



GCC Forensics

GE Healthcare

Date

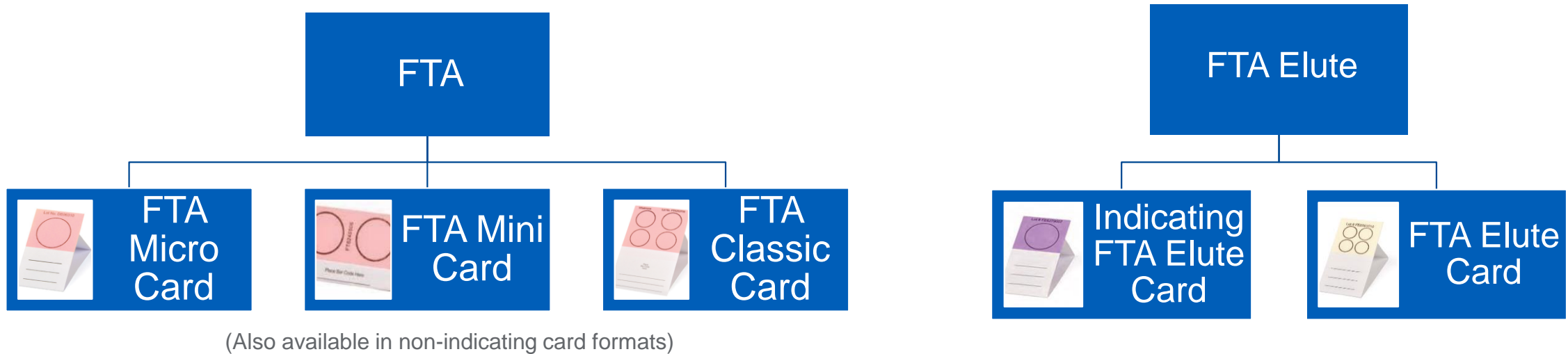
Objectives

- Brief Introduction to Whatman™ FTA™ technology
- Review of EasiCollect+ Buccal Collection Device
- Describe the application of extracted DNA on FTA Elute
- Features/Benefits to utilizing the EasiKit app
- Describe kitting and automation capabilities/Quality Management at GEHC



Whatman™ FTA™ Technology

- Whatman FTA technology consists of two distinct chemistries; FTA and FTA Elute
- Both chemistries lyse cells on contact, denature proteins, and protect DNA from degradation
- FTA cards: DNA is tightly bound while proteins and inhibitors are washed away
- FTA Elute cards: Proteins remain tightly bound while DNA is eluted from the matrix
- Both chemistries are suitable for blood and buccal collection.



The EasiCollect™ + Device



EasiCollect™ + Reference Sample Collection Device

- An integrated sample collection device for simplified collection and transport
- Contains Whatman™ FTA™ card technology for long term sample stabilization
- Consistent transfer of sample from swab to card
- 98% first pass success rate in field trials and laboratory models



Whatman™ FTA™ Elute

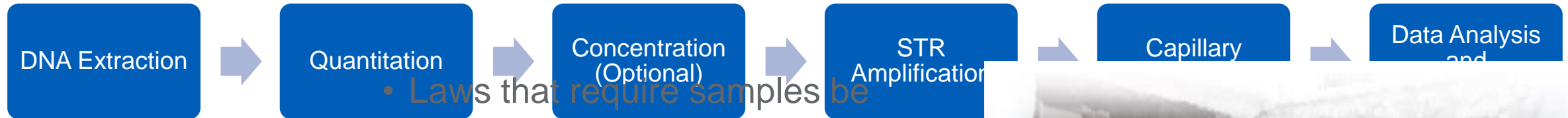


Sample Collection using FTA™ Elute

- Suitable for blood and buccal collection
- Blood can be applied directly to the card
- Buccal requires a transfer step (indicating cards are purple)
- No integrated sample collection device available



Sample Processing Workflow



- Laws that require samples be maintained:

Until the case is adjudicated
Until the statute of limitations
passes or forever

- Re-testing at request of judges or defense attorneys
- Future testing using new technologies
- May be kept at the lab or returned to the submitting agency



DNA Extract Storage

Method	Challenges
Cold Temperature Storage	<ul style="list-style-type: none">• Freezers/Refrigerators take up precious laboratory space• Require routine maintenance/monitoring• Sample quality decreases after multiple freeze-thaw cycles
Dry Down Samples	<ul style="list-style-type: none">• Time Consuming• Only small sets processed at a time• Residual DNA “stuck” to tube (sample loss)

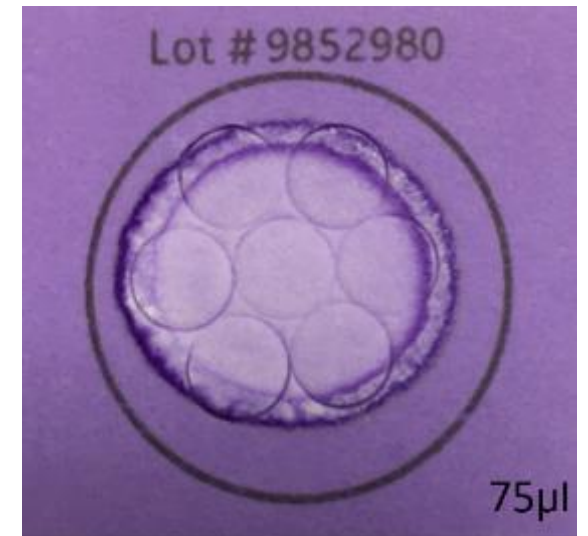


FTA Elute Cards: An Alternative Storage Solution for Extracted DNA

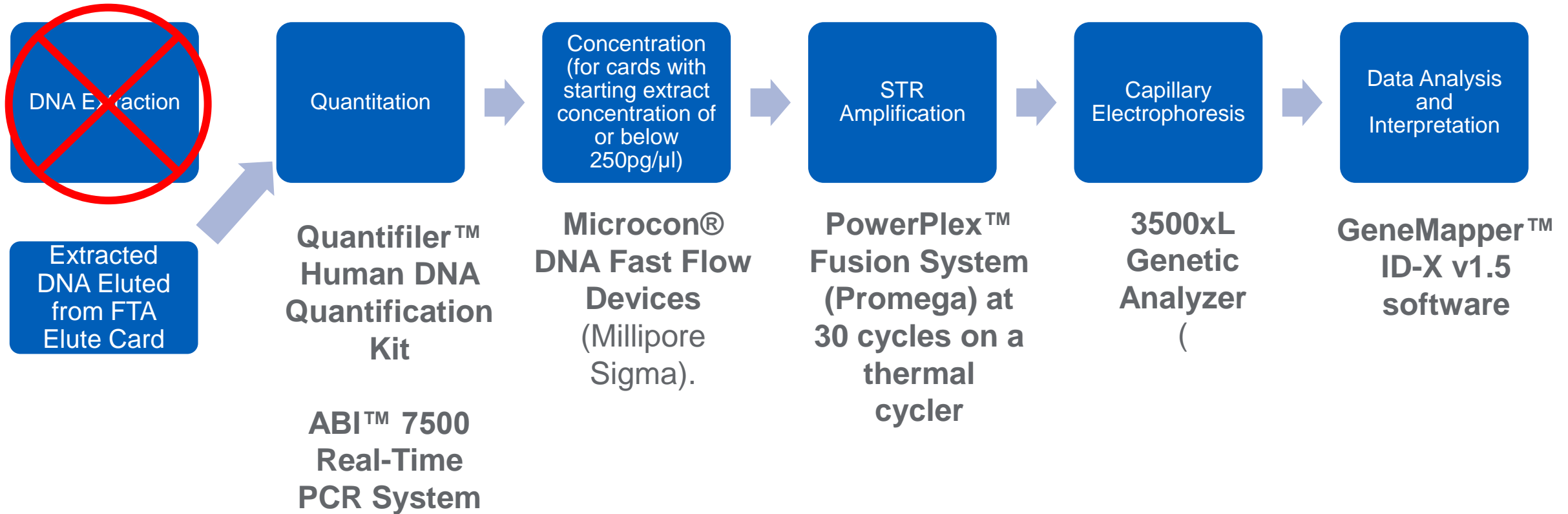


FTA Elute Study

- Five dilutions were prepared from purified human genomic DNA
 - ✓ 1 ng/μl,
 - ✓ 500 pg/μl
 - ✓ 250 pg/μl
 - ✓ 100 pg/μl
 - ✓ 50 pg/μl
- Indicating FTA Elute cards (n=6 per dilution) were spotted with each dilution using 25μl and 75μl
- Cards were dried and stored in airtight pouch with a desiccant for 1 week at RT
- 7 x 6mm punches were removed from each card and processed using the FTA Elute procedure



Sample Processing Workflow



FTA Elute Study

- The average DNA recovery obtained from each DNA extract concentration was 117%, 98%, 136%, 95%, 114% and 108%.
- There was large variability in the quantification values for the 25ul aliquots of 50 pg/ul and 100 pg/ul samples with the values near the limit of detection

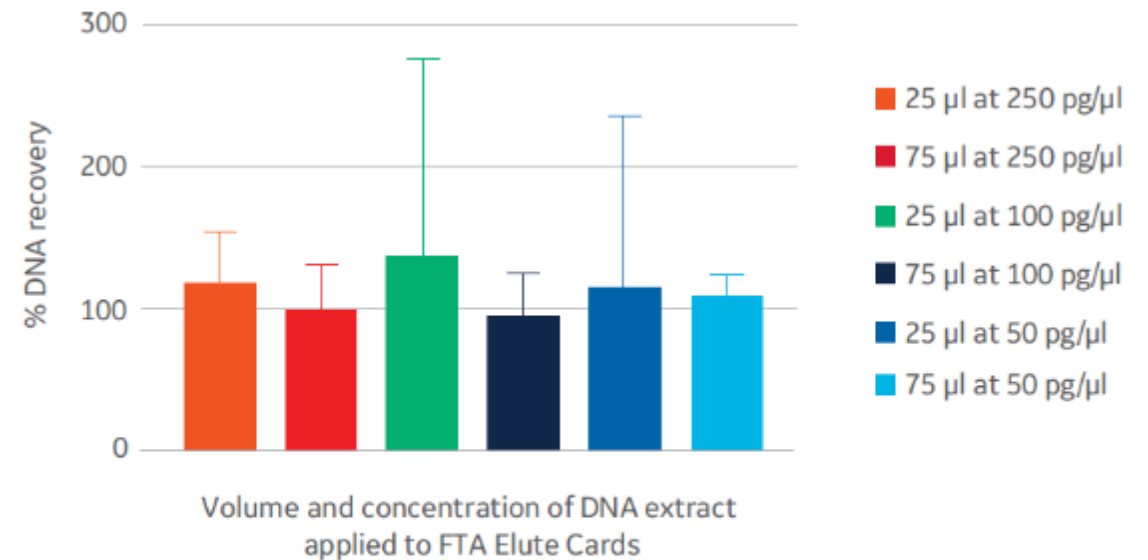


Fig 2. DNA recovery for a dilution series of DNA extracts stored on FTA Elute cards. Averages (n=6) with bars representing the standard deviation. Data not shown for 1 ng/µl and 500 pg/µl concentrations.

FTA Elute Study

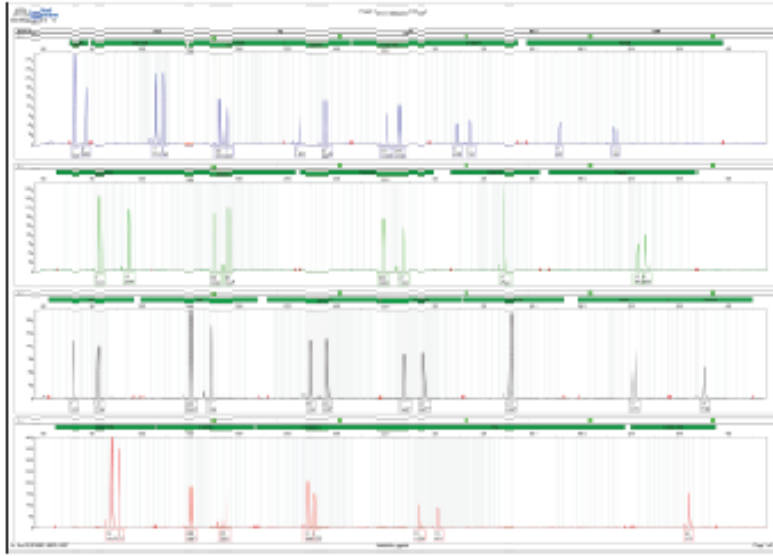


Fig 3. STR profile of DNA extract (75 µl applied at 1 ng/µl) recovered from an FTA Elute card.

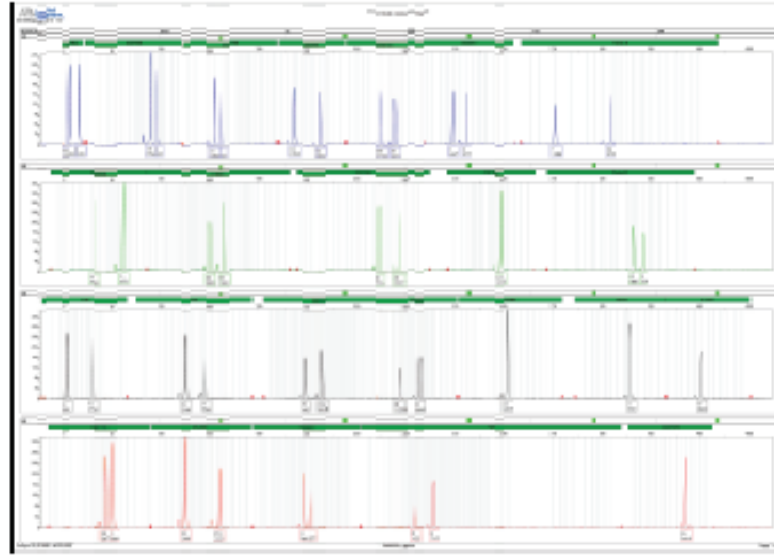


Fig 5. STR profile of DNA extract (25 µl applied at 50 pg/µl) recovered from an FTA Elute card.

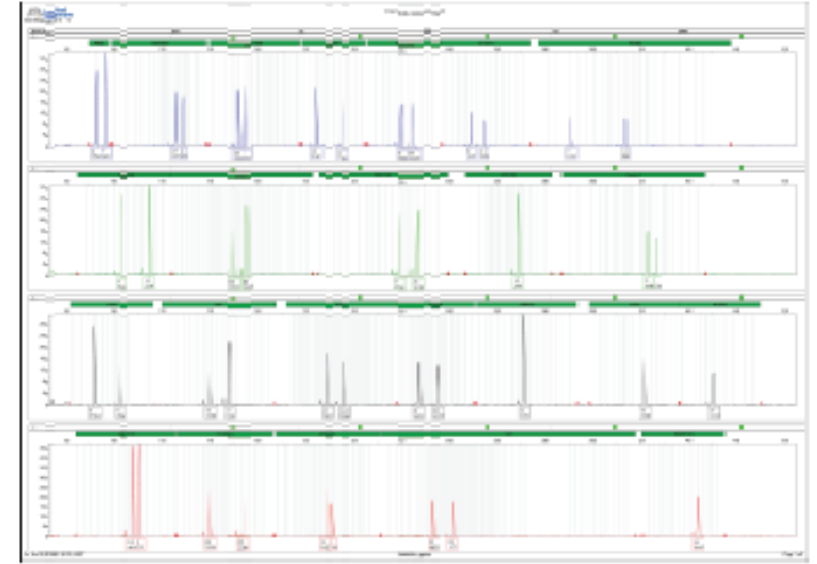


Fig 4. STR profile of DNA extract (75 µl applied at 250 pg/µl) recovered from an FTA Elute card.

Complete STR DNA profiles were obtained from all samples with starting concentrations ranging from 1 ng/µl down to 50 pg/µl !

FAQs: Sample preparation and storage

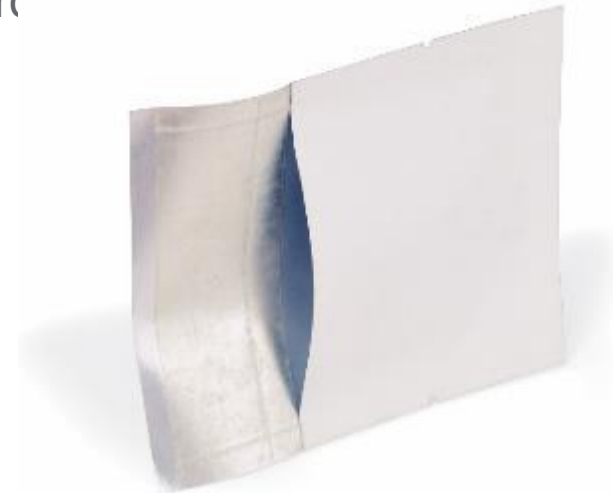
How much sample can the FTA™ Elute Card hold?

We recommend applying up to **75µl** of extracted DNA to FTA Elute Cards. This ensures that the sample is applied to the inside of the printed circle as to avoid transfer to the carrier card.



How should FTA Elute cards be stored?

- Store dried FTA Elute cards in a cool, dry environment away from light.
- The best practice is to use a multi-barrier pouch with a desiccant, particularly in high humidity environments.



Solve DNA extract storage issues with Whatman FTA Elute Cards

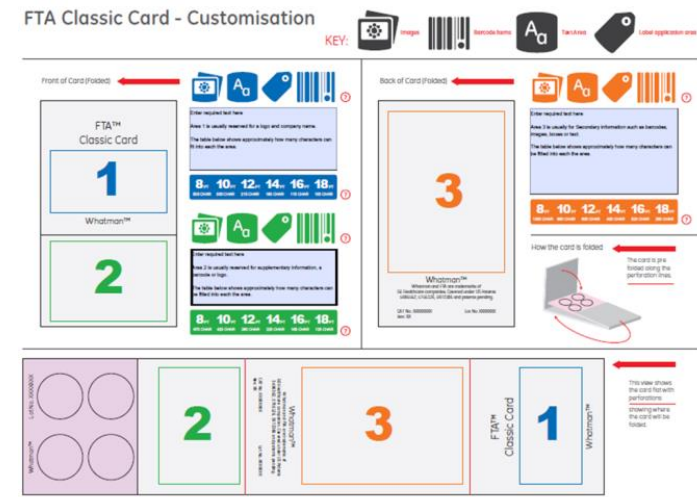
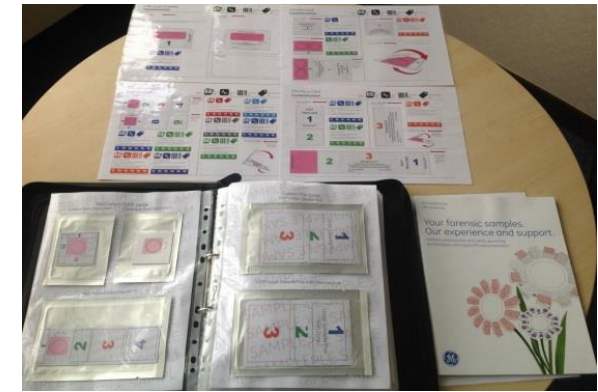
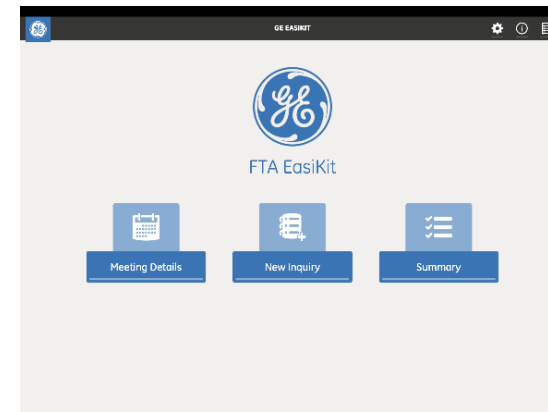
How can we help?

- Trusted Whatman FTA technology protects samples
- Full STR profiles from stored samples, including DNA extracts at low concentrations
- Compact and easy to return to outside agencies
- Room temperature storage eliminates the need for freezers
- Easily trackable with customized bar coding
- Easy elution protocol with efficient sample recovery

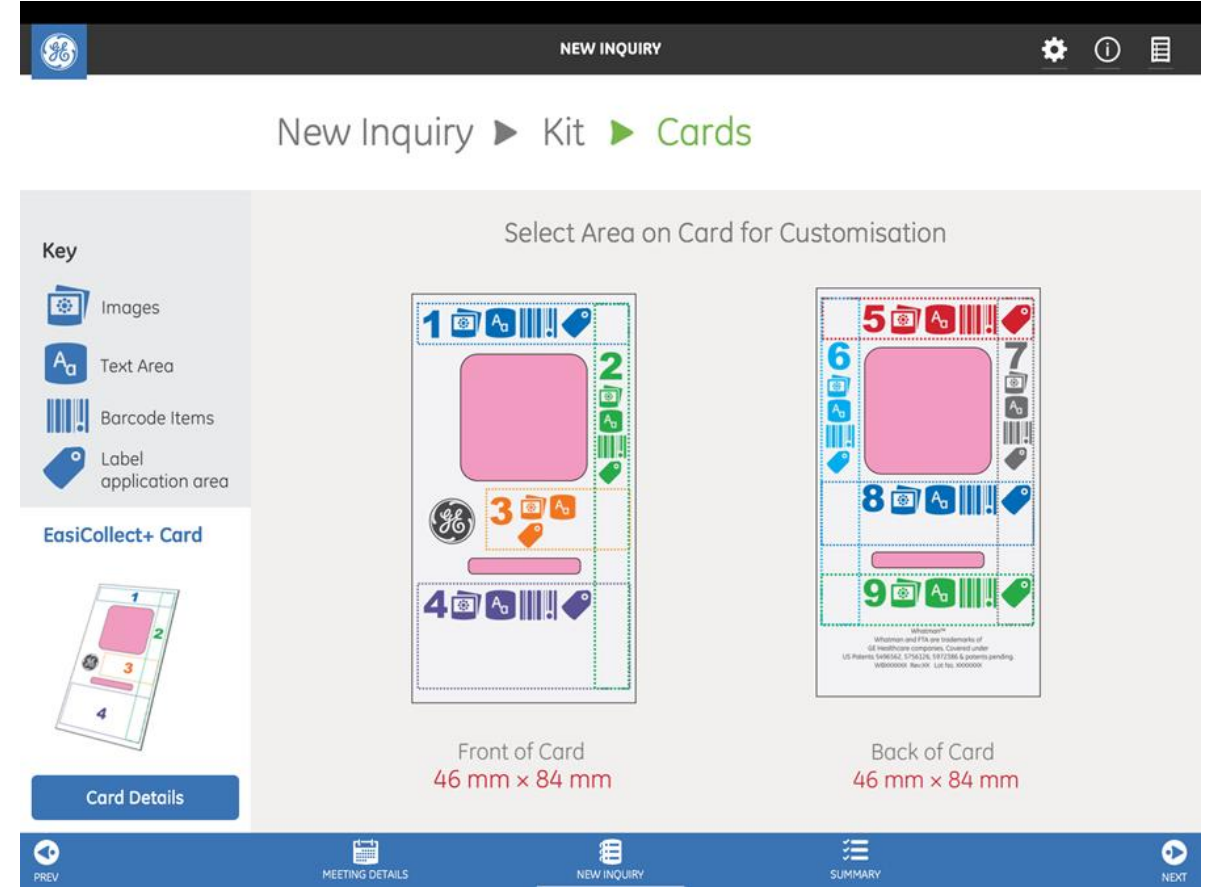
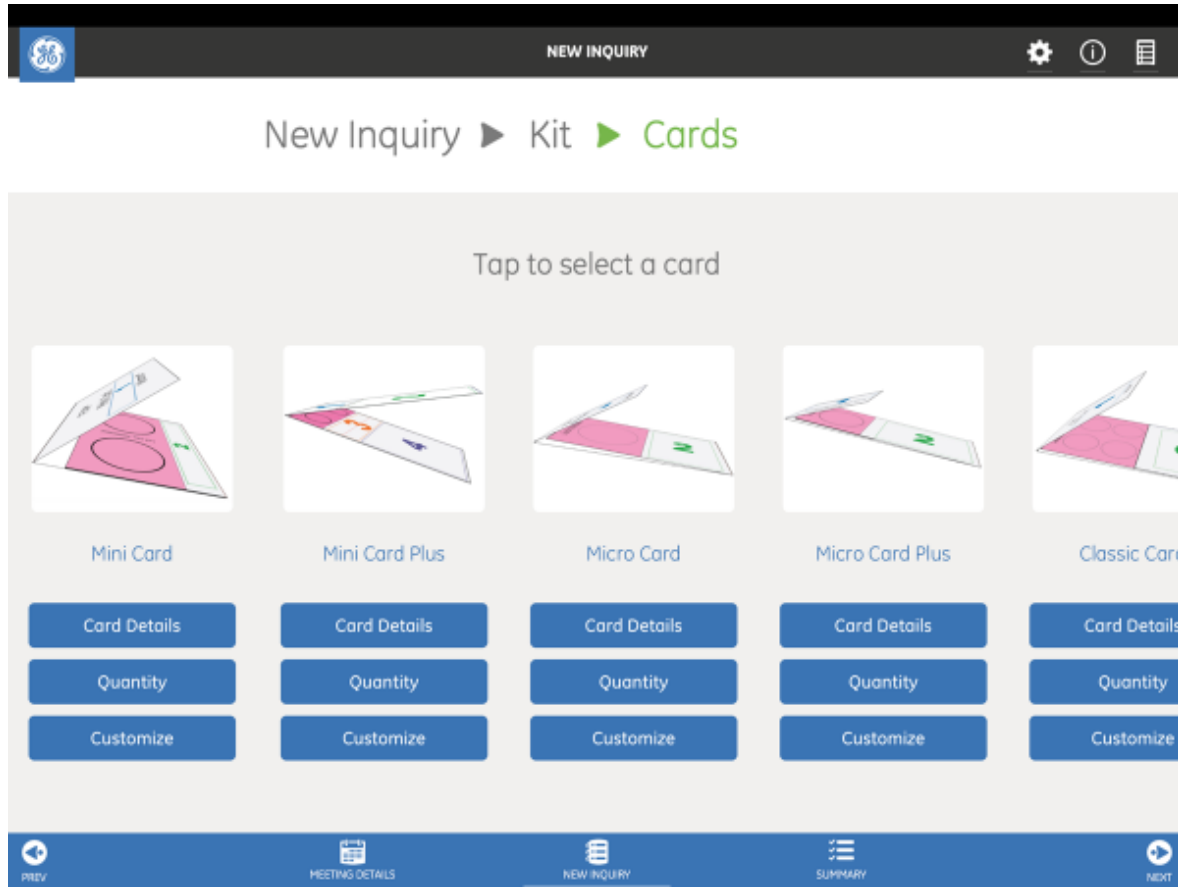


EasiKit Sales Tool

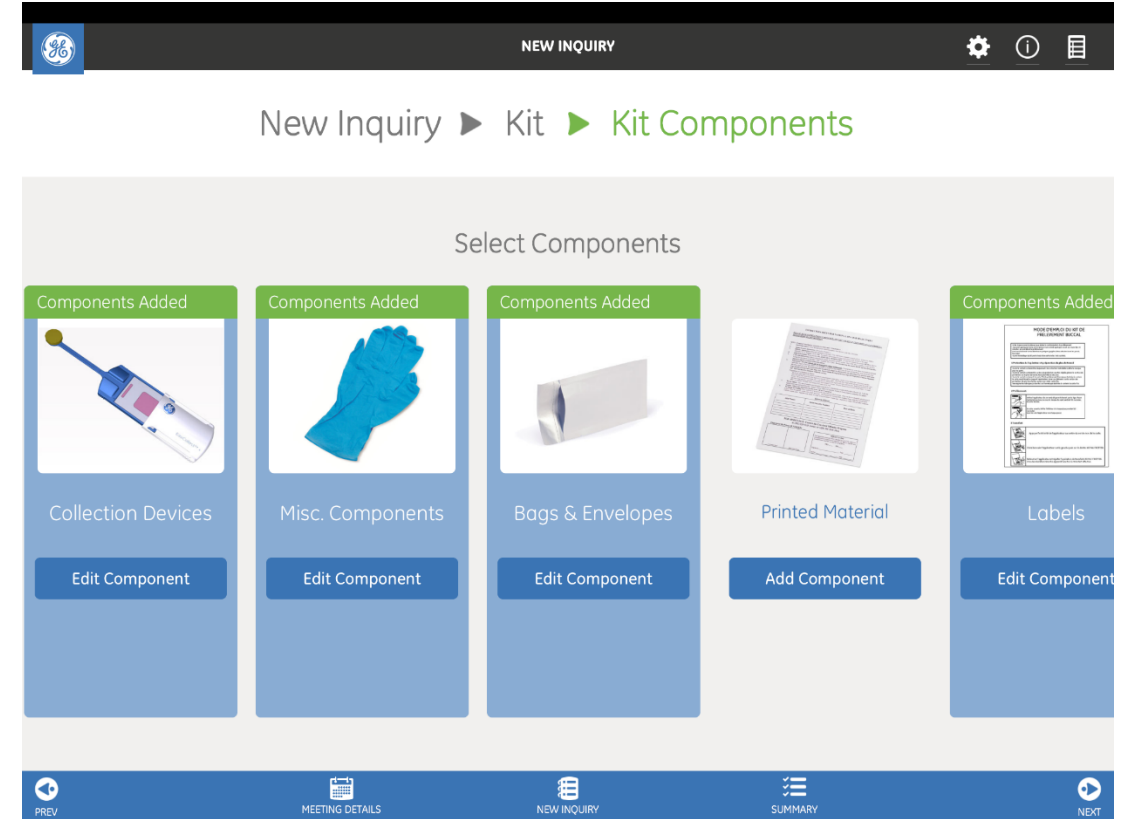
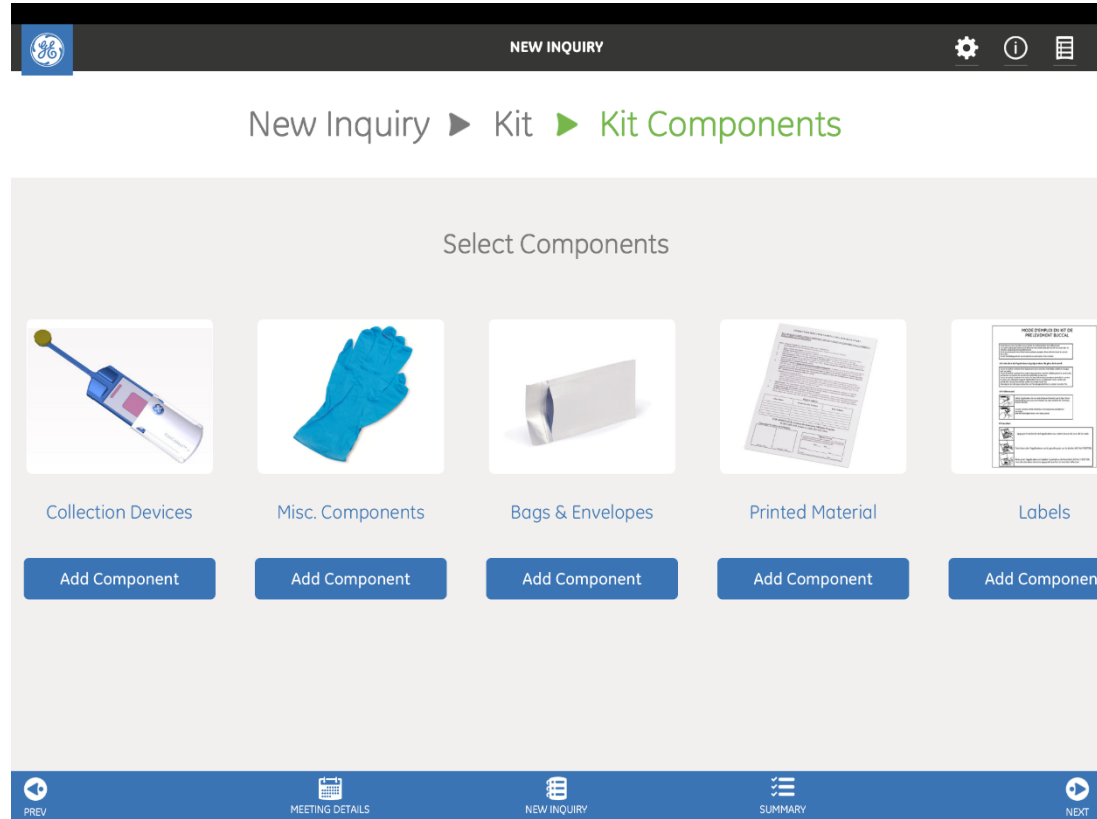
- GE also offers a wide range of custom FTA products.
- Selection and Customization of DNA testing kits at the touch of a button.
- Able to deliver custom product offerings with significantly improved lead times & lower costs
- EasiKit benefits
 - ✓ 30-day lead time
 - ✓ 48-hour quote
 - ✓ Late stage customisation







EasiKit - Card Customization



EasiKit Features-Kit Component Customization



EasiKit Features-QC Requirements for Cards

NEW INQUIRY



New Inquiry ► QC Requirements for Cards

Select all that apply

DNA	DNase	RNase	None
<div>Certificate of Conformity</div>	<div>Certificate of Conformity</div>	<div>Certificate of Conformity</div>	<div>Standard Certificate of Conformity Supplied</div>
<div>Certificate of Quality</div>	<div>Certificate of Quality</div>	<div>Certificate of Quality</div>	
<div>Certificate of Analysis</div>	<div>Certificate of Analysis</div>	<div>Certificate of Analysis</div>	

Testing is carried out on cards only.

Selection of these tests can extend delivery lead times by up to 2 weeks dependant on the test selected.

PREVMEETING DETAILSNEW INQUIRYSUMMARY



Cardiff HID Production and Quality Management

- Since 2012, GEHC has invested more than \$3 million in upgrades to the facilities and infrastructure to support the FTA™ business.
- Modern equipment is now on line and this has led to dramatic improvements in manufacturing capacity, efficiency and production cycle time (ie. 10-30K cards/shift).
- A \$750k capital investment in both semi-automation and collaborative robotics was introduced in 2016 - 2017 offering improved productivity, linearity management and minimal human interaction with the products.
- Kits are manufactured to ISO9001 standard (~2.5K kits/shift)

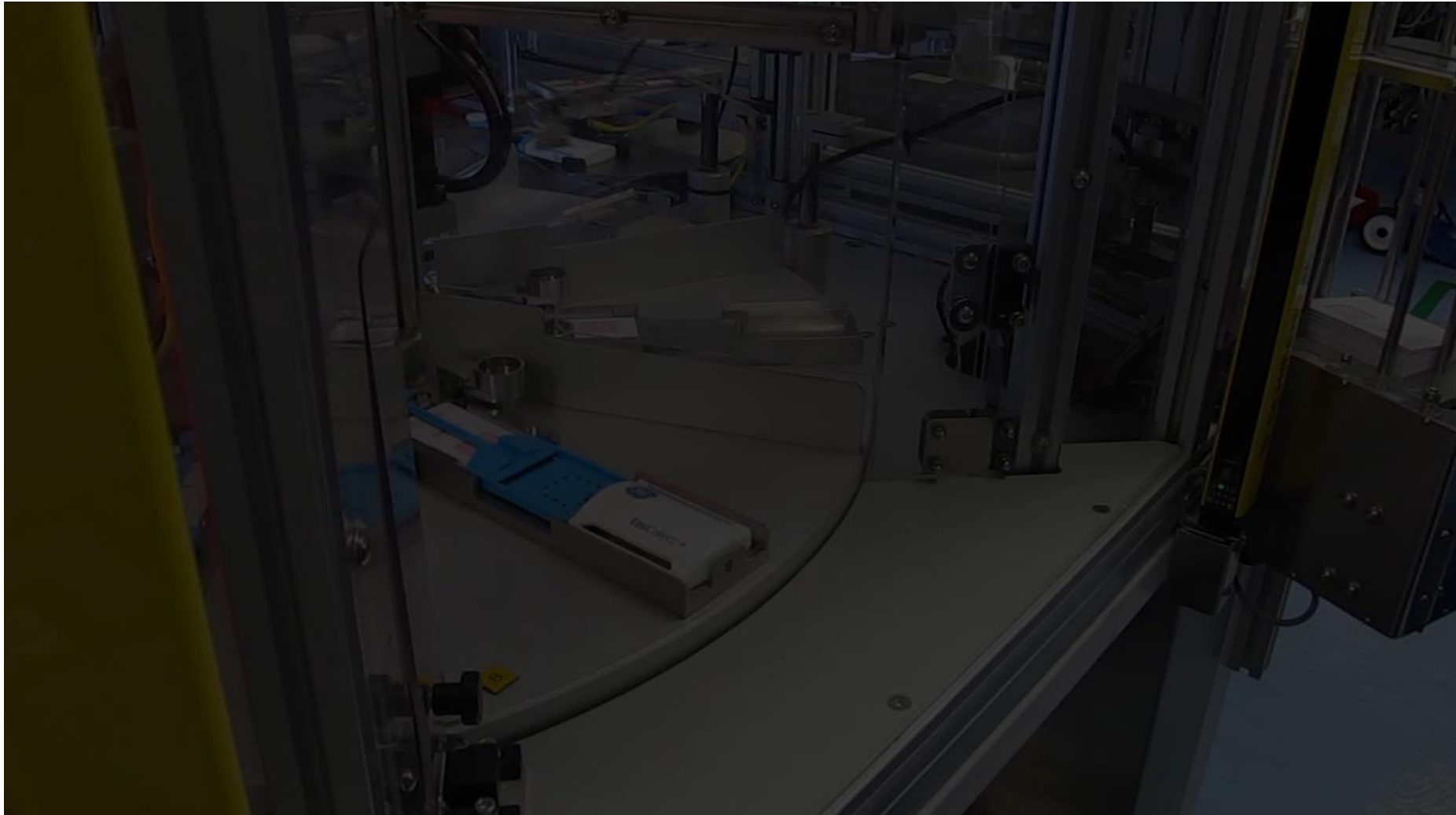


Cardiff HID Production and Quality Management

- HID products are manufactured in a cleanroom class 7 at rest, and class 8 operationally in accordance with ISO 14644.
- Our HID manufacturing processes are self-declared to the requirements of ISO 18385:2016 as per our internal audit procedure.



All FTA product are manufactured in ISO Class 8 Clean Rooms



Conclusion

GEHC strives to provide customers with efficient solutions for forensic sample collection via:

- ✓ Whatman™ FTA™ Technology
- ✓ Capability to manufacture high-quality sample collection cards and kits
- ✓ Offering a variety of off-the-shelf and custom FTA products



