

Reliable Results for Nucleic Acid Analysis

Agilent 5200, 5300, and 5400 Fragment Analyzer Systems





Eliminate Sample Quality Control Bottlenecks to Obtain Reliable Results Faster

The Agilent Fragment Analyzer systems employ several unique design features to alleviate common quality control chokepoints. These features include, increased instrument availability, flexible and dependable operations, and customizable runs helping you reach results faster.

Using automated parallel capillary electrophoresis, the Fragment Analyzer systems offer nucleic acid quality control for a range of applications, including NGS libraries and cfDNA QC. Simple sample preparation, automated operation, and intuitive analysis software contribute to efficient and accurate measurement.

There are three models, varying only in throughput, to fit the needs of any lab.



5200 Fragment Analyzer System

Medium throughput system for labs running 12-96 samples one to three times per day.



5300 Fragment Analyzer System

High-throughput system for labs running one to two 96-well plates up to three times per day.



5400 Fragment Analyzer System

Ultrahigh-throughput system for robotic automation running more than two 96-well plates per day.

Take Advantage of the Benefits of Automated Parallel Electrophoresis

A smooth workflow helps reduce user stress and increase efficiency. The Fragment Analyzer systems offer many workflow advantages to users of all types. Whether you run a dozen or hundreds of samples per day, you will experience an intuitive instrument designed with the user in mind.

Easy set up and programming allows you to use your time efficiently.

- Unattended operation provides additional time for concentrating on other tasks
- Two gel capacity enables seamless switching between applications
- Single dilution of a sample simplifies run preparation
- No daily array handling and room-temperature stable reagents minimize hands on time



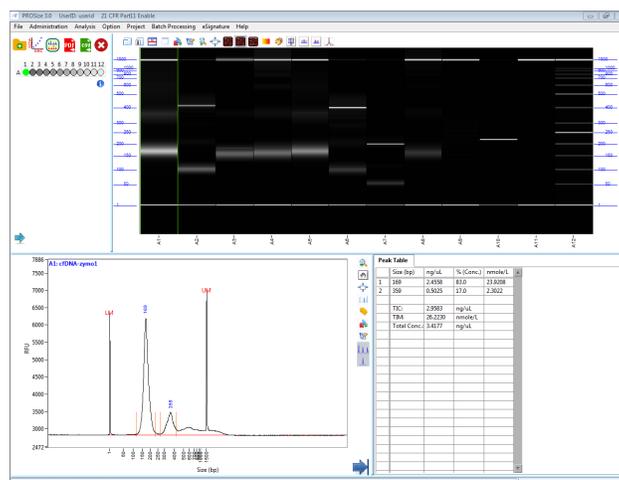


Easily adapt to changes in your workflow with flexible options.

- Maximize for speed or resolution of individual samples by choosing a shorter or longer array
- Minimize wait times with the capability to program additional sample trays during active runs
- Intuitive software allows changing the priority of runs in the queue
- Extend separation time during a run for more thorough sample analysis

Identify samples suitable for your applications with quality data.

- Quality metrics for RNA (RQN) and genomic DNA (GQN) remove subjective quality calls
- Reliable smear analysis delivers accurate molarity calculations
- See clear results with separation resolution as good as 3 bp
- DNA and RNA input concentration ranges cover two orders of magnitude to provide a wide dynamic range



Features of the Fragment Analyzer Systems

The Fragment Analyzer systems were designed to improve the efficiency of quality control workflows while keeping researchers in mind. Key instrument features mean you can perform analysis unattended, helping you minimize time to results. These features also allow a smoother transition between the needs of multiple researchers improving your lab's efficiency.

Variable throughput

Choose the array that best fits your throughput needs, 12, 48, or 96 capillaries.

Flexibility

Load up to two additional trays and program your analysis during an active run.

Versatility

Set up two different gels at the same time for automated separation of completely different sample types.



Key Features of the Capillary Arrays

The capillary array is the basis of the Fragment Analyzer systems. Once filled with gel, voltage is applied to first inject, then move DNA and RNA samples through individual capillaries in a size-dependent manner. As the fragments pass the detection window, a sensitive Charged Coupled Device (CCD) detector captures the size and concentration levels of the fragments which are then displayed in ProSize data analysis software.

Suitable for RNA and DNA

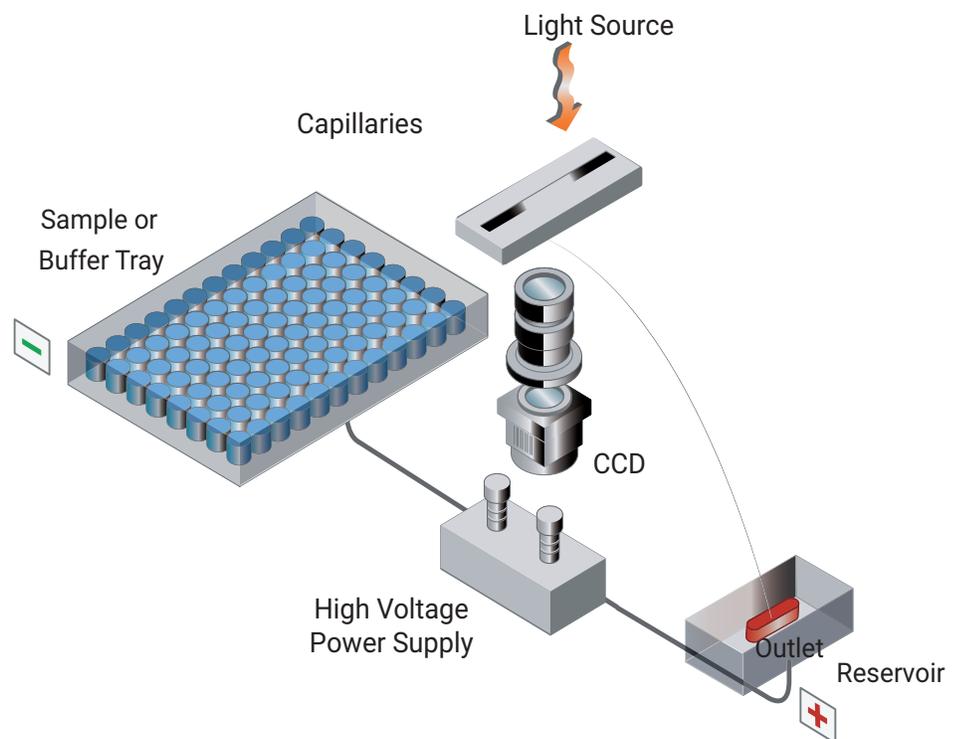
Every capillary array can reliably separate DNA and RNA samples. This capability reduces system preparation time and allows users to switch between RNA and DNA samples with ease.

Prioritize separation resolution or separation time

Capillary arrays are available in different lengths. Shorter capillaries offer faster separation times but reduce separation resolution. Longer capillaries offer slower separation times and improved separation resolution, allowing you to choose what is important.

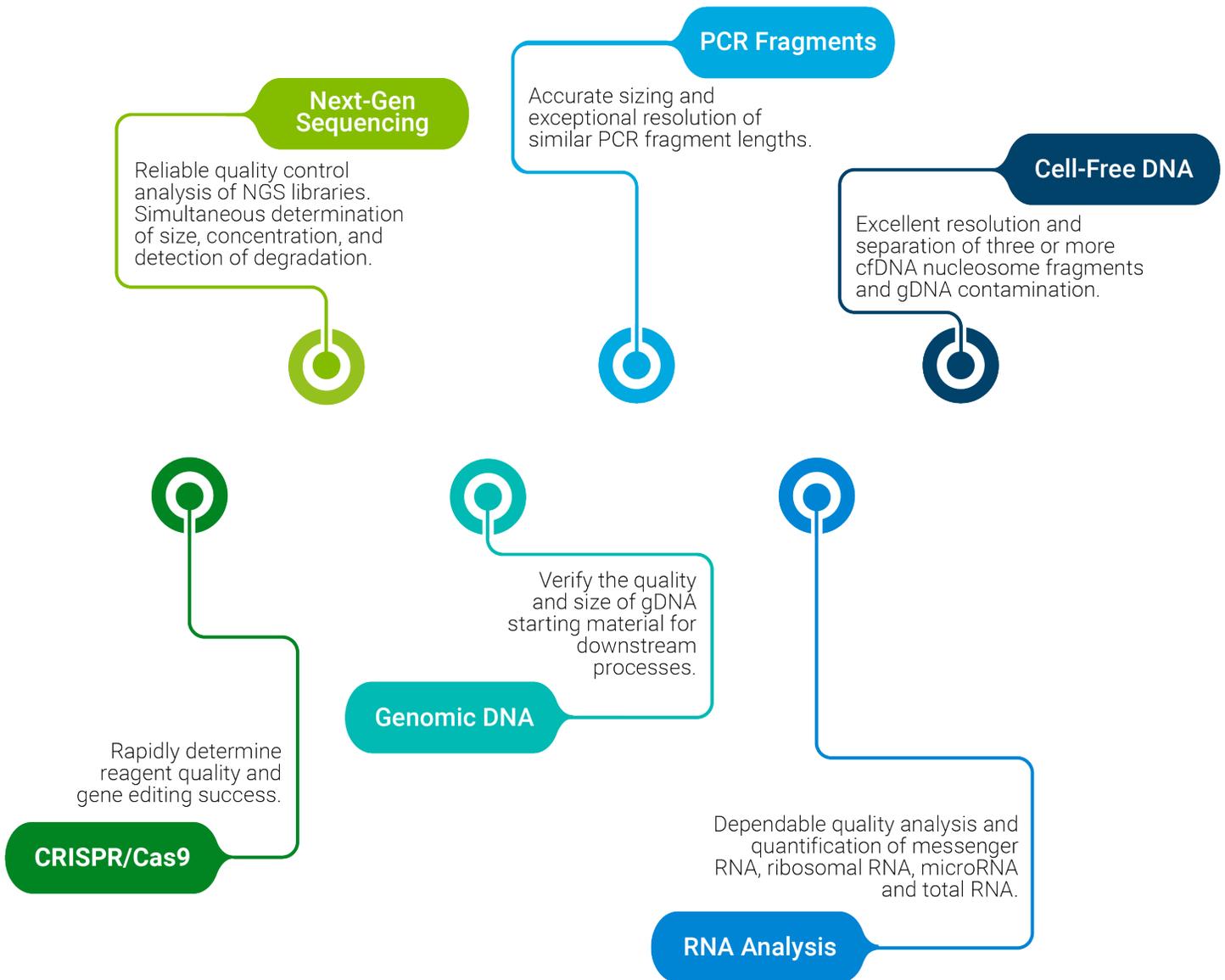
Low maintenance

Durable design and construction allow the capillary array to be stored on the instrument. Automated maintenance tasks including cleaning and conditioning, reducing the need for array handling.



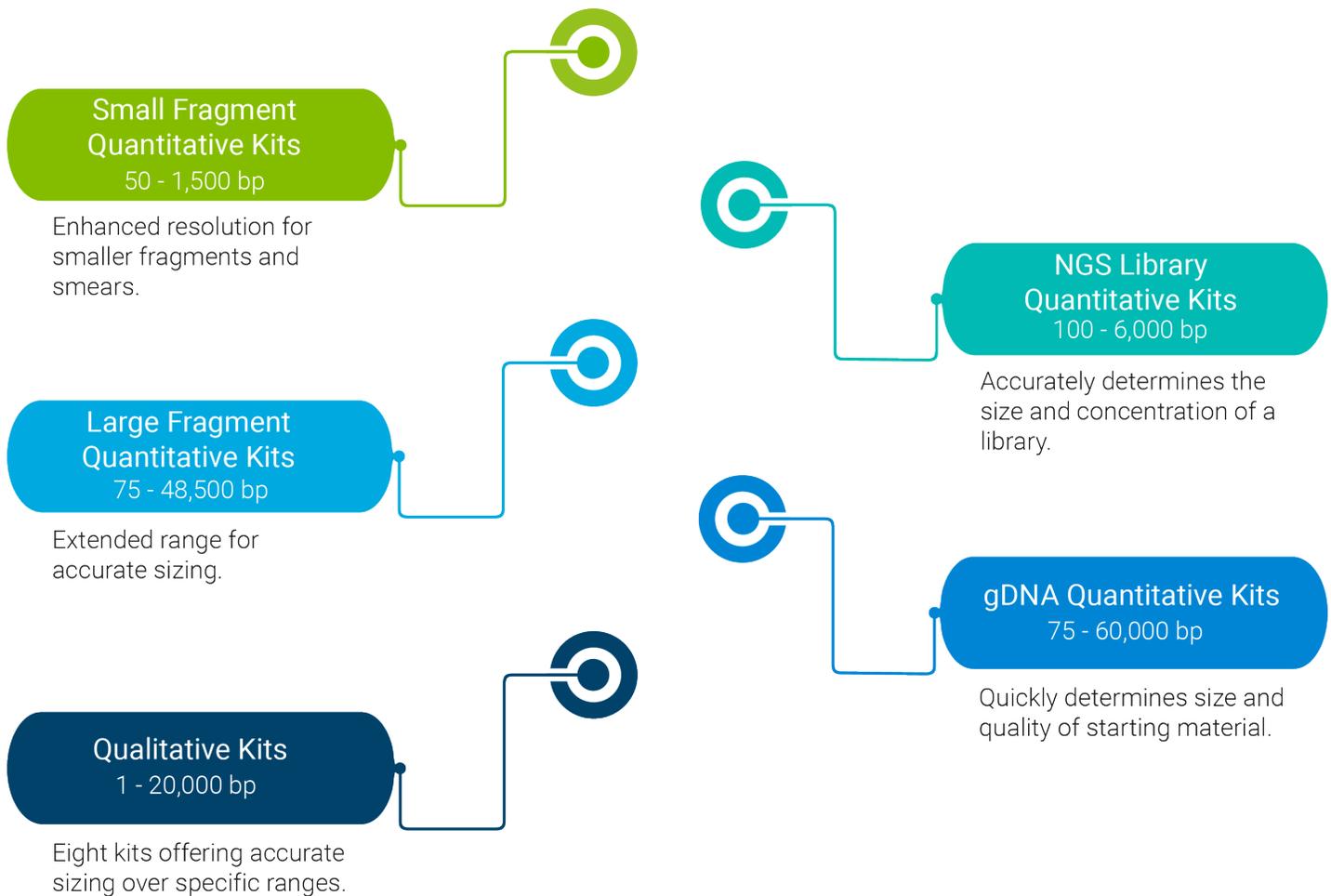
Perform Reliable Quality Control for Any Application

Applications including NGS, PCR, cfDNA, and many others need accurate nucleic acid assessment for optimal performance. Whether you are verifying the quality of your sample as a first step, determining the size of your fragments during your workflow, or confirming your results, you need efficient and reliable quality control methods for all your applications. With a broad range of kits, a Fragment Analyzer system allows you to assess diverse applications in one instrument.



Sizing Range and Input Concentration of DNA Kits

With both qualitative and quantitative DNA kits, the Fragment Analyzer systems can assess various DNA sample subtypes. The qualitative DNA kits are ideal for fragment analysis, offering accurate sizing of small and large fragments as well as relative quantification. Use of the quantitative kits enables the separation and assessment of samples as diverse as small DNA fragments and high-molecular weight genomic DNA.



Assess a Broad Range of Nucleic Acid Types with the Fragment Analyzer Systems

The broad range of kits available for the Fragment Analyzer systems allow you to qualify and quantify DNA and RNA samples such as plasmids, genomic DNA, total RNA, small RNA, CRISPR edits, large DNA fragments, and much more. The quantitative kits provide measurements of both sample size (bp or nt) and concentration. Similarly, the qualitative DNA kits offer accurate sizing and provide relative quantification.

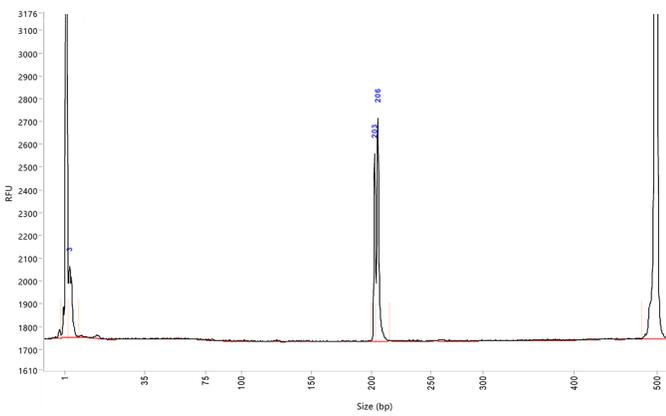


Figure 1. Mixed PCR fragments (201 bp and 204 bp) analyzed on the dsDNA 905 Reagent kit (1-500 bp) using the long 55 cm array on the 5200 Fragment Analyzer system. The two fragments are clearly defined demonstrating the high resolution capabilities on these Fragment Analyzer systems.

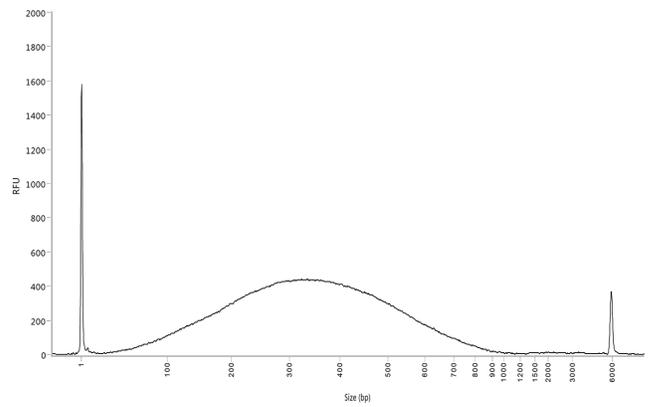


Figure 2. Short-read NGS library separated using the HS NGS Fragment kit (p/n DNF-474) on the 5200 Fragment Analyzer system. NGS library contaminants, including primer and adapter dimers, are quickly identified as peaks near the lower marker on library electropherograms.

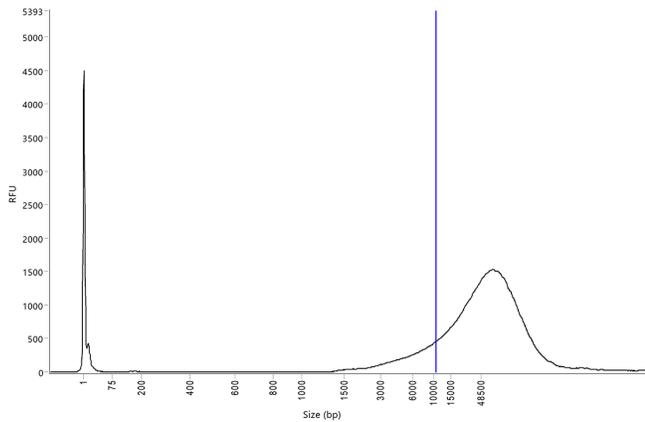


Figure 3. Genomic DNA separated using the Genomic DNA 50 kb kit (p/n DNF-467) on the 5200 Fragment Analyzer system. This sample has a Genomic Quality Number of 7.9 with a user-defined threshold of 10,000 bp (blue line).

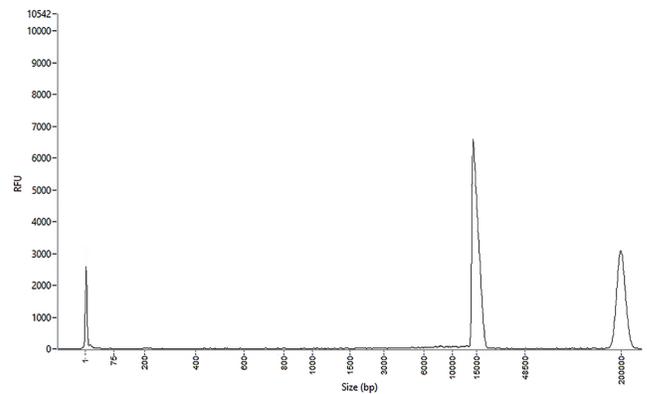


Figure 4. 15,000 bp DNA fragment separated using the HS Large Fragment 50 kb kit (p/n DNF-464) on the 5200 Fragment Analyzer system. Large DNA fragments of all origins can be separated on these systems.

Sizing Range and Input Concentration of RNA Kits

The RNA kits available for the Fragment Analyzer systems cover a broad range of sample types. Kits are available to assess samples from microRNA to total RNA. Concentration ranges for every kit cover two orders of magnitude, minimizing the amount of dilutions you must do for sample preparation.

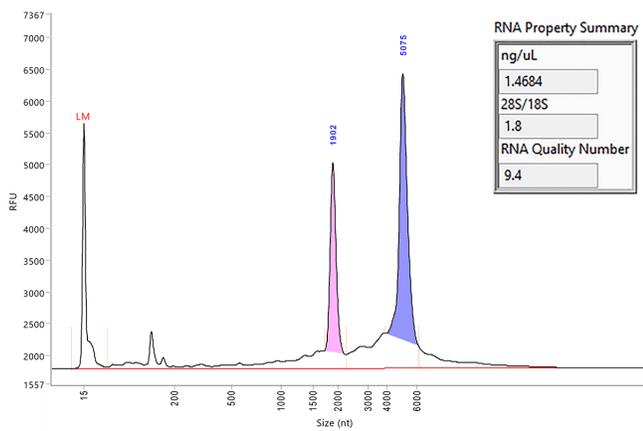
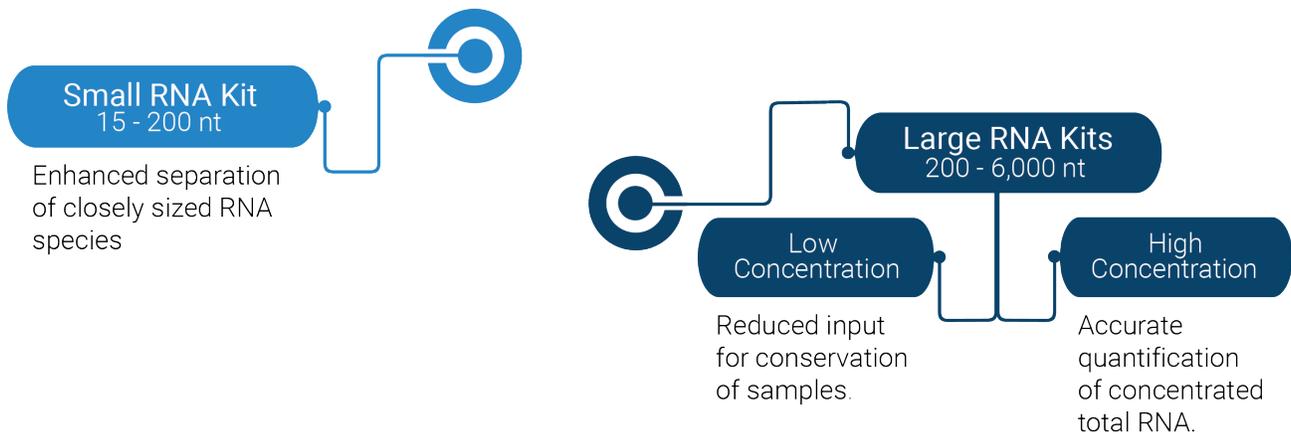


Figure 1. Total RNA sample separated using the HS RNA kit (p/n DNF-472) on the 5200 Fragment Analyzer system. The RNA Property Summary offers further insight into individual samples, reporting the RQN, concentration, and rRNA ratios.

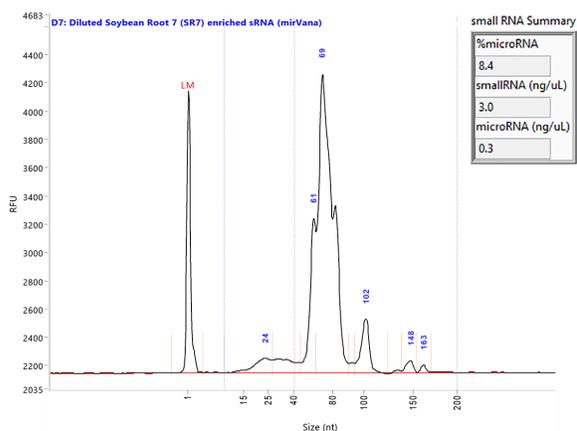


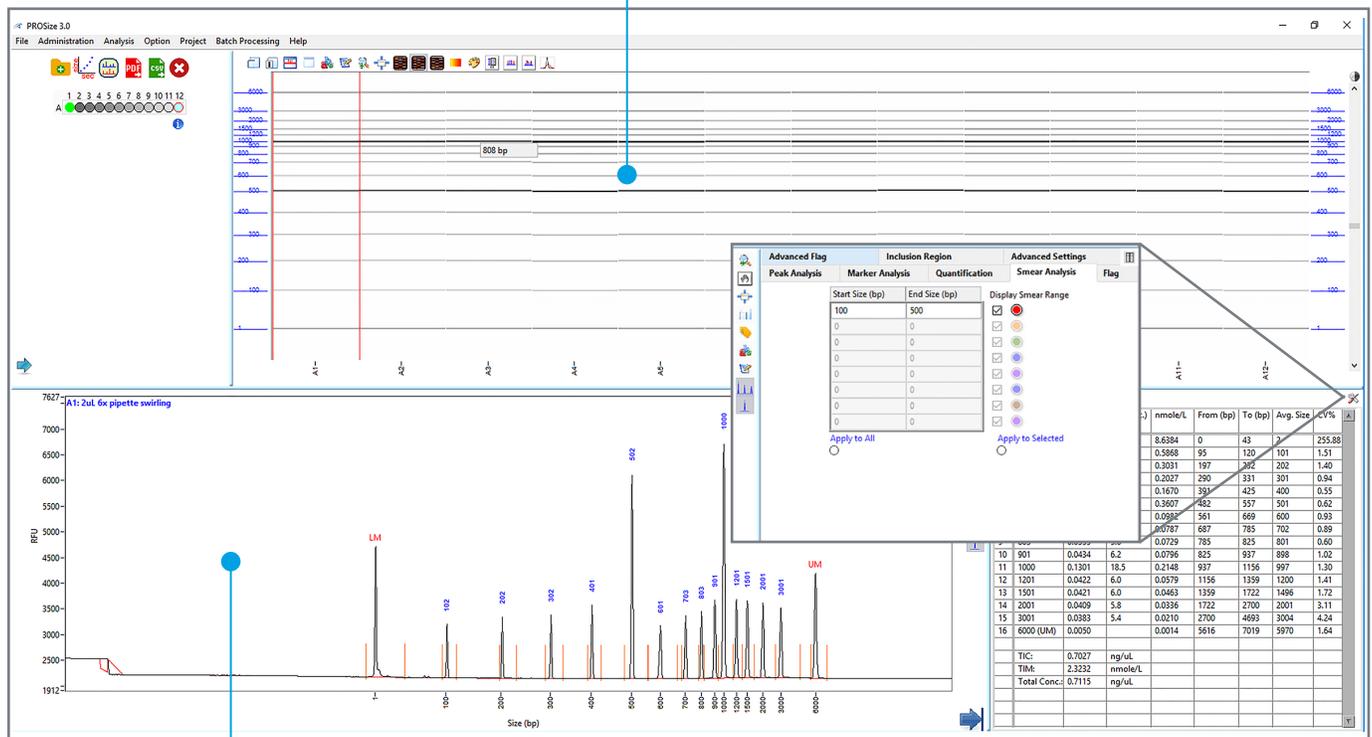
Figure 2. Small RNA sample separated using the Small RNA kit (p/n DNF-470) on the 5200 Fragment Analyzer system. Small RNA and microRNA concentrations and the percent microRNA are reported in the RNA Property Summary.

Key Aspects of ProSize Data Analysis Software

ProSize data analysis software is a robust, validated software package that simplifies the identification and analysis of nucleic acid fragments and smears. Designed with researchers in mind, ProSize software automatically calculates fragment size and quantification displaying the data in multiple formats. Reduce subjective assessment for certain DNA and RNA samples with custom quality metrics. ProSize data analysis software allows you to easily share data with coworkers with options to export run files in PDF and CSV formats.

Digital gel image

Data represented as an interactive digital gel image with tools for basic adjustments.



Electropherogram

Data represented as an interactive electropherogram with tools for basic adjustments.

Individual Parameter

Set specific parameters to customize sample analysis, aid in evaluating contaminated samples, and expedite quality control decisions.

Quality Metric Scoring with ProSize

The RNA Quality Number (RQN), Genomic Quality Number (GQN), and DNA Quality Number (DQN), were designed for use in ProSize data analysis software to allow for easy analysis of total RNA, gDNA, and sheared DNA quality, respectively. RQN calculates a quality score taking into account the entire electropherogram from the small RNA region to the ratio of the ribosomal peaks. This allows ProSize to assign an RQN based on a scale of 1 to 10, where 1 represents completely degraded RNA and 10 represents intact RNA. ProSize calculates a GQN or DQN value based on the fraction of total DNA sample concentration that lies above a user defined threshold value. The threshold value or size (bp), can be varied depending on the requirements of the specific application. RQN, GQN, and DQN allow for independent objective quality analysis that users can rely on for assessing all sample types.

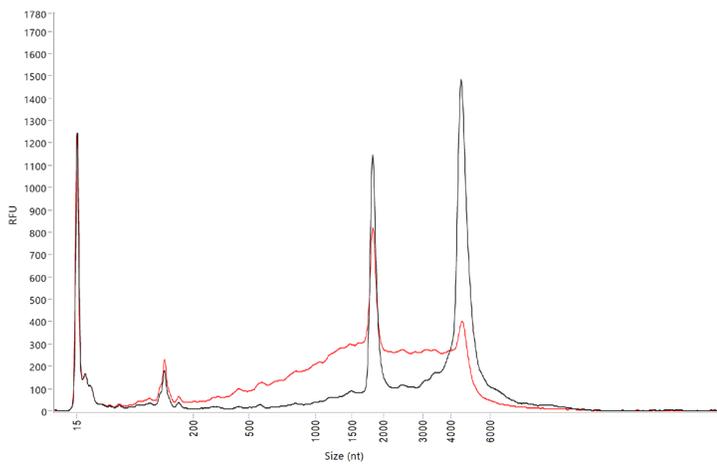


Figure 1. Universal mouse reference total RNA separated on the Agilent Fragment Analyzer system with the HS RNA kit (p/n DNF-472). Sample at 0 (black) and 8 (red) minutes at 70°C. RQN = 9.6 & 6.2, respectively.

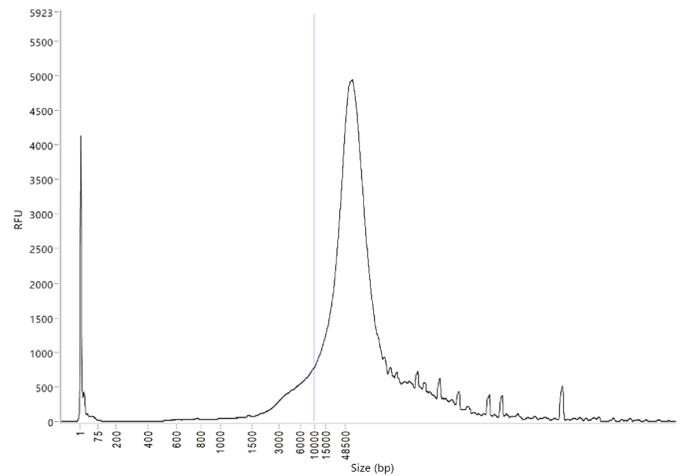
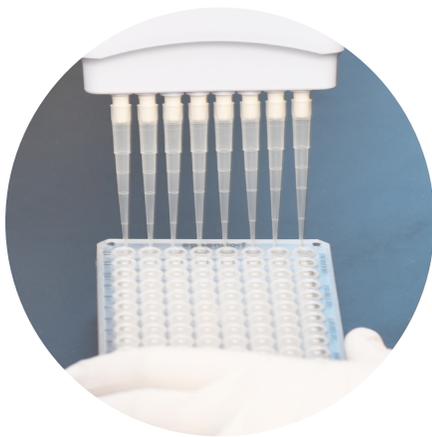


Figure 2. Genomic DNA analyzed on the Agilent Fragment Analyzer system with the Genomic DNA 50 kb kit (p/n DNF-467). $GQN_{10\text{kb}} = 8.8$.

How to Use the Fragment Analyzer Systems

Performing QC on a Fragment Analyzer system is easy, prepare the instrument, load your samples, select method, start your run, and walk away until you are ready to analyze the results. The systems are low maintenance and allow you to automate maintenance tasks, such as capillary conditioning, to run before or after separations. This ability to analyze samples unattended means your QC is on your schedule.



Step 1: Prepare Instrument

Load gel and conditioning solution, change inlet buffer, and empty waste draw/bottle.



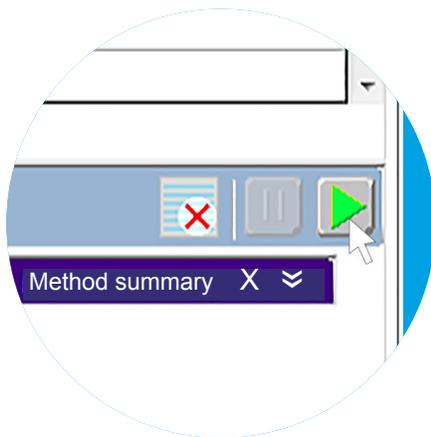
Step 2: Load Sample

Load your runs with just a single dilution and 2 μ L of sample per well.



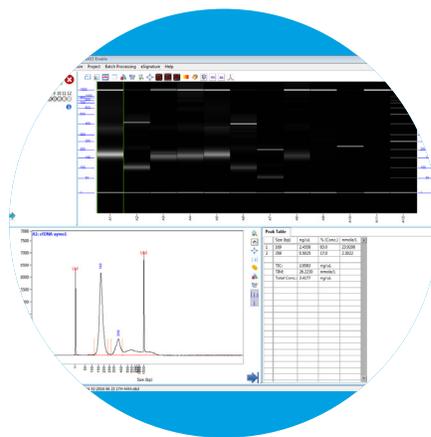
Step 3: Choose Method

Select your method from the dropdown menu and enter any notes for the run.



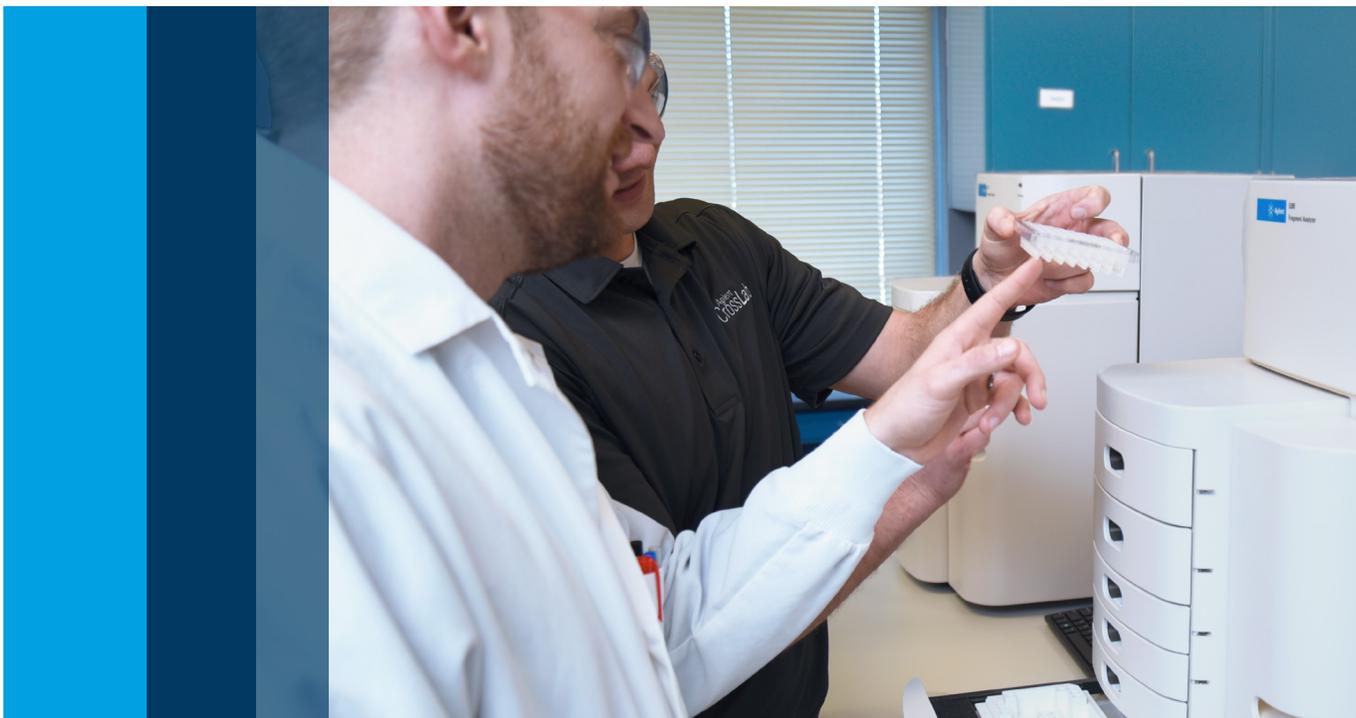
Step 4: Start Runs

Queue up to 288 samples and walk away.



Step 5: Analyze Results

Process separation data with ProSize data analysis software.



Support Services for the Fragment Analyzer Systems

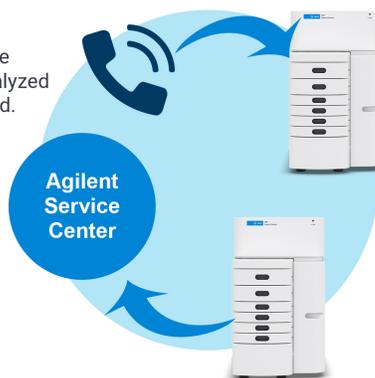
Get peace of mind through comprehensive instrument IQ/OQ services and assay familiarization

Agilent offers an onsite startup service to familiarize you with the instrument and software, as well as an assay of your choice. You can also choose from additional service options to suit your lab's specific service-level needs including Installation Qualification and Operational Qualification (IQ/OQ).

Additional Support Services

One-year standard warranty is included in all Fragment Analyzer systems. This may be upgraded to CrossLab Silver level and extended to cover up to five years total warranty time. This premium service includes travel, labor, parts, onsite repair, and an annual system preventative maintenance service. IQ/OQ services are also available with instrument purchase or on-demand.

1. Call Agilent. Issues can be remotely analyzed and corrected.



2. Should onsite service be required Agilent will schedule this with you.

Learn more:

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