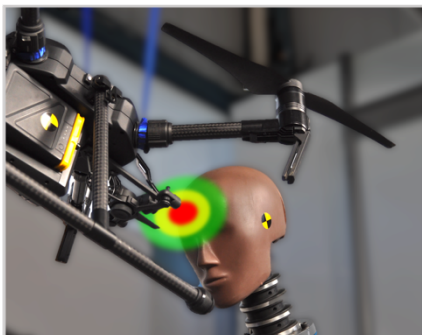




# Drone Safety Lab – FAA Safety Regulations

## Assessing drone impact injury risk with people according to FAA Regulations (14 CFR Part 107)

With drones becoming the prominent in everyday life, the need to maximize their potential is highly dependent on the aviation regulations that control their operation and integration into the airspace. Until recently, commercial drone operators had to seek waivers from the FAA to grant operation under specific circumstances, including for operations over people. The US Federal Aviation Administration (FAA) has since released a regulation to permit drone operators to fly over people and vehicles under prescribed conditions. The regulation is commonly referred to as Part 107 and is in reference to the Code of Federal Regulations Title 14, Part 107 (i.e., 14 CFR Part 107). An overview and details of the regulations can be found on the FAA web site (<https://www.faa.gov/uas>).



The Part 107 regulation contains two sections relevant to personal safety. The first section is Subpart B “Operating Rules” which states that operations over people is only allowed if they are protected or directly involved in operating the drone. Another section, Part 107- Subpart D “Operations Over Human Beings”, is provided and is more applicable to drone services permitting operation over a wider range of conditions. Subpart D requires impacting some categories of drones into a crash dummy head and neck to assess their injury causation potential, see photo. The resulting impact severity is used to establish safe operating speeds of the drone or to promote the use of impact reducing measures such as parachutes (used in the case of drone failure), padded structures, impact deflectors or break-away parts. The regulation also requires the drone to not have exposed parts that can lacerate the skin and it also differentiates

among different scenarios where people may or may not be involved with the drone operations by imposing operating or performance requirements. A further distinction is made with the size of the drone since smaller-lighter drones will likely cause less severe injuries than the larger-heavier commercial drones and, as such, the FAA regulation has four categories based on weight and airworthiness. Drones not certified to be airworthy must demonstrate that if they unexpectedly fail during operation or unintentionally strike a person, that they pose minimal permanent injury as established with the crash dummy impacts. In contrast, drones certified to be airworthy have the least number of operating restrictions and do not require safety impact tests to be conducted due to their reliability and lower risk of impact, much like larger aircraft flying today. The four categories in Part 107 - Operation Over People (OOP) are labelled as Category 1, 2, 3 and 4, as shown below. Operators must select the most applicable category of drone and operating conditions in which they intend to fly with and submit the required proof of compliance to the FAA to obtain approval.

### Small Unmanned Aircraft System Operation Over People (OOP)

	Transit	Hovering + Remote ID	Transit	Hovering	Transit	Hovering	Transit	Hovering + Remote ID	Transit	Hovering + Remote ID
<b>sUA Cat 4:</b> Airworthy Certified	👍	👍	👍	👍	👍	👍	👍	👍	👍	👍
<b>sUA Cat 3:</b> (0.55-55 lb) Part 107 Approved	👎	👎	👍	👎	👍	👍	👎	👎	👍	👎
<b>sUA Cat 2:</b> (0.55-55 lb) Part 107 Approved	👍	👍	👍	👍	👍	👍	👎	👎	👍	👎
<b>sUA Cat 1:</b> (<0.55 lb) Approval not req'd	👍	👍	👍	👍	👍	👍	👎	👎	👍	👎
<b>Operating Scenarios</b>										

(cont'd)

**Category 1** drones are very small (<0.55 lb) and do not require testing to prove their safety, however, they must still be operated in a safe manner and not fly over moving vehicles unless the occupant(s) are involved in the drone operations.

**Category 2** represents larger drones with more demanding impact safety requirements and, as such, they are deemed safer and are allowed to operate over people. Impact tests must be performed by an approved laboratory in order for the operator to received authorization.

**Category 3** also requires proof of safety with impact testing but allows for more severe impacts to occur. As a result, greater restrictions are placed on its operating environment only allowing their use in controlled situations. Both Category 2 and 3 do not allow operation over moving vehicles unless they are in a controlled site with occupants aware of the drone operations.

**Category 4** was introduced to represent industrial type drones that need to fly over a wide range of conditions without as many restrictions. In order to do so, an airworthiness certificate is required, and once approved, drones can fly over people and vehicles within the allowed airspace.

Biokinetics provides full turkey testing and evaluation services at our Drone Safety Lab (DSL) that is consistent with the Part 107 Means of Compliance (MoC) and provides reports to support the Declaration of Compliance (DoC) application by the customer. Please refer to our DSL test services information sheet.