

ECE R 21 & FMVSS201 Pendulum

**The stand alone solution for
instrument panel & similar impact testing**



- ◆ High stiffness pendulum structure (CAE optimized) for low vibration
- ◆ Excellent accuracy by rotating nitrogen piston
- ◆ No hydraulics means low maintenance cost & minimum downtime
- ◆ Low operating cost (\$1/Launch)
- ◆ Robust design for extended life and high reliability
- ◆ Fully controlled by Microsys SureFire Software

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System Description:

The pendulum system is designed to support the development of instrument panels or similar energy absorbing elements like seats, headliners and center-consols according to the regulations ECE-R21 and FMVSS 201. The acceleration of the ball head is measured by an accelerometer and evaluated against the test criteria of max. acceleration over 3 msec < 80g.

The system is propelled by a rotating piston powered by nitrogen. The advantage of using a rotating piston is a constant acceleration and therefore a higher speed accuracy than a linear driven pendulum.

The high stiffness of the impactor allows for excellent correlation to the CAE results of pendulum tests with very low harmonic noise.

A simulation model of the pendulum is available for customers.

Basic System Specifications:

- ⇒ Work and Control Medium: Bottled Nitrogen N2
- ⇒ Supply Pressure N2: Up to 16 Bar
- ⇒ Control System: B&R or Siemens
- ⇒ Required Power Supply: 3-phase AC 2.5kW
- ⇒ Standard Weight: Approx. 1000 kg

Load Cases:

- ⇒ ECE-R21, -R80, -R25
- ⇒ ECE R17
- ⇒ TRIAS 34
- ⇒ 74/60/EC
- ⇒ GB11552-2009
- ⇒ FMVSS 201
- ⇒ Similar Test



System Performance:

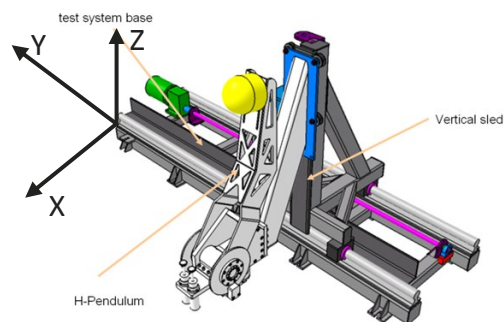
- ⇒ Weight of Impactor: 6.8 kg
- ⇒ Diameter of Impactor: 165mm
- ⇒ Speed at Impact: 18 - 25 km/h
- ⇒ Accuracy of Speed at Impact: ± 0.2 km/h
- ⇒ Accuracy of Impact Location: ± 5mm

Certified Quality:

The test system is certified by TÜV and will be delivered with the CE - mark. The pendulum test system is used by many OEM's for conformity of production testing, for vehicle engineering, self-certification and type approval.

Since 2012 Concept & Microsys combined forces inside the "Concept Tech Group" to supply the automotive industry from its global sales & support network. Our family of safety testing products & services includes airbag deployment, cold gas inflation, impactor launch, low speed crash devices and much more.....

Movement of System:



- ⇒ X-direction: possible on Customer request
 - ⇒ Y-direction: 2500 mm / accuracy < 0.1 mm
 - ⇒ Z-direction: 1000 mm / accuracy < 0.1 mm
- (All Travel can be modified to customer request)

Accessories:



An adjustable instrument panel test stand is used for mounting the instrument panel or other test specimen. It is adjustable longitudinally (e.g. on a T-slot base plate) as well as rotating the IP along around the Y-axis.

Control System & Data Analysis:

Like all Microsys products, the Pendulum Test System is controlled by the Microsys SureFire software. SureFire provides a common test platform for impactor and airbag testing, which reduces the time and cost for training of technical personal.

Microsys PowerPlay software is implemented into SureFire as a powerful data analysis and data processing tool. It can be used for post processing and automated reporting. DIADEM can be optionally included.

SureFire can also be upgraded to manage high speed cameras and lighting, as well to provide data acquisition and facility safety management.



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