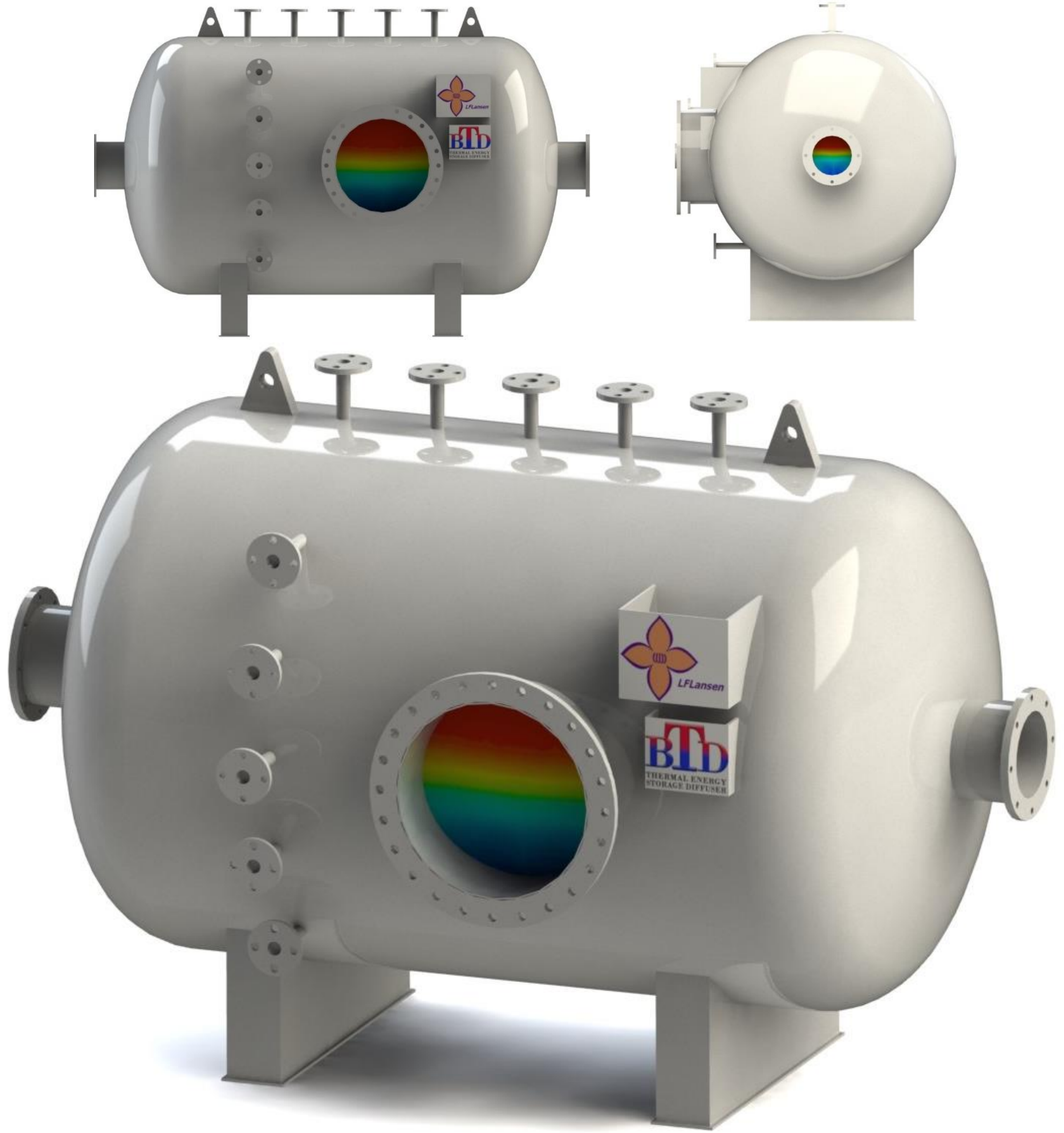


LFLansen

BTD
THERMAL ENERGY
STORAGE DIFFUSER

CHILLED WATER BUFFER TANK

LF LANSEN SDN. BHD.

<2022>

Sales Office: No. 16-1, Jalan Putra Mahkota 7/6B, Putra Heights, 47650 Subang Jaya, Selangor, Malaysia.

Telephone: +60 3 56140365 Facsimile: +60 3 56140367

www.lansen.com.my

Content

Product Introduction

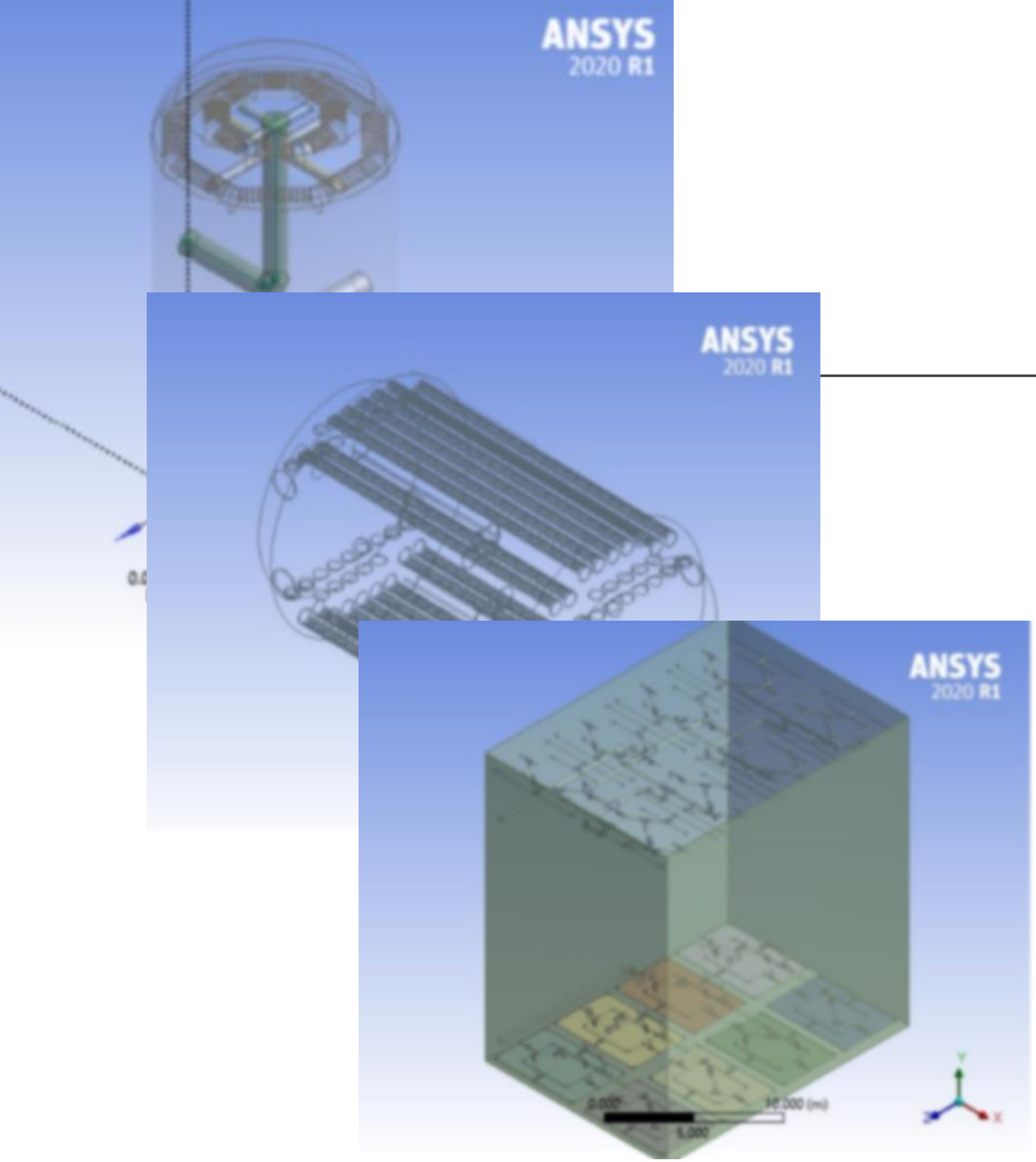
Fabrication and Logistic

Installation, T&C

Supporting Team in Thailand

Our Story

- Founded in year 2000 as MSI Reliabilities Sdn. Bhd., engaging in all kinds of engineering works, particularly in metal fabrication, vibration monitoring and troubleshooting. In 2005, there is a change in company management and the company was subsequently named LF Lansen Sdn. Bhd.
- Thereafter, we, LF Lansen Sdn. Bhd., realigned ourselves to be more specialised in Project Contracting and Metal Fabrication Works, particularly in the Field of Industrial Ventilation and Thermal Energy Storage System.
- Today, LF Lansen Sdn. Bhd. is a well worked Engineering, Procurement, Construction & Commissioning (EPCC) company, equipped with highly experienced and professional human capitals, that claims expertise in the fields of Industrial Ventilation, Air-conditioning & Mechanical Ventilation (ACMV), and Thermal Energy Storage System.
- It is our belief that for the years to come, the company will only grow stronger, and continue to look forward confidently to new challenges and to serve new customers in all disciplines that our know-how will be utilised fully.

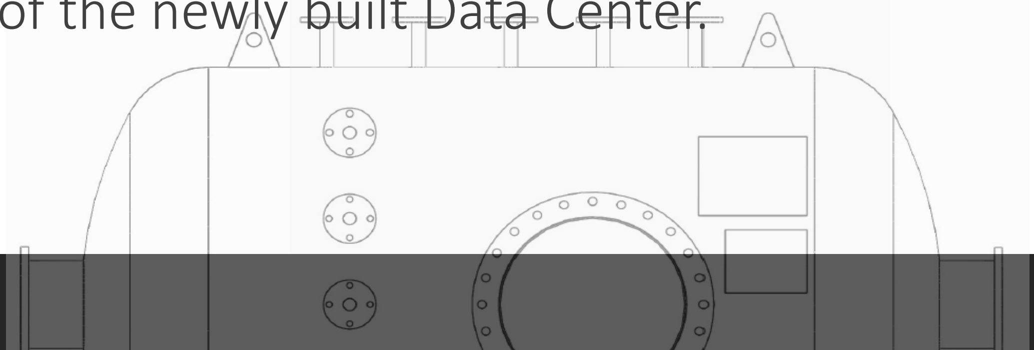


LF LANSEN & BUFFER TANK

In year 2014, LF LANSEN was presented with an opportunity to troubleshoot a few buffer tanks that failed to meet the system requirement for a well-known Data Center.

With years of engineering experience in Thermal Energy Storage, our engineers, via continuous innovation, managed to overcome such requirement by integrating a new diffusers system into the buffer tank.

Since then, our product has been adopted and used by most of the newly built Data Center.



About LF Lansen Buffer Tank

- Specification
- Ours against others
- BTD Diffuser
- Importance of choosing a right buffer tank

Specification

TANK

Design code	: ASME SECT VIII DIV 1
Approval	: JKKP MALAYSIA (DOSH)
Material	: S275JR, SA516 or others
Operating Temperature	: -20° C to 60° C
Operating Pressure	: 6 bar/10 bar or specified
Medium	: Mono Ethylene Glycol/Water
Lifespan	: 20 years

INSULATION

Material	: Polyurethane
Density	: 45-50kg/m3
Thickness	: 100mm or specified
Jacketing	: GI or Aluminium

DIFFUSERS

Design code	: ASHRAE DESIGN GUIDE FOR COOL THERMAL STORAGE
Material	: Carbon Steel Pipe
Froud Number	: < 1
Reynold Numbers	: < 500
Pressure drop	: < 0.3 bar
CFD Simulation	: ANSYS FLUENT (Upon request)

Our Against Others

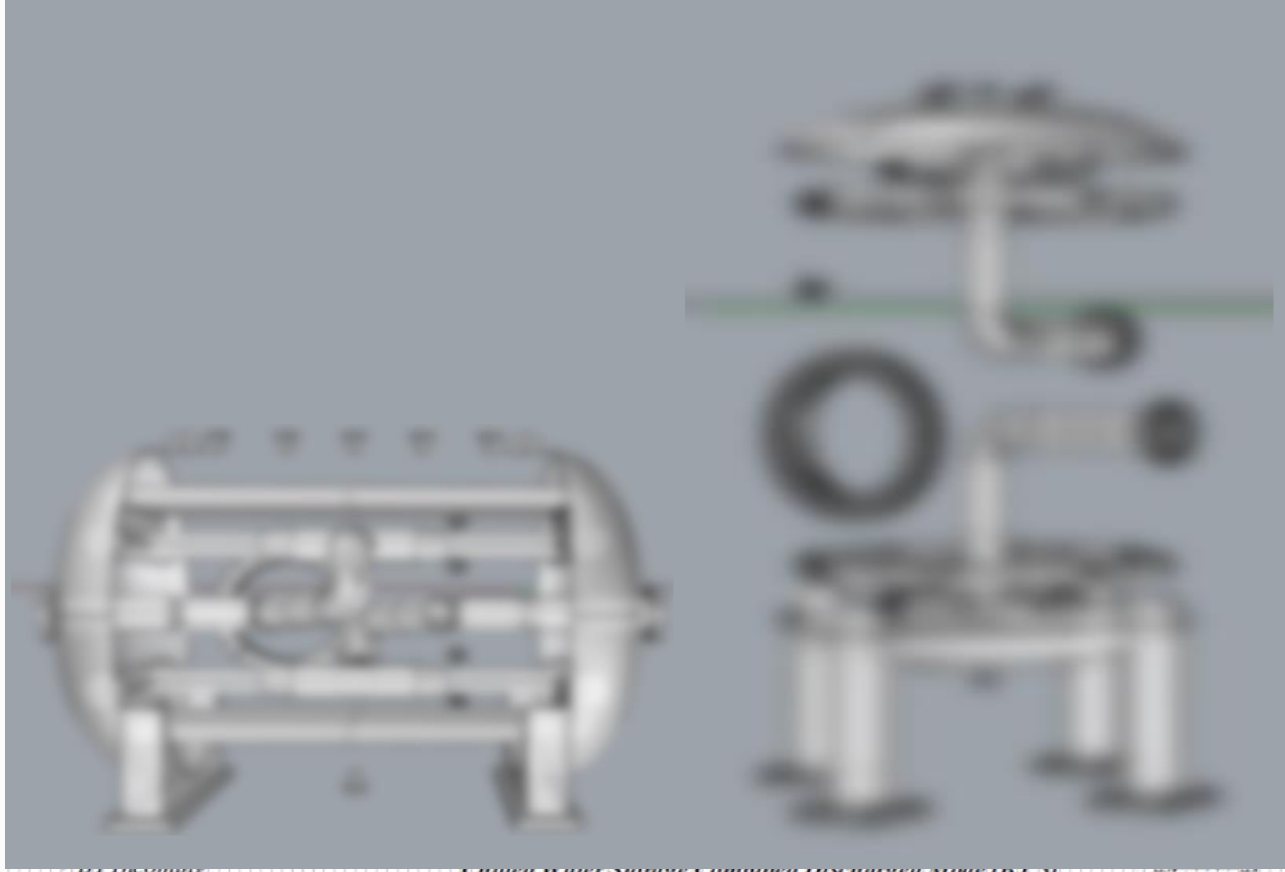
- Our buffer tank includes custom designed internal diffusers system, which is different from conventional tank, such as:

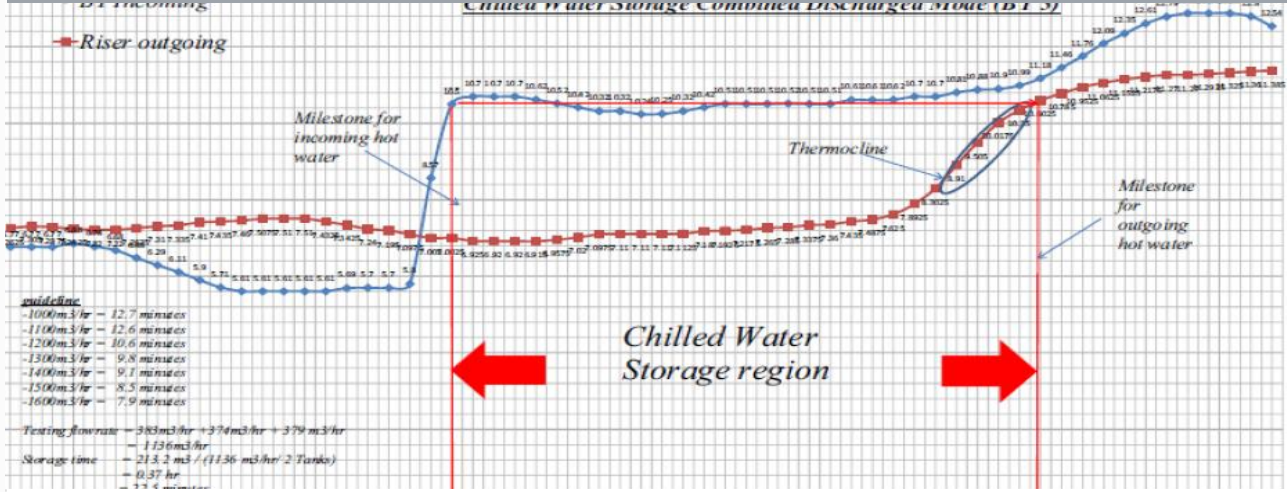
  - Empty buffer tank

  - Baffle plated buffer tank.

- Our buffer tank is able to maximize the usage of tank capacity and achieve high FOM as compared to conventional buffer tank.

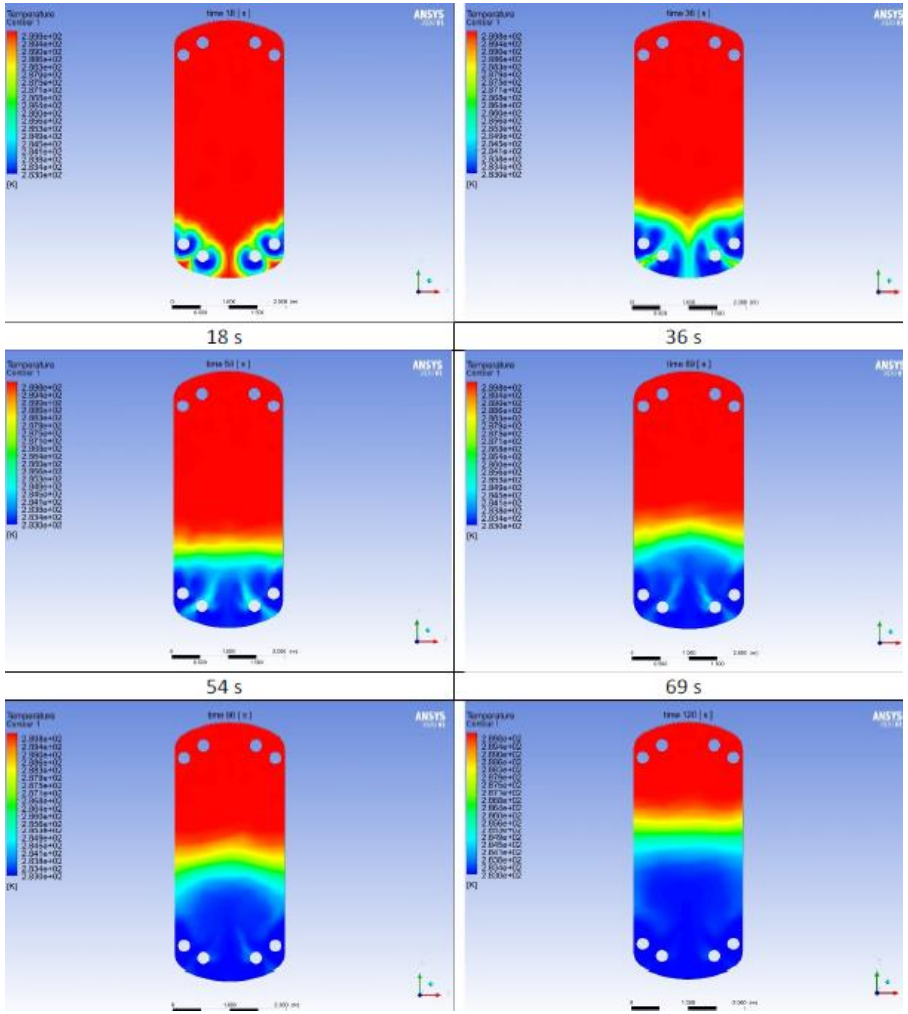
- The unique design enable it to maintain a constant supply temperature in order to achieve longer storage time.



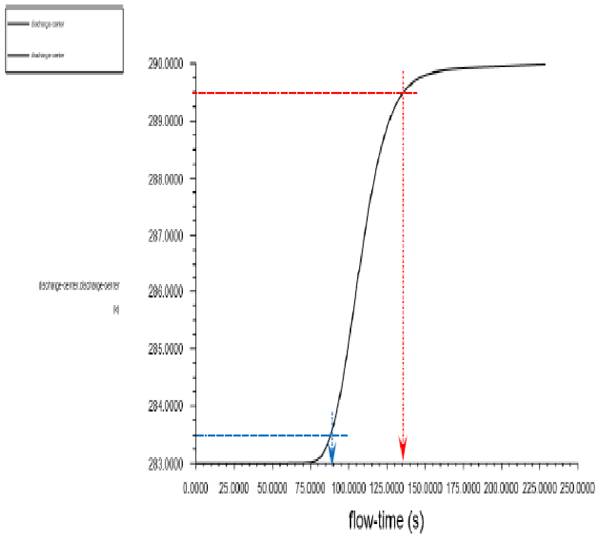


Real Time Data

BTD Diffuser Technology



Discharging Thermocline Thickness



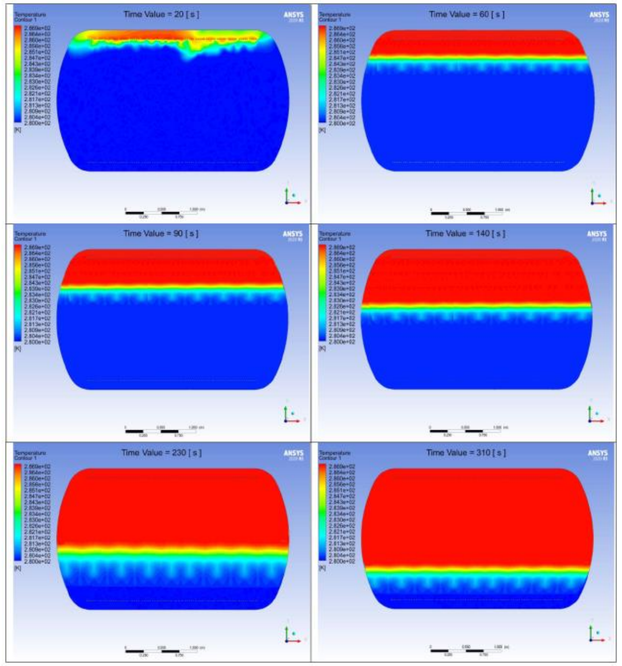
- BTD diffusers applies thermal stratification to create temperature layers. It is custom designed by experienced TES designer to suit every single different condition.
- Different from other diffusers, BTD diffusers can be applied in all storage conditions.
- BTD diffusers create perfect LAMINAR flow. By utilizing the natural density differential characteristic of water, thermocline will be formed due to isothermal reaction.
- Performance of a buffer tank is depending on its FOM. BTD diffuser is able to achieve 80% and above which is comparatively higher than others.

Importance of Choosing a Right Buffer Tank

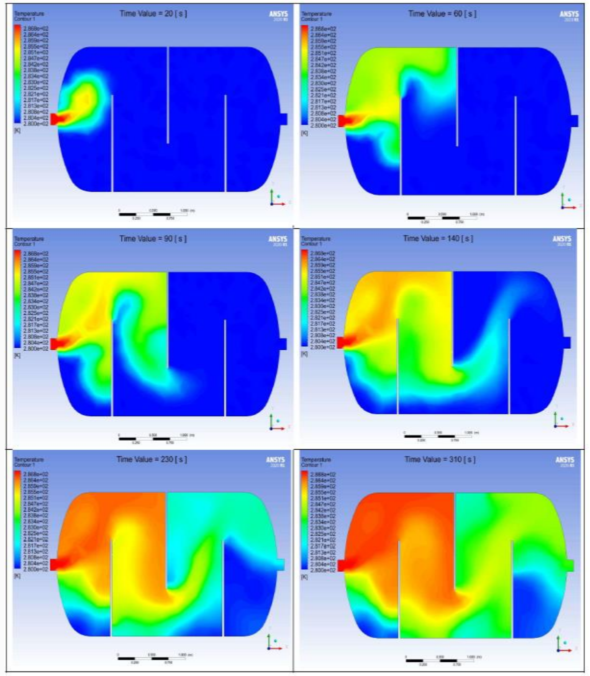
Comparison between different types of tanks

BTD
THERMAL ENERGY STORAGE DIFFUSER

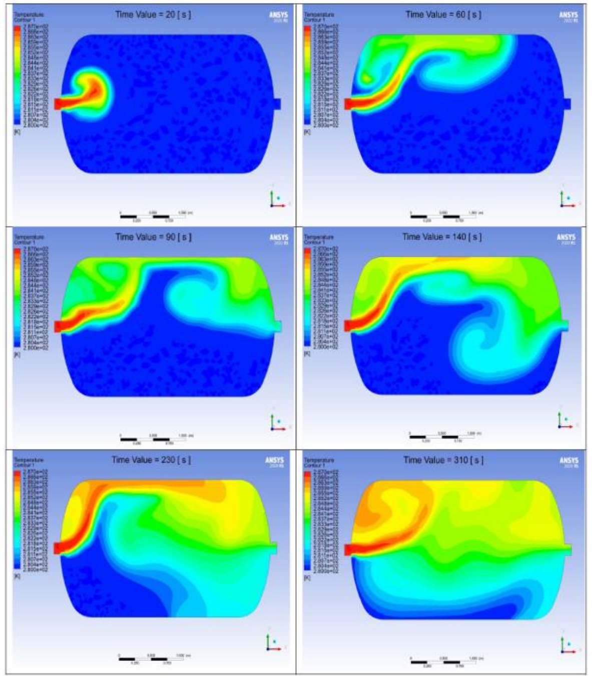
BTD TES DIFFUSER



BAFFLE PLATE TANK



EMPTY TANK WITHOUT DIFFUSER



Importance of Choosing a Right Buffer Tank

Comparison between different types of tanks

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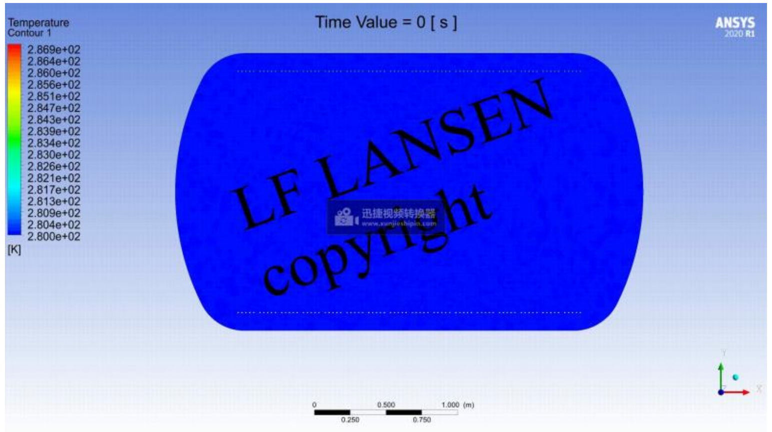
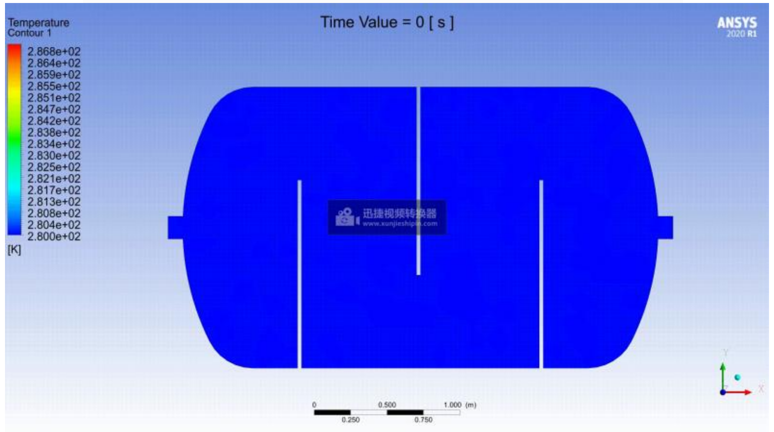
THERMAL ENERGY STORAGE DIFFUSER

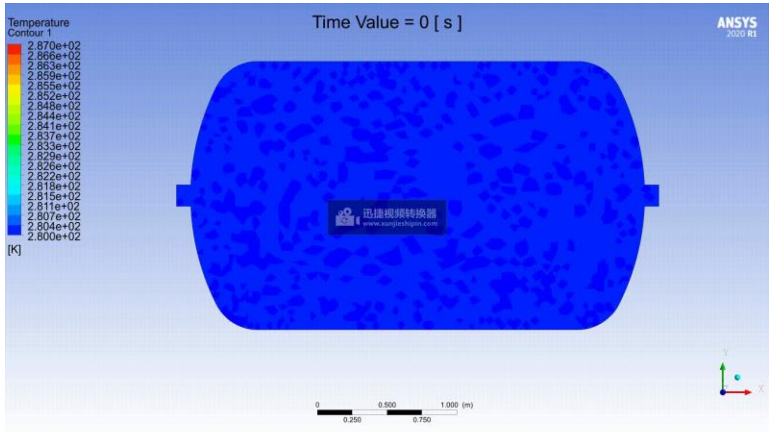
BTD TES DIFFUSER



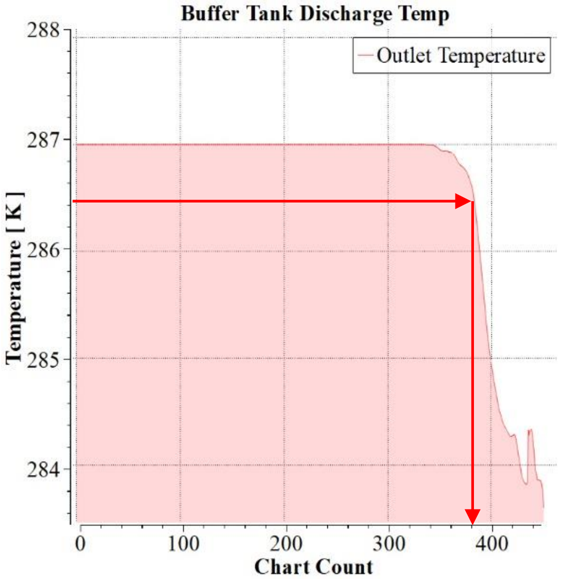
BAFFLE PLATE TANK



EMPTY TANK WITHOUT DIFFUSER

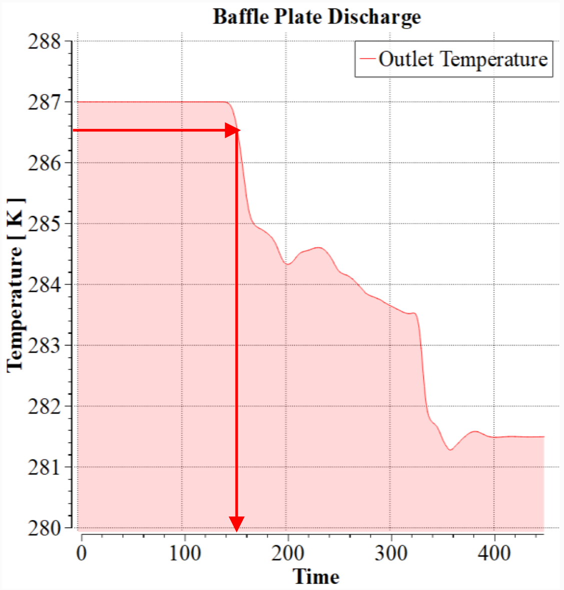


BTD TES DIFFUSER



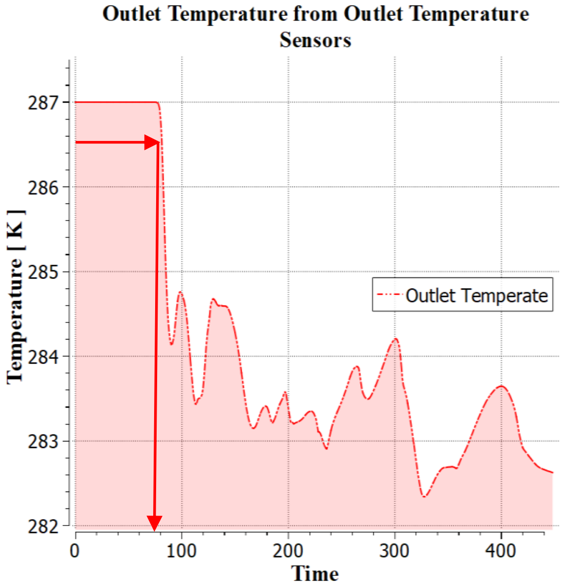
F.O.M = 380s/448s
= 84%

BAFFLE PLATE TANK



F.O.M = 170s/448s
= 38%

EMPTY TANK WITHOUT DIFFUSER



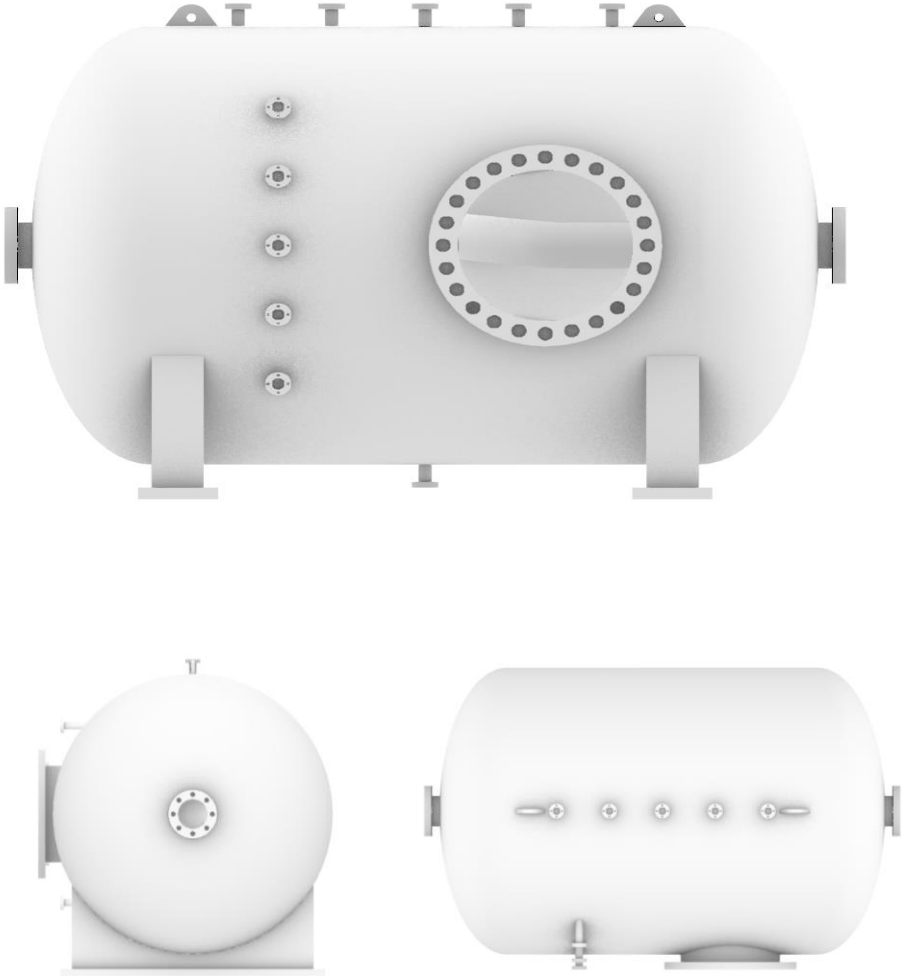
F.O.M = 80s/448s
= 18%

TYPES

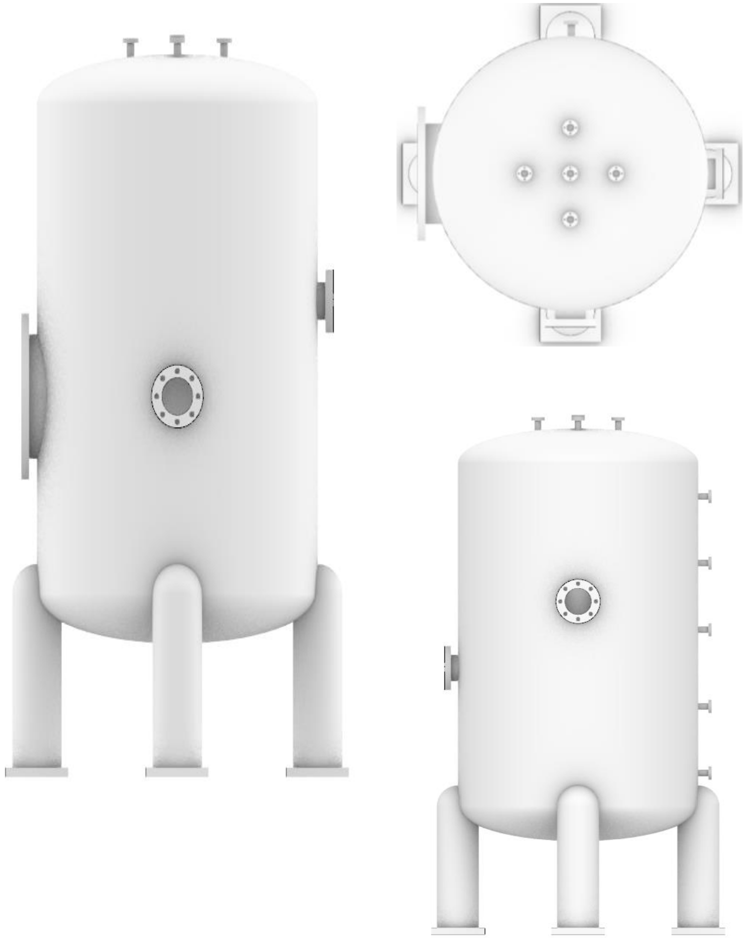
- HORIZONTAL OR VERTICAL?
- DIMENSIONAL TABLE

TYPE OF BUFFER TANK

HORIZONTAL



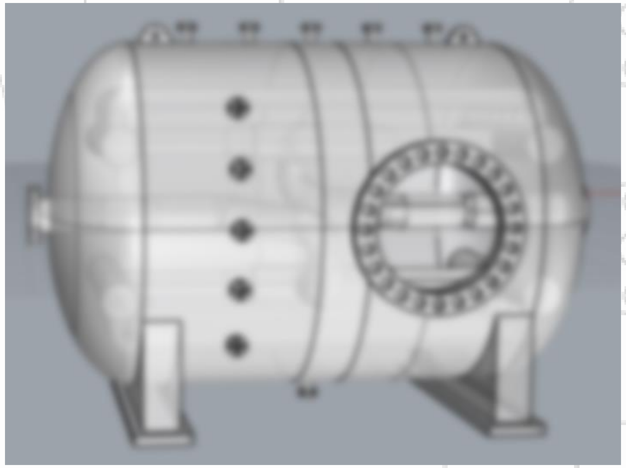
VERTICAL



HORIZONTAL OR VERTICAL?

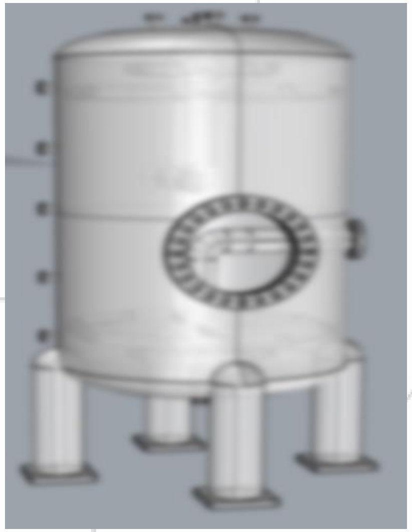
HORIZONTAL

- Better F.O.M and Performance
- Suitable for Indoor Installation which have height limitation
- Suitable for all capacities



VERTICAL

- Small foot print
- More connection option
- Suitable for 9m3 to 30m3
- Lower F.O.M compared to horizontal



F.O.M= Figure of Merit (Efficiency),
$0 < FOM < 1$

Dimensional Table

Effective Volume, m3			5	7	9	12	15	20	25	30	35	40	>40
FOM		Horizontal	>80	>80	>80	>80	>80	>85	>85	>85	>85	>85	Request for custom design
		Vertical	>75	>75	>75	>75	>80	>80	>80	>80	>80	>85	
Dimension (Proposed)	Tank Diameter, mm (Exclude Insulation)	Horizontal	1832	1832	1832	2000	2000	2500	2900	2900	3300	3300	
		Vertical	-	1832	1832	2000	2200	2500	2900	2900	3300	3300	
	Estimated Height, mm (Exclude railing)	Horizontal	2400	2400	2400	2600	2600	3100	3600	3600	4000	4000	
		Vertical	-	4350	5120	5400	5600	6000	6000	6800	6800	7200	
	Estimated Footprint, mm	Horizontal	3700 x 2200	4500 x 2200	5300 x 2200	6200 x 2400	7200 x 2400	7600 x 2900	7600 x 3500	8400 x 3500	8400 x 3900	8800 x 3900	
		Vertical	-	2200 x 2200	2200 x 2200	2400 x 2400	2600 x 2600	2800 x 2800	3400 x 3400	3400 x 3400	3800 x 3800	3800 x 3800	
			All tank dimension can be custom made upon request										

Project References

Project Reference - Data Center Buffer Tank

		Capacity	Year	Data Center	Customer	Owner / End user
1	Modify, Supply & Installation of Diffuser for Existing Buffer Tank	50m3 & 250m3	2014	CSF Computer Exchange CX-5	TES Engineering	Bridge DC / Microsoft
2	Modify, Supply & Installation of Diffuser for Existing Buffer Tank (L Shape Concrete Tank)	330m3	2015	CSF Computer Exchange CX-2	Progress Center	Bridge DC / Multiple
3	Supply of Chilled Water Buffer Tank (Without Diffuser)	30m3 x 2	2016	TM Data Center, Nusajaya	Wah Loon	Telekom Malaysia
4	Supply of Chilled Water Buffer Tank	35m3 x 2	2017	TM Data Center, Cyberjaya	Prestasi Baru	Telekom Malaysia
5	Supply of Chilled Water Buffer Tank	22m3 x 1	2018	TM Data Center, Brickfield	CSS	Telekom Malaysia
6	Supply of Chilled Water Buffer Tank (Baffled Plate)	1m3 x 6	2019	TM Data Center, Cyberjaya	Prestasi Baru	Telekom Malaysia
7	Supply of Chilled Water Buffer Tank	25m3 x 2	2020	Keppel Data Center, Sedenak	New Malaysia	Keppel DC / Microsoft
8	Supply of Chilled Water Buffer Tank (Baffled Plate)	1.2m3 x 8	2020	TM Data Center, Cyberjaya	Prestasi Baru	Telekom Malaysia
9	Supply of Chilled Water Buffer Tank	9m3 x 2	2021	AIMS Data Center, Cyberjaya	S6ME	TIMES
10	Supply of Chilled Water Buffer Tank	30m3 x 2	2022	Lion Data Center, Bukit Jalil	Semarak MNE	Bridge DC / Microsoft
11	Supply of Chilled Water Buffer Tank	5m3 x 1	2022	TM Data Center, Kelana Jaya	CSS	Telekom Malaysia
12	Supply of Chilled Water Buffer Tank	210m3 x 4	2022	Bridge Data Center, Sedenak	Pro-Matrix (PMX)	Bridge DC / Bytedance (TikTok)
13	Supply of Chilled Water Buffer Tank	40m3 x 2	2023	TIM Data Center, Manila	AMICI	Total Information
14	Supply of Chilled Water Buffer Tank	67m3 x 2	Ongoing	YTL Data Center, Kulai	New Malaysia	YTL
15	Supply of Chilled Water Buffer Tank	350m3 x 4	Ongoing	Bridge Data Center, Sedenak	Pro-Matrix (PMX)	Bridge DC
16	Supply of Chilled Water Buffer Tank	25m3 x 2	Ongoing	Jaguar Data Center, Bukit Jalil	Bond M&E	Bridge DC

Gallery

Vertical Type

- Keppel Data Center, Nusajaya
- 6MV Tier 3 DC
- End user - Microsoft
- Vertical Type Buffer Tank (25m3)

Vertical

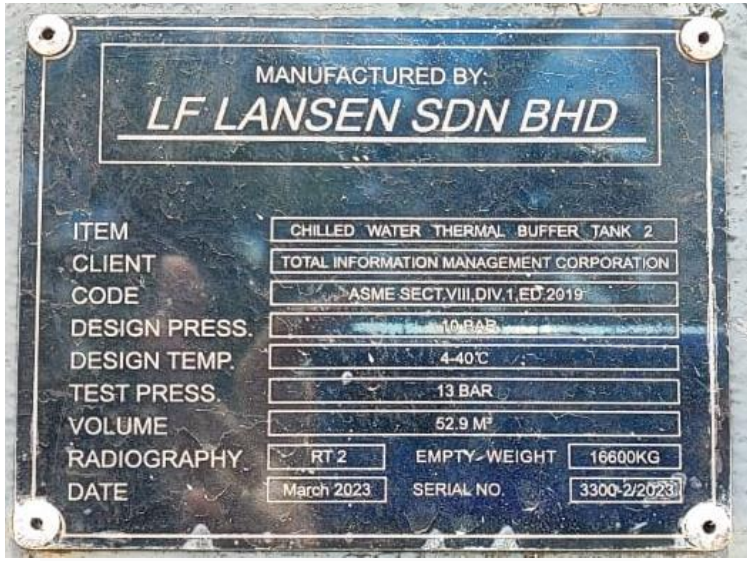
- Lion Data Center, Bukit Jalil
- End User - Microsoft
- Vertical Type Buffer Tank (30m3)

HORIZONTAL

- TM Data Center, Nusajaya
- Horizontal Type Buffer Tank (30m3)

HORIZONTAL

- TM Data Center, Kelana Jaya
- Horizontal Compacted Type Buffer Tank (<10m3)



HORIZONTAL

- Total Information Management (TIM DC), Manila
- Horizontal Type Buffer Tank (40m3)
- Lead time < 8 weeks

VERTICAL

- Bridge Data Center, Sedenak
- End user – Bytedance (TikTok)
- 120MW Hyperscale DC
- Vertical Type Buffer Tank (210m3)

Contact Us

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