

The Market for Aircraft Carriers and Amphibious Warfare Ships 2019-2028



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The Market for Aircraft Carriers and Amphibious Warfare Ships 2019-2028

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The Market for Aircraft Carriers and Amphibious Warfare Ships

Executive Summary

The market for aircraft carriers and amphibious warfare ships is expanding steadily as more navies become responsible for power projection into areas removed from their home waters. In terms of strategic significance, this market sector certainly outweighs any other in the maritime sector and is of profound worldwide importance.

A total of 90 ships are represented in this overview, an increase of 11.25 percent over the 2017-2026 edition of this survey. These ships are valued at a total of \$61.625 billion for the 10 years ending in 2027, an increase of 3.8 percent over the equivalent value of production in last year's survey. Of these, nine are aircraft carriers, comprising two each for Britain, India and the United States and three for China. These nine ships represent just over 11 percent of the total for this sector but have an aggregate value of \$32.4 billion, 52.5 percent of the sector total. The balance includes amphibious warfare ships and craft, a segment that includes large amphibious transports of varying types down to air cushion landing craft.

The one constant factor in every international crisis since the end of World War II has been the deployment of U.S. and allied aircraft carriers as a means of first response. This market overview covers aircraft carriers ranging from large warships carrying a mixed, multipurpose air group exhibiting the highest performance characteristics to amphibious assault ships that primarily carry transport helicopters, with a limited number of VSTOL aircraft tasked with a restricted number of missions.

The linkage of these two sectors within a single market overview may seem idiosyncratic, but there are solid operational and technical reasons behind doing so. Operationally, the distinction between an aircraft carrier and a large amphibious assault ship is indistinct. Even the big U.S. Navy CVNs, the largest and most powerful warships in the world (not to mention by far the most expensive), have at times embarked helicopters and Marines in order to carry out amphibious operations. The amphibious warfare ships have, when the situation demands, served as small aircraft carriers. The technical link is that the design and to a large extent the size of these ships are determined by the demands of the aircraft they carry.

Large aircraft carriers remain a rarity in the world's navies, a direct result of the costs involved in acquiring and operating this type of ship. Little can be done to

reduce the size of modern carriers, as it is driven by the performance characteristics of modern combat aircraft. Attempting to operate modern high-performance aircraft from any but the largest hulls is doomed to failure, yet the importance of this class of ship is such that additional countries are making the investments necessary to follow this route.

The air group attached to a fleet aircraft carrier is a voracious consumer of fuel and munitions, and it also requires a large number of personnel to keep the aircraft flying. Those personnel require accommodation, feeding and all the other forms of support collectively known as "hotel load." A typical full-size fleet carrier carries in excess of 3,000 tons of munitions and has the endurance necessary to stay in combat for three to five days before pulling back to replenish.

The combination of ski-jump and VSTOL technology enables VSTOL aircraft to take off with a full load of underwing and underbelly stores without incurring punitive levels of fuel expenditure. In this application, the ski-jump is useful in that it permits relatively small amphibious warfare ships to operate fixed-wing combat aircraft, albeit ones of restricted capability and for only a limited period. The last point is the big Achilles' heel of using amphibious warfare ships as small carriers; their stockpile of onboard munitions and fuel is usually only enough for a single day's combat before replenishment is essential. Maintenance and support are also more limited, resulting in the air group quickly becoming attrited as aircraft become unserviceable due to defects or battle damage.

Aircraft carrying amphibious warfare ships originated as helicopter carriers tasked either with supporting amphibious assaults by carrying out vertical envelopments or with anti-submarine operations. Once VSTOL aircraft (primarily the AV-8, or Harrier) became available, they were quickly assigned to these ships, to provide either offensive air support for the landing force or defensive fighter cover for ASW operations. This process led to the adoption of through-deck configurations for many categories of amphibious warfare ships. Indeed, these days it is rare to find a helicopter-carrying amphibious warfare ship in the LPH, LHA or LHD categories that is not configured with a through deck. Even dock landing ships such as LPDs and LSDs for which helicopter operation is a secondary role are increasingly being designed with through decks.

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It is an essential truth that aircraft carriers dominate the seas and make operations by hostile fleets without such ships impossible. The presence of even a small number of strike aircraft has proved to be a major force multiplier, with the inevitable result that the "if some are good, more are better" principle applies. Each successive generation of amphibious warfare ships is larger, carries more aircraft, and has greater fuel, munitions and maintenance capability. These ships have now reached the size of World War II Essex class aircraft carriers. Across most of the world, large amphibious warfare ships and aircraft carriers are merging.

The number of purely naval fighter/strike aircraft in the world is very limited; only the F/A-18, MiG-29K, Su-35 and Rafale-M remain in production, with the F-35 now joining them. This implies that equipping aircraft carriers with effective naval aircraft means coming to Russia, France or the U.S. for the air group. This, in turn, means that the deployment of naval aircraft will be restricted by the export policies imposed by these countries. If, as we believe, interest in naval aviation will continue to spread as ships capable of operating fixed-wing aircraft become more widely accepted, there will be an impetus for other countries to design and build naval fighter/strike aircraft. Both India and China appear to be moving in this direction.

The exponential growth in the value of offshore mineral, energy, and food resources within territorial

waters has resulted in growing requirements for naval aviation. This is the direct cause of a major expansion in the small craft and paramilitary vessel markets. These small craft, however, cannot provide adequate surveillance of the international-standard 200-mile exclusive economic zone (EEZ), and require the support of air assets. At present, this requirement is fulfilled by land-based maritime patrol aircraft (MPA) and helicopters. As experience is gained with these operations, the limitations of land-based air are becoming apparent.

Helicopter carriers developed for amphibious warfare operations have found an unexpected role as a mobile base for maritime surveillance operations. They can be moved in response to evolving activity profiles, making their patrol patterns highly unpredictable. Being much closer to the scene, their response times are shorter. Importantly, the fact that they operate from well out to sea enables them to deploy helicopters that can stop suspect craft with machine-gun fire or thrown grenades, and to land customs teams or special forces troops on ships to inspect for illicit cargo or weapons.

Note: *This analysis surveys leading programs in order to ascertain market patterns. Figures and monetary amounts represent only systems currently in production or planned for production. Based on the trends identified in the analysis, an overall picture of the market is formulated.*

* * *

PROGRAMS

The following reports are included in this section: (**Note:** a single report may cover several programs.)

Chinese Aircraft Carrier
Dokdo Class
Enforcer Class LPD
Gerald R. Ford
Hyuga Class DDH
LCAC-100
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LPD-17
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EVA Aviation

TOSHIYUKI HARADA

903 Casa Gyoen, 2-4-2 Shinjuku,
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