Four-stroke marine systems

Cruise and ferry

MAN Energy Solutions
Future in the making

Intelligent and reliable engine solutions

Future in the making

MAN Energy Solutions is the world's leading provider of large-bore diesel engines, turbomachinery, and integrated power systems. We make four-stroke and two-stroke engines for marine and stationary applications, turbochargers and propellers, gas and steam turbines, compressors and chemical reactors.

Our marine systems expertise is focused on emission reduction, complete propulsion packages, electrical propulsion, dual fuel, LNG, and digitized services.

Our commitment to minimizing fuel consumption while meeting even the most stringent emission regulations plays a vital role in safeguarding the environment for future generations.

Specialized know-how for your sector

Safety first

The cruise and ferry industry goes hand in hand with the highest standards of safety. Our engines contribute to the overall safety of your ship, its passengers and its crew by means of reliable design and quality.

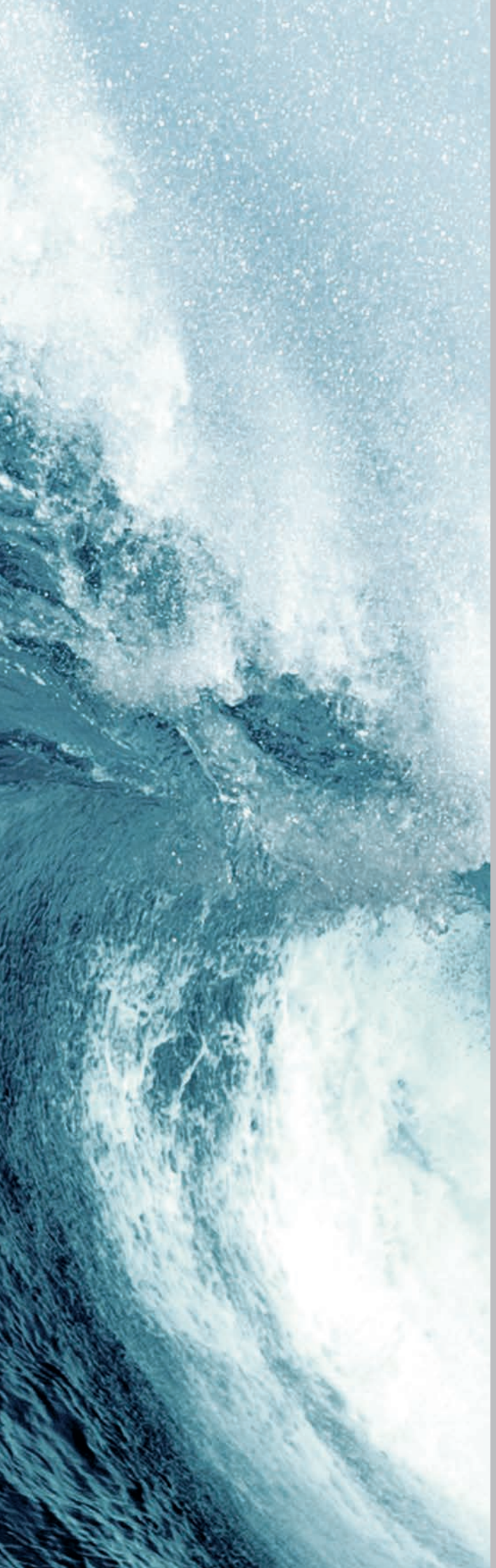
Environmental and economical factors

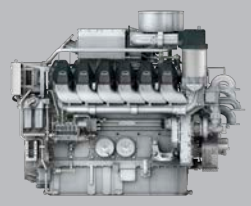
Passenger vessels typically sail in environmentally sensitive areas, so their engines must meet stringent emission regulations. At the same time, operating costs must be kept low to ensure the best possible economic result in an increasingly competitive environment.

Intelligent power for your business

We offer a wide range of highly efficient and reliable common rail engines for cruise ships and ferries. Common rail technology allows the independent setting of injection timing, duration, and pressure. This flexibility promotes the highest possible degree of freedom of optimization in fuel consumption, NO_x and smoke emissions.

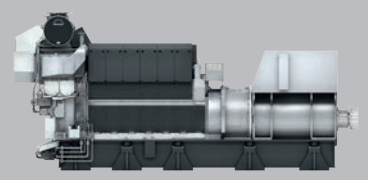
Four-stroke engines for cruise ships and ferries





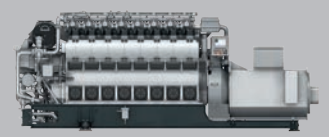
MAN 175D
Propulsion

1,499 – 4,400 kW



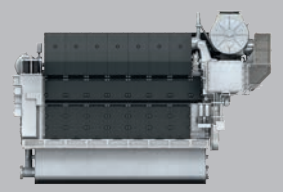
MAN 21/31
GenSet

1,000 – 1,980 kW



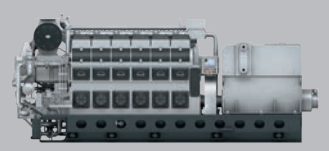
MAN 23/30DF
GenSet

625 – 1,200 kW



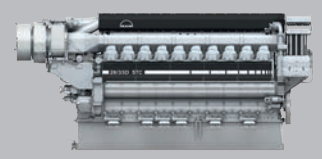
MAN 27/38
Propulsion

2,040 – 3,285 kW



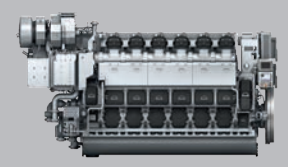
MAN 28/32DF
GenSet

1,000 – 1,800 kW



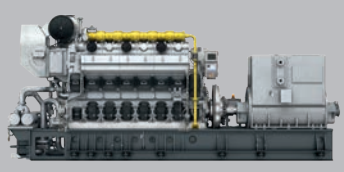
MAN 28/33D STC
Propulsion

5,460 – 9,100 kW



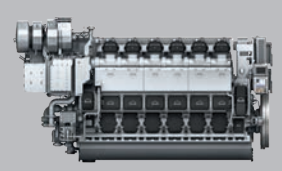
MAN 32/44CR
Propulsion

3,600 – 6,000 kW
7,200 – 12,000 kW



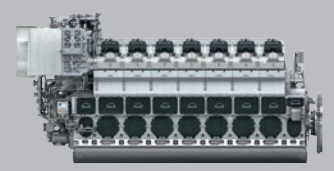
MAN 35/44DF
GenSet

3,060 – 5,300 kW



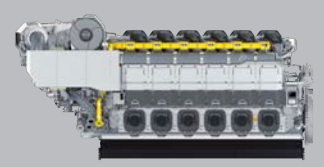
MAN 35/44DF
Propulsion

3,060 – 5,300 kW



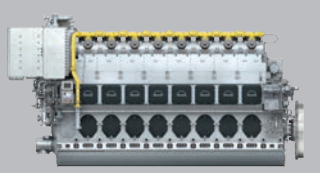
MAN 48/60CR
Propulsion

7,200 – 10,800 kW
14,400 – 21,600 kW



MAN 49/60DF
Propulsion

7,800 – 13,000 kW
15,600 – 18,200 kW



MAN 51/60DF
Propulsion

6,300 – 18,900 kW
6,900 – 20,700 kW

Powering people's leisure

Cruise ships

Once the preserve of the wealthy, cruises are now affordable to many and this segment is experiencing significant growth. Cruise lines are building spectacularly complex ships that operate all day, practically every day of the year.

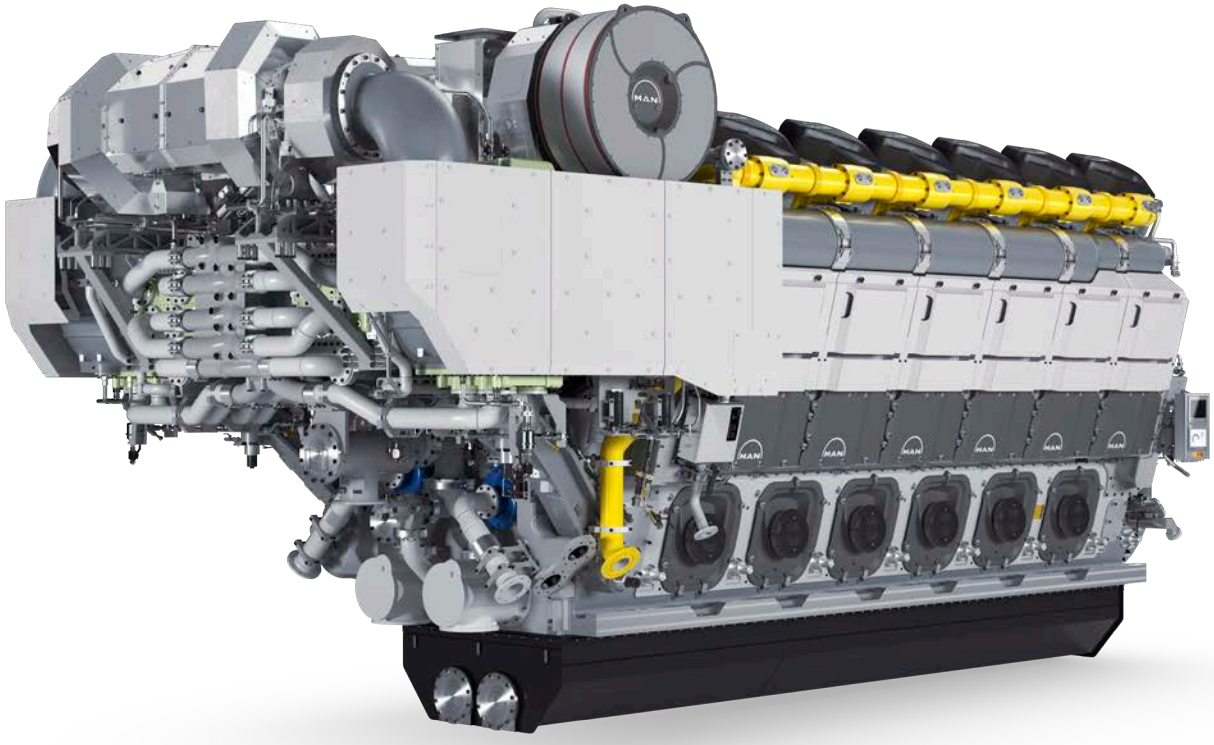
Engineering for environmentally friendly holidays

The growing awareness of the cruise industry's environmental impact together with ever more stringent emission regulations, especially in coastal areas, is an important factor in the design of new cruise ships. The ships must also be economical to operate, so as to keep holiday prices attractive.

Today's cruise ships must accommodate high demands for non-stop reliable, comfortable and silent power generation onboard. We offer highly efficient and reliable common rail (CR) propulsion engines and GenSets, which – thanks to their fully electronic injection system – allow the highest possible degree of freedom of optimization in fuel consumption, reducing NO_x and smoke emissions while ensuring the utmost passenger comfort.

An engine for change

MAN 49/60DF



The MAN 49/60DF resets the efficiency benchmark and ensures the lowest fuel costs for cruise vessels and ferries thanks to its fuel flexibility, enabling it to run on LNG or diesel. Looking to the future, its efficiency and low methane slip assure compliance with emissions legislation well into the 2030s. Beyond that, the flexibility of its dual fuel design creates multiple paths for emissions compliance through to 2050.

Benefits

New benchmark in efficiency
171.0 g/kWh liquid fuel consumption at 85 % MCR*
6,990 kJ/kWh gas consumption at 85 % MCR*
*Higher values apply for 8L and 10L

Long-term CO_2 emissions compliance
Thanks to benchmark efficiency, low methane emissions and fuel flexibility

Ready for further digitalization
With next-generation engine automation

Compact design
By increased power density

Alternative paths for emission compliance

Low methane slip and benchmark efficiency ensure vessels are emissions-compliant until approximately 2035. Solutions in response to more stringent regulations, are easy to implement and include retrofittable exhaust gas after-treatment systems, replacing natural gas with bio gas or synthetic natural gas, and future fuels such as green methanol.

MAN SaCoS 5000 and ACC 2.0
The MAN 49/60DF features the new MAN SaCoS 5000 engine automation system, and the new Advanced Combustion Control ACC 2.0. Both features future-proof your vessel for the digital age. While ACC 2.0 is essential for improved efficiency and robust in-field performance, the new MAN SaCoS offers enhanced remote support features and options to attain the highest levels of cybersecurity.

Further power solutions
MAN 35/44DF
MAN 32/44CR
MAN 51/60DF
MAN 48/60CR

Combining comfort and speed

Fast ferries

When quick shore-to-shore connections become too long for bridges or inconvenient to be reached by driving around the coast, that's where fast ferries come in. Their task: to transport passengers and vehicles quickly, safely, reliably, and on time.

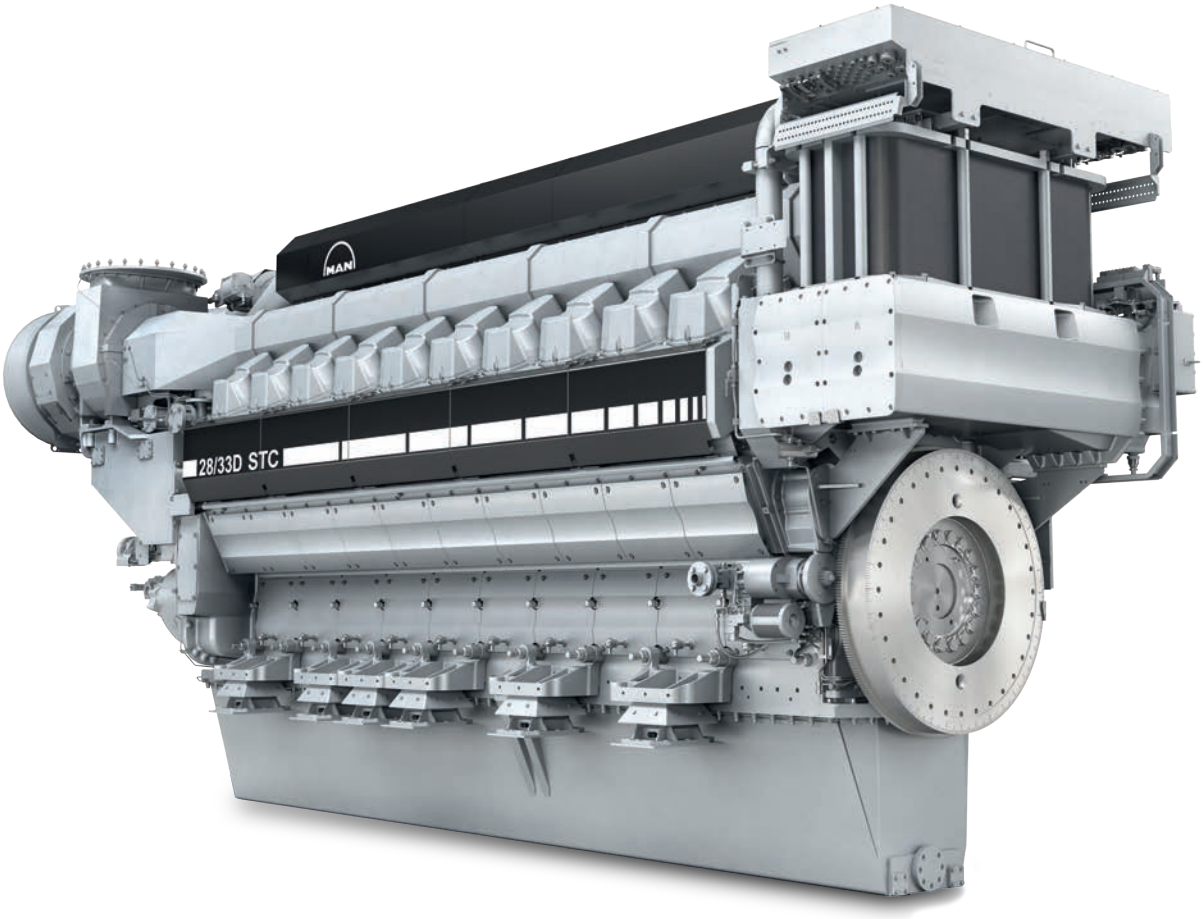
Improving performance

Fast-ferry operators provide rapid shore-to-shore connections with high power, low-weight ship designs that ensure their economic viability compared to other means of transportation. At the same time, they have to ensure passenger comfort with low noise and vibration levels as well as compliance with stringent emission limits in their typical areas of operation.

Our answer is a set of engines that deliver the necessary power quietly with minimum impact on payload and operating costs.

High-speed economy

MAN 28/33D STC



High speed, fast acceleration, and continuously high power – the MAN 28/33D STC really moves. The compact yet powerful engine has a high power-to-weight ratio and is fully compliant with current environmental standards, producing NO_x emissions that adhere to IMO Tier II and EPA Tier II regulations.

Benefits

Economic operation
Lowest TCO (total cost of ownership) on the market

Low maintenance costs
Due to long TBO (time between overhauls) intervals and on-board maintenance

Best power-to-weight ratio in its class
5.7 kg/kW, unequaled by any other medium-speed engine

Easy on maintenance and costs

Maintenance costs are kept low thanks to high engine availability. And with main overhauls only necessary every 32,000 hours, servicing downtime is kept to a minimum. As a result, you can count on low overall operating costs and best-in-class SFOC.

Sequential turbocharging (STC)
Two identical yet independent turbochargers provide high torque at low rpm. Fuel injection quantity, rate, and timing are precisely managed by micro-processors. For perfect torque and acceleration control.

MAN SaCoS$_{one}$ (safety and control system on engine)
Combines all functions of modern engine management into one complete system. Fully integrated it forms one unit with the drive assembly.

Further power solutions
MAN 175D

The advance of clean technologies

RoRo passenger vessels

Singapore Technologies Marine Ltd

Modern ferries place high demands for reliability and comfort on their main engines. Growing public awareness with respect to ship emissions and, in particular, the expected increase of future NO_x emission control areas in important regions of ferry operation have made environmental compliance another key factor for modern RoRo passenger vessel designs.

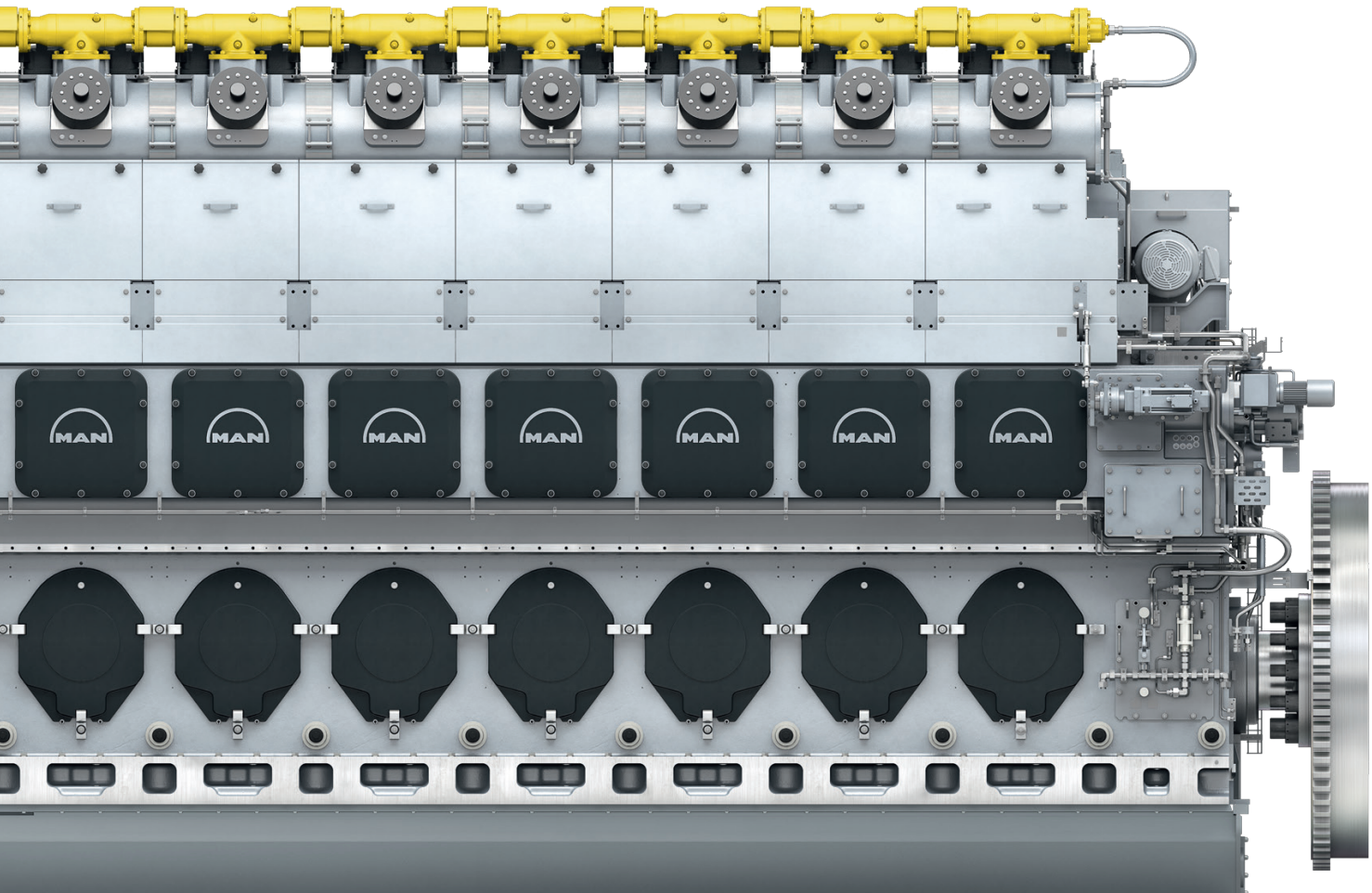
Improving economic performance

As well as dealing with environmental concerns, ferry operators have to keep operating costs at a low level to ensure their viability in a very competitive business environment.

We offer a wide choice of efficient diesel engines (running on heavy fuel or distillate) that make an economic difference and comply with IMO Tier III NO_x limits through the addition of our MAN SCR system for cleaning exhaust gas. Our closed-loop system control, supplemented by an intelligent regeneration algorithm for the MAN SCR, enables the engine and the catalyst to operate with minimum urea consumption and the best possible fuel efficiency. Of course, we also offer dual fuel engines that are IMO Tier III-compliant when running on gas.

Proven dual-fuel performer

MAN 51/60DF



This highly efficient dual fuel engine with low emissions can switch conveniently from gas mode to liquid fuel mode and vice versa without interruption. In a propulsion system with multiple dual fuel engines, the MAN 51/60DF ensures high reliability and speed flexibility at any time and load. The high efficiency variant offers best-in-class fuel consumption for low operating costs while the high power variant offers best-in-class load pickup for dynamic applications. The engine also provides 100 % MCR even at low gas fuel qualities, down to methane number 70.

Benefits

High power output
Up to 1,150 kW per cylinder

Excellent engine performance
Best-in-class fuel consumption or load pickup

Operating stability and flexibility
Seamless switch from HFO to gas mode and vice versa, gas operation even above 100 % MCR and gas start capability

Full environmental compliance
IMO Tier III in gas mode and liquid mode (with optional MAN SCR)

Lower maintenance costs

Intelligent use of the engines minimizes annual maintenance costs.

Safety beyond the standards
The MAN 51/60DF comes fully equipped with a safety and control system developed for full compliance with classification society standards. MAN SaCoS$_{one}$ allows for safe engine operation in liquid fuel or gas mode, offering optimum fuel consumption and very low emissions. In addition to all safety-relevant engine features, we offer an integrated safety solution for the whole engine room, tailor-made for each specific application.

Further power solutions

MAN 23/30DF GenSet
MAN 28/32DF GenSet
MAN 21/31 GenSet
MAN 27/38
MAN 35/44DF
MAN 35/44DF GenSet
MAN 32/44CR
MAN 48/60CR
MAN 49/60DF

Sustainable transport solutions

RoRo cargo ferries

RoRo cargo ferries play an essential role in connecting the roads and railways of regions separated by sea. Loading and unloading take little time, because the cargo is simply driven on and off board. This enables the just-in-time delivery of products such as food.

Ensuring commercial reliability

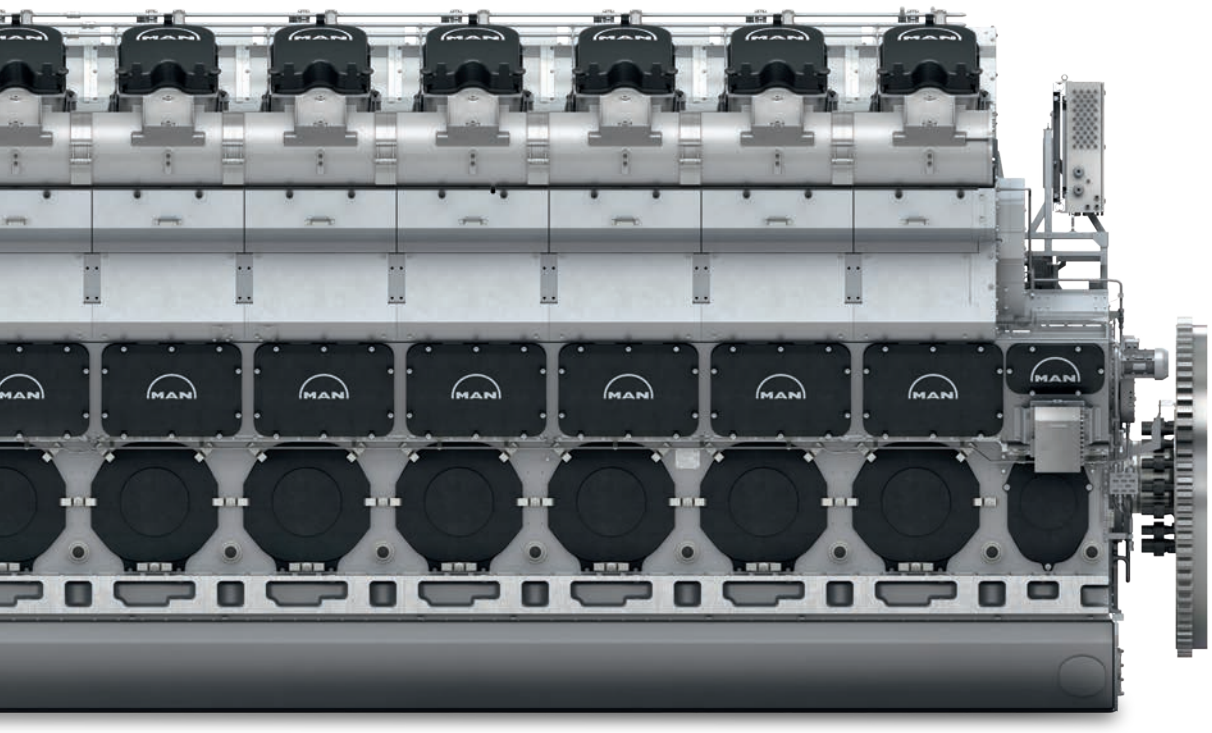
Driven by global growth, the mobility of wheeled cargo – both domestically and internationally – has increased rapidly in recent decades. Sustaining this increase depends on reliability and punctuality.

Reliability allows the operator to guarantee departure and arrival times. Without reliability, there can be no planning of local transport logistics or global supply chains.

We offer a wide range of highly reliable and efficient engines for powering ferries. Whether large ferries sailing in international waters or smaller ones operating on local routes, they all benefit from our advanced engine portfolio, whether for operation using conventional marine fuels or LNG.

Power for reliable logistics

MAN 48/60CR



The MAN 48/60CR combines high power output with low fuel consumption. It delivers top performance, operational flexibility and ultimate reliability.

Benefits

Fuel savings
Thanks to common rail technology and our innovative MAN ECOMAP optional feature

Low maintenance costs
Maintenance-friendly design with long service intervals

High reliability and availability
Due to established, robust design

Dual fuel option

Our dual fuel engine derivatives and conversion solutions are safe and powerful. We also offer complete solutions for gas-burning propulsion plants with dual fuel engines, onboard LNG storage and fuel gas supply systems (thanks to the recent acquisition of Cryo AB).

Common rail safety concept
All high pressure pipes are screened or have a double wall design. Flow-limiting valves at each cylinder prevent uncontrolled injection. Redundant high pressure pumps and sensors safeguard the operating ability. In single-engine plants, the electronic control units are redundant as well.

MAN SaCoS$_{one}$ engine management system
Ease of operation, outstanding reliability, and fast commissioning are the key features of the MAN SaCoS$_{one}$. The system is highly standardized and its modules can be replaced quickly.

Further power solutions

MAN 23/30DF GenSet
MAN 28/32DF GenSet
MAN 21/31 GenSet
MAN 27/38
MAN 35/44DF GenSet
MAN 35/44DF
MAN 32/44CR
MAN 51/60DF
MAN 49/60DF

Improving your environmental performance

Equipped for strict emission regulations

We are firmly committed to reducing emissions with minimum impact on your operating costs. This includes an active partnership with environmental institutions and development banks. For our customers, it means engines and system packages that are extremely well matched with integrated, intelligent and dynamic controls.

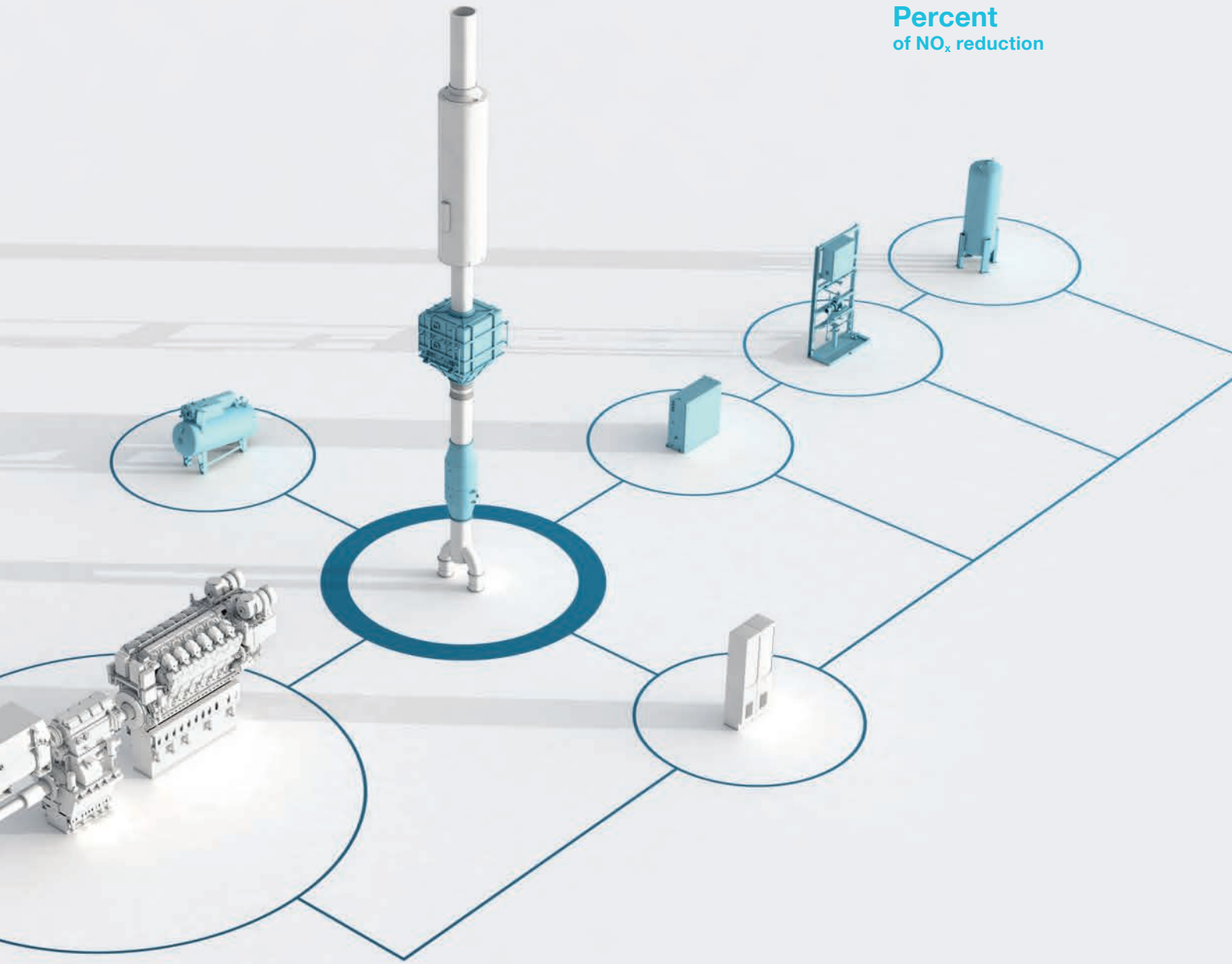
Benefit from overall system competence

MAN Energy Solutions unites under one roof the core technologies and competencies which decisively influence the performance of our products: injection systems, turbocharger, controls for both, engine and after-treatment systems. This enables us to design and implement highly efficient emission-reduction packages for both new constructions and retrofits.

Selective catalytic reduction (MAN SCR) is the most field-tested and reliable system for achieving NO_x reduction rates of up to 90%. Due to a chain of chemical reactions taking place between catalyst and exhaust gas, harmful NO_x substances are transformed into ecologically benign constituents.

90

Percent
of NO_x reduction



MAN PrimeServ

Service with passion

MAN PrimeServ is the dedicated MAN Energy Solutions service brand. Via a network of over 100 service centers worldwide, MAN PrimeServ provides 24/7 service across the globe. Our range of services includes technical support, consulting, and OEM spares, as well as maintenance, repair, and comprehensive individualized service plans.

365
days a year

24
hours a day

MAN PrimeServ provides:

- Prompt delivery of high-demand OEM spare parts within 24 hours
- Fast, reliable, and competent customer support
- Individually tailored O&M contracts
- Ongoing training and qualification of operators and maintenance staff
- Global service, 24 hours a day, 365 days a year
- Diagnosis and troubleshooting with our high-performance online service

MAN Energy Solutions and legacy brands

MAN PrimeServ is our brand name for high-quality aftersales support for the entire MAN Energy Solutions product portfolio. Through refinements to our products and repair techniques, we ensure and reinforce our technological leadership and technical expertise as an original equipment manufacturer (OEM) for the brands united under MAN Energy Solutions.

Worldwide service

We offer retrofitting and upgrade services to bring engines and turbo-chargers already in service up to the very latest standards of performance and efficiency.

Using the latest digital technology, we enable you to maximize the performance and availability of your MAN equipment by accessing real-time data analysis, remote support, and rapid solutions. We also offer an extensive range of training courses at MAN PrimeServ Academies around the world.

Our service does not vary according to location. We know that a vessel may be built in Asia, operated in Europe for ten years and then move to Africa for the next ten years. That does not alter our focus on dedicated training, fast delivery of strategic spare parts, a comprehensive approach, or our tailored maintenance contracts.

For more information please visit
www.man-es.com/services

100

service centers
worldwide

Get your engines started ...

An interactive experience
Download our MAN Brochure Store app from the App Store or Google Play Store. Use its exciting interactive features to explore our complete range of products and services. Suitable for iPhone, iPad, and Android.

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