

TECHNICAL REPORT

Project No. **A11511**

Date: **11-Nov-11**

To: **John Poston**

From: **Carol Slowik**

Analyst(s): **C. Slowik**

Copy: **J. Pier, S. Sharma, G. Myers**

Title: **TEM ASBESTOS ANALYSIS OF GUANGXI #2 POST-SHIPMENT SAMPLE**
MV Prabhu Puni Barge AEP402

Request:

One sample, representing a post-shipment sample of Guangxi #2 ore milled at Houston was submitted to the Technical Center for asbestos analysis by transmission electron microscopy (TEM). This analysis is in partial fulfillment of Imerys' Fiber Management Framework Program.

Results:

The attached TEM results were obtained using the current ASTM draft method "Standard test method for indirect analysis of talc by transmission electron microscopy for asbestos mass concentration." This method is currently being developed by ASTM committee D22.07 (Sampling and Analysis of Asbestos) and is a modification of ASTM method D 5756 "Standard test method for microvacuum sampling and indirect analysis of dust by transmission electron microscopy for asbestos mass surface loading." The modification is to adapt existing methodology to the specific analysis of talc products and/or ore samples.

A program of laboratory "blank" analysis is in place and has been used to determine the detection limit for this analysis according to ASTM method D 6620, "Standard practice for asbestos detection limit based on counts."

Table 1. Result Summary

			AMPHIBOLE			CHRYSC	
Sample Description		Sample No.	Number of Structures		Fiber Concentration	Number of Structures	
			≥5 μm	<5 μm	ppm	≥5 μm	<5 μm
Guangxi #2 composite	MV Prabhu Puni	A11511-1	0	0	BDL	0	0

BDL = Below detection limit, as defined by ASTM D 6620

OTILE
Asbestos Concentration
ppm
BDL

Table 2. Analysis parameters

Sample Description		Sample No.	Starting Weight	Aliquot Filtered	Grid Spaces Analyzed	Total Sample Analyzed
			g	mL	#	ng
Guangxi #2 composite	MV Prabhu Puni	A11511-1	0.2450	0.2	10	47.2

*Analytical Sensitivity is defined by ASTM D 5756 as the detection of one structure with minimum dimer

AMPHIBOLE		CHRYSTOTILE	
Analytical Sensitivity*	Detection Limit	Analytical Sensitivity*	Detection Limit
ppm	ppm	ppm	ppm
0.020	0.13	0.013	0.09

nsions.



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ORE ANALYSIS REPORT

Date: November 11, 2011

To: [REDACTED]

Reported by: Jennie Sulik

Copy: J. Poston, S. Wulf

Results:

The following composite ore sample, representing the MV "Prabhu Puni Barge AEP4020 Gaungxi #2 shipment to Houston was analyzed by X-ray diffraction (XRD) for the presence of amphibole minerals and quartz. The sample was also analyzed by transmission electron microscopy (TEM) for the presence of asbestiform minerals. The requested tests are in partial fulfillment of specifications required by [REDACTED].

Analytical Lab Code:	Guangxi #2 Composite MV Prabhu Puni Barge AEP4020 A11511-1
Specification:	
<i>Initial Ore Results – After Grinding (1B)</i>	
3.14 Percent Fibrous Amphibole (CTFA J4-1)	
Part A (X-ray Diffraction):	None detected
Part B (Optical Microscopy):	Not required
3.15 Percent Free Crystalline Silica Quartz (CTFA Method J6-1) (X-Ray Diffraction)	0.2% (Passes Test)
<i>TEM Results – After Grinding (1C)</i>	
3.16 Asbestos by Transmission Electron Microscope (TM 7024)	None detected



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TECHNICAL REPORT

Project No. **A11528**
Date: **7-Dec-11**

To: **John Poston**
From: **Carol Slowik**
Analyst(s): **C. Slowik**
Copy: **J. Pier, S. Sharma, G. Myers**

Title: **TEM ASBESTOS ANALYSIS OF GUANGXI #2 POST-SHIPMENT SAMPLE**
MV. Prabhu Puni, Barges ING7515, T13726, T13931

Request:

One sample, representing a post-shipment sample of Guangxi #2 ore milled at Houston was submitted to the Technical Center for asbestos analysis by transmission electron microscopy (TEM). This analysis is in partial fulfillment of Imerys' Fiber Management Framework Program.

Results:

The attached TEM results were obtained using the current ASTM draft method "Standard test method for indirect analysis of talc by transmission electron microscopy for asbestos mass concentration." This method is currently being developed by ASTM committee D22.07 (Sampling and Analysis of Asbestos) and is a modification of ASTM method D 5756 "Standard test method for microvacuum sampling and indirect analysis of dust by transmission electron microscopy for asbestos mass surface loading." The modification is to adapt existing methodology to the specific analysis of talc products and/or ore samples.

A program of laboratory "blank" analysis is in place and has been used to determine the detection limit for this analysis according to ASTM method D 6620, "Standard practice for asbestos detection limit based on counts."

A11528 TEM Analysis Results

Table 1. Result Summary

Sample Description		Sample No.	AMPHIBOLE			CHRYSTILE		
			Number of Structures		Fiber Concentration	Number of Structures		Asbestos Concentration
			≥5 μm	<5 μm	ppm	≥5 μm	<5 μm	ppm
Guangxi #2 RM composite	MV. Prabhu Puni, Barges ING7515, T13726, T13931	A11528-1	0	0	BDL	0	0	BDL

BDL = Below detection limit, as defined by ASTM D 6620

A11528 TEM Analysis Parameters

Table 2. Analysis parameters

Table 2. Analysis parameters							AMPHIBOLE		CHRYSTILE	
Sample Description		Sample No.	Starting Weight	Aliquot Filtered	Grid Spaces Analyzed	Total Sample Analyzed	Analytical Sensitivity*	Detection Limit	Analytical Sensitivity*	Detection Limit
			g	mL	#	ng	ppm	ppm	ppm	ppm
Guangxi #2 RM composite	MV. Prabhu Puni, Barges ING7515, T13726, T13931	A11528-1	0.2570	0.3	10	74.2	0.013	0.08	0.008	0.06

*Analytical Sensitivity is defined by ASTM D 5756 as the detection of one structure with minimum dimensions.