

# ARCHIVED REPORT

For data and forecasts on current programs please visit  
[www.forecastinternational.com](http://www.forecastinternational.com) or call +1 203.426.0800

## Asahi Class

### Outlook

- Production of Asahi class ended at two ships
- 30DX Mogami class frigate is replacing the Asahi design
- No exports models seen at this time
- This report will be archived in 2025

### Orientation

**Description.** Large destroyers (DD/DDG) with guided missiles for anti-submarine warfare (ASW) and anti-aircraft warfare (AAW) operations.

#### Sponsor

Japan Maritime Self-Defense Force (JMSDF)  
 Japanese Ministry of Defense  
 7-45 Akasaka 9-chome  
 Minato-ku  
 Tokyo 107  
 Japan

**Status.** In service.

**Total Produced.** The last of the 18 Murasame, Improved Murasame (Takanami) and "Later Murasame" (Akizuki) classes were delivered in March 2014.

The second of the two Asahi class was commissioned in February 2019.

#### Pennant List (Planned Schedule)

<u>Number &amp; Name</u>	<u>Builder</u>	<u>Laid Down</u>	<u>Launched</u>	<u>Commissioned</u>
<b><u>Murasame Class</u></b>				
DD-101 <i>Murasame</i>	Ishikawajima-Harima, Tokyo	8/8/1993	8/23/1994	3/12/1996
DD-102 <i>Harusame</i>	Mitsui, Tamano	8/11/1994	10/16/1995	3/24/1997
DD-103 <i>Yudachi</i>	Sumitomo, Uruga	3/18/1996	8/19/1997	3/4/1999
DD-104 <i>Kirisame</i>	Mitsubishi, Nagasaki	4/3/1996	8/21/1997	3/18/1999
DD-105 <i>Inazuma</i>	Mitsubishi, Nagasaki	5/8/1997	9/9/1998	3/15/2000
DD-106 <i>Samidare</i>	Ishikawajima-Harima, Tokyo	9/11/1997	9/24/1998	3/21/2000
DD-107 <i>Ikazuchi</i>	Hitachi, Maizuru	2/25/1998	6/24/1999	3/14/2001
DD-108 <i>Akebono</i>	Ishikawajima-Harima, Tokyo	10/29/1999	9/25/2000	3/19/2002
DD-109 <i>Ariake</i>	Mitsubishi, Nagasaki	5/18/1999	10/16/2000	3/7/2002
<b><u>Improved Murasame Class</u></b>				
DD-110 <i>Takanami</i> *	Sumitomo, Uruga	4/25/2000	7/26/2001	3/12/2003
DD-111 <i>Onami</i> *	Mitsubishi, Nagasaki	5/17/2000	9/20/2001	3/13/2003
DD-112 <i>Makinami</i> *	Ishikawajima-Harima, Tokyo	7/17/2001	8/8/2002	3/18/2004

## Asahi Class

<u>Number &amp; Name</u>	<u>Builder</u>	<u>Laid Down</u>	<u>Launched</u>	<u>Commissioned</u>
DD-113 <i>Sazanami</i> *	Mitsubishi, Nagasaki	4/4/2002	8/29/2003	2/16/2005
DD-114 <i>Suzunami</i> *	Marine United, Yokosuka	9/24/2003	8/26/2004	2/16/2006
<b><u>Later Murasame Class</u></b>				
DD-115 <i>Akizuki</i> **	Mitsubishi, Nagasaki	7/17/2009	10/13/2010	3/14/2012
DD-116 <i>Teruzuki</i> **	Mitsubishi, Nagasaki	7/9/2010	9/15/2011	3/7/2013
DD-117 <i>Suzutsuki</i> **	Mitsubishi, Nagasaki	5/18/2011	10/17/2012	3/12/2014
DD-118 <i>Fuyuzuki</i> **	Mitsui, Tamano	6/14/2011	8/22/2012	3/13/2014
<b><u>Asahi Class</u></b>				
DD-119 <i>Asahi</i>	Mitsubishi, Nagasaki	8/4/2015	10/19/2016	3/7/2018
DD-120 <i>Shiranui</i>	Mitsubishi, Nagasaki	5/20/2016	10/12/2017	2/27/2019

\*Improved Murasame class.

\*\*Later Murasame class. Reports that Hull 115 was named *Nobita* are incorrect.

**Application.** The Murasame class were designed as general-purpose escorts for anti-surface and anti-air warfare operations.

The Asahi class are modified versions of the Murasame class intended to perform open-ocean anti-submarine warfare either as part of a task force or independently.

**Price Range.** The cost of each Murasame class vessel was estimated to be \$750 million each.

The Asahi class ASW variant reportedly cost \$893 million (2009 U.S. dollars).

## Contractors

### Prime

<b>Mitsubishi Heavy Industries, Nagasaki Shipyard &amp; Machinery Works</b>	<a href="http://www.mhi.com">http://www.mhi.com</a> , 1-1 Akunoura-machi, Nagasaki, Japan, Tel: + 81 95 828 4121, Fax: + 81 95 828 4034, Prime
<b>Mitsui Engineering &amp; Shipbuilding Company Ltd, (Power Systems Department)</b>	<a href="http://www.mes.co.jp/english">http://www.mes.co.jp/english</a> , 6-4, Tsukiji 5-chome, Chuo-ku, Tokyo, Japan, Tel: + 81 3 3544 3639, Fax: + 81 3 3544 3045, Second Prime
<b>Sumitomo Heavy Industries</b>	<a href="http://www.shi.co.jp/english">http://www.shi.co.jp/english</a> , 9-11 Kitashinaga 5-chome, Shinagawa-ku, Tokyo, Japan, Tel: + 81 3 5488 8000, Fax: + 81 3 5488 8056, Second Prime

### Subcontractor

<b>Furuno Electric Co Ltd</b>	<a href="http://www.furuno.com">http://www.furuno.com</a> , 9-52 Ashihara-cho, Nishinomiya-Shi, Hyogo-Pref., Japan, Tel: + 81 798 65 21, Fax: + 81 798 63 10 (Navigation Radar)
<b>GE Aerospace</b>	<a href="http://www.geaerospace.com">http://www.geaerospace.com</a> , 1 Neumann Way, Cincinnati, OH 45215-6301 United States, Tel: + 1 (513) 243-2000 (LM2500 Marine Gas Turbine)
<b>Leonardo Defence Systems</b>	<a href="http://www.leonardo.com">http://www.leonardo.com</a> , Via Valdicocchi 15, La Spezia, Italy, Tel: + 39 0187 5811 11, Fax: + 39 0187 58266, Email: <a href="mailto:pressoffice@leonardocompany.com">pressoffice@leonardocompany.com</a> (76mm L62 Super Rapid)
<b>Mitsubishi Electric Corp</b>	<a href="http://www.mitsubishielectric.com">http://www.mitsubishielectric.com</a> , Tokyo Bldg 2-7-3, Marunouchi, Chiyoda-ku, Tokyo, Japan, Tel: + 81 3 3218 2111, Fax: + 81 3 3218 2185 (Ballistic Computer & Fire Control Components)
<b>RTX Corporation</b>	<a href="http://www.rtx.com">http://www.rtx.com</a> , 1000 Wilson Blvd, Arlington, VA 22209 United States, Tel: + 1 (781) 522-3000, Fax: + 1 (781) 860-2520 (NATO SeaSparrow)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; [rich.pettibone@forecast1.com](mailto:rich.pettibone@forecast1.com)

**Asahi Class****Technical Data**

	<u>Metric</u>	<u>U.S.</u>
<b>Dimensions</b>		
Length	151 m	495.5 ft
Beam	18.3 m	60.0 ft
Draft	5.1 m	17.0 ft
<b>Displacement</b>		
Standard	4,470 tonnes	4,400 tons
Full Load	5,180 tonnes	5,100 tons
<b>Performance</b>		
Speed – Maximum	55+ kmph	30+ kt
Speed – Sustained	35 kmph	19 kt
Operating Range	8,340 km at 35 kmph	4,500 nm at 19 kt
Crew	160	
<b>Weaponry</b>		
<u>Type</u>		
<u>Quantity</u>		
Guns	5-inch Mk 54 L62	1
CIWS	20mm Phalanx Mk 15	2
Missiles – SSM	SSM-1B Harpoon	8
Missiles – SAM	SeaSparrow (16 Mk 48 VLS cells)	(See "Design Features")
Missiles – ASW	Mk 41 VL ASROC (32 cells)	32 SAM & ASW missiles
Torpedo Tubes	Type 68 (12.75 in)	2x 3
Torpedoes	Mk 46 Mod 5	24 (est.)
Helicopter	SH-60K Seahawk	1
<b>Electronics</b>		
Radars – Air/Surface Search	OPS-40A	1
Radars – Surface Search	OPY-1	1
Radars – Gunnery Fire Control	FCS-3	2
Radars – Navigation	Furuno	1
Sonars – Low-Freq Hull-Mounted	OQS-24A	1
Sonars – Towed Array	OQR-4 TASS	1
EW – ESM	NOLQ-2	1
EW – RWR	NOLR-8	1
EW – Noise Jammer	OLT-3	1
EW – Deception Jammer	OLT-5	1
COMINT – Wideband	OPN-7B	1
COMINT – OTH	OPN-11B	1
Decoy Launchers	Mk 36 SRBOC	4
C2 – Command System	OYQ-7	1
C2 – Datalinking	Links 11, 14, and 16	
C2 – Air Control	URN-25 TACAN	
<b>Machinery</b>		
Propulsion Configuration	COGLAG	
Gas Turbines	GE LM2500IEC gas turbines	2x 31,250 shp
<b>Auxiliary Power</b>		
Propellers	LM500 electric generators	2
	Controllable pitch	2

## Asahi Class

**Design Features.** The ship has a steel hull; the superstructure, funnel, and mast are made of a mixture of steel and radar-absorbing composite materials. The Asahi's superstructure bears a superficial resemblance to that of the Kongo, with stealth features such as sloping sides built in and rounded elements eliminated. The lack of a phased-array radar system, such as the SPY-1 in the Kongo class, is the most notable difference in external design.

The Asahi class carries the Japanese OPS-50 surface-search radar and the Melco OPY-1 active-array 3D air-search radar. Fire control is provided by a pair of FCS-3 radars, fitted on top of a structure behind the aft smokestack.

The primary sonar system is Mitsubishi's OQS-24A, a Japanese equivalent to the U.S. SQS-53C. It is an active/passive, low-frequency, hull-mounted system with excellent shallow water capability due to the use of digital beam-forming. The Asahi class also carries a Japanese-developed towed array, the OQR-4.

The ships have a remarkably comprehensive electronic warfare installation. Electronic support measures (ESM) systems include an NOLQ-2 fully integrated passive intercept unit that has sufficient bearing accuracy to provide over-the-horizon target information and to activate the OLT-3 noise/barrage jammers and OLT-5 deception jammers. In addition, an NOLR-8 radar warning receiver (RWR) provides rapid reaction alerts of inbound "hostiles" and activates the four Mk 36 SRBOC launchers to fire chaff or infrared decoys.

The ships are fitted with a 16-cell Mk 41 vertical launch system for anti-submarine rockets (ASROCs) forward and a 16-cell Mk 48 VLS between the smokestacks for anti-aircraft SeaSparrow missiles. Additionally, a nest of eight Harpoon anti-ship missiles is fitted midships behind the first smokestack. The forward deck houses a 5 inch Mk 45 Mod 4 gun. Two Mk 15 Phalanx close-in weapon systems (CIWSs) are fitted, one forward and one aft. An FC3-3 fire control system is fitted for the SeaSparrows, along with an upgraded sonar system.

The Mk 48 cells are reconfigurable for quad-pack installation. Each tube can be adapted to accept four Evolved SeaSparrow missiles, and the fire control

system on board can be easily modified to support such a change.

The three ASW weapons are torpedoes, ASROCs, and a helicopter. The Model 89 torpedoes, made in Japan, have a range and speed of approximately 6 nautical miles and 45 knots. The torpedoes are launched from two Type 68 triple-tube mounts, which are similar to the American Mk 32. The VL ASROCs are carried in the forward Mk 41 VLS. The ASROCs have a range of 5 nautical miles and carry a Mk 46 torpedo as their payload. The helicopter hangar can hold one SH-60J helicopter equipped with Model 73 torpedoes, sonobuoys, and an AQS-13 dipping sonar.

The Asahi class differs primarily from the earlier Murasame group in having a composite gas turbine electric propulsion system intended to improve fuel efficiency and decrease self-noise, thus greatly improving the ship's anti-submarine capability.

**Operational Characteristics.** Overall, these ships are fast, long-range ASW escorts that have defensive firepower capable of handling the swamping attacks of the low-technology weapons that are likely to be encountered. They are also able to contribute substantially to the area defense of a task force.

In an expanded firepower configuration – with quad-pack VLS cells – they could also act as magazine ships for the Kongo class AEGIS ships, firing missiles that would be targeted by the AEGIS on the Kongos. Some reports state that the Murasames do not carry ASROCs, although the ships' intended mission would suggest that they would be necessary for effective anti-submarine warfare.

The Japanese shipbuilding industry has a demonstrated ability to produce destroyers of this quality with very short construction times – as little as two years per ship. In addition, the Japanese Navy has a policy of scrapping its ships and replacing them with construction that is more modern rather than upgrading them at midlife. Thus, the Murasame class demonstrates not only that the Japan Maritime Self-Defense Force has a generous budget, but also that Japanese warship hulls are built largely to mercantile standards and therefore have a shorter inherent life than ships built to warship standards.

## Variants/Upgrades

**Asahi Class.** The Asahi class is a further modification of the Akizuki class using a combined gas turbine engine and electric propulsion system for better fuel efficiency. It is also fitted with a new sonar system and enhanced anti-submarine capabilities.

**Later Murasame (Akizuki) Class.** The Improved Murasame class was followed by a new class of destroyers that replaced the Hatsuyuki class. The lead ship was named *Akizuki* in October 2010, the name honoring a class of large multirole destroyers that saw

## Asahi Class

strenuous service in World War II. These destroyers are also known by the funding designation for the first-of-class, 19DD (meaning the destroyer was funded in the 19th year of Heisei, the name given to the reign of Emperor Akihito). The class consists of four ships.

The Akizuki class appears to be almost identical in dimensions and armament to the Improved Murasame class, the most important difference being the replacement of the 5-inch L64 Oto Melara gun with a BAE Systems 5-inch Mk 45 Mod 4. The ships differ significantly in appearance from the Improved Murasame class, but the changes are purely cosmetic. The lattice mast has been replaced by a pylon mast, and the superstructure has been extended, with the sides angled to reduce radar cross-section.

The machinery plant is more rational, with four Rolls-Royce Spey SM1C engines replacing the combination of the Rolls-Royce SM1C and the General Electric LM2500 used on the Takanami and Murasame classes.

**Improved Murasame (Takanami) Class.** In early 1998 it was reported that the Japan Maritime Self-Defense Force (JMSDF) was planning a new class of 4,900- to 5,100-ton destroyers (5,600 tons full load). Eight ships were projected.

The Improved Murasame class is a larger and more capable design but shares many of the design characteristics of the Murasames. The ships are powered by the same unorthodox gas turbine

combination, with GE supplying two LM2500s (through its local affiliate IHI) per ship and Rolls-Royce providing two SM-1 Speys per ship. These ships are armed with a 127mm Oto Melara gun as standard, in lieu of the 76mm gun on the first nine. The Mk 48 SeaSparrow vertical launchers on DD-101/108 are replaced by the Mk 41 VLS on these ships. The CIWS consists of two Mk 15 Phalanx systems. The torpedo fit is the same as on the first Murasames, with two triple launchers of lightweight Type 89 weapons.

These ships have the same basic mission as the first group. They are designed as multimission-capable destroyers with escort functions subordinate to the AEGIS-fitted Kongo class, which have theater-wide control. Funding for the first two ships was requested (and approved) in the FY98 budget; funding for the third was finalized in FY99. Procurement then settled down to one per year. Construction was terminated at five ships.

**4,000-ton Class.** In December 1993, the JMSDF released details of a new destroyer design. Designated the 4,000-ton class (the Murasame class being referred to as the 4,400-ton class), these are similar to the Murasames but have barely half the installed power, restricting their speed to 28-30 knots. Nothing has been heard of this second class since that time, and these ships appear to have been deferred in order to allocate scarce resources for the Murasame class.



JS Shiranui (DD-120) Asahi Class Destroyer

Source: Japan Maritime Self-Defense Force

## Asahi Class

### Program Review

**Background.** In 1990, the JMSDF initiated work on a follow-on design to the Asagiri class frigates. These ships are substantially longer and more than 1,000 tons heavier than their predecessors. Major differences include the replacement of separate SeaSparrow and ASROC launchers with a Mk 41 vertical launch system and the use of the new FCS-3 phased-array fire control system. The latter equipment was designed to duplicate the performance of the point-defense systems examined under the NATO Anti-Air Warfare Systems program.

The new design was completed during 1991, and the first ship of this class was authorized in FY91 financial statements. First metal was cut in August 1993, and the ship was launched a year later. Commissioning took place in March 1996. Originally, 16 ships of this type were to be built. The second ship was approved for FY92, and two more hulls were to be ordered under the 1994 budget. In FY95, another pair was approved, as was an additional ship in FY96. In FY97, yet another pair was sanctioned, bringing the grand total of approved ships to nine.

#### *Improving the Product*

In spring 1998, Japan was in the process of designing a larger destroyer class to succeed the Murasame class as a follow-on design. The Improved Murasame class has a full-load displacement of about 5,600 tons. This new class took the place of the original Murasame design from unit number 10 onward.

JS *Ariake* (DD-109) was the last Murasame, and JS *Takanami* (DD-110) was the first Improved Murasame. The JMSDF refers to the Improved Murasame class as the Takanami class.

Funding for the first pair of these 5,600-ton general-purpose destroyers was approved in the FY98 budget. The FY99 budget included a request for funding for a third ship. Two additional ships were funded in FY00 and FY01, making a total of five. A sixth ship was included in the FY02 budget request but was apparently reprogrammed to a later class (the 19DD group). The lead ship of a different class of destroyer, the DDH, was funded in FY04. Following this – for the first time since 1954 – no destroyer was included in the FY05 annual budget.

#### *Building Plans*

As of 2004, future Japanese building plans mentioned only the Kongo class and the new DDHs. Yet, some Japanese-language press reports were already including

mention of a new general-purpose destroyer to supplement the Murasame and Takanami classes. The new design was then reportedly designated the 18DD class. At the same time, there were reports that the JMSDF might build a version of the U.S. Navy's Littoral Combat Ship.

The first of the new destroyers was funded in 2007, a year later than originally intended and causing the ship to be assigned the 19DD funding designator. At the time, it was suggested that four ships of this class would be built. The second-of-class was funded in 2008. In July 2009, the Japanese government announced that the third ship in this class was to be funded in that financial year, with the fourth and last ship of the class following in 2010. The first three ships were to be built by Mitsubishi in Nagasaki, and the fourth by the Mitsui yard in Tamano.

The lead ship of the new class was launched in October 2010 and was named *Akizuki*, honoring the lead ship of a class of large, multirole destroyers that saw extensive service in World War II. That destroyer was sunk by air attack during the Battle of Cape Engaño on October 25, 1944. The second-of-class was named *Teruzuki*, honoring a destroyer sunk on December 11, 1942, during the Battle of Guadalcanal. The two remaining ships of this class, the *Suzutsuki* and the *Fuyuzuki*, were both completed in March 2014. They were named in honor of two Japanese destroyers that took part in the last mission of the battleship *Yamato* in April 1945 and subsequently survived World War II.

In 2011, the Japanese Navy released some preliminary information on another new class of destroyers, known as the Future Surface Destroyer. This marked the first real break from the basic Murasame design that has dominated Japanese destroyer thought for two decades. These ships represented a continuation of the Abukuma class frigate design tradition. By 2014, this project had evolved into the Destroyer Revolution program that envisioned the construction of a 5,400-ton light escort destroyer intended for the defense of sea lines of communication. This evolved into the 30DX Multimission Frigate class.

As construction proceeded, it quickly became apparent that the only substantive differences between the new Asahi class and its predecessors were an upgraded sensor fit and the new COGLAG power system. Accordingly, the ships are a further evolutionary extension of the Murasame class.

## Asahi Class

JS *Shiranui* (DD-120) which is the first JMSDF ship to feature a periscope-detection radar, was launched in October 2017 and began sea trials in July 2018. The first vessel of the class, JS *Asahi* (DD-119), was

commissioned in March 2018. (*Shiranui* was commissioned in 2019.) At that time, a JMSDF spokesperson said there are no plans to build more ships of this class.

## Funding

This program was funded by the Japan Maritime Self-Defense Force. The first ship of the Murasame class was authorized in the FY91 budget and the second in the FY92 budget. Subsequently, two were approved in the FY94 budget, with another two approved in FY95. This was followed by a request for an additional ship in the FY96 budget, with funding for the last two requested in the FY97 budget. The Improved Murasame (Takanami) class had been funded at a rate of one per year, with hull numbers up to DD-116 assigned. However, construction stopped at hull number 114. Hulls 115 and 116 now appear to be members of the new 19DD class. Funding for the DD-117 was allocated in 2009 and for the DD-118 in 2010. DD-119 was funded in FY13, with funding for DD-120 following in FY15.

## Contracts/Orders & Options

No recent contracts, orders, or options have been identified at this time.

## Worldwide Distribution/Inventories

**Japan** 9 Murasame class  
5 Improved Murasame (Takanami) class  
4 Later Murasame (Akizuki) class  
2 Asahi class

## Forecast Rationale

The decision to end production of the Asahi class destroyer at two ships suggests that the original Akizuki class had probably pushed the basic Murasame design as far as it could go. It is hard to avoid the impression that the Asahi class was an interim design while the new 3,900-ton frigate design was readied for production. (A report on the new 30DX frigate is available from Forecast International.)

With a total of 20 ships built over a period of 25 years, the original Murasame design and its descendants have provided the backbone of the Japanese destroyer flotillas. The way they have evolved to fill different roles and adjust to changing strategic imperatives is an excellent demonstration of the merits of a progressive rather than revolutionary approach to ship design. However, it also shows that no matter how good a basic

design may be, there are limits to how far it can be developed and recognizing that those limits have been reached is a key to proper naval planning. There comes a time when changing strategic circumstances and the technologies available to fill operational requirements combine to make a new start inevitable. The two ships of the Asahi class make that point.

Although the Japanese government now permits military export sales, these highly sophisticated and expensive destroyers will not benefit from this change. They are simply too capable for the majority of prospective customers, who will look for a less expensive solution for their requirements. With Japanese production complete and no exports likely, no future production is forecast.

This report will be archived in 2025.