TESTING
CNAS L5329

No. SHOU-JPMT-2013002

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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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-2013002

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-014A1~A18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-10 2013-07-11	**Test date**	2013-07-10~2013-07-30
Sampling location	**Uptake**:Dayang mountain harbor in Zhoushan, Zhejiang province; ship:Shunan No. 328 **Discharge**:Dafeng harbor in Yan city, Jiangsu province; ship:Shun an 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**	426.50	235.00	236.50	0.25
					0.20
					0.45
	Middle	328.50	452.50	107.50	0.70
					0.10
					0.15
	End	339.00	697.50	128.50	0.15
					0.10
					0.30
	Mean value	364.67	461.67	157.50	0.27
Remarks	Shipboard test to OceanDoctor BWMS (500m^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-2013002

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-014B1~B18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-10 2013-07-11	**Test date**	2013-07-10~2013-07-30
Sampling location	**Uptake**:Dayang mountain harbor in Zhoushan, Zhejiang province; ship:Shunan No. 328 **Discharge**:Dafeng harbor in Yan city, Jiangsu province; ship:Shun an 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**	4.13×10^4	3.33×10^4	5.98×10^3	2.00
					4.00
					6.00
	Middle	3.73×10^4	2.95×10^4	5.90×10^3	1.00
					4.00
					3.00
	End	3.98×10^4	3.05×10^4	5.64×10^3	2.00
					2.00
					3.00
	Mean value	3.95×10^4	3.11×10^4	5.84×10^3	3.00
Remarks	Shipboard test to OceanDoctor BWMS (500m^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-2013002

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-014C1~C18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-10 2013-07-11	**Test date**	2013-07-10~2013-07-30
Sampling location	**Uptake**:Dayang mountain harbor in Zhoushan, Zhejiang province; ship:Shunan No. 328 **Discharge**:Dafeng harbor in Yan city, Jiangsu province; ship:Shun an 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 following table for the detailed information on the test results		
Remarks	Shipboard test to OceanDoctor BWMS (500m^3/h)		

Main operator: Liu Liang **Checked by:** Wu Hai xian **Approved by:** Xue Junzeng

Wang Qiong

Ballast Water Detecting Lab of Shanghai Ocean University
Test report of bacteria test

No. SHOU-JPMT-2013002

Name	Sampling phase	Uptake S-1	Control uptake S-2	Control discharge S-4	Treated discharge S-3
Heterotrophic bacteria (cfu/mL)	Beginning	9.0×10^5	1.2×10^6	1.5×10^4	430
					970
					190
	Middle	9.8×10^5	7.0×10^5	1.1×10^4	240
					720
					310
	End	8.0×10^5	9.7×10^5	4.4×10^6	200
					230
					270
	Mean value	8.9×10^5	9.6×10^5	1.5×10^6	395.6
Escherichia coli (cfu/100mL)	Beginning	7.2×10^5	8.2×10^5	4.5×10^4	13
					24
					17
	Middle	7.1×10^5	3.1×10^5	5.2×10^4	12
					18
					7
	End	7.9×10^5	6.2×10^6	3.7×10^4	18
					12
					13
	Mean value	7.4×10^5	2.4×10^6	4.5×10^4	14.9
Intestinal Enterococci (cfu/100mL)	Beginning	9	22	2	ND
					ND
					ND
	Middle	15	12	ND	ND
					ND
					ND
	End	38	16	ND	ND
					ND
					ND
	Mean value	20.7	16.7	<1.3	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-2013002

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-014D1~D18
Sample	seawater	**Sampling personnel**	Liu liang,Yuan lin, Jiang jianfei,Guo zhangwei
Sample delivery date	2013-07-10 2013-07-11	**Test date**	2013-07-10~2013-07-30
Sampling location	**Uptake**:Dayang mountain harbor in Zhoushan, Zhejiang province; ship:Shunan No. 328 **Discharge**:Dafeng harbor in Yan city, Jiangsu province; ship:Shun an 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 (500m^3/h)		

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

Version: A/1 Liuguo Qun

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

No. SHOU-JPMT-2013002

Sampling point	Time phase	Temperature (℃)	Salinity (PSU)	TSS (mg/L)	POC (mg/L)
Uptake S-1	Beginning	26.6	20.8	28.4	0.57
	Middle	26.6	20.7	29.6	0.65
	End	26.6	20.7	28.4	0.50
	Mean value	26.6	20.7	28.8	0.57
Control uptake S-2	Beginning	27.8	20.1	20.6	0.55
	Middle	27.3	20.3	32.0	0.65
	End	27.6	20.1	34.8	0.69
	Mean value	27.6	20.2	29.1	0.63
Control discharge S-4	Beginning	26.5	20.7	21.6	0.38
	Middle	26.5	20.7	20.8	0.30
	End	26.5	20.7	26.4	0.41
	Mean value	26.5	20.7	22.9	0.36
Treated dischargeS-3	Beginning	28.6	20.8	18.6	0.32
		28.3	20.8	16.0	0.29
		28.1	20.4	14.4	0.22
	Middle	27.9	20.4	19.8	0.31
		27.8	20.4	15.2	0.24
		27.7	20.4	11.2	0.20
	End	27.6	20.4	16.0	0.28
		27.6	20.4	19.6	0.36
		27.6	20.4	11.2	0.25
	Mean value	27.9	20.5	15.8	0.27

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

Bacillariophyta *Chaetoceros curvisetus* （51） *Skeletonema costatum* （355.5） *Chaetoceros didymus* （12.5） *Coscinodiscus marginato-lineatus* （0.5） *Cyclotella striata* （1） *Rhaphoneis belgica* （0.5） *Schroederella delicatula* （1.5） *Frybioptychus cocconeiformis* （0.5） *Ditylum brightwellii* （0.5） *Chaetoceros castracanei* *Eucampia zoodiacus* *Cerataulina bieomis* *Thalassiosira rotula* *Coscinodiscus radiatus* *Thalassiosira pacifica* *Asterionellopsis glacialis* *Coscinodiscus subtilis* *Cyclotella meneghiniana* *Nitzschia closteriumf* *Thalassiosira nordenskioldi* *Coscinodiscus bipartitus*
Chlorophyta *Scenedesmus obliquus* （2） *Scenedesmus quadricanda* *Westlla botryoides*
Chrysophyta *Dictyocha speculum var. octonarium* （1） *Dictyocha fibula*
Pyrrophyta *Gonyaulax polyedra*
Ciliophora *Euplotes* 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 Nauplius（420） *Limnoithona tetraspin*a *Paracalanus* sp. （4460） *Microsetella norvegica*（40） *Oithona* sp. *Corycaeus* sp. （80） *Labidooera enchaeta*（20） *Acartia pacifica* *Tisbe furcata*（20）
Rotifera *Notholca* sp.
Bacillariophyta *Coscinodiscus* sp. （31680）
Annelida *Sabellaria* sp.
Pyrrophyta *Ceratium tripos*（620） *Pleurosigma* sp. （2640） *Ceratium fusus*（140） *Peridinium* sp. （1140） *Ceratium furca*

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