

NIST STS Entropy Scorecard

STS SP 800-22 • $\alpha = 0.01$ • 200 sequences \times 1,000,000 bits • Binary mode
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PASS
Winner: **QSE**

Headline Verdict: Both sources pass NIST STS; QSE shows slightly stronger margins across tests.

QSE OVERALL

PASS

Passed Tests: 188/188

SYSTEM OVERALL

PASS

Passed Tests: 188/188

WINS BY TEST

9 QSE • 6 System

0 ties

Key Risk / Weakest Tests

Source	Weakest Test	Pass Rate	Uniformity p-value	Threshold Margin
QSE	RandomExcursions	114/118 (96.61%)	0.021594	2
System	RandomExcursionsVariant	126/130 (96.92%)	0.416251	3

Note: STS evaluates statistical randomness. It does not alone certify cryptographic strength or "quantum resilience."

Per-Test Comparison (All Tests)

Test	QSE Pass Rate	QSE p-value	System Pass Rate	System p-value	Winner
ApproximateEntropy	199/200 (99.50%)	0.149495	198/200 (99.00%)	0.062821	QSE
BlockFrequency	197/200 (98.50%)	0.616305	197/200 (98.50%)	0.262249	QSE
CumulativeSums	200/200 (100.00%)	0.689019	199/200 (99.50%)	0.605916	QSE
FFT	197/200 (98.50%)	0.971699	198/200 (99.00%)	0.64753	System
Frequency	198/200 (99.00%)	0.133404	200/200 (100.00%)	0.955835	System
LinearComplexity	196/200 (98.00%)	0.437274	198/200 (99.00%)	0.657933	System

LongestRun	199/200 (99.50%)	0.289667	200/200 (100.00%)	0.689019	System
NonOverlappingTemplate	199/200 (99.50%)	0.983453	199/200 (99.50%)	0.064822	QSE
OverlappingTemplate	195/200 (97.50%)	0.057146	197/200 (98.50%)	0.319084	System
RandomExcursions	117/118 (99.15%)	0.257477	128/130 (98.46%)	0.028669	QSE
RandomExcursionsVariant	117/118 (99.15%)	0.534146	127/130 (97.69%)	0.430204	QSE
Rank	199/200 (99.50%)	0.699313	197/200 (98.50%)	0.410055	QSE
Runs	200/200 (100.00%)	0.102526	199/200 (99.50%)	0.050305	QSE
Serial	198/200 (99.00%)	0.366918	199/200 (99.50%)	0.504219	System
Universal	200/200 (100.00%)	0.626709	197/200 (98.50%)	0.859637	QSE

Recommended Next Steps

- Run multiple independent batches (e.g., 5 runs) with newly generated data for both sources.
- Increase sequences to 200–300 per run for stronger statistical confidence.
- Track stability: count how often any test hits minimum thresholds across runs.
- Archive all STS reports and parameters for auditability.

— End of Report —