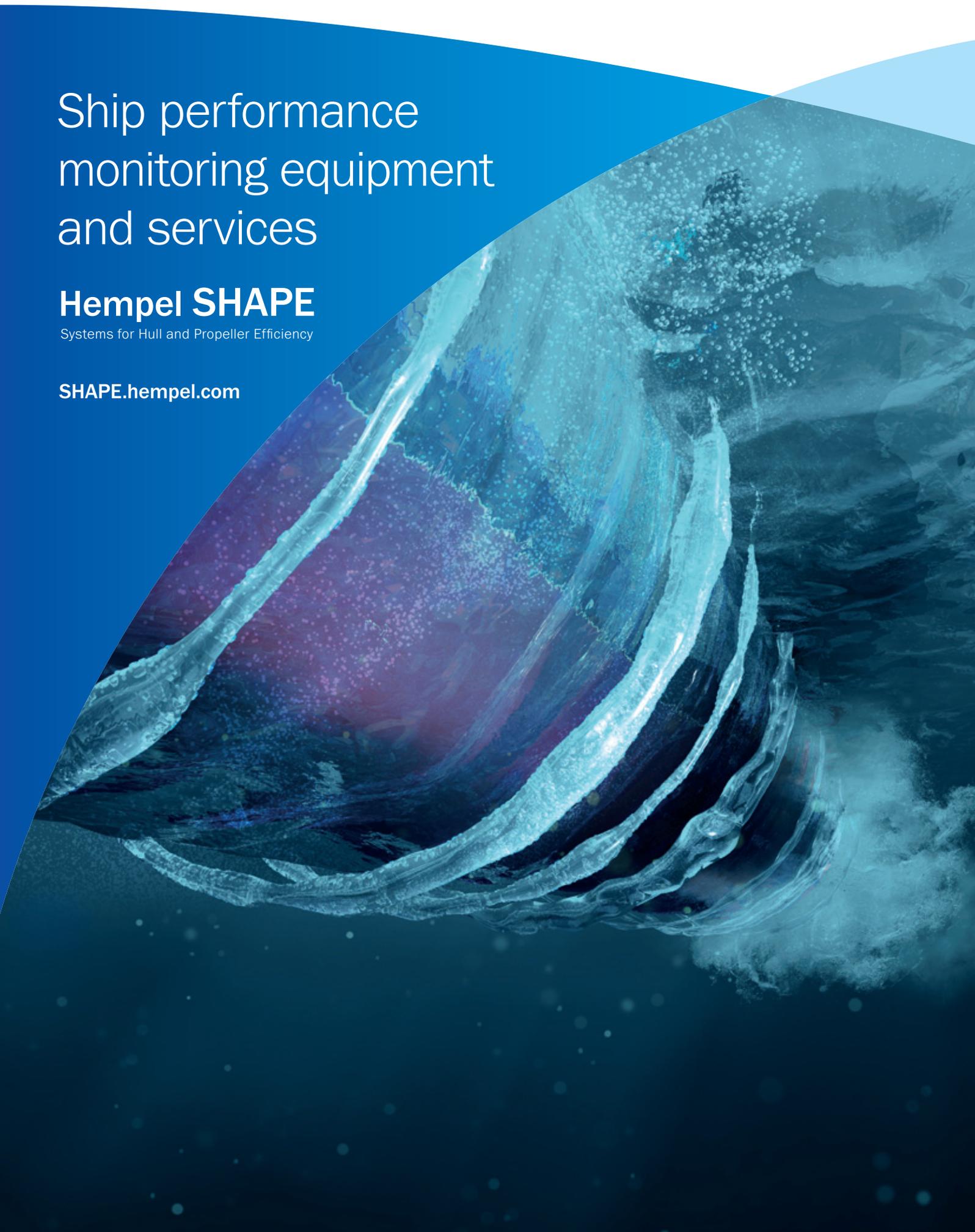


Ship performance monitoring equipment and services

Hempel SHAPE

Systems for Hull and Propeller Efficiency

SHAPE.hempel.com



To determine in-service ship performance, it is essential to monitor power used. The ISO 19030 standard on performance monitoring specifies that the preferred method for measuring power is by a torque meter. Alternatively, the power can be calculated from the fuel consumption – provided that certain requirements are fulfilled.



Torque meters
(preferred method for power measurement)



Fuel meters
(alternative method for power measurement)



Performance monitoring services

Measure the torque and RPM on the shaft in order to determine the shaft power delivered to the propeller. Power is calculated automatically from the measured torque and RPM.

Measure the net flow of fuel to the engine and can also be used to estimate the used power. Often more than one flow meter is necessary to determine the fuel consumed by the main engine.

Analysis methods and the data used (noon, auto-logged etc.) vary. Some providers require installation of special hardware or software on-board, while others use data in the form available.

Types of torque meters

- Strain gauge torque meters
- Optical torque meter (no recalibration/correction needed after installation)
- Proximity sensor
- Torque flange (most accurate, but difficult to retrofit. No recalibration/correction needed after installation)

Types of fuel meters

- Positive displacement meters (volume flow meter, most common)
- Coriolis meters (mass flow meter, most accurate)
- Ultrasonic meters (velocity flow meter)

Service providers

- ABB
- ABS Nautical Systems
- Amarcon
- Applied Weather Technology Inc.
- BMT SMART
- ClassNK - NAPA
- Danaos Information Service Group
- DNV GL Maritime Advisory
- DNV GL Software
- Engineering Software Reliability Group (ESRG)
- Eniram
- Force Technology
- Global Navigation Solutions
- GreenSteam
- Hempel
- Imtech Marine
- INTERSCHALT Maritime Systems
- Jeppesen
- Kongsberg Maritime
- Kyma
- Lemag Lehmann & Michels
- MACSEA
- MARIN
- Marorka
- MeteoGroup
- Nautical Control Solutions
- Pole Star
- Propulsion Dynamics
- Royston
- SAJ Instrument AB
- Siemens
- SkySails
- StormGeo
- TecnoVeritas
- Tidetech
- Transas Marine
- Wärtsilä
- Weather Routing Inc.

Torque meter providers

- Aquametro
- Binsfeld Engineering
- Datum Electronics
- Hoppe Marine
- Hottinger Baldwin
- Messtechnik (HBM)
- Kongsberg Maritime
- Kyma*
- Lemag Lehmann & Michels
- Seatechnik
- Shoyo Engineering
- TecnoVeritas
- VAF

Fuel meter providers

- Aquametro
- Bopp & Rheuter Messtechnik
- Emerson
- Endress+Hauser
- FloScan Instrument Company
- Katronic Technologies
- KRAL AG
- Krohne Skarpenord
- Macnaught
- Total Control Systems
- VAF

* The performance team in Hempel recommends the Kyma torque meter based on experience, but other meters are also accepted.

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