



## Turning Characteristics and Capabilities of High-Speed Monohulls

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### Abstract

The turning characteristics and capabilities of displacement vessels are well understood and documented. Standards for the maneuvering capability of displacement vessels exist. However, the same information regarding high speed craft is not so readily available. Most documents in the public domain contain information on what high speed craft shouldn't be able to do, not what they should be able to do.

This paper examines various aspects of the turning capabilities and characteristics of high speed monohull craft with regard to typical behavior and what type of maneuvering performance should be achievable. The dynamics, characteristics, and relationships of a hard chine monohull in a high speed turn are investigated and summarized.

The execution of high speed turns on hard chine monohulls can sometimes lead to unexpected responses. This paper identifies several of the typical symptoms. The severity of these events will be discussed, and typical causes are identified. Notional maneuvering criteria are also proposed.

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Download full-text PDF. Seakeeping Assessment for High-Speed Monohulls – A Comparative Study. Conference Paper (PDF Available) · May 2003 with 180 Reads. How we measure 'reads'. Assess seakeeping qualities of ships in waves. Nevertheless, the capabilities of strip theory and 3D. panel methods to simulate the dynamic responses of fast displacement hulls, cruising at speeds corresponding to Froude numbers  $F_n = 0.26$  to  $0.34$ , and semi-displacement ships, operating at a fast monohull series developed by the National Technical University of Athens (NTUA) was chosen as representative of fast light-displacement vessels operating at speeds in the  $F_n$  range  $0.34$  to  $0.68$ . High-speed catamaran ferries can exceed 40 knots (74 km/h). Catamarans range typically from 15 ft to 330 ft in length and are among the world's fastest sailing and motor craft. As a constructive characteristic they cannot achieve the high payload of monohulls with a square-like cross-section. Also the advantage of low resistance and a higher cruise speed is lost with the growing size of a catamaran, as the hullspeed increases in proportion to the length of a monohull. At the same time propulsion power needed to use a possible efficiency benefit of a catamaran grows exponentially. So there is Expected economic, continuous ahead cruising speed  $v_M$  [kn] of the ship, which provides the maximum radius of action. 8. Rated driving power. 7. Ship speed. 7.1 Speed  $v_0$ . Expected maximum ahead speed  $v_{max}$  [kn] of the ship in calm water, at the draught  $T$ , when the total available driving power is solely acting on the propulsion. The rated driving power [kW] is defined as continuous power to be delivered by the propulsion machinery for running at continuous speed  $v_0$  and with the total available power solely acting on the propulsion devices. 9. Auxiliary electrical power. The auxiliary electrical power [kVA] is defined as the continuous electrical power at continuous speed  $v_0$ , which is not directly used for propulsion of the ship, but for driving all kinds of auxi