on QIAcard FTA Elute cards are shown in Figure 1.

   Optional: If 3 mm punches are used, the punches can alternatively be washed within a QIAshredder basket. For 6 mm punches, up to four punches can be handled this way. Place the punches into QIAshredder baskets.

   IMPORTANT: Before continuing with the next step, read the instruction below carefully:

   If the punches are left in TE^{-4} buffer too long, the sample can potentially be compromised. Therefore, when processing more than two samples, we recommend processing only two samples at a time for step 3–6: process only the first two samples, and then process the next batch of two samples and continue processing samples in sets of two. Once the first wash is completed for all samples, proceed with the next wash (step 7) in sets of two samples until all samples are ready for step 8.
3. Pipette 500 µl TE^{-4} buffer into the microcentrifuge tube containing the punches.

   Optional: If the punches are washed within a QIAshredder basket, pipette 500 µl TE^{-4} buffer into the QIAshredder basket containing the punches.
4. Close the microcentrifuge tube and vortex for 5 s. Ensure the punches move up into the center of the microcentrifuge tube when they are vortexed.

   Optionally: If the punches are washed within a QIAshredder basket, close the basket and ensure the punches move up into the center of the basket when they are vortexed.

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5. Briefly centrifuge the microcentrifuge tubes to remove any excess liquid from the cap.

   Optional: If the punches are washed within a QIAshredder basket, centrifuge at 2000 rpm for 1 min to separate the wash liquid from the punches.

6. Remove excess TE^{-4} buffer and discard.

   Optional: If the punches are washed within a QIAshredder basket, remove the TE^{-4} buffer flowthrough from the microcentrifuge tube.

7. Repeat steps 3–6 once or twice (for a total of two to three washes with TE^{-4} buffer).

   Note: If high amount of inhibitors are expected, we recommend washing three times.

   Optional: If the punches were washed within a QIAshredder basket, transfer the punches into a fresh 2 ml microcentrifuge tube. Retain the QIAshredder basket inside the original microcentrifuge tube,

8. Pipette an appropriate amount of QIAcard FTA Elute Buffer and Proteinase K into the microcentrifuge tube containing the sample punches based on the number of punches and suggested volumes in Table 2

   Note: The QIAcard FTA Elute Buffer and Proteinase K serves as the elution buffer.

   Note: Seven 6 mm punches require a volume of 400 µl QIAcard FTA Elute Buffer.

9. Place the microcentrifuge tube on a heated mixer or shaker at 60°C (Proteinase K digestion) for 25 min at 1000 rpm.
10. For inactivation of Proteinase K, place the microcentrifuge tube on a heated mixer or shaker at 95°C (Proteinase K inactivation) for 5 min at 1000 rpm.
11. After incubation, briefly centrifuge the microcentrifuge tube to remove any excess liquid from the cap.

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12. Place a clean spin basket into a new microcentrifuge tube. Transfer the punches and eluate to the spin basket and spin at maximum speed for 2 min. Remove the spin basket, discard the punches, and proceed with quantification and/or amplification.

    Recommended: To obtain the best results, we recommend transferring the punches to a QIAshredder basket. Place the basket back into the tube that was used for elution on the heated mixer or shaker. Pipette the eluate onto the sample punches, close the basket and spin at maximum speed for 2 min. Remove the QIAshredder basket, discard the punches, and proceed with quantification and/or amplification.

    Optional: If the punches were washed within a QIAshredder basket, the same QIAshredder can be used for elution.

    Note: If there is still liquid in the basket, use a clean pipette tip to move the punches away from the filter of the QIAshredder basket and repeat centrifugation.

    Note: Concentration using a suitable method, such as using filtration devices, may be required for any combination of punches and elution volumes, depending on the initial amount of the sample. . Concentrating the eluate by evaporation is strongly discouraged.

13 . Store extracts according to your laboratory protocols.

Table 2. Recommended elution volume (QIAcard FTA Elute Buffer) for different numbers of 3 mm and 6 mm card punches.

Number of punches	Proteinase K for Ø 3 mm punches	QIAcard FTA Elute Buffer for Ø 3 mm punches	Proteinase K for Ø 6 mm punches	QIAcard FTA Elute Buffer for Ø 6 mm punches
1	4 µl	≥50 µl	6 µl	≥100 µl
2	5 µl	≥75 µl	8 µl	≥160 µl
3	6 µl	≥100 µl	10 µl	≥200 µl
4	7 µl	≥125 µl	14 µl	≥260 µl
5	8 µl	≥150 µl	16 µl	≥320 µl
6	9 µl	≥175 µl	18 µl	≥360 µl
7	10 µl	≥200 µl	20 µl	≥400 µl

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Troubleshooting Guide

This troubleshooting guide may be helpful in solving any problems that may arise. For more information, see also the Frequently Asked Questions page in our Technical Support Center: **www.qiagen.com/FAQ/FAQList.aspx**. The scientists in QIAGEN Technical Services are always happy to answer any questions you may have about either the information or protocols in this handbook (for contact information, visit **support.qiagen.com**).

Comments and suggestions

Calculating the percent recovery of eluted DNA	1. Measure the diameter of the sample area (stain) covered by the DNA extract and divide this value by 2 to calculate the radius (mm). 2. Calculate the area of the stain as follows: Area of stain (mm^2) = 3.14 × radius of stain (mm) × radius of stain (mm) For a sample area with a 10 mm diameter: Area of 10 mm stain (mm^2) = 3.14 × 5 mm × 5 mm = 78.5 mm^2 3. Calculate quantity of DNA per mm^2 of stain as follows: Amount of DNA spotted onto FTA Elute card (pg)/area of stain (mm^2) For a 25 µl sample at a concentration of 1,000 pg/µl: 25,000 pg DNA applied per 78.5 mm^2 = 25,000 pg /78.5 mm^2 Quantity of DNA per mm^2 of stain = 318.47 pg DNA/mm^2 4. Calculate the area of a 3 mm punch. Area of 3 mm punch (mm^2) = 3.14 x radius of punch (mm) x radius of punch (mm) Area of 3 mm punch (mm^2) = 3.14 x 1.5 mm x 1.5 mm Area of one, 3 mm punch = 7.065 mm^2 Area of two 3 mm punches = 2 x 7.065 mm^2 = 14.13 mm^2 5. Calculate quantity of DNA per 3 mm punch: If DNA was applied to the FTA Elute card at 318.47 pg/mm^2 and the area of each 3 mm punch is 7.065 mm^2, each 3 mm punch contains: 318.47 pg DNA/mm^2 × 7.065 mm^2 Quantity of DNA per 3 mm punch = 2,250 pg (Multiply 2,250 pg by number of 3 mm punches processed) 6. Calculate % DNA recovery: % DNA recovery = 100 × (A)/(B) Where: A = quantity of DNA eluted from FTA Elute Card (total pg) B = expected quantity of DNA per 3 mm punch, calculated in step 5 (pg)
Use of QIAGEN Lyse & Spin Baskets	We do not recommend using the Investigator Lyse & Spin Basket, as the separation performance of the recommended QIAshredder baskets is superior for this application.
Use of Investigator Lyse & Spin Baskets for separation not working as expected	When using Investigator Lyse & Spin Baskets, the punched discs may seal the holes of the basket during centrifugation and prevent lysate flowthrough. However if the use of Investigator Lyse & Spin Basket is required in your laboratory, it is advised to push the punched discs towards the wall of the basket. We recommend using the QIAshredder baskets for separation instead.

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Ordering Information

Product	Description	Cat. no.
QIAcard FTA Elute Buffer (40 ml)	40 ml QIAcard FTA Elute Buffer.	WB120100
QIAcard FTA Elute Indicating Micro (25)	100 QIAcard FTA Elute Indicating cards (one sample area per card).	WB120411
QIAcard FTA Elute Indicating Micro (25)	25 QIAcard FTA Elute Indicating Micro cards (one sample area per card).	WB120412
QIAcard FTA Elute Micro (25)	100 QIAcard FTA Elute Micro cards (four sample areas per card).	WB120410
QIAcard FTA Elute Micro (25)	25 QIAcard FTA Elute Micro cards (4 sample areas per card).	WB120401
UniCore Punch Kit 3.0 mm (4)	4 UniCore Punches, 3.0 mm, and 2 cutting mats.	WB100039
UniCore Punch 3.0 mm (25)	25 UniCore Punches, 3.0 mm.	WB100078
UniCore Punch Kit 6.00 mm (4)	4 UniCore Punches, 6.0 mm, and 2 cutting mats.	WB100040
UniCore Punches 6.00 mm (25)	25 UniCore Punches, 6.0 mm.	WB100082
Cutting Mat 2.5" × 3.0"	1 Cutting Mat 2.5" × 3.0".	WB100088
Cutting Mat 6.0" × 8.0"	1 Cutting Mat, 6.0" × 8.0".	WB100020

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Product	Description	Cat. no.
Multi-Barrier Pouches, 3.75″ x 3″ (100)	100 Multi-Barrier Pouches, 3.75″ x 3″.	WB100036
Indicating Desiccant Pack (1000)	1000 Indicating Desiccant Packs (1 g each)	WB100003
QIAshredder (250)	250 disposable cell-lysate homogenizers for use in nucleic acid minipreps, caps	79656
QIAGEN Proteinase K (2 ml)	2 ml (>600 mAU/ml, solution)	19131

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at **www.qiagen.com** or can be requested from QIAGEN Technical Services or your local distributor.

Document Revision History

Date	Changes
06/2022	Initial release

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Hb-3091-001 06/2022