

Descripción del barco de diseño

BARCO PORTACONTENEDORES

- Eslora: 273 m
- Manga: 32.20 m
- Calado: 11.60 m

Ship's description: con011a3

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FIGURES

A. GENERAL DATA

con011a3

1. Ship's dimensions and data

Ship's type	-	CONTAINER VESSEL
Length over all	[m]	318.20
Length between perpendiculars	[m]	300.60
Beam	[m]	42.80
Depth	[m]	24.10
Draught amid ship's	[m]	11.60
Draught forward	[m]	11.60
Draught after	[m]	11.60
Displacement	[tons]	94000
Dead weight tonnage (fully loaded)	[tons]	84000
Maximum draught (fully loaded)	[m]	14.00
Engine type	[-]	Diesel
Power	[kW]	54860
Number of revolutions	[rpm]	94
Service speed	[kn]	25.4
Number of propellers	[-]	1
Diameter of propellers	[m]	8.80
Pitch ratio	[-]	0.8
Number of rudders	[-]	1
Frontal wind area	[m2]	1498.7
Lateral wind area	[m2]	9279
Bow Thruster	[kW]	2500
Stern Thruster	[kW]	-

2. WindCoefficients

```
**      Windangles :WALFA   [deg]
**
      0      10      20      30      40      50      60      70
      80      90      100     110     120     130     140     150
      160     170     180
**
**      record              6
**
**      X-coefficient :      CXW      [-]
**
      0.6659   0.8807   1.0053   0.9666   0.7733   0.7862   0.6229   0.3695
      0.0816   -0.1504  -0.3566  -0.5972  -0.7518  -0.7089  -0.7733  -0.9366
      -0.9752  -0.8077  -0.7561
**
**      Y-coefficient :      CYW      [-]
**
      0.0000   0.1075   0.2375   0.4000   0.5650   0.6450   0.6925   0.7150
      0.7325   0.7300   0.7250   0.6750   0.8150   0.8000   0.6625   0.4725
      0.2850   0.1225   0.0000
**
**      N-coefficient :      CNW      [-]
**
      -0.0055  -0.0315  -0.0710  -0.0780  -0.0920  -0.0845  -0.0750  -0.0625
      -0.0350   0.0000   0.0640   0.0950   0.0970   0.0955   0.0800   0.0540
      0.0380   0.0230   0.0000
**
**
```

3. Wave Coefficients

The wave coefficients have been calculated with the MARIN program DBSHIP.
All computations have been made assuming a JONSWAP wave spectrum and a water depth of 20 m.

$T_p = 8s$, $T_{mean} = 5.66 s$

$T_p = 10s$, $T_{mean} = 7.07 s$

Alfa [deg]	X-Force [N]	Y-Force [N]	Moment [Nm]	X-Force [N]	Y-Force [N]	Moment [Nm]
0	6.20E+03	0.00E+00	0.00E+00	8.30E+03	0.00E+00	0.00E+00
10	6.70E+03	9.00E+03	-1.02E+05	8.70E+03	1.16E+04	-1.97E+05
20	6.80E+03	2.17E+04	-2.30E+05	9.00E+03	2.76E+04	-3.73E+05
30	6.10E+03	3.86E+04	-3.74E+05	8.70E+03	4.93E+04	-3.15E+05
40	5.30E+03	5.85E+04	-5.56E+05	9.10E+03	7.39E+04	-5.22E+05
50	4.80E+03	8.21E+04	-8.16E+05	1.14E+04	1.02E+05	-1.38E+06
60	4.60E+03	1.05E+05	-1.07E+06	1.42E+04	1.27E+05	-2.59E+06
70	3.60E+03	1.19E+05	-1.04E+06	1.06E+04	1.43E+05	-2.46E+06
80	1.80E+03	1.26E+05	-8.34E+05	4.80E+03	1.51E+05	-1.80E+06
90	-7.00E+02	1.26E+05	-4.59E+05	-2.90E+03	1.51E+05	-6.10E+05
100	-4.80E+03	1.19E+05	1.27E+05	-9.90E+03	1.43E+05	7.21E+05
110	-8.30E+03	1.08E+05	6.32E+05	-1.52E+04	1.30E+05	1.75E+06
120	-8.50E+03	9.54E+04	6.10E+05	-1.46E+04	1.15E+05	1.33E+06
130	-7.60E+03	8.07E+04	4.48E+05	-1.23E+04	9.77E+04	6.22E+05
140	-6.50E+03	6.22E+04	2.71E+05	-1.00E+04	7.58E+04	1.10E+05
150	-5.90E+03	4.23E+04	1.91E+05	-9.10E+03	5.18E+04	8.03E+04
160	-5.50E+03	2.30E+04	1.24E+05	-8.40E+03	2.86E+04	1.60E+05
170	-5.30E+03	9.70E+03	5.87E+04	-7.80E+03	1.22E+04	9.73E+04
180	-5.40E+03	0.00E+00	0.00E+00	-7.40E+03	0.00E+00	0.00E+00

$T_p = 12s$, $T_{mean} = 8.49 s$

Alfa [deg]	X-Force [N]	Y-Force [N]	Moment [Nm]
0	1.07E+04	0.00E+00	0.00E+00
10	1.11E+04	1.13E+04	-2.10E+05
20	1.13E+04	2.62E+04	-3.70E+05
30	1.04E+04	4.63E+04	-2.77E+05
40	1.05E+04	6.80E+04	-4.08E+05
50	1.30E+04	8.99E+04	-1.13E+06
60	1.64E+04	1.09E+05	-2.17E+06
70	1.17E+04	1.26E+05	-1.94E+06
80	4.80E+03	1.37E+05	-1.24E+06
90	-4.20E+03	1.40E+05	-7.97E+04
100	-1.08E+04	1.28E+05	1.15E+06
110	-1.56E+04	1.12E+05	2.06E+06
120	-1.54E+04	1.00E+05	1.52E+06
130	-1.38E+04	8.72E+04	7.27E+05
140	-1.22E+04	6.94E+04	1.60E+05
150	-1.16E+04	4.77E+04	1.10E+05
160	-1.12E+04	2.62E+04	1.86E+05
170	-1.07E+04	1.12E+04	1.10E+05
180	-1.02E+04	0.00E+00	0.00E+00

4.1 Ship information Sheet

Principal dimensions		Engine	
Length over all	318.20 m	Type:	Diesel
Beam	42.80 m	Power:	54860 kW
Draft fully laden	14.00 m	Max. revs:	94 rpm
Displacement fully laden	113448 tons	Bow Thruster:	2500 kW
Dead weight tonnage	84000 tons	Stern Thruster:	- kW

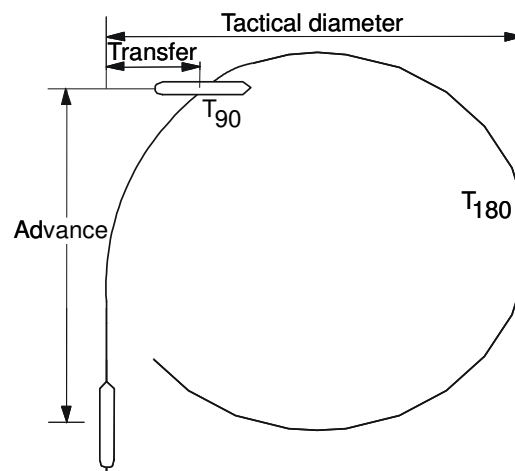
Telegraph Setting	rpm	Speed [kn]	Crash Stop		
			Distance		Stopping Time
			[mile]	[min]	[sec]
SEA FULL	94	25.4	0.52	5	15
FULL	74	20.0			
HALF	58	15.7			
SLOW	44	11.9			
DEAD SLOW	30	8.1			

Telegraph	Rudder	Advance	Transfer	T90		Tac. Diam.
		[mile]	[mile]	[min]	[sec]	[mile]
SEA FULL	P	0.38	0.15	1	18	0.31
	SB	0.38	0.16	1	21	0.32
HALF	P	0.37	0.15	2	3	0.31
	SB	0.37	0.16	2	7	0.32

WARNING:

The response of this ship may be different from that listed above if any of the following conditions upon which the manoeuvring information is based are varied:

1. Calm weather - wind 8 knots or less, calm sea.
2. No current.
3. Water depth twice vessels draft or greater.
4. Clean hull.
5. Load condition FULL LOAD



1.1 Turning circle test

Waterdepth 1 = 12.76 m

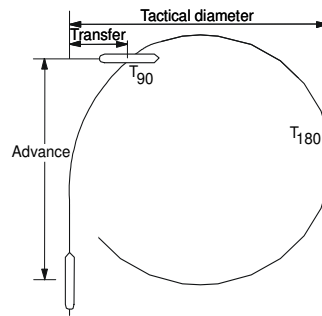
INPUT:

Initial speed	[m/s]	7.74
Number of revolutions	[1/s]	1
Rudder angle	[deg]	20

RESULTS:

		Starboard	Port
Advance	[m]	1089	-
Transfer	[m]	789	-
Tactical diameter	[m]	1615	-
Final diameter	[m]	1492	-
T90	[s]	221	-
T180	[s]	425	-
T270	[s]	629	-
T360	[s]	833	-
uf	[m/s]	5.7	5.7
vf	[m/s]	-0.38	0.38
rf	[deg/s]	0.4401	-0.4401

See also Figure 1.1



1.2 Turning circle test

Waterdepth 1 = 12.76 m

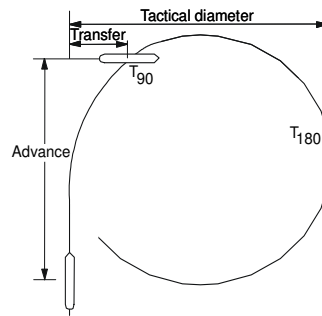
INPUT:

Initial speed	[m/s]	7.74
Number of revolutions	[1/s]	1
Rudder angle	[deg]	35

RESULTS:

		Starboard	Port
Advance	[m]	881	-
Transfer	[m]	551	-
Tactical diameter	[m]	1105	-
Final diameter	[m]	864	-
T90	[s]	193	-
T180	[s]	373	-
T270	[s]	556	-
T360	[s]	741	-
uf	[m/s]	3.57	3.57
vf	[m/s]	-0.48	0.48
rf	[deg/s]	0.4872	-0.4872

See also Figure 1.2



1.3 Zig/zag test

Waterdepth 1 = 12.76 m

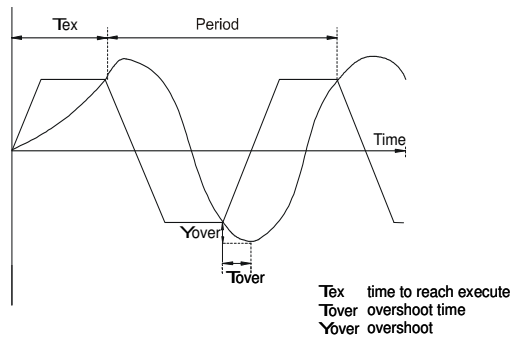
INPUT:

Initial speed	[m/s]	7.74
Number of revolutions	[1/s]	1
Rudder angle	[deg]	20/20

RESULTS:

T _{ex}	[s]	65.3
T _{overshoot}	[s]	29.0
Overshoot angle	[deg]	7.7
Period	[s]	294.7

See also Figure 1.3 and 1.4



1.4 Stopping manoeuvre

Waterdepth 1 = 12.76 m

INPUT:

Initial speed	[m/s]	7.74
Number of revolutions ahead	[1/s]	1
Number of revolutions astern	[deg]	-1

RESULTS:

Stopping time	[s]	222
Stopping distance	[m]	966
Heading after stopping	[deg]	32.8
Deviation of track	[m]	22.4

See also Figure 1.5 and 1.6

1.5 Acceleration manoeuvre

Waterdepth 1 = 12.76 m

INPUT:

Initial speed	[m/s]	0.01
Number of revolutions ahead	[1/s]	1

RESULTS:

Final speed	[m/s]	7.61
Time to reach this speed	[s]	750
Distance to reach this speed	[m]	4209

See also Figure 1.7

2.1 Turning circle test

Waterdepth 2 = 13.9 m

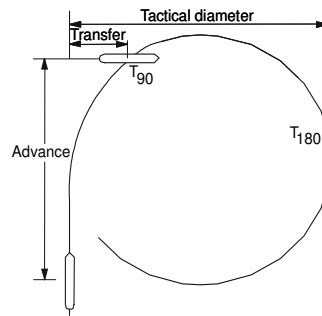
INPUT:

Initial speed	[m/s]	8.44
Number of revolutions	[1/s]	1
Rudder angle	[deg]	20

RESULTS:

		Starboard	Port
Advance	[m]	766	-
Transfer	[m]	353	-
Tactical diameter	[m]	728	-
Final diameter	[m]	477	-
T90	[s]	128	-
T180	[s]	236	-
T270	[s]	356	-
T360	[s]	480	-
uf	[m/s]	2.97	2.97
vf	[m/s]	-0.956	0.956
rf	[deg/s]	0.7243	-0.7243

See also Figure 2.1



2.2 Turning circle test

Waterdepth 2 = 13.9 m

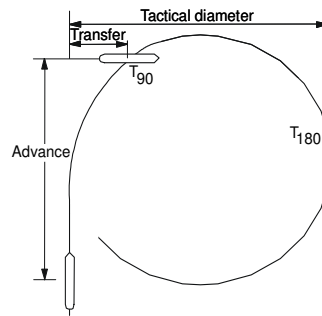
INPUT:

Initial speed	[m/s]	8.44
Number of revolutions	[1/s]	1
Rudder angle	[deg]	35

RESULTS:

		Starboard	Port
Advance	[m]	686	-
Transfer	[m]	285	-
Tactical diameter	[m]	582	-
Final diameter	[m]	306	-
T90	[s]	122	-
T180	[s]	231	-
T270	[s]	352	-
T360	[s]	476	-
uf	[m/s]	1.88	1.88
vf	[m/s]	-0.88	0.88
rf	deg/s]	0.7186	-0.7186

See also Figure 2.2



2.3 Zig/zag test

Waterdepth 2 = 13.9 m

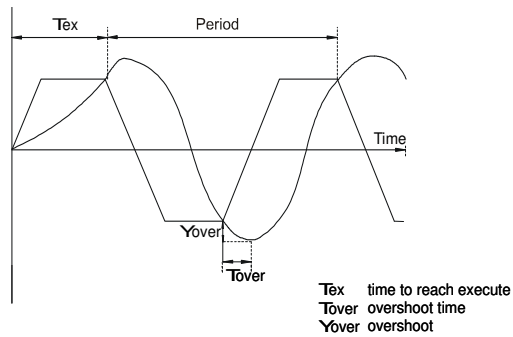
INPUT:

Initial speed	[m/s]	8.44
Number of revolutions	[1/s]	1
Rudder angle	[deg]	20/20

RESULTS:

T _{ex}	[s]	47.8
T _{overshoot}	[s]	49.7
Overshoot angle	[deg]	19.7
Period	[s]	301.9

See also Figure 2.3 and 2.4



2.4 Stopping manoeuvre

Waterdepth 2 = 13.9 m

INPUT:

Initial speed	[m/s]	8.44
Number of revolutions ahead	[1/s]	1
Number of revolutions astern	[deg]	-1

RESULTS:

Stopping time	[s]	221
Stopping distance	[m]	1124
Heading after stopping	[deg]	52.6
Deviation of track	[m]	20.5

See also Figure 2.5 and 2.6

2.5 Acceleration manoeuvre

Waterdepth 2 = 13.9 m

INPUT:

Initial speed	[m/s]	0.01
Number of revolutions ahead	[1/s]	1

RESULTS:

Final speed	[m/s]	8.26
Time to reach this speed	[s]	750
Distance to reach this speed	[m]	4526

See also Figure 2.7