



“The Wide Operating Speed Range of the C32 main engine provides flexibility to achieve full power from a fixed pitch propeller both whilst steaming and trawling.”



SKIPPERS HELM CONSOLES.



TRAWL CONTROL STATION.

New Build 'Celestial Dawn' BF 109

Macduff Shipyards Limited's latest vessel for George Hepburn will fish out of Peterhead and mainly target prawns

MACDUFF SHIPYARDS LIMITED have recently signed over their latest new build fishing vessel, 'CELESTIAL DAWN, BF 109', to owner George Hepburn and partners. This fishing vessel replaces the owners previously vessel of the same name, which was also built by the yard in 2000, and is intended to fish out of Peterhead in the North East of Scotland, targeting primarily prawns in the North Sea.

Celestial Dawn is a new design of fishing vessel, designed between the yard and local Naval Architecture & Consultancy firm **Macduff Ship Design**. The vessel is the first of three sisterships,

with the second vessel now under construction, and the third vessel due to commence construction later in the year. This series of fishing vessel will share not only the same hull form but also the same place of origin, with all three vessels being built at the yard's fabrication hall in Buckie, a significant milestone for both the yard and town.

The design of *Celestial Dawn* began in 2018 and although intended to fish in a similar way to the owner's previous vessel, the design of the new vessel was focused to both enhance crew comfort and improve fuel efficiency. During the early design phase, the yard commissioned

the **Wolfson Unit** in Southampton to run a case study of two hull forms utilising CFD technology. The first hull form was a design previously built by the yard for a similar type of fishing.

The second was a new concept model for the *Celestial Dawn* featuring increased length, a gradual bustle forward of the propeller and a unique stem where the bulbous bow was not fully submerged but rather tapered gradually into the bow's upper region. Results from the study indicated a significant reduction in hull resistance at the two test speeds of 8 and 10 knots which was verified recently during sea trials where the *Celestial*





CELESTIAL DAWN – BF 109

Length overall: 22.75 m
Length Registered: 21.70 m
Beam: 7.60 m
Depth: 4.15 m
Depart port displacement: 305 t
Fresh water capacity: 15,500 li
Oil fuel capacity: 21,000 litres
Hold capacity: 650 boxes
Speed: 10.5 knots
Crew: 8

CELESTIAL DAWN HEADS OUT FOR HER FISHING TRIALS.

Dawn recorded an average top speed of 10.5 knots..

Another significant difference between designs was the increase in beam from around 7.0 m of previous vessels in this category up to around 7.6m. The increase in beam allowed the vessel to carry less internal ballast whilst also creating more deck space which was of particular benefit within the accommodation and fish processing areas. As a result of the increased dimensions the gross tonnage of the vessel was around 10% higher than the previous *Celestial Dawn*.

With the initial design complete the construction plans were drawn up by **Macduff Ship**

Design and submitted to SFIA for plan approval with the MCA completing plan approval and certification after SFIA terminated this service. The hull of *Celestial Dawn* is built entirely from steel, apart from the wheelhouse and mast which are aluminium, and features a double chine hull form, transom stern and modern bow designed to cut cleanly through the sea with less energy leading to a reduction in fuel consumption and emissions along with increased crew comfort.

In broad terms the layout of the *Celestial Dawn* is similar to some of the other recent new builds produced by the yard.

Below deck features the cabins,



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BEST WISHES TO GEORGE HEPBURN, PARTNERS, FAMILY, & CREW WITH THEIR NEW VESSEL
CELESTIAL DAWN BF 109

SERVICES PROVIDED:
 Hydrojetting Specialists
 - Grit Blasting - Hot Zinc Spraying - High Pressure Cleaning Foam Injection
 Insulation - Fish room Refurbishment - Specialist plastic coatings - Specialist resin deck coatings - Vacuum blasting

FACILITIES/LOCATIONS
 Peterhead, Fraserburgh, Macduff - Covered shiplift for vessels up to 40m



FISH PROCESSING DECK.

engine room, fish hold and a large freshwater tank forward of the collision bulkhead. Whereas above deck is situated the aft shelter, galley/mess and side passage area, fish processing area and then forepeak where the trawl winch is situated.

A bespoke hydraulic deck machinery package was fabricated by the yard comprising of a triple barrel winch featuring a Haggblunds compact CA210 motor, two split net drums complete with two Haggblunds compact CA70 motor per drum, two bagging winches complete with Haggblunds CA70 motors, two small gear handling winches and a cod end lifting winch.

Thistle Marine of Peterhead supplied both the MFB8 landing crane and MBK13 powerblock crane, both of which featuring a slew ring base. Primary hydraulic power is provided by a single Parker hydraulic pump driven from a dedicated Mitsubishi 6D24 auxiliary engine producing 218 kW whilst secondary hydraulic power is provided by a Parker hydraulic

pump driven from a power take off fitted to the main propulsion's gearbox. A hydraulically powered bow thruster with 1.1 tonnes of thrust is also fitted, supplied by **Kort Propulsion**. The hydraulic system, designed by the yard, is cooled via a Blokland box cooler and Bowman heat exchanger.

The propulsion package features a 2.5 m fixed pitch propeller supplied by **Wartsila**, driven by a CATERPILLAR C32 main engine with 660 hp @ 1600-1800 rpm through a Masson Marine W7400 reversible gearbox with 9.077:1 reduction.

Celestial Dawn is now the ninth vessel built by the yard in recent years to feature this propulsion package which has demonstrated itself to be both robust and adaptable with the Wide Operating Speed Range of the C32 main engine providing flexibility to achieve full power from a fixed pitch propeller both whilst steaming and trawling.

Celestial Dawn also features a triple rudder system and high lift propeller nozzle provided by



THE VESSEL FEATURES A TRIPLE RUDDER SYSTEM AND HIGH LIFT PROPELLER NOZZLE PROVIDED BY WARTSILA.

Thistle Marine of Peterhead supplied both the MFB8 landing crane and MBK13 powerblock crane, both of which featuring a slew ring base.

Wartsila. Cooling systems for all engines and hydraulics onboard are served by box coolers supplied by **Blokland Non-Ferro**.

Electrical power onboard is provided by two Mitsubishi generator sets supplied by **Macduff Diesels Limited**, each with a rating of 98 kW and of sufficient size to run the vessels power independently providing complete redundancy.

The electrical systems onboard were designed and fitted by **R.D. Downie** who also fabricated the vessels switchboard and control panels for all the pumps and

motor starters. In addition to this R.D. Downie also provided the fire, bilge and gas alarm systems onboard along with the navigation light panel and assisted with the installation of the navigation equipment.

The fish processing deck features a catch handling system built by the yard and **Northeast Fabricators** and is complemented by a resin floor system fitted by **Davidsons Marine & Industrial Painters**. A separate compartment is formed within the fish processing area which house both the ice plant



TRIPLE BARREL WINCH.



GALLEY AND CREW MESS.



INSULATED FISH ROOM.



mitsubishi generator set.



room as well as an access hatch and fixed permanent stair to the hold. The fish hold refrigeration system along with ice machine was supplied and fitted by **Airo-Tech Solutions**.

The vessel was fully painted by **Davidson Marine & Industrial Painters** with International Paints products applied to a comprehensive marine spec.

The high specification navigation package was supplied and fitted onboard by **Woodsons of Aberdeen**. A Scanmar net monitoring package along with a JFC transducer was also supplied by Woodsons. ■



ENGINE ROOM.

Celestial Dawn Equipment List

Radio-Telephones

GPS/GPS Gyro

Echo-Sounder

JRC JFC180BB Black box Echosounder

Navigation

Olex 3D seabed mapping system
Sodena Easywin plotting system

Radar

JRC JMA5312-6BB radar
JRC JMA5209-4BB radar

Wind sensor

Ultrasonic wind speed and direction sensor c/w

Auto Pilot

Navitron NT921MKII

Talk-Back

Phontech 3100 5 way system talkback

CCTV

CCTV System c/w 20 x IP HD Cameras

Satellite television

1x e-SEA 60 Satellite TV system
Satellite Communications
1x eSEA 60Ka INTERNET communications system

Emergency

Jotron TRON 60GPS
EASY NAVTEX

Monitor

1x4K Video wall and control system
3x 55" Bridge Monitors
7x X24 wide screen monitors

Hull Mount Camera

Industrial Underwater Prop camera

Marine scales

VCU Catch management and weighing system

Net Monitoring System

Scanmar Twin Rig Net monitoring system c/w
Scanbas 365 Graphical display
WDR Digital receiver
2 x Hydrophone
SS4 Master door sensor with Angles
SS4 Clump sensor
SS4 Slave sensor with Angles

