

NIST STS Entropy Scorecard

STS SP 800-22 • $\alpha = 0.01$ • 100 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

10 QSE • 5 System

0 ties

Key Risk / Weakest Tests

Source	Weakest Test	Pass Rate	Uniformity p-value	Threshold Margin
QSE	NonOverlappingTemplate	96/100 (96.00%)	0.191687	0
System	Universal	96/100 (96.00%)	0.009535	0

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	99/100 (99.00%)	0.699313	99/100 (99.00%)	0.115387	QSE
BlockFrequency	99/100 (99.00%)	0.401199	98/100 (98.00%)	0.574903	QSE
CumulativeSums	98/100 (98.00%)	0.798139	99/100 (99.00%)	0.739918	System
FFT	100/100 (100.00%)	0.137282	99/100 (99.00%)	0.494392	QSE
Frequency	99/100 (99.00%)	0.834308	99/100 (99.00%)	0.816537	QSE
LinearComplexity	100/100 (100.00%)	0.678686	99/100 (99.00%)	0.304126	QSE

LongestRun	98/100 (98.00%)	0.924076	97/100 (97.00%)	0.678686	QSE
NonOverlappingTemplate	98/100 (98.00%)	0.181557	99/100 (99.00%)	0.262249	System
OverlappingTemplate	99/100 (99.00%)	0.816537	99/100 (99.00%)	0.759756	QSE
RandomExcursions	59/60 (98.33%)	0.534146	60/60 (100.00%)	0.066882	System
RandomExcursionsVariant	60/60 (100.00%)	0.100508	60/60 (100.00%)	0.534146	System
Rank	99/100 (99.00%)	0.262249	100/100 (100.00%)	0.455937	System
Runs	98/100 (98.00%)	0.759756	97/100 (97.00%)	0.699313	QSE
Serial	99/100 (99.00%)	0.99425	99/100 (99.00%)	0.616305	QSE
Universal	98/100 (98.00%)	0.983453	96/100 (96.00%)	0.009535	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 —