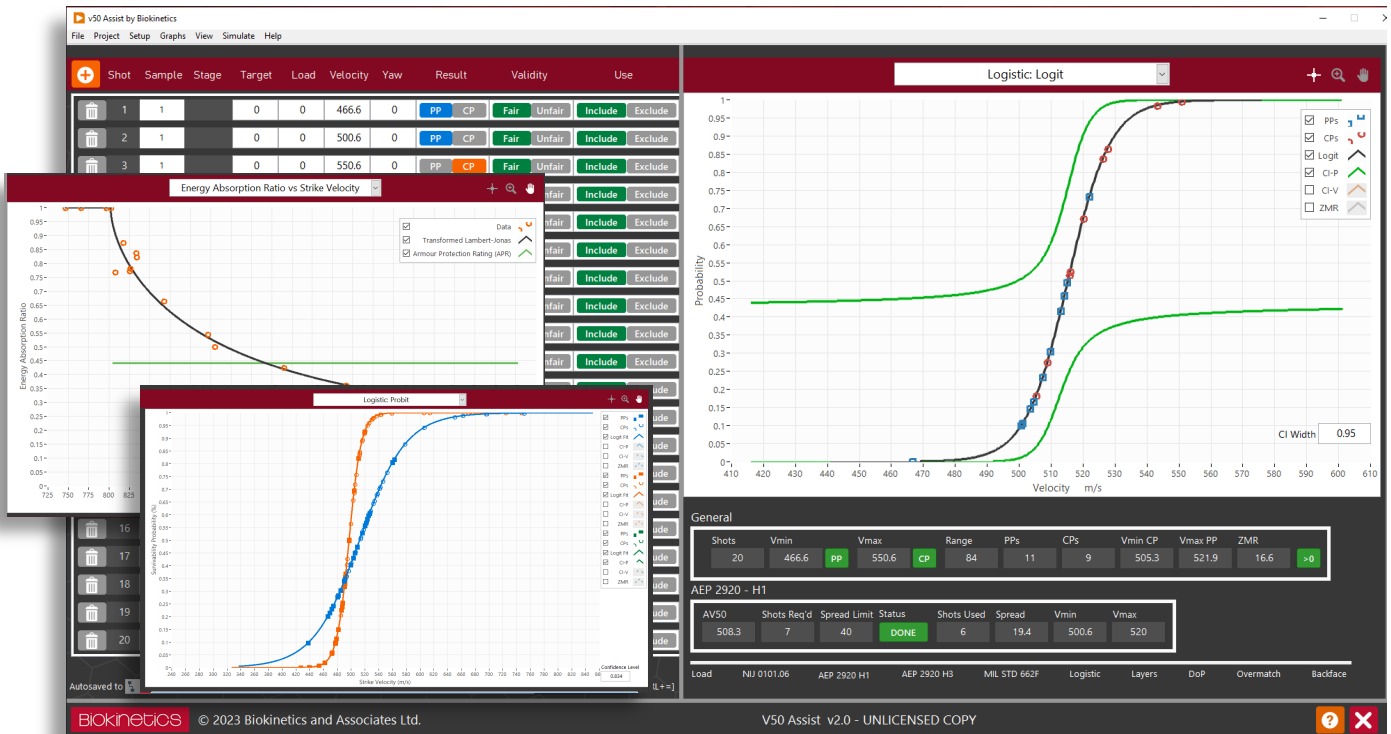


V50 Assist™ 3.0

Active V50 software for testing the ballistics performance of armour systems

V50 Ballistics Software – V50 Assist™



Overview:

Biokinetics' V50 Assist™ provides a standalone tool for the collection and documentation V50/ballistic limit testing required in many body armour performance standards (e.g. AEP/STANAG 2920, NIJ 0101.06/07, MIL STD 662F). The software is designed to simplify V₅₀ studies from start-to-finish by recommending the next shot velocity using common firing procedures (AEP/STANAG 2920, NIJ 0101.06/07, MIL-STD-662F, Modified Langlie, 3POD2, Neyer D-Optimal and more), providing an intuitive user interface to simplify user input and minimize user errors, instantaneously computing common ballistic limit parameters including plotting and confidence intervals, visually displaying completion criteria status and automated generation of customizable Microsoft Excel® reports. More advanced analysis capabilities are available in the *Research Edition* which is designed specifically for detailed data analysis and presentation.

Features:

- **Active V50 Assist:** Recommends the velocity for the next shot based on the velocities and outcomes of previous shots. Up and down firing procedures from NIJ 0101.06/07, AEP 2920, and MIL-STD-662F, along with a customizable step size option are complimented by 3POD v2, Modified Langley, and Delta/Ladder (fixed step size with N repeats at each step), Neyer D-Optimal, and Shatter Gap. Prior to each new study, the user either specifies the parameters required for the selected firing method or loads a saved configuration from a previous study. The Velocity Assistant can be disabled to reanalyze data from previous studies or if an alternate firing method is required. Charge calibration data from a prior test series can also be uploaded to facilitate testing.
- **Get insight into your data:** Updates shot history and output curves in real time. Indicates when V50 computation conditions are met according to standards [e.g. AEP 2920]. Multiple V50 computation methods are provided including Logit regression [NIJ 0101.06/07], Probit regression, arithmetic procedure [AEP 2920] and 4/6/10 shot arithmetic V50 per MIL-STD-662F. Includes capability to report a second ballistic limit (e.g. V01, V10, etc.). For more advanced analyses (Research Edition), alternate logistic regressions (Gompit, Scobit, Weibull, LogLog), the number of layers perforated, the ratio of absorbed to incident energy, the depth of penetration into a recovery medium, and the residual velocities are also analyzed with respect to incident velocity and shatter gap.

(cont'd)

- **Smart import interpreter:** Easily import data from the clipboard from previous studies or reports for reanalysis and V50 Assist report generation (Research Edition). The smart interpreter detects column types and values to suggest which columns correspond to velocities, outcomes, and all other fields.
- **Record test parameters and results:** Each project can track test sample and projectile information. For each shot, the following parameters can be easily recorded: target velocity, measured velocity, outcome (partial penetration/complete perforation/inconclusive), inclusion criteria (fair/unfair and include/exclude) and yaw. The following additional parameters are also available: automatically generated shot timestamps, number of layers perforated (for multi-ply soft armour), residual velocity, depth of penetration into a recovery pack (for overmatch testing), clay backface deformation and volume, and additional information/comments. The shot summary table can be easily sorted by any field. Add up to 16 additional text fields and 16 extra numeric fields to record the information that matters most for your specific testing needs.
- **Easily access recent projects:** Changes are automatically saved to the active file to prevent data loss and to allow for easy loading of previous test studies. This facilitates first and second shot V50 for hard armour samples.
- **Generate reports.** One-click automated Excel® report generation using customizable templates. Automatically generated time stamps improve estimates of effort required for future test programs. Plot data and tabular data can also be easily exported to the clipboard for use in external analysis and report templates.

V50 Assist™ 3.0 Features

Category	Included in Standard and Research Editions	Exclusive to Research Edition
Firing Procedures	AEP/STANAG 2920 Modified Langlie NIJ 0101.06/07 MIL-STD-662F Neyer D-Optimal	Delta/Ladder 3POD 2.0 ARL Shatter Gap (two velocity up-down) Custom step size up-down
Plot Types	Firing Sequence Charge Calibration Yaw vs Strike Velocity Logit Probit	Gombit (cloglog) Scobit Yawgit (velocity-yaw perforation probability) Unperforated Layer Ratio (ULR) vs Strike Velocity, Recovery Depth vs Strike Velocity Residual Velocity vs Strike Velocity Backface Deformation vs Strike Velocity Backface Volume vs Strike Velocity Energy Absorption Ratio (EAR) vs Strike Velocity (includes Armour Performance Rating (APR)) Energy Absorption Ratio vs Strike Energy Ballistic Resistance Triple Plot (ULR, Logit, and EAR with APR)
Data Management	Autosaves all changes Copy shot data or figure data series to clipboard Easy Export to customizable MS Excel® template Import charge calibration data from a previous test	Smart Import from Clipboard Compare three data series overlaid in one plot.

Specifications

Distribution:	Per-seat license with hardware Dongle	Computer Requirements:	PC: Intel i5 or better OS: Windows 10 or 11, 64 bit Other: Microsoft Office 365, 64 bit Screen: 1920x1080 min. resolution
		Part Numbers:	V50A-003 (Standard Edition) V50ARE-003 (Research Edition)

(All specifications are subject to change)

References:

- Magnan, S., Pageau, G., and Bouamoul, A., "Understanding the Feasibility and Limitations of the 3Pod2.0 Firing Method in Ballistic Armour Evaluation", 33rd International Symposium on Ballistics (ISB), Bruges, Belgium, 16-20 October 2023.
- Magnan, S., Pageau, G., and Bouamoul, A., "Beyond V50: A More Comprehensive and Efficient Methodology for Assessing Armour Performance", 16th International Personal Armour Safety Symposium, Dresden, Germany, 11-15 September 2023.

