

# Tarang Kinetics

## Entest Solutions Catalog

**Vibration Test Machine**

**Bump Test Machine**

**Shock Test Machine**

**Linear Acceleration Machine**



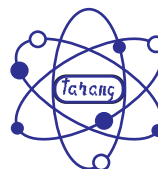
**Tarang Kinetics** is a leading destination for environmental testing solutions since 1995. With a glorious history of more than 27 years of excellence in the manufacturing of various Environmental Testing Solutions such as Electrodynamic Vibration Shaker System, Bump Test Machine, Shock Test Machine, Centrifuge Machine for Acceleration as per Customer's stringent application requirement to test every/any end-product under simulated environment in laboratory. Using our testing solutions at the Design and Production phase provides the confidence that our customers need to develop highly reliable products. Tarang has progressed to become a pioneer in delivering comprehensive testing capabilities with accuracy and reliability. Tarang has always been acknowledged for its excellence.

**We have been indigenously manufacturing these systems and making INDIA stronger.**

**MAKE IN INDIA**

We are empowered with a competent production team, whose extensive experience and technical expertise makes us the top choice of leading industries. Tarang follows a strong customer-focused approach by delivering tailored solutions to suit the exact application needs of our clients. Providing exceptional customer service that meets and exceeds their expectations remains at the core of our business. Our R&D facility is in constant efforts of expanding our product line to meet the ever increasing application demands of our customers.

**Because testing matters**, it's our focus. Testing can distinctly differentiate a machine and deliver a marketplace advantage by improving its performance. This translates to overall increased reliability and efficiency of your products. Testing also represents endless possibilities for innovation. We have always understood this potential, and thus, have kept testing at our core, relentlessly developing testing solutions that offer precise simulation of the test environment.



### Innovation

Tarang Kinetics provides creative solutions to suit the exact application needs of our customers with reliable performance and operation of our products. Our continuous R&D effort leads our way to creating better solutions.

### Indigenization

We take pride being involved in "making INDIA stronger" We have indigenously developed these machines and have optimized our solutions understanding the requirement of the Indian market.

### Integrating Standard and Custom products

The optimal solution is often not clear-cut. Being an OEM, our expertise in this field allows us to modify standard products or develop totally custom solutions across our whole product portfolio, so that we can cater to the exact requirement of our customers. Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS 55555 & ASTM etc.

### Vision

TKPL aims to be most competitive and leading solution provider in all the fields of our activities by providing our customers with the best in class solutions.

### Our Core Values

Excellence driven by dedication and commitment  
Innovation and Kaizen  
Customer service and care  
Respect for each individual  
Courage and faith



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## Expert Environmental Testing Solutions





# Vibration Test Machine

## Electro-Dynamic Shaker

Our system consists of Drive Coil (Armature) positioned in direct current magnetic field excited by alternating current signal generated by Digital Power Amplifier. This generates a force making the drive coil to move as per the magnitude and frequency of the signal. This vibratory force is applied on the objects/specimens mounted on Shaker platform. The armature assembly utilize modern armature suspension systems which is Rolling strut type featuring low transverse motion.

Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS 55555 & ASTM etc.

## Vibration Test Force Calculations

$$F = m \times a \quad \text{-----} \quad \text{Formula 1}$$

$$a = \frac{2 \pi f v}{9800} \quad \text{-----} \quad \text{Formula 2}$$

$$v = \pi f d \quad \text{-----} \quad \text{Formula 3}$$

Where

F = Force in 'Kgf'

m = Mass in 'Kg'

a = Acceleration in 'g' unit (peak)

v = Velocity in mm/s (peak)

d = Displacement in mm (peak-peak)

f = Frequency in Hz.

## Power Amplifier

The Digital Power Amplifier is a MOSFET/IGBT based Modular Type Class-D Switching interlocked with the shaker. Digital Amplifier Controller is a microcontroller, colour touch screen based user-friendly interface equipped with self-diagnostic, calibration and protection features which gets the input signal from vibration controller and controls the alternating current amplitude and frequency accordingly.

The remote operation module can be optionally used to remotely operate the complete Vibration Test System.



Vibration Testing Machine



## Vibration Controller

The Digital Vibration controller is used to simulate actual field vibration conditions at test laboratory in a controlled manner so as to reproduce the same vibration atmosphere.

The controller is capable of full control and analysis applications for sine, resonance & dwell, random, classical shock, random-on-random, sine-on-random, shock SRS, vibro-shock and field data replication.

## Head Expander and Slip Tables

Our range of wide variety of head expanders and sliptables provides various possibilities to increase the effective mounting surface and orientation of the direction of test.

Mg Alloy is used for the construction of head expanders and sliptables to ensure minimal weight thereby being more suitable to the existing force of the system.

### Advantages for you

Customizable Reliable Solutions

### Key features

- Long stroke with displacement up to 76 mm
- High Velocity with velocity up to 2.4 m/s
- Low mass, Magnesium Alloy Armature Structure
- Various safety interlocks for safe Operation
- Capable to perform tests in accordance with Various standards eg. IS, MIL,D IN, ISO, EN, IEC, Def , JSS 55555 & ASTM etc.

Efficient performance

- PC based Remote Operation of Power Amplifier
- Auto-Resume from power failure
- Optional Green Amplifier with Variable Field
- Robust rolling struct suspension
- Efficiency is greater than 92%
- High Signal to noise ratio
- Auto Centring of Armature
- Self-Lubricating Armature Guidance Bearing

User Friendly

- Touch Screen based Digital Amplifier Controller
- Trunion mounted shaker for easy integration with slip Table for X-Y Axis Testing
- Modular in design for easy and quick operation
- Body Isolation using Air Bellows for Vibrations from Shaker

Universal Compatibility

- Compatible with all worldwide controllers
- Integration with Environmental Chamber

## Vibration Test System standard models

Model	TEDV-400	TEDV-600	TEDV-1000	TEDV-1500
Performance Parameters				
Sine Force (Peak)	400 Kgf	600 Kgf	1000 Kgf	1500 Kgf
Random Force	280 Kgf	420 Kgf	1000 Kgf	1500 Kgf
Shock Force	800 Kgf	1200 Kgf	2000 Kgf	3000 Kgf
Max Acceleration Bare Table (Sine)	50 g	75 g	75 g	90 g
System Velocity (Sine Peak)	1.8 m/s	1.8 m/s	1.8 m/s	1.8 m/s
System Velocity (Shock Peak)	2.4 m/s	2.4 m/s	2.4 m/s	2.4 m/s
Max Displacement (pk to pk)	38 / 51 mm	38 / 51 mm	38 / 51 mm	38 / 51 mm
Axial Resonance ( ± 5%)	3200 Hz	3200 Hz	2800 Hz	2800 Hz
Useful Frequency Range	5 to 3500 Hz	5 to 3500 Hz	5 to 3200 Hz	5 to 3200 Hz
Shaker Parameters				
Mass of Armature	8 Kgs	8 Kgs	13 Kgs	17 Kgs
Size of Armature (dia)	180 mm	180 mm	240 mm	240 mm
Suspension Axial Stiffness	3.2 kg/mm	3.2 kg/mm	5 kg/mm	5 kg/mm
Suspension Cross-Axial Stiffness	250 kg/mm	250 kg/mm	300 kg/mm	300 kg/mm
Insert Pattern (M8 / M10)	Center – 1 100pcd – 4 141.4pcd – 4	Center – 1 100pcd – 4 141.4pcd – 4	Center – 1 100pcd – 4 141.4pcd – 4 200pcd – 4	Center – 1 100pcd – 4 141.4pcd – 4 200pcd – 4
Payload Capacity	150 Kgs	150 Kgs	225 Kgs	250 Kgs
Stray magnetic field (150mm above table)	<2 mT	<2 mT	<1.5 mT	<1.5mT
Cooling blower	700 cfm	700 cfm	1200 cfm	1200 cfm
Shaker Mass	900 kgs	950 kgs	1600 kgs	1600 kgs
Dimensions (mm)	720*500*790	720*500*790	1000*650*860	1000*650*860
Utilities required	4-6 bar compressed air, earthing			
Power Amplifier Characteristics				
THD (resistive Load)	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Signal to noise ratio	> 75 dB	> 75 dB	> 75 dB	> 75 dB
Power efficiency	> 92%	> 92%	> 92%	> 92%
Input Impedance	10 Kohm	10 Kohm	10 Kohm	10 Kohm
Input sensitivity	4Vrms, compatible with all standard controllers			
Power Requirement (3 Phase)	17 KVA	20 KVA	25 KVA	30 KVA
Protection interlocks	Over Current, Over Voltage, Under Voltage, Module Failure, Cooling Interlock, Over Temperature Amplifier & Shaker, Current Limit, loss of input phase etc			
Vibration Controller				
Standard Software	Swept Sine, Random, Classical Shock, Resonance Search Track & Dwell			
Optional Software	Random on Random, Sine on Random, Shock Response Spectrum, Transient Time history etc			
No Of Channels	4 Channels upgradable upto 16 channels			

**Note** – Customized Solutions are available

## Vibration Test System standard models

Model	TEDV-2000	TEDV-2500	TEDV-3000	TEDV-3500
Performance Parameters				
Sine Force (Peak)	2000 Kgf	2500 Kgf	3000 Kgf	3500 Kgf
Random Force	2000 Kgf	2500 Kgf	3000 Kgf	3500 Kgf
Shock Force	4000 Kgf	5000 Kgf	6000 Kgf	7000 Kgf
Max Acceleration Bare Table (Sine)	80 g	100 g	85 g	100 g
System Velocity (Sine Peak)	1.8 m/s	1.8 m/s	1.8 m/s	1.8 m/s
System Velocity (Shock Peak)	2.4 m/s	2.4 m/s	2.4 m/s	2.4 m/s
Max Displacement (pk to pk)	51 / 76 mm	51 / 76 mm	51 / 76 mm	51 / 76 mm
Axial Resonance ( ± 5%)	2700 Hz	2700 Hz	2600 Hz	2600 Hz
Useful Frequency Range	5 to 3000 Hz	5 to 3000 Hz	5 to 2800 Hz	5 to 2800 Hz
Shaker Parameters				
Mass of Armature	25 Kgs	25 Kgs	35 Kgs	35 Kgs
Size of Armature (dia)	300 mm	300 mm	360 mm	360 mm
Suspension Axial Stiffness	8 kg/mm	8 kg/mm	8 kg/mm	8 kg/mm
Suspension Cross-Axial Stiffness	400 kg/mm	400 kg/mm	400 kg/mm	400 kg/mm
Insert Pattern (M10 / M12)	Center – 1 141.4pcd – 4 200pcd – 4 250pcd – 8	Center – 1 141.4pcd – 4 200pcd – 4 250pcd – 8	Center – 1 141.4pcd – 4 200pcd – 4 300pcd – 8	Center – 1 141.4pcd – 4 200pcd – 4 300pcd – 8
Payload Capacity	350 Kgs	350 Kgs	375 Kgs	375 Kgs
Stray magnetic field (150mm above table)	<1 mT	<1 mT	<1 mT	<1 mT
Cooling blower	1500 cfm	1500 cfm	1800 cfm	1800 cfm
Shaker Mass	3200 kgs	3200 kgs	3500 kgs	3500 kgs
Dimensions (mm)	1350 *825*1100	1350 *825*1100	1420*885*1165	1420*885*1165
Utilities required	6-7 bar compressed air, earthing			
Power Amplifier Characteristics				
THD (resistive Load)	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Signal to noise ratio	> 75 dB	> 75 dB	> 75 dB	> 75 dB
Power efficiency	> 92%	> 92%	> 92%	> 92%
Input Impedance	10 Kohm	10 Kohm	10 Kohm	10 Kohm
Input sensitivity	4Vrms, compatible with all standard controllers			
Power Requirement (3 Phase)	45 KVA	50 KVA	55 KVA	60 KVA
Protection interlocks	Over Current, Over Voltage, Under Voltage, Module Failure, Cooling Interlock, Over Temperature Amplifier & Shaker, Current Limit, loss of input phase etc			
Vibration Controller				
Standard Software	Swept Sine, Random, Classical Shock, Resonance Search Track & Dwell			
Optional Software	Random on Random, Sine on Random, Shock Response Spectrum, Transient Time history etc			
No Of Channels	4 Channels upgradable upto 16 channels			

**Note** – Customized Solutions are available



## Vibration Test System standard models

Model	TEDV-4000	TEDV-5000	TEDV-6000	TEDV-7000
Performance Parameters				
Sine Force (Peak)	4000 Kgf	5000 Kgf	6000 Kgf	7000 Kgf
Random Force	4000 Kgf	5000 Kgf	6000 Kgf	7000 Kgf
Shock Force	8000 Kgf	10000 Kgf	12000 Kgf	14000 Kgf
Max Acceleration Bare Table (Sine)	80 g	100 g	100 g	100 g
System Velocity (Sine Peak)	1.8 / 2.4 m/s	1.8 m/s	1.8 m/s	1.8 m/s
System Velocity (Shock Peak)	2.4 m/s	2.4 m/s	2.4 m/s	2.4 m/s
Max Displacement (pk to pk)	51 / 76 mm	51 / 76 mm	51 / 76 mm	51 / 76 mm
Axial Resonance ( ± 5%)	2100 Hz	2100 Hz	2100 Hz	2100 Hz
Useful Frequency Range	5 to 2400 Hz	5 to 2300 Hz	5 to 2100 Hz	5 to 2000 Hz
Shaker Parameters				
Mass of Armature	50 Kgs	50 Kgs	60 Kgs	70 Kgs
Size of Armature (dia)	440 mm	440 mm	440 mm	460 mm
Suspension Axial Stiffness	15 kg/mm	15 kg/mm	15 kg/mm	15 kg/mm
Suspension Cross-Axial Stiffness	500 kg/mm	500 kg/mm	500 kg/mm	500 kg/mm
Insert Pattern (M10 / M12)	Center – 1 200pcd – 8 400pcd – 8	Center – 1 200pcd – 8 400pcd – 8	Center – 1 200pcd – 8 400pcd – 8	Center – 1 200pcd – 8 400pcd – 8
Payload Capacity	600 Kgs	600 Kgs	600 Kgs	600 Kgs
Stray magnetic field (150mm above table)	<1 mT	<1 mT	<1 mT	<1 mT
Cooling blower	2000 cfm	3000 cfm	3000 cfm	3500 cfm
Shaker Mass	5400 kgs	5600 kgs	5800 kgs	6000 kgs
Dimensions (mm)	1600*980*1240	1600*980*1240	1600*980*1240	1700*1080*1340
Utilities required	6-7 bar compressed air, earthing			
Power Amplifier Characteristics				
THD (resistive Load)	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Signal to noise ratio	> 75 dB	> 75 dB	> 75 dB	> 75 dB
Power efficiency	> 92%	> 92%	> 92%	> 92%
Input Impedance	10 Kohm	10 Kohm	10 Kohm	10 Kohm
Input sensitivity	4Vrms, compatible with all standard controllers			
Power Requirement (3 Phase)	80 KVA	90 KVA	110 KVA	130 KVA
Protection interlocks	Over Current, Over Voltage, Under Voltage, Module Failure, Cooling Interlock, Over Temperature Amplifier & Shaker, Current Limit, loss of input phase etc			
Vibration Controller				
Standard Software	Swept Sine, Random, Classical Shock, Resonance Search Track & Dwell			
Optional Software	Random on Random, Sine on Random, Shock Response Spectrum, Transient Time history etc			
No Of Channels	4 Channels upgradable upto 16 channels			

**Note** – Customized Solutions are available

## Vibration Test System standard models

Model	TEDV-9000	TEDV-12000	TEDV-16000	TEDV-20000
Performance Parameters				
Sine Force (Peak)	9000 Kgf	12000 Kgf	16000 Kgf	20000 Kgf
Random Force	9000 Kgf	12000 Kgf	16000 Kgf	20000 Kgf
Shock Force	18000 Kgf	24000 Kgf	32000 Kgf	40000 Kgf
Max Acceleration Bare Table (Sine)	100 g	100 g	100 g	100 g
System Velocity (Sine Peak)	1.8 m/s	1.8 m/s	1.8 m/s	1.8 m/s
System Velocity (Shock Peak)	2.4 m/s	2.4 m/s	2.4 m/s	2.4 m/s
Max Displacement (pk to pk)	51 / 76 mm	51 / 76 mm	51 / 76 mm	51 / 76 mm
Axial Resonance ( ± 5%)	1800 Hz	1700 Hz	1700 Hz	1700 Hz
Useful Frequency Range	5 to 2000 Hz	5 to 2000 Hz	5 to 2000 Hz	5 to 2000 Hz
Shaker Parameters				
Mass of Armature	90 Kgs	120 Kgs	160 Kgs	200 Kgs
Size of Armature (dia)	460 mm	590 mm	590 mm	590 mm
Suspension Axial Stiffness	8 kg/mm	10 kg/mm	10 kg/mm	10 kg/mm
Suspension Cross-Axial Stiffness	2200 kg/mm	3200 Kgs	3200 kg/mm	3500 kg/mm
Insert Pattern (M10 / M12)	Center – 1 200pcd – 8 400pcd – 8	Center – 1 200pcd – 8 400pcd – 8 550pcd – 8	Center – 1 200pcd – 8 400pcd – 8 550pcd – 8	Center – 1 200pcd – 8 400pcd – 8 550pcd – 8
Payload Capacity	2000 Kgs	2000 Kgs	2000 Kgs	2000 Kgs
Stray magnetic field (150mm above table)	<1 mT	<1 mT	<1 mT	<1 mT
Cooling	Water Cooling based system including storing, circulating and cooling distilled water			
Shaker Mass	8500 kgs	11500 kgs	15500 kgs	19800 kgs
Dimensions (mm)	1800*1100*1350	1900*1200*1450	2000*1200*1550	2500*1350*1550
Utilities required	6-7 bar compressed air, earthing, DM water			
Power Amplifier Characteristics				
THD (resistive Load)	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Signal to noise ratio	> 75 dB	> 75 dB	> 75 dB	> 75 dB
Power efficiency	> 92%	> 92%	> 92%	> 92%
Input Impedance	10 Kohm	10 Kohm	10 Kohm	10 Kohm
Input sensitivity	4Vrms, compatible with all standard controllers			
Power Requirement (3 Phase)	220 KVA	300 KVA	400 KVA	500 KVA
Protection interlocks	Over Current, Over Voltage, Under Voltage, Module Failure, Cooling Interlock, Over Temperature Amplifier & Shaker, Current Limit, loss of input phase etc			
Vibration Controller				
Standard Software	Swept Sine, Random, Classical Shock, Resonance Search Track & Dwell			
Optional Software	Random on Random, Sine on Random, Shock Response Spectrum, Transient Time history etc			
No Of Channels	4 Channels upgradable upto 16 channels			

**Note** – Customized Solutions are available

## Vibration Integrated Chamber

The Integrated system are meant for applications that demand accelerated multi environment test systems. The integrated testing ascertains the reliability and endurance of the test units by simulating environmental conditions as they are. The vibrations shaker slips over the rail guide and combines with the chamber.

Both the systems can be used in integrated configuration else both systems can be utilized individually as well. These are customizable solutions and as per the exact requirement of the customer the system parameters of the Integrated system can be configured.



Combined Vibration (2000Kgf) & Temperature Chamber of -70°C to +120°C

## Digital Amplifier Controller

We have incorporated an ARM9 microcontroller, colour touch screen based Digital amplifier Controller to control the Power Amplifier of the Vibration Test System. This makes the operation of the system very user friendly and at the same time enhances the control and operational safety parameters of the system.

It incorporates a calibration menu for quick and easy calibration of the system



Touchscreen User Interface of Digital Amplifier Controller

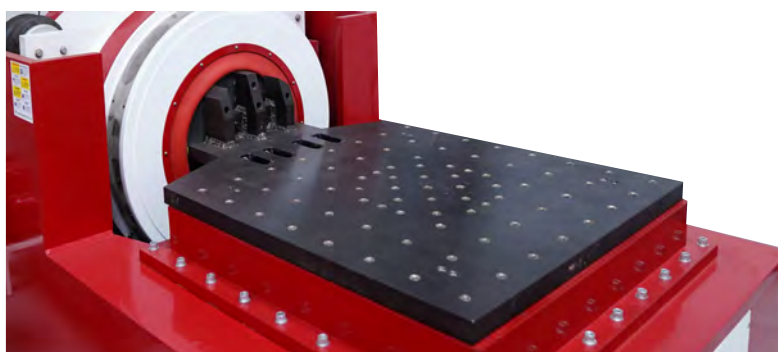


## HORIZONTAL SLIP TABLE

'TARANG' Combo Base Horizontal Slip Table eliminates the necessity for supporting test specimens by complicated flexures and permits simplified transnational motion for testing the components in both horizontal axes X & Y, without disturbing the orientation of tests objects.

Model	THST-4040	THST-6060	THST-8080	THST-1010	THST-1212	THST-1515
Size (mm)	400 x 400	600 x 600	800 x 800	1000 x 1000	1200 x 1200	1500 x 1500
Insert Pattern (M10/M12)	50 x 50mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix
Weight	20 Kgs	40 Kgs	80 Kgs	130 Kgs	180 Kgs	240 Kgs

**Note** – Customized Sizes are available



Horizontal Slip-Table (X,Y - Axis Testing)

Head Expander (Z-Axis Testing)



## HEAD EXPANDER / VERTICAL LOAD SUPPORT

Tarang Head expander is an attachment that increases your loading options of your vibration shaker system that enables it to mount larger or multiple test objects. These come in three standard shapes - circular, rectangular and square. Head expander provides a larger surface mounting area for an occasional test object that is bigger in size than the limiting dimensions specified for your shaker system.

Model	THE-4040	THE-6060	THE-8080	THE-1010	THE-1212	THE-1515
Size (mm)	400 x 400	600 x 600	800 x 800	1000 x 1000	1200 x 1200	1500 x 1500
Insert Pattern (M10/M12)	50 x 50mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix	100x100mm matrix
Weight	25 Kgs	44 Kgs	85 Kgs	140 Kgs	220 Kgs	330 Kgs

**Note** – Customized Sizes are available

# Bump Test Machine

## Free Fall type

This machine can be used for testing of test objects having weight from 50 Kg to 2000 Kg, with Acceleration from 3 "g" to 60 "g" & pulse duration from 3 ms to 20 ms. The machine is intended to reproduce the effects of repetitive bumps 60 to 180 bumps per minute likely to be experienced by components and equipment during transportation or when installed in various classes of vehicles. The machine is mounted on air springs and heavy duty shockers are also used to isolate it from the ground.

## Force fall type

Customized robust steel structure that enables it to be used for testing of test objects having weights from 50 Kg to 2000 Kg, Acceleration from 3 "g" to 200 "g" & pulse duration from 3 ms to 30 ms. The object mounting hole pattern of the platform is 100 X 100mm matrix or as desired by the customer. An optional T-slot for mounting of test objects is also provided.

Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS 55555 & ASTM etc.



Bump Test Machine  
500 Kg Payload capacity

The mounting platform is lifted vertically through a Cam arrangement and is made to drop freely / forcefully on the Elastomer pad (Half-Sine Programmer Pad) placed on the anvil which provides the required acceleration level. The desired impact acceleration can be obtained by adjusting the drop height of the mounting platform. Elastomer pads are used to produce half-sine pulses, duration of pulse can be adjusted by changing the hardness and thickness of the rubber pads.

## Advantages for you

Customizable Reliable Solutions

## Key features

- Heavy duty structure
- Standard 4-channel signal conditioner upgradable to 16-channel
- Adjustable drop height
- Adjustable Acceleration and pulse duration
- Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS 55555 & ASTM etc.

Efficient performance

- Bump tests in accordance with various international standards
- Highly accurate repeatability
- Ground is isolated from bumps generated
- Various safety interlocks for safe operation

User Friendly

- PC based control, monitoring and waveform analysis
- Report generation feature

## Bump Test Machine standard models

	<b>TBTM - 6060</b>	<b>TBTM - 7575</b>	<b>TBTM - 1005</b>	<b>TBTM - 1010</b>	<b>TBTM - 6060F</b>
<b>Type</b>	Free Fall	Free Fall	Free Fall	Free Fall	Force Fall
<b>Table Size</b>	600 x 600 mm	750 x 750 mm	1000 x 1000 mm	1000 x 1000 mm	600 x 600 mm
<b>Payload Capacity</b>	200 Kgs	350 kgs	500 kgs	1000 kgs	500 kgs
<b>Payload Height</b>	unlimited	unlimited	unlimited	unlimited	unlimited
<b>Max Payload Size</b>	600 x 600 mm	750 x 750 mm	1000 x 1000 mm	1000 x 1000 mm	600 x 600 mm
<b>Acceleration*</b>	3-60 g	3-60 g	3-60 g	3-60 g	3-200 g
<b>Pulse Duration*</b>	3-18 ms	3-18 ms	3-18 ms	3-18 ms	3-30 ms
<b>Pulse Shape</b>	Half-Sine	Half-Sine	Half-Sine	Half-Sine	Half-Sine
<b>Standard Test**</b>	3'g' – 10'ms' 7'g' – 10'ms' 20'g' – 11'ms' 30'g' - 6'ms' 40'g' - 6'ms'				20'g' – 11'ms' 40'g' - 6'ms' 50'g' – 18'ms' 100'g' – 6'ms' 200'g' – 3'ms'
<b>Bump Rate</b>	1-3 bumps/sec	1-3 bumps/sec	1-3 bumps/sec	1-3 bumps/sec	1-3 bumps/sec
<b>Max Drop Height</b>	50 mm	50 mm	50 mm	50 mm	50 mm
<b>Max Deviation of specimen from table centre</b>	15 mm	15 mm	20 mm	20 mm	15 mm
<b>Machine Mass</b>	2700 kgs	3000 kgs	3500 kgs	4000 kgs	4800 kgs
<b>Dimensions (mm)</b>	1500x1500x950	1500x1500x950	1600x1600x1000	1600x1600x1000	1500x1500x1000
<b>Utilities required</b>	6-7 bar compressed air, Earthing, 3-phase Power				
<b>Safety Interlocks</b>	Mains Input Over & Under Voltage, Phase drop, programmer pad change protection, over travel				

\* Higher 'g' at lower 'ms' and lower 'g' at higher 'ms'

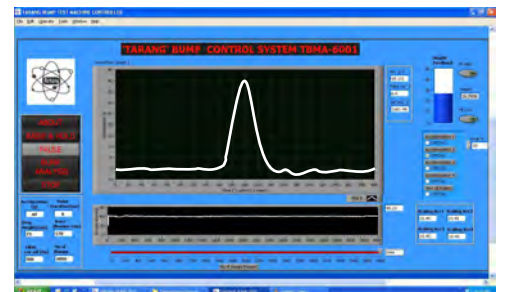
\*\* Various other bump tests can be conducted other than the ones listed above

**Note** – Customized Solutions are available

## Bump Monitoring and Control System

Tarang make Digital Bump Monitoring System, Model - TBMA 6001 is a PC based intelligent instrumentation for on-line control & monitoring of bump vibration severity on an object mounted on Tarang make BUMP Test Machine, which is easy to operate and to set useful input parameters. All relevant parameters viz. pulse height (acceleration), pulse duration, corresponding velocity change, Bump counts are displayed on screen in numerical format for all the four channels simultaneously.

Tarang make BUMP Test Machine, which is easy to operate and to set useful input parameters. All relevant parameters viz. pulse height (acceleration), pulse duration, corresponding velocity change, Bump counts are displayed on screen in numerical format for all the four channels simultaneously.



Screenshot of Bump Test Machine control and monitoring system



# Shock Test Machine

The machine is fabricated with Mild steel of a very robust design to provide necessary mechanical strength and rigidity. The machine produces the shock pulses using compressed air to force the platform to impact on the elastomer pads (Half-Sine Programmer Pads) which are placed between the platform and anvil of the impact area to produce half-sine pulses, Lead pellets are placed to generate sawtooth pulses and pneumatic cylinders are used to generate square pulses. The drop height and the air pressure are responsible to generate the desired acceleration.

The lifting of the platform is done by pneumatic cylinders, the drop height is determined by the desired acceleration level. In a shock test due to the rebound action secondary shocks may occur, which are totally unacceptable by most of the test standards. Fail safe brakes are used as a rebound brake and as a quick release device to avoid secondary and tertiary shocks. The shock test machine is isolated from the ground by heavy duty shockers and shock absorbers. The Shock test machine is supported by a PC based intelligent Instrumentation system to control, monitor and analyse acquired shock test waveforms. The system has 4 channels to monitor the shock pulses generated which are expandable upto 16 channels.



Pneumatic Shock Test Machine  
500 Kg Payload capacity

## Advantages for you

Customizable Reliable Solutions

## Key features

- Heavy duty structure
- Adjustable drop height
- Standard 4-channel signal conditioner upgradable to 16-channel
- Adjustable Acceleration and pulse duration
- Use of Shock Amplifier can be made to increase the change in velocity & acceleration upto 30,000'g'
- Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS 55555 & ASTM etc.

## Efficient Performance

- Pneumatic operation with low maintenance requirement
- Fail safe brakes for no Secondary Shocks
- Shock Response Spectrum Analysis
- Highly accurate repeatability
- Ground is isolated from bumps generated
- PC based control, monitoring and waveform analysis
- Various safety interlocks for safe operation
- Report generation feature



Pneumatic Shock Test Machine  
1000 Kg Payload capacity

## Pneumatic Shock Test Machine standard models

Model	TSTS-4040HS	TSTS - 6060	TSTS - 7575	TSTS - 1005	TSTS - 1010
Table Size	400 x 400 mm	600 x 600 mm	750 x 750 mm	1000x1000 mm	1000x1000 mm
Payload Capacity	100 Kgs	200 Kgs	300 kgs	500 kgs	1000 kgs
Payload Height	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited
Max Payload Size	400 x 400 mm	600 x 600 mm	750 x 750 mm	1000x1000 mm	1000x1000 mm
Insert Pattern	50 x 50 mm Matrix	100x100 mm Matrix	100 x 100 mm Matrix	100 x 100 mm Matrix	100 x 100 mm Matrix
Stroke Length (Max)	400 mm	300 mm	350 mm	350 mm	450 mm
Velocity Change No load	7.7 m/s	7 m/s	7 m/s	10 m/s	15 m/s
Velocity Change Full Load	5.1 m/s	5 m/s	5 m/s	8 m/s	12 m/s
Standard Test*	3000'g'-0.3'ms'	20'g' – 11'ms'			
	1500'g'-0.5'ms'	30'g' – 20'ms'			
	100'g'- 6'ms'	40'g' – 6'ms'			
	50'g'- 11'ms'	50'g' – 11'ms'			
		50'g' – 18'ms'			
Tests with Shock Amplifier (Optional)	75'g' – 11'ms'				
	100'g' – 6'ms'				
	150'g' – 3'ms'				
Pulse Shape	175'g' – 3'ms'				
	200'g' – 3'ms'				
Tests with Shock Amplifier (Optional)	30,000 'g' with 1 Kg payload				
	10,000 'g' with 5 Kgs payload				
	5,000 'g' with 10 Kgs payload				
Pulse Shape	Half Sine				
	Optional – Sawtooth / Square wave / Trapezoidal Waveform				
Shock Rate	1-8 shocks/min	1-8 shocks/min	1-8 shocks/min	1-6 shocks/min	1-5 shocks/min
Max Deviation of specimen from table centre	30 mm	30 mm	30 mm	30 mm	30 mm
Machine Mass	4200 kgs	5000 kgs	6500 kgs	9500 kgs	19500 kgs
Dimensions (mm)**	1000*1000*1400	1200*1200*1500	1400*1400*1600	1600*1600*1700	2500*3000*2000
Utilities required	8-10 bar compressed air (1-2 m³/min) , earthing				
Safety Interlocks	Mains Input Over & Under Voltage, Phase drop, programmer pad change protection, over travel, Fail safe brake				

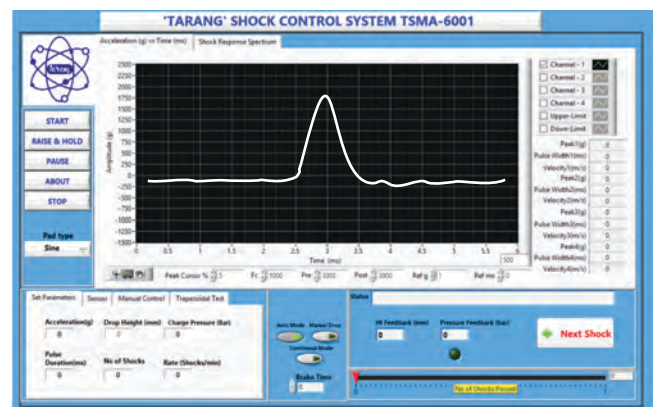
\* Higher 'g' at lower 'ms' and lower 'g' at higher 'ms' ; Various other bump tests can be conducted other than the ones listed above

\*\* Total dynamic height will increase after mounting test unit on platform and lifting for about 500 mm

**Note** – Customized Solutions are available

## PC Based Instrumentation System

PC based instrumentation system provides an easy control, monitoring and waveform analysis to be done. The control of the machine is very user friendly and incorporates various safety interlocks for safe operation of the machine. The test report of any test performed can be viewed and printed easily. The Shock Analysis software is specially designed for the analysis of waveforms generated. Shock Response Spectrum Analysis can also be done with this software.



Screenshot of Shock Test Machine control and monitoring system

# Centrifuge Machine for Acceleration

Tarang's Centrifuge Machine for Acceleration is used to analyze the mechanical behavior of parts and assemblies subjected to linear acceleration.

The centrifuge machine for acceleration has a robust structure that consists of an outer enclosure for safety point of view to withstand centrifugal force acting on the test object. It consists of a rotating platform with two mounting plates which can accommodate a wide variety of payloads, in various sizes and load at a required radial distance from centre to achieve the desired acceleration. The machine is driven by permanent magnet brushless servo motor. The speed of machine is varied by the PWM amplifier with instrumentation system having built-in digital closed loop control.

Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS-55555 & ASTM etc.

Tarang Linear Acceleration Machines are available from 1mG to 10000G / 1g-kg to 50000 g-kg of very high precision. Facility of visual monitoring of Unit under Test mounted on platform is through CCTV Electrical, electronic, Data transfer, RF, Pneumatic, Hydraulic connections are available for actual working conditions test environment.



Linear Acceleration Machine  
100g acceleration and 100Kg Payload capacity

Advantages for you	Key features
Customizable Reliable Solutions	<ul style="list-style-type: none"><li>• Rigid and robust structure</li><li>• Visual monitoring of Unit under test</li><li>• Electrical, Electronics, Pneumatic, Hydraulic terminals are available</li><li>• Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS-55555 &amp; ASTM etc.</li></ul>
Efficient performance	<ul style="list-style-type: none"><li>• Servo motor control for high accuracy</li><li>• Acceleration tests in accordance with IS, IEC, MIL-810, ASTM etc</li><li>• Various safety interlocks for safe operation</li></ul>
User Friendly	<ul style="list-style-type: none"><li>• PC based control and monitoring</li><li>• Easy programmable test parameters</li><li>• Upto 100 programmable steps</li></ul>



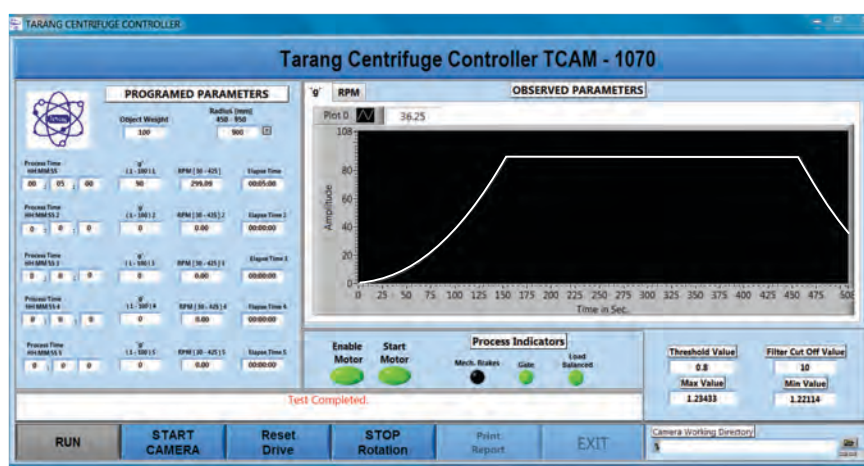
## Linear Acceleration Machine standard models

Model	TCAM - 250	TCAM - 500	TCAM - 1000	TCAM - 2500
<b>Acceleration Range</b>	1-50 'g'	1-100 'g'	1-100 'g'	1-200 'g'
<b>Nominal Radius</b>	300 mm	700 mm	750 mm	1250 mm
<b>Platform Radius range</b>	250-350 mm	500-900 mm	550-950 mm	750-1750 mm
<b>Payload size</b>	100 mm cube	400 mm cube	400 mm cube	1000 mm cube
<b>Payload Capacity</b>	50 Kg	50 Kg	100 Kg	250 Kg
<b>No of Test Profiles</b>	1-100	1-100	1-100	1-100
<b>Max speed</b>	550 rpm	350 rpm	350 rpm	400 rpm
<b>Speed resolution</b>	.01rpm	.01rpm	.01rpm	.01rpm
<b>Dimensions</b>	Dia – 800mm Height – 800mm	Dia – 2000mm Height – 2000mm	Dia – 2000mm Height – 2000mm	Dia – 3600mm Height – 2000mm
<b>Mass</b>	1500 Kg	2500 Kg	3000 Kg	5000 Kg
<b>Online Testing Connections (Slip Ring)</b>	Electrical, electronic, Data transfer, RF, Pneumatic, Hydraulic connections (Multiple connection configuration is available)			
<b>Utilities Required</b>	6-8 bar compressed air; 410V, 3-phase 50 Hz; earthing			
<b>Safety Interlocks</b>	Mains Input Over & Under Voltage, Phase drop, Door Lock, Imbalance Vibration			

**Note** – Customized Solutions are available

## PC Based Instrumentation System

Tarang Centrifuge Machine for Acceleration is supported by PC Based instrumentation system to control & monitor the test parameters. To make the system more versatile a suitably designed LABVIEW based GUI programme to control, monitor various parameters with data logging and data analysis features for setting rotation speed, acceleration "g", radius, test time cycle, unit mass etc as per the test application requirements. All safety interlocks e.g. Imbalance, door open etc are controlled & monitored via external PC with software. The software supports upto 100 programmable test profiles in a single test.



Screen shot of Centrifuge Machine for acceleration control and monitoring system

# Environmental Chamber

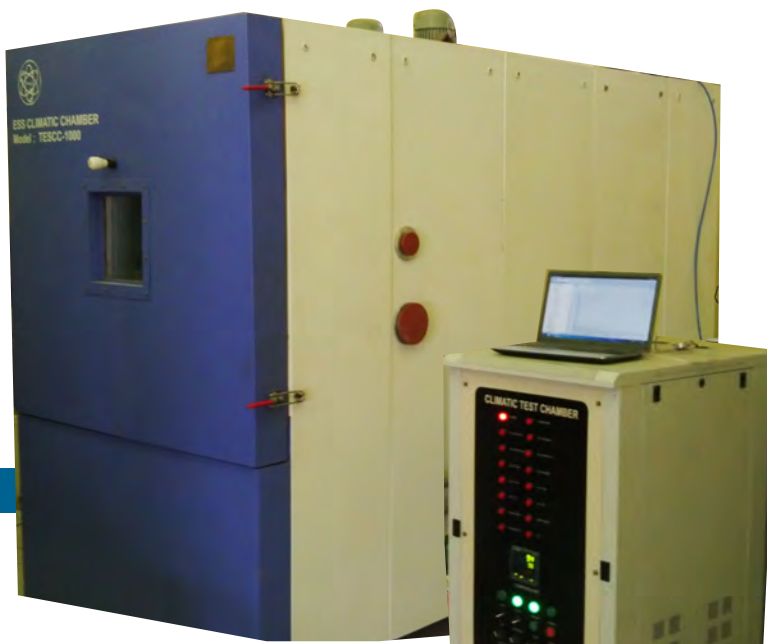
Tarang environmental chambers are used to simulate the desired environment such as Cold, Heat, humidity, altitude, thermal shock, solar radiation, salt spray, rain spray, dust & sand etc. as per the customer's requirement. These chambers are available in different ranges of parameters and capacities as per specific testing requirements of the customer. These chambers can be integrated with Vibration shaker systems as well to perform combined environment vibration tests. A walk-in variant is also available for products that require very large capacity & size such as complete automobile, bikes, missiles etc.

The Chambers feature various safety interlocks that are necessary to provide a safe environment of operation. We are incorporating the best

engineering practices to develop a Chamber that is capable of performing all types of versatile testing as per international standards for a long life of reliable performance. The design is very good and simple from maintenance point of view.

The Chamber Controller is very user friendly and as per the requirement of the customer it can be upgraded to a latest touch screen panel type as well. The controller is capable of remote operation and monitoring as well. It can easily be integrated with any computer to download / upload test profile or data using high speed communication RS 232/485, Ethernet and USB ports. The features of data recording, monitoring and report generation are also available.

Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS-55555 & ASTM etc.



Environmental Chamber  
(Temp Range -  $-60^{\circ}\text{C}$  to  $+120^{\circ}\text{C}$ )  
(Humidity Range -  $+15\%$  to  $98\% \text{ Rh}$ )

## Environmental Chamber configurable parameters

<b>Test Environment Simulation</b>	As per customer's requirement (Cold, Heat, humidity, altitude, thermal shock)
<b>Test space</b>	As per customer's requirement
<b>Temperature Range</b>	-80° C to +200° C
<b>Ramp Rate</b>	Upto 10° C per min
<b>Temperature Uniformity</b>	± 1° C (average)
<b>Relative Humidity</b>	10% to 98% Rh (20° C to 80° C)
<b>Humidity Uniformity</b>	± 3%
<b>Construction</b>	Interior & Exterior constructed with stainless steel / CRC powder coated
<b>Window</b>	Size as per customer's requirement with wiper, illumination, six panes of toughened glass
<b>Refrigeration System</b>	Air / Water cooled
<b>Refrigerant Used</b>	Non CFC
<b>Insulation</b>	100-125 mm thick Rockwool / PUF
<b>Controller</b>	Micro-controller based
<b>Port Holes</b>	As per customer's requirement
<b>Power Requirement</b>	Three Phase supply with Neutral

### Advantages for you

### Key features

Customizable Reliable Solutions

- Corrosion resistant interior and exterior
- CFC free operation
- Aesthetically designed
- Capable to perform tests in accordance with various standards eg. IS, MIL, DIN, ISO, EN, IEC, DEF, JSS-55555 & ASTM etc.

Efficient performance

- Accurate control of test parameters
- Reliable performance
- Energy efficient
- Inbuilt Variable frequency drive

User Friendly

- Easy to operate
- Light weight
- Easy integration with Vibration Test System

## Fixture Design

We offer custom made fixtures that increase the loading options for testing multiple test objects on your shaker system. The 'L' and 'T' shape fixtures are used to provide a mounting surface perpendicular to the direction of the test apparatus. This eliminates the need of high cost slip table attachment where the test object can be mounted on the L or T fixture.

One of the least expensive method to perform multi-axis vibration testing is through the use of specially designed fixtures. These fixtures provide atleast one vertical mounting surface to allow two axes of vibration by rotation of the test article.

Our team can do fixture designing for your test applications. The designing of custom made fixtures is done after understanding the test application and doing the software simulation and analysis.

## Research & development

The key to growth and success of any company lies with the strength of its R&D division. We understand this and thus put back our R&D team in most promising manner. The R&D team of Tarang Kinetics is in constant operation to upgrade the existing technology as and when required. This ascertains that our solutions have higher performance and more consistently reliable. Each of our solution is better than the last one. We do comprehensive study of each of our solution to ensure improvement each time.

We constantly get the feedback from our customers as well, which we take very seriously and take necessary actions. Our priorities are to increase system efficiency, achieving accurate results, consistently reliable performance, ease of operation, safety of operator by adapting to latest technology.





## Refurbishment of Shock Test Machines

Tarang Kinetics refurbishes all MRAD / VST / AVEX / AVCO models of Pneumatic Shock Test Machines.

### Features:

- Upgradation of Windows 11 based Data Acquisition & Control System
- Replacement of micro-switch controls with PC based controls
- Complete overhaul of the machine
- Upgradation of the braking system
- Upgradation of the Pneumatic Control Panel
- Refurbished machine comes with 1 year warranty



Pneumatic Panel for Shock Testing Machine



Replacement Power Amplifier

## Armature Rewinding & Replacement Power Amplifier

- Tarang Kinetics rewinds Armature Coils of all make Vibration Shakers including that of LDS / UD / IMV etc.
- We provide new replacement Power Amplifiers for all old Vibration Shakers.
- We repair / supply new Slip Tables for old systems of all makes.



Rewound Armature

## Clients

### Space, Defence & Aerospace Sector

• Indian Institute of Astrophysics, Bangalore	• BrahMos Aerospace Pvt Ltd
• Research Centre Imarat, Hyderabad	• Godrej Aerospace, Mumbai
• Terminal Ballistics Research Laboratory	• Astra Microwave Products Ltd
• Bharat Dynamics Limited	• Apollo Computing laboratories
• Hindustan Aeronautics Limited	• Ananth Technologies Limited
• Bharat Electronics Limited	• Nucon Aerospace Pvt Ltd
• Defence Electronics Applications Laboratory	• Sigma Microsystems Pvt Ltd
• Defence Research & Development Laboratory	• Electro Circuit Systems
• Instrument Research Development Est.	• Nutek Technologies Pvt Ltd
• Opto Electronics Factory, Dehradun	• ICOMM TELE Ltd
• Defence Research & Development Est.	• Vedang Radio Technology Pvt Ltd
• CQA(WE), Bangalore	• Ordnance Factory, Tiruchirappalli
• Electronics Corporation of India Limited	• Ammunition Factory, Pune

### EV Testing, Drone Manufacturers & Testing Laboratories

• ICAT, Manesar	• Ideaforge, Mumbai
• NATRAX, Indore	• MSME Testing Station, Bangalore
• ERDA, Vadodara	• Society for Applied Microwave Electronics Engineering & Research, Mumbai
• ITI Limited, Bangalore	• Pioneer Testing Laboratory, Delhi
• SITARC, Coimbatore	• Deogiri Electronics Cluster, Aurangabad
• Atharva Laboratories Pvt Ltd, Noida	• Crompton Greaves Limited, Bhopal
• Anuvega Technologies, Hyderabad	• ERTL, Mumbai
• Medha Servo Drives Pvt Ltd	

### Automotive Sector

• Varroc Engineering, Pune	• Bosch Limited, Bangalore
• Sanden Vikas India Pvt Ltd	• Poona Shims Pvt Ltd, Pune
• ADM JOINFELX India Pvt Ltd	• Amphenol Interconnect India Pvt Ltd
• Borg Warner Emissions Systems	• TATA Motors
• HCL Technologies Ltd	• Central Institute of Road Transport

## Service and Support

- Old system can be refurbished / upgraded
- Training the operative staff
- Software updates
- Calibration of systems
- Replacement power amplifiers
- Annual maintenance contracts
- Preventive maintenance during warranty
- Application assistance guidance



# Application Areas

- Space
- Defence & Aerospace
- Drones
- Electric Vehicles
- Automotive
- R&D Labs
- Electronics & Telecom
- Railways
- Transport and packaging
- Structural analysis
- Education



[www.tarangkinetics.com](http://www.tarangkinetics.com)

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or Scan QR code for **Whatsapp**



Branches : Hyderabad - Delhi NCR - Chennai - Pune - Bengaluru

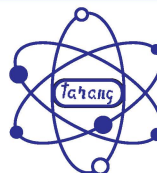


## About Tarang Kinetics

Tarang Kinetics is a leading destination for environmental testing solutions since 1995. With a glorious history of more than 27 years of excellence in the manufacturing of various Environmental Testing Solutions such as Electrodynamic Vibration Shaker System, Bump Test Machine, Shock Test Machine, Centrifuge Machine for Acceleration as per Customer's stringent application requirement to test every/any end-product under simulated environment in laboratory. Using our testing solutions at the Design and Production phase provides the confidence that our customers need to develop highly reliable products. Tarang has progressed to become a pioneer in delivering comprehensive testing capabilities with accuracy and reliability. Tarang has always been acknowledged for its excellence.

**We have been indigenously manufacturing these systems and making INDIA stronger (MAKE IN INDIA).**

We are empowered with a competent production team, whose extensive experience and technical expertise makes us the top choice of leading industries. Tarang follows a strong customer-focused approach by delivering tailored solutions to suit the exact application needs of our clients. Providing exceptional customer service that meets and exceeds their expectations remains at the core of our business. Our R&D facility is in constant efforts of expanding our product line to meet the ever increasing application demands of our customers.



**TARANG KINETICS**