ADDITIUM
Multi E-Launcher

Designed for pedestrian, misuse, and component impact testing; the system includes a state-of-the-art E-launcher controlled by electrical linear motors technology and is integrated on a multifunctional frame structure capable of easy and efficient interchange between modules.

- Controlled by electrical linear motors technology
- Impact speed accuracy < 0.05 km/h
- Maximum velocity: 60 km/h
- Maximum propelled mass: 50 kg (free flight), 130 kg (guided)
- No need for pre-tests
- Silent operation and compact design



EUROAMERICA LLC | 7953 County Road 5 North | Rushsylvania, OH 43347 | USA | +1 (937) 407-7572

EUROAMERICA
TEST AND MEASUREMENT SOLUTIONS

Additional Information

E-Launcher Family	E-Launcher 1205	E-Launcher 0935	E-Launcher 1235	E-Launcher 1750	E-Launcher 0705
Max. Speed (m/s)	12.5 m/s (45 km/h)	9 m/s (32 km/h)	12 m/s (43 km/h)	17 m/s (61 km/h)	7 m/s (25 km/h)
Max. Impactor Weight (Free Flight)	6.8 kg	35 kg	35 kg	50 kg	5 kg
Max. Impact Weight (Guided)	-	50 kg	100 kg	130 kg	-
Energy	1,200 Jules	3,000 Jules	3,700 Jules	5,200 Jules	500 Jules
					

Control System
State-of-the-art modular, expandable, and robust control hardware architecture with a fanless embedded PC that utilizes a real-time operative system and a friendly user interface, opearated from a movable control stand. Integrated DAS, contact inputs and trigger outputs incuded.

Regulations
Pedestrian: ECE R127, European Directive 78/2009, 631/2009, EEVC-WG17, GTR No. 9, Euro NCAP, JNCAP, KNCAP, US NCAP, C-NCAP, ANCAP, Japan Article 18 A99, AIS 100
Guided Head: ECE R12, FMVSS 201/203, GB11557
Body Block: ECE R12, FMVSS 203, GB 11557
Head Form Pendulum: ECE R21, FMVSS 201/202A, ECE R17, ECE R25, ECE R80, TRIAS 20, GB 11552
Free Motion Head Form (FMH): FMVSS 201U
Ejection Mitigation: FMVSS 226
Knee Impact & Misuse Test

Linear Motors vs. Hydraulics

General

A linear actuator is the generic name for a device able to accelerate a mass ("impactor") up to a target speed in a controlled way. Usually, this propulsion event occurs in a linear guided path up to the point where the impactor is released either in a free flight or still guided final free run at target speed.

The technologies for linear actuator systems have been in evolution during the last years. Old days, open loop pneumatics systems were replaced by close loop hydraulic systems for accuracy improvement. However, in the present, the improvements in the digital power electronics control bring actuators controlled by Linear Motors as a real and affordable option with many advantages. Therefore, linear motors is the technology selected by ADDITIUM for its new family of launchers.

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Comparison Table

This table compares the two technologies: Linear Motor (LM) versus Hydraulic based linear actuators and explains the advantages of modern application of electric systems.

Feature	Linear Motor Actuator	Hydraulic Actuator
Acceleration during propulsion	Mean acceleration is lower, protecting impact shapes from high force peaks	High acceleration peaks that could influence impactors instrumentation
Controllability & Accuracy	Better controllability & accuracy due to the lower level acceleration propulsion impulse	More difficult controllability as propulsion distance is shorter and hydraulics non-linear effects requires better control tuning.
Repeatability	Higher repeatability as system is less influenced by external factors	Influenced by more factors that need to be controlled such as oil temperature, accumulator charge pressure, etc.

Maintenance	Less maintenance and operational costs	Higher maintenance costs due to the hydraulics (filter, seals, oil replacement, etc.)
Noise	Less noise	Noise is higher due to the pump operation
Propeller Force	Lower maximum force	Higher peak force, adequate for heavy impactors
Occupied Space	Less occupied space	More space needed around for the pump system, accumulators, and hoses
Power Demand	Peak electric power demand is higher v	Lower electric power demand as energy is stored in accumulators before each launch
Flexibility	Able to perform other types of tests due to the controllability at low speed	Dynamic propellers cannot be used for lower speed accurate applications
Safety	There is no accumulator	The use of accumulators can cause accidents