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A Bosch Company

There are a number of factors that determine the types of inspection documents and certificates needed for a ship's approval, including size, intended use and type of ship and the application of a ship's operating equipment and installation room.

Navigating the Rough Waters of Marine Certification

The marine industry brings its own unique set of challenges. With the trend moving offshore exploration and production equipment for oil and gas to the seabed, safety, longevity and environmental protection are just a few of the considerations when choosing marine products.

A clear understanding of purposes and advantages of marine certifications and inspection documents for hydraulic products—such as valves, and axial piston pumps and motors—that are used in marine systems is crucial to making an informed decision. Worldwide statutory provisions enacted by the United Nations (UN) agency on shipping specify general regulation and rules necessary to obtain an operating license for all categories of ship, marine, and offshore applications.

The size, intended use, and type of ship, as well as the application of the ship's operating equipment and installation room, define the mandatory types of inspection documents and certificates needed for approval. With higher hazard potential, the legal requirements and approval tests necessary to be accepted and certified by the respective classification society become stricter.

These certifications and inspection documents serve a key purpose: they confirm, either by the manufacturer or by a third-party verification service, that the equipment has been tested in compliance with specified operating and performance requirements set forth by the industry standards. There can be significant time and cost savings if these certifications and inspection documents are obtained when ordering pumps, motors, valves, control blocks, and other shipboard equipment.

THE INTERNATIONAL MARITIME ORGANIZATION (IMO)

In regards to marine certifications, there are a lot of involved organizations to understand. Starting with the International Maritime Organization (IMO), which is a specialized agency of the UN. Its primary purpose is to develop and maintain a comprehensive regulatory framework for shipping. Its remit includes safety, environmental concerns, legal matters, technical cooperation, maritime security, and shipping efficiency.

The IMO is the source of approximately 60 legal instruments that guide the regulatory development of its member states to improve safety at sea, facilitate trade among seafaring states and protect the maritime environment. The most well-known are the International Convention for the Safety of Life at Sea (SOLAS), the International Convention for the Prevention of Maritime Pollution (MARPOL), and International Convention of the Safe and Environmental Sound Recycling of Ships (“Green Passport”).

CLASSIFICATION SOCIETIES

In addition to the IMO, classification societies add another level to the marine certification structure. A classification society is a non-governmental organization that establishes and maintains technical standards for the construction and operation of ships and offshore structures based on IMO regulations. The society also validates that the construction adheres to set standards and executes regular surveys to ensure compliance with the standards. Classification societies are also responsible for classifying oil platforms, submarines, and other offshore structures. Their extensive survey process covers diesel engines, important ship-board pumps, and other vital machinery.

Major classification societies are members of the International Association of Classification Societies (IACS), which is a technically-based organization headquartered in London that currently consists of twelve marine classifications societies. Marine classification is designed to promote occupational safety, property and the environment. This promotion is achieved through the establishment and verification of compliance with technical and engineering standards for the design, construction and life-cycle maintenance of ships, offshore units and other marine-related facilities. These standards are contained in rules established by each individual society.

Although IACS is a non-governmental organization, it plays a role within the IMO, for which IACS provides technical support and guidance and develops unified interpretations of the international statutory regulations developed by the member states of the IMO. Once adopted, these interpretations are applied by each IACS member society when certifying compliance with statutory regulations on behalf of authorizing flag states.

INSPECTION DOCUMENTS AND CERTIFICATES

Depending on the function for which a product is used, specific approval from classification societies may be required. This specific product approval or certification requires the societies’ involvement for establishing individual product certificates or for issuing general applicable product type approvals. Product certificates may be according to standard EN10204, while type-approval certificates require a specific format from the society involved. According to EN10204 standards, the certificates can be summarized into two categories.

The first category involves non-specific inspections, which are issued for non-essential equipment. This means inspected equipment is without hazard potential for life or limb and includes applications such as cranes or winches. This category includes a Declaration of Compliance with the order (Type 2.1) and a Test Report (Type 2.2). A Type 2.1 declaration is a document in which the manufacturer declares that the products supplied are in compliance with the requirements of the order, without the inclusion of test results. A Type 2.2 report is similar, but the requirements of the order are fulfilled with the provision of test results based on a non-specific inspection.

The second category is defined by specific inspections, which are issued for essential equipment, meaning inspected equipment has a hazard potential for life and limb. Hazardous equipment includes applications such as steering gears and propulsion systems. This category includes Inspection Certificates Type 3.1 and 3.2. A Type 3.1 certificate is a document issued by the manufacturer in which they declare that the products supplied are in compliance with the requirements of the order and in which they supply test results. This document is validated by the manufacturer’s authorized inspection representative, independent of the manufacturing department.

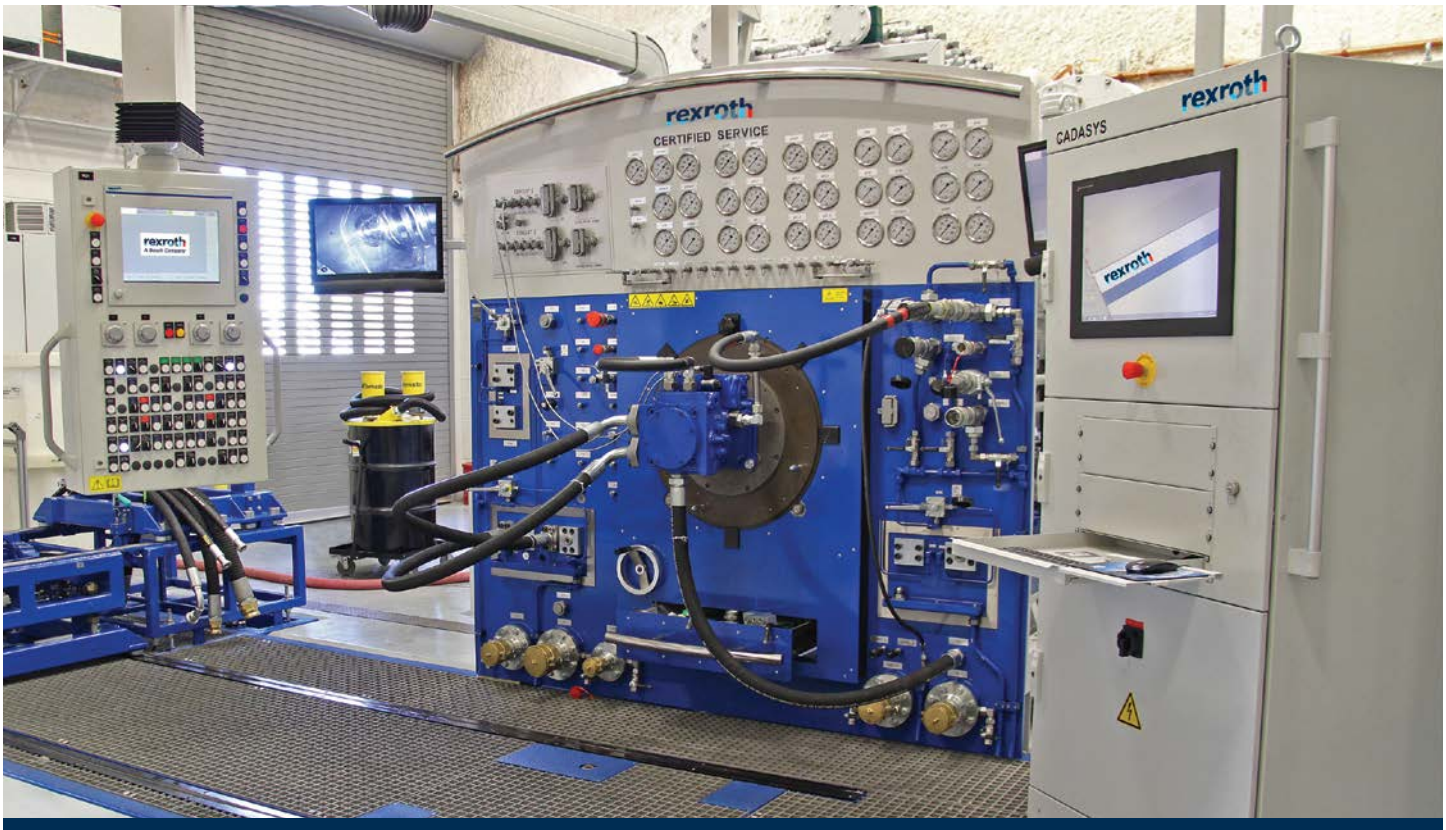
A Type 3.2 certification is a document prepared by both the manufacturer's authorized representative, independent of the manufacturing department and either the purchaser's authorized representative or the inspector designated by the official regulations. Like the Type 3.1 certificate, this certificate declares the products supplied comply fully with the requirements of the order and in which test results are supplied.

Marine notified bodies such as the American Bureau of Shipping (ABS), which is a member of the IACS, is one of the largest certification bodies presiding over the US shipbuilding community. ABS, like other classification societies, conducts engineering design reviews and inspection testing to certify that components and machinery are built and installed according to the standards required for their class. Typically, classification societies provide general design standards for marine vessel application-specific requirements in standards (e.g., subject marine systems would include propulsion systems, cranes, winches, ballast systems, and stabilizers).

When an OEM supplies shipboard drive and control equipment, for example, and must incorporate high pressure piston pumps, the OEM can request that the pump manufacturer provide test certifications for the pump's operating characteristics at time of purchase. This can prevent excess cost related to the time involved for inspection verifications when the system is to be installed and certified at the shipyard.

Manufacturers such as Bosch Rexroth provide certification of its products' operating characteristics at the manufacturing factory.

For both the Type 3.1 and 3.2 certificates, it is permissible for the manufacturer to transit relevant test results previously obtained by a specific inspection on primary or incoming products to the inspection certificate, provided that the manufacturer operates traceability procedures and can provide the required corresponding inspection documents.



Test stands verify a pump's performance and aid in its certification. Most marine notified bodies, such as ABS, will require witness inspection for hydrostatic testing at 150% of the intended application pressure.

CONCLUSION

With so many organizations involved and documentation types, it's easy to get overwhelmed with the certification and inspection process for marine products. With all the intricacies involved, partnering with a knowledgeable company like Bosch Rexroth for marine product solutions is crucial to success in the industry. Companies capable of providing the full range of material and testing certifications for components, assemblies and systems for above and below deck marine applications help enable significant cost and time savings later during the final marine notified body approval certification process. Ultimately, these testing certifications at the individual component level support a faster comprehensive inspection approval process for the final vessel performance validation.

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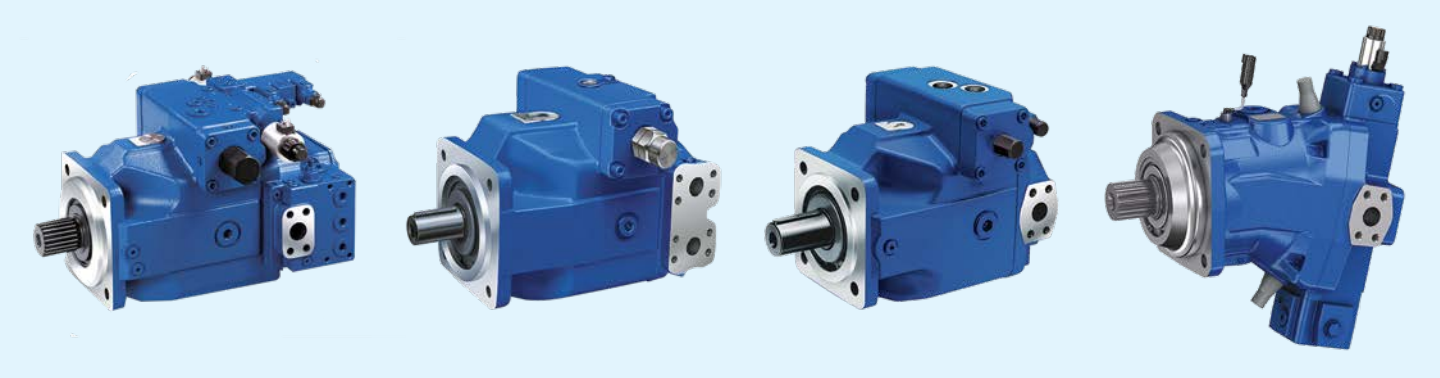

Bosch Rexroth offers a variety of certified products for marine applications, for both above deck and below deck applications, including axial piston pumps and motors. Pictured L to R: A4CSG Axial Piston Variable Pump, A4VSG Axial Piston Variable Pump, A4VSO Axial Piston Variable Pump, A6VM Axial Piston Variable Motor.

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