Bokju

SPEP Panel

The next generation of lining material









| Company Introduction |

Hello?

We sincerely thank you for your continuous interest and love for Bokju Co., Ltd.

Since its founding in 2009, Bokju Co., Ltd. has put all its efforts into supplying only clean, healthy and sustainable water, and as a result of continuous technological development to produce eco-friendly, modern water bag products, we are very pleased to meet the expectations of the customers by successively developing <SPEP Chemical Tank>, <SPEP Cylindrical Water Tank>, and <Filter Attached Seismic-Resistant STS Cylindrical Water Tank>.

<SPEP Panel Lining> and <SPEP Panel Cylindrical Tank> were designated as excellent procurement products already and have been widely recognized for their excellence, and it was also selected as [Promising company to enter overseas procurement market] and honored to achieve exports, and the Filter Attached Seismic-Resistant STS Cylindrical Water Tank was also designated as an excellent procurement product, and it has received enthusiastic response for medium and large-capacity water reservoirs that improved structural functionality and safety for external environmental changes in case of an emergency by dramatically improving the functionality of the existing STS cylindrical water tank. In turn, we promise to continue to make efforts to fulfill our duties as one of the top 10 water industry leading companies in Gyeongsangbuk-do.

From all employees

Award Winning



SMETechnology Innovation Award (October 19, 2012)



Water Management Green Technology Award (November 01, 2012)



Grand Prize at the 7th Water and Health Forum (June 14, 2013)



FKI Chairman Award on the Day of Commerce and Industry (March 19, 2014)



Citation from the Chairman of the Small and Medium Business (February 11, 2015)



Special Award for Venture Business (February 11, 2015)



Citation from the Small and Medium Business Administration (February 24, 2016)



Citation from the Director of Public Procurement Service



Grand Prize in Small and Medium-sized Enterprise from Gyeongsangbuk-d



Ministry of SMEs and Startups Award in Creative Innovation Sector (December 11, 2018)



Citation from the Gyeongbuk Small and Medium Venture Grand Festival (December 03, 2019)

We will be responsible with the best products of Bokju, a company specializing in the development of clean water, healthy water, and eco-friendly water tanks.

Company History

1		/ / /			
2021	March	Acquired an excellent procurement producertification (Filter attached stainless steel water tar		December	Awarded Citation for Excellent Venture Company from the Director of Daegu Regional Procurement
	January	Acquired a certificate for excellent R&D innovation product designation (SPEP panel)	on	November	Service ticipated as an excellent company in the Korea
2020	Novembe	ISO14001 Acquired ISO14001 certificate			Excellent Product Exhibition in Tianjin, China
	Jul	Exported to Dubai (SPEP panel), acquired NSF (Unite States) Renewal Certification from the Internation Sanitation Association		November	Signed a contract with a Leaders in Industry- university Cooperation (LINC) project group (Yeongnam University)
	May	Acquired Safety Standard Certification from Singapore Productivity and Standards Board	m	August	cquired Material Certification for Use in KC water Supply
2019	January	Exported to Thailand (SPEP panel)		1.1.	(PDF panel type water tank)
	April	Acquired NSF (United States) Certification from International Sanitation Association	m	July	Signed MOUs for export to Two Southeast Asian Countries
	May	Registration of New Technology Platform in Daeg City (Technology for installing baffle wall for floo side, and pillar part with no anchor method)		February June	Awarded Citation from the Korea Federation of SMEs Acquired Procurement Excellent Product Certification (inner and outer reinforcement and double-floor
	June	Registration of New Technology Platform in Daeg City (Non-adhesive lining waterproofing methousing SPEP panel and silicone pad)	gu od	May	cylindrical water tank) Selected as a support company for Overseas Private Network Utilization Project by the Small and Medium
	October	Selected as one of the 100 national R&D excellent achievements	ce	April	Business Corporation Selected as a support company for the Export
2018	December	Received the Venture Award of the Year in the Creativ Innovation sector from the Ministry of SMEs ar		•	Capability Enhancement Project by Small and Medium Business Administration
	November	Startups er Awarded a Commendation Award from the		March	Citation for an exemplary businessman from FKI on the 41st Day of Commerce and Industry
		Director of the Procurement Service as an excelle procurement company	nt 2013	•	Group Standard Certification
	November	Acquired Procurement Excellent Product Certification	n	•	Signed an MOU for exporting water tanks to China
		(SPEP panel cylindrical water tank)		May	K-Mark (Cylindrical water tank with inner and outer reinforcement structure)
		Exported stainless steel cylindrical water tank overseas (Hanoi, Vietnam)		May	Q-Mark (Cylindrical water tank with inner and outer reinforcement structure)
	June	Acquired K-Mark certification (SPEP panel cylindric water tank) Acquired Q-Mark certification (SPEP panel cylindric		March	Selected as a promising company (PO-100) to enter the overseas procurement market by the Public
	April	water tank)		February	Procurement Service Acquired Material Certification for Use in KC water
	April	K water (Korea Water Resources Corporation) Wat Industry Open Platform, Test Bed Agreement (SPE panel water tank / lining)	P	November	Supply (STS water tank / wall panel (SPE lining, STS lining)
		Acquired NSF (United States) Certification from the International Sanitation Association	ne	November	Awarded the Green Technology Award for Water Management from the President of Korea Environmental Industry and Technology Institute
	February	Acquired International Hygiene Certification WRA (UK)		October	2012 Awarded the National Assembly Award Knowledge Economy Chairman Award in the
2017	December	Designated as an Export promising SME (Director Daegu- Gyeongbuk Regional Office of SMBA)	of		technological innovation sector at the Korea Small and Medium-sized Enterprises Innovation Award
	September	Acquired Material Certification for Use in KC wat Supply, and designated as a hidden champion for	or	August	Acquired Excellent Procurement Product Certification (SPE combined reservoir, lining)
		youth growth selected by the Ministry of Employment and Labor		July	Selected as a Venture Company No. 20120400488
	July	Exported to Vietnam (SPEP panel)		May	Passed the Test of the National Health Commission of China
	March	Signed an MOU for exporting \$ 2 million to India	2011	December	Geon-Mark Certification
	January	Acquired Intellectual Property Management		December	(SPE panel lining unit concrete reservoir)
2010		Certification		July	Established company affiliated research institute / Established Busan and Daegu branches
2016	Decembe	Grand Prize in Management Innovation sector at the Gyeongbuk Small and Medium Business Award	2010	November	Designated as CLEAN Business
	April	Selected as "Leading Company in the water indust in Gyeongsangbuk-do		August	Acquired ISO9001:2008 & KSQ ISO9001:2009 certifications
	March	Signed a contract to export to Malaysia (USD million)	3	March	Patent Registration No. 10-0949071 (Panel unit for lining and reservoir that uses it)
	February	Awarded Citation from the Small and Mediu Business Administration	m 2009	July	Established corporation
	lanuani	Acquired Technology intensive Small and Mediu	m		

Acquired Technology-intensive Small and Medium Business (INNO-BIZ) Certification

January

| What is SPEP panel? |







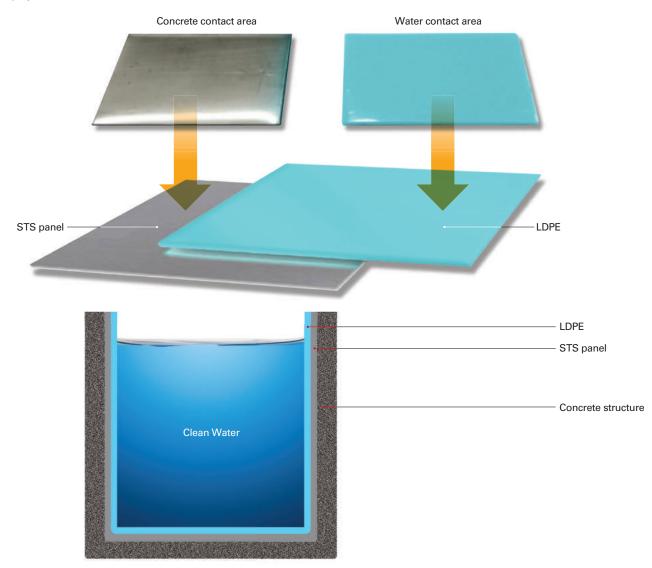






Manufacturing one-piece panel by fusing LDPE onto stainless steel plate

product structure



Features and Advantages

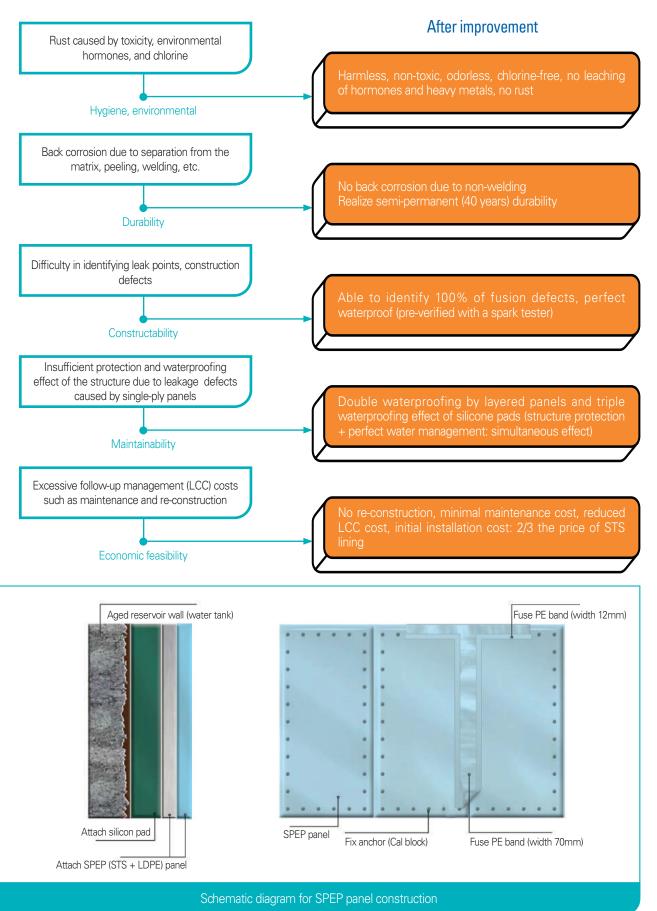
• Superiority : Optimal inner waterproof / anti-corrosive product for reservoirs for drinking water structures

· STS : Excellent physical properties, good durability, but vulnerable to chlorine

PE : High ductility and weak adhesion to structures, but excellent chlorine corrosion resistance
 SPEP panel : Combined the advantages of physical properties of STS + chlorine corrosion resistance of PE

- Double waterproof Maintains the secondary waterproofing effect of STS even when the primary PE is damaged during use
- Perfect waterproof construction Prevent leakage by systematically and perfectly checking defective parts at all times by using a spark tester
- Ease of maintenance and cost reduction PE can be fused on the damaged area, simple repair
- Semi-permanent life (40 years) Compressive double compression strength and impact strength and wear resistance
- Excellent hygiene because there are no harmful substances as no rust is generated.
- There is no transition corrosion caused by the inflow of foreign substances from old piping
- Applicable to various products such as concrete reservoir waterproof lining, chemical tanks, and waste water tank, etc.

Improvements compared to existing products



| Water reservoir lining using SPEP panel |

Technical Details

Water reservoir lining using SPEP panel



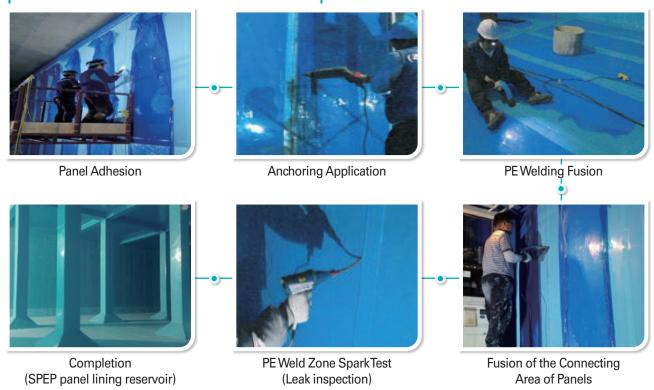


Features

- Excellence: Optimum internal waterproof product for use in construction of reservoir for potable water ·STS: Good durability due to excellent material properties but vulnerable to chlori ·PE: Soft and weak adhesiveness to the structural body but excellent resistance to corrosion against chlorine ·SPE Panel: Combination of STS material properties + PE Chlorine corrosion-resistance qualities
- Durability Semi-permanent durability due to double adhesion during construction (primary adhesion to the structural body + anchor bolts attached at 70 cm intervals)
- Economic Feasibility 2/3 of the installation cost of STS lining, lowest LCC cost
- Construction Perfectly waterproof Checking for defects with scientific method (Spark Test Instrument), perfect waterproof construction
- Maintenance Accomplishes both structure body durability enhancement and perfect water quality maintenance due to dual waterproof function of PE and STS's layered panel (SPEP panel) and the structural waterproof function of epoxy adhesive product (EMB) (no spreading of corrosion)

SPEP Panel

Construction Procedure



Adhesion strength & Dissolution test

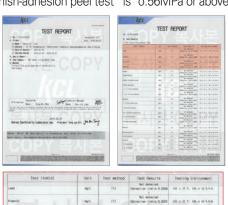
The standard measure suggested ont the "KS M ISO 4624 paint and varnish-adhesion peel test" is "o.56MPa or above."



TEST RESULTS							
TEST ITEM	UNIT	SAMPLE	RESULT	TEST METHOD			
Pull-off Strength	MPa		5.	Appropriate use criteria for water pump and other			



Adhesion strength improved by 5 times



Not detected in all 26 items

Sanitation and safety verified

Water Regulations Advisory Scheme



NSF







WRAS

| Comparison of waterproofing products |

	SPEP Panel	Other materials	
Construction	100% waterproof construction • Anchor construction on concrete structure	Fragment type or simple adhesion	
	Anchor construction		
	Partial repair possible and lowest repair cost Repair damaged part with PE welding column Less than 20% compared to previously	Excessive repair cost, partial repair not possible • Epoxy, PE Sheet, Tile type: Difficult leak inspection and repair, concrete curing required • STS: Acid cleaning expense required	
Maintenance	No water outage or interruption of operation • Regular cleaning is sufficient for maintenance	Operation interruption required even for simple repairs	
	No effect on structural material, piping • Does not cause structural crack, inflow of foreign materials in piping (No spreading of corrosion)	Fragment, Tile type: Waterproof removal • STS: Reservoir body/corrosion spreading occurs	
	Dual waterproof STS maintains water-proofing when PE is damaged	Single layered waterproof mmediately leaks when a problem occurs	
	Chlorine resistance, chemical resistance, no chlorine effect	STS: Most vulnerable to chlorine	
Durability	Semi-permanent life-span • STS, PE → Material with more than 20-year durability	Epoxy: 3 - 5 yearsSTS: 10 - 20 years (Corrosion, rusting)Tile type: 5 - 10 years	
Hygiene	Eco-friendly, hygienic material • Fully recyclable • Free of corrosion, harmful leachable materials	Epoxy: Environmental hormones such as Bisphenol A • FRP: Designated waste, fiberglass elution • STS: Heavy metal elution during corrosion	
Economic Feasibility	LCC: (Life Cycle - Cost) Lowest Cost Realization of lowest LCC through construction, durability, maintenance, recyclable, etc. (More than 60% lower compared to epoxy)	Increased LCC due to lack of durability, maintenance, etc. (At least 2 - 3 times compared to SPE panel)	

SPEP Panel

Construction Example |

This is an eco-friendly product that prevents leakage of stored water and blocks the inflow of external pollutants. The interior of the water tank is made with PE material to prevent corrosion by the disinfection chlorine and guarantee safe and clean water quality.







After Installation



Before installing colleting well



After installing collecting well



Before installing colleting well



After installing collecting well

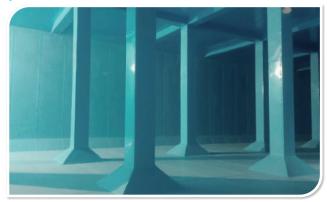


Before Installation



After Installation

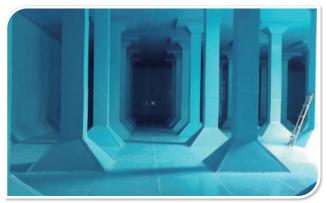
SPEP Panel Completed Pictures



Gyeongbuk Sindocheong Transferred Reservoir (20,000 ton)



Cheongju Yullyang Reservoir (5,500 ton)



Jeju International Airport Reservoir (3,000 ton)



Andong Anmak Reservoir (5,000 ton)



Daegu Manchon Reservoir (5,000 ton)



Andong Okdong Reservoir (15,000 ton)

Overseas construction site



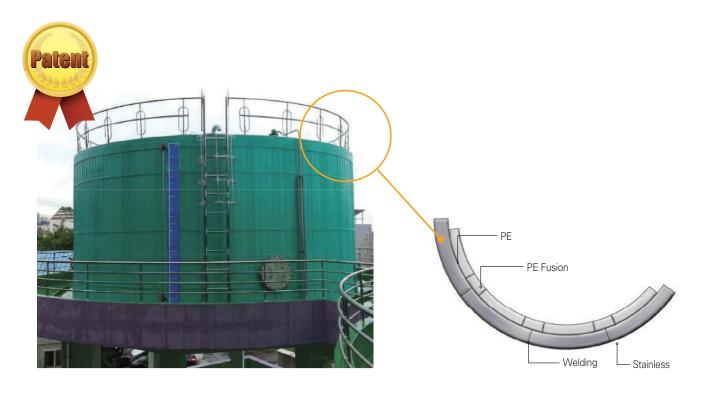
Phaya Thai Hospital Water Tank, Thailand



BOON RAWD BREWERY Water Tank, Thailand

SPEP Panel Tank

First in the World! Combination of the Best of PE and STS! Dually protected semi-permanent effect SPEP panel tank



Features

- Economical and exceptionally innovative product that remedies the shortcomings of existing products
- Hygienic and harmless to humans, eco-friendly product (STS: Universal Use, PE: Drinking Use)
- Combination of the strong chemical resistance of the inner PE part and the structural stability of the outer STS
- Semi-permanent life-span (STS gives semi-permanent protection to PE which is weak against UV rays)
- Dual waterproof (Double protection against chemical leak, separate total welding of both STS and PE)
- Large capacity tanks possible through STS welding enhanced structural body
- Structural Stability: Secured structural stability through combined STS part welding
- Maintenance is easy and inexpensive (Defective area PE fusion, simple repair)
- Perfect waterproof construction (Spark tester equipment)
- Excellent economic feasibility (Almost the same as existing PE, FRP tank construction cost)
- Excellent thermal effect by installing external thermal material
- Extensive Use: Usable from filtration plant, tap water, and chemical storage tanks to waste storage

STS Cylinder Type Water Tank

The internal and external of enhanced double-floor STS cylinder water tank with excellent structural stability with earthquake resistant design, economic, durability and corrosion resistance!



Features

- Perfect internal and external enhanced construction
 - Prevents or delays water tank explosion, rupture or overturning
 - Enhanced durability and structural stability against fatigue accumulation, snow load, etc.
 - Increased resistance coefficient of external impact or expanded water pressure (stress)
- Introversion bend welding
 - No basic material damage or body part corrosion
 - · Increased stress resistance coefficient
- Double floor construction
 - Enhanced earthquake resistant design and stability due to integration of basic pad and water tank floor plate
 - Corrosion prevention of body part of floor plate material
 - Enhanced structural stability due to decreased fatigue accumulation against movement such as typhoon and overturn prevention

Fission Painting Apply Effect

- Light reflection prevention, no decolorization/discoloration and balance with surrounding environment
- · Keeps elegant figure of tank and protects external finishing material
- Enhanced sealing intensity by creasing longitudinal line (improved durability against external impacts)

Filter attached seismic-proof stainless steel cylindrical water tank





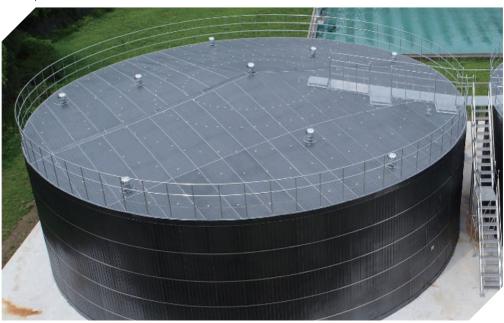






Characteristics of filtration performance

- It is a storage tank with a function to filter the water supplied with a filter attached to the inside of the water tank, and to filter out suspended substances in the event of secondary contamination such as foreign substances inside the pipe while the purified water is transferred to the water tank.
- It establishes trust in the hygiene and safety of tap water and public water by installing a filter system using eco-friendly filter media in the inflow pipe of the water tank to physically filter various foreign substances mixed in the influent in the event of an unexpected situation.

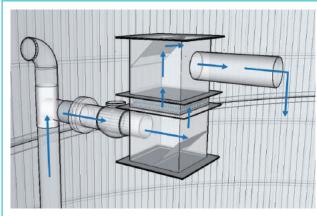


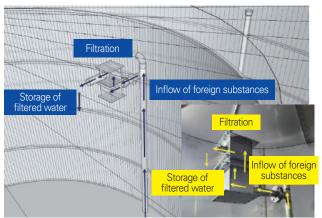




Features and Advantages

- Maintainability: Since it can be washed and reused by using eco-friendly filter media, it is not necessary to replace the filter media.
- · Convenience: In the event of an unexpected situation, it provides time to prepare a countermeasure to respond to a crisis by physically filtering foreign substances mixed in the influent and supplying clean water.
- Water quality safety and hygiene: Prevention of inflow of rust residues and foreign substances, etc. through filtration
- Function and efficiency increase: Filtration can be performed by natural backwashing, and the filtration efficiency is improved because the circulation of the filter media is smooth and particulate matter is not accumulated.
- · Economic feasibility: Since the filtration process is carried out without power, there is no follow-up management cost, and the economic feasibility is strengthened by using semi-permanent filter media (LDPE).





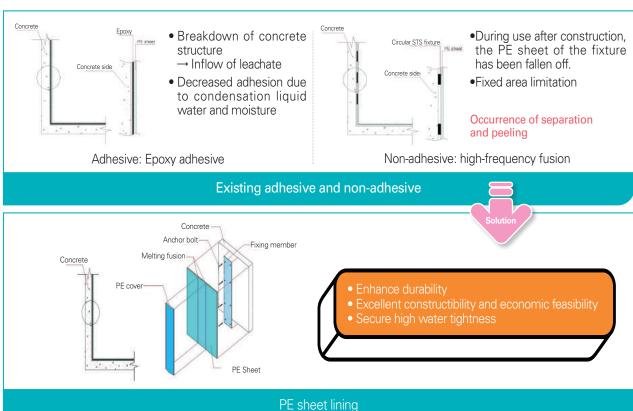
Filtration process

PE sheet waterproof lining using joint fixing member





- Waterproof lining method for realizing perfect waterproofing and improving durability, constructibility, economic feasibility, etc. by fixing using double panel members at the joint of PE sheet
- By securing stability between PE sheet and concrete structure by using double panel fixing members, existing problems are improved, such as better constructibility and durability than non-adhesive construction method using fixtures, and reduction of initial cost compared to adhesive PE sheet waterproofing method.



Features and Advantages

- ① Strengthen leak prevention by expanding and reinforcing water tightness
- ② Strengthen durability (perfectly solved the peeling / falling phenomenon of PE sheet)
- 3 Improved durability compared to fixture construction method
- (4) Reduced initial cost and improved constructibility compared to adhesive construction method
- ⑤ Reduced LCC (life cycle cost) by improving durability
 - Reconstruction cost (at least once)
 - Maintenance and management cost
- © Secured hygiene by using joint fixing members that are harmless to the human body
 - Secure reliability by using materials that have acquired international certifications NSF61 and WRAS

Comparison before and after PE lining construction





| STS panel lining |





Materials for lining

Lining by welding STS stainless steel plate on STS flat iron arranged like a go board, such as STS304, STS329J3L, STS329LD, etc. 1000×2000mm is the basic standard, and it is flexibly adjusted and constructed according to the site situation





Specification

Thickness: 1.5T~2.0T STS flat iron: 2~3T

Configuration



Before construction



Fresh water after construction



Before construction



After construction

© Construction process



STS flat iron arrangement & fixing



Fixing by welding flat iron + panel



Main welding



Complete

| STS Square Water Tank |

Excellent organization standard





Bolt prefabricated water tank





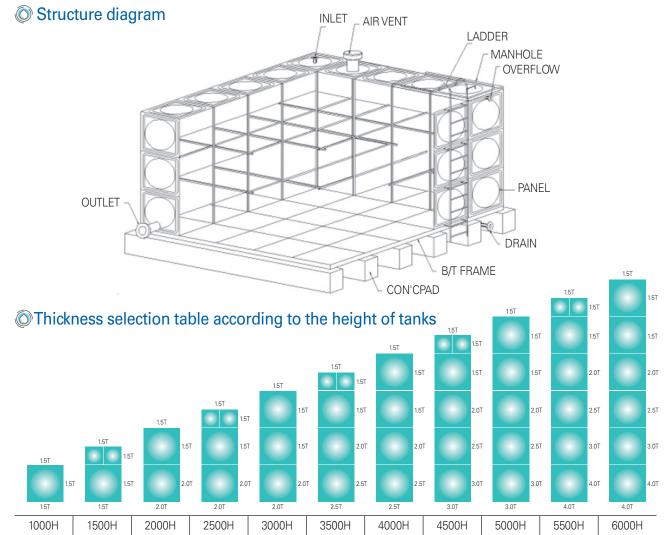
It is a product developed for water tanks with STS sheets, and standardized panels of 500×500 , 500×1000 , and 1000×1000 mm are assembled with bolts, respectively, and manufactured according to the site situation and order capacity

General welded water tank





Installed by welding using panels of 500×500, 500×1000, and 1000×1000mm of STS sheets.



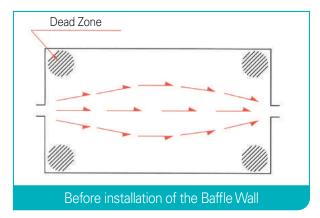
PDF (Polyethylene Double Frame) Baffle Wall |

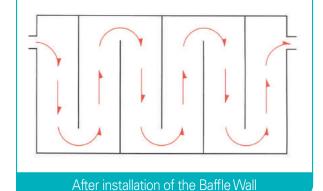




Pathogens are detected when the residence time of the disinfectants through the disinfection process in the reservoir is insufficient, the Baffle Wall facilitates the flow of water to prevent dead water due to water stagnation and to prevent the detection of pathogenic microorganisms due to the increased residence time of the disinfectants

Water flow chart and construction photos before and after installation of the Baffle Wall







Andong Yongsang Reservoir PDF Baffle Wall



Ulsan Sanggae Reservoir PDF Baffle Wall

© Existing Baffle Wall

- Construction method: Install by fixing with anchor bolts to the wall and floor of the reservoir structure
- Problem: Loss of waterproofing effect of the structure due to water leakage caused by anchor bolt drilling

O Bokju Baffle Wall

- No anchor bolt construction according to Patent No. 10-1257325
- New technology method registered in Daegu Metropolitan City's New Technology Platform
- Prevent surface damage and leakage of waterproof inner materials by fixing the ceiling and tightening the bolts the angle fastening belt









Supply and construct baffle walls of various materials such as STS baffle wall, PDF baffle wall, SPEP baffle wall, etc. by combining Bokju's unique technology.

Certificates Status



K-Mark certificate SPE panel unit reservoir



K-Mark certificate Stainless steel water tank



K-Mark certificate SPEP panel cylindrical water tank



Certificate of Designation of Excellent Product SPEP panel cylindrical water tank



Certificate of Designation of Excellent Product Filter attached water tank



Sanitary safety standard certificate (KC certified) wall panel



Sanitary safety standard certificate (KC certified) water tank



Sanitary safety standard certificate (KC certified) PDF Baffle Wall



Conformity certification water panel



Excellent invention confirmation SPEP panel water tank



Environmental management system ISO 14001 certification



Excellent organization standard product confirmation Stainless steel cylindrical water tank



Concrete water tank stainless steel lining



Excellent organization standard product confirmation Polyethylene double frame water tank



Certificate of INNO-BIZ



market entry company G-PASS company



company certification



R&D innovation product





Venture business confirmation



WRAS (Water Regulations Advisory



FDA (U.S. Food and Drug Administration Approved by FDA)



PSB (Safety Standard Certification from Singapore



(National Sanitation Foundation) (United States) Certification

Bokju's path

Bokju's path

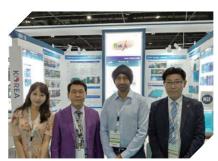
With the development of eco-friendly water tanks, Bokju's passion for supplying clean and healthy water continues.



Awarded FKI Chairman's citation on the Day of Commerce and Industry



Awarded a citation from the Director of the Public Procurement Service as an excellent procurement company



Participated in various overseas exhibitions such as the United States, Europe,



Selected Bokju as 'Top 10 Leading Companies in the Water Industry' in Gyeongsangbuk-do



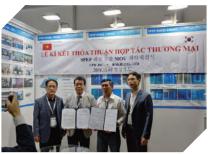
Awarded Grand Prize for the Technology Innovation



Venture of the Year Award in Creative Innovation Sector



Bokju's Press Release



Signed official agency MOU with CPW JSC (Subsidiary of Vietnam Water Resources Corporation) in Vietnam



Signed MOU with India



Exclusive technology presentation in the Thailand MWA (Metropolitan Waterworks Authority)



Participated and presented at India ADB Linked Technology Road Show



Grand Prize in Management Innovation Sector at the Gyeongbuk Small and Medium Business Award

Head company. 37-10, Nonggong-gil, Namhu-myeon, Andong-si, Gyeongsangbuk-do, Republic of Korea

F. +82-54-841-9566 T. +82-54-823-9500 E. bj9559500@hanmail.net H. www.bokju.com

Daegu. Software Venture Tower 804~5, 117, Dongbuk-ro, Buk-gu, Daegu, Republic of Korea T. +82-53-955-9500~1 F. +82-53-955-9560

Busan. Choice Building 405, 498, Nakdong-daero, Saha-gu, Busan, Republic of Korea T. +82-51-202-2156 F. +82-51-205-1015

Thailand. Bhiraj Tower at EmQuartier, Units 3901, 3911-3912, 39th Floo 689 Sukhumvit Road, North Klongton, Vadhana, Bangkok 10110

Vietnam. 1009A, Diamond Plaza, 34 Le Duan Street District 1, HCMC Vietnam































