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BalBok Engineering AD

Real solutions for environmental problems

Who we are

BalBok Engineering AD is a leading Bulgarian company from EU with over 25-year experience in radioactive and hazardous waste management. The Mission of BalBok is protection of the environment and people, and prevention of pollution through safe and efficient services based on R&D, design, production and consultancy. The motto of the company is "Real solutions for environmental problems". BalBok is involved in development and implementation of technologies for radioactive and hazardous waste solidification and stabilization and production and realization of containers "B-B CUBE"[®] for radioactive and hazardous waste disposal. With its activities, the company provides solutions of historically accumulated and currently generated waste.

The company is managed by Board of Directors.



Executive director of BalBok Engineering AD since 2017 is Dr. Ralitzia Anguelova, who has two MSc degrees in International business relations from University of National and World Economy, Sofia, Bulgaria and Environmental management from Illinois Institute of Technology, Chicago, USA, and PhD in national security/protection of population in case of emergencies from National Defence Academy, Sofia, Bulgaria.

BalBok has been awarded as Innovative Enterprise of the Year for 2014 in the area "Green Innovation" at the tenth National Contest for Innovative Enterprise of the Year.

Bulgarian President Mr. Rosen Plevneliev presented the honorary certificate to Dr. Lilia Jeliaskova – Head of the Board of directors and founder of BalBok, at a ceremony which was part of the Tenth National Innovation Forum, held on December 16th, 2014 in Sofia.



More information <http://enterprise-europe-network.bg/en/topic/news/?nid=17190>

BalBok Engineering was among nominated and one of the three finalist companies in the category "New directions" of the Enterprise Europe Network 2016 Awards. <https://een.ec.europa.eu/success-story/balbok-hunting-hazardous-waste-bulgaria>

Our activities

- Production and realization of "B-B CUBE"[®] - container for storage and transportation of low and intermediate level radioactive waste and hazardous waste
 - ✓ licensed as IP-3 and A type package
 - ✓ trade mark and industrial design
 - ✓ produced, delivered and currently in usage over 2200 pcs.
- Collection, transportation, treatment and disposal of hazardous waste
- R&D in waste management – technologies for solidification / stabilization of radioactive and hazardous waste
- Design of equipment and facilities for waste treatment and disposal
- Consultancy, including elaboration of draft legislation and documents
- Studies related to environmentally sound management of waste
- Training in environmental field

BalBok Engineering AD adopted an integrated system for quality, environment, health and safety management, certified for compliance with ISO 9000, ISO 14000 and OHSAS 18000 standards, comprising:

Management of hazardous and non-hazardous waste (collection, transportation, pre-treatment, recovery, disposal).

Production of containers for storage and transportation of radioactive and hazardous waste.

Consultancy on environmental protection and sustainable development.



The "B-B CUBE"[®]

"B-B CUBE"[®] is a reinforced concrete container in the shape of a cube with a side length of 1950 mm and consisting of two components – a body and a lid.

Depending on the filling process the lid is provided with or without an opening with specific form.

The container is designed for storage and transportation of low- and intermediate-level radioactive waste (solid and solidified liquid radioactive waste), ionising radiation sources, as well as highly toxic waste in solid form.



Main characteristics of "B-B CUBE"[®]:

- Internal volume – 5 m³
- Weight – tare weight 6 t, allowed gross weight – 20 t
- Special concrete formula with combined usage of active mineral aggregates
- Overall reinforcement without welding (except for hooks)
- Stacking ability - 4 containers stack easily on top of each other (allowing storage of 64 t of waste on 4 m² of space)
- Internal volume/external volume ratio – exceeds 67.5% (optimized repository usage)



"B-B CUBE"[®] is a registered trademark and an industrial design.

BalBok Engineering AD is the producer and seller of containers "B-B CUBE"[®] and also provides full range of services for disposal of hazardous waste in Bulgaria, including physicochemical treatment and permanent storage in containers "B-B CUBE"[®] on own sites.

The advantages of "B-B CUBE"[®]

- High storage capacity utilization due to internal volume/external volume ratio and stacking ability
- Possibilities for automated handling in the storage facility
- High compression strength due to special concrete formula – thus the compression strength is raised from 25 to 75% - up to 40 MPa on the 28th day from production
- Water permeability is 2 to 7 times lower compared to conventional concrete mixtures
- Guaranteed period of transportation and handling (up to 50 years) and safe storage (300 years)
- Easy relocation of full containers (the container is licensed as IP-3 industrial package)
- Exceptional radiation protection proved by series of tests and in practice
- Low operation costs for the storage facility operators
- It allows versatile solutions for large-scale problems, including intermediate outside storage of low- and intermediate-level radioactive waste prior to transportation to permanent storage facilities or supporting structures for storage of LLW and contaminated soils in big-bags

Proven by tests

Before licensing for use for transportation and storage of low- and intermediate-level radioactive waste, the container was tested according to Bulgarian legislative requirements, and International Atomic Energy Agency (IAEA) Safety Series No.6. The tests were performed in Bulgaria in the presence of an expert from the IAEA.

The scope of the tests included seismic test (pic. 1 and 2), water permeability test, penetration tests, drop tests – from 30 cm onto edge and corner, from 60 cm onto base and edge, as well as drop test from 6.5 m (pic. 3), fire tests (pic. 4), and test on shielding efficacy.



The "B-B Cube"[®] container has passed all the tests for IP-3 industrial package and A type packages under accident transport conditions. In all tests, including drop test from 6.5 m (simulating accident during stacking on 4th level), the container retained its integrity and no content had been released in the environment.

Proven by usage

BalBok Engineering produced over 2000 "B-B CUBE"[®] containers, currently used in Bulgaria and Ukraine for permanent storage of hazardous and low- and intermediate-level radioactive waste. During the production each step is strictly monitored and recorded according to approved by competent authorities Quality assurance programme and ISO 9001:2015 Quality Management System.

"B-B CUBE"[®] containers have an identification number embodied on 4 external walls, thus each one can be identified and traced during production and usage. All "B-B CUBE"[®] containers are delivered with a passport, certifying quality checks and results.



In 2000 BalBok Engineering AD produced and delivered 300 "B-B CUBE"[®] containers within 6 months for Kozloduy NPP in Bulgaria. On the pictures: "B-B CUBE"[®] at Kozloduy NPP in Bulgaria - filled with radioactive waste stored at Radioactive waste storage facility.

The pictures are from <http://www.dprao.bg>

In 1994 Khmelnytsky NPP in Ukraine needed a quick and reliable solution for safe storage of highly aggressive radioactive salts from vaporisation of liquid radioactive waste, which were stored on site. 100 containers "B-B CUBE"[®] were produced and delivered to be filled with metal drums with radioactive salts.

The radioactivity measured 1 m from all sides of the figure proved that no additional protection barrier is necessary as the radioactivity is within the allowed levels.



Since 1995 the full containers are stored safely on site, as seen on the picture from 2011. (<http://www.xaec.org.ua/store/pages/eng/wastetreat/latest/page.html>, accessed 2011)

The six-step technology - 6ST

BalBok developed its 6ST technology for disposal of hazardous waste in "B-B CUBE"[®] containers and applied it in Bulgaria in a nationwide old pesticides clean-up project. This waste disposal operation is classified "D12 permanent storage" as per Basel convention Annex IV.

The technology was successfully presented during the 7th and 8th International HCH and Pesticides Forums.



1st step – Site inspection and planning



2nd step – Re-packaging



3rd step – Treatment and solidification



4th step – Filling "B-B CUBE"[®] containers



5th step – Location of full containers



6th step – Site's decontamination

The presented here approach towards disposal of old pesticides was applied by BalBok between 1998 and 2009 in Bulgaria. More than 7500 t of old pesticides have been treated and disposed in 1800 "B-B CUBE"[®] containers, produced, delivered and filled by BalBok Engineering AD.

Ние пази
земята ни чиста!
... а вие?

We keep our Earth clean!
... do you?

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