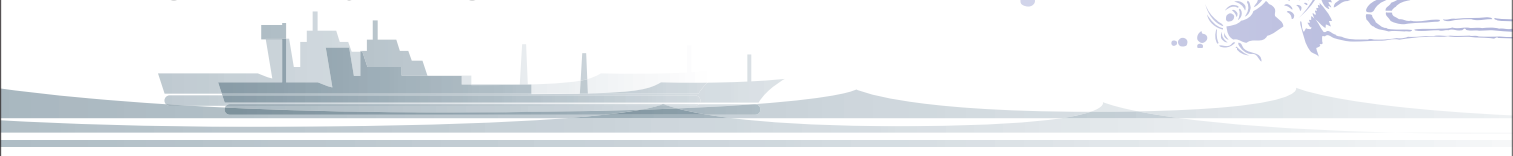
Maritime 海事

High Quality & High Performance



MLIT
Ministry of Land, Infrastructure, Transport and Tourism

Maritime

Japan's Shipbuilding and Marine Equipment Industries Lead the World with Exceptional Technological Expertise, a Proven Track Record and Extensive Experience

Japan develops and produces a wide variety of ships and marine equipment and continues to lead the world with exceptional technological expertise, a proven track record and extensive experience. This range extends from "carrier vessels" such as bulk carriers, oil tankers, car carriers and container ships to "high-value-added vessels" such as cruise ships and ocean development support ships, "work and research vessels" such as dredgers, fisheries research vessels and drill ships, and "marine structures" such as Mega-Float and semi-submersible drilling rigs.

In particular, Japan boasts the world's top-level technologies in environmental and energy-saving measures, which have been in strong demand in recent years, by vigorously promoting global-leading research and development.

Japan's Shipbuilding Lineup
日本の造船ラインナップ

Japanese Shipbuilding
日本の造船

Carrier Vessels 物資運搬船
Oil tankers, bulk carriers, car carriers, container ships, LNG carriers, LPG carriers, etc.
オイルタンカー、バルクキャリア、自動車運搬船、コンテナ船、LNG 船、LPG 船など

High-Value-Added Vessels 高付加価値船
Cruise ships, ocean development support ships, etc.
クルーズ船、海洋開発支援船など

Work and Research Vessels 作業・調査船
Dredgers, fisheries research vessels, floating production storage and offloading units (FPSOs), tugboats, drill ships, platform supply vessels (PSVs), anchor handling vessels (AHVs), etc.
浚渫船、漁業調査船、FPSO、タグボート、掘削船、PSV・AHV など

Marine Structures 海洋構造物
Mega-Float, semi-submersible drilling rigs, etc.
メガフロート、セミサブリグなど

Features

1. Stable provision of high-quality, high-performance ships
2. Global-leading environmental and energy-saving technologies
3. Maritime clusters that generate synergistic effects
4. Active efforts to pass on techniques and develop human resources

優れた技術力と豊富な実績・経験で世界をリードする日本の造船・舶用工業

日本は、バルクキャリア、オイルタンカー、自動車運搬船、コンテナ船などの「物資運搬船」から、クルーズ船、海洋開発支援船などの「高付加価値船」、浚渫船、漁業調査船、掘削船などの「作業・調査船」、メガフロート、セミサブリグなどの「海洋構造物」まで、多種多様な船舶・舶用機械を開発・製造し、その優れた技術力と豊富な実績・経験で世界をリードし続けています。

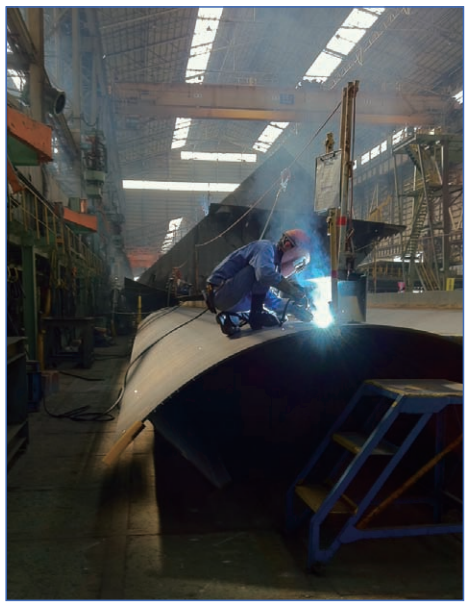
なかでも、近年強く求められている環境・省エネ対策については、世界に先駆けて積極的に研究開発を進めてきたことにより、世界最高レベルの技術を有しています。

Features

1. 高品質かつ高性能な船舶を安定的に提供
2. 世界をリードする環境・省エネ技術
3. 相乗効果を生みだす海事クラスター
4. 技術の伝承と人材育成に積極的に取り組む

1 Stable Provision of High-Quality, High-Performance Ships

Backed by Japan's outstanding technology, proven track record and wealth of experience accumulated over the years, Japanese shipbuilding and marine equipment industries provide a stable supply of a wide range of ships both in terms of "High Performance," which allows safe and economical operation of ships, and "High Quality," which promises excellent durability and reliability.



2 Global-Leading Environmental and Energy-Saving Technologies

Being an important part of social infrastructure, ships have always been required to realize high safety and economic efficiency. Nowadays, there are also strong demands for new innovations that ensure ships are environmentally friendly and energy saving.

In Japan, government, industry and academia work hand in hand to continuously devise cutting-edge technologies for the design and construction of advanced ships that meet the needs of society and ship owners.

World's First Large Container Vessel Equipped with Air Lubrication System

The *MALS-14000CS* represents the world's first successful application of a large container vessel equipped with an air lubrication system (Capacity of 14,000 TEU <Twenty-foot equivalent container unit>). In addition to the newly developed air lubrication system, the vessel reduces CO_2 emissions by 35% compared with container carriers of conventional design thanks to the adoption of today's most advanced, high-efficiency ship hull design and propulsion system.

● CO_2 Emissions Cut by 10% with Air Lubrication System

The *MALS-14000CS* adopts the proprietary Mitsubishi Air Lubrication System (MALS), which reduces frictional resistance between the vessel hull and seawater by pumping air bubbles onto the bottom of the vessel, reducing CO_2 emissions by 10%.

1 高品質かつ高性能な船舶を安定的に提供

日本の造船・舶用工業産業は、優れた技術力および豊富な実績・経験をもとに、安全かつ経済的な「高性能」と、耐久性・信頼性を確保する「高品質」の両面をもつ多様な船舶を安定的に提供しています。

2 世界をリードする環境・省エネ技術

重要な社会基盤である船舶には、安全性や経済性はもちろん、近年は特に環境・省エネ対策についての技術革新が強く求められています。

日本は、官民学が一体となって継続的な技術開発に取り組み、社会や船主のニーズに応えた先進的な船舶の設計・建造および舶用技術の開発を行っています。

世界初、空気潤滑システム搭載の大型コンテナ船

世界で初めて実用化に成功した空気潤滑システム搭載の大型コンテナ船「MALS−14000CS」（コンテナ積載量14,000個<20フィートコンテナ換算>）。新開発の空気潤滑システムに加え、最新鋭の高効率な船型や推進機関の採用などにより、従来船に比べCO_2の排出量を35%削減しています。

●空気潤滑システムの搭載で10%のCO_2削減

空気を船底に送り込み、泡の力で船舶と海水の摩擦抵抗を低減させる独自の空気潤滑システム「MALS」（Mitsubishi Air Lubrication System）」を搭載し、CO_2を10%削減しました。

Newly Developed Hull and Propulsion System Reduce CO_2 Emissions by 24%

In addition to the low-friction hull, the new ship design, which provides innovative arrangement for the bridge and exhaust funnels as well as increased container carrying capacity, coupled with a two-engine, two-shaft propulsion system, enables a 24% reduction in CO_2 emissions.

CO_2 Reduced by 5% by Electronically Controlled Diesel Engine and Waste Heat Recovery System

The combination of an electronically controlled diesel engine and waste heat recovery system helps reduce CO_2 emissions by 5%.

MALS-14000CS

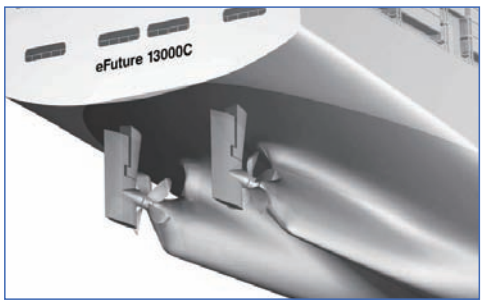
Low Environmental-Impact Container Carrier, Tanker and Bulk Carrier

A low environmental-impact container carrier, tanker and bulk carrier incorporating state-of-the-art technologies each realize a 30% reduction in both energy consumption and CO_2 emissions compared with conventional ships.

Low Environmental-Impact Container Carrier

The low environmental-impact container carrier *eFuture 13000C* significantly reduces environmental load by employing a newly developed twin-skeg hull form, considerably improving propulsion performance, boosting efficiency of the engine plant system and incorporating photovoltaic panels and high-capacity batteries.

eFuture 13000C



Twin-skeg hull form
2軸船型

新開発の船型・推進装置などで24%のCO_2削減

抵抗の少ない船型の開発に加え、船橋・煙突・コンテナ積載スペースの配置の工夫、新2機2軸推進装置の採用などにより、CO_2を24%削減しました。

電子制御機関・排熱回収装置などで5%のCO_2削減

電子制御機関や排熱回収装置の組み合わせなどにより、CO_2を5%削減しました。

環境負荷低減型のコンテナ船・タンカー・バルクキャリア

最新技術を随所に織り込んだ環境負荷低減型の「コンテナ船」「タンカー」「バルクキャリア」。いずれも、従来船に比べ、エネルギー消費量・CO_2排出量ともに30%低減を実現しています。

環境負荷低減型コンテナ船

環境負荷低減コンテナ船「eFuture13000C」は、新開発の2軸船型の採用や推進性能の大幅な向上、プラントシステムの効率向上、太陽光パネル・大容量蓄電池の採用などにより、環境負荷の大幅な低減を図りました。

Low Environmental-Impact Tanker and Bulk Carrier

The low environmental-impact tanker *eFuture 310T* and low environmental-impact bulk carrier *eFuture 56B* significantly reduce environmental load by employing an updated contra-rotating propeller system, composite-type energy-saving devices and a ship configuration that reduces resistance from waves and wind pressure.

eFuture 310T

eFuture 56B

Contra-rotating propeller system
二重反転プロペラ

3 Maritime Clusters that Generate Synergistic Effects

The Japanese shipbuilding industry, marine equipment industry and marine shipping industry, each of which has achieved top global scale and results, work closely together to form maritime clusters. This cooperative relationship creates a synergy that is unique to Japan, driving effective quality improvement and technological development.

4 Active Efforts to Pass On Techniques and Develop Human Resources

Although manufacturing processes are fully automated for many industrial products, certain shipbuilding processes still require skilled technicians, and these can greatly impact the quality and performance of the ship.

The Japanese shipbuilding industry places emphasis on passing on techniques and developing human resources in order to maintain and improve the quality of personnel.

Shipbuilding site
造船風景

環境負荷低減型タンカー・バルクキャリア

環境負荷低減型タンカー「eFuture 310T」および環境負荷低減型バルクキャリア「eFuture 56B」は、改良型二重反転プロペラシステムや複合型省エネ付加物、波浪中抵抗・風圧抵抗を抑える船体形状の採用などにより、環境負荷の大幅な低減を図りました。

3 相乗効果を生みだす海事クラスター

日本は、世界トップクラスの規模と実績をもつ造船業・舶用工業・海運業を有しており、これらの関連産業が密接に連携･協力して海事クラスターを形成しています。これにより、他国にはない相乗効果を生みだし、効率的な品質向上と技術開発を可能にしています。

4 技術の伝承と人材育成に積極的に取り組む

生産工程の自動化が進む工業製品。しかし、造船には作業者の熟練技能が不可欠な工程がいくつも残されており、これが船舶の品質と性能に大きく影響します。

日本の造船業は、積極的に技能の伝承や人材育成を行うことにより、人々のクオリティの維持や向上に努めています。

Very Large Floating Marine Structure “Mega-Float”

Mega-Float is a very large floating marine structure consisting of steel blocks, or floating units. This structure is gaining a great deal of attention as a new construction method for social infrastructure on account of its various advantages such as environmental friendliness, freedom in installation location, short construction time and ease of transfer and removal.

Japan has been actively conducting research and development on Mega-Float since the 1990s. Testing using the world’s largest 1,000m floating airport model demonstrated the technological feasibility of constructing a 4,000m class Mega-Float airport. Through Japan’s exceptional design and construction technology for floating structures and environmental impact assessment technology, Mega-Float can be effectively applied to multipurpose facilities at underutilized marine space.

Features of Mega-Float

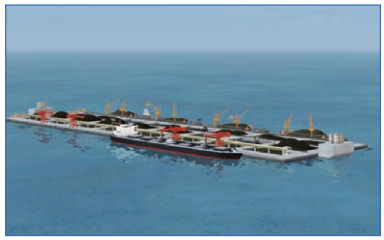
- Can be installed irrespective of water depth and submarine geology
- Adaptable to changes in weather and sea conditions and earthquake-proof
- High affinity with marine eco-systems
- Short construction period
- Possibility of using internal spaces
- Ease of transfer and removal
- Ease of expansion and modifying shape

Applications of Mega-Float

Airports, coal terminals, container terminals, emergency storage and response facilities, liquid storage facilities, bulk storage and transshipment facilities, photovoltaic generation plants, recreation facilities, wind turbine platforms, etc.

Airports
空港

Coal terminals
石炭ターミナル



Oil storage bases
石油備蓄基地

Emergency storage and response facilities
防災フロート

超大型浮体式海洋構造物「メガフロート」

メガフロートは、鋼材の浮体ブロックにより構成された超大型浮体式海洋構造物です。環境に優しい、設置場所が自由、工期が短い、移動・撤去が容易などのさまざまな特徴をもち、社会インフラの新しい工法として大きな注目を集めています。

メガフロートの特徴

- 水深や海底地質に関係なく設置できる
- 天候や海上模様の変化、地震に強い
- 海洋生態系との親和性がある
- 工期が短い
- 内部空間の利用が可能
- 移動・撤去が容易
- 拡張・形状変更が容易

メガフロートの用途

空港、石炭ターミナル、コンテナターミナル、防災施設、液体貯蔵施設、ばら積み貨物貯蔵・積出設備、太陽光発電所、娯楽施設、風力タービンプラットフォームなど

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