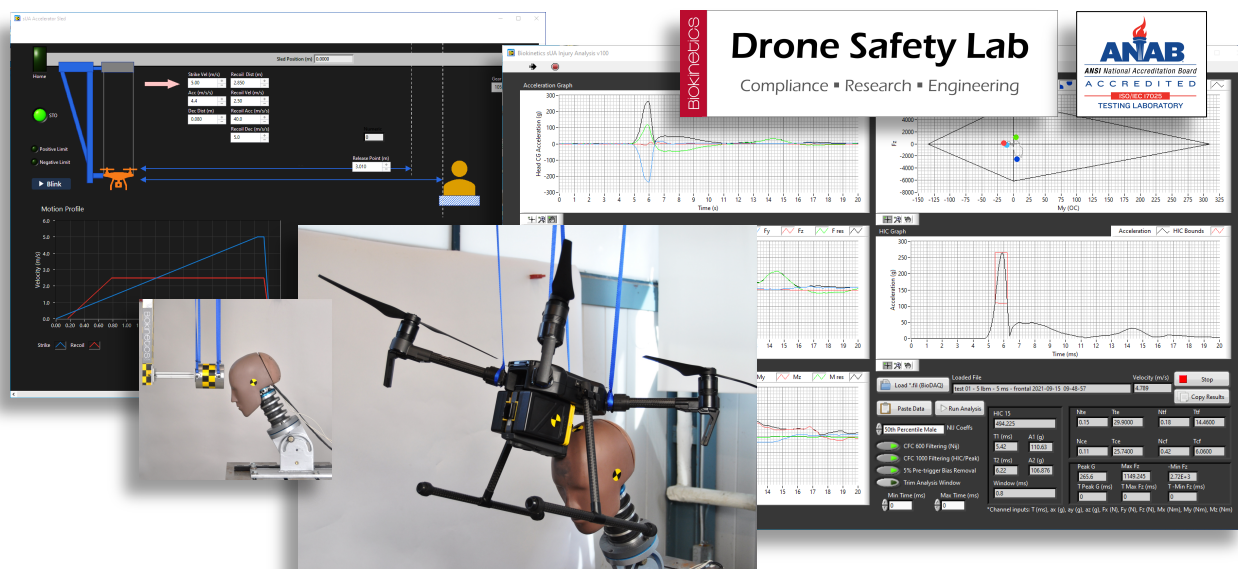




Drone Safety Lab – Injury Assessment for UAV Impacts

Assessing drone impact injury risk according to FAA (14 CFR Part 107) and ASTM F3389-21, Method-D



Biokinetics' Drone Safety Lab (DSL) helps drone manufacturers, aftermarket suppliers and operators meet the latest safety requirements issued by the FAA which, in part, address unintended impacts with people. Demonstration of compliance with the requirements is essential in gaining authorization for flight over people, where previously, waivers would have been required. The demonstration requires evaluation of crash test dummy head and neck responses from controlled impacts of a drone representing worst case crash conditions. The responses must remain below threshold values defined by a reference impactor to demonstrate compliance.

Biokinetics has leveraged its decades of expertise in injury biomechanics and crash testing to develop a rigorous test methodology that fulfills FAA's requirements. There is a strong focus on the repeatability, traceability and confidence gained with the impact response measurements. An innovative horizontal, computer-controlled drone accelerator sled was developed by Biokinetics to exceed these exacting requirements ensuring repeatable drone impacts in any impact configuration with minimal risk of damage to the drone from secondary impacts.

- U.S. FAA accredited (pending) to 14 CFR Part 107.120 and Part 107.130, Means of Compliance (MoC), for small, unmanned aircraft (sUA) that are 25 kg or less. Follows industry test method proposed by ASTM F3389-21, Method D.
- Injury assessments: Head (peak acceleration, HIC₁₅), Neck (peak compression\ntension, neck injury criterion Nij)
- Biokinetics adheres to ISO-17025 quality management practices ensuring confidence in data recorded.
- Over 45 years of experience in crash safety research and personal injury with international recognition.
- Test programs are offered to meet recognized standards or adapted for research, development, and certification needs.

DSL Specifications:

Test Specification:	Biokinetics' Doc. D21-03 "Test Method to ASTM F3389/F3389M-21, Method D. (available upon request)	Drone Physical Limits:	Mass: <25 kg (55 lb) Size: <1.5 m (5 ft) (approx. L x W x D)
Drone Accelerator Sled:	Payload ≤ 25 kg (55 lb) Velocity ≤ 10 m/s (32 ft/s) High Speed Video = 2000 fps	Crash Dummy:	Head and Neck: FAA compliant Hybrid III 50 th percentile male Head responses: A _x , A _y , A _z (α _x , α _y , α _z available) Neck responses: F _x , F _y , F _z , M _x , M _y , M _z
Injury Assessments:	Head: A _{resultant max} , HIC ₁₅ (α _{max} , ω _{max} , DAMAGE available) Neck: Nij, F _{max/mix} , M _{max/min}	Data Collection:	Compliant with SAE J211-1 and 49 CFR § 571.208

(All specifications are subject to change)