



# HULLWIPER

## General Specifications



HullWiper supports the  
UN Sustainable Development Goal SDG14



## 1. Features

- Variable cleaning speed with auto functions dependent on biofouling encountered and the coating condition.
- Significantly kinder to the vessels coating utilising variable pressure water jets.
- Seawater is the cleaning medium for a smoother surface finish extending cleaning interval requirements.
- Extremely good power and stability.
- Faster onsite mobilisation and demobilisation.
- Capable of continuous 24/7 operations.
- 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"> <li>• Horizontal: 2.0 knot</li> <li>• Vertical: 0.7 knot</li> <li>• Turn xyz: 360 deg</li> </ul>
14.	Light	<ul style="list-style-type: none"> <li>• 2 x 250W LED light</li> <li>• 1 x 36 W LED light</li> <li>• 3 x channel light dimmer</li> </ul>
15.	Sensors	<ul style="list-style-type: none"> <li>• 4 bar depth sensors</li> <li>• 160 bar oil pressure sensors</li> <li>• Magnetic 5 level oil sensor with automatic shutdown (with 25% oil level)</li> <li>• 600 bar high water pressure sensor</li> </ul>

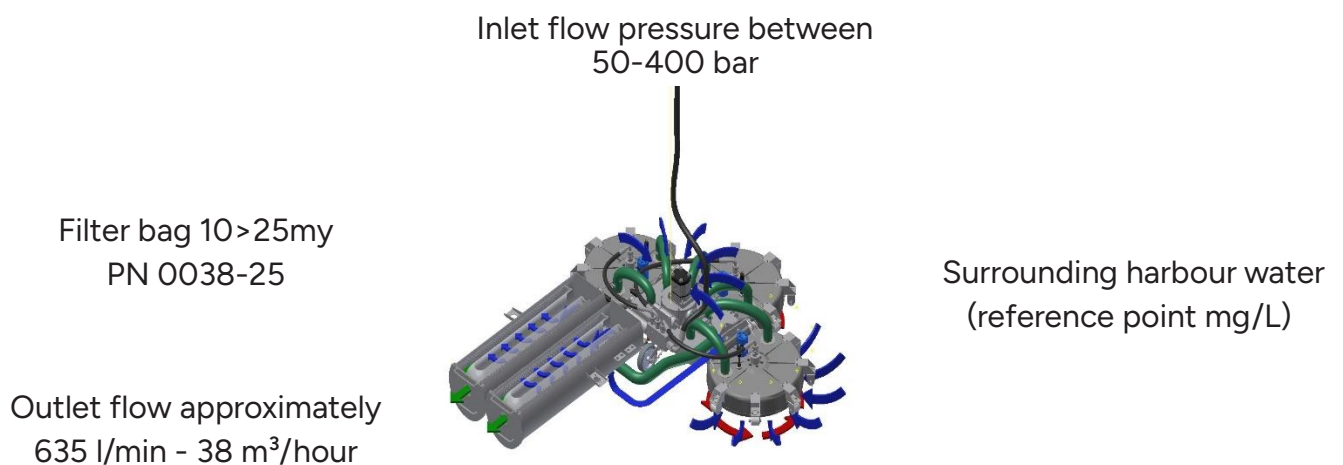
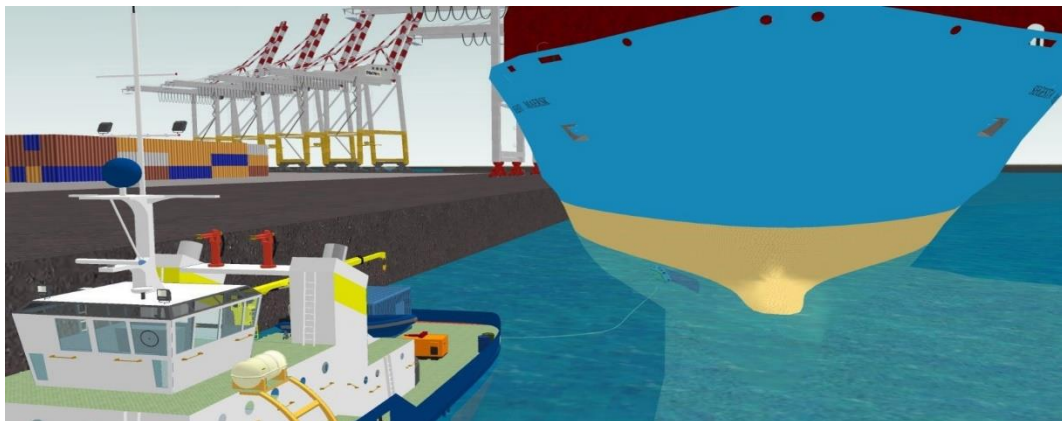
16.	Camera	<ul style="list-style-type: none"> <li>• CMOS Sensor in 1280 X 800 resolution</li> <li>• Removable IR-cut filter for day &amp; night function</li> <li>• Built-in IR Illuminators, effective up to 15 metres</li> <li>• Real-time H.264, MPEG-4 and MJPEG Compression (Triple Codec)</li> <li>• Multiple Simultaneous Streams</li> <li>• Activity Adaptive Streaming for Dynamic Frame Rate Control</li> <li>• Tamper detection for unauthorised changes</li> <li>• Built-in 802.3af Compliant PoE</li> <li>• Built-in MicroSD/SDHC card slot for onboard storage</li> </ul>
17.	Others	<ul style="list-style-type: none"> <li>• Auto depth</li> <li>• Auto heading</li> <li>• Digital control of thrusters</li> <li>• Speed sqm/ hour</li> </ul>

### 3. Surface Equipment

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

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

## 4. Filter and Recovery Design



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

According to IMO 2000 vs IMO 2008 directives, ships sailing in international waters with SPC antifouling are subject to a daily maximum leakage of copper of approximately  $55\mu\text{g}/\text{cm}^2/\text{day}$ . This produces a daily leakage of approximately 5.5kg of pure copper oxide on a ship with underwater areas of  $10,000\text{ m}^2$  within the current legislation.



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

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



## 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



# HULLWIPER GENERAL SPECIFICATIONS



Water sample EIL- 3K-26934		NYK TENJUN		Attachment 1	
Water pressure	220 bar				
Operation time	4,62 hour				
Cleaning Area	3573 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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		FR CAFN		Attachment 5+6	
Water pressure	220 bar				
Operation time	5,58 hour				
Cleaning Area	3570 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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 m2				
Flow 80l/min	4800				
Allowed Cu leakage according to IMO 2000 55µg/cm2/day	0,55 g/m2				
Allowed Cu leakage according to IMO 2008 200µg/cm2/day	2 g/m2				
	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				