



ASPHALT CARRIERS

**MAXIMIZE SAFETY,
SAFEGUARD THE ENVIRONMENT**



Move Forward with Confidence

**BUREAU
VERITAS**

PARTNER OF CHOICE FOR A DEMANDING INDUSTRY

Asphalt is carried at higher temperatures than any other cargo, with major implications for hull structure and strength. Bureau Veritas' longstanding experience makes us the number one choice for shipowners and charterers seeking safety and environmental protection.

Hazardous cargo carried at extremely high temperatures creates a specific set of challenges for asphalt carriers in terms of structure, construction quality and equipment.

Avoiding spills is a priority: as natural components of crude oil, asphalt and bitumen are highly polluting, posing a major threat to marine life. And the risk of spills is high: cargo is carried at 180°C - 250°C for liquefaction purposes, resulting in significant stresses to the hull, tanks or tank supports.

ASSESSING STRESSES, MINIMIZING RISK

For ships designed with integral tanks, these stresses include a decrease in materials strength, thermal longitudinal stresses and increased bucking sensitivity. For vessels using insulated independent tanks, stresses arise from the interaction between the tanks and the hull and include hull girder stresses, and vertical and transverse accelerations. In all cases, heat is the key parameter governing asphalt carrier design and operations. Against this backdrop, choice of classification partner is a high-stakes decision, enabling you to reduce risk and improve asset integrity.

PARTNER OF CHOICE FOR ASPHALT CARRIERS

Bureau Veritas' experience and reputation make us a natural choice for new asphalt carrier projects. We already class 1 in 5 asphalt carriers



WHY CHOOSE BUREAU VERITAS?

- ✓ Protect your ship, your crew and the environment
- ✓ One of the oldest classification societies (established 1828)
- ✓ The Bureau Veritas brand: a mark of confidence
- ✓ Industry-leading research, knowledge and technical expertise
- ✓ In-depth knowledge of regulations
- ✓ Extensive geographical network

CLASSIFICATION OF THE WORLD'S LARGEST ASPHALT CARRIERS

Bureau Veritas classes vessels of all sizes, including large vessels that can also be used to carry chemicals. Large vessels are more complex in terms of design, with constraints on construction and inspection.

We are classing four of the world's largest vessels. The 37,000 dwt Asphalt Splendor (delivered 2016 to Sargeant Marine) can carry liquid asphalt at temperatures up to 170°C in sixteen tanks. Two other vessels are being built to the same design, one for Japanese owner Kumai Sempaku. Separately, a 49,000 dwt vessel is under construction on behalf of ASP Ship Management Group in Korea and two 37,000 dwt carriers have been delivered by Hyundai Mipo Dockyards for Wisby Tankers. These vessels carry all three notations: Asphalt carrier, Oil tanker and Chemical tanker.

worldwide, and over two thirds of newbuildings under construction have been designed to BV class. We offer proven design review expertise, supported by advanced modeling tools that help you optimize both cargo tank structure design, hull structure design, and the arrangement, number and design of supports and keys.

Once a vessel is in operation, our global network of experienced ship surveyors ensures convenience for owners, who can request an inspection anywhere they go. This, combined with our technical expertise, makes us a reassuring presence for asphalt carrier owners and charterers throughout the world.





CLASSIFICATION SERVICES

Bureau Veritas' experience and advanced tools ensure we remain at the forefront of asphalt carrier classification.

For asphalt carriers, classification plays an essential role. As well as ensuring compliance with regulations, it helps preserve the structural integrity of the vessel. It also provides reassurance that the right measures have been taken to avoid polluting spills.

Bureau Veritas is the global leader in newbuild asphalt carriers. Our rules have dedicated notations for asphalt carriers: multipurpose vessels also carry oil tanker and

chemical tanker notations. We also offer specific notations for owners targeting improved energy efficiency or compliance with new legislation relating to emissions and ballast water.

We use a range of sophisticated tools as part of our classification services covering structure and fatigue (Veristar Hull, MARS and Saphirs); cargo safety (Veristar Chemicals); on-board equipment (Veristar Machinery) and stability and longitudinal strength (Veristar Stability).



STRUCTURAL ANALYSIS

Bureau Veritas expertise in fatigue crack avoidance is recognized. Our industry-leading Veristar Hull software uses Finite Element Method (FEM) to assess the ship's structure and analyze potential causes of damage. Tankers are able to obtain the notation Fatigue Plus, and those over 150m in length use the analysis to meet the requirements of the harmonized Common Structural Rules.

Our MARS software also evaluates the ship structure by checking all structural members of cross-sections or transverse bulkheads against classification rules and external standards.

DESIGN REVIEW

Exceptionally high cargo temperatures of up to 250°C affect steel strength and properties and impact the design of asphalt carriers. This makes a comprehensive design review essential for new projects: we also have approved standard designs with designers around the world, including in China.

Bureau Veritas has proven design review expertise for all types of tank and the particular challenges they represent. For independent tanks, interaction between tank and hull is the major focus: for integral tanks, heating of hull structure results in thermal stresses, and impacts on material strength and buckling sensitivity.

Our iterative process includes temperature mapping, thermal and strength analyses of hull, tanks and supports.

CLASSIFICATION NOTATIONS ISSUED TO ASPHALT CARRIERS BY BUREAU VERITAS

Some of the classification notations commonly used for new-build asphalt carriers:

▶ Class symbol and construction marks:	I ✕ HULL ✕ MACH
▶ Service notations:	Asphalt carrier, Oil tanker, Chemical tanker
▶ Other features:	✕ AUT – UMS, INWATERSURVEY, MON-SHAFT, CPS (WBT), ESP
▶ Environmental management:	CLEANSHIP, GREEN PASSPORT

▶ Visit the Bureau Veritas client portal www.veristar.com for a full list and detail of classification notations and statutory certificates.

VALUE-ADDED SERVICES AND TOOLS

You can access our expertise even if you are not classed with us. Bureau Veritas provides a range of advisory services to promote safety at sea, and efficient operation of asphalt carriers.



Cargo heater scheduling tool

OPTIMIZE EFFICIENCY

Cargo tanks must be heated to maintain asphalt at the high temperatures required for liquefaction. Assessing the tank, including dimensions and insulation, enables you to calculate the optimal heating program resulting in more efficient fuel use. Bureau Veritas offers a dedicated tool to optimize cargo heating, and ultimately, lower operating costs.



Energy efficiency services

CONTROL OPERATIONAL COSTS

Energy efficiency is rising up the agenda of ship owners. The International Maritime Organization is pushing the industry to reduce CO₂ emissions: at the same time, ship owners and charterers seek to manage operating costs. Bureau Veritas can assess all documentation relating to energy calculations, planning and management, and provide the necessary advice (EEDI) and validations (SEEMP).



Veristar Project Management

SPEED UP APPROVALS

Efficient ship design assessment and construction surveys depend on effective communication between numerous stakeholders. A web-based collaborative platform, Veristar Project Management enables designers, shipbuilders and, increasingly, owners, to review and exchange information. Used from design review through to construction, it improves communication and speeds up approvals.



Veristar Chemicals

ASSESS YOUR CARGO

Modern asphalt carriers use to have chemical tanker notation. This is why a dedicated tool to assess chemical tankers compliance with the IBC Code is useful. Our Veristar Chemicals software assists to crosscheck the ship equipment and applicable regulations to get the list of transportable products. A reverse function helps to define the characteristics of the ship based on the list of chemical products.



180 YEARS OF CLIENT CONFIDENCE

We are driven by a single commitment: to keep our clients' crew and assets safe, every day.

A global leader in testing, inspection and certification, Bureau Veritas serves clients' needs in quality, health, safety, environmental protection and social responsibility.

For over 180 years, our clients across all industries have looked to us to provide technical support, verify compliance, or obtain certification. Our network of over 1,400 offices and laboratories ensures we meet our their needs, wherever they are in the world.

HISTORICAL PARTNER TO THE MARINE INDUSTRY

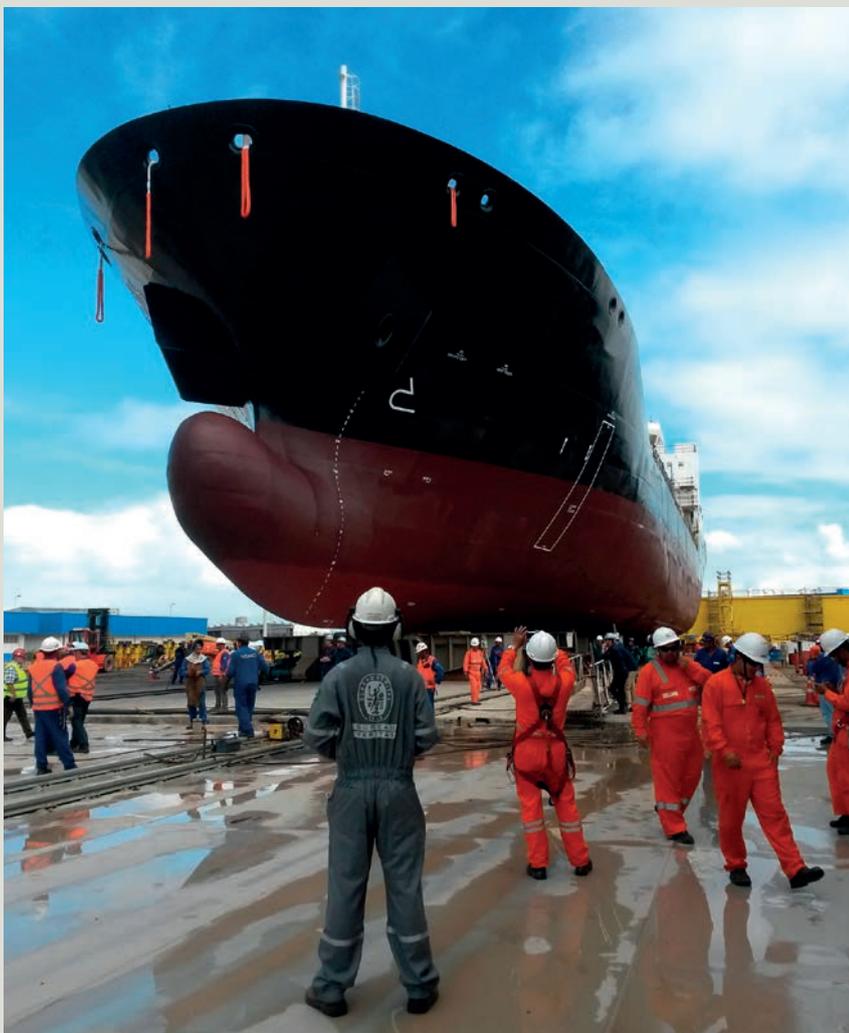
Bureau Veritas was founded in 1828 for the initial purpose of collecting, verifying and providing maritime insurance companies with precise and up-to-date information about the condition of ships and their equipment around the world. Today, over 2,600 experts in Marine and Offshore serve our clients' needs worldwide.

OVER 1,000 ACCREDITATIONS AND AUTHORIZATIONS

Our wide range of accreditations and authorizations across a range of industry sectors prove that we operate professionally and that our reports and certifications are recognized and respected. We hold 150 delegations of authority on behalf of national maritime authorities.

EXPERTISE IN UNDERLYING OIL AND PETROCHEMICALS INDUSTRIES

Our testing, inspection and certification services go beyond shipping. A leader in the classification of offshore structures, we carry out tests and inspections at all stages of oil and petrochemicals production, from extraction and processing to distribution.





Move Forward with Confidence

Bureau Veritas - Marine & Offshore

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