

Name of organization CNR-INM National Research Council of Italy Institute of Marine Engineering		Year of information updating 2021
Year established 1927 (INSEAN) 1962 (new site in via di Vallerano) 2018 INSEAN changed to INM		Year of joining the ITTC 1933
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Type of facility Cavitation tunnel	Year constructed/upgraded 1963	
Name of facility Hydrodynamic Experimental Facility of the Italian Navy (C.E.I.M.M.)	Location (if different from the above address)	
Main characteristics (dimensions of tank/basin/test section; for simulators: full mission, part task or desk top) Closed type cavitation tunnel Type K 15 Test section, characteristics and dimensions square, rounded edges, 600 x 600 x 2600 mm ³ Contraction ratio 5.96 : 1 Maximum speed 12 m/s Pressure range 1.5 – 0.15 atm Total dimensions – length 13.9 m Total dimensions – height 9.3 m		
Drawings of facility		
<p>1 Test section 2 Dynamometer J15 3 Impeller Motor 4 Axial Flow Impeller</p>		



Detailed characteristics (carriages, wave/current/wind generators, instrumentations, etc.)

At the Hydrodynamic Experimental Facility of the Italian Navy (C.E.I.M.M.), a cavitation tunnel, Cussons Technology, model K15, is operated and managed by CNR-INM. This kind of facility, is adaptable for various purposes, mainly devoted to propeller, rudder and appendage tests, in cavitating and non-cavitating conditions. Global performance, in terms of forces and moments exerted, and local quantities, as velocity, pressure and noise, are measured with a high level of accuracy. Through the Perplex windows placed in the test section, high quality, flow visualizations allow an impressive insight into the physics of the phenomena. Propellers can be investigated in uniform, non-uniform flow with straight and inclined axis. Counter-rotating propellers (CRP) are investigated as well. Cavitation and erosion tests can be performed, reducing the facility pressure to suitable values. The maximum velocity is 12 m/s and the pressure value is adjustable from 1.5 to 0.15 Atm.

Propeller dynamometer

Type J15, Kempf & Remmers, Germany, intended for tests of propeller models.

Specifications:

Thrust	± 3000 N
Torque	± 150 Nm
Rate of rotation	up to 60 rps
Accuracy	± 0,15%

Applications (Tests performed)

The facility is equipped with high accuracy and precision measuring systems, ranging from the standard dynamometers used to collect global information to high-level, non intrusive velocity measuring systems based on laser technology (Laser Doppler Velocimetry, Particle Image Velocimetry). A partial list of the measuring systems is reported:

- Main dynamometer, J15, Kempfs&Remmers
- Auxiliary dynamometer, H40, Kempfs&Remmers
- 3-components and 5-components balance, Kempfs&Remmers
- Velocity measuring systems, LDV, PIV, Stereo-PIV and 3D-PIV.

Published description (Publications on this facility)

<http://www.inm.cnr.it/labs/ceimm-cavitation-tunnel/>