

# Handling Guideline for the EEVC WG 17 Legform Impactor

***- DRAFT -***

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## **1. Objective**

To ensure the highest possible repeatability and reproducibility of the test parameters in tests with the EEVC WG 17 legform impactor, concomitant with a least possible uncertainty of results, special care while dealing with the legform impactor has to be taken. The following list shall help to achieve this quality. The list is regarded as an addition to the legform's user manual, which has to be followed closely, and is not exhaustive. It shall rather call attention to possible mistakes and make the users sensitive for inaccuracies.

## **2. Certification of the legform impactor**

- According to the calibration procedures and intervals documented in the test regulations
- Usability of the impactor only when every specification is complied with
- Impactor shall be certified as a complete unit, i.e. with the same batch of ligaments and the same batch of foam piece as in the test that follows
- Certification of the potentiometers within the effective range
- Certification of the potentiometers in steps of max. 2 degrees
- Certification of the impactor within a relative humidity range between 25% and 45%

## **3. Additional verifications on the occasion of certification**

- Check of total mass
- Verify the center of gravity of femur and tibia
- Verify the correct mounting position of the tibia insert: The accelerometer has to be positioned on the rear side of the legform
- Verify the correct mounting of the potentiometer
- Verify the electric position of the potentiometer: There should be no point of discontinuity and no zero point within the effective range
- Verify the correct position of the accelerometer: Entran sensors can be fastened to the wrong screw drilling
- Check the operability and correct, centre position of damper adjustment.

**4. Additional verifications before each test**

- Check and correction of possible rotation of the femur insert
- Check and correction of possible rotation of the tibia insert
- Check and correction of possible deformation of the shear spring, to be seen at an ex-centric position of the femur ligament socket
- Dismounting of the potentiometer rod and check of possible deformation
- Check the potentiometer rod ball joint of defects
- Check the potentiometer guide tube of deformation and correct position
- Verify tight mounting of the potentiometers
- Verify tight mounting of the grub screws at the tibia centre weight; if loose: check and correction of the center of gravity
- Verify tight mounting of all mounting screws
- Check wiring for damages

**5. Test preparation**

- Mounting of the ligaments: screw down screws lightly first, then set up impactor, finally fix screws tightly
- Check foam piece of damages and deformations
- Storage of foam piece under the same climatic conditions as in the test for at least 2 hours prior to the test
- Never put / store anything on foam piece
- During the mounting of the foam: position the impactor as short as possible on the foam; afterwards set up the impactor immediately

**6. Test execution**

- Ensure avoidance of cable damages during the impact (e.g. by sensor cable suspension)
- Ensure the exact position of the impactor in the guiding system
- Ensure the accuracy of the vertical, lateral and longitudinal impact orientation of the impactor - avoidance of rotation of the impactor around the vertical (yaw)-axis, lateral (pitch)-axis and the longitudinal (roll)-axis
- Ensure the accuracy of the impact height and the lateral impact position of the impactor
- Measurement of the impact velocity in each test
- Conducting test within a relative humidity range between 20% and 50 %

**7. Storage and transport of the foam pieces**

- Climatized storage location (within a temperature range between 16 °C and 24 °C, and a relative humidity range between 10% and 70%)
- Climatized storage of the foam pieces before and after the certification until the test
- Horizontal storage and transport, a maximum of 10 foam pieces of equal size on top of each other, no further loads
- No bending and rolling of foam pieces, avoidance of cracks
- Maximum storage duration: one year; otherwise further calibration necessary