

Product Name :
Astra Scientific Free and Forced Vortex

Product Code :
Fluid Mechanics Lab0016



Description :

Astra Scientific Free and Forced Vortex

Technical Specification :

DESCRIPTION:

The Free and Forced Vortex Apparatus for the study of the shape of 'free and forced vortices' consists of a cylindrical, transparent vessel, having two pairs of diametrically opposed inlet tubes of 9.0 mm and 12.5 mm diameter. The 12.5 mm diameter inlet tubes which are angled at 15° to the diameter, so that a swirling motion is imparted to the liquid entering the vessel, are used as entry tubes for the free vortex experiment.

A smooth outlet is centrally positioned in the base of the vessel and a set of push-in orifices of 24, 16, 12 and 8 mm diameter is supplied to reduce the outlet diameter to a suitable value. A gauge determines the profile of the vortex formed at the top of the vessel, housed on a diametrically mounted bridge piece, which measures the diameter of the vortex at various depths. This gives the co-ordinate points required to plot the vortex profile.

The forced vortex is created in the vessel described above by using as the inlet the 9 mm bore tubes which are angled at 60° to the diameter. The input water from these tubes impinges on a simple two-blade paddle, which acts as a stirrer/flow straightener. The water 'leaves' the vessel via the 12.5 mm diameter angled tubes, which are used as the 'entry' tubes for the free vortex experiment.

FEATURES:

- Experiment to plot the shape of a free vortex by measurement of the surface profile co-ordinates, and thus verify that $v r = \text{constant}$ where v is the speed and r is the radius of the vortex
- Experiment to plot the surface profiles of various forced vortices formed under different speed conditions
- Verification of the formula $h = (w^2 r^2) / 2g$ for forced vortices where h is the height of the surface of the water above the datum point; w is the vortex angular velocity and r is the vortex radius.

SPECIFICATIONS:

- Cylindrical, transparent vessel 250 mm diameter & 180 mm depth,
- Inlet tubes of 9.0 mm and 12.5 mm diameter.
- Set of push-in orifices of 24, 16, 12 and 8 mm diameter



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