

Everllence

PrimeServ

Retrofit & upgrade



Products
services
portfolio

Two-stroke
Tailored Performance
Optimization



Customized performance

Your partner for retrofit solutions

Tailored optimization for your fleet

Everllence PrimeServ's retrofit portfolio offers a wide range of engine system solutions for your existing fleet. With stricter operational demands, an increasing number of in-service vessels can benefit from custom-engineered upgrades.

With PrimeServ's customized retrofit optimizations you can achieve significant performance improvements across your fleet with each individual upgrade tailored to your specific two-stroke engine setup, operating profile, and performance goals.

DeRating

Optimize your fleet for today's low speed operations with a tailored solution that cuts fuel costs, emissions, and boosts efficiency across your engine, propeller, and turbocharger systems.

Many vessels in today's global fleet were originally designed with a higher specified maximum continuous rating (SMCR) for their main engines. However, evolving markets, stricter environmental regulations, and the drive for cost efficiency have led to lower operating speeds. This presents a valuable opportunity for optimizing engine efficiency, unlocking significant fuel savings, and staying compliant with global marine regulations.

Tailored DeRating that goes beyond

Everllence has developed a tailored retrofit solution that goes beyond simple engine optimization. By integrating the engine, propeller, and turbocharger into a unified system, we ensure that every DeRating solution is optimized for each vessel's actual and individual operating profile. This improves efficiency and reliability while delivering measurable savings and compliance benefits. From initial assessment to installation and class approval, Everllence supports our customers every step of the way, making this customizable solution a powerful investment for your existing fleet.

A comprehensive approach for maximum results

The mean effective pressure (MEP) is a key technical parameter that measures the average pressure in the cylinders during operation.

By optimizing MEP, the engine output can be precisely optimized to match real-world requirements, reducing fuel consumption without compromising performance. Depending on individual vessel needs, the solution may also involve propeller modifications to ensure efficient propulsion at lower power. Turbocharger parts can be adjusted to accommodate changed operational conditions to maintain optimal air supply and combustion temperatures across the new load range. This tailored, holistic, and comprehensive approach for each vessel maximizes your results.

Precision installation and commissioning

Before your vessel arrives at the designated shipyard, you will receive a complete installation kit for the DeRating solution. Our engineer team will supervise the installation on-site and participate in sea trials to provide expert oversight that ensures peak performance and regulatory compliance, securing class approval and optimal integration of your tailored solution.

Please contact your Everllence PrimeServ office for more details.

Unlock powerful fuel savings with tailored DeRating

Key benefits

- Complete tailored retrofit solution based on vessel-specific operational data
- Significant fuel savings through optimized engine output tailored to actual operating conditions
- Lower emissions and improved environmental compliance
- Extended engine lifetime and reduced maintenance costs
- Optimized propeller performance ensures efficient propulsion at reduced power
- Turbocharger adjustment or replacement maintains optimal air supply and combustion across the new operating range loads

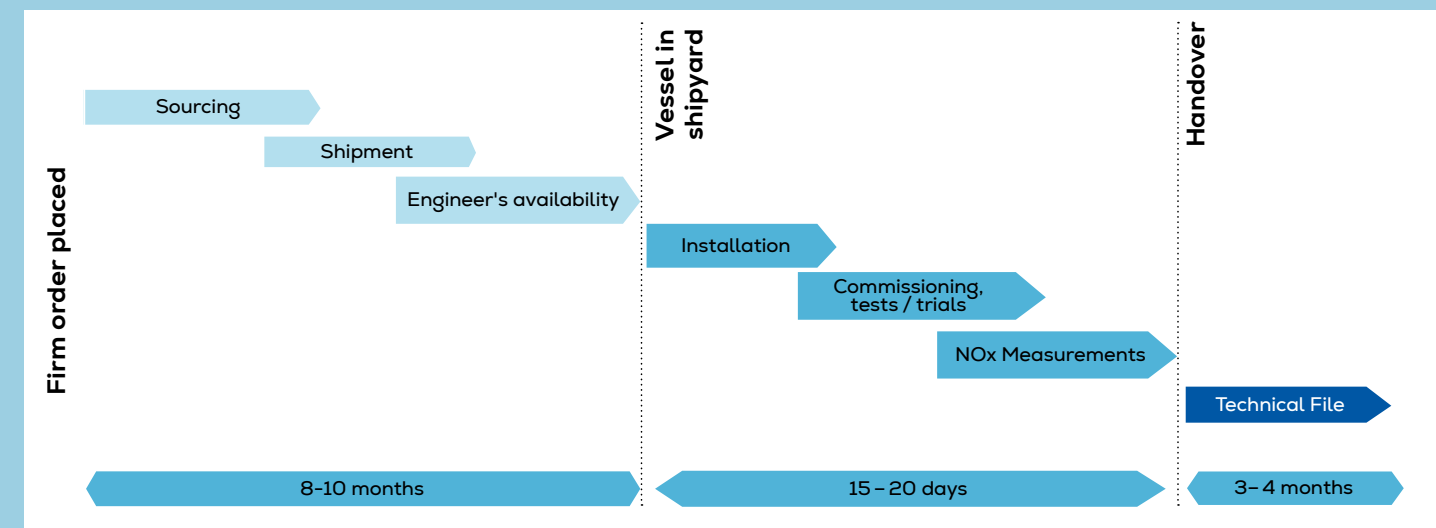
Scope of supply

Everllence delivers a complete solution. Depending on the selected services, the scope may include:

- Piston crowns & piston rings
- Camshafts, turning wheel, and intermediate shaft replacement or modification
- Complete turbocharger replacement or turbocharger re-matching
- Engine control software updates
- Control system parameterization and adjustments tailored to derated operation
- Engineering & project management
- Installation and commissioning of the solution

Applicable to

- Everllence B&W two-stroke engines



EcoTuning

EcoTuning is a tailor-engineered part-load tuning that reduces the engine's fuel oil consumption significantly, supporting your in-service fleet's decarbonization.

In a time where shipowners and operators are challenged by increasing fuel costs and emission regulations such as the Carbon Intensity Indicator, the Emissions Trading System (EU ETS), and the FuelEU Maritime directives, EcoTuning offers a proven solution to save fuel oil and support the regulatory compliance of your fleet.

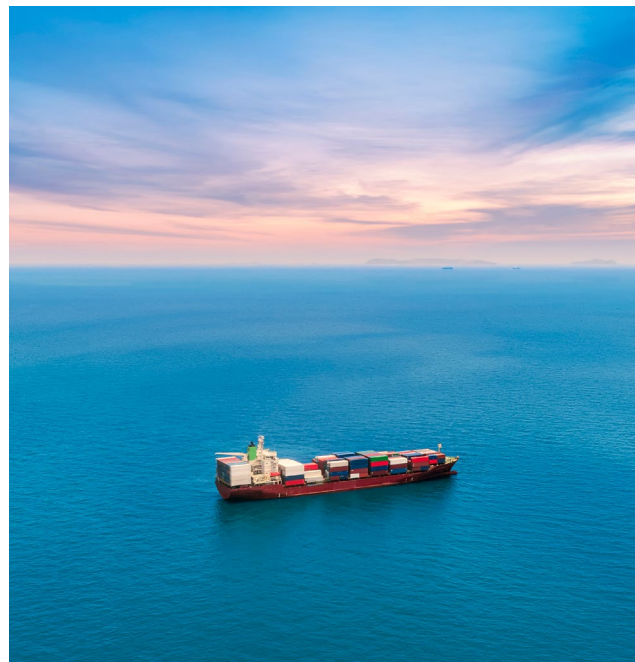
EcoTuning is a powerful retrofit part-load tuning, tailor-engineered for each individual engine system, and specifically designed for Everllence B&W two-stroke ME and ME-C engines. This engine tuning solution secures significant fuel oil savings, resulting in reduced CO₂ emissions and fuel costs.

Using engineering calibration, EcoTuning increases engine efficiency. This is achieved through software-based fine-tuning of the maximum combustion pressure across the entire load range. As a result, the combustion pressure will match the load profile of your specific vessel.

EcoTuning provides an optimized engine performance layout and includes a NO_x recertification. As a result, the NO_x Technical File must be amended to ensure compliance across all relevant IMO NO_x regulations. And as the engineering analysis behind EcoTuning is based on correction factors, no sea trials or service tests are needed.

The EcoTuning, installation and commissioning process is easy. An update of the engine performance parameters is all that is needed, and there is no need for hardware component modifications or replacements. This means no operational downtime.

Ask your Everllence PrimeServ office for more details.



Optimizing your fleet's fuel savings and decarbonization

Key benefits

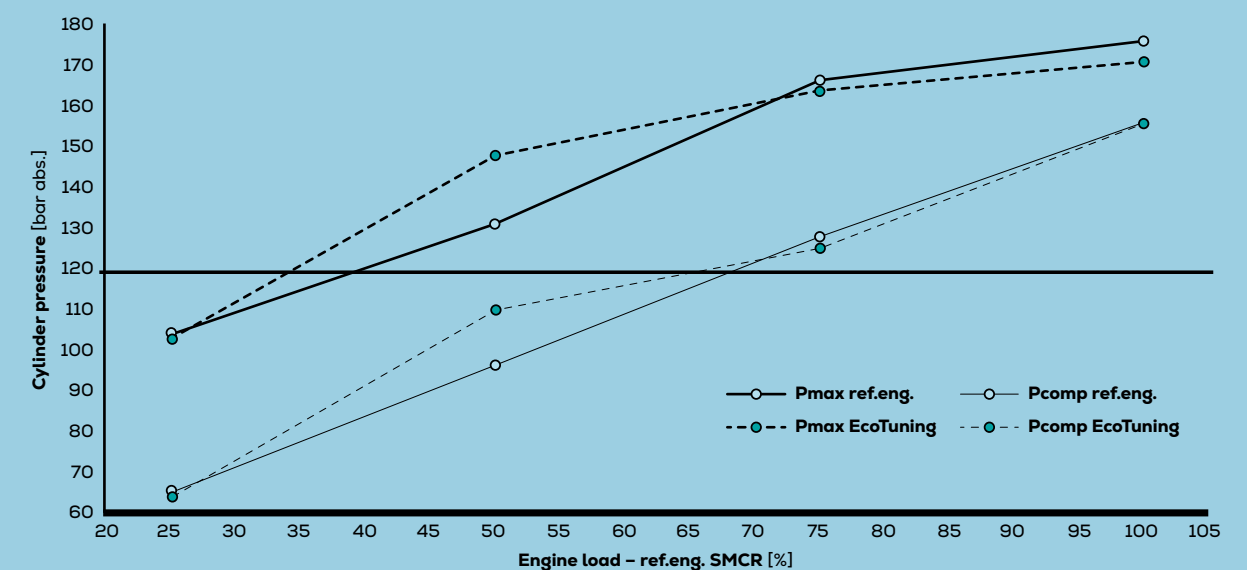
- Significant fuel oil savings up to 7 g/kwh, depending on the desired load profile
- Substantial emission reductions support higher Carbon Intensity Indicator ratings and stronger decarbonization regulatory compliance
- Simple installation with no operational downtime
- No requirement for sea trials or service tests
- EcoTuning can be updated if your vessel's operations pattern change, ensuring peak performance

Scope of supply

- The optimized performance layout for the engine
- An updated torsional vibration calculation for the engine
- Amendment of the IMO NO_x Technical File

Applicable to

- All Everllence B&W ME/ME-C engines
- EcoTuning is not applicable for vessels fitted with Turbocharger Cut-Out or vessels limited (EEXI) to a power below 75% MCR



EcoTuning cylinder pressure vs. engine load

EPLO

(Engine Part-Load Optimization)

Turn part/low-load operation into fuel oil savings and improved combustion with EPLO, optimizing engine tuning and turbocharger performance for real operating conditions.

Most modern ocean-going vessels operate for extended periods at low engine loads due to slow steaming, regulatory compliance, and fuel-saving strategies. However, main engines and turbochargers are often originally designed for higher load operation, leading to reduced efficiency at part/low load. This results in increased fuel consumption, greater deposit build-up, higher maintenance requirements, and reduced component lifetime.

EPLO addresses this mismatch by shifting the engine's optimal operating range through advanced tuning and turbocharger upgrades, improving combustion, reducing fuel consumption, and enhancing efficiency under real operating conditions, while supporting environmental compliance and lowering operating costs.

Tailored engine optimization

Everllence introduces EPLO, a tailored engine part-load solution designed to optimize performance where it matters most – at low engine loads. By modifying key turbocharger internal components, it ensures enhanced air supply and improved combustion across varying operating profiles.

From initial assessment to implementation and class acceptance, Everllence supports customers throughout the entire process. EPLO delivers a high-impact solution that enhances fuel efficiency, reduces maintenance needs, and enables reliable, compliant, and cost-effective vessel operation.

A key technical element of EPLO is the optimization of air-fuel interaction at part-load operation. By retuning engine parameters and rematching turbocharger components, the engine's efficiency range is shifted toward lower loads, improving combustion stability and reducing fuel consumption. This is achieved through optimized scavenging air pressure and enhanced air supply across the operating range.

Depending on vessel requirements, different turbocharger retrofit packages can be applied to deliver incremental efficiency gains, while load control solutions ensure safe operation across the entire operating range. This tailored and comprehensive approach ensures maximum performance, reliability, and efficiency for each vessel under real operating conditions.

Full engineering package

Everllence's EPLO retrofit scope integrates all key components and services required for a robust and efficient engine part-load/low-load optimization upgrade. This includes a full engineering package as well as onsite installation supervision, commissioning, and certification. Our expert team ensures precise implementation and supports sea trials to verify performance, compliance, and seamless integration of the solution.

Please contact your Everllence PrimeServ office for more details.

Optimizing your fleet's fuel savings and decarbonization

Scope of supply

Everllence offers EPLO as a flexible, end-to-end solution. Depending on requirements, it may include:

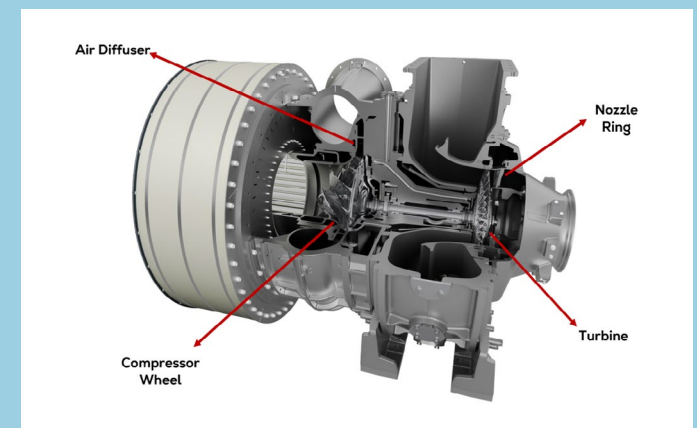
- Feasibility study and approved engine suitability assessment for EPLO
- Definition of turbocharger(s) specifications and engine tuning parameters
- Thermodynamic verification and gas harmonics assessment
- Torsional vibration calculations (TVC)
- Turbocharger upgrade components
- Engine retuning
- Engine/software parameter optimization (for ME engines)
- On-board NO_x measurements
- Coordination and customer support of class re-certification process
- Certification including technical file amendments
- Installation of components and associated services
- Commissioning of the engine, turbocharger(s) and system integration
- Sea trials for performance validation and tuning
- Final documentation and report to the customer
- No requirement for sea trials or service tests

Key benefits

- The optimized performance layout for the engine
- An updated torsional vibration calculation for the engine
- Amendment of the IMO NO_x Technical File

Applicable to

Everllence B&W two-stroke engines and all major turbocharger manufacturers.



Flexible Turbocharger Cut-Out

The Flexible Turbocharger Cut-Out system disconnects one or more turbochargers during slow steaming (low-load operation) to reduce specific fuel oil consumption (SFOC) and consequently CO₂ emissions.

Speed reduction can pay off well in cost savings on fuel as well as lowering CO₂ emissions due to the relationship between speed, fuel consumption and emissions. However, the engines have been designed for optimal performance within specific parameters. Operating them outside these parameters will reduce the benefits of slow steaming.

Improved combustion without dependence on auxiliary blowers reduces CO₂

The Flexible Turbocharger Cut-Out increases the efficiency of the remaining turbochargers without depending on auxiliary blowers when slow steaming. This allows for significant savings in SFOC, and consequently CO₂ emissions, when the engines are running within the low load range.

Cutting out one or more turbochargers will return the operating levels of the remaining turbochargers to the usual parameters for optimal performance.

The activation of the Flexible Turbocharger Cut-Out system improves the scavenge air pressure significantly, optimizing the combustion and contributing to SFOC reductions at 4–6 g/kWh at low load. Moreover, this can reduce the heat load, especially on the exhaust valves.

The auxiliary blower activation will be moved to a lower load range to reduce the power consumption of the blowers.

Simple, cost-effective solution, widely used worldwide
The Flexible Turbocharger Cut-Out consists of two pneumatically operated swing gate valves – one at the turbine inlet and one at the compressor outlet of the turbocharger.

The Flexible Turbocharger Cut-Out has been very well received in the maritime world with more than 500 systems in operation worldwide.

Please contact your Everllence PrimeServ office for more details.



Turbocharger Cut-Out

Improved fuel oil consumption and slow steaming capabilities

Key benefits

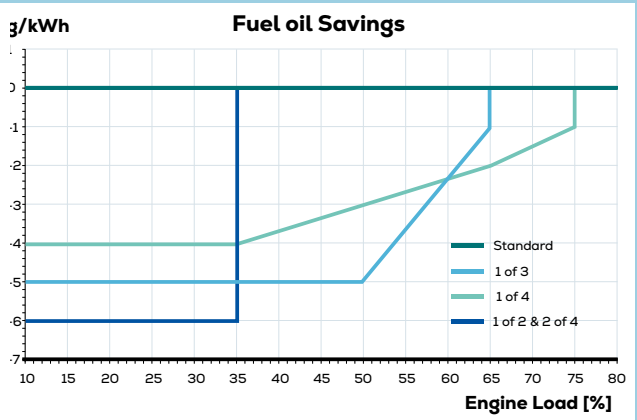
- Improved performance of the remaining turbochargers
- Improved combustion resulting in cleaner engine
- Fuel savings up to 6 g/kWh SFOC
- Potentially lower costs on fuel consumption for auxiliary blowers
- CO₂ reduction will help cutting carbon costs within the EU Emissions Trading System
- Short payback period
- High flexibility

Scope of supply

- 2 x cut-out swing gate valves for the turbocharger turbine and compressor sides
- Insulation for swing gate valves
- Pneumatic system to control the turbocharger cut-out swing gate valves
- Indicator panel for engine control room
- Amendment to Technical File and emission measurements if needed
- Engineering package:
 - Engine feasibility calculations
 - Torsional Vibration Calculations (TVC)
 - Gas Harmonics Calculations (GHC)
- Sealing air modification if needed

Applicable to

All Everllence B&W MC/MC-C and ME/ME-C engines with two or more turbochargers



Fuel oil savings [g/kWh]

Obtainable SFOC reduction when turbochargers are cut out

Load range	10-35% of MCR	10-66%	10-74% of MCR	10-35% of MCR
Turbochargers in total	2	3	4	4
Turbochargers cut out	1	1	1	2
SFOC reduction at 25% engine load	6 g/kWh	5 g/kWh	4 g/kWh	6 g/kWh

Load range in %

Retrofit solutions

Upgrade your fleet's competitiveness with powerful retrofits

From mechanical and digital upgrades to comprehensive dual-fuel conversions, we specialize in advanced retrofits and upgrades for your vessels.

Keep your engine systems and equipment competitive

Our portfolio of upgrade products and tailored retrofit solutions offers a vast selection of innovative options to optimize your fleet's reliability, efficiency, decarbonization, safety, and compliance. This supports your operation's competitiveness in an ever-evolving market with increasing environmental standards.

In addition to our two-stroke retrofit engine solutions, our portfolio includes:

- **Two-Stroke Engine Solutions:** Optimize your two-stroke engine operations with powerful PrimeServ upgrades. Achieve fuel oil savings, improve decarbonization, boost reliability, reduce maintenance costs, and secure crew safety with advanced retrofit equipment. Keep your operations competitive and compliant.
- **Four-Stroke Propulsion & CP Propeller Solutions:** High power and increased efficiency for mechanical and electric propulsion. Maintains fuel flexibility, compliance with environmental standards, and reliable performance.

- **Four-Stroke GenSet Solutions:** Reliable, compact power for auxiliary and main power supply in diesel-electric propulsion. Maintains operational efficiency, meets regulatory requirements, and saves space.
- **Dual-Fuel Retrofit Conversions:** Significantly optimizes engine emissions, fuel oil consumption, and the decarbonization profile by converting to dual-fuel systems. This complete retrofit conversion enhances environmental compliance and operational flexibility, allowing switching between traditional fuel oils and e-fuels.

For more information, please visit our website to explore our retrofit brochures or contact us to learn more.

Everllence

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Dual fuel conversion



For marine systems with two-stroke applications



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Retrofit & upgrade



Four-stroke propulsion & propeller solutions



Everllence

PrimeServ

Retrofit & upgrade



Four-stroke GenSet solutions



Everllence

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Retrofit & upgrade



Two-stroke engine solutions



PrimeServ Service with passion

Everllence PrimeServ is the dedicated Everllence service brand. Via a network of over 100 service centers worldwide, Everllence 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.

24

hours a day

365

days a year



BABCOCK BORSIG

SULZER
TURBO

B+V Industrietechnik



Everllence

Alpha
PROPULSION SYSTEMS

S.E.M.T.
PIELSTICK

Ruston

Paxman

**Mirrlees
Blackstone**

HOLEBY
GENERATING SETS

**B&W
MOTOR**

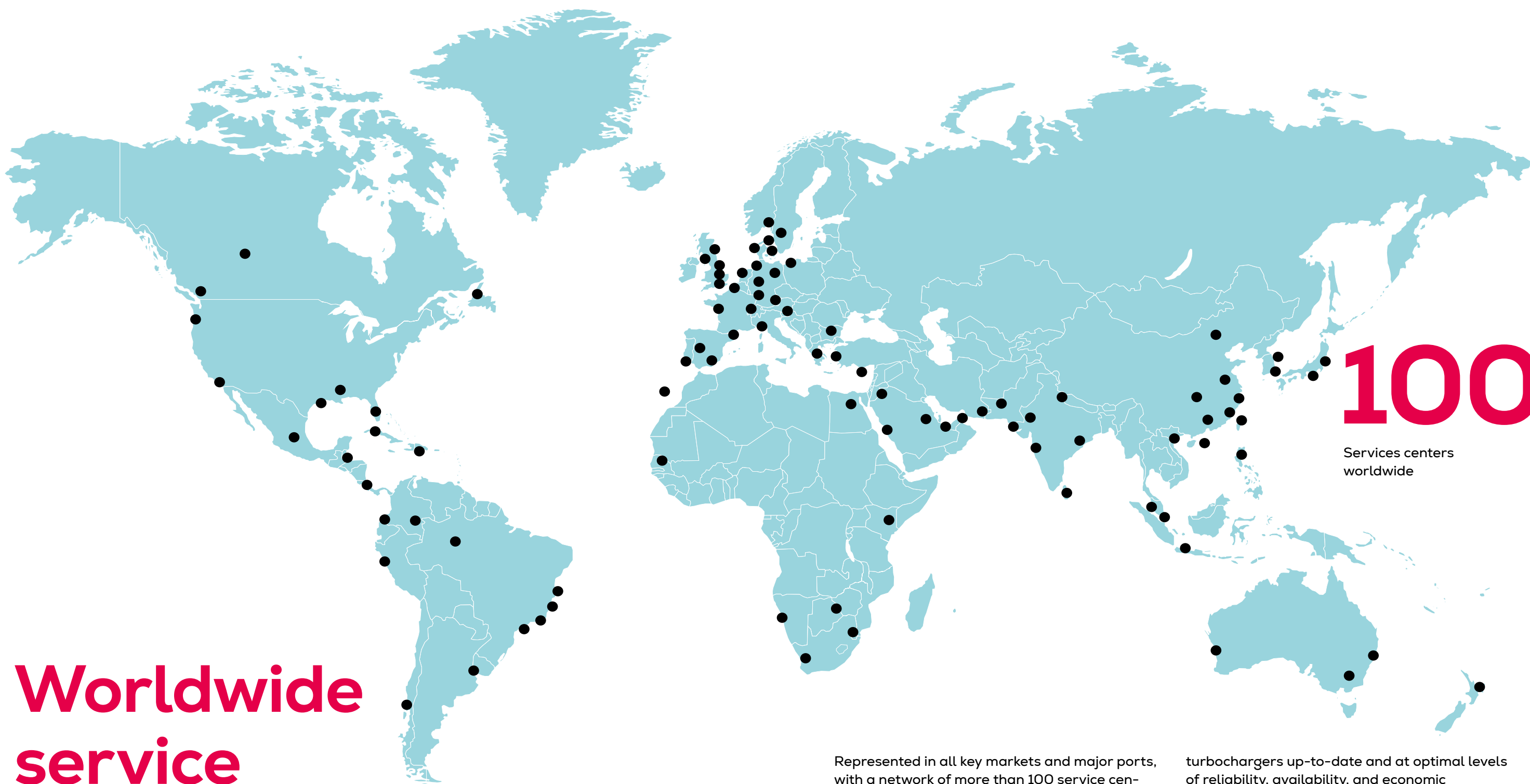


Everllence and legacy brands

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

Everllence PrimeServ's aim is to provide

- 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



Worldwide service

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

Represented in all key markets and major ports, with a network of more than 100 service centers, and with skilled field service managers at the ready to provide first-class technical support, Everllence PrimeServ is fully primed to provide 24/7 service, wherever you are. In power plants, marine engines & systems and turbo-machinery, offering reliable technical support when you need it most, our service solutions include OEM spare parts, engine and machinery maintenance and repairs, customized service agreements, and individual consulting.

For existing equipment, our holistic retrofit and modernization solutions keep your engines or

turbochargers up-to-date and at optimal levels of reliability, availability, and economic efficiency. Through cutting-edge digital technology we are able to enhance performance and minimize downtimes, while our remote connections enable live data analysis, ensuring quick, and effective solutions. Everllence PrimeServ Academies provide expert training courses around the world, developing the operational and maintenance skills required.

For more information please visit
www.everllence.com/services

Everllence

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MAN Energy Solutions SE has been renamed to Everllence SE and its products are being rebranded from "MAN" and/or "MAN Energy Solutions" to "Everllence". As this is an ongoing process, any reference to "MAN" and/or "MAN Energy Solutions" is actually a reference to "Everllence". All data provided in this document is non-binding. This data serves informational purposes only and is not guaranteed in any way. Depending on the subsequent specific individual projects, the relevant data may be subject to changes and will be assessed and determined individually for each project. This will depend on the particular characteristics of each individual project, especially specific site and operational conditions.

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