

BIOFIDELIC BIRD ALPHA



WHAT IT'S ABOUT

STANDARD TEST METHOD FOR BIRD IMPACT TESTS

- ❖ Prescribed standard weight
- ❖ Weighing the bird immediately before use / weight adjustments usually necessary by e.g., additional gel or removal of extremities
- ❖ Store freshly killed or in a sealed container at a specified temperature
- ❖ Defrost frozen birds for 4 hours to the prescribed temperature


Standard Test Method for Bird Impact Testing of Aerospace Transparent Enclosures¹

This standard is issued under the fixed designation F330; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.



TEST SETUP

 Cannon and carrier



CHALLENGES REAL BIRD

- ✦ Freshly slaughtered
- ✦ Every chicken is different - conflict reproducibility
- ✦ Selection of suitable test specimens after slaughter
- ✦ Time course (40 min from standard)
- ✦ Much light required for super high-speed recordings
=> cleaning effort
- ✦ Adaptation of carrier to each chicken

Source: <https://www.icao.int/Meetings/wildlife/Can%20Airports%20do%20it%20Alone/CHRIS%20DEMERS%20WSHRS%202017.pdf>



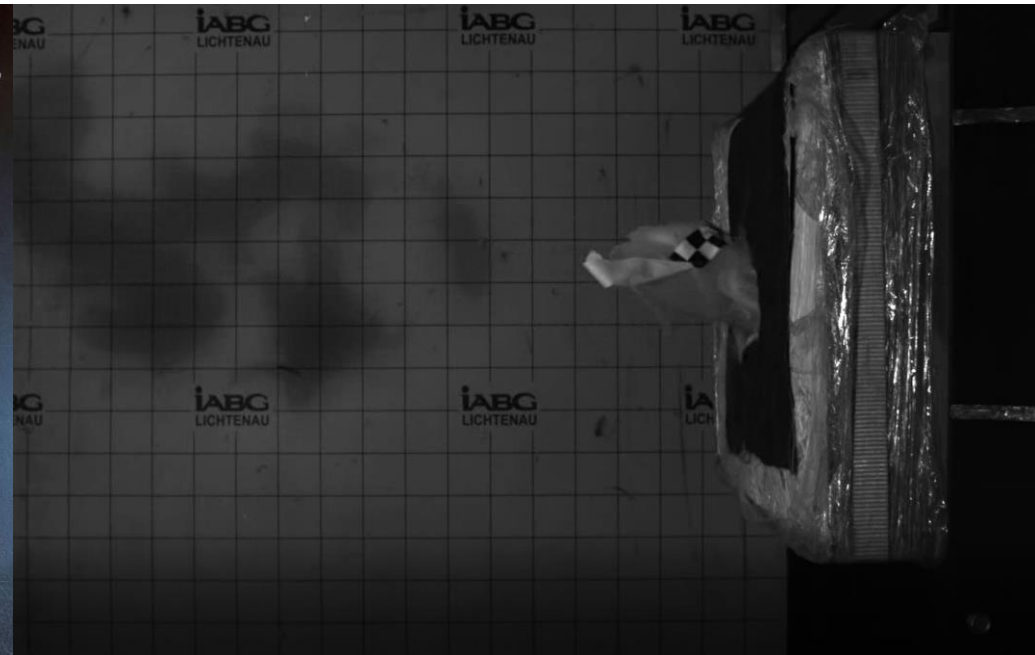
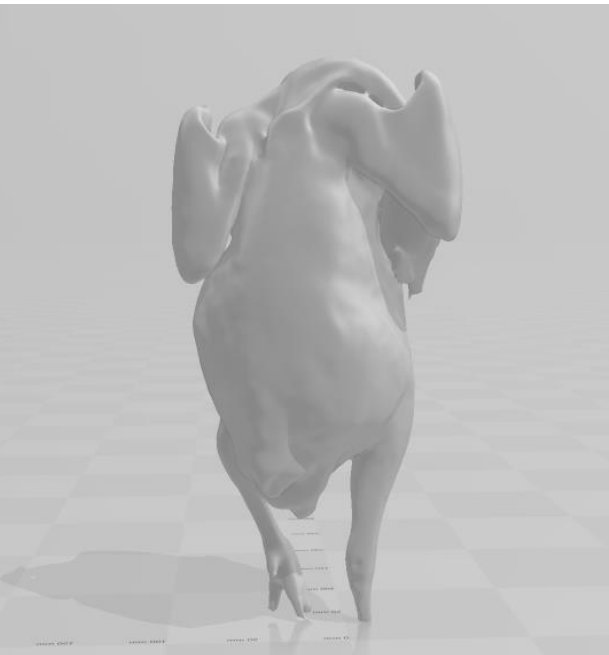
CHALLENGES OF CURRENT REPLACEMENT BODIES

- ❖ No bone skeleton
- ❖ Other plastic behaviour



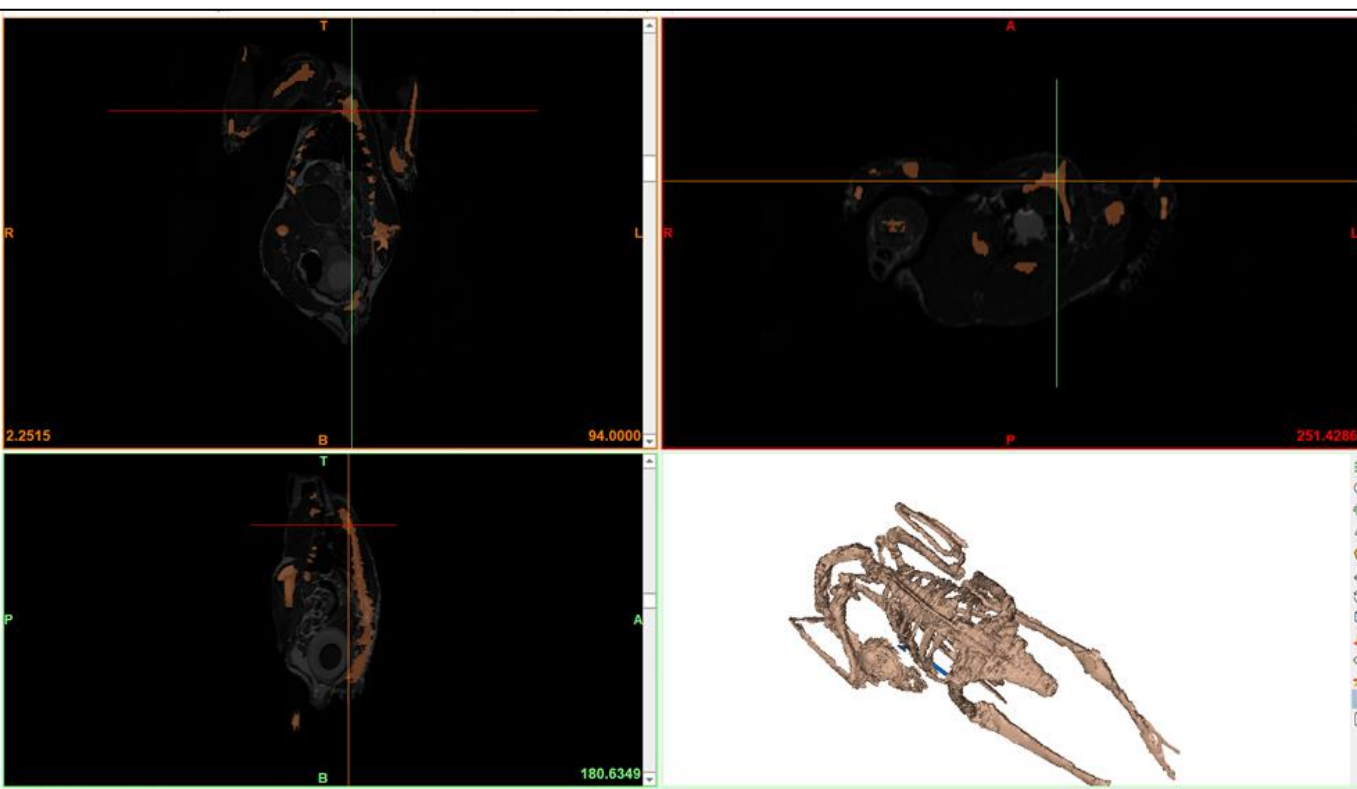
SOLUTION: THE BIOFIDELIC BIRD

- ❖ Artificial test body equivalent to a 1.8 kg chicken
- ❖ True to nature with skeleton and soft tissue
- ❖ Identical test body => reproducible test result



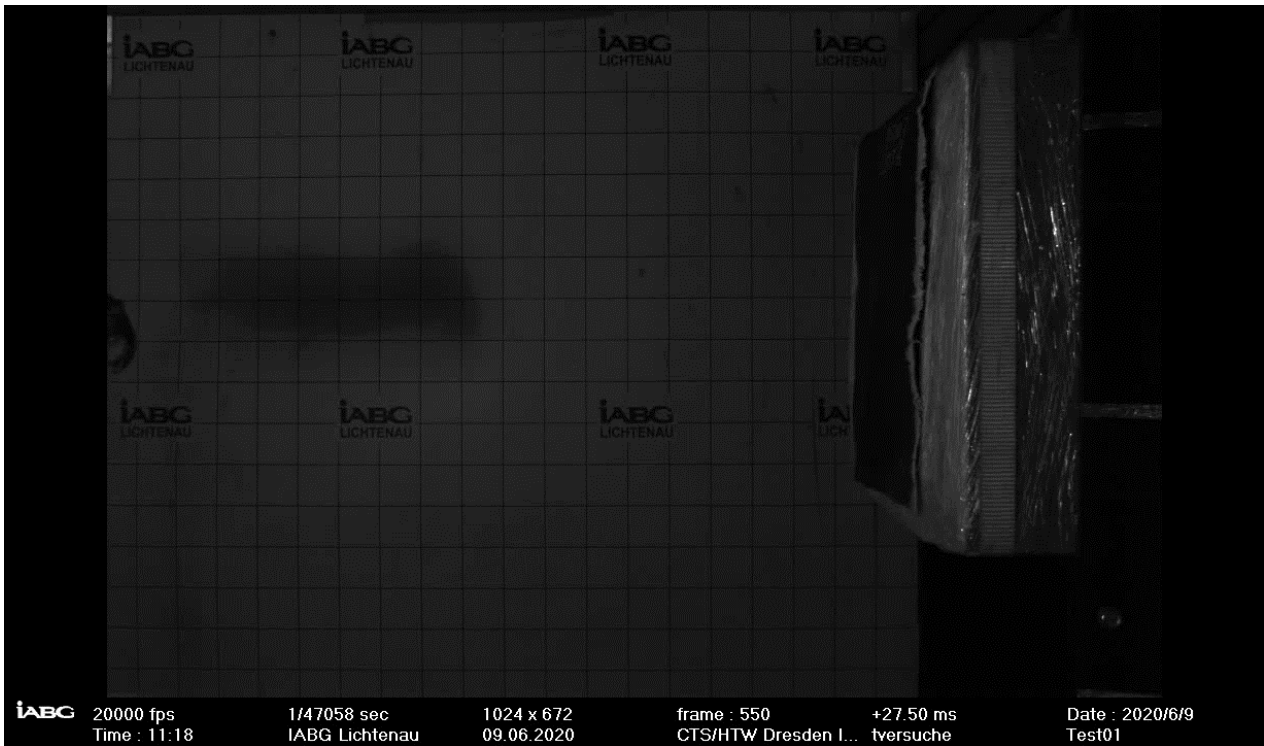
THE BIOFIDELIC BIRD

- ✦ Bone structure and tissue structure derived from a CT scan of an average chicken (1.8 kg)
- ✦ Tissue substitutes with different properties replicate the outer shell and the internal organs of the bird.



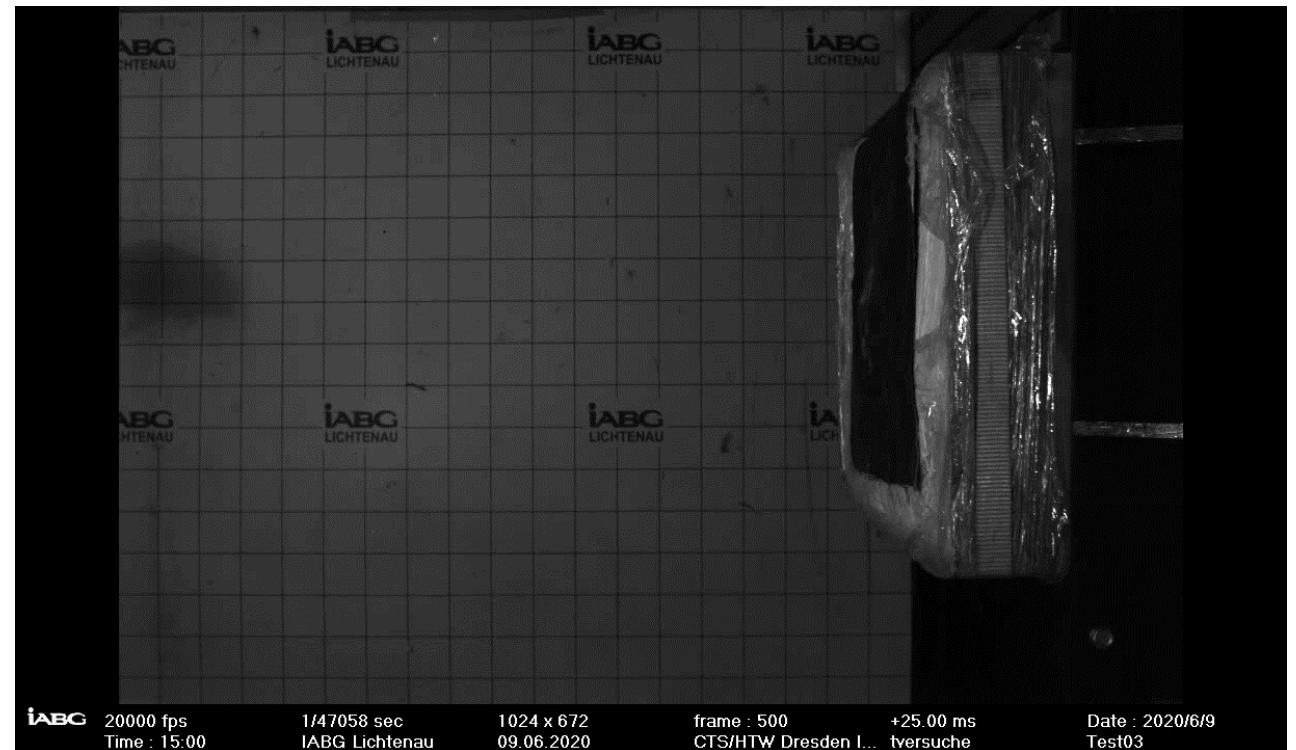
VALIDATION

- Comparison **real chicken** vs. biofidelic bird



VALIDATION

- Comparison real chicken vs. **biofidelic bird**



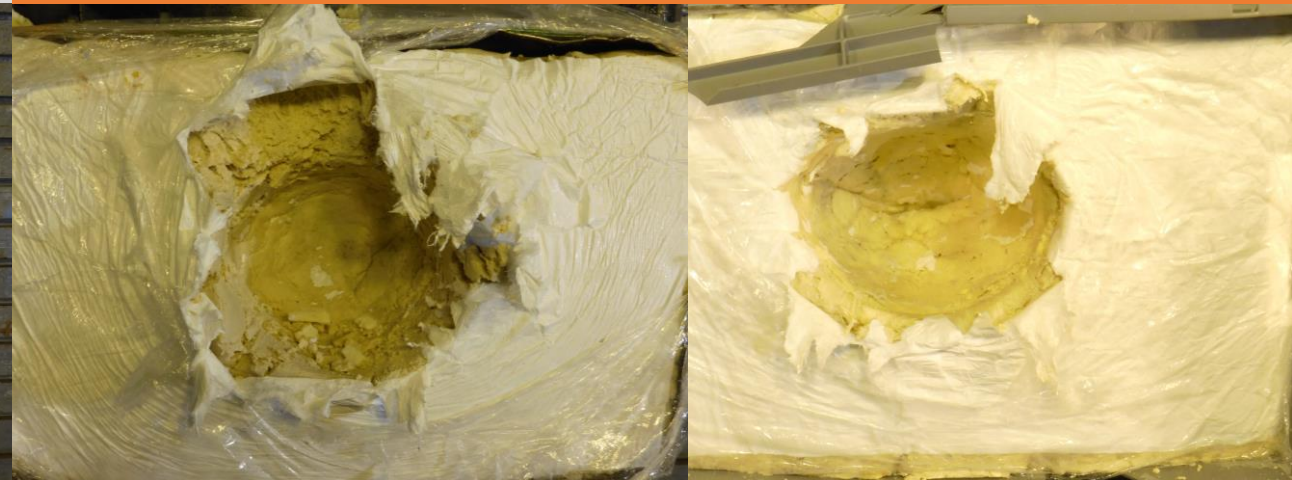
VALIDATION

 Bullet holes


Real chicken

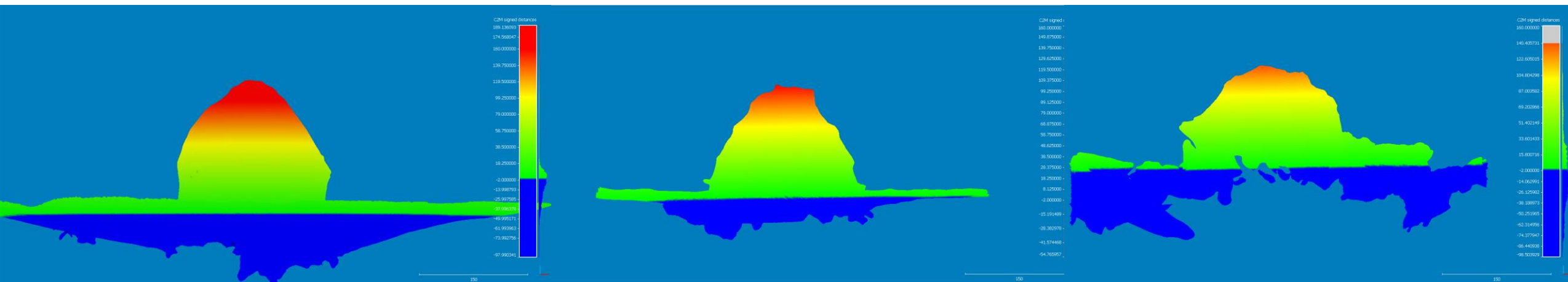


biofidelic bird



VALIDATION

 Surveying bullet holes



BENEFITS BIOFIDELIC BIRD

- ✦ True to nature test specimen
- ✦ High reproducibility
- ✦ Plannable, constant availability
- ✦ Reduction of cleaning effort between and after tests
- ✦ Increased efficiency in test processing due to complete preparation of the test specimens

APPLICATIONS

- ✦ Aircraft engines
- ✦ Wing edges
- ✦ Windscreens of aircraft
- ✦ Windscreens of high-speed trains
- ✦ Helicopters

