

YOUR PROPULSION EXPERTS



100  
SINCE 1921



# SOUTHEAST CONFERENCE TRANSPORTATION SYMPOSIUM

SCHOTTEL EXECUTIVE SUMMARY FEBRUARY 2023

# STABILITY

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100 YEARS OF SUCCESS

# Success Story

**1921**

Josef Becker (1897–1973) establishes his craftman's workshop in an old farmhouse in Spay/Germany.



**1958 – today**

First international subsidiary is founded in the Netherlands; 13 more to follow.

**1967**

First harbour tug with SCHOTTEL propulsion

**1980**

Introduction of CAD/CAM

**1998 & 1999**

Start of production in Suzhou/China and Wismar/Germany

**2015**

Opening of production site in Dörth/Germany



**2021**

100 years of SCHOTTEL

**1950 – today**

Development and construction of the first SCHOTTEL RudderPropeller that becomes a worldwide synonym for 360-degree manoeuvring. Today SCHOTTEL offers nine different types of propulsion systems for various applications.

**2007**

Acquisition of a 15.4 % share in SCHOTTEL by Frydenbø Industri AS/Norway; 84.6 % still held by family members.

**2013**

SCHOTTEL Industries GmbH

**2018**

Expansion of the portfolio with digital products and services

# SCHOTTEL Group Structure



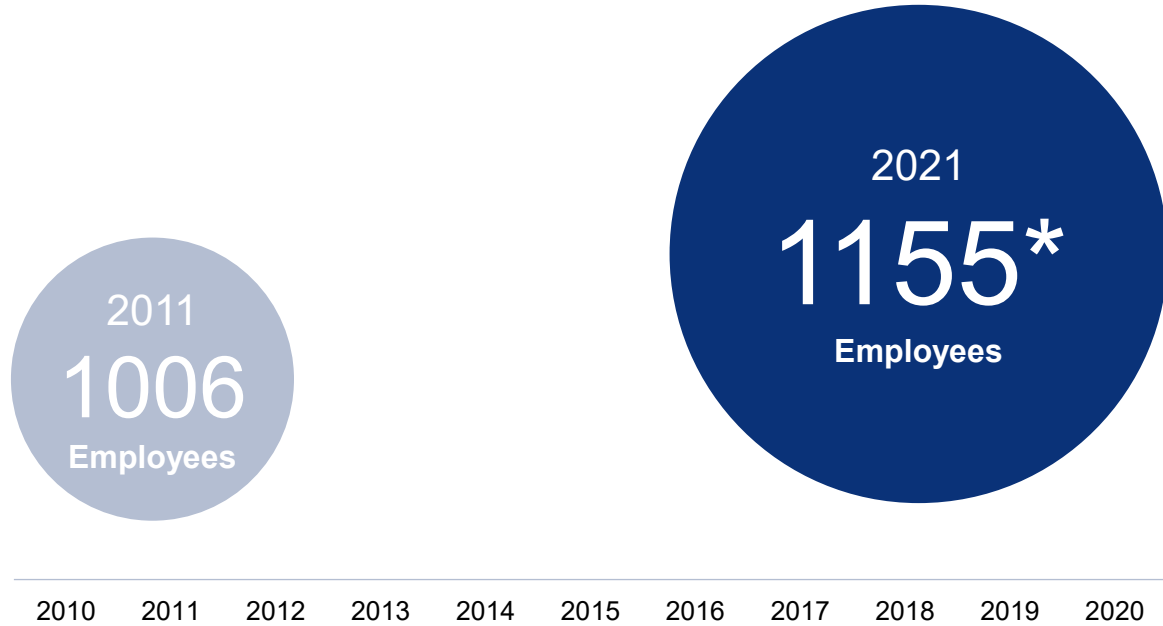
SCHOTTEL GmbH	HW Elektrotechnik GmbH	Wolfgang Preinfalk GmbH	SCHOTTEL HYDRO GmbH	Elkon Elektrik San. ve Tic. A.Ş.	AQUOS SCHOTTEL Marine Technologies GmbH
			 HYDRO		
Marine propulsion systems	Automation technology	Gearing and gearboxes	Hydrokinetic and tidal energy	Electric system integration	Marine Technologies

# SCHOTTEL Group

## Facts & Figures

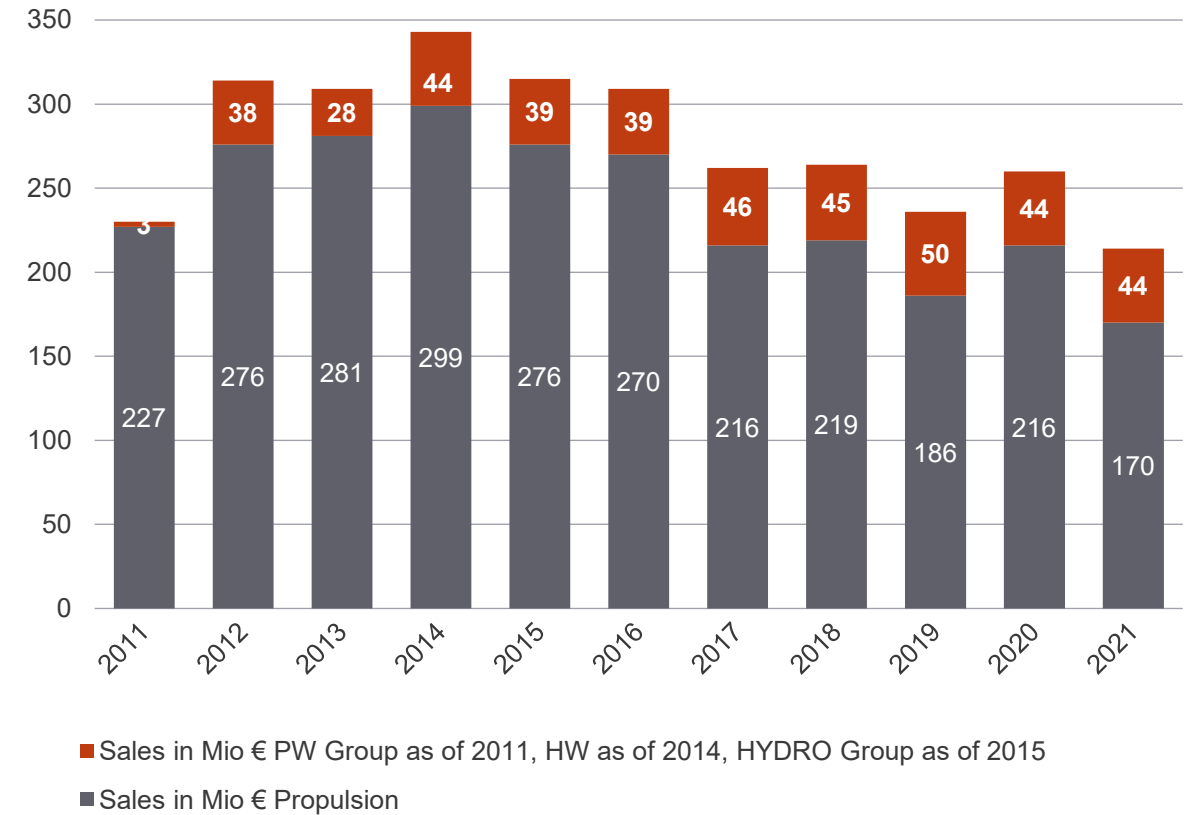


### Headcount



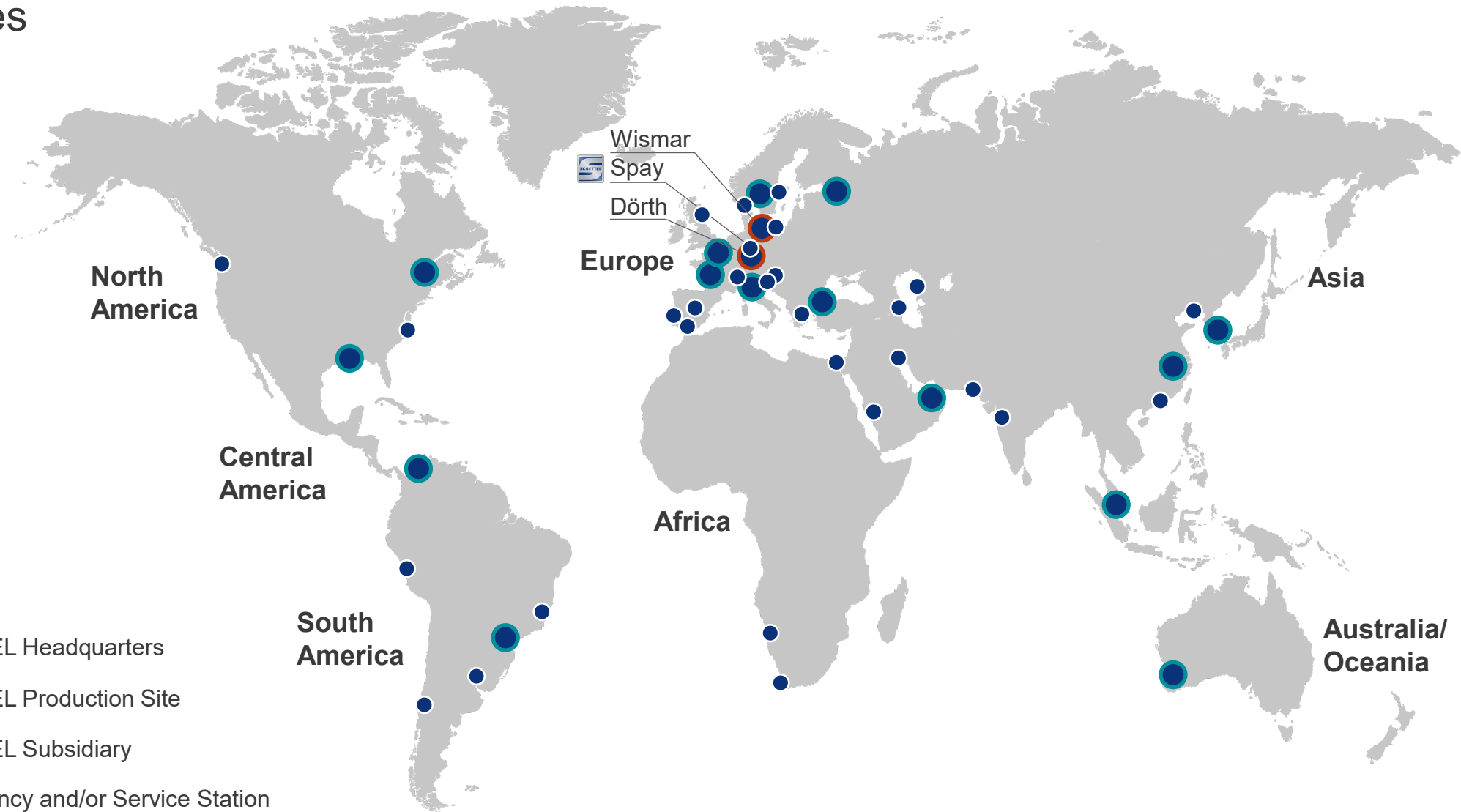
\*of which 953 in Germany





### Sales



# SCHOTTEL Worldwide

## Our Sites



-  SCHOTTEL Headquarters
-  SCHOTTEL Production Site
-  SCHOTTEL Subsidiary
-  Sales Agency and/or Service Station

# SCHOTTEL Maritime Group

In a nutshell



**846**  
Employees worldwide

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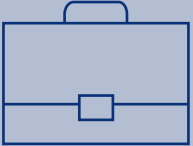


Family-owned with long-term, future-orientated strategies

**#1**  
Solid market position in azimuthing propulsion

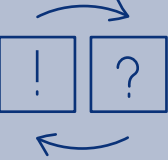
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Global network with  **14** subsidiaries



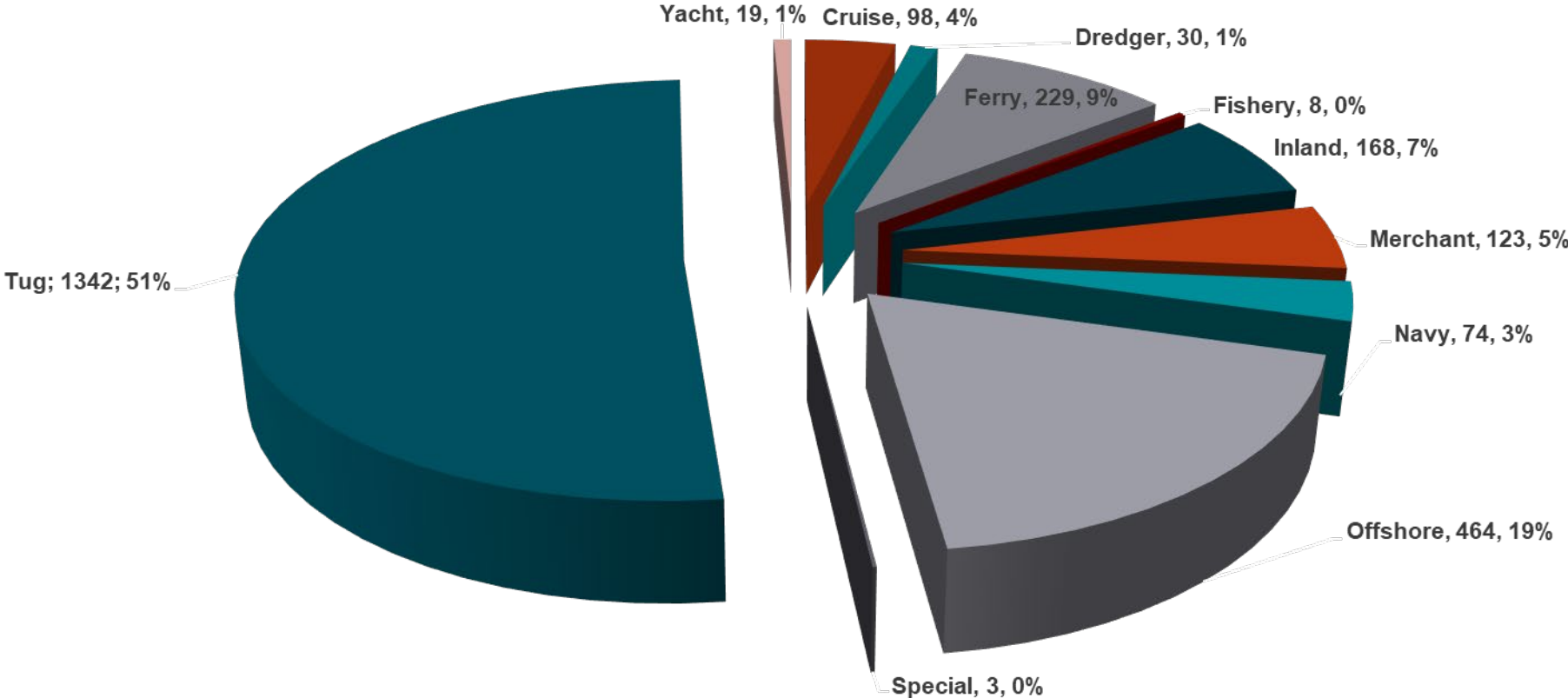
Broad scope of **job** profiles

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International knowledge transfer

## Ships with SCHOTTEL propulsion





# SCHOTTEL Facilities



Schottel Factory-Dorth Germany



Schottel Headquarter-Spay Germany



Schottel Factory-Wismar Germany



Schottel Factory-Laudert Germany

# Certifications



## ABS Quality Evaluations

### Certificate Of Conformance

This is to certify that the Quality Management System of:

**SCHOTTEL Group**  
**SCHOTTEL GmbH**  
 Zentrale u. Qualitätsleitung  
 Mainzer Strasse 99  
 56322 Spay/Rhein  
 Germany

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:  
**ISO 9001:2008**

The Quality Management System is applicable to:

**RESEARCH, DEVELOPMENT, DESIGN, CONSTRUCTION, WORLDWIDE SALES AND SERVICE OF AZIMUTHING SHIP PROPULSION UNITS, MANOEUVRING AIDS, CONTROLLABLE PITCH PROPELLERS, SHAFT LINES AND STEERING SYSTEMS FOR VESSELS OF ALL KINDS, CONSTRUCTION AND SERVICE OF INSTREAM TURBINES AND COMPONENTS, CONSTRUCTION OF GENERAL MACHINERY COMPONENTS, TRAINING PROVIDED IN THE SCHOTTEL ACADEMY.**

**FORSCHUNG, ENTWICKLUNG, KONSTRUKTION, HERSTELLUNG, WELTWEITER VERTRIEB UND SERVICE VON RUNDUM STEUERBAREN SCHIFFSANTRIEBEN, MANÖVRIERHILFEN, VERSTELLPROPELLERANLAGEN, WELLENLEITUNGEN UND STEUERUNGSSYSTEMEN FÜR SCHIFFE ALLER ART, HERSTELLUNG UND SERVICE VON STRÖMUNGSTURBINEN UND KOMPONENTEN, BAU VON ALLGEMEINEN MASCHINENBAUKOMPONENTEN, DURCHFÜHRUNG VON SCHULUNGEN IN DER SCHOTTEL ACADEMY.**

This certificate may be found on the ABS CE Website ([www.abs-qa.com](http://www.abs-qa.com)). For certificates issued in the People's Republic of China information may also be verified on the CNCA website ([www.cnca.gov.cn](http://www.cnca.gov.cn)).

Certificate No:	30548
Original Certification Date:	02 December 1993
Effective Date:	09 March 2015
Expiration Date:	09 March 2018
Revision Date:	28 April 2015

*Alex Weisberg*  
 Alex Weisberg, President

Validity of this certificate is based on the periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or corporate benefit.  
 ABS Quality Evaluations, Inc. 14051 Northchase Drive, Houston, TX 77060 U.S.A.  
 Validity of this certificate may be confirmed at [www.abs-qa.com/cert\\_validation](http://www.abs-qa.com/cert_validation).

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## BUREAU VERITAS Certification

### Certificate

awarded to

**SCHOTTEL Group**  
**SCHOTTEL GmbH**  
 Zentrale und Qualitätsleitung  
 Mainzer Str. 99  
 56322 Spay, Germany

Bureau Veritas Certification certifies that the Management System of the above organisation has been assessed and found to be in accordance with the requirements of the standards detailed below.

Standard  
**DIN EN ISO 9001:2008**

Scope

Research, development, design, construction, worldwide sales and service of azimuthing ship propulsion units, manoeuvring aids, controllable pitch propellers, shaft lines and steering systems for vessels of all kinds. Construction and service of instream turbines and components. Construction of general machinery components. Training provided in the SCHOTTEL Academy.

Original approval date:	29.11.1993	Date of next surveillance:	25.02.2018
Date of this audit:	26.02.2015	Subject to the continual satisfactory operation of the organisation's Management System, this certificate is valid from:	
Date of certification:	08.05.2015	Valid until:	21.03.2018

To check the certificate validity you may contact Bureau Veritas Certification. Further clarifications regarding the scope of the certificate and the applicability of the Management System requirements may be obtained by consulting the organisation.

*Andreas Leibel*  
 Certification Manager

Date: 23.07.2015  
 Certificate number: DE004588-2  
 Page: 1 of 3

Bureau Veritas Certification Germany GmbH  
 Veritasstr. 1 - 21079 Hamburg

## MANAGEMENT SYSTEM ZERTIFIKAT

DNV-GL

Zertifikat-Nr.: 106297-2011-AQ-GER-04465      Datum der Eingetragung: 12. Januar 2014      Gültig: 27. März 2015 - 27. Februar 2018

Hiermit wird bescheinigt, dass das Unternehmen

**SCHOTTEL Gruppe**  
 Mainzer Straße 99, 56322 Spay, Deutschland

sowie die im Anhang aufgeführten Standorte

ein Qualitäts-Managementsystem in Übereinstimmung mit dem folgenden Standard eingeführt hat:

**ISO 9001:2008**

Dieses Zertifikat ist gültig für die folgenden Produkt- oder Dienstleistungsbereiche:  
**Forschung, Entwicklung, Konstruktion, Herstellung, weltweiter Vertrieb und Service von rundum steuerbaren Schiffsantrieben, Manövrierhilfen, Verstellpropelleranlagen, Wellenleitungen und Steuerungssystemen für Schiffe aller Art, Herstellung und Service von Strömungsturbinen und Komponenten, Bau von allgemeinen Maschinenbauteilen, Durchführung von Schulungen in der SCHOTTEL Academy.**

Ort und Datum:  
 Essen, 27. März 2015

Zertifizierungsstelle:  
 DNV GL - Business Assurance  
 Schillerstraße 14, 45328 Essen, Germany

Thomas Beck  
 Leiter Zertifizierungsstelle

Nur Verstoß gegen die im Zertifikatsantrag genannten Bedingungen kann das Zertifikat seine Gültigkeit verlieren.  
 0453282015 Z012 | Ihre 24 Stunden erreichbare Zertifizierungs- und Kundenbetriebs-Zentrale, Schillerstraße 14, 45328 Essen, Germany  
 Tel. +49 201 7036 122, www.dnv-gl.de/zertifikat

SCHOTTEL is certified according to DIN EN ISO 9001 by ABS, BV, DNV-GL

# Schottel in North America

- First entered United States in 1961
- Schottel Inc incorporated in 1997 (Delaware Corp)
- Over 750+ vessels supported in North America today, with over 1800+ pieces of Schottel equipment



# Schottel Inc, Houma Louisiana



- Spare parts warehouse with over 5 million in value
- Training facility for customers
- Factory trained 4 Control Engineers
- Factory trained 10 Mechanical Engineers
- 2 contract Service Engineers (1 Canada & 1 US)
- Operation Manager has over 30 years experience in service industry with over 19 years working on propulsion equipment as Service Superintendent
- All commissioning done via domestic engineers
- We only work on Schottel equipment, not engines, gearboxes, etc



SCHOTTEL ECOPELER  
SRE

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# Products

## SCHOTTEL EcoPeller SRE

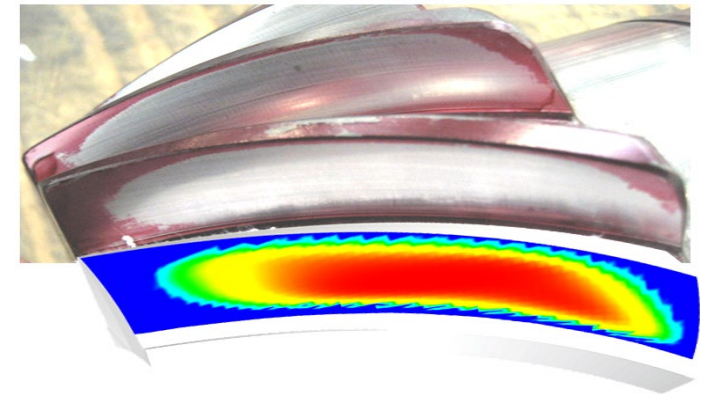
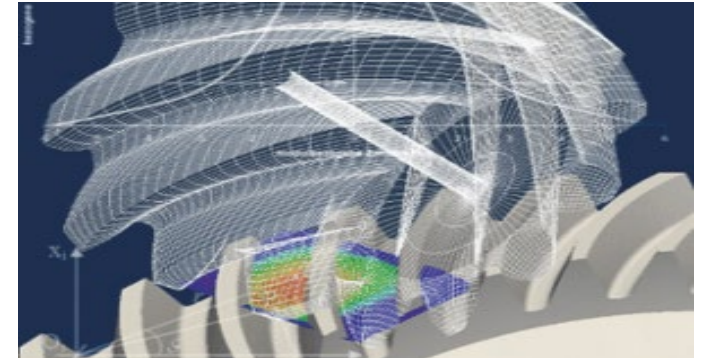


- 1 Top performance in overall efficiency and course stability
- 2 Low operating costs and emissions
- 3 Optimized for open sea and coastal operating conditions



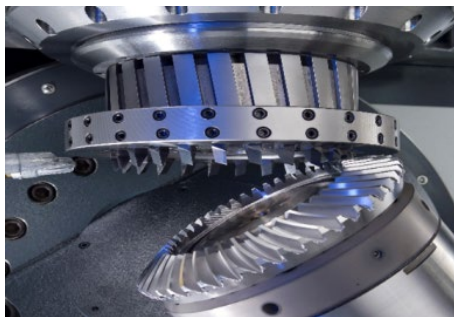
# HTG-Bevel Gear Technology

- HTG=High Torque Gear, project of Schottel from 2005 thru 2015
- Patented solution with Technische Universitat Dresden
- Manufacturing method: Free Flank Modification, 5 Axis
- The HTG gear is able to transmit about 15% more torque than a standard bevel gear.
- More torque can be transmitted on a smaller diameter. By this you can gain either a higher safety margin or Reduce the size of the lower gearbox housing and increase the hydrodynamic efficiency due to an improved propeller diameter/ gearbox diameter.



# HTG-Bevel Gear Technology

*free flank modification*

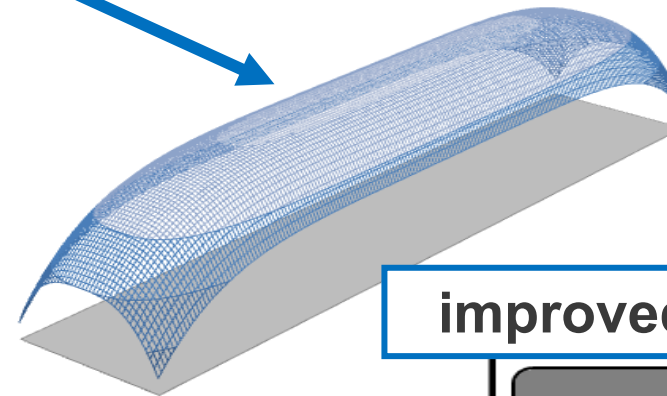
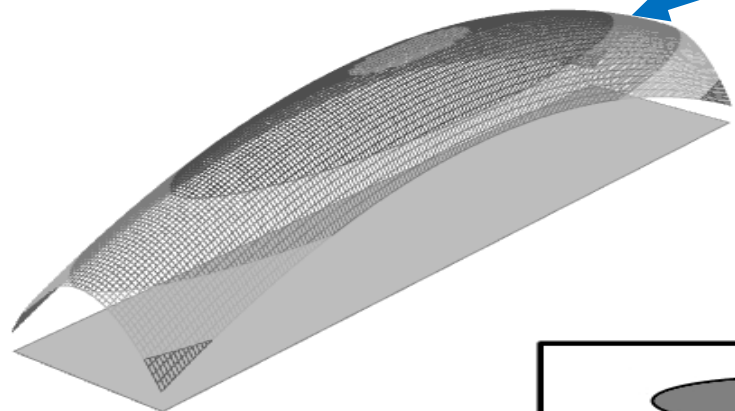


**conventional**

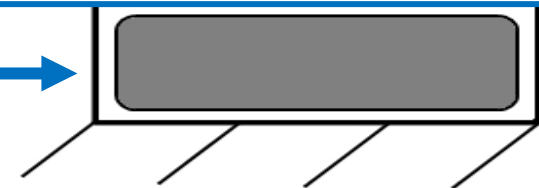
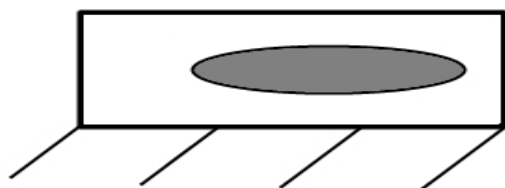
**HTG**  
bigger plateau  
equivalent **end reliefs**



**HTG**

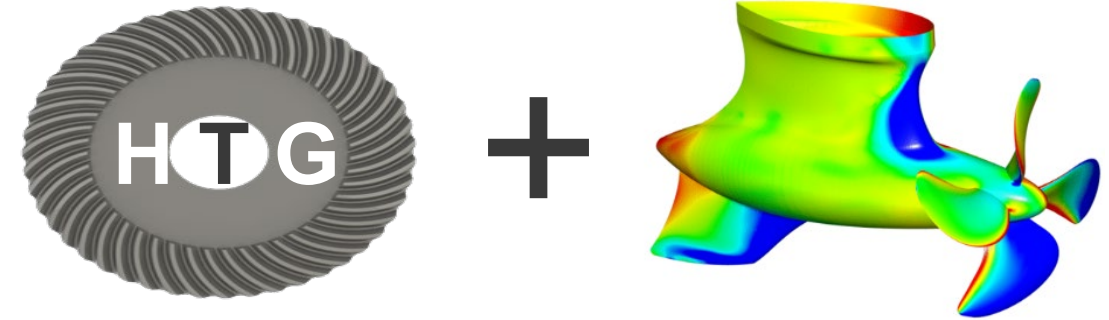


**improved utilization**





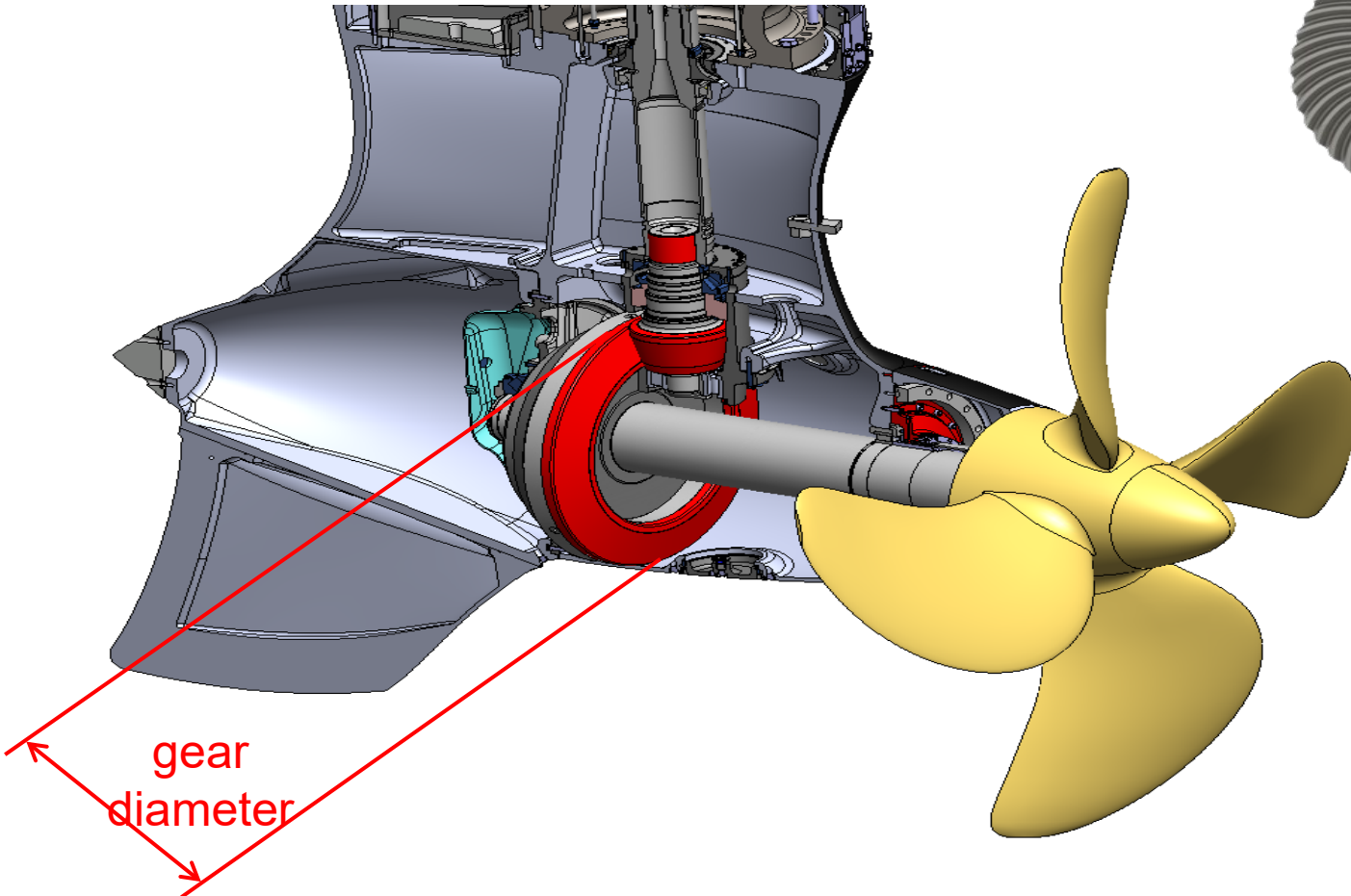
# Increased hydrodynamic efficiency by HTG gears



## Using HTG gear:

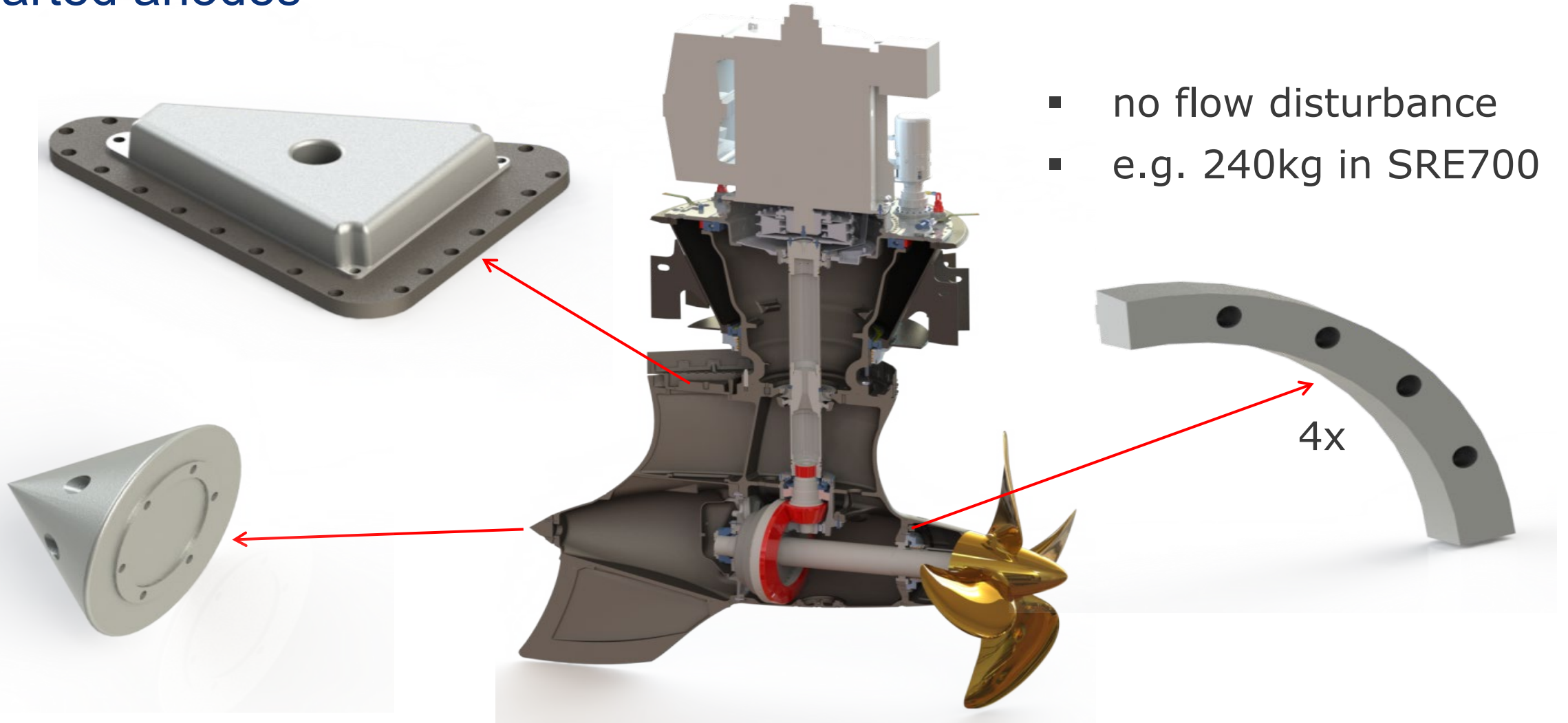
- diameter gain
- increased torque
- allows even better, leaner hydrodynamic shape

=> >1,5% efficiency gain

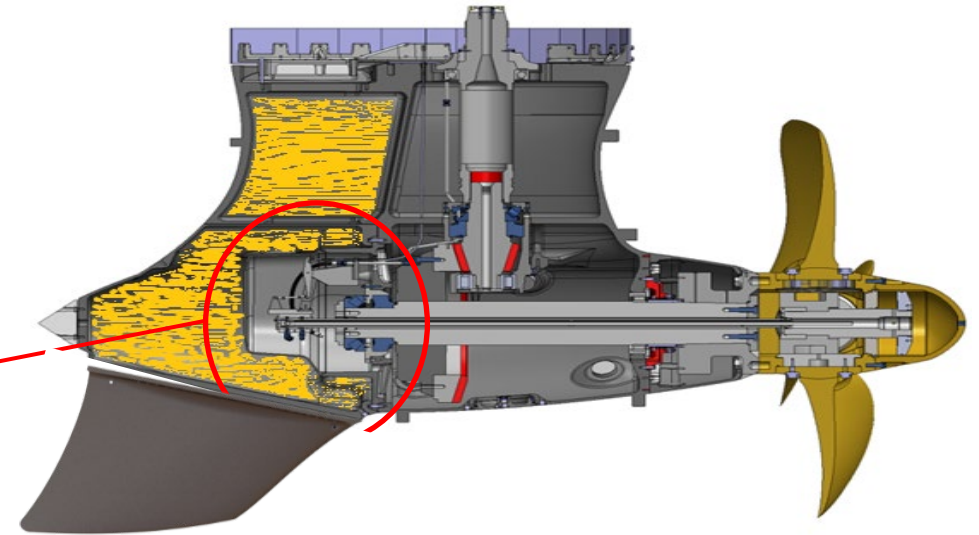
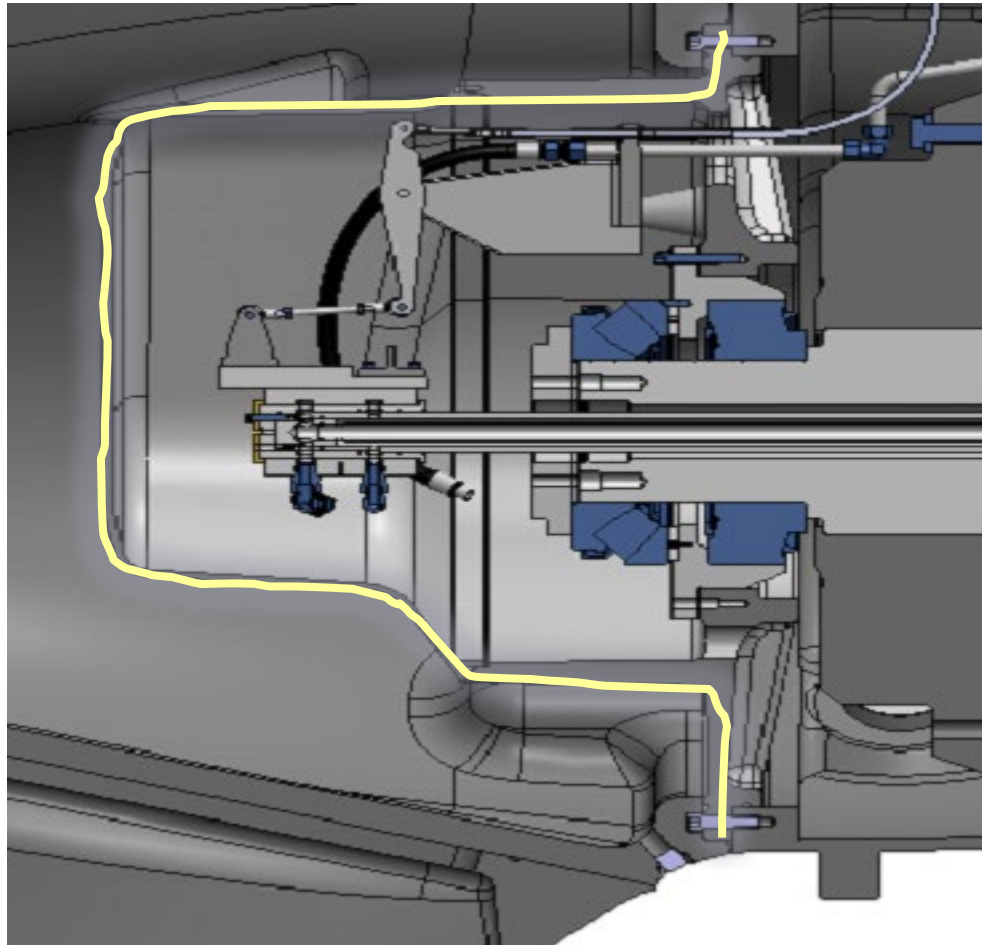


# Increased hydrodynamic efficiency by integrated anodes

- no flow disturbance
- e.g. 240kg in SRE700



# Environmental Friendly



- reduction of ab. 1500l lub oil
- additional safety against leakage due to grounding

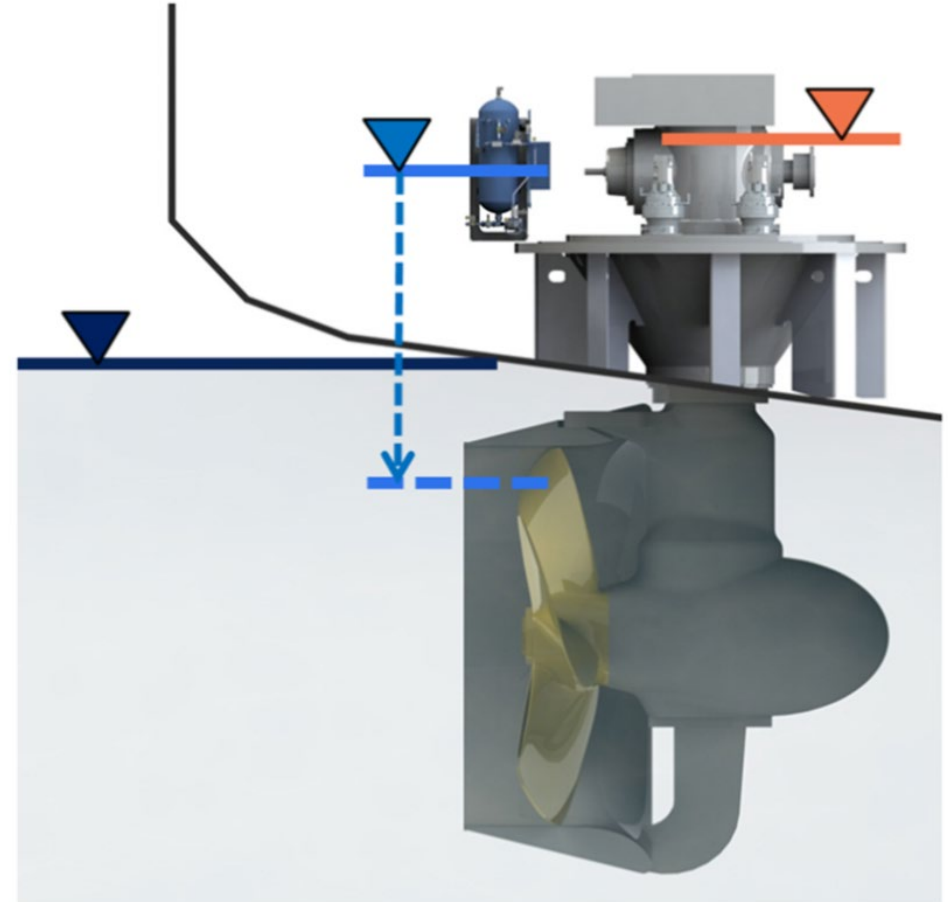
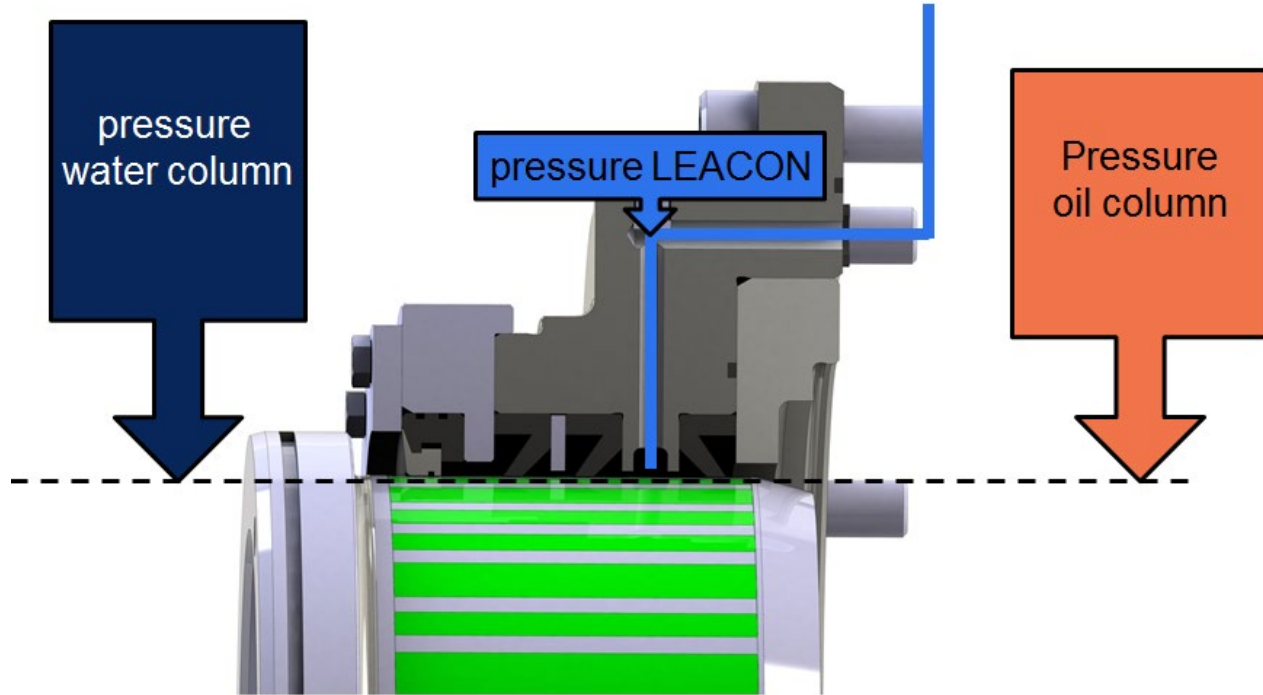
# SCHOTTEL LEACON

## Environmental friendliness



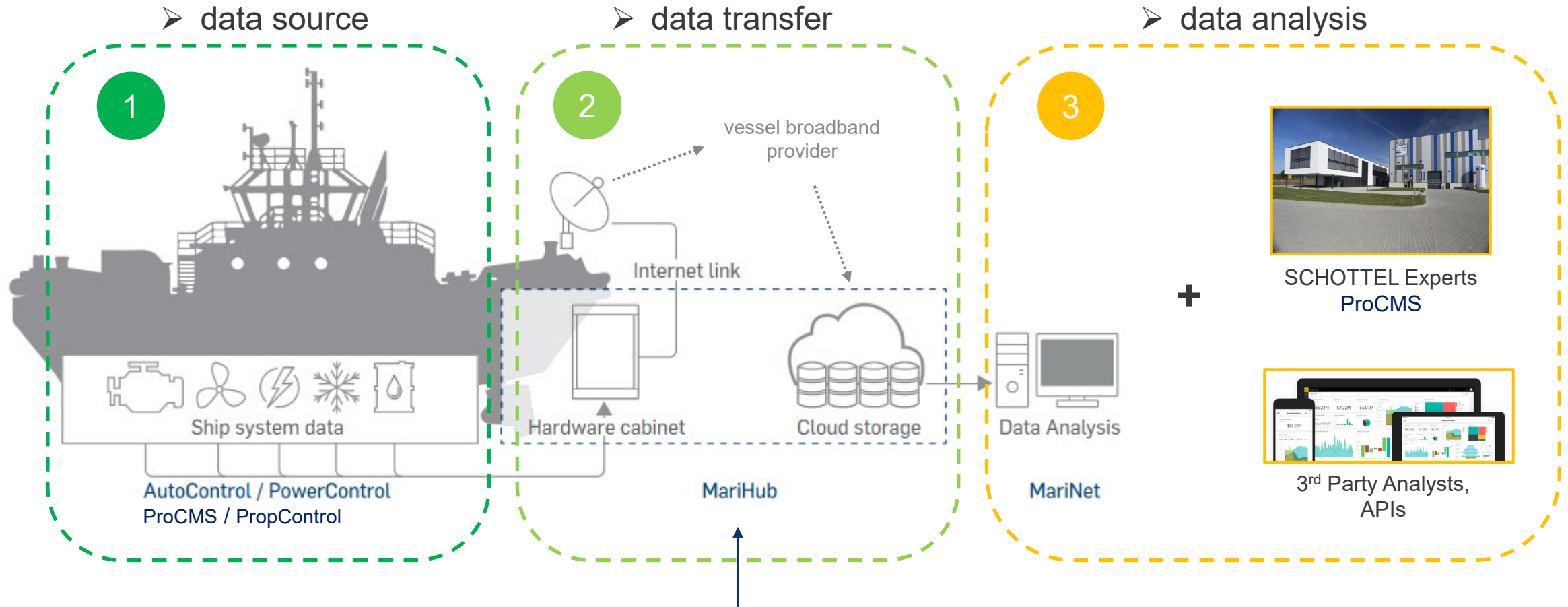
The SCHOTTEL LeaCon sealing system is a type approved sealing system which monitors the propeller and steering shaft seal. The LeaCon system is recognized as a non oil to water interface and complies with the current VGP rules without using EALS

# LEACON System



The Vacuum tank has always a lower pressure than the oil or the seawater this way any leakage will be guide to the leakage tank. This reduces the risk of polluting the environment with oil or water contamination of the thruster

# ProCMS, MariHub, MariNet



# Our Quality Promise



**100+ worldwide**

sales agencies and service stations  
for customer proximity

**150+ service technicians**

for worldwide vessel mobility

Standardized  
**FAT procedures**

Rudderpropeller plant with highest  
possible  
**shop floor quality control**



**YOUR  
THRUSTER  
PARTNER**

for a lifetime

**Permanent certification**  
processes throughout production plants

**70+ years**  
of competence in development  
& manufacture of propulsion systems

Expert advise with  
a global sales workforce of  
**90+ specialists**

Customer-orientated development with  
**experienced in-house R&D**

Continuous quality check/audit of  
**100+ key suppliers**

