



V I R T U A L T E S T I N G

June, 2021

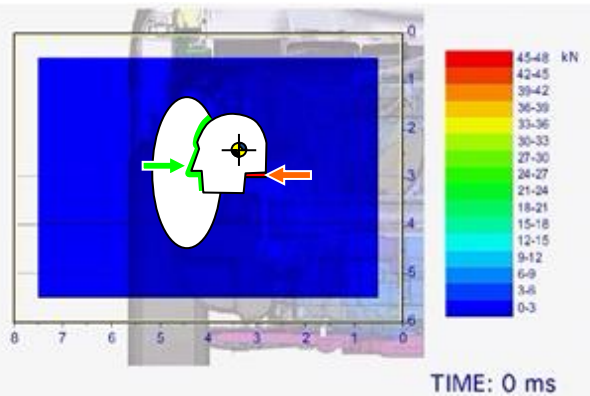


CONTENTS

1. Virtual testing for Worst Case
2. Virtual testing for approval
3. General conditions
4. Validation process
5. Approval

VIRTUAL TESTING FOR WORST CASE

- UN Regulations (1958 Agreement) - Revision 3
- "worst-casing", selecting the variant or version that for the purpose of testing will represent the type to be approved under the worst conditions.
- **Virtual testing methods may be used to aid the decision-making on the selection of the worst-case.**
 - <https://unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2017/E-ECE-TRANS-505-Rev.3e.pdf>



VIRTUAL TESTING FOR APPROVAL (1/2)

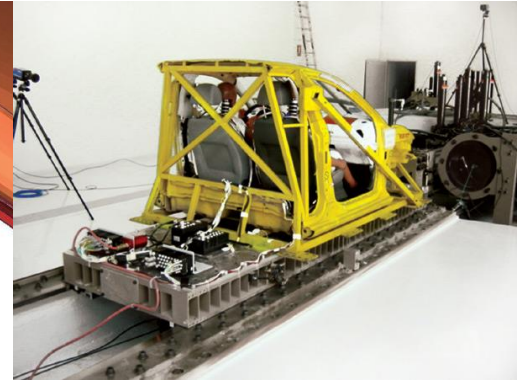
Regulatory act reference	Subject
UN Regulation No 58	Rear underrun protective devices (RUPDs) and their installation; rear underrun protection (RUP)
Regulation (EU) No 130/2012	Vehicle access and manoeuvrability (steps, running boards and handholds)
UN Regulation No 11	Door latches and door retention components
UN Regulation No 46	Devices for indirect vision and their installation
UN Regulation No 21	Interior fittings
UN Regulation No 26	External projections
UN Regulation No 48	Installation of lighting and light-signalling devices on vehicles
Regulation (EU) No 1005/2010	Towing device
UN Regulation No 125	Forward field of vision
Regulation (EU) No 1008/2010	Windscreen wiper and washer systems
Regulation (EU) No 1009/2010	Rear underrun protective devices (RUPDs) and their installation; rear underrun protection (RUP)

VIRTUAL TESTING FOR APPROVAL (1/2)

LOREM IPSUM	XXXX
UN Regulation No 73	Lateral protection of goods vehicles
Regulation (EU) No 1230/2012	Masses and dimensions
UN Regulation No 61	Commercial vehicles with regard to their external projections forward of the cab's rear panel
UN Regulation No 55	Mechanical coupling components of combinations of vehicles
UN Regulation No 102	Close-coupling device (CCD); fitting of an approved type of CCD
UN Regulation No 107	M2 and M3 vehicles
UN Regulation No 66	Strength of the superstructure of large passenger vehicles
UN Regulation No 93	Front underrun protective devices (FUPDs) and their installation; front underrun protection (FUP)

GENERAL CONDITIONS

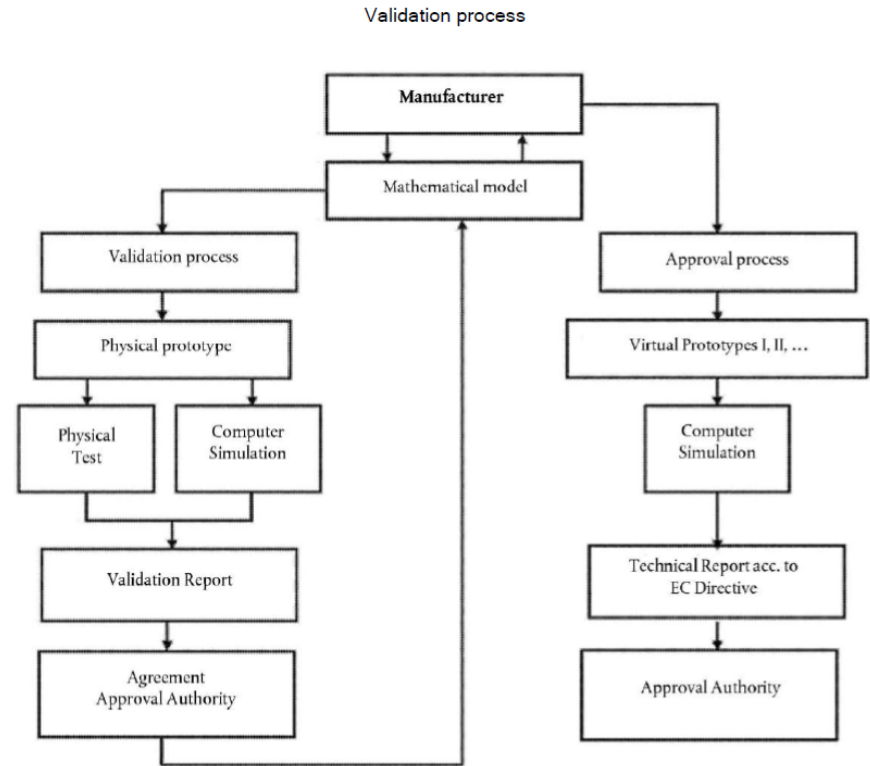
- Validation process of the virtual methodology
- Results comparison between virtual and physical tests
- Validation of the virtual tool



VALIDATED

— VALIDATION PROCESS —

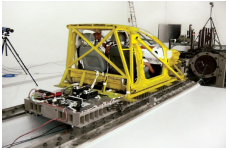
- Manufacturer shall provide the mathematical model
- Validation process includes a physical test to compare the results
- Once the methodology is validated, the approval process can start



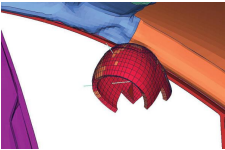
APPROVAL

E9

First approval



Physical test



Validation of the
virtual tool

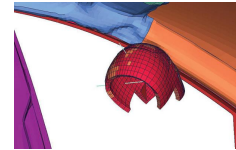


Approval process



Approval process

Virtual model



Following approvals

E9





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