Agilent TapeStation 4200

User Guide for BRC Genomics Facility Customers

Self-service loading, run setup, data analysis, and PDF export

The TapeStation is a high-throughput automated electrophoresis platform for nucleic acids. It utilizes disposable ScreenTapes that enable the running of 1 to 15 samples (plus a ladder) and has a runtime of ~2 minutes per sample. DNA, RNA, and high molecular weight genomic DNA may be analyzed on the system when utilizing the corresponding ScreenTapes and reagents. Sample requirements are typically only 1-2 uL and the effective concentration range varies between assays. Software for analyzing runs is freely available from Agilent (PC only).

Scope: This guide covers instrument operation only. Customers prepare and bring their own samples, ScreenTape devices, loading tips, and reagents.
Provided by the facility: the 4200 TapeStation instrument, the dedicated control computer with the TapeStation Controller and Analysis Software installed, a thermocycler for RNA denaturing, a strip-tube spinner, and the benchtop vortexer.

Important: This computer is not connected to the network or internet. You must bring a USB flash drive to take your data with you — see Section 6.

Interactive video overview
https://www.agilent.com/en/tapestation-interactive

1. Before You Start

Please arrive with your prepared samples and be ready to load — sample preparation (mixing with sample buffer) should be completed at your own bench beforehand according to the Agilent Quick Guide for your specific ScreenTape assay (e.g., genomic DNA, RNA, D1000, D5000, or HS D1000). If performing an RNA assay, you may use the thermocycler next to the Bio-Rad digital PCR to denature your RNA samples before loading. This walk-up session is for instrument loading, the run, and data analysis only.

1.1 What you need to bring

Item	Notes	Provided by facility?
ScreenTape device (correct assay type)	Equilibrate to room temperature 30 min before use; flick to remove bubbles before loading	No
Loading tips	One tip per sample/ladder well used	No
Sample buffer and ladder	Assay-specific; keep on ice until use	No
Prepared samples in tube strips or 96-well plate	Capped, spun down, no bubbles at the bottom of wells	No
USB flash drive	For copying your results — the computer is not networked	No
Gloves	Recommended for handling ScreenTape and tips	No

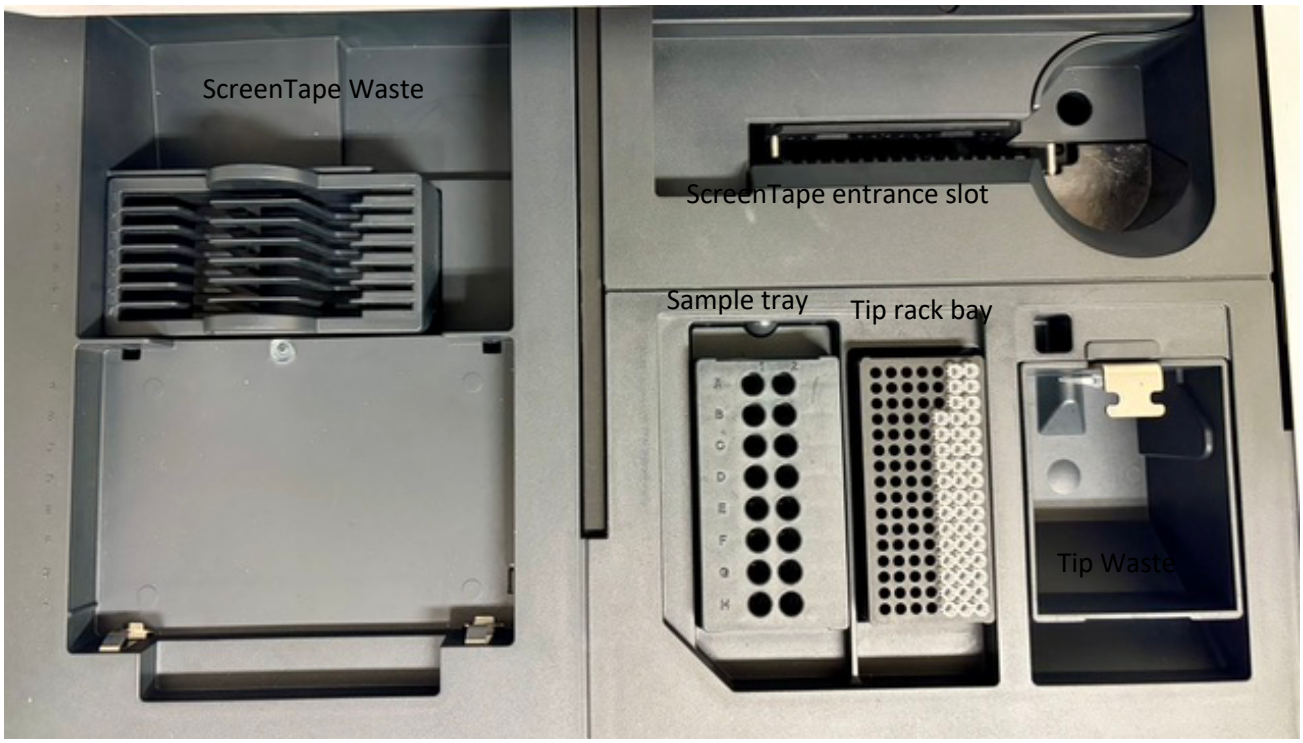
Note: If you are unsure which ScreenTape/reagent kit matches your sample type, check with facility staff (genomics@cornell.edu) before your session — mismatched consumables can jam the instrument. Recommended kits and catalog numbers are below.

Catalog numbers: (Available from Agilent or VWR)

- High Sensitivity Genomic DNA ScreenTape:
  - 5067-5635(Reagents)
  - 5067-5634 (ScreenTape)
    https://www.agilent.com/cs/library/usermanuals/public/HS_gDNA_QuickGuide.pdf
- High Sensitivity DNA:
  - D1000: 5067-5585 (Reagents), 5067-5584(ScreenTape)
    https://www.agilent.com/cs/library/usermanuals/public/HS-D1000_QuickGuide.pdf
  - D5000: 5067-5593(Reagents), 5067-5592(ScreenTape)
    https://www.agilent.com/cs/library/usermanuals/public/HS-D5000_QuickGuide.pdf
- High Sensitivity RNA:
  - 5067-5580 (Sample buffer)
  - 5067-5581 (Ladder)
  - 5067-5579 (ScreenTape)
    https://www.agilent.com/cs/library/usermanuals/public/HS-RNA_QuickGuide.pdf
- Loading Tips: 5067-5153 (1Pk-384tips) or 5067-5152 (10PK)

2. Instrument Overview

The 4200 TapeStation is a fully automated capillary-gel electrophoresis platform that reads ScreenTape devices to assess nucleic acid size, concentration, and integrity (RIN^e for RNA, DIN for genomic DNA). To open the instrument, press the black button located beneath the googly eyes. The interior of the TapeStation contains:



- ScreenTape entrance slot — where the ScreenTape device (cartridge) is inserted
- Tip rack loading bay — holds the loading tip boxes
- Sample tray — holds the tube strip holder or 96-well plate of prepared samples

The instrument is fully automated once a run starts: it uses the loading tips to pipette from your sample plate into the ScreenTape lanes, records the electropherogram trace, and ejects used tips automatically. You do not touch the samples again once the run begins.

3. Loading the Instrument

Confirm the green “Ready” light is on and the TapeStation Controller Software is open on the computer before loading (Section 4 covers launching the software). If necessary, enter the user ID “TapeStation” on the login screen.

3.1 Load the ScreenTape device

1. Remove the ScreenTape device from its pouch and let it reach room temperature if you haven’t already.

2. Flick the ScreenTape device sharply two to three times to move any bubbles in the buffer chamber away from the gel-buffer interface.
3. Open the ScreenTape entrance slot on the front of the instrument and insert the device, barcode facing the back of the slot, and the label with the ScreenTape type facing you and on the right-hand side of the slot, until it seats fully.

3.2 Load the tips

4. Open the tip bay and place a box of loading tips (in a sufficient number for your assay - the instrument will count to confirm there are sufficient tips before proceeding to the actual run) into the bay.
5. Ensure the tip box is seated flat and the lid is fully removed.

3.3 Load your samples

6. After preparing, vortexing, and spinning down your tube strip(s), remove the caps from your tube strips (or peel the foil seal from your 96-well plate), and confirm the liquid is pooled at the bottom of each well with no bubbles.
7. Place your ladder in position A1 of the tube strip holder (the ladder is always loaded from A1).
8. Load the tube strip holder or plate into the sample tray, aligned to position A1 in the front-left corner.
9. Close the TapeStation door.

> **Caution:** Do not use non-Agilent tips, tape, or plates. Mismatched consumables are the most common cause of blank lanes, bent tips, jammed tape, and instrument faults.

4. Running the Assay in the TapeStation Controller Software

10. Double-click the Agilent 4200 TapeStation Controller icon on the desktop to launch the software.
11. The software will confirm the assay against the barcode on your inserted ScreenTape. Confirm that the assay loaded matches the software.
12. In the sample layout grid, click each well position you have loaded and type a short sample name for each. Confirm that the ladder is assigned to A1 (or select the electronic ladder option if you did not load a physical ladder).
13. The software will display the consumables it expects (tips, ScreenTape) — confirm these match what you loaded.
14. Click “Start” to begin the run.

A run typically takes several minutes depending on the number of samples. The instrument handles all pipetting automatically — do not open the sample tray or tip bay while “Running” is displayed. When the run finishes, the Agilent TapeStation Analysis Software opens automatically and loads your results.

> **Note:** If the run stops with an error, do not attempt to clear a jam yourself. Leave the instrument as is and notify facility staff (email: genomics@cornell.edu).
>
> Please let us know if you are team cat, dog, or something else in your email to request access.

5. Analyzing Your Results

The Analysis Software opens automatically after a run and is also where you will spend most of your walk-up time. Three linked views are available for every run, and selecting a sample in one view highlights it in the others:

View	What it shows	Best for
Electropherogram	A trace of signal intensity vs. migration time/size for one or more selected samples, overlaid on the same axes	Comparing peak shape, size, and relative abundance between samples
Gel view	A simulated gel image with one lane per sample, in loading order	Quick visual QC across many samples at once, spotting degradation or contamination
Results table (Peak Table / Sample Table)	Numeric values per sample: concentration, molarity, size, purity ratios, and RIN^e (RNA) or DIN (genomic DNA)	Recording exact values, sorting/filtering, exporting for downstream use

5.1 Examining a single trace

- Select one sample in the Sample Table (or gel lane) to display just its electropherogram.
- Peaks are automatically labeled with size (bp or nt) and, depending on assay, concentration; the lower and upper marker peaks bracket the assay's detectable range.
- For RNA assays, check the RIN^e score and the 28S:18S ratio in the results table as an integrity summary; for genomic DNA, check the DIN score.
- Flags or warning icons next to a sample (e.g., “concentration below range,” “no peaks found”) indicate the software could not confidently score that lane — hover over the flag for details.

Caveats:

- TapeStation traces are algorithmically smoothed as the TapeStation is designed to run fast and provide a quick answer. The quantification is not reliable, and any sequencing libraries checked on the TapeStation and submitted to the Genomics Facility for sequencing will need to be re-checked on the Fragment Analyzer as it provides higher resolution.

5.2 Comparing multiple samples

- Select several samples (Ctrl/Shift-click in the Sample Table or gel view) to overlay their electropherograms on one plot for a direct comparison of peak position and height.
- Use the gel view to visually scan all lanes at once for consistent banding patterns or obvious outliers before diving into individual traces.

- Sort the results table by a column (e.g., concentration or RIN^e) to quickly rank samples or spot the outliers in a batch.
- Traces can be renamed, and colors/labels adjusted, to make an overlay easier to read before exporting or screenshotting.

> **Note:** Peak calling is automatic but not infallible, especially for smears, low-concentration samples, or non-standard peaks. Use your own judgment alongside the software's calls, or ask facility staff if a result looks unexpected.

6. Exporting Results

6.1 Export a PDF report

15. With your run open in the Analysis Software, go to File > Create Report. You can then select options for what to include to either print or save as a PDF.
16. Choose which samples/lanes to include and select a report template (e.g., one that includes the gel image, electropherograms, and the results table).
17. Choose a save location — save to the Desktop or a local Documents folder on the instrument computer, not directly to a removable drive, to avoid write errors during generation.
18. Give the file a clear name including your name/lab and the date (e.g., Smith_Lab_RNA_2026-09-04.pdf) and click Save/Export.
19. Open the generated PDF to confirm it includes the traces and values you expect before moving on.

6.2 Other export options

- The results table can also be exported directly to CSV or Excel from the Sample Table view for numeric downstream analysis. File > Export Data
- The full run file (.D2200/.D1200 file) can be copied as well if you want to reopen the run later in TapeStation Analysis Software elsewhere.

7. Copying Your Data to a USB Drive

This computer is not connected to the network, so a USB flash drive is the only way to take your files with you.

20. Insert your USB flash drive into an available USB port on the computer.
21. Open File Explorer and locate your exported PDF (and any CSV/Excel or run files) in the folder where you saved them in Section 6.1.
22. Select the file(s), right-click, and choose Send to > your USB drive (or drag and drop the files onto the drive icon).
23. Wait for the copy to finish, then right-click the drive in File Explorer and choose "Eject" before physically removing it.
24. Confirm your files open correctly on another computer before you leave, if possible.

Caution: Please delete your run data and exported files from the shared computer once you have copied them to your USB drive, to keep the instrument computer free of accumulated data and protect the confidentiality of your results.

8. End-of-Session Checklist

- Remove your ScreenTape device, tip box, and sample plate/tube strips from the instrument.
- **Dispose of used tips and ScreenTape per facility waste guidelines. Do not throw tips in regular trash! Place in the provided labeled boxes.**
- Copy and verify your files on your USB drive, then delete local copies from the computer (Section 7).
- Leave the TapeStation Controller and Analysis Software open and the instrument powered on unless instructed otherwise.
- Report any errors, jams, or unexpected instrument behavior to facility staff before leaving — do not attempt repairs yourself.

9. Getting Help

For questions about sample preparation or choosing the right ScreenTape assay, consult the Agilent Quick Guide for your specific kit.
For instrument errors, jams, or software issues during your walk-up session, contact core facility staff directly (genomics@cornell.edu) rather than troubleshooting the hardware yourself.