

## VIBRATION SYSTEMS

To guarantee the perfect product delivery to final customers, a previous packaging behavior analysis against vibrations is needed. The innWave family is the best solution to optimize the packaging design against vibration forces.

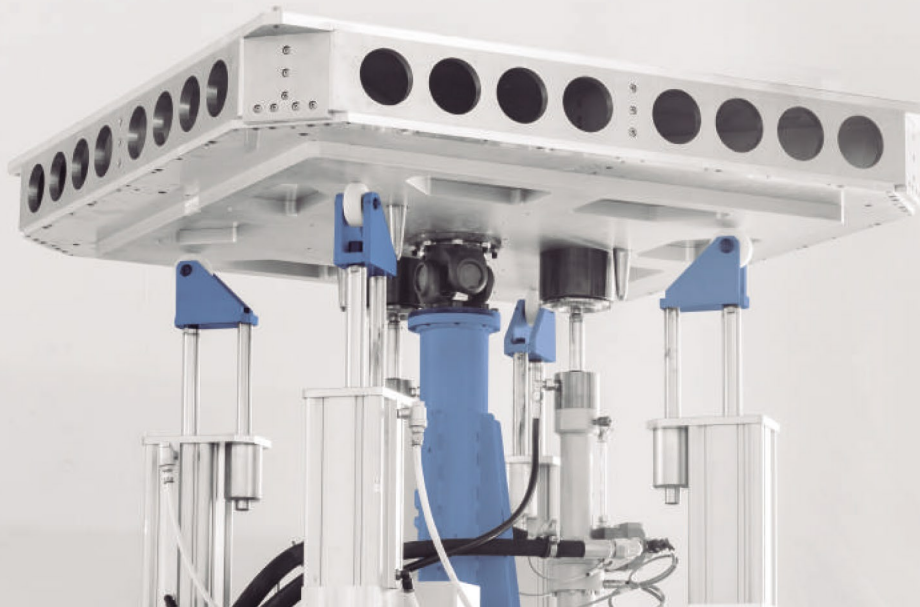
## VIBRATION TESTS SUPPORTED

### > EN 15552

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

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

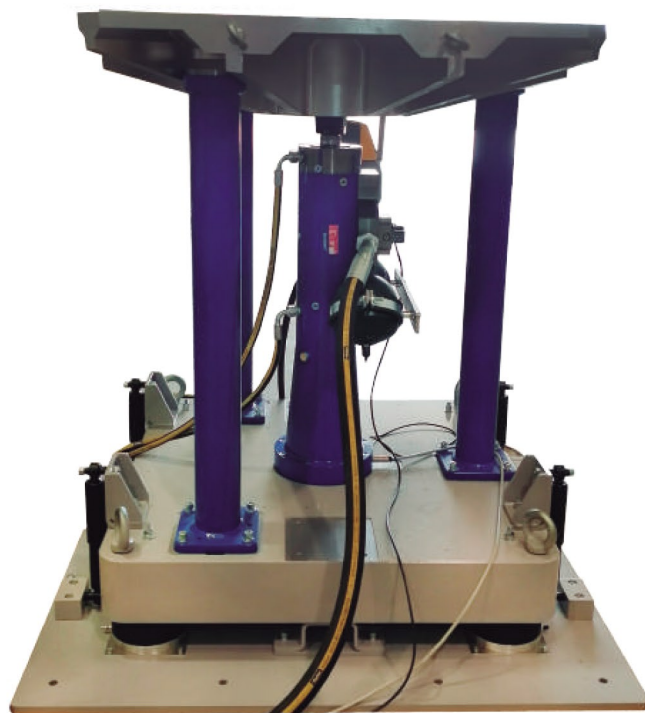
> **ISTA Procedures** 1A, B, C, D, E, G, H; 2A, B, C; 3A, B, E, F, H; K; 4 Series; 6-FEDEX; 6-SAMSCLUB, 6-AMAZON.COM



# 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 200Hz (optional 300 Hz).
- > 1-G Air dumpers for static load support (optional).
- > Test table sizes: 500, 1.000, 1.250, 1.500, 1.800 mm.
- > Vibration isolation: steel seismic mass.
- > Able to reproduce recorded PSD (innRecord and other data recorders).
- > Standard PSD for testing included.
- > Intuitive control software.
- > Ready to install Safeload TT [P&R Module](#).
- > The system can be installed inside a climatic chamber that allows testing under real climatic conditions.



## VERTICAL VIBRATION SYSTEM

	Dynamic Force		Stroke		Expander	
	kN	lbf	mm	in	mm	in
<b>SF-VV130-1800-70</b>	130	29,2	70	2,8	1.800	70,9
<b>SF-VV90-1500-70</b>	90	20,2	70	2,8	1.500	59,1
<b>SF-VV50-1250-70</b>	50	11,2	70	2,8	1.250	49,2
<b>SF-VV15-1000-70</b>	15	3,4	70	2,8	1.000	39,4
<b>SF-VV6-500-70</b>	6	1,3	70	2,8	500	19,7

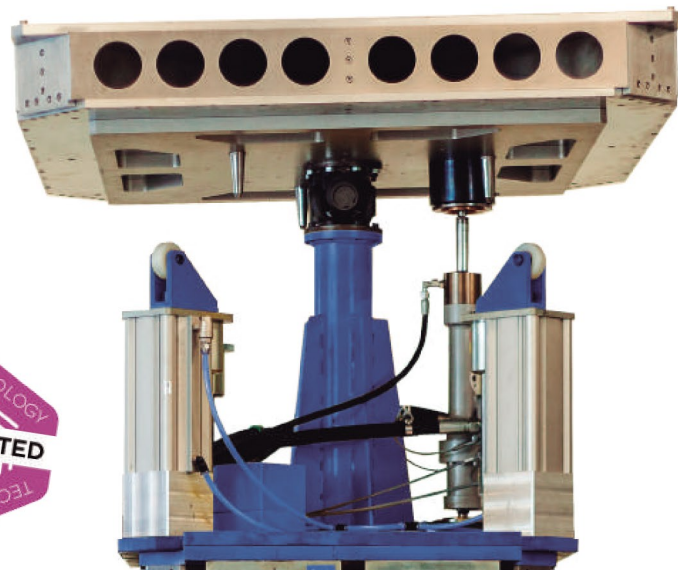
# VERTICAL VIBRATION + PITCH & ROLL SYSTEM

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 realistic tests can be performed.

The simulation of transport by road, train and plane:

- > Vertical frequency ranges up to 200 Hz.
- > P&R frequency range up to 100 Hz.
- > P&R rotation  $\pm 5^\circ$ .

A special system for simulating maritime transport.



## VERTICAL VIBRATION SYSTEM + PITCH & ROLL

Model	Dynamic Force		Stroke		Rotation	Expander	
	kN	lbf	mm	in	°	mm	in
<b>SF-PR130-1800-200</b>	130	29,2	200	7,9	$\pm 5$	1.800	70,9
<b>SF-PR90-1500-200</b>	90	20,2	200	7,9	$\pm 5$	1.500	59,1
<b>SF-PR50-1250-200</b>	50	11,2	200	7,9	$\pm 5$	1.250	49,2
<b>SF-PR20-1000-200</b>	15	3,4	200	7,9	$\pm 5$	1.000	39,4

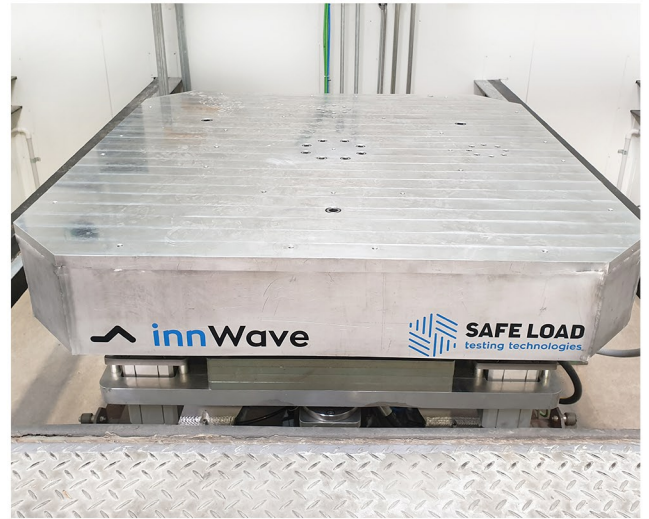
## PITCH & ROLL MODULE

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

- > More realistic simulations.
- > Independent HPU.
- > Customized design to fit in your machine.
- > More affordable than a complete VV, P&R system.
- > Doesn't need an extra foundation or seismic mass.
- > Completely independent module controller.



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](http://www.safeloadtesting.com)  
[www.safeloadtesting-usa.com](http://www.safeloadtesting-usa.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.