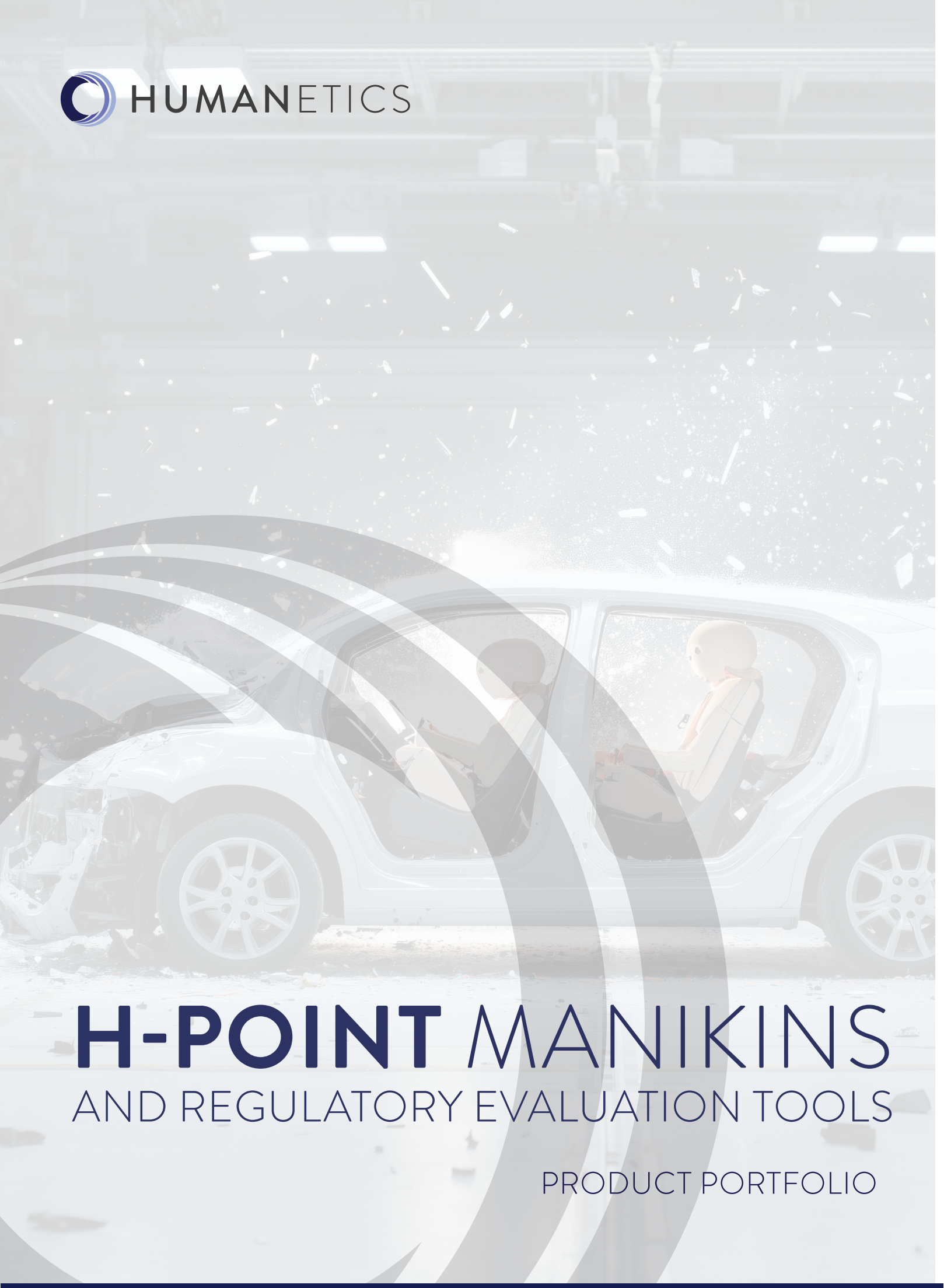
HUMANETICS



H-POINT MANIKINS

AND REGULATORY EVALUATION TOOLS

PRODUCT PORTFOLIO

H-POINT MANIKIN

The **H-Point-Manikin (HPM)** is a physical measurement device used to determine the H-point, a key reference point that represents the theoretical pivot center between the human torso and upper legs when seated.

When placed in a vehicle seat, the HPM settles into the cushion and backrest under defined conditions, allowing the seat structure and foam to position the manikin naturally. This process simulates how a human occupant interacts with the seat, producing a repeatable and measurable H-point location. The resulting H-point is used as a foundational reference for **seating design, occupant packaging, EPA volume determination, and crash test dummy positioning,** ensuring consistent and standardized test setups across development and validation activities.

TE-HPM MANIKIN 50TH

The TE-HPM H-Point-Manikin is an essential tool for accurate measurements and correct dummy positioning across a wide range of test applications. It fulfills the requirements of SAE J826 (June 22, 2021) and the recommended VDA 304, ensuring compliance with global industry standards. When combined with the Measuring Head (TE-MK), the TE-HPM provides one of the most accurate solutions available for H-point determination. The H-point serves as a key reference for occupant location, seating package configuration, EPA volume determination, and crash test positioning.

KEY FEATURES & BENEFITS

- Fully compliant with SAE J826 (2021 update)
- Meets VDA 304 recommendations
- High measurement accuracy and repeatability
- Compatible with TE-MK Measuring Head
- Reliable reference for standardized test setups

SCOPE OF PACKAGE

COMPONENT DESCRIPTION	QUANTITY
HPM INCLUDING FORCE GAUGE INDICATOR	1
HEAD ROOM PROBE (PLUG-IN VERSION)	1
LEG, RIGHT (ADJUSTABLE FOR 10%, 50% & 95% LENGTH)	1
LEG, LEFT (ADJUSTABLE FOR 10%, 50% & 95% LENGTH)	1
TORSO, WEIGHT DISK	10
UPPER LEGS	2
LOWER LEGS	2
CLOTH	1
HPM TRANSPORT BOX	1
WEIGHT TRANSPORT BOX	1

H-POINT MANIKIN 5TH

The 5th H-Point-Manikin (TE-HPM-05) is designed to support accurate measurements and dummy positioning for small-stature occupant scenarios. It ensures that seating systems and vehicle interiors are evaluated across a broader occupant population, supporting inclusive and robust safety assessments.

Like other HPM solutions, the H-point remains a critical reference for occupant location, seating package configuration, EPA volumes, and crash test positioning.

KEY FEATURES & BENEFITS

- Represents small occupant geometry
- Enables accurate measurement and positioning for small-stature occupants
- Supports repeatable and standardized test setups
- Improves coverage of occupant diversity in testing

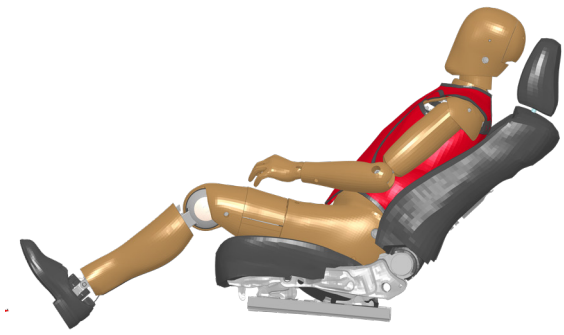
SCOPE OF PACKAGE

COMPONENT DESCRIPTION	QUANTITY
HPM INCLUDING FORCE GAUGE INDICATOR	1
LEG SET	1
TORSO WEIGHTS 3920G	4
BUTTOCK WEIGHTS 4290G	2
THIGHT WEIGHTS 1830G	2
LOWER LEG WEIGHTS 1230G	2
CLOTH	1
HPM TRANSPORT BOX	1

ALTERNATIVE SEATING POSITIONS

New vehicle concepts — especially automated and autonomous vehicles — introduce seating positions that differ significantly from traditional forward-facing postures. These configurations require advanced measurement tools and highly adaptable ATDs to ensure accurate positioning, repeatable testing, and meaningful crash data.

The THOR-AV-50M is a fully adjustable Anthropomorphic Test Device (ATD) developed to better represent the human form in crash scenarios, particularly those involving automated vehicle (AV) seating environments.



HPM*tae*

Modern vehicles offer an increasing variety of seating positions, resulting in new test configurations, standardized setup requirements, and higher demands on measurement equipment. The HPMtae (torso angle extension) addresses these challenges by extending the functionality of a traditional HPM.

The HPMtae integrates a torso angle extension (tae) of up to 65° while maintaining standard weight, enabling precise H-point measurement and positioning across both conventional and non-standard seating postures. It remains fully usable for all previous HPM applications while expanding capability for future vehicle concepts.

KEY FEATURES & BENEFITS

- Integrated torso angle extension up to 65°
- Standard weight for realistic positioning
- Compatible with all previous HPM applications
- Enables repeatable and standardized test setups
- Provides precise, measurable results for development

HPM-II

The HPM-II H-Point Machine provides a precise physical representation of the H-point and is a vital tool for seating design, auditing, and bench-marking. Developed as the successor to the OSCAR H-Point Machine, HPM-II incorporates the design updates defined in SAE J4002, reflecting modern vehicle interiors and evolving seating concepts.

The design philosophy of HPM-II is based on the natural kinematics of the human spine and pelvis. Thanks to this biofidelic behavior, the back of the manikin adapts naturally to the contours of the seat backrest, enabling realistic interaction with both upright and reclined seating configurations. This principle supports reliable and repeatable H-point determination even in more complex seat geometries.

The HPM-II plays a key role in C-IASI documented "Reclined Seat Protocols 2025", where it is used in combination with THOR-AV to support standardized and repeatable test setups for reclined seating positions.

SCOPE OF PACKAGE

COMPONENT DESCRIPTION	QUANTITY
HEAD ROOM PROBE (HRP)	1
BACKREST PAN	1
TORSO WEIGHTS 1785G	12
PELVIS WEIGHTS 3176G	6
THIGH WEIGHTS 2140G	6
THIGH FRAME	1
SEAT PAN	1
LOWER LEG	1
SHOE	1
FOOT WITH FLOOR PLATE	1
COTTON FABRIC	1
LOAD APPLICATION TOOL	1

KEY FEATURES & BENEFITS

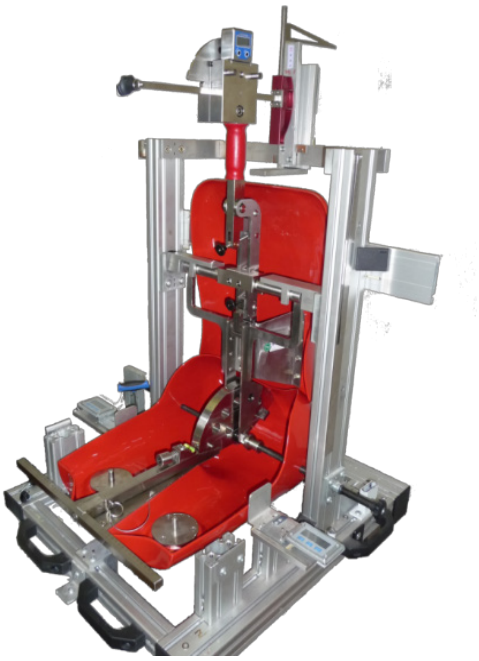
- Complies with SAE J4002
- Reformed shell design for consistent fit in bucket and contoured seats
- Articulating back enables lumbar support measurement
- H-point measurement possible without the leg assembly
- Improved design for faster installation and handling
- High repeatability for benchmarking and audits

ECAL-HPM-MK-CALIBRATION

The calibration of the Hip Point Dummy (HPM) and the Measuring Head (MK or HRMD) meet recommendation of the German Association of the Automotive Industry (VDA), which predefines particularly tight tolerance on the instrument.

Additionally, the calibration of the H-Point-Manikin is fulfilling all standards of the Society of Automotive Engineers. is the central specification for H-Point Manikins worldwide, and the GLORIA standard for the Euro NCAP tests. In combination (HPM and MK/HRMD) Humanetics is also able to fulfill the GLORIA standard for calibration.

Regular calibration of the H-Point Manikin results in a reproducible measurement standard that can be used during development and series production. Almost every HPM and HRMD can be modified to meet standard.



TRANSPORT BOX FOR **HPM WEIGHTS**

The HPM Transport box contains one box for the H-Point Manikin (TE-HPM-Box-1), as well as a second box for the weights (TE-HPM-Box2).

TE-MK **MEASURING HEAD**

The Humanetics Measuring Head (MK) is an advanced tool, used for precise and repeatable back set measurement. The device can be used on any H-Point machine that fulfills SAE J826 requirements.

With its multiple adjustment possibilities, it allows for correct installation as well as positioning. A proper handle simplifies the installation onto the HPM (H-Point Manikin). The device fulfills the VDA 304 calibration requirements.

SPECIFICATIONS

MEASUREMENT CAPABILITIES HEAD	RANGE
X-DIRECTION	14 - 200mm
Z-DIRECTION	-70 - 100mm
TORSO ANGLE	0 - 35 Deg.

PHYSICAL	WEIGHT
TOTAL MASS (INCL. INCLINOMETER)	8300 g
MASS INCLINOMETER - SUPPY	185 g
ADDITIONAL WEIGHTS	2x 4800 g
COMPENSATION WEIGHTS (BACKSET MEASUREMENT WITH HEAD ROOM PROBE)	2x 2770 g

INCLINOMETER	
ACCURACY	±0,1 Deg
SUPPLY	3V Battery

SCOPE OF PACKAGE

COMPONENT DESCRIPTION	QUANTITY
MEASURING HEAD (INCL. INCLINOMETER & WEIGHTS)	1
TRANSPORT BOX	1
BASE FOR SECURED STORAGE	1

TE-KSM

The Head Restraint Measuring Device (TE-KSM) determines the head restraint height / width according to the legal requirements of UNECE R17 and FMVSS202a.

The measuring device can be applied to all H-Point Manikins with standard HRP shaft (Ø 22,3 mm).

SPECIFICATIONS	
WEIGHT	875 g ±25 g
SCALE	120 – 280 mm

TE-HRP

The Plug-in Head Room Probe (HRP) can be mounted or dismounted no influence on the calibration of the H-Point Manikin. It is placed on the guidance of the plastic bushings and fixed with safety pins. The HRP can be retrofitted on all common HPM with standard HRP shaft (Ø 22,3 mm).

KEY FEATURES & BENEFITS

» Removal of HRP, without dismantling of H-point axis

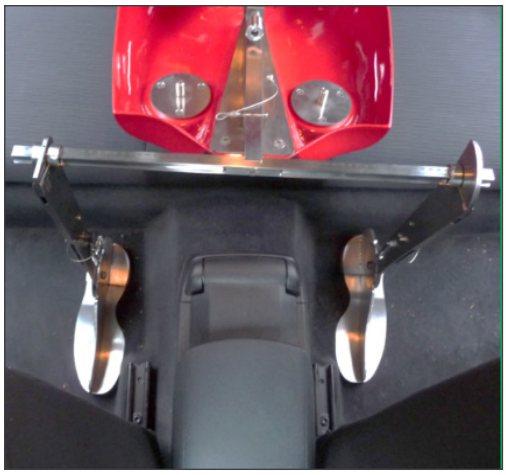
» Dismantling of the HRP doesn't affect the HPM calibration

SPECIFICATIONS	
WEIGHT	2300 g
SCALE	760 - 1070 mm

TE-TBW

H-Point measurement with standard T-Bar on the middle seat:

» Positioning of the legs is in most vehicles not possible, because of the wide center tunnel
» H-Point measurement failure as it leads to a undefined sliding HPM
» Measurement without legs is not according to regulations



H-Point measurement with extended T-Bar:

» Positioning of the HPM is also possible for the center seat by the heel points
» H-Point measurement can be performed reproducible with mounted legs

TE-TBN

H-Point measurement with standard T-Bar on the middle seat:

» Positioning of the HPM is not possible due to risk of collision with the center console
» Risk of damage to the interior is very high

H-Point measurement with small T-Bar:

» The T-bar was shortened from 420 mm to 360 mm without weight influence.
» Positioning of the HPM on the front seats, even with bulky center consoles
» Danger of damage of the interior significantly reduced Mounting of the legs on HPM is much easier

TE-CAM

» Adaptation for mounting a camera on HPM
» Allows attachment of all common camera types
» Meets the legal requirements according to FMVSS111/ ECE R158 (rear visibility)
» Photographic documentation of the field of view Camera
» Camera can be swiveled and moved around X, Y and Z Axis

PHYSICAL	QUANTITY
ADAPTION ON HPM	1
CAMERA ADAPTATION	1
T-BAR SMALL	1
WEIGHT 2770G	2
TRANSPORTBOX	1

Camera is not included in the scope of delivery and can be ordered as an option.

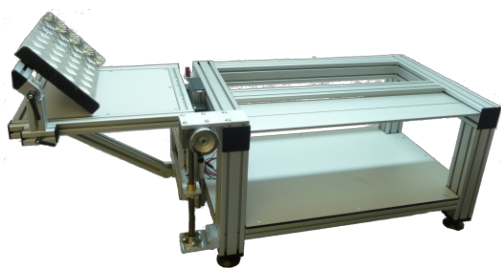
TE-HPM-TEST STAND

H-Point Teststand W/ adjustable footstand.

PHYSICAL	
WEIGHT	70kg
WIDTH	600mm
GROUNDLEVEL	520mm
ADJUSTABLE FOOT RANGE HEIGHT	250mm
DEEPNESS	1500mm
ADJUSTABLE RANGE FOR ADAPTA-TION PLATE	500mm
ADJUSTABLE RANGE FOOT ANGLE LENGTH	0 - 300mm
ADJUSTABLE RANGE FOOT ANGLE	0 - 30°
POWER SUPPLY	12V

KEY FEATURES & BENEFITS

» Seat adapter for vehicle-specific adapter plates which can be produced on request.
» Due to significant adjustment range each vehicle geometry can be adjusted.

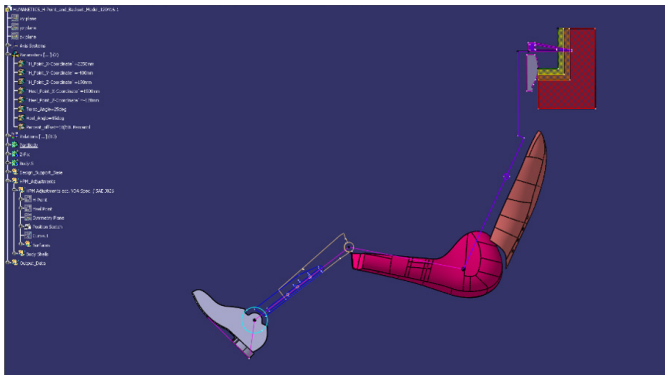


SCOPE OF PACKAGE

» H-Point measurement
» Seat function tests
» Presentation

TE-HPM-CAD

» CAD Model based on CATIA V5 R19
» Dummy shells are based on the VDA defined surfaces of 2009
» Dummy, head positions and dimensions are in accordance with the „VDA Specification of the H-Point and Backset Measuring Equipment “ of 2010 and representing the Humanetics Measuring Head Updates to lumbar spine, pelvis, and abdomen
» Analysis geometry is according to RCAR definitions



TE-FTM PRV-038

Durability Manikin

» For functional testing of vehicle seats according PRV-038
» Shell contour and position in accordance with the SAE J826/VDA304 and are derived from the 50th percentile dummy
» Force introduction into the H-Point

PHYSICAL	
WEIGHT TOTAL MAX.	140 kg
WEIGHT UNEQUIPPED	19,5 kg
ANGLE (SEAT TO BACKSHELL)	105 Deg
FORCE INTRODUCTION POINTS	3

TE-FTM PRV-038

Durability Manikin

» For functional testing of vehicle seats
» Shell contour and position in accordance with the **SAE J826/VDA304** and are derived from the 50th percentile dummy
» Depending on weight charging incl. legs, weights for different percentile dummy can be achieved

PHYSICAL	
ADJUSTABLE RANGE	76° - 96°
CONNECTING POINTS	3
TORSO WEIGHT	6 Blades | 3 kg
BUTT WEIGHT	16 Blades | 2 kg
SPACERS	4x 20/22/41/54/61 mm

Optional: Also available with T-Bar and HPM legs.

TE-SBTD-50

The Belt Evaluation Dummy is used to check the belt progress
» Breast,- and pelvic-shells are removable
» Shell geometry corresponds to **VDA304**

TE-SFAD I

The Static Force Application Device I (SFAD I), is used to test child restraint anchorage systems. The tests are to ensure their proper strength and location for the effective securing of child restraints and to reduce the likelihood of anchorage system failure, in accordance with **FMVSS 225**.

TE-SFAD II

The Static Force Application Device II (SFAD II), is used to test child restraint anchorage systems. The tests are to ensure their proper strength and location for the effective securing of child restraints and to reduce the probability of anchorage system failure, in accordance with **FMVSS 225** and **UNECE R14**.

» Availability of I-size (TE-SFAD-II-SUPPORT-LEG)
» Calibration services available on request

TE-TB CARGO I

Luggage test block type I
» Available in solid beech and aluminium
» All edges and corners rounded to 20 mm
» Attachment for securing belt
» Analog to the legal requirements of UNECE R17

PHYSICAL	
WEIGHT	18 kg (+/- 100 g)
LENGTH	300 mm
WIDTH	300 mm
HEIGHT	300 mm
MATERIAL	Beechwood / Aluminium

Optional:
» TE-TB CARGO I MT
(Device for accommodating an accelerometer at the center of the test block)
» TE-TB CARGO I CG
(Determination of the moment of inertia in the X, Y and Z Axes).

TE-TB CARGO I Aluminium

TE-TB CARGO I Beech

TE-TB CARGO II

Luggage test block type II
» Available in solid beech and aluminium
» All edges and corners rounded to 20 mm
» Attachment for securing belt
» Analog to the legal requirements of UNECE R17

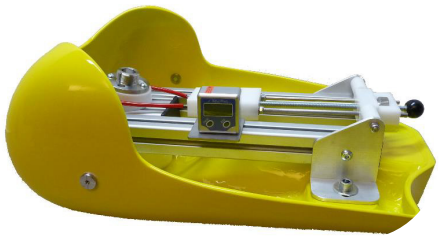
PHYSICAL	
WEIGHT	10 kg (+/- 100 g)
LENGTH	500 mm
WIDTH	350 mm
HEIGHT	125 mm
MATERIAL	Beechwood / Aluminium

TE-TB CARGO II Beech

TE-TB CARGO II Aluminium

TE-COMI1-V2

For comfort measurement on seat assembly according to Audi specification PV3410/VR604.1
» Connection for Zwick measuring machine
» H-Point marking outside
» Digital magnetic protractor
» Painted in RAL 1021



TE-COMI1-V3

For comfort measurement on seat back rest. to Audi specification PV3410/VR604.1
» Connection for Zwick measuring machine
» Digital magnetic protractor
» Painted in RAL 1021

TE-CRF-R16 UNIVERSAL

The test fixture shall be used to determine the suitability of seat positions for the installation of child restraints of the “universal” category. According to the legal requirements of **UNECE R16** and the **Euro NCAP assessment protocol for children occupant protection, version 6.4.1 of 2013.**

» TE-CRF-R16 UNIVERSAL-CC
(available with aluminum corners)

» Cotton cloth available on request

PHYSICAL	
WEIGHT	23 kg
LENGTH	690 mm
WIDTH	400 mm
HEIGHT	420 mm
MATERIAL	Ureol, Coated

TE-CRF-R16

CRF	UN ECE KEY	MASS (KG)	TOLERANCE (KG)
ISO/R1	E	10	± 0,2
ISO/R2	D	10	± 0,2
ISO/R2X	D1	10	± 0,2
ISO/R3	C	13	± 0,2
ISO/F2	B	13	± 0,2
ISO/F2X	B1	13	± 0,2
ISO/F3	A	13	± 0,2
ISO/L1		13	± 0,2
ISO/L2		13	± 0,2
ISO/B1		3	± 0,2
ISO/B2		7	± 0,2
ISO/B3		7	± 0,2
I-Size	Support Leg		

» Ilsofix reference block according to **UNECE R16.**

» High strength and dimensional stability

» Divided horizontally and with sliding aluminum ISOFIX connectors that can be locked

» Labeling on the ISOFIX connectors

» I-Size Support Leg with adapter for backward-facing ISO-Blocks

TE-CRF-R16 MODULAR

» Modular add-ons for the Isofix TE-CRF-R16
» Available in seven different mounting kits
» I-size support leg adaptable

PART NUMBER	DESCRIPTION
TE-CRF-R16-MOD-BASE	SEAT BELT FIXT ECE R16-BASE
TE-CRF-SUPPORT-LEG	SUPPORT LEG FOR CRF-FMVSS225/ECE R16.A17
TE-CRF-R16-MOD-F2	SEAT BELT FIXT ECE R16.A17.2 TYPE F2
TE-CRF-R16-MOD-F2X	SEAT BELT FIXT ECE R16.A17.2, TYPE F2X
TE-CRF-R16-MOD-F3	SEAT BELT FIXT ECE R16.A17.2, TYPE F3
TE-CRF-R16-MOD-R1	SEAT BELT FIXT ECE R16.A17.2 TYPE R1
TE-CRF-R16-MOD-R2	SEAT BELT FIXT ECE R16.A17.2 TYPE R2
TE-CRF-R16-MOD-R2X	SEAT BELT FIXT ECE R16.A17.2 TYPE R2X
TE-CRF-R16-MOD-R3	SEAT BELT FIXT ECE R16.A17.2, TYPE R3

TE-ECE-R29.03 MANIKIN

UNECE Regulation 29.03 specifies that commercial truck cabs must be designed to guarantee sufficient suvival space for the driver and passenger in the event of an accident.
Humanetics has developed a manikin specifically für UNECE R29 survival space tests, including frontal pendulum impact and roof strength. The manikin is based on a 50th percentile Hybrid male. Integrated hip joints enable a 20 degree lateral rotation of the legs, and joints between the upper legs and torso allow for a 45 degree rotation of the legs. This new dummy is much cheaper for UNECE R29 tests than the HIII-50M or HIIIU because it was only developed for static indentation tests. Therefore, there are no additional measuring sensors that are not required for these test scenarios. One advantage is the lower weight of approx. 10 kg compared to the HII or HIIIU-50 dummies that normally are being used for these tests.

400-0000-WH/RD OCCUBOTT

Structure of the OccuForm-Dummy:

» Highly durable fiberglass shells
» Colour of shells are red; Optional: every colour available
» Three piece design with removable torso which allows for individual seat back or seat pan testing
» Adjustable and lockable seat back angle positioning

Typical Testing Applications:

» Ingress / Egress testing
» Jounce and Squirm
» Vibrational / Shaker Table Testing
» Ballast Testing

The OccuForm Features:

» Size and contours conforms to SAE J-826 definition of a 50th Male
» 4x Bolts directly to KUKA Robot
» 4x additionals threads for „Schrunk quick hitch“ clamping ring
» Compatible with all Robots
» Upper and Lower Torso hinges at H-Point
» Weights can easily be added for ballast testing

Covers:

» Scrub-Covers are available on request
» Fixation with hook-and-loop fastener ore strap and rope

400-0000-WH OCCUBOTT

400-0000-RD OCCUBOTT

TE-HIZ-165

Measuring device to determine the head impact zone according to ECE R21
H-Point adjustable in X / Z direction
Scale tube with length measurement from 650mm to 900mm
Acrylic glass ball d = 165mm
Leather covered weight bags to increase test shell weight

TE-CSF-ECE R126 F2/F3

Child seat measuring device.

» All measured variables can be checked in accordance with UNECE R129 Annex 18 Fig. 2/ Fig. 3 and easily read on the scale
» Measurement display for calibration adjustable
» Scope of the adjustment units adjustable
» Simplified width adjustment via threaded spindle

TE-CSF-ECE R129 F2

TE-CSF-ECE R129 F3

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HUMANETICS

PROTECTING HUMANS IN MOTION

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