



# **PRODUCT CATALOG 2023**



# JASTI PRODUCT CATALOG

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# **Corporate Identity**



We cast away "egoism" which allows caring only about ourselves, and keep the mind of "altruism" to sacrifice ourselves to help others. We consider the feelings of others, look around calmly, and extend our hands to help others. Every employee in JASTI keeps the mind of "altruism" in his or her hearts, and walks with people through works which can do good in the world.

# **Quality Policy**

# **Action Policies**

- -Contribute to society through automobile collision safety evaluations-
- 1. Aim at being one of a kind instead of being the number one
- 2. Carry out cooperate activities from customers' viewpoint
- 3. Increase abilities and strive for continuous quality improvement
- Maintain fairness and control risks adequately to improve customer trust

# **Goals in Production of Anthropomorphic Dummies**

- Anthropomorphic dummies as measuring apparatus (Reduce individual differences of dummies and control stability of performance levels)
- 2. Repeatability (Keep repeatability and reliability of dummies)
- 3. Anthropomorphic dummies with reproducibility





# JASTI's Cutting-edge Safety Technologies the Automobile Industry Worldwide





# **Remarkable Features of JASTI's Dummy Products**

# **Safety of Mold Products**

Since the company started manufacturing, JASTI has used DINA and DINP instead of DOP as plasticizers for molded products, which provide a high degree of safety, however, according to requirements for environmental assessment in Europe (RoHS 2), the cancer-causing property of these plasticizers is concerned because they contain phthalic acid. We switched to a new phthalic acid free plasticizer in 2015. That makes JASTI's PVC products much safer.



# **Damping Material**

JASTI developed a new damping material which has a performance that is equal to conventional products. The combination of steel ribs and this new damping material enables issuing a Low/High Speed Impact Certification for displacement of a thorax.





Rib unit test

# **Features of Rubber Products**

Dummies require a high degree of biofidelity and are made up of many kinds of rubber materials to use their properties of flexion, extension, etc.

JASTI offers parts with different hardness for Lumbar Spine, Nodding Block, and Knee Flesh Insert, based on information on drawings. In a calibration test of a dummy, adjustment and calibration are possible by combining these parts with different hardness. You are welcome to try and please feel free to contact us.

\*These matters are reported at ISO/TC22/SC12/WG5, etc. For details, refer to our website http://www.jasti.co.jp/en.

### **Different Hardness Types of Rubber Products**

#### Lumbar Spine

Lumbar Spine is based on rubber materials, has a role of the lumbar spine of a human body, and absorbs an impact on the thorax by deforming.

Performance requirements of Lumbar Spine include not only surface hardness, but also repeatability, reproducibility, and durability. Specially, a surface hardness test is required for Hybrid-III 50th Male, and a torso flexion test is required for 5th Female, and Chest Jacket, Rib Assembly, and Lumbar Spine, which are basic components of the dummies, largely relate to the displacement of the thorax and limit its properties. Therefore, the precision of each component is obviously important and improving the precision and reliability of each component secures the reliability of a dummy. For this reason, we always conduct various unique tests to pursuit reliability, durability, and reproducibility.



•Reliable Lumbar Spine



•Test on Lumbar Spine



Debond test



### Fine adjustment in a knee impact test

The legal drawing requires a hardness of 40 to 50 (Shore A), and JASTI offers a Knee Flesh Insert with a hardness of 45, which is the intermediate value, as the standard product. If a required impact force cannot be obtained in a performance test, replace the Knee Flesh Insert with another one with different hardness for adjustment. JASTI offers 3 different types of Knee Flesh Insert: Low, Middle, and High. When a required value cannot be met in a knee impact test, we recommend to use another type of Knee Flesh Insert which differs in hardness.



# **Front Impact Test Dummy**

### Hybrid-III 50th Percentile Male Dummy Hybrid-III 5th Percentile Female Dummy

Front Impact Test Dummies, Adult Male/Adult Female, 49CFR PART572 Subpart E/Subpart O, EuroNCAP Applicable standard 回本 TRIAS ■USA FMVSS208 ■EU ECE R94



#### Hybrid-III 50th Percentile Male Dummy

Outer Size (mm)	
Sitting Height	878 - 889
Shoulder Pivot Height	505 - 521
Buttock to Knee Length	579 - 605
Knee Pivot Height	485 - 501
Shoulder Width	421 - 437
Head Back to Backline	40 - 46
Popliteal Height	429 - 455

Weight (kg)	
Head	4.536±0.045
Neck	1.542±0.045
Upper Torso	17.191±0.136
Lower Torso	23.042±0.136
Upper Arm (each)	1.996±0.090
Lower Arm and Hand (each)	2.268±0.090
Thigh (each)	5.987±0.090
Lower Leg and Foot (each)	5.443±0.136
Total Weight	77.700±1.180

#### **Dummy Specifications**

Hybrid-III 50M , 5F Dummy		
	USA (NHTSA)	EuroNCAP
Head	Head drop	Same
Neck	Neck Bent/ Extension	Same
Thorax	High/ (Low Speed)	High / Low Speed
Pelvis	Femur Flexion	Same
Knee Slider	Friction	Ball Bearing (High / Low)
Foot	Compression	Impact

#### Hybrid-III 5th Percentile Female Dummy

-	-	
Outer Size (mm)		
Sitting Height	774 - 800	
Shoulder Pivot Height	431 - 457	
Buttock to Knee Length	520 - 546	
Knee Pivot Height	393 - 419	
Shoulder Width	350 - 366	
Head Back to Backline	43 - 48	
Popliteal Height	355 - 376	

Weight (kg)	
Head	3.730±0.05
Neck	0.910±0.09
Upper Torso	12.020±0.14
Lower Torso	13.250±0.14
Upper Arm (each)	1.180±0.05
Lower Arm (each)	0.900±0.05
Hand (each)	0.280±0.05
Thigh (each)	3.130±0.09
Lower Leg	3.270±0.05
Foot	0.790±0.05
Total Weight	49.050±0.91

101.24±1.63

# Front Impact Test Dummy

### Hybrid-III 95th Percentile Large Male Dummy

Front Impact Test Dummy, Adult Large Male

Applicable standard Designated as SAE standard H3-95 dummy



# Hybrid-III 3 Year Old Child Dummy

Front Impact Test Dummy, 3 Year-old Child Applicable standard 49 CFR PART572 Subpart P





# Q3 Dummy Q3 Dummy(EU) / Q3s Dummy(USA)





#### Hybrid-III 95th Percentile Large Male Dummy

Outer Size (mm)	
Sitting Height	927 - 942
Shoulder Pivot Height	541 - 556
Buttock to Knee Length	624 - 650
Knee Pivot Height	521 - 546
Shoulder Width	467 - 483
Head Back to Backline	86 - 91
Popliteal Height	457 - 483
Weight (kg)	
Head	4.94±0.05
Neck	1.68±0.05
Upper Torso	22.32±0.36
Lower Torso	30.30±0.36
Upper Arm (each)	2.81±0.05
Lower Arm and Hand (each)	2.06±0.05
Thigh (each)	8.21±0.09
Lower Log and Fast	575+0.09

Hybrid-III 3Year Old Child Dummy

Total Weight

#### Outer Size (mm) 546.1 Sitting Height 315.0 Shoulder Pivot Height Buttock to Knee Length 292.4 249.2 Knee Pivot Height Shoulder Width 244.1 Head Back to Backline 53.3 Popliteal Height 226.1 Weight (kg) 2.72 Head 0.79 Neck Upper Torso 7.00 0.44 Upper Arm (each) Lower Arm (each) 0.46 1.01 Thigh (each) 0.61 Lower Leg (each) 0.31 Foot (each) Total Weight 16.17 Q3 Dummy

### Outer Size (mm)

· · · · ·		
Sitting Height	544	
Shoulder Pivot Height	329	
Chest	142	
Shoulder Width	259	
Buttock to Knee Length	305	
Buttock to Behind the Knee Length	253	
Weight (kg)		
Head + Neck	3.17	
Torso (including clothing)	6.40	
Upper Arm	0.75	
Lower Arm	0.73	
Thigh	2.00	
Lower Leg	1.54	
Total Weight	14.60	

# Front Impact Test Dummy

### THOR 50th Percentile Male Dummy

Applicable standard NHTSA EURO NCAP



#### NHTSA

#### THOR 50th Dummy

Outer Size (mm)		
Seated height	L1	906±13
Hip pivot height	L2	116±5
Hip pivot to seat back	L3	153±13
Thigh clearance	L4	183±9
Knee pivot to bottom of foot	L5	505±7
Knee pivot to hip pivot	L6	413±9
Knee centerline to knee centerline	L7	253±5
Head back to seat back	L8	91±1.180
Rib 3 depth	L9	226±9
Rib 7 depth	L10	229±9
Shoulder-Elbow length	L11	391±7
Width across arms	L12	461±9
Waist width	L13	331±7
Back of elbow to wrist pivot	L14	291±9
Wrist pivot to tip of middle finger	L15	165±9



#### EURO NCAP

Weight (kg)	
Head Assembly	3.88 - 4.28
Neck Assembly	2.66 - 2.94
Lower Torso Assembly	14.39 - 15.85
Lower Arm Assembly (including hands), (left & right)	2.69 - 2.97
Upper Leg Assembly, (left & right)	5.37 - 5.91
Lower Leg Assembly, (left & right)	4.74 - 5.22
Instrument Ground Straps, (4) M6 SHCS, (8) M6 FHCS	0.03 - 0.09
Upper Torso	24.85 - 26.25
Neck Foam and Skin Assembly	0.16 - 0.19
Front/Rear Panel Assembly, Jacket	1.67 - 1.85
Thermal Pants	0.21 - 0.27
Total Weight	73.45

	NHTSA	EuroNCAP
Spine Box	All 3 deg teeth	Set at 9 , 0,-9,-12 deg
Lower Leg	THOR LX original	Hybrid-III 50th

# **THOR-50M Finite Element Model**



# For virtual testing and verification of advanced safety systems

#### Main features

•Compliant with all calibration conditions for THOR-50M

- •Simplified positioning by Positree(TM)
- •Easy access to standardized sensor output

•Verified stability at a higher impact velocity or under impact conditions with restrained/unrestrained passengers

•Easy to integrate with existing models through block numbering

# **THOR 5th Percentile Female Dummy**



A prototype is being developed with a draft drawing.

Outer Size (mm)		
Seated height	788	
Weight (kg)		
Total Weight	48.2	

# **Side Impact Dummy**

ES-2/ES-2re/SID-IIs Side Impact Dummy

EURO NCAP ES-2 Applicable standard ■ECE R95



US NCAP ES-2re Applicable standard ■FMVSS214 49CFR PART572 Subpart U



SID-IIs Applicable standard ■49CFR PART572 Subpart V



#### ES-2 Side Impact Dummy

Outer Size (mm)	
Sitting Height	900 - 918
Seat to Shoulder Joint	558 - 572
Buttock to Front Knee	597 - 615
Thorax Width	322 - 332
Shoulder/Arm Width	461 - 479
Abdomen Width	273 - 287
Seat to Sole	433 - 451

Weight (kg)	
4.0±0.20	
1.0±0.05	
22.4±1.00	
1.3±0.10	
5.0±0.25	
12.7±0.60	
12.0±0.60	
72.4±1.20	

#### ES-2re Side Impact Dummy

Outer Size (mm)	
Sitting Height	900 - 918
Seat to Shoulder Joint	558 - 572
Buttock to Front Knee	597 - 615
Thorax Width	322 - 332
Shoulder/Arm Width	461 - 479
Abdomen Width	273 - 287
Seat to Sole	433 - 451

Weight (kg)	
Head	4.0±0.20
Neck	1.0±0.05
Upper Torso	22.4±1.00
Arm (each)	1.3±0.10
Abdomen	5.0±0.25
Leg (each)	12.7±0.60
Pelvis	12.0±0.60
Total Weight	72.4±1.20

#### SID-IIs Side Impact Dummy

Outer Size (mm)	
Sitting Height	772 - 788
Shoulder Pivot Heght	437 - 453
Buttock to Knee Length	514 - 540
Chest Width	851 - 881
Shoulder Width	341 - 357
Waist Width	761 - 791
Popliteal Height	343 - 369

Weight (kg)	
Head	3.70±0.05
Neck	0.91±0.09
Upper Torso	11.11±0.20
Lower Torso	12.52±0.18
Arm (each)	0.91±0.05
Thigh (each)	3.13±0.09
Lower Leg (each)	3.27±0.09
Foot (each)	0.79±0.05
Jacket	0.59±0.07
Total Weight	44.12±1.09

# **Side Impact Test Dummy**

# WorldSID 50th Percentile Male Side Impact Dummy W50-00000

Applicable standard ■ECE R95 (EU)Euro NCAP TB-029 (USA)FMVSS 214





#### WorldSID 50th Percentile Male Dummy

Outer Size (mm)	
Sitting Height	869±30
Buttock to Knee Length	670±30
Chest/Arm Width	468±30
Arm Length	330±30
Waist Width	324±30
Knee to Sole	588±30

Weight (kg)	
Head	4.29±0.05
Neck	2.86±0.02
Upper Torso	20.56±0.35
Arm	1.77±0.09
Lower Torso	17.76±0.20
Thigh (each)	6.71±0.30
Lower Leg (each)	5.09±0.13
Suit	1.54±0.10
Total Weight	73.91±1.02

# **FAA Dummy**

FAA H-III 50th Dummy FAA H-III 95th Dummy

Dummy for Airplane Seat Evaluation

A FAA H-III 50th DummyB FAA H-III 95th Dummy

\*The FAA Dummy is standardized in Part 23.562, 25.562, 27.562, and 29.562 of CFR 14. \*HS (Heli safe) specification models are available both for 50th and 95th FAA Dummies.



В

# **Advanced Models of Dummies**

### **Pedestrian Dummy**

**Dummies for Pedestrian Protection Performance Test** 

Pedestrian dummies are standing posture dummies which are modified versions of Hybrid-III 5F, 5OM, and 95LM dummies, created by replacing some parts in the Pelvis, Lumbar Spine, and Knee Slider.

A Hybrid-III 5th Percentile Female Pedestrian Dummy

B Hybrid-III 95th Percentile Large Male Pedestrian Dummy

# Sensor, Transducer, Potentiometer

ES-2(re) Side Impact Dummy Linear Position Transducer

■H-III 50M•5F•95LM Dummy Chest Rotary Potentiometer



Knee Potentiometer & String



SID-IIs Side Impact Dummy 1/2" Potentiometer

A

SPIRAL Track®

# **Headform Impactor**

The pedestrian headform impactors are dummies replicating heads of human bodies used for "pedestrian protection performance tests" required by car assessment programs such as NCAP in each country. They were developed by JASTI in cooperation with JARI and JAMA, became the new pedestrian protection safety standard, and were later approved by ISO. They are ejected to make a collision mainly with the hood or the windshield of a car to measure the impact value in G and HIC (Head Injury Criteria). That enables measuring a head injury value in a pedestrian accident. They are also used for safety evaluations of playground equipment including mats in places such as playgrounds, other than automobile safety evaluations.

### **ISO** Type

\*EC type products which are in compliance with European laws and regulations are also available.



### Flex PLI - GTR

Since it is highly possible that a pedestrian receives a severe injury to his or her legs in a vehicle-pedestrian collision accident, UNECE WP29/GRSP released standards for protecting pedestrians' legs in 2002 and a flexible type of legform impactor was added to the Global Technical Regulations (GTR) in 2009 according to the proposal of JAMA and JARI. The reason of the proposal is that it is more biofidelic than a rigid impactor and enables measuring leg injuries appropriately.

Since 2013, after specifications of Flexible Pedestrian Legform Impactor (Flex PLI-GTR), which was evaluated by organizations including Flex TEG, were determined, JASTI has been engaged in developing and manufacturing the final specification model. At the end of 2015, we completed evaluation of prototypes both in Japan and overseas and started manufacturing and selling the products in 2016. They are currently used in Japan, China, India, and Europe.



The knee joint part is composed of machined aluminum knee block of which top and bottom ends bonded with 12 spring wires, and 4 displacement gauges measure the amount of elongation displacement of the knee joint.

To facilitate ease of data collection for the bending moment of the femur and tibia and the amount of displacement of the knee, its structure allows attaching a data collection device inside the knee and ensures a high degree of flexibility in handling.





#### Flex PLI-GTR

Outer Size (without flesh) (mm)	
Leg Length	982.0
Femur Length to Knee Joint	433.0
Tibia Length to Knee Joint	495.0
Knee Width	118.0
Leg Width	84.0
Knee Depth	108.0
Leg Depth	90.0
Femur Length from Top of Knee Assembly	339.0
Tibia Length from Bottom of Knee Assembly	404.0

Calibration Test on Flex PLI-GTR



Tibia



Knee

We have made many improvements in the product to pass the calibration test. Please see how the test was performed.



Femur



Pendulum

# Skin damage test

For testing if skin gets torn when any body part gets caught





Evaluation equipment A (for adults)

Evaluation equipment A (for children)

### H-III 50th Ankle Bumper For Non Metal Contact (J2949)

A conventional ankle bumper is attached to an ankle lower shell, but the contact between metal parts of the ball ankle shaft and the lower shell caused noises. To prevent the noise, we offer an ankle bumper integrated with an ankle lower shell. This integrated ankle bumper is the standard specification in IIHS in the United States.



### H-III 50M/5F/95LM Zippered Lower Leg Flesh



### H-III 50M/5F/95LM Velcro Joined Lower Leg Flesh



### Ball Baring Knee Slider



According to the standard specifications of Hybrid-III 50th Male Dummy and 5th Female Dummy, a friction knee slider is installed in both of them, however, with the newly developed ball bearing knee sliders, both 50M and 5F can address needs in the market.

#### **Other Products**

Chairs for safekeeping



with casters and adjusters



# **Calibration And Certification**



Head Drop Test System

•Test objects Front drop test:Hybrid-III 5F/50th /95th, World SID50th,THOR50th Side drop test:ES-2,ES-2re,SID-IIs



Neck Flex/ Extension Test System

•Test objects Hybrid-III 5F/50th /95 th、ES-2、 World SID50th、THOR50th



Thorax Impact Test System

Front impact test dummy Side impact test dummy



Knee Impact / Share Test



Hip Joint Test System •Test objects Hybrid-III 5F/50th

You can see a movie of the test from the QR code on the right.





**Torso Flexion Test** 

You can see a movie of the test from the QR code on the right.



#### **Calibration And Certification**



•Test objects ES-2、ES-2re



Foot Impact Test ECE R94



Foot Compression Test CFR PART572 Subpart E

# Next-generation calibration test software that uses a web server

#### Features

1. Introduction of a web server enables users to view and print out test data and reports using a browser from anywhere without installing any special software.

2. As functions to control the test, import test data, as well as create, view, and print reports are separated, test systems can be configured more flexibly.

3. Introduction of a full-scale database enables large-capacity, safer test data management.



#### Support for consistency in calibration tests

JASTI conducts calibration tests on all dummies and parts that require a calibration test certification based on CFR 49 Part 572 before delivery. However, there are many cases in the market where the same result as a calibration test certification cannot be reproduced. Many sites have the problem of difference in reproducibility even though they meet the calibration test standard in CFR 49. To minimize the problem, it is necessary to achieve consistency among many test conditions such as calibration test equipment, data acquisition system, test software, test environment, and skills. As a dummy manufacturer, we have a vast amount of experience not only with consistency in dummies, but in achieving consistency in calibration test equipment, to minimize the problem (difference). Please feel free to consult us for any problem no matter how small. As a dummy manufacturer, JASTI will support customers for consistency in test conditions.



Jasti Co., Ltd.



jasti.co.jp/en



#### **Head Office**

2-4-3 Miyoshi, Koto-ku, Tokyo 135-0022, Japan TEL: +81-(0)3-5245-3661 / FAX: +81-(0)3-5245-8596

#### **Technical Center**

669 Yanagisawa, Numazu, Shizuoka 410-0308, Japan TEL: +81-(0)55-966-8620 / FAX: +81-(0)55-966-8629



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