

PASSIVE SAFETY LAB (PSL)



ICAT's Passive Safety Lab (PSL) is an advanced state of art facility which deals with dynamic impact testing on vehicle as well as component level. This includes Full vehicle Crash Test, High g deceleration sled test, Pedestrian Protection Tests, Energy dissipation Impact test and Airbag Deployment Tests. The lab is equipped to meet Indian as well as per various Indian, International and Global NCAP regulations (including Global NCAP & Bharat NCAP).



CAPABILITIES

❖ Compliance and Verification of Occupant Protection

- ❑ Full Frontal Crash
- ❑ Offset Frontal Crash
- ❑ Side Impact Crash
- ❑ Rear Impact Crash
- ❑ Underride Test
- ❑ Side Pole Impact Crash
- ❑ 30 degree Angular Crash
- ❑ Frontal Pole Crash
- ❑ Post – Crash Fuel Leakage Evaluation

- ❖ Airbag ECU Calibration/Validation Development Testing
- ❖ Pedestrian Testing

- ❖ Seat Anchorage Strength Test
- ❖ Seat Belt Dynamic Test
- ❖ Luggage Retention Test
- ❖ Stretcher Anchorage Test
- ❖ Occupant Restraint System Test
- ❖ Side Door Intrusion Strength Test
- ❖ Door Latches & Hinges Test Pulse
- ❖ Body Block Impact Test
- ❖ Airbag Deployment Testing (Static & Dynamic)
- ❖ Interior Fitment evaluation
- ❖ Head form Impact Test
- ❖ Testing of Energy Dissipating Material
- ❖ CRS Installation
- ❖ Proposed Bharat NCAP & Global NCAP Testing

SPECIALISED TESTING

- Out of Position Test (Airbag Deployment with Child Dummies).
- Head on Glass Testing
- Electric Vehicle Testing
- Head Drop Test
- Disc Impactor test
- Knee Impact Test



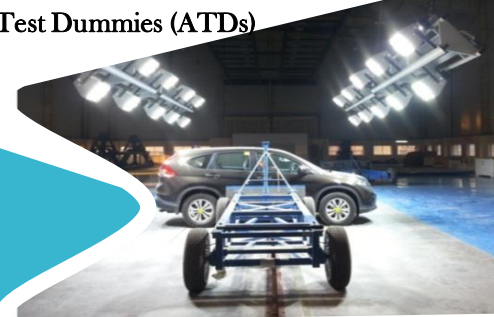
SPECIFICATIONS OF TEST EQUIPMENTS

ICAT commits to provide the customers with the best cutting-edge, high - precision sensor technology and Anthropomorphic Test Dummies (ATDs)

CRASH FACILITY

❖ BARRIERS

S.No.	Barrier	Specifications
1	Mobile Deformable Barrier Trolley	AIS : 099
2	Rear Impact Trolley	AIS : 101
3	Offset Deformable Barriers	AIS : 098
4	Mobile Deformable Barriers	AIS : 099
5	Pole Barrier and Side Pole Trolley	Pole Dia : 254 mm & 400 mm
6	Angular Barrier	30 Degree
7	Underride Barrier	-
8	R CAR Barrier	-



❖ DATA ACQUISITION SYSTEM / SENSORS

- Kistler Data Acquisition System : 32 channels *9 units = 288 channels (Analog)
- Kistler Digital Event Recorder : 16 channels *3 units = 48 digital events
- Airbag Timer with 12 firing programmable output
- 400 + Accelerometers up to 2000g capability
- Vehicle and Dummy Angular Velocity Sensors/ Seat belt load cells/ Pressure sensors
- 150+ Load cells (Crash test dummies)

❖ DRIVE SYSTEM

- 480 V AC variable frequency electric motor pulling, a continuous loop steel cable
- Impact Speed (Max) : 85 km/h @ 3500kg
- Speed Accuracy : +0.25 km/h
- Track Length : 110m
- Acceleration range: 0.1g to 0.5

❖ HIGH SPEED CAMERAS

- Off- Board Cameras : 14Nos. (Min 1280 X 800 resolution @ 1000 fps)
- On- Board Cameras : 6Nos. (Min. 1280 X 800 resolution @ 1000 fps)

❖ UNDERBODY CAMERA PITS

- Deep photo pits (6m x 3m x 3m) for capturing under body view for frontal & side crashes

❖ High Speed Lights

- KHS (8KW@200%), 150,000 lux: 20Nos (On- Frame Movable lights)
- On-Board Lights : - HMI Lights (0.25KW): 4Nos and LED (28,000 lumens): 4No

❖ Static Rollover

- Post-test fuel leakage Evaluation

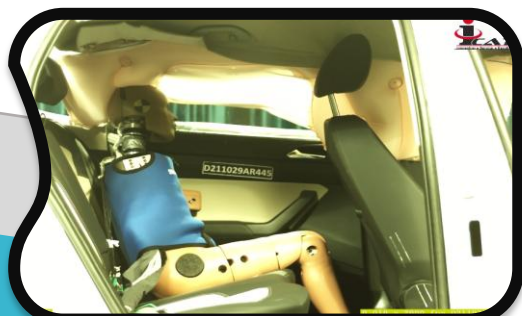
❖ 3D Dummy positioning System & 3D Coordinate Measurement Machine

- Used for Dummy positioning system inside the vehicle
- Pre and Post Test CMM for Deformation Measurement

SLED FACILITY

❖ SLED TROLLEY AND DECELERATOR UNIT SPECIFICATION

S. No.	Parameter	Specifications
1	SLED SIZE	2m(w) x 3m(l) Large enough to accommodate large BIWs
2	PEAK FORCE	1000KN (225,000 lb)
3	STROKE	1.9m (74in)
4	PEAK G	90g
5	MAXIMUM VELOCITY	85 kmph
6	MAXIMUM PAYLOAD	1200kg (2640lbs)
7	MAXIMUM JERK RATE	3.0g/msec (rise) 2.0g/msec (decay)
8	Accuracy from predicated to acquired value	+3%



❖ HIGH SPEED LIGHTS

- KHS On-frame Movable Lights (8KW @200%), 150,000 lux : 8Nos
- On-Board Lights : - HMI Lights (0.25KW): 4Nos and LED (28,000 lumens): 4Nos

❖ HIGH SPEED CAMERAS

- ❖ Off-Board Cameras: 3Nos. (Min.1280 x 800 resolution @ 1000fps)

❖ DATA ACQUISITION SYSTEM

- Kistler Data Acquisition System : 32 channels * 3 units = 96 channels

PEDESTRIAN PROTECTION TEST FACILITY

❖ Maximum Vehicle Dimension for Test :

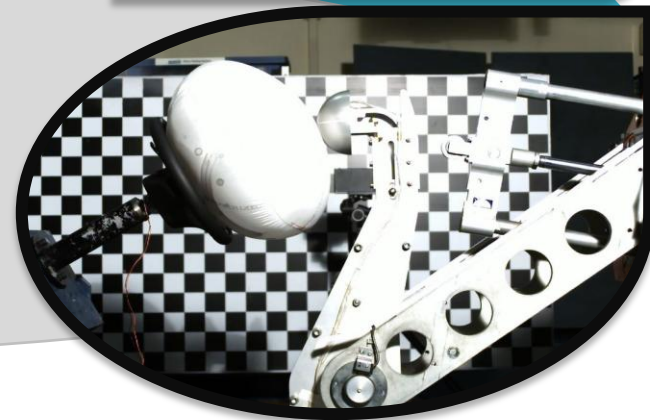
- ❑ Width : 2.8m, Height up to windscreen : 2.5m
- ❑ Height up to front bonnet : 1.25m , Weight : 3500kg
- ❑ Including all M1 category vehicles & N1 category derived from M1

❖ Maximum Impact Speed : 54 km/h (40kmph is regulatory / NCAP test speed)

❖ Impactors Calibration Facility / 3D Measurement equipment in built

❖ Impactors Available at lab –

- Adult Head form WG17(4.8kg)/Adult Head form ISO (4.5kg)/ Child Head form WG17/ISO (3.5kg)/ Flex PLI GTR 9/ TRL Lower Legform /Upper Legform /Free Motion Headform
- Body Block/Guided Head form/ECE R21 Pendulum
- Disc Impactor / Knee Impactor



STATIC AIRBAG DEPLOYMENT TEST FACILITY

- ❖ Dual Stage Capability
- ❖ 10 to 100ms delay between two stages
- ❖ Temperature range : -40°C to 110°C
- ❖ Output current and Voltage Range : 0.5A to 5A, upto 30V
- ❖ Resistance Measurement/Programmable Squib Pulse
- ❖ Firing Accuracy : less than 1ms

MISUSE ABUSE TEST FACILITY

❖ STATIC TEST

Door Slam, Door Fitment, Hammer Blow, Mallet Blow, Seat Adjustment, Horn Blow etc. and customer specific.

❖ DYNAMIC TEST

- **Road Conditions Tests** - Belgian Pave, Corrugated track, Random track, Herringbone, Gravel & Off road track, etc.
- **Obstacles Hit Tests** - Curb hit, Ramp jump, Ditch drop, Deer hit, Railway crossing etc and customer specific.

CRASH TEST DUMMIES WITH CALIBRATION LAB

FRONTAL IMPACT DUMMIES

- ❖ Hybrid III AM 50 - 4Nos.
- ❖ Hybrid III AF 5 - 1No.
- ❖ Hybrid III AM 95 - 1No.

SIDE IMPACT DUMMIES

- ❖ ES II - 2Nos.
- ❖ ES II- Re - 1No.
- ❖ SID-IIs - 1No.

REAR IMPACT DUMMY

- ❖ BioRID-II - 1No.

CHILD DUMMY

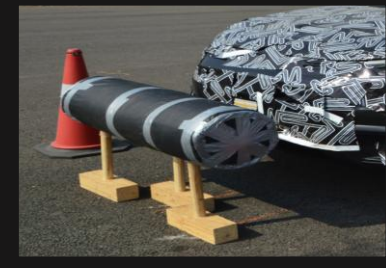
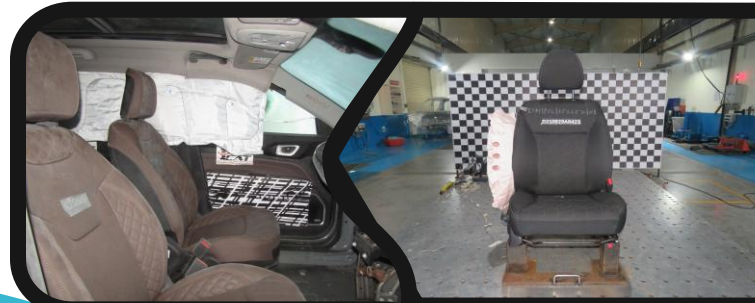
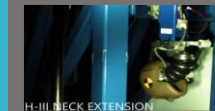
- ❖ Family Q : Q0,Q3/4, Q1.5,Q3,Q6,Q10- 1 Set
- ❖ P3 - 1No.

R16 MAIKIN (SEAT BELT DYNMAIC TEST)

- ❖ ECE R16 Manikin - 5No.

COMPLIANCE / LAB ACCREDITATION

- ❖ MORTH Notification S.O. 1139(E)
- ❖ VCA UK Accrediation
- ❖ ISO 17025 / NABL Accrediation



PASSIVE SAFETY LAB (PSL)

Email – psl.info@icat.in | Phone- +91-124-4586111| Website – www.icat.in

International Centre for Automotive Technology

Centre II - Plot No. 1, Sector-M- 11,HSIIDC,IMT Manesar, Gurugram- 122050,Haryana