

Program for appended hull PMM tests in deep water

KVLCC1 & KVLCC2

PMM tests shall be conducted in deep water (i.e. $h/T > 10$) with an appended model i.e. equipped with (stock) propeller and rudder. Model size shall be $L_{pp} = 7.0 \text{ m}$, i.e. a scale of **1:45.71**. The model shall be free in heave and pitch but fixed in roll (3 DOF). Approach speed is **15.5 kn** (U_0). The nominal rate of revolutions at this speed is **X rpm** (N_0). The scope of the tests shall cover at least the parameters given in Table 1 in the stated combinations.

Table 1: Scope of appended hull PMM tests in deep water, KVLCC1 & KVLCC2

	Speed U/U_0 (non-dim.)	Prop. Revs. (non-dim.)	Rudder Angle δ (deg)	Drift Angle β (deg)	Sway Vel. v' (non-dim)	Yaw Vel. r' (non-dim)
STATIC TESTS						
static rudder	1.00	1.00	$\pm 0, 10, 20, 30, 35$	0	-	-
	0.80	(*)	$\pm 0, 10, 20, 30, 35$	0	-	-
	0.60	(*)	$\pm 0, 10, 20, 30, 35$	0	-	-
	0.35	(*)	$\pm 0, 10, 20, 30, 35$	0	-	-
static drift	1.00	1.00	0	$\pm 0, 0.5, 1, 2, 4, 8$	-	-
	0.80	(*)	0	$\pm 0, 4, 8, 12$	-	-
	0.60	(*)	0	$\pm 0, 4, 8, 12, 16$	-	-
	0.35	(*)	0	$\pm 0, 4, 8, 12, 16, 20$	-	-
drift & rudder	0.80	(*)	$\pm 0, 10, 20, 30, 35$	± 4	-	-
	0.60	(*)	$\pm 0, 10, 20, 30, 35$	± 12	-	-
	0.35	(*)	$\pm 0, 10, 20, 30, 35$	± 20	-	-
DYNAMIC TESTS						
pure sway	1.00	1.00	-	-	0.04, 0.08	-
	0.60	(*)	-	-	0.12, 0.16	-
pure yaw	1.00	1.00	-	-	-	0.05, 0.10, 0.15, 0.20
	0.80	(*)	-	-	-	0.40
	0.60	(*)	-	-	-	0.70
	0.35	(*)	-	-	-	1.00
yaw & drift	0.80	(*)	-	± 4	-	0.40
	0.60	(*)	-	± 12	-	0.70
	0.35	(*)	-	± 20	-	1.00
yaw & rudder	0.80	(*)	± 20	-	-	0.40
	0.60	(*)	± 30	-	-	0.70
	0.35	(*)	± 35	-	-	1.00

SIMMAN 2008

(*) Note about propeller revolutions

To allow direct comparison of the results with the results from CFD calculations (at model scale) two conditions should be fulfilled, if possible:

- 1) The rate of revolutions should be adjusted to the model scale self-propulsion point.
- 2) At speed fractions below the nominal approach speed, corresponding to a certain point in the manoeuvre (e.g. a turning circle), the rate of revolutions shall be reduced to maintain the correct loading on the propeller(s). This reduction should follow a constant torque strategy for fixed pitch propellers or a constant power strategy for controllable pitch propellers. Initial speed tests (at zero rudder and drift angles) shall be conducted to determine these rates of revolutions.