

VIBRATION SYSTEMS

The innWave family includes a wide range of solutions for the simulation of vertical and pitch & roll vibrations. These equipment are designed to perform the vibrations (vertical and angular) produced by various means of handling and transportation. It can simulate both standard and recorded results from real transport routes. This way, more accurate results can be obtained.

VIBRATION TESTS SUPPORTED

> EN 15552:2009

Packaging: Complete, filled transport packages and unit loads.
Performance: testing schedules for common distribution chains.

> **ASTM D4169-16** Standard practice for performance testing of shipping containers and systems.

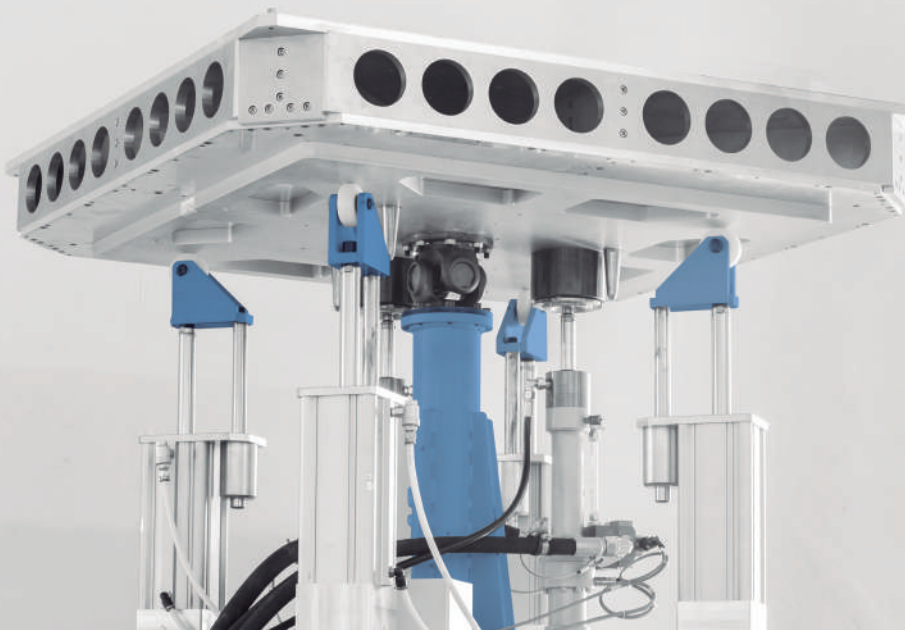
> **ISTA Procedures** 1A, B, C, D, E, G, H; 2A, B, C; 3A, B, E, F, H; K; 4 Series; 6-FEDEX; 6-SAMSCLUB, 6-AMAZON.COM

> MIL-STD-167

1A Mechanical Vibration of Shipboard Equipment
• Test Method 514.7 Vibration

> MIL-STD-810

Test methods for determining the environmental effects on equipment
• Test Method 514.7 Vibration



VERTICAL VIBRATION SYSTEM

This equipment is designed to perform the vertical vibrations produced by several means of handling and transportation both standard and recorded from real transport routes. Besides, it is ready to install our Pitch & Roll Module that allows to be simulated pitch and roll movements.

- > Servo-hydraulic vibration system.
- > Actuator dynamic force up to 130 kN.
- > Stroke up to 70 mm only for standard protocols.
- > 200 mm stroke optional for monitored routes.
- > Frequency range up to 300 Hz. (500Hz optional).
- > 1-G Air dumpers for static load support.
- > Test table sizes: 500, 1,000, 1,250, 1,500, 1,800 mm.
- > Vibration isolation: steel seismic mass.
- > The system can be installed inside a climatic chamber that allows testing under real climatic conditions.
- > Able to reproduce recorded PSD (innRecord and other data recorders).
- > Standard PSD for testing included.
- > Intuitive control software by Real Vibrations.
- > Ready to install Safeload TT P&R Module.



VERTICAL VIBRATION SERIES

Model	Dynamic Force (kN)	Random Max. Acceleration (g)	Max. Load Weight (kg)	Stroke (mm)	Expander (mm)
SF-VV130-1800-70	130	4	2.500	70	1.800
SF-VV90-1500-70	90	4	1.750	70	1.500
SF-VV50-1250-70	50	4	1.000	70	1.250
SF-VV15-1000-70	15	4	200	70	1.000
SF-VV6-500-70	6	4	50	70	500

VERTICAL VIBRATION + PITCH & ROLL SYSTEM

The Vertical Vibration + Pitch & Roll equipment simulates vertical vibrations and pitch and roll movements produced by various means of handling and transportation, thanks to its patented technology. This way, more accurate results can be obtained.

This solution has the features of the Vertical Vibration System and includes:

The simulation of transport by road, train and plane:

- > Vertical frequency ranges up to 200 HZ.
- > P&R frequency range up to 25 Hz.
- > P&R rotation $\pm 5^\circ$.

A special system for simulating maritime transport:

- > P&R rotation $\pm 15^\circ$.



VERTICAL VIBRATION

Model	Dynamic Force (kN)	Stroke (mm)
SF-PR130-1800-200	130	200
SF-PR90-1500-200	90	200
SF-PR50-1250-200	50	200
SF-PR20-1000-200	20	200

P&R

Rotation ($^\circ$)	Max. Load Weight (kg)	Expander (mm)
5 \pm	2.000	1.800
5 \pm	1.250	1.500
5 \pm	650	1.250
5 \pm	200	1.000

GENERAL

PITCH & ROLL MODULE

Using the patented technology of our P&R module, we are able to update an existing vertical vibration table, no matter the manufacturer, into an innovative vibration tester in 3 axes: vertical, pitch & roll.

Currently, different studies prove that loads are not just affected by vertical vibrations, but by pitch and roll movements as well.

ADVANTAGES

- > Cheaper than a complete V, P&R system.
- > Doesn't need an extra foundation or seismic mass.
- > Completely independent module controller by Real Vibrations.
- > Independent HPU.
- > Customized design to fit in your machine.
- > Closer to reality simulation.



All our solutions comply with the security standards to guarantee the CE Mark.
If you are interested in getting a custom solution, please do not hesitate to contact us.

www.safeloadtesting.com

TESTING EQUIPMENT | CONSULTANCY | TRAINING | AFTER-SALES SERVICES

NOTE: Safe Load Testing Technologies reserves the right to modify these specifications at any time without notice due to continuous product innovation.