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When is a Crush Test Not a Crush Test? or What Constitutes a Valid Crush Test?

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Consultants Services Meeting
IAEA Headquarters, Vienna
8 to 12 September 2008

- List of Attendees
  - Frank-Michael Borst, Chairman
  - Danny Vince, Secretary
  - Gilles Sert
  - Frank Wille
  - Chihiro Itoh
  - Gordon Bjorkman
  - Michael Kubel
  - Pierre Malesys
  - Yongkang Zhao

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Consultant Services Meeting

- One Objective:
  - To address proposed changes to the IAEA Regulations for Crush Testing and provide additional clarification as necessary.

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- To clarify recent changes to IAEA Regulations on crush testing the consultants embarked on an extensive discussion as to what constitutes a valid crush test?

- Per paragraph 727.17 of TS-G1.1 Rev 1: "For the crush test (drop III) the packaging should rest on the target in such a way that it is stable in the orientation selected to give the maximum damage. In order to achieve this it may be necessary to provide support, in which case the presence of the support should not influence the damage to the package."

- To aid the discussion I drew the following figure, which asked the question "When is a crush test not a crush test?"

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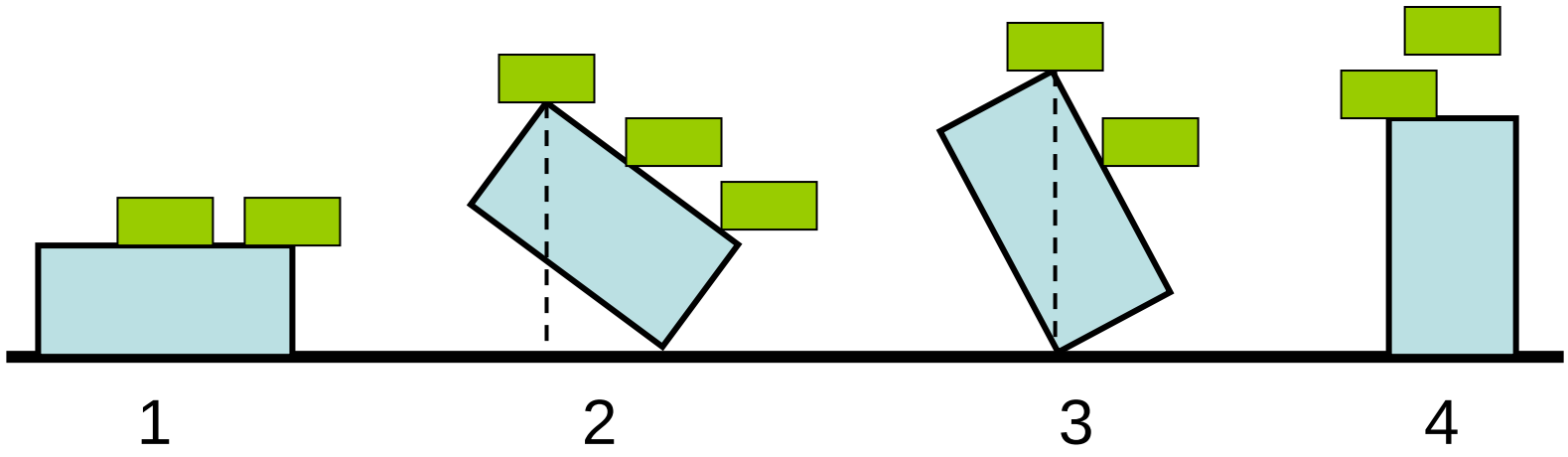
What Constitutes a Valid Crush Test?



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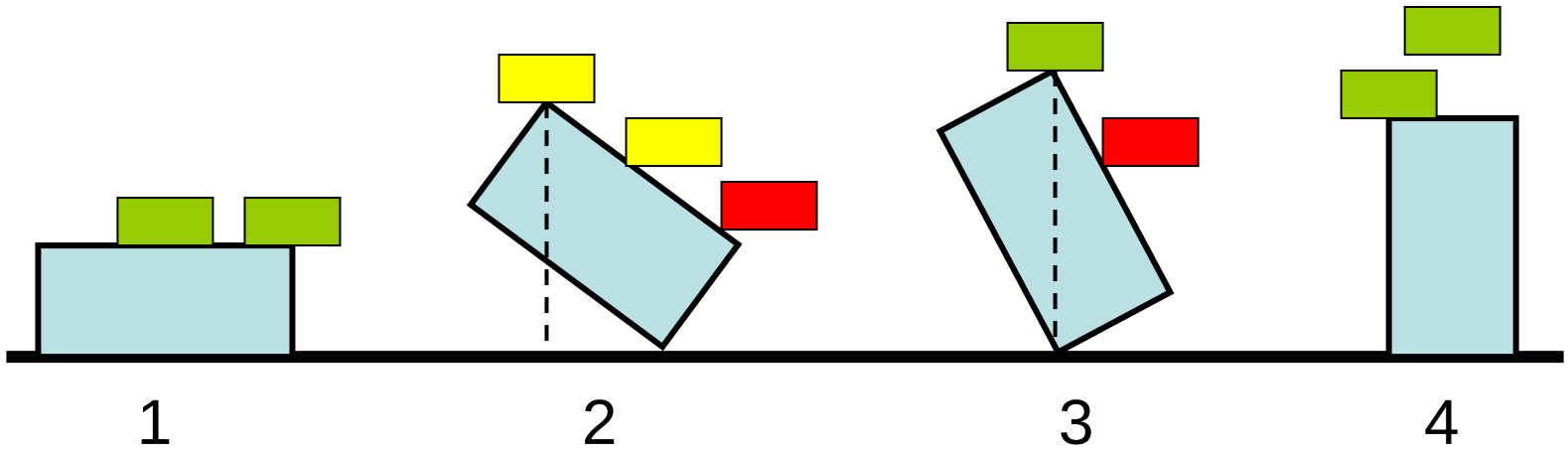
What Constitutes a Valid Crush Test? Results and Rational

Valid Impact Position

Disputed Impact Position

Invalid Impact Position



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- What constitutes a valid crush test must be stated simply in unambiguous terms.

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In the Author's Opinion

- A valid crush test is one wherein:

- 1) At the instant of the plate's first contact with the package a direct load path (crush path) is established between the plate at the point of contact and the unyielding surface. (This load path must be capable of statically supporting 500 kg.)

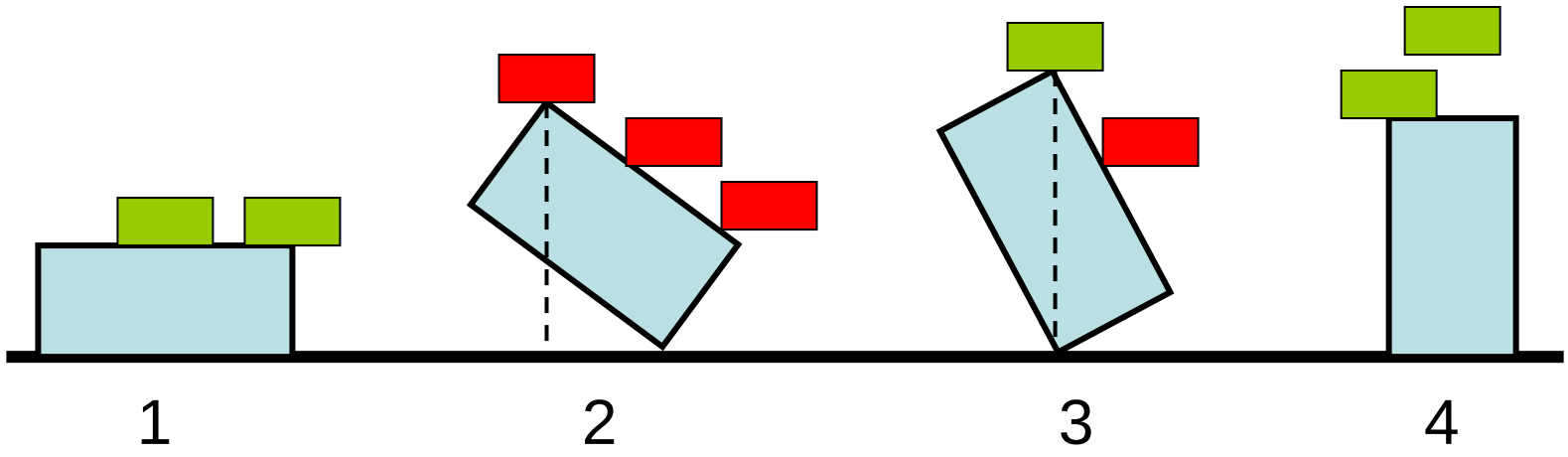
- 2) The drop location does not produce a condition where the first action of the plate is to tear the package.

What Constitutes a Valid Crush Test? NRC Perspective

Valid Impact Position

Disputed Impact Position

Invalid Impact Position



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