

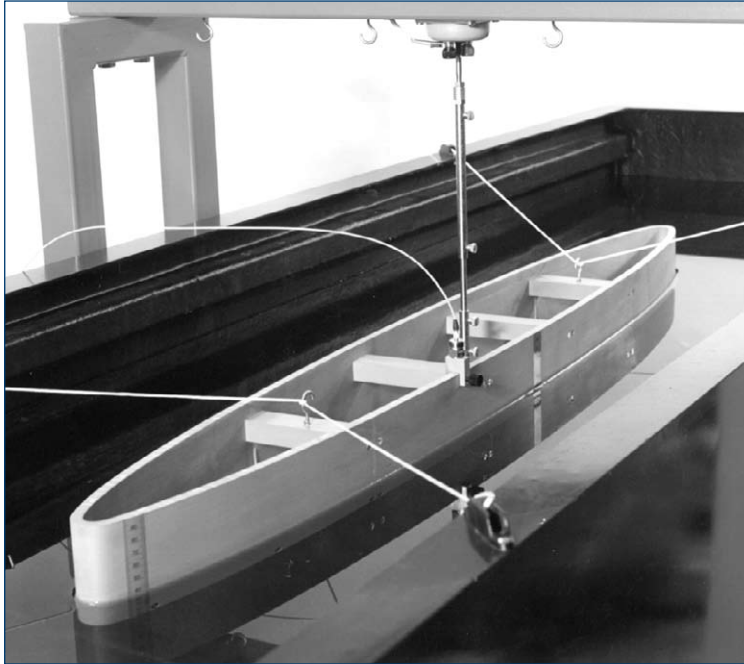


armfield

SHIPS VIBRATIONS TEST MODEL SHIPS STABILITY APPARATUS

NA4 & NA8

issue 5



The NA4-10 Ships Vibrations Test Model apparatus is designed to enable students to investigate a simple model hull form for resonance phenomena. It may be used in conjunction with the optional fresh water tank or any suitable tank which may be available. Many of the principal phenomena associated with ship resonant vibration are clearly demonstrated.

At a more advanced level the distribution of mass and second moment of area may be calculated and using a Young's Modulus value for the material of the ship shaped beam, the natural frequencies may be estimated by a simple tabular method or other means and compared with the measured value.

DEMONSTRATION CAPABILITIES

In air to:

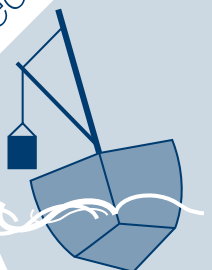
- *Investigate modal characteristics of a simple suspended ship shaped box girder*
- *Produce a resonance curve*
- *Produce the amplitude curve of a 2-node and 3-node flexural model*
- *Illustrate the influence of mass and its distribution upon natural flexural frequencies*

In water to:

- *Measure the influence of added virtual mass on natural frequency*
- *Illustrate the effect of the addition and distribution of sand ballast on the natural frequency*
- *Calculate the added virtual mass by different methods and compare with experimentally measured influence using a Schlick-type formula*

Naval Architecture

NA



ORDERING SPECIFICATION

- **Apparatus designed to enable students to investigate a simple model hull form for resonance phenomena.**
- **The apparatus comprises an experimental model hull, a rigid supporting frame, a vibrator (complete with signal generator and power amplifier) and an optional Flotation Tank (order code NA4-11).**
- **The experimental model is flat bottomed, wall-sided and open topped. It has an elliptical plan form.**
 - **Length to Beam ratio 8:1**
 - **Length to Depth ratio 12:1**
- **Used to demonstrate the principle phenomena associated with ship resonant vibration.**
- **Can be used to investigate resonance phenomena in both air and water.**

OPTIONAL ACCESSORY

NA4-11 Flotation Tank for NA4-10

SERVICES REQUIRED

Electrical supply:

NA4-10-A: 220V-240V/1PH/50HZ

NA4-10-B: 120V/1PH/60HZ

Free water surface, if NA4-11 Fresh Water Tank not ordered

OVERALL DIMENSIONS

NA4-10 only:

Height: 1.44m

Width: 2.66m

Depth: 1.17m

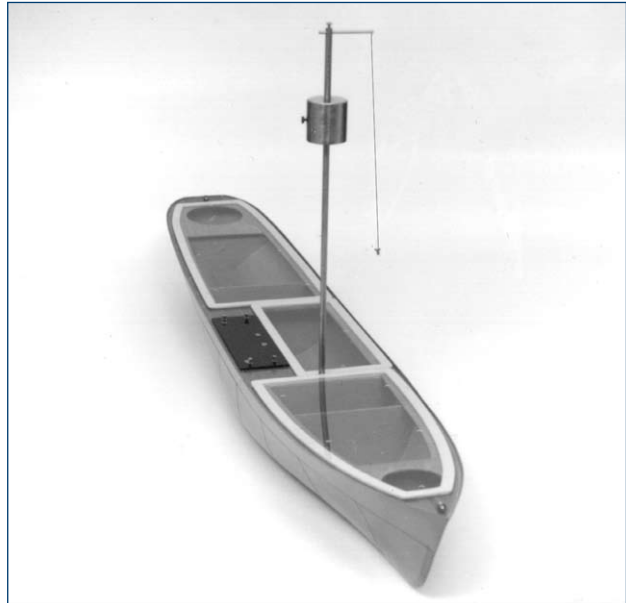
SHIPPING SPECIFICATION

NA4-10 only:

Volume: 1.0m³

Gross weight: 120Kg

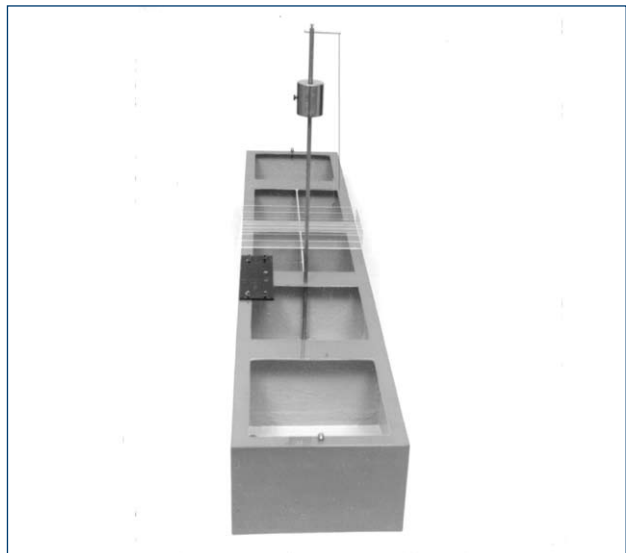
Optional Ship Models for NA8-10
see details on back page



NA8-14 Trawler Model



NA8-15 Crane Ship Model



NA8-16 Rectangular Barge Model



The NA8-10 Ships Stability Apparatus is designed for the study of ship hydrostatics and stability. A comprehensive manual provides hydrostatic stability and other data for ship models and includes a number of experiments which are useful to students. Exercises are conducted on a $1/70$ scale model of a general cargo vessel of 28000 tonnes ship mass. Rolling, righting and the effects of flooding various compartments may be studied. Optional alternative ships models are also available for study.

DEMONSTRATION CAPABILITIES

- *Inclining experiment*
- *Influence of a free surface*
- *Influence of a suspended mass, (with the optional crane ship model)*
- *Effect of flooding various compartments*
- *Rolling experiments*

ORDERING SPECIFICATION

- **Apparatus designed to enable students to study ship hydrostatics and stability.**
- **Supply includes a water tank, a floating ship model, a dynamometer and a clinometer.**
- **The model supplied is a 1/70 scale model of a 28000 tonne general cargo vessel.**
 - **It includes a number of transverse watertight bulkheads in representation positions.**
 - **The compartments are fitted with individual flooding valves.**
 - **The model is constructed of glass reinforced plastic (GRP).**
 - **Models of other ships are available as optional accessories.**
- **The dynamometer measures the righting moment of the model.**
 - **It holds the model at any angle of heel within the range, with the model either free to trim or with heeling axis kept horizontal.**
 - **It exerts no vertical force on the model.**
 - **It is floor standing, with castors and is supplied complete with counterweights.**
- **Battery powered clinometer measures the inclination of the model, over the range of 0 to 45 degrees.**

OPTIONAL ACCESSORIES

NA8-14 Trawler Model:

A 1/25 scale model of an ocean going trawler of 850 tonnes ship mass constructed in glass reinforced plastic (GRP). The hull is fitted with a number of transverse watertight bulkheads in their correct positions. Flooding valves are fitted.

NA8-15 Crane Ship Model:

A 1/50 scale model of a crane ship typical of those used in off-shore industries. The hull is ballasted and fitted with a moveable derrick supplied with a number of masses for suspension.

NA8-16 Rectangular Barge Model:

Moulded in GRP, dimensions 2200 x 400 x 250mm and fitted with internal bulkheads, supplied with the necessary ballast and trimming weights.

OVERALL DIMENSIONS

NA8-10 only:

Height: 2.17m
Width: 2.66m
Depth: 1.95m

SHIPPING SPECIFICATION

NA8-10 only:

Volume: 3.0m³
Gross weight: 550Kg

Armfield Limited

Bridge House, West Street, Ringwood,
Hampshire BH24 1DY, England

Tel: +44 (0)1425 478781 Fax: +44 (0)1425 470916

E mail: sales@armfield.co.uk

URL: <http://www.armfield.co.uk>

USA Office:

Armfield Inc.

436 West Commodore Blvd (#2)

Jackson NJ 08527

Tel: (732) 928-3332 Fax: (732) 928-3542

E mail: armfield@optonline.net

Specifications may change without notice.
iss5/5k/1203/RG.