



RED RIVER

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TES TANKS

Product Catalog | ASME-Stamped Pressure Vessels
Data Center & Industrial Cooling Applications

ASME STAMPED

Section VIII Div. 1

U.S. FABRICATED

Gillette, Wyoming

CUSTOM SIZING

Available on Request

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About Red River

Red River is an ASME-certified pressure vessel manufacturer headquartered in Gillette, Wyoming. We specialize in the design, fabrication, and delivery of code-stamped vessels for data center, industrial, and energy sector clients across the United States. Every vessel we build carries our commitment: We Care More - about your project, your timeline, and your uptime.

This catalog presents our standard TES tank product line. All tanks are fabricated to ASME Section VIII Division 1 and are available with a U-stamp. Custom sizes, nozzle configurations, and pressure ratings are available upon request.

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Section 1 - What Is a TES Tank?

A TES tank (thermal energy storage tank) is a pressure vessel inserted into a chilled water loop to add thermal mass and hydraulic stability. It acts as a thermal shock absorber - storing cold water when the chiller is running at full output and releasing it when the chiller is off or transitioning between states. The result is a system that delivers consistent, stable supply temperatures regardless of how the chiller is cycling.

Primary Functions

- **Reduce chiller cycling:** Prevents rapid on/off cycling that shortens chiller life and wastes energy.
- **Stabilize supply temperature:** Delivers consistent entering water temperature to all cooling equipment.
- **Improve control loop stability:** Dampens abrupt changes in variable flow systems.
- **Support efficient operating strategies:** Enables warmer setpoints and economizer-first sequences.
- **Decouple production from consumption:** Chillers run at full efficiency; loads vary independently.

How Sizing Works

Tank volume is driven by two variables: system flow rate and desired storage/buffer time. For most data center and industrial applications, 5 to 10 minutes of storage/buffer time is standard.

$$\text{Tank Volume (gal)} = \text{System Flow Rate (GPM)} \times \text{Desired Storage Time (min)}$$

Chiller Size	Typical Flow (GPM)	5-Min Tank (gal)	10-Min Tank (gal)
100 Tons	150 GPM	750	1,500
200 Tons	300 GPM	1,500	3,000
400 Tons	600 GPM	3,000	6,000
600 Tons	900 GPM	4,500	9,000
1,000 Tons	1,500 GPM	7,500	15,000

GPM based on 1.5 GPM/ton. Custom delta-T and glycol systems will vary. Contact Red River engineering for site-specific sizing assistance.

Approx. Flow Check by Inlet / Outlet Size

Use this as a quick reference when selecting inlet/outlet options from the vertical TES tank table.

Inlet / Outlet Size	Approx. Flow Range
4" CL. 150 RFSO	125-250 GPM
6" CL. 150 RFSO	275-550 GPM
8" CL. 150 RFSO	500-1,000 GPM
10" CL. 150 RFSO	770-1,540 GPM
12" CL. 150 RFSO	1,100-2,200 GPM

Approximate flow range based on 4-8 ft/sec water velocity. Final nozzle sizing shall be confirmed by customer P&ID, flow rate, pressure drop, and project requirements.



Section 2 - Standard Product Line: Vertical TES Tanks

Red River vertical TES tanks are our most common configuration for data center mechanical rooms and utility spaces where floor footprint is at a premium. The standard vertical tank table below includes nominal gallons, actual gallons, diameter, shell length, baffle, manway, standard inlet/outlet sizes, vent/drain, design temperature, and model numbers.

TABLE VERSION: V1.10

Version date: 2026-06-19

NOM GAL	STYLE	ACTUAL GAL	OD (ft-in)	SL (ft-in)	BAFFLE	MANWAY	INLET / OUTLET OPTIONS	VENT / DRAIN	DESIGN TEMP	MODEL NO. 125 PSI	MODEL NO. 150 PSI
500	TALL	509	3'-6"	5'-9"	A/B	14" x 18" Elliptical, 1" THK	4", 6", 8" CL 150 RFSO	2" NPT	400°F	42.69.V.125.TES	42.69.V.150.TES
500	SHORT	521	4'-0"	4'-0"	A/B	14" x 18" Elliptical, 1" THK	4", 6", 8" CL 150 RFSO	2" NPT	400°F	48.48.V.125.TES	48.48.V.150.TES
750	TALL	767	4'-0"	6'-8"	A/B	14" x 18" Elliptical, 1" THK	4", 6", 8" CL 150 RFSO	2" NPT	400°F	48.80.V.125.TES	48.80.V.150.TES
750	SHORT	774	4'-6"	4'-10"	A/B	14" x 18" Elliptical, 1" THK	4", 6", 8" CL 150 RFSO	2" NPT	400°F	54.58.V.125.TES	54.58.V.150.TES
1,000	TALL	1,196	4'-0"	9'-4"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10" CL 150 RFSO	2" NPT	400°F	48.112.V.125.TES	48.112.V.150.TES
1,000	SHORT	1,030	5'-0"	5'-2"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10" CL 150 RFSO	2" NPT	400°F	60.62.V.125.TES	60.62.V.150.TES
1,500	TALL	1,521	5'-0"	8'-7"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	60.103.V.125.TES	60.103.V.150.TES
1,500	SHORT	1,540	6'-0"	5'-1"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	72.61.V.125.TES	72.61.V.150.TES
2,000	TALL	2,001	5'-0"	11'-11"	A/B	14" x 18" Elliptical, 1" THK	8", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	60.143.V.125.TES	60.143.V.150.TES
2,000	SHORT	2,017	6'-0"	7'-5"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	72.89.V.125.TES	72.89.V.150.TES
2,500	TALL	2,518	6'-0"	9'-10"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	72.118.V.125.TES	72.118.V.150.TES
2,500	SHORT	2,542	7'-0"	6'-4"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	84.76.V.125.TES	84.76.V.150.TES
3,000	TALL	3,012	6'-0"	12'-2"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	72.146.V.125.TES	72.146.V.150.TES
3,000	SHORT	3,018	7'-0"	8'-1"	A/B	14" x 18" Elliptical, 1" THK	6", 8", 10", 12" CL 150 RFSO	2" NPT	400°F	84.97.V.125.TES	84.97.V.150.TES
4,000	TALL	3,985	6'-0"	16'-11"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	72.203.V.125.TES	72.203.V.150.TES
4,000	SHORT	4,046	8'-0"	8'-0"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	96.96.V.125.TES	96.96.V.150.TES
5,000	TALL	5,009	7'-0"	15'-2"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	84.182.V.125.TES	84.182.V.150.TES
5,000	SHORT	5,028	8'-0"	10'-8"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	96.128.V.125.TES	96.128.V.150.TES
6,000	TALL	5,946	7'-0"	18'-6"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	84.222.V.125.TES	84.222.V.150.TES
6,000	SHORT	5,997	9'-0"	9'-7"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	108.115.V.125.TES	108.115.V.150.TES
8,000	TALL	7,943	8'-0"	18'-7"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	96.223.V.125.TES	96.223.V.150.TES
8,000	SHORT	7,998	10'-0"	10'-3"	A/B	14" x 18" Elliptical, 1" THK	8", 10", 12" CL 150 RFSO	2" NPT	400°F	120.123.V.125.TES	120.123.V.150.TES
10,000	TALL	9,911	9'-0"	18'-0"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	108.216.V.125.TES	108.216.V.150.TES
10,000	SHORT	10,001	11'-0"	10'-5"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	132.125.V.125.TES	132.125.V.150.TES
12,000	TALL	11,930	10'-0"	17'-1"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	120.205.V.125.TES	120.205.V.150.TES
12,000	SHORT	11,994	12'-0"	10'-2"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	144.122.V.125.TES	144.122.V.150.TES
15,000	TALL	14,865	11'-0"	17'-5"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	132.209.V.125.TES	132.209.V.150.TES
15,000	SHORT	14,963	12'-0"	13'-9"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	144.165.V.125.TES	144.165.V.150.TES
20,000	MAX	19,865	12'-0"	19'-8"	A/B	14" x 18" Elliptical, 1" THK	10", 12" CL 150 RFSO	2" NPT	400°F	144.236.V.125.TES	144.236.V.150.TES

All dimensions are nominal. Final dimensions are confirmed on approved drawings. Custom sizes and nozzle arrangements are available on request.

STANDARD INCLUSIONS - ALL VERTICAL MODELS

ASME Section VIII Div. 1 fabrication - U-stamp & NB registration available - Full-length internal flow baffle - 2" NPT vent/drain - 3/4" NPT pressure gauge connection - skirt with baseplate or angle-iron mounting supports - exterior primer coat

Section 3 - Internal Baffle Types

Vertical TES tanks are available with internal baffle arrangements to suit the required flow path, separation requirements, and customer P&ID. The vertical product table uses baffle designation A/B. Final baffle layout is confirmed on the approved drawing.

Baffle Type	Description	Flow Arrangement
Type A Standard Full Baffle	Standard full-height internal baffle used for the normal vertical TES tank layout.	Inlet and outlet are separated by a solid baffle to support hot/cold separation and reduce short-circuiting.
Type B High Perforated Baffle	Upper internal perforated baffle used to spread flow and reduce short-circuiting. Perforation size and quantity are engineered from required GPM.	Inlet turns up through an internal 90. Water passes through upper perforations before dropping through the tank volume. Outlet draws from the lower section.

TYPE B PERFORATED BAFFLE SIZING / FILL-OUT BASIS

Required inputs

- Design flow (GPM)
- Controlling inlet/outlet pipe ID
- Selected hole diameter
- Open area factor / allowable pressure drop

Calculation

- Pipe area = $\pi \times \text{Pipe ID}^2 / 4$
- One hole area = $\pi \times \text{Hole Dia}^2 / 4$
- Required open area = Pipe area x factor
- Hole count = Required open area / One hole area, round up

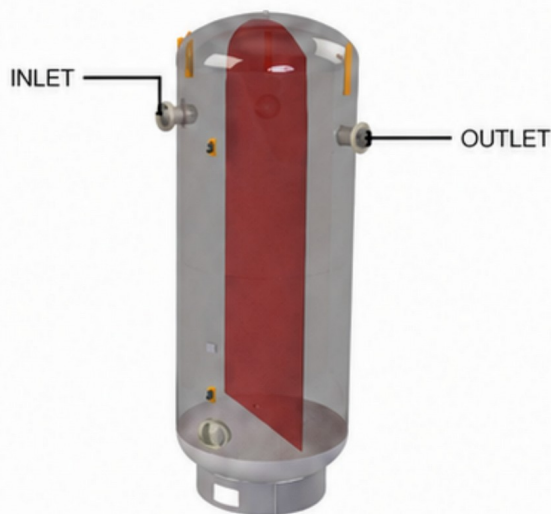
Show on drawing

- Hole dia and quantity
- Provided open area
- Pattern / spacing
- Pressure drop check if required

Standard starting check: total baffle open area should be equal to or greater than the controlling pipe flow area; use 1.25 x pipe area unless the project requires a different pressure drop or open area.

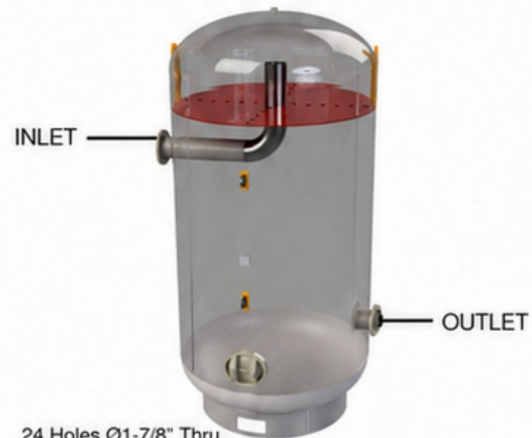
Type A - Standard Full Baffle

Full-height internal baffle



Type B - High Perforated Baffle

Upper perforated baffle sized by open area



24 Holes Ø1-7/8" Thru
Total Open Area = 66.3 in²
8" Sch. 80 Pipe Flow Area = 45.7 in²
Open Area = 145% of Pipe Flow Area

Pattern, edge distance, and pressure-drop check per approved drawing.

Baffle type, nozzle projection, hole size/count, pressure drop, and internal pipe details shall be confirmed on approved drawings before fabrication.



Section 4 - Configurations & Nozzle Options

Standard nozzle sizing is selected from the inlet/outlet options shown in the product table. Use the approximate flow check in Section 1 as a quick reference, then confirm final nozzle sizing from the customer P&ID, required GPM, pressure drop, and project requirements. Standard vent/drain connections are listed in the product table. Custom nozzle schedules, additional connections, and alternate flange ratings are available upon request.

Nozzle / Connection Guidance

Connection / Item	Standard Catalog Basis	Notes
Inlet / Outlet	CL. 150 RFSO per product table	Select size range by model; verify against flow and pressure drop.
Vent / Drain	2" NPT	Vertical standard catalog basis.
Pressure Gauge	3/4" NPT	Gauge connection included unless otherwise specified.
Manway	14" x 18" Elliptical, 1" THK	Final orientation and location shown on approved drawing.
Baffle	Type A / Type B	See Section 3 for baffle descriptions.
Alternate Flanges / Nozzles	Per spec	Available on request with customer P&ID or nozzle schedule.

Optional Add-Ons

Option	Description
Insulation Package	2" or 3" closed-cell foam with aluminum or stainless jacket
Stainless Interior Lining	304 or 316L lining for corrosive or high-purity fluid service
Glycol Service Package	Upgraded seals and coating for ethylene or propylene glycol service
Skid-Mounted Assembly	Tank pre-piped on structural steel skid, ready for rigging and bolt-down
Level Indication	Sight glass or transmitter connection for controls interface
Hydrostatic Test Report	Documented test report with test pressure and witnessed results
National Board Registration	NB number assigned; vessel registered with the National Board



Section 5 - Materials & Code Compliance

Item	Standard Specification	Notes
Shell & Head	SA-516 Gr. 70 Carbon Steel	Impact tested available
Stainless Option	SA-240 304 / 316L	For corrosive or high-purity service
Nozzle Forgings	SA-105 / SA-182	Carbon or stainless to match shell
Weld Filler	Per ASME Section IX WPS	All welders qualified per Sec. IX
Flange Rating	ASME B16.5 150# standard	300# available on request
Design Code	ASME BPV Section VIII Div. 1	U-stamp available on all models
NDE	RT or UT per code	Additional NDE per customer spec available
Post-Weld Heat Treat	Per ASME code requirements	Performed in-house
Hydrostatic Test	1.3 x MAWP per ASME Sec. VIII	Test report provided
Exterior Coating	Primer + finish coat standard	Epoxy lining available
Nameplate	ASME stamped nameplate	Includes MAWP, design temp, NB number

Quality & Certifications

- ✓ ASME Section VIII Division 1 - Certificate of Authorization (U-stamp)
- ✓ National Board of Boiler and Pressure Vessel Inspectors - Registration available
- ✓ All welders qualified per ASME Section IX
- ✓ Written QC Program on file and available for customer review
- ✓ Third-party Authorized Inspector (AI) engagement on all stamped vessels
- ✓ Full material traceability from mill cert through final documentation package



Section 6 - How to Order / Application Checklist

For standard catalog TES models, provide the information below and we will confirm the right selection and return a quote. For custom sizes or special service, our engineering team will work directly with your team.

APPLICATION INFORMATION CHECKLIST

*Fields marked * required for sizing confirmation.*

- | | |
|---|---|
| ☐ * Chiller capacity (tons) | ☐ Seismic design information: site class, Ss/S1, risk category, anchorage requirements, or project structural criteria |
| ☐ * System flow rate (GPM) | ☐ Wind / outdoor exposure requirements, if applicable |
| ☐ * Desired storage/buffer time (minutes) or known required volume (gallons) | ☐ Inlet / outlet nozzle size preference or connecting pipe size |
| ☐ * Supply / return temperature (°F) and delta-T | ☐ Customer P&ID or nozzle schedule, if available |
| ☐ * Fluid type: water / ethylene glycol % / propylene glycol % | ☐ Mounting preference: skirt/baseplate or angle-iron mounts |
| ☐ * Design pressure (PSI): 125 / 150 / other | ☐ ASME U-stamp required? |
| ☐ * Design temperature (°F) - 400°F if unknown | ☐ National Board registration required? |
| ☐ Installation orientation: vertical | ☐ Special coatings, insulation, glycol service, or fluid service requirements |
| ☐ Available floor space and ceiling height | ☐ Required delivery timeframe |
| ☐ Project location: city, state, indoor / outdoor | |

GET A QUOTE

Red River | Gillette, Wyoming | redriver.team We Care More. Our team responds to quote requests within one business day. Share the application checklist above and we will return a budget number or firm quote, along with any clarifying questions from our engineering team.