

In Confidence - Not to be quoted without prior reference to the Laboratory

FRV 'Goldseeker'  
Cruise 7/82  
Report  
7 - 25 June 1982

7GR82

Objectives

To measure the hydrodynamic drag, at various speeds, of codends of different mesh sizes, lengths, solidities and hanging ratios.

General

'Goldseeker' sailed from Buckie on 7 June and entered the Caledonian Canal. On the 8th, she steamed to Fort Augustus and gear and instrumentation were prepared for use. The vessel worked at the South end of Loch Ness until noon on the 11th when she steamed to Muirton for the weekend. On the 8th, 9th and 10th and other weekdays during the cruise, 'Goldseeker' tied up at night at Fort Augustus. On the 14th June the vessel returned to the South end of Loch Ness, worked there each day and went to Muirton on the afternoon of the 18th. On the 21st, the vessel returned to the South end of Loch Ness and worked there until noon on the 24th. She then steamed to Clachnaharry to tie up for the crew's weekend break.

Procedure

The codends were towed from the same 2.5m diameter aluminium rings used in the 1981 cruise. The same measurement procedure was used and the same parameters were recorded: warp tension and declination at the ship, towing speed and combined underwater bridle tension. Measurements were made at towing speeds between 1.3 and 4.8 knots. The majority of the codends tested were constructed from twisted nylon twine of 364 m/kg.

Results

A total of 56 experimental hauls were carried out during the cruise. The trials were designed to clarify and extend the measurements made in 1981. The effect on drag of varying the projected area, the twine area and the length of the codends was investigated in 4 main series of experiments:

- 1) Length variation at constant projected area (at 2 different projected areas).
- 2) Length variation at constant twine area.
- 3) Projected area variation at constant twine area.
- 4) Projected area variation at constant length.

A large amount of data was collected and this will take some time to process. Preliminary analysis shows however, that the most significant factor determining the drag of a codend is the projected area. Variations in length and twine area have a secondary effect.

During the first series of measurements, drag was measured with the codend closed, open and terminated by a PVC disc. There was little difference in drag with the codend open or closed, and only at short lengths did the PVC disc substantially increase the drag. The disc was used to indicate the likely effect of fish in the codend.

A small mesh cover (mesh size 16 mm) was used during two hauls. This gave a substantially increased drag compared to that of the larger mesh codends (40 mm and 50 mm mesh size). The combined drag of codend plus cover was about 10% greater than that of the cover alone.

The drag of a pair of 80 mm square and diamond mesh codends was compared. The square mesh codend was found to have 2.5 to 3 times more drag than the diamond mesh over the speed range.

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