FragQ-S100

Bio-fragment Analyzer

All in One Step

DNA/RNA Fragment Analyzer

FragQ-S100 capillary gel electrophoresis (CGE) system is a fully automated fragment analyzer for DNA and RNA analysis. The easy-to-use system simplifies the number of complicated and time-intensive steps of gel electrophoresis, including gel preparation, sample loading, electrophoresis and gel image.

Unlike conventional CGE systems, the capillary, fluorophore and gel-matrix are integrated as a disposable pen-shaped gel-cartridge. The embedded tag gives the identity of the cartridge and allows the customers to monitor its condition.

The system provides a user-friendly software "Q-Analyzer". The intuitive graphic user interface enables the user to accomplish the tests in a few steps. Even inexperienced technician can operate the system with a short training.

FragQ-S100 system is a powerful tool for Life Science, Agriculture, Pharmaceutical Industry, and Food Science research.

Applications

- PCR Product Screening
- CRISPR QC
- Next Generation Sequencing (NGS) QC
- Restriction Fragment Length Polymorphism (RFLP)
- Oligonucleotides Analysis
- Genomic DNA Analysis
- Plasmid Purification& Vector Cloning Analysis
- RNA Analysis
- cfDNA Analysis

Specifications

- **Detection**: Fluorescence
- **Light Source**: LED
- **Separation Voltage**: 1-15 kV
- **Connectivity**: USB cable
- **Power Source**: AC 100-240 V
- **Maximum Power**: 60 W
- **System Weight**: 15 kg
- **Dimensions**: 38x30x40 cm
- **Automated Sampling**: 1 to 100 samples

Highlights

Automated Sample Handling

- Automated process for 1 to 100 samples

Disposable Gel-Cartridge

- No need for gel preparation
- 100-300 samples per cartridge

Rapid Analysis

- 3-10 minutes per sample
- Broad Size Range: 20 bp-60 kbp
- Broad Detection Range: 20 bp-165 kbp

Resolution

- 1-4 bp (between 100-500 bp)

Sensitivity

- Detects as low as 0.1 ng/µL (5 pg/µL in DDW)

Minimum Sample Volume

- 20 µL in micro vial; 10 µL in 0.1 mL PCR tube
- 20 µL in 0.2 mL PCR tube
- Sample consumption: <0.1 µL

Software: Q-Analyzer

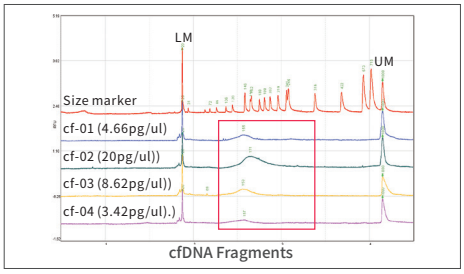
- Relative qualitative and quantitative analysis
- Electropherogram
- Gel-image
- Customer-oriented report

FragQ-S100 DNA/RNA Fragment Analyzer

Cell-free DNA (cfDNA) and NGS fragment Analysis

A powerful tool for detecting cfDNA (low concentration DNA fragments).
cfDNA in the blood plasma exists at very low concentrations and is difficult to detect by using other systems.

cfDNA detection by high-sensitivity cartridge



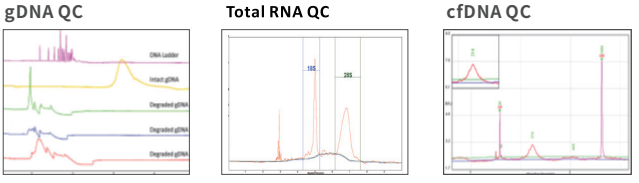
The concentration of cf-04 is 3.42 pg/ul
(measured by Qubit fluorometer).

Advances in Next-Generation Sequencing (NGS) technology now allow the use of cfDNA as a biomarker for liquid biopsy applications. Cell-free fetal DNA (cffDNA) is fetal DNA circulating freely in the maternal bloodstream. It can be used in Non-invasive Prenatal Diagnosis (NIPD) to screen for birth defects and inherited diseases. Circulating tumor DNA (ctDNA) is tumor DNA circulating freely in the blood of a cancer patient. Researchers can compare known cancer markers with ctDNA samples to obtain valuable insights for cancer prevention and treatment.

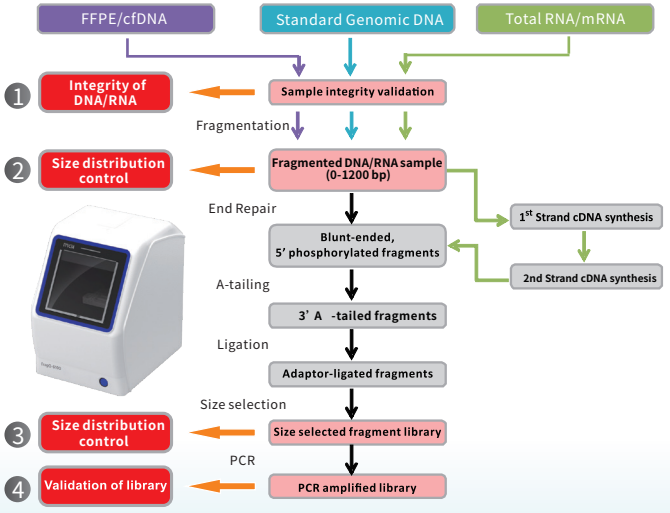
NGS Fragmentation/Library QC

To ensure the success of NGS results, quality check must be conducted at many steps of the workflow.
The FragQ-S100 system is a high-quality control platform for NGS, which provides the easiest and simplest solution for monitoring each stage of library preparation.
The system can produce high-sensitivity results from serially diluted library samples. The average size of the DNA library is 515 bp, and library concentrations range from 0.33 ng/μL to 0.07 ng/μL.

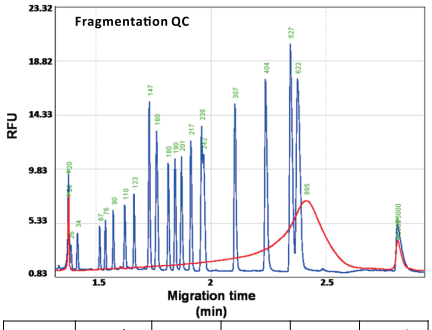
Isolation quality check



NGS Workflow

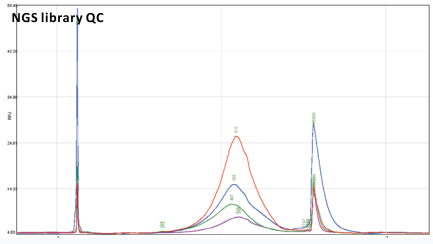


Size distribution and library quality check



	Range(bp)	ng/μL	% total	nmole/L	Avg. size
Library	100-5000	55.98	99.71%	101.71	846.96
	400 - 600	7.63	13.62%	23.75	493.97
	600 - 800	7.16	15.03%	15.53	709.73
	800 - 1000	9.22	19.37%	15.82	896.50
	1000 - 1200	5.29	10.40%	7.52	1082.95

Fragment distribution of sheared gDNA



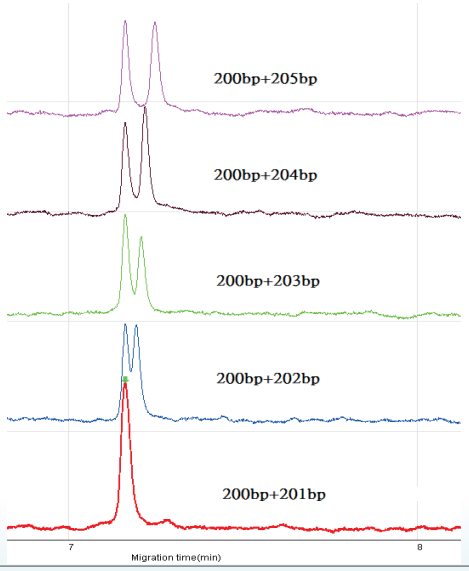
High sensitivity results from serially diluted library samples. Average size of DNA library is 515 bp. Library concentrations are from 0.33 ng/ul to 0.07 ng/ul.

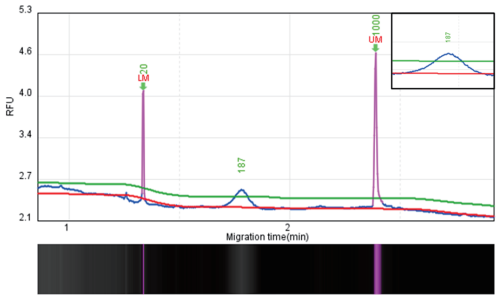
FragQ-S100 DNA/RNA Fragment Analyzer

High Resolution and Sensitivity

Resolution is dependent on the conformation and sequence of DNA sample. The High Resolution Cartridge (S1) is able to resolve 1-4 bp differences.

Sensitivity is affected by the salt condition of the sample. A lower salt concentration can enhance the sensitivity.





	Range (bp)	pg/μL	% total	pmol/L	Avg. size
cfDNA	100-300	4.03	71.80	33.27	184.28

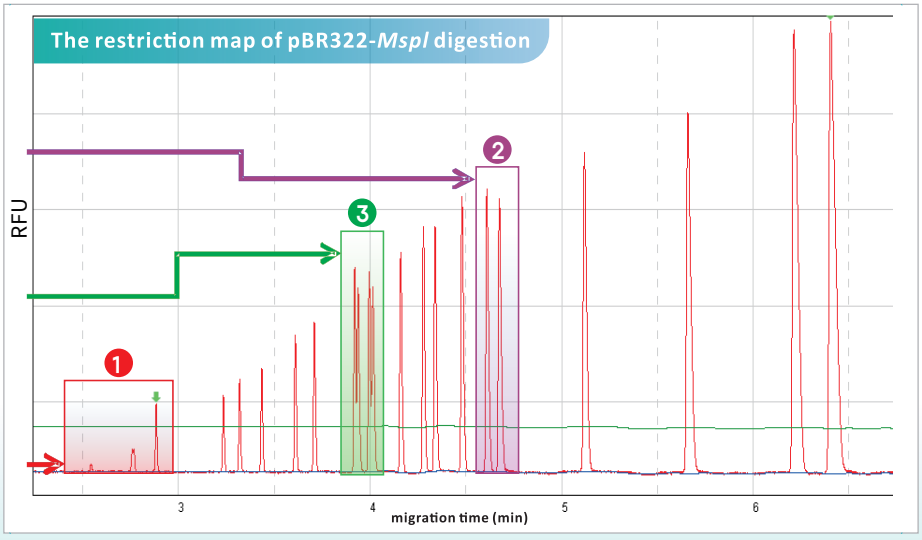
High Sensitivity:

The cDNA sample with the concentration of 4.03 pg/μL (measured by Qubit fluorometer) is detected by High Sensitivity Cartridge (N1).

High Resolution:

The PCR product is designed for the same sequence with 1 to 5 bp difference. 2 bp is resolved in this test.

Fragment Size (bp)	
1	622
2	527
3	404
4	307
5	242
6	238
7	217
8	201
9	190
10	180
11,12	160
13,14	147
15	123
16	110
17	90
18	76
19	67
20,21	34
22,23	26
24	15
25,26	9



System highlights

1 High sensitivity:

15, 26 and 34 bp fragments are detected. (15 bp: 0.056 ng/μL, 26 bp: 0.194 ng/μL, 34 bp: 0.253 ng/μL)

2 High resolution:

238 bp, 242 bp fragments (4 bp differences) are resolved.

3 High resolution:

The fragments (147/147 and 160/160 bp) with same size, but different sequences are well resolved.

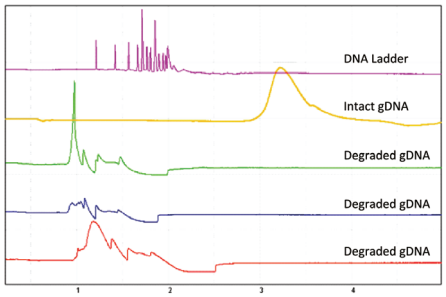
Excellent Tool for QC

DNA/RNA Quality Control

Sample quality is the most important factor for a good result. The success of NGS, downstream gene expressing analysis, such as qPCR, microarray analysis, and other DNA/RNA-based applications, relies on the sample quality.

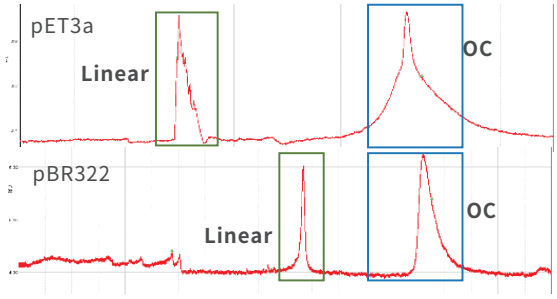
DNA QC

Genomic DNA QC



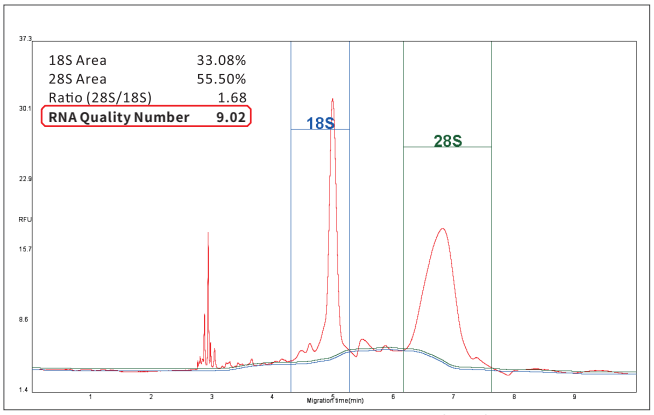
gDNA integrity check

Plasmid DNA QC

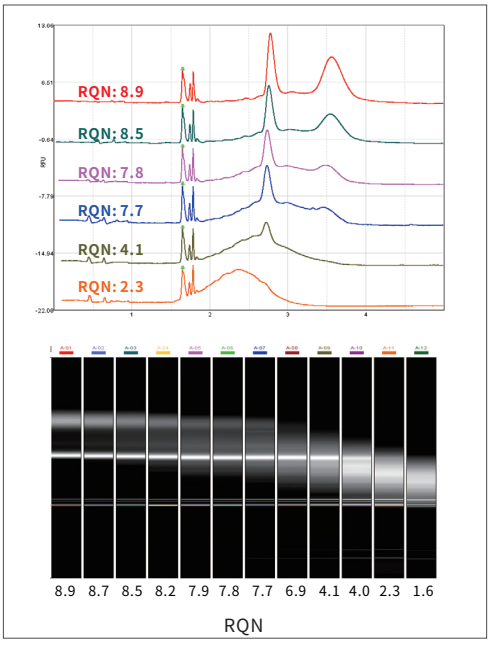


Linear/ Open-circular forms are resolved

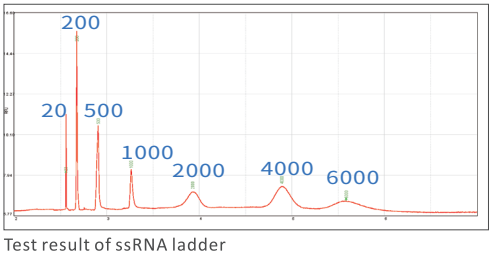
RNA QC



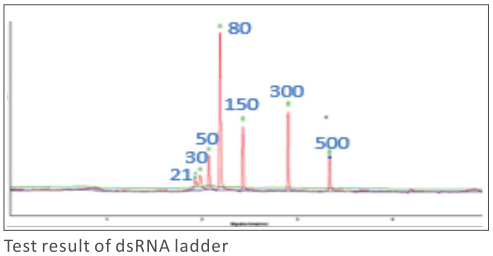
Qsep100 provides an indicator "RNA quality number (RQN)" for the RNA integrity.



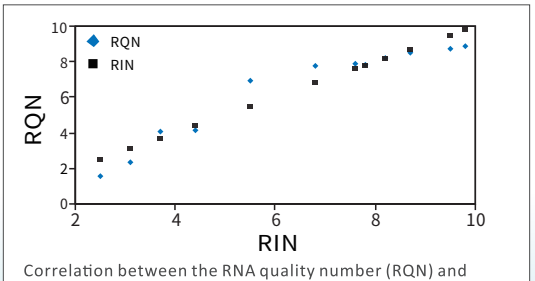
RNA integrity categories: The figures show typical representatives of the different RQNs.



Test result of ssRNA ladder



Test result of dsRNA ladder



Correlation between the RNA quality number (RQN) and RIN tested by Mission Sequencing Center.

Say Goodbye to Slab-gel Electrophoresis

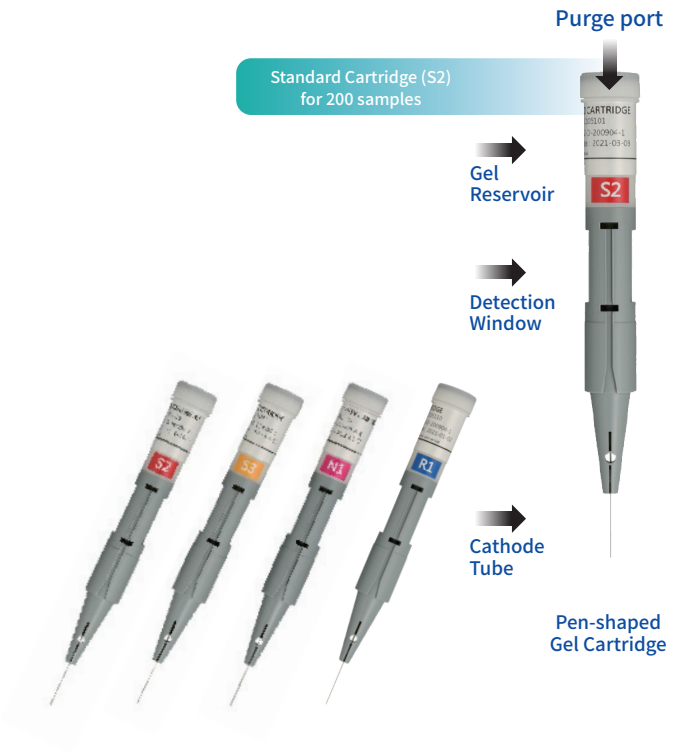
Disposable Cartridge

Different types of cartridge are available for DNA and RNA applications. Users are advised to choose a suitable kit from the cartridge list in accordance with their requirements.

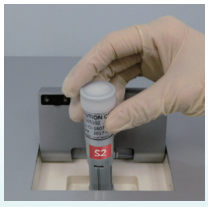
Respective cartridge is programmed for 100 to 200 samples. The kit provides all the reagent consumables needed for your test.

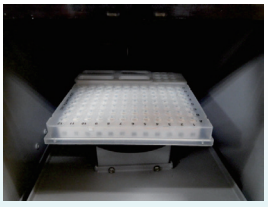
Content	DNA Cartridge Kit	RNA Cartridge Kit
Separation buffer	1× separation buffer	*10× separation buffer
Dilution buffer	1× dilution buffer	*10× dilution buffer
Mineral Oil	√	√
Buffer tray	√	√
Alignment Marker	√	**
Size Marker	**	**

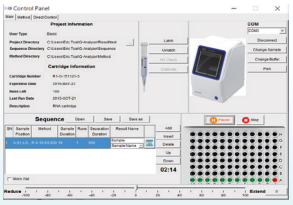
* User needs to use DEPC water to dilute the stock buffers before testing
** Contact with MGI for more details

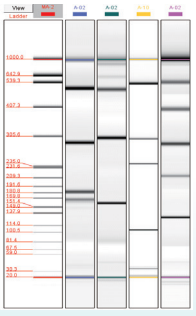


Few steps to run your test


Insert Gel-cartridge


Place Samples


Choose Method and Run


Display Results

Ordering Information

Product Number	Product Name	Product Number	Product Name
950-000177-00	Bio-fragment Analyzer FragQ-S100	962-000178-00	0.1ml tube (4-STRIPS)
950-000174-00	MGIEasy High Sensitivity Cartridge Kit (N1)	962-000179-00	Qsepl 18-strip Sample Tube
950-000176-00	MGIEasy Standard Cartridge Kit (S2)	961-000676-00	Size Marker pBR322 MspI Digest
950-000172-00	MGIEasy Kilobase Cartridge Kit (S3)	961-000677-00	Size Marker Standard 50bp Ladder
950-000173-00	MGIEasy RNA Cartridge Kit (R1)	961-000678-00	Size Marker 500bp-23kb
960-002324-00	Qube Purge Station for 1 Channel	961-000679-00	Alignment Marker 20bp&1000bp
962-000177-00	8-STRIPS Micro Vial	961-000680-00	Alignment Marker 20bp&5000bp

MGI Tech Co.,Ltd.
Building 11, Beishan Industrial Zone, Yantian District, Shenzhen, CHINA, 518083
4000-688-114
en.mgi-tech.com
MGI-service@mgi-tech.com
Version: April 2025