

Научни публикации – резюмета на английски език по процедура за защита на дисертационен труд на Генчо Динев Георгиев за присъждане на образователна научна степен „доктор” на тема: „ПЛАВАЩ КЕСОН ТИП ПНЕВМО – КОНСТРУКЦИЯ”

1. **Georgiev G.**, Floating Caisson Type Pneumo-Structure, Proceedings of the Union of Scientists – Varna, Series “Marine sciences”, 2017, ISSN 1314-3379, pp. 53-58

***Abstract:** This paper gives a brief description of a new type of floating caisson, structure, applicable in hydraulic construction of facilities subjected to heavy loadings in water areas, practically by every kind of a baseplate in shallow and deep water.*

The caisson has a prismatic or cylindrical form and no bottom. It is divided in vertical chambers and is provided with top plate (cover). The caisson is transported in a floating condition to the lay place. It is possible to introduce slight corrections of the caisson trim and its exact laying on a particular place by varying the air pressure in the chambers. When used as underwater oil and gas reservoir, the plate should not be dismantled.

The structure discussed is designed mainly for construction in poor soils and it has extremely wide scope of application.

***Key words:** Hydraulic Construction, Floating Caisson, Air Pressure*

2. **Georgiev G.**, Method for Preliminary Crossing, Niveling of Flowering Caisson Type Pneumo-Structure and Pressure of the Earth Basis, Proceedings of the Union of Scientists – Varna, Series “Marine sciences (Oceanology)”, 2018, ISSN 1314-3379, pp. 19-25

***Abstract:** The prediction of the cutting force of the knives of contouring hydraulic structures of the sinking type (caisson) is not solved unambiguously in hydrotechnical science, and its pre-fixation is impossible without additional, costly bottom processing, which leads to limited use of contemporary and economical conversions such as large-diameter pilots, floating bottomless moorings and other gravitational hydraulic constructions with contour interactions with the bottom.*

The essence of the problem is to create a method of designing the basic contour of a new type of floating caisson, leveling a gear made up of one or more caissons, a continuous consolidation of the earth's foundation under the main caisson contour, pre-stressing of the ground foundation the main caisson contour with loads greater than operational in case of necessity of subsequent filling with another contractor by raising a water column above the average water level in the caissons working chambers after laying on the bottom, keeping the raised water volume above the average water level to the project elevation, redistributing the weight of the raised and retained water volume as a gravity fill in operating conditions.

Key words: *Hydraulic Construction, Floating Caisson, Air Pressure*

3. Palazov A., **Georgiev G.**, Donev V., Pneumo-structures for gravitational hydrotechnical construction, Sustainable Development and Innovations in Marine Technologies – Georgiev & Guedes Soares (eds), © 2020 Taylor & Francis Group, London, ISBN 978-0-367-40951-7, pp. 579-584

ABSTRACT: This paper gives a description of a new type of pneumo-structures, applicable in gravitational hydrotechnical construction of facilities subjected to heavy loadings in water areas, practically applicable for different kind of baseplate in shallow and deep waters. The pneumo-structure has a prismatic or cylinder-shaped form and is without bottom plate. It is divided into vertical chambers and is covered by top plate (cover). The pneumo-structures are transported to the dedicated fitting place in a floating position. Some small corrections of the position of the pneumo-structure trim and its exact laying on a particular place are possible by varying the air pressure in the chambers. After positioning on the bottom, the vertical chambers are filled up with filler. When used as an underwater oil or gas reservoir, the cover plate should not be dismantled. The pneumo-structure discussed is designed mainly for construction in poor soils and it has very wide scope of maritime applications. The external loads are transmitted to the substrate mainly by the internal filler, resulting in evenly redistributed. The need for a stone redistribution prism and the precise (with the help of divers) alignment of the bottom is avoided. The absence of a bottom plate allows uneven subsidence of the earth's foundation. The gravitational constructions built with the pneumo-structures allow a significant increase in wall

deformations and of the loads assumed without deterioration of their overall operational condition.

4. **Georgiev G.**, Air-imperviousness of Reinforced Concrete Floating Caisson Type Pneumo-Structure, "Science in Service of Society 2017" - Conference of the Union of Scientists – Varna, Varna.

Abstract: This paper gives a brief description of a new type of floating caisson, structure, applicable in hydrotechnical construction of facilities subjected to heavy loadings in water areas, practically by every kind of a baseplate in shallow and deep water.

The caisson has a prismatic or cylindrical form and no bottom. It is divided in vertical chambers and is provided with top plate (cover). The caisson is transported in a floating condition to the lay place. It is possible to introduce slight corrections of the caisson trim and its exact laying on a particular place by varying the air pressure in the chambers

One of the most important things in the construction and operation of concrete-type pneumatic structures is to provide air- imperviousness of the structure for air pressure values up to 2 bar (0.2 MPa).

It is believed that the reinforced concrete walls and slabs, properly executed and vibrated, are air-tight even without plaster on them. Nevertheless, the prescribed requirements for the insulation and the provision of airtightness of reinforced concrete must be fully met in combination with varying outside temperature and the constant impact of aggressive seawater.

Key words: Hydrotechnical Construction, Floating Caisson, Air Pressure, air-imperviousness, reinforced concrete
