No. SHOU-JPMT-2013007

Test Report

Product Name: Ballast water

Applicant: Jiujiang Precision Measuring Technology Research Institute

Test Category: Shipboard Test

Delivered Data of Report: 26/10/2013

Ballast Water Detecting Lab of Shanghai Ocean University

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6. Test results only indicate this sampling.

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Ballast Water Detecting Lab of Shanghai Ocean University

Testing report of viable organisms greater than or equal to 10 micrometres and less than 50 micrometres in minimum dimension

No. SHOU-JPMT-2013007

Sample name	ballast water	**Applicant**	Jiujiang Precision Measuring Technology Research Institute
Test category	shipboard test	**Address of the applicant**	No,83 Jiurui Avenue, Jiujiang, Jiangxi, China
No. of samples	18	**Sample ID number**	SHOU-BWDL-JPMT-019A1~A18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-18 2013-07-19	**Test date**	2013-07-18~2013-08-23
Sampling location	**Uptake:**Lvshun Harbor, Liaoning Province, ship: Shunan No.328 **Discharge:** Yantai Harbor, Shandong Province, ship: Shunan No. 328		
Test item	Viable organisms of 10~50μm in minimum dimension		
Reference standard	GB 17378.7-2007/5.3.2.3 concentration counting method		

	Sampling time phase	**Untreated S-1 at uptake**	**Control S-2 at uptake**	**Control discharge S-4**	**Treated discharge S-3**
Test result cell/mL	**Beginning**	195.00	165.00	45.00	0.15
					0.30
					0.30
	Middle	195.00	285.00	94.00	0.05
					0.15
					0.25
	End	210.00	225.00	83.00	0.30
					0.10
					0.15
	Mean value	200.00	225.00	74.00	0.19
Remarks	Shipboard test to OceanDoctor BWMS (250m^3/h)				

Main operator: Liu Liang **Checked by:** Wang Qiong **Approved by:** Xue Junzeng

Ballast Water Detecting Lab of Shanghai Ocean University

Testing report of viable organisms greater than or equal to 50 micrometres in minimum dimension

No. SHOU-JPMT-2013007

Sample name	ballast water	**Applicant**	Jiujiang Precision Measuring Technology Research Institute
Test category	shipboard test	**Address of the applicant**	No,83 Jiurui Avenue, Jiujiang, Jiangxi, China
No.of the samples	18	**Sample ID**	SHOU-BWDL-JPMT-019B1~B18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-18 2013-07-19	**Test date**	2013-07-18~2013-08-23
Sampling location	**Uptake:**Lvshun Harbor, Liaoning Province, ship: Shunan No.328 **Discharge:** Yantai Harbor, Shandong Province, ship: Shunan No. 328		
Test item	Viable organisms of ≥ 50μm in minimum dimension		
Reference standard	GB17378.7-2007/5.3.3.3 individual counting method		

	Sampling point	**Uptake S-1**	**Control uptake S-2**	**Control discharge S-4**	**Treated discharge S-3**
Test result ind/m^3	**Beginning**	3.18×10^4	2.21×10^4	8.57×10^3	3.00
					1.00
					2.00
	Middle	4.61×10^4	1.88×10^4	7.73×10^3	2.00
					2.00
					2.00
	End	4.89×10^4	1.80×10^4	7.74×10^3	0.00
					4.00
					0.00
	Mean value	4.23×10^4	1.96×10^4	8.01×10^4	1.78
Remarks	Shipboard test to OceanDoctor BWMS (250m^3/h)				

Main operator: Yuan Lin **Checked by:** Liu Liang **Approved by:** Xue Junzeng

Ballast Water Detecting Lab of Shanghai Ocean University

Test report of bacteria test

No. SHOU-JPMT-2013007

Sample name	ballast water	**Applicant**	Jiujiang Precision Measuring Technology Research Institute
Test category	shipboard test	**Address of the applicant**	No,83 Jiurui Avenue, Jiujiang, Jiangxi, China
No.of the samples	18	**Sample ID**	SHOU-BWDL-JPMT-019C1~C18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-18 2013-07-19	**Test date**	2013-07-18~2013-08-23
Sampling location	**Uptake:**Lvshun Harbor, Liaoning Province, ship: Shunan No.328 **Discharge:** Yantai Harbor, Shandong Province, ship: Shunan No. 328		
Test item	Heterotrophic bacteria, *Escherichia coli* , Vibrio cholerae, *Intestinal Enterococci*		
Reference standard (all valid except for those specified)	The Specification for Marine Monitoring—Part 7:Ecological survey for offshore pollution and biological monitoring GB17378.7-2007/10.1-plate count method Standard examination methods for drinking water—indicator microbes GB/T5750.12-2006/1.1 -plate count method The Specification for Marine Monitoring—Part 7:Ecological survey for offshore pollution and biological monitoring GB17378.7-2007/9.1-fermentation method; 9.2 -filter membrane method Standard examination methods for drinking water—indicator microbes GB/T5750.12-2006/4.1-multiple-tube fermentation method;4.2-filter membrane method Diagnosis Standard for *Vibrio cholerae* WS289-2008; Water Quality - Detection and Enumeration of Intestinal Enterococci in Surface and waste water - Membrane Filtration Method. ISO 7899-2:2000		
Test result	Refer to the followingtable for the detailed information on the test results		
Remarks	Shipboard test to OceanDoctor BWMS (250m^3/h)		

Main operator: Liu Liang Wang Qiong **Checked by:** **Approved by:**

Ballast Water Detecting Lab of Shanghai Ocean University

Test report of bacteria test

No. SHOU-JPMT-2013007

Name	Sampling phase	Uptake S-1	Control uptake S-2	Control discharge S-4	Treated discharge S-3
Heterotrophic bacteria (cfu/mL)	Beginning	6.1×10^4	6.8×10^4	7.9×10^4	223.0
					130.0
					147.0
	Middle	2.1×10^4	9.3×10^4	8.8×10^4	140.0
					130.0
					134.0
	End	7.8×10^4	1.3×10^4	7.0×10^4	139.0
					132.0
					222.0
	Mean value	5.3×10^4	5.8×10^4	7.9×10^4	155.2
Escherichia coli (cfu/100mL)	Beginning	3.2×10^5	1.7×10^5	1.4×10^5	13.0
					44.0
					18.0
	Middle	1.3×10^5	1.2×10^5	3.9×10^4	20.0
					14.0
					16.0
	End	1.9×10^5	2.9×10^4	2.5×10^4	13.0
					13.0
					10.0
	Mean value	2.1×10^5	1.1×10^5	6.8×10^4	17.9
Intestinal Enterococci (cfu/100mL)	Beginning	ND	1.0	ND	ND
					ND
					ND
	Middle	ND	3.0	ND	ND
					ND
					ND
	End	7.0	ND	1.0	ND
					ND
					ND
	Mean value	<3.0	<1.7	<1.0	ND
Vibrio cholerae (cfu/100mL)	Beginning	ND	ND	ND	ND
					ND
					ND
	Middle	ND	ND	ND	ND
					ND
					ND
	End	ND	ND	ND	ND
					ND
					ND
	Mean value	ND	ND	ND	ND

Note: ND represents not detected

Ballast Water Detecting Lab of Shanghai Ocean University

Test report of water quality test

No. SHOU-JPMT-2013007

Sample name	ballast water	**Applicant**	Jiujiang Precision Measuring Technology Research Institute
Test category	shipboard test	**Address of the applicant**	No,83 Jiurui Avenue, Jiujiang, Jiangxi, China
No. of the samples	18	**Sample ID**	SHOU-BWDL-JPMT-019D1~D18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-18 2013-07-19	**Test date**	2013-07-18~2013-08-23
Sampling location	**Uptake:**Lvshun Harbor, Liaoning Province, ship: Shunan No.328 **Discharge:** Yantai Harbor, Shandong Province, ship: Shunan No. 328		
Test item	Water temperature; salinity; TSS; POC		
Reference standard (all valid except for those specified)	The Specification for Marine Monitoring - Part 4: Seawater Analysis GB17378.4-2007/25.1: surface temperature method, 27: gravimetric method, 29.1: salinometer method, Gulf Ecosystem Observation Methods (China Environmental Science Press, 2005/4.5.14.1) - Spectrophotometer Method		
Test result	Refer to the following table for the detailed information on the test results		
Remarks	Shipboard test to OceanDoctor BWMS (250m^3/h)		

Main operator: Liu Liang Liuguifun **Checked by:** Yuan Lin. **Approved by:** Xue Junzeng

Ballast Water Detecting Lab of Shanghai Ocean University
Test report of water quality test

No. SHOU-JPMT-2013007

Sampling point	Time phase	Temperature (℃)	Salinity (PSU)	TSS (mg/L)	POC (mg/L)
Uptake S-1	Beginning	20.9	29.1	42.4	0.95
	Middle	20.8	29.1.	30.4	0.96
	End	20.7	29.1	44.6	1.03
	Mean value	20.8	29.1	39.1	0.98
Control uptake S-2	Beginning	20.8	29.2	23.6	0.69
	Middle	20.6	29.2	26.2	0.75
	End	20.5	29.2	35.4	0.97
	Mean value	20.6	29.2	28.4	0.80
Control discharge S-4	Beginning	23.8	28.9	20.8	0.67
	Middle	23.6	29.0	19.6	0.52
	End	23.5	29.0	23.0	0.55
	Mean value	23.6	29.0	21.1	0.58
Treated dischargeS-3	Beginning	24.1	29.2	19.2	0.55
		23.9	29.2	23.6	0.47
		23.8	28.9	17.4	0.50
	Middle	23.7	29.1	18.6	0.54
		23.7	29.0	14.2	0.52
		23.7	29.0	24.2	0.53
	End	23.7	29.0	21.8	0.45
		23.7	29.0	18.2	0.51
		23.7	29.0	18.4	0.50
	Mean value	23.8	29.0	19.5	0.51

Appendix 1 :list of the viable organisms of 10~50μm in minimum dimension

Bacillariophyta *Cyclotella* sp. （15） *Cyclotella striata* *Melosira* sp. （15） *Eucampia zoodiacus* *Chaetoceros curvisetus* *Cerataulina* sp. *Pinnularia* sp. Asterionellopsis glacialis *Leptocylindrus danicus* *Stauroneis smithii* *Surirella fluminensis* *Nitzschia* sp. *Coscinodiscus minor* *Coscinodiscus marginato-lineatus* *Melosira sultana* *Frybioptychus cocconeiformis* *Rhizosolenia sinensis* *Skeletonema costatum*
Pyrrophyta *Alexandrium tamarense* （5） *Alexandrium affine* *Alexandrium* sp. （5） *Prorocentrum triestinum* （55） *Prorocentrum minimum* （35） *Prorocentrum micans* *Scrippsiella trochoidea* （10） *Lingulodinium polyedrum* *Peridinium thorianum* *Dinophysis acuminate* （15） *Dinophysis favus*
Chrysophyta *Dictyocha fibula* （35） *Dictyocha speculum* var. *octonarium*
原生动物门 **Protozoa** *Ciliophora* sp. （5） *Vorticella* sp.

Note : the number in the bracket following the plankton name represents the density of organisms in influent water(unit: cell/mL)

Appendix 2 : list of organisms of ≥ 50μm in minimum dimension

Arthropoda Copepodid larva Nauplius（1010） *Limnoithona tetraspin*a *Paracalanus* sp.（1200） *Oithona* sp.（550） *Corycaeus* sp.（30） *Acartiaclausi* sp.（100） *Tisbe furcate*（10） *Labidooera enchaeta*
Rotifera *Notholca* sp.
Bacillariophyta *Coscinodiscus* sp.（220）
Chaetognatha *Sagitta* sp.
Coelenterata Actinula
Pyrrophyta Ceratium tripos（60） Pleurosigma

Note : the number in the bracket following the plankton name represents the density of organisms in influent water(unit:ind/m^3)