

IWHR Geotechnical Centrifuge Centre

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Owner: China Institute of Water Resources and Hydropower Research, IWHR

Location: Beijing, China

Introduction

The IWHR Geotechnical Centrifuge Centre was founded in 1991, encompasses two experimental buildings, three geotechnical beam centrifuges, a 8.5 m diameter (1000 g-ton capacity) centrifuge, a 5.01 m diameter centrifuge (450 g-ton capacity) , and a 4.5 m diameter (400 g-ton capacity) centrifuge, two centrifuge earthquake simulators, a centrifuge Robot, and a variety of actuators, tool platforms, and highly specialized devices and sensors. Our experimental infrastructure is predominantly used for research purposes, mainly in hydropower industry. On demand, we also offer professional consulting services in geotechnical engineering.



The IWHR Geotechnical Centrifuge Centre

Key Technical Specification

1000 g-ton Beam Centrifuge	
Manufacturer	ACTIDYN SYSTEMES SA
Year established	2023
Radius to base of soil container	8.5 m
Capacity	1000 g-ton (5 tons @200g, max G-level: 350g)
Bucket area	2.0 m x 2.0 m
Major equipment	Earthquake simulator (capacity 1.5 tons @100g) Automated sand raining system 4DOF Robotic loading system

400 gton High-Speed Beam Centrifuge	
Manufacturer	China Academy of Engineering Physics
Year established	2022
Radius to base of soil container	4.5 m
Capacity	400 g-ton (2 tons @200g, max G-level: 1000g)
Bucket area	1.5 m x 1.3 m

Major equipment	2 DOF Robotic loading system
450 gton Beam Centrifuge	
Manufacturer	Beijing Institute of Spacecraft Environment Engineering
Year established	1991
Radius to base of soil container	5.01 m
Capacity	450 g-ton (1.5 tons @300g, max G-level: 300g)
Bucket area	1.5 m x 1.5 m
Major equipment	2 Directions Earthquake simulator (capacity 0.4 tons @80g)

1000 g-ton Beam Centrifuge



The IWHR 1000 g-ton Geo-centrifuge

With an effective diameter of 8.5 m, the centrifuge can be accelerated up to 350 g carrying a payload of 2.5 tons (or equivalently 5 tons at 200 g). Its 1000 g-ton capacity is the largest in Asia and one of the biggest in the world. A key advantage of the beam centrifuge is that the centrifuge could achieve automatic balance adjustment during centrifuge operation. Its swing has a platform of 2.0 x 2.0 m, where the soil container is placed. The setup offers the possibility of a soil container of up to 2 m length, allowing testing large models corresponding to up to 700 m length (at the maximum g level).

400 g-ton High-Speed Beam Centrifuge



The IWHR 400 g-ton High-Speed Beam Centrifuge

With an effective diameter of 4.0 m, the centrifuge can be accelerated up to 1000 g carrying a payload of 0.4 tons (or equivalently 2 tons at 200g). Its 1000g Acceleration is the highest g-level in the world.

450 g-ton Beam Centrifuge

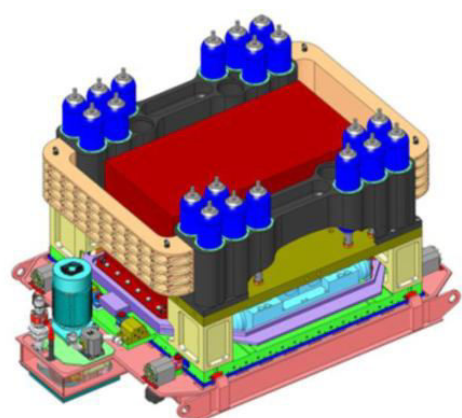


The IWHR 450 g-ton Beam Centrifuge

With an effective diameter of 4.5 m, the centrifuge can be accelerated up to 300g carrying a payload of 1.5 tons.

Earthquake Simulator

Custom-designed for the 1000gton centrifuge, the Actidyn earthquake simulator is capable of delivering horizontal seismic ground motions of any target waveform (including recorded and artificial motions) at up to 0.6 g peak ground acceleration on packages of up to 1500 kg over a wide frequency band, at a maximum centrifugal acceleration of 100 g.



Actidyn on-board earthquake simulator