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Global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems Market Growth 2026-2032

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Abstracts

The global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market size is predicted to grow from US$ 186 million in 2025 to US$ 533 million in 2032; it is expected to grow at a CAGR of 15.0% from 2026 to 2032.

Shell-and-tube heat exchangers for AI training cluster cooling systems are indirect heat transfer devices used in the cooling infrastructure of AI training data centres, intelligent computing facilities and high-density GPU clusters. Structurally, they consist of a shell, tube bundle, tube sheets, baffles, heads and nozzles, allowing chilled water, condenser water, glycol mixtures, refrigerants or other engineering fluids to exchange heat across the tube wall between shell-side and tube-side circuits. In AI training environments, these exchangers are primarily deployed within chiller evaporators or condensers, primary cooling plants, facility-water isolation loops, liquid-cooling support systems, free-cooling arrangements and heat recovery modules. Their role is not to cool the processor directly, but to provide a robust, maintainable and certifiable thermal bridge for mission-critical cooling infrastructure. Pricing varies widely: small standard coolers may be priced from several thousand US dollars, while medium and large customised exchangers for data-centre cooling plants can reach several hundred thousand dollars or more per unit.

Based on our research, shell-and-tube heat exchangers for AI training cluster cooling systems should not be treated as a newly created product category detached from the traditional heat exchanger industry. They are better understood as a mature pressure-vessel heat transfer technology being redeployed into mission-critical cooling infrastructure for high-density AI computing. The product should not be described as an ?air-cooled? component. Its engineering role is to provide stable indirect heat transfer in

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chilled-water plants, chiller evaporators or condensers, facility-water loops, glycol systems and heat recovery arrangements. In direct-to-chip or immersion liquid cooling, heat is captured close to processors, but it still has to be rejected into facility water, dry coolers, chillers or broader thermal infrastructure. This is where robust heat exchangers remain essential. However, shell-and-tube units do not cover the entire data-centre heat exchanger market. Plate heat exchangers are often more common in compact CDU and liquid-to-liquid modules, while shell-and-tube designs are more relevant in larger, higher-pressure, more serviceable or chiller-integrated applications.

The global supply base is structurally layered. North America and Europe remain the strongest regions for TEMA-type engineering, ASME/PED pressure-vessel fabrication and high-end custom shell-and-tube heat exchangers. Specialist manufacturers such as API Heat Transfer, Xylem Standard Xchange, Metalforms Heat Transfer, FUNKE, Bronswerk and Enerquip provide clear shell-and-tube product evidence. At the same time, data-centre cooling system OEMs such as Johnson Controls, Trane, Carrier and Dunham-Bush participate through chillers and cooling plants, where the shell-and-tube component value is often embedded within larger systems. China is becoming increasingly important because AI computing centres, liquid-cooling systems, domestic thermal management suppliers and industrial cooling equipment makers are growing together. Chinese suppliers such as Envicool, Sanhe Tongfei and Binglun Environment are relevant to the broader cooling infrastructure chain, although the revenue directly attributable to shell-and-tube heat exchangers requires careful separation from total system revenue.

Demand growth is being driven by three primary forces. First, new AI training data centres require larger and more resilient cooling plants as GPU cluster density rises. Second, existing data centres are being retrofitted for hybrid air-liquid and liquid-cooling deployments, creating demand for primary-side heat exchange, hydraulic separation and redundancy. Third, pressure to reduce PUE, WUE and power-system stress is making cooling infrastructure a board-level and site-selection issue rather than a back-end mechanical service. The market is therefore not simply growing because more heat exchangers are needed; it is growing because thermal infrastructure has become a constraint on AI deployment. Shell-and-tube products will benefit selectively, particularly where high duty, pressure tolerance, corrosion resistance, inspectability and long operating life are valued more than footprint minimisation.

The future competitive landscape will be shaped by integration rather than by component manufacturing alone. Shell-and-tube heat exchanger suppliers that can work with chiller OEMs, liquid-cooling integrators, data-centre EPC contractors and

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hyperscale owners will have stronger access to AI-related demand. Manufacturers with pressure-vessel certification, short engineering cycles, proven thermal design capability, material flexibility and global service support will be better positioned than commodity fabricators. At the same time, substitution risk from plate heat exchangers remains real in compact CDU and liquid-to-liquid applications. The practical conclusion is that this is a mature industry with a new growth vector, not a broad-based hypergrowth component market. The investable and strategic opportunity lies in the intersection of high-reliability heat transfer engineering, AI data-centre cooling architecture and regional supply-chain localisation.

LP Information, Inc. (LPI) ' newest research report, the ?Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems Industry Forecast? looks at past sales and reviews total world Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems sales in 2025, providing a comprehensive analysis by region and market sector of projected Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems sales for 2026 through 2032. With Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US$ millions of the world Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems industry.

This Insight Report provides a comprehensive analysis of the global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyzes the strategies of leading global companies with a focus on Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms? unique position in an accelerating global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems and breaks down the forecast by Product Configuration, by Application, geography, and market size to highlight emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems.

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This report presents a comprehensive overview, market shares, and growth opportunities of Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market by product type, application, key manufacturers and key regions and countries.

Segmentation by Product Configuration:

Fixed Tubesheet Shell-and-Tube Heat Exchanger

U-Tube Shell-and-Tube Heat Exchanger

Floating Head Shell-and-Tube Heat Exchanger

Other

Segmentation by System Position:

Chiller-integrated Heat Exchanger

Primary Cooling Plant Heat Exchanger

Liquid-cooling Support Heat Exchanger

Heat Recovery Heat Exchanger

Segmentation by Heat Transfer Media:

Water-to-Water

Glycol-to-Water

Refrigerant-to-Water

Other

Segmentation by Manufacturing Model:

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Specialist Heat Exchanger OEM

Chiller / Cooling System OEM

Pressure Vessel Fabricator

System Integrator / Non-manufacturer

Segmentation by Application:

Hyperscale AI Training Data Center

Colocation AI Computing Facility

Enterprise / Research HPC Facility

Edge / Modular AI Data Center

Other

This report also splits the market by region:

Americas

United States

Canada

Mexico

Brazil

APAC

China

Japan

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- Korea
- Southeast Asia
- India
- Australia

Europe

- Germany
- France
- UK
- Italy
- Russia

Middle East & Africa

- Egypt
- South Africa
- Israel
- Turkey
- GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analysing the company's coverage, product portfolio, its market penetration.

- API Heat Transfer

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Johnson Controls

Kelvion

Xylem Standard Xchange

Metalforms Heat Transfer

FUNKE

Bronswerk Heat Transfer

Binglun Environment

Enerquip Thermal Solutions

Graham Corporation

Hughes-Anderson

SACOME

HRS Heat Exchangers

E.J. Bowman

Sanhe Tongfei

Taiwan Heat Transfer

Kaori

Trane Technologies

Carrier Global

Dunham-Bush

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Key Questions Addressed in this Report
What is the 10-year outlook for the global Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market?
What factors are driving Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market growth, globally and by region?
Which technologies are poised for the fastest growth by market and region?
How do Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems market opportunities vary by end market size?
How does Shell-and-Tube Heat Exchangers for AI Training Cluster Cooling Systems break out by Product Configuration, by Application?

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