

HullWiper

hullwiper.co

Component & Filter Specifications



1. Features

- Variable and increased cleaning speed dependent on biofouling and coating condition
- Does not damage the anti-fouling coating on vessel hulls
- Uses sea water as a medium for hull cleaning
- Extremely good power and stability
- Fast mobilisation / demobilisation
- Operational 24/7
- Made in Norway according to Norwegian offshore standards

2. Technical Specifications

1. Dimensions	330 cm (L) x 170 cm (W) x 85 cm (H)
2. Frame	Stainless steel, tube structure
3. Weight	1,275 kg
4. Max. depth	40m
5. Buoyancy	Solid cell structure
6. Power input	690 Vac, 3 phase, 60 Hz, 37 kW
7. Oil reservoir	40 litres
8. Hydraulic power	Flow 195 l/min 130 bar compensated with an overpressure of 0.5 bar
9. Hydraulic oil	Standard is 32 hydraulic oil but the system can use all types of hydraulic oil
10. Thrusters	8 hydraulic thrusters 3 Hp
11. Water pump	Capacity up to 635 l/min
12. Water pressure	50-450 bar 80 l/min
13. Speed	<ul style="list-style-type: none"> • Horizontal: 2.0 knot • Vertical: 0.7 knot • Turn xyz: 360 deg
14. Light	<ul style="list-style-type: none"> • 2 x 250W LED light • 1 x 36 W LED light • 3 channel light dimmer

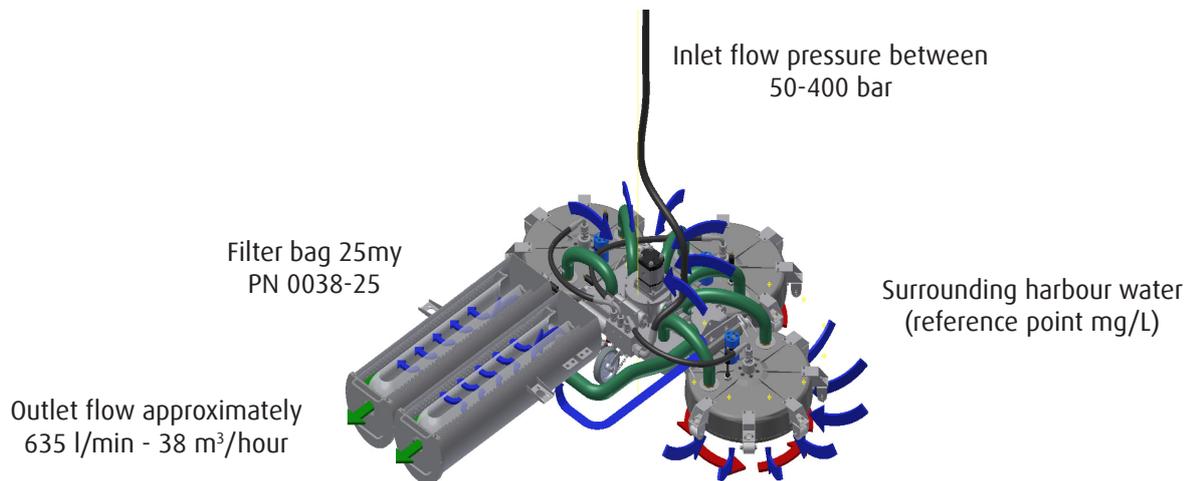
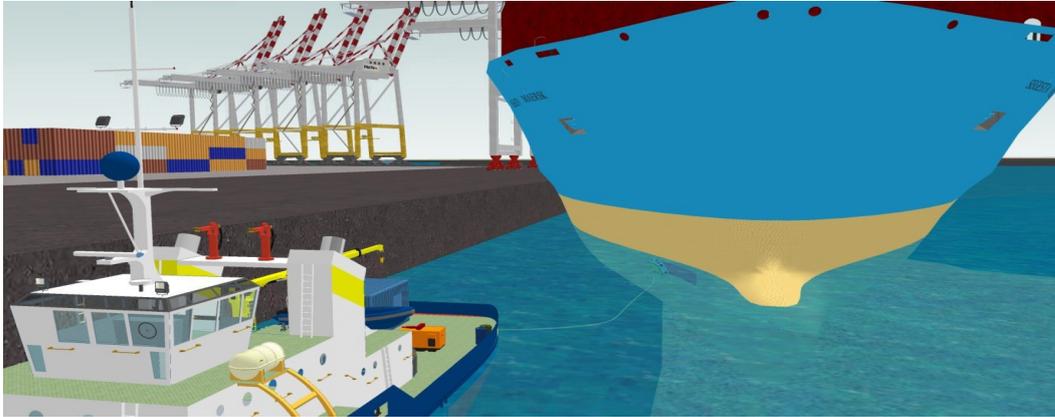
15. Sensors	<ul style="list-style-type: none"> • 4 bar depth sensor • 160 bar oil pressure sensor • Magnetic 5 level oil sensor with automatic shut down (with 25% oil level) • 600 bar high water pressure sensor
16. Camera	<ul style="list-style-type: none"> • CMOS Sensor in 1280 X 800 resolution • Removable IR-cut filter for day & night function • Built-in IR Illuminators, effective up to 15 metres • Real-time H.264, MPEG-4 and MJPEG Compression (Triple Codec) • Multiple Simultaneous Streams • Activity Adaptive Streaming for Dynamic Frame Rate Control • Tamper detection for unauthorised changes • Built-in 802.3af Compliant PoE • Built-in MicroSD/SDHC Card Slot for Onboard Storage
17. Others	<ul style="list-style-type: none"> • Auto depth • Auto heading • Digital control of thrusters • Speed sqm/ hour

3. Surface Equipment

1. Power control cabinet	<ul style="list-style-type: none"> • Power input of 220 V 50 Hz 3 phase, 12 kW • Digital instruments for, Volts, Amps and Hz • Fuses and ground fault system • Connections for umbilical
2. Surface viewing	<ul style="list-style-type: none"> • 60 cm (L) x 54 cm (W) x 64 cm (H) • PC rack with 2" x 32" monitors • Idcon overlay system and data presentations • Depth, date, time, heading, twist counter, video grabber and screen writer • Online recording
3. Umbilical	Kevlar armoured cable length 350m Outer diameter 24 mm <ul style="list-style-type: none"> • 4 x 8 AWG • 4 x 12 AWG • 8 x Single Mode Fibers • Auto altitude • Lighting • ¾" HP water hose 300 bar

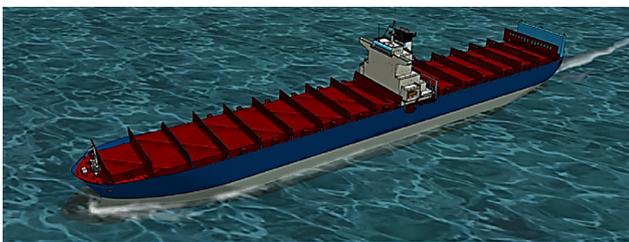
4. High pressure pump	CD100 135 l/min <ul style="list-style-type: none"> • Working pressure 230 bar 3336 Psi • Maximum pressure 350 bar – 5076 Psi • Pump triplex ceramic plunger • Remote operated start-stop • Remote operated pressure adjustment
5. Cleaning unit	<ul style="list-style-type: none"> • 3x cleaning discs, each disc 480mm diameter; cleaning width 1,460mm • 4 nozzles on each disc; 12 in total • Waste collection system • Waste suction pump 38 m³/ hour
6. Generator	Diesel driven 60Hz/400V Super Silence <ul style="list-style-type: none"> • Standby power (ESP) 144 KVA / 115kW • Prime power (PRP) 152 KVA / 122kW

4. Filter and recovery design



5. The Legislative Position Key Points Summary IMO 2000 vs IMO 2008

Leakage to the sea



According to IMO 2000 vs IMO 2008 directives, ships sailing in international waters with SPC anti-fouling are subject to have a daily maximum leakage of copper of 55µg/cm²/day. This produces a daily leakage of approximately 5.5kg of pure copper oxide on a ship with an underwater areas of 10,000 m² within the current legislation.



A ship that is berthed will have the same daily migration of copper oxide release because of the design SPC paint.

A port with 3000 ship calls per year will have an environmental impact of approximately 16 x tons of pure copper oxide released in the inner harbour.

6. Documentation

- Anti-fouling, The Legislative Position Key Points Summary IMO 2000
- Anti-fouling, The Legislative Position Key Points Summary IMO 2008
- NIVA Memo 3rd Update
- AMT, EIA Report
- AMTP0028 - Resubmission 24/02/2013
- Water Samples

Water sample EIL- 3K-26934		NYK TENJUN		Attachment 1	
Water pressure	220 bar				
Operation time	4,62 hour				
Cleaning Area	3573 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	< 250	50	2,3	3,9	
ROV (2)	< 250	50	2,3	3,91	
Filter Inlet during cleaning (3)	< 250	50	4	2,86	
Filter Outlet during cleaning (4)	< 250	50	3	1,71	
Total Cu pr cleaning	5,5 g				
Allowed Cu leakage according to IMO 2000	378,0 g				
Allowed Cu leakage according to IMO 2008	1374,6 g				

Water sample EIL- 3K-27181		HOEGH OSLO		Attachment 2	
Water pressure	220 bar				
Operation time	6,60 hour				
Cleaning Area	4268 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	< 63	<50		<5	
ROV (2)	< 34	<50		<5	
Filter Inlet during cleaning (3)	< 0	<50		<5	
Filter Outlet during cleaning (4)	< 39	<55		<5	
Total Cu pr cleaning	1,2 g				
Allowed Cu leakage according to IMO 2000	645,5 g				
Allowed Cu leakage according to IMO 2008	2347,4 g				

Water sample AR/ELC/1233-1241/11		Nysted Maersk		Attachment 3	
Water pressure	220 bar				
Operation time	5,17 hour				
Cleaning Area	3800 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	< 90	140	2,3	3,9	
ROV (2)	< 20	50	2,3	3,91	
Filter Inlet during cleaning (3)	< 20	50	4	2,86	
Filter Outlet during cleaning (4)	< 10	40	3	1,71	
Total Cu pr cleaning	0,2 g				
Allowed Cu leakage according to IMO 2000	449,9 g				
Allowed Cu leakage according to IMO 2008	1636,1 g				

Water sample AR/ELC/098-101/12		MSC Kreta		Attachment 4	
Water pressure	220 bar				
Operation time	3,50 hour				
Cleaning Area	1937 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	< 70	20		<5	
ROV (2)	< 20	70		<5	
Filter Inlet during cleaning (3)	< 0	3520		<5	
Filter Outlet during cleaning (4)	< 39	940		<5	
Total Cu pr cleaning	0,7 g				
Allowed Cu leakage according to IMO 2000	155,4 g				
Allowed Cu leakage according to IMO 2008	565,0 g				

Water sample CLR/12/1131/02		ER CAEN		Attachment 5+6	
Water pressure	220 bar				
Operation time	5,58 hour				
Cleaning Area	3570 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	< 5	5			
ROV (2)	< 5	5			
Filter Inlet during cleaning (3)	< 5	5			
Filter Outlet during cleaning (4)	< 5	5	16		
Total Cu pr cleaning	0,1 g				
Allowed Cu leakage according to IMO 2000	456,8 g				
Allowed Cu leakage according to IMO 2008	1661,0 g				

Water sample AR/ELC/344/13		Nedloyd Europa		Attachment 7	
Water pressure	220 bar				
Operation time	7,32 hour				
Cleaning Area	6435 m ²				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm ² /day	0,55 g/m ²				
Allowed Cu leakage according to IMO 2008 200µg/cm ² /day	2 g/m ²				
	Copper µg/l	Zink µg/l	Total suspended matter mg/l	Total organic Carbon mg/l	
Reference (1)	<				
ROV (2)	<				
Filter Inlet during cleaning (3)	<				
Inside Filter bags (4)	<	4020	691	49	1,71
Total Cu pr cleaning	141,2 g				
Allowed Cu leakage according to IMO 2000	1079,0 g				
Allowed Cu leakage according to IMO 2008	3923,6 g				

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