



# CAST RESIN TRANSFORMERS FOR MARINE APPLICATIONS



LEGRAND IS **THE GLOBAL SPECIALIST**  
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES



# BUILDING PROJECTS SUCCESSFULLY

“OUR COMPREHENSIVE AND RELIABLE SOLUTIONS AND SERVICES ENABLE YOU TO FULLY EXPRESS YOUR VISION WORLDWIDE.”

In a context of accelerated globalisation and increasingly complex projects, **the support of a reliable and competent partner** is absolutely essential, a real key to the success of your company.

Choosing the Legrand Group means the assurance of benefitting from **global expertise** throughout the world thanks to its strong local presence.

A vast choice of carefully styled products compose solutions which in turn form coherent systems incorporating the latest technological innovations.

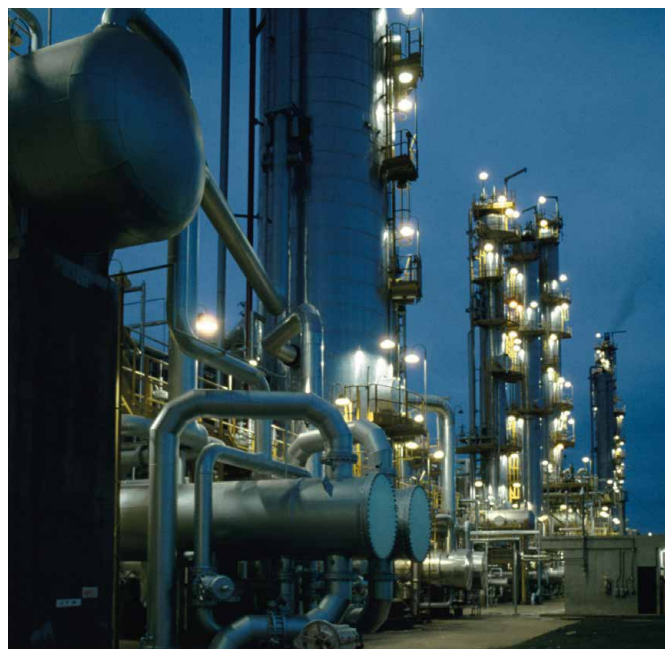
Choosing Legrand also means you are sure to be assisted by professionals **at your service any time**, from your project's design through to its completion.



**98** product families  
forming a comprehensive system offer  
for any type of project

**Leading positions**  
in close to **30 countries**

**Close to**  
**4 600** patents  
covering about 1 700 different systems  
and technologies



## AN ACTIVE INTERNATIONAL PRESENCE

More than 80 subsidiaries and offices, sales in close to 180 countries

### Asia, Middle East and Pacific

Australia • China • Hong-Kong • India • Indonesia • Iran  
• Jordan • Kazakhstan • Lebanon • Malaysia • New Zealand  
• Philippines • Qatar • Saudi Arabia • Singapore • South Korea  
• Syria • Thailand • United Arab Emirates • Uzbekistan • Vietnam

### Europe and Africa

Algeria • Austria • Belarus • Belgium • Bosnia-Herzegovina  
• Bulgaria • Croatia • Czech Republic • Denmark • Egypt  
• Estonia • France • Germany • Greece • Hungary • Ireland  
• Italy • Libya • Lithuania • Morocco • Netherlands • Poland  
• Portugal • Romania • Russia • Serbia and Montenegro  
• Senegal • Slovakia • Slovenia • South Africa • Spain  
• Switzerland • Tunisia • Turkey • Ukraine • United Kingdom

### The Americas

Brazil • Canada • Chile • Colombia • Costa Rica • Mexico  
• Peru • United States • Venezuela



# CAST RESIN TRANSFORMER LEGRAND

The perfect choice for  
marine applications

Legrand has vast experience in the design and production of cast resin transformers.

This experience has allowed Legrand to develop specific transformers for supply and propulsion in a wide range of applications, including marine, shipping vessels and offshore oil rigs.



## A WIDE RANGE OF APPLICATIONS

Legrand has a wide range of cast resin transformers for naval and offshore applications, each manufactured to a high level of performance and reliability in terms of quality and safety. Legrand's cast resin transformers are the perfect choice for energy and power distribution, as well as propulsion, in this type of environment.

## EXPERIENCE AND TECHNOLOGY

Legrand's technical engineers are recognised for their design expertise, and employ the most up-to-date calculation and simulation software tools in order to guarantee the best designs for each project. The Legrand team has a sound knowledge of Standards which apply to the shipping sector.



# TECHNICAL CHARACTERISTICS

Modern **cruise ships** and **high tech ships** use electric propulsion systems that require special transformers to cope with strict on-board technical requirements such as reduced noise and vibration levels, limited space, reduced maintenance system, high resistance to the corrosive action of sea water and sea air, and a high degree of security to avoid risk to humans.

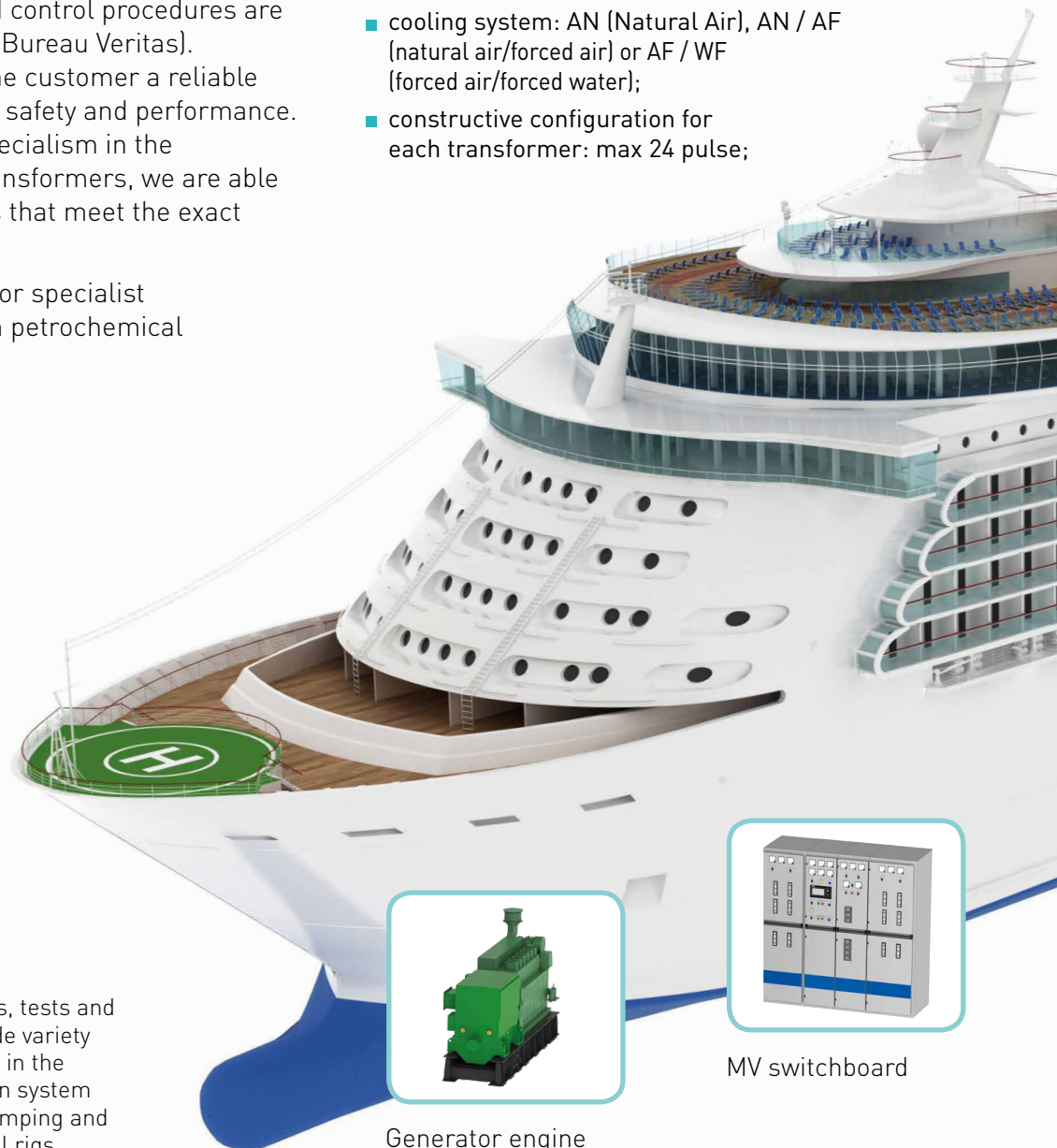
Legrand cast resin transformers and reactors for marine applications are designed and manufactured according to the highest International Standards and are approved by the most stringent certification bodies.

Our design, production and control procedures are certified by ISO 9001:2008 (Bureau Veritas). This allows us to offer to the customer a reliable product in terms of quality, safety and performance. Moreover, thanks to our specialism in the production of cast resin transformers, we are able to design reliable solutions that meet the exact needs of our customers.

Our products are suitable for specialist applications, particularly in petrochemical and gas environments.

## TRANSFORMERS FOR MARINE APPLICATIONS: MAIN FEATURES

- optimised design based on specific harmonic loads
- compact dimensions, lightweight materials
- designs can be adapted to the dimensional constraints of any installation
- specific cooling enclosure
- rated power: max 20 MVA;
- insulation levels: max 36 kV;
- frequency: 50 or 60 Hz;
- degree of protection: max IP55;
- standard colour (UK): RAL 7035 (color available on request);
- cooling system: AN (Natural Air), AN / AF (natural air/forced air) or AF / WF (forced air/forced water);
- constructive configuration for each transformer: max 24 pulse;



Legrand designs, manufactures, tests and supplies transformers for a wide variety of applications, including those in the ship sector: from the propulsion system and auxiliary services to the pumping and heating stations on off-shore oil rigs.

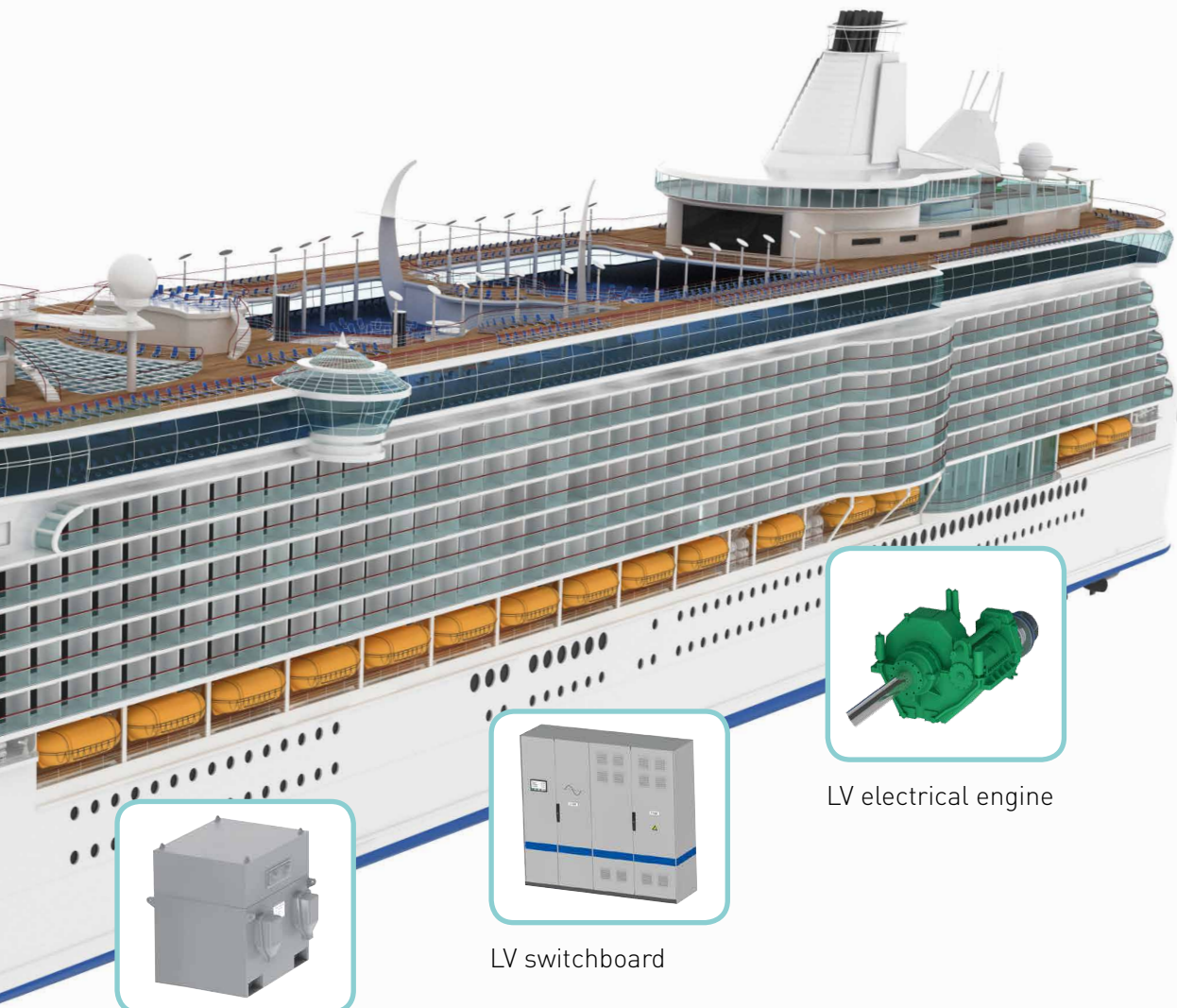
Generator engine

MV switchboard

**WORKING CONDITIONS:**

- good resistance to humid and salty environments
- heavy-duty use, working even in the presence of vibrations and considerable mechanical stresses
- meeting the most stringent Standards and specifications

Custom transformers are also available and can be equipped with temperature, current and voltage control systems, PreMag transformers, antivibration devices and IR temperature control.



TRANSFORMERS



LV switchboard



LV electrical engine



# MARINE APPLICATIONS: TYPICAL TRANSFORMERS

## Cruise ships

Power: 2200 kVA  
Primary voltage: 11 kV 60 Hz  
Secondary voltage: 0,705-0,403 kV  
Cooling: AN/AF  
Degree of protection: IP23



## Offshore drilling rigs

Power: 5600 kVA  
Primary voltage: 11 kV 60 Hz  
Secondary voltage: 0,69-0,69/0,69-0,69 kV  
Cooling: AFWF  
Degree of protection: IP44

## LNG carriers

Power: 7700 kVA  
Primary voltage: 6,6 kV 60 Hz  
Secondary voltage: 1,88-1,88 kV  
Cooling: AFWF  
Degree of protection: IP44



## Multifunctional ships

Power: 4900 kVA  
Primary voltage: 6,6 kV 60 Hz  
Secondary voltage: 0,69-0,69/0,69-0,69 kV  
Cooling: AFWF  
Degree of protection: IP44



## CERTIFICATIONS

Legrand transformers are certified by the most stringent classification societies, including:

- ABS:** American Bureau of Shipping
- DNV:** Det Norske Veritas
- GL:** Germanischer Lloyd
- RMRS:** Russian Maritime Register of Shipping
- LR:** Lloyd's register
- RINA:** Registro Italiano Navale
- CCS:** China Classification Society

### Quality:

ISO 9001:2008;

**BV:** Bureau Veritas;

Certificate of conformity to **GOST R**;

Manufacturing with respect to the environment:

ISO 14001-2004



## MAIN REFERENCES

### ■ CRUISE SHIPS

DISNEY CRUISES , HAPAG LLOYD & FINCANTIERI MEGAYACHTS

### ■ OFFSHORE DRILLING RIGS

SCARABEO 9, TYRIHANS, LAY VESSEL SAIPEM 7000,  
H6 Rig I & H6 Rig II (THE 2 BIGGEST DRILLING RIGS IN THE WORLD)

### ■ LNG CARRIERS

QATAR GAS LNGs, AWILCO LNGs & MARAN GAS I & II

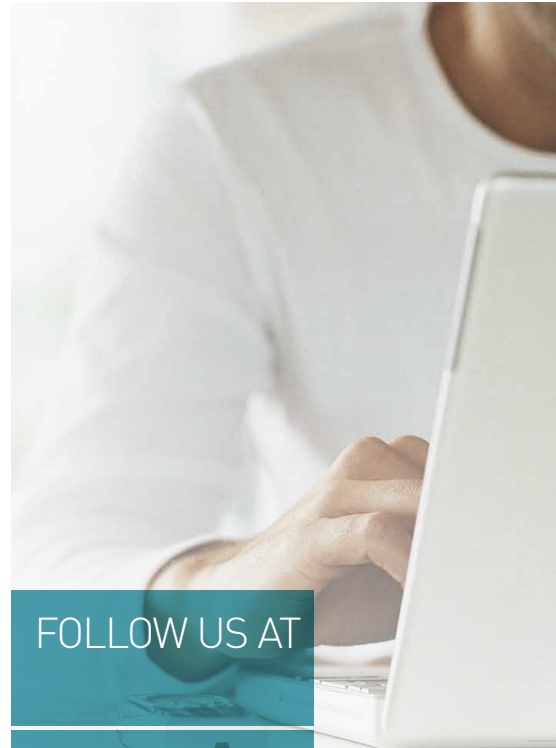
### ■ MULTIFUNCTIONAL SHIPS

ULSTEIN 271 & ULSTEIN 277

### ■ ICEBREAKERS

BALTIYSKY ZAVOD





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