MOTOR-TO-FLIGHT EVALUATION

RPL Engine Workbench 2.0.2 reference case
Portable inputs, computed results and review outputs

This worked example follows one solid motor through vehicle flight and an engineering report. Load the portable project, solve it and compare your displayed outputs with the reference values on page 2. The archive includes the inputs, the native report, the sampled motor curve and the native chart exports.

The reference calculation was produced on 1 November 2026 using the macOS release 2.0.2, build 2d3fae358c77, with an active Business license. This guide revision updates presentation; the reference inputs, numerical results and native exports are preserved.

REPRODUCE THE CASE

1. Open the project. Extract the archive. In RPL, choose **File > Load Project...** and open **solid-flight.rplproj**. It contains inputs and opens unsolved.

2. Solve. Click **Solve**. Keep the supplied inputs unchanged for the reference comparison. Inspect the motor results and the **Flight** tab.

3. Compare. Use Table I and **solid-flight-report.pdf** to review the outputs. The CSV contains 402 samples of the same motor calculation.

4. Try a change. Save a separate project copy, change one input and solve again. Compare the new case with the supplied reference. The built-in trial supports project saving and reopening; image exports require a license.

FILES IN THE ARCHIVE

File	Purpose
evaluation-guide.pdf	This workflow and its reference values.
solid-flight.rplproj	Portable, input-only project saved through the app.
solid-flight-report.pdf	Unmodified five-page native motor and flight report.
motor-curve.csv	Native motor-curve export, with SI column headings.
reference-results.json	Matching computed reference results; a data record.
figures/ and SHA256SUMS.txt	Four native figures and file-integrity checksums.

Start the built-in 30-day trial: rocketpropulsionlab.net/download/
Workflow questions: thomas@rocketpropulsionlab.net

REFERENCE RESULTS AND BASIS

The unchanged included KNSB solid-rocket example; values use the native report's display rounding.

TABLE I. COMPUTED REFERENCE VALUES

Output	Reference value	Native report
Burn time	1.941 s	Page 1
Total impulse at project ambient	712.6 N s	Page 1
Average thrust at project ambient	367.1 N	Page 1
Peak chamber pressure	3.535 MPa	Page 1
Propellant mass	0.5162 kg	Page 1
Apogee above launch site	1977.5 m	Page 3
Highest Mach number	0.966	Page 3
Rail-exit speed	25.15 m/s	Page 3

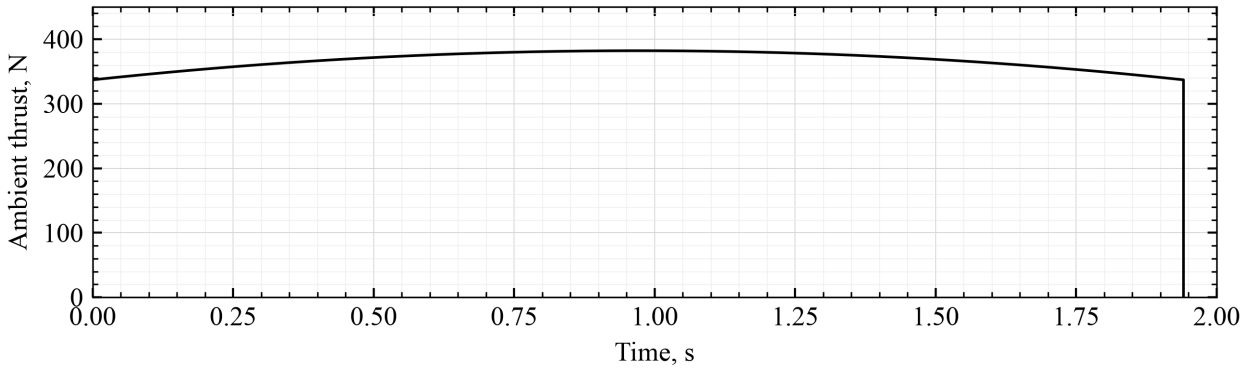

Figure 1. Ambient thrust from the 402-point native CSV export. Samples are plotted without smoothing; project ambient pressure is 101325 Pa.

MODEL BASIS

The motor calculation is quasi-steady and uses the supplied geometry and sourced burn-rate properties. The native report describes the full input basis. The flight calculation uses the supplied vehicle, launch, wind and recovery inputs and its local atmosphere.

For this case, the app flags its transonic drag and centre-of-pressure interpolation near the highest Mach number. The supplied values establish a reproduction and numerical-consistency check; this example does not assert agreement with a measured firing or flight.

SOURCE RECORD

RPL Engine Workbench 2.0.2, build 2d3fae358c77; reference solved and reopened on macOS, 1 November 2026. The native PDF retains its model assumptions and stored source citations. The package README describes the original check, and SHA256SUMS.txt identifies the delivered files.