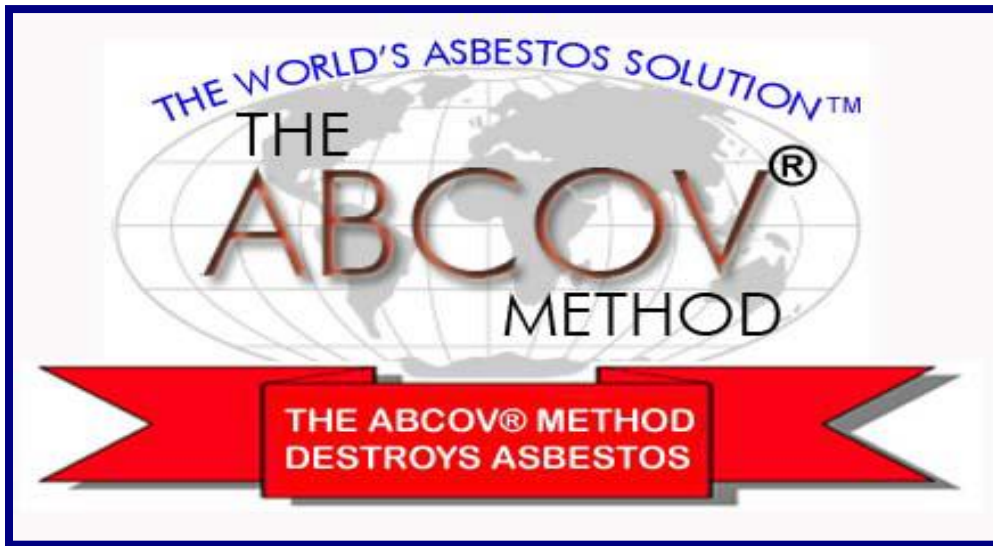
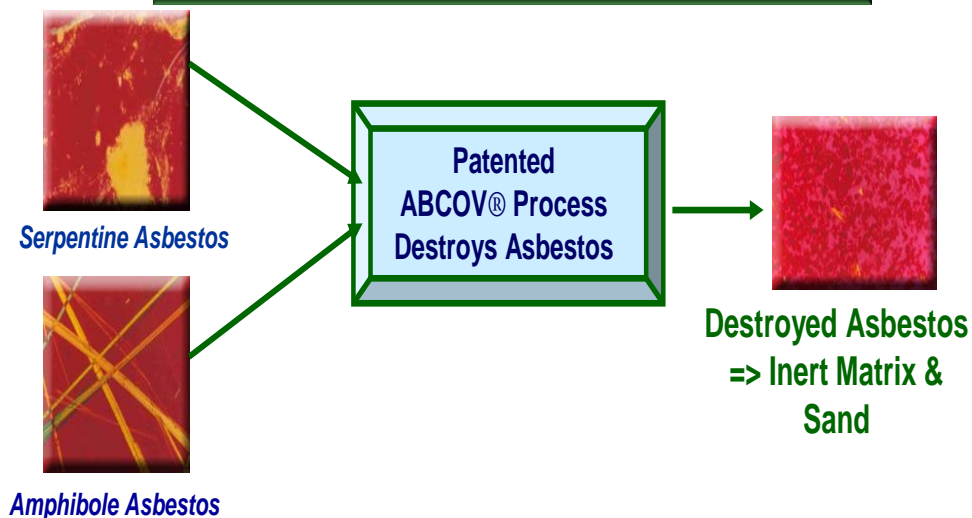


# ABCOV® COMPANIES



*“Zero Asbestos Waste to the Landfill, Zero Asbestos Future Liability!”*

**ABCOV® Conversion of Asbestos Insulation Board (AIB) to a Non-Hazardous, Non-Asbestos Material**



**Ending Asbestos Liability Brings Value to Your Company™**

**Contact: Tony Nocito**

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The ABCOV Method

"World's Asbestos Solution"

Destroys Asbestos

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## **ABCOV® Conversion of Asbestos Insulation Board (AIB) to a**

### **Non-Hazardous, Non-Asbestos Material**

#### **AIB Site Location**

**Fire Service Collage, London Road, Moreton-in-Marsh, Gloucestershire**

**GL56 0RH.**

**Site Manager: Capita**

#### **The ABCOV® Method of Asbestos Destruction:**

The ABCOV® Method of asbestos destruction is the only commercially proven and readily available, United States Environmental Protection Agency approved, non-thermal, simple to operate, physical-chemical process that eradicates all 6 forms of asbestos in asbestos containing material (ACM) from our environment.

Using the ABCOV® Method eliminates all landfill cradle-to-grave liability, minimizes waste and provides end product recycling.

The ABCOV® equipment is commercially proven and reliable; built to ABCOV®'s specification. All ABCOV® equipment is built modular and transportable to meet the client's needs.

The ABCOV® conversion system is operated by accredited asbestos workers who receive training and certification in the ABCOV® process to properly operate the conversion system process equipment. A laboratory technician is required who is efficient in Polarized Light Microscope (PLM) reading to track and record starting percentage of asbestos in the binder/matrix, type or types of asbestos in the binder/matrix and to track asbestos destruction to non-detected (ND) through process; keep records of ACM throughput; keep records of asbestos type or types and percentage of asbestos type or types imbedded in the binder/matrix, as well as identify the constituents of the binder/matrix, and keep track of and record ABCOV® chemical use.

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## **Asbestos Insulation Board Treatment:**

On 11/8/14 ABCOV® received three samples of Asbestos Insulation Board (AIB) at its ABCOV® Training, Demonstration and Testing Facility, 12 Maple Avenue, Pine Brook New Jersey, 07058 that were sent from the Capita Symonds' project, Fire Safety Collage, London Road, Moreton-in-Marsh, Gloucestershire GL56 0RH

The samples were unwrapped under a High Efficiency Particulate Air filter (HEPA) negative air hood and a small section of each of the three samples were taken to be tested by EMSL Testing Laboratory for binder/matrix content and percentage of asbestos type or types.

EMSL Laboratory results were read by PLM and reported by EMSL Laboratory Manager, Chaiyut Sae Lao.

The results of the AIB PLM readings varied in binder/matrix and percentage of asbestos: Board 1: 60% Calcium Carbonate, 20% non-fibrous and 20% Amosite; Board 2: 65% Calcium Carbonate, 24% non-fibrous and 24% Amosite; Board 3: 70% Calcium Carbonate, 14% non-fibrous and 16% Amosite.

**Please Note:** The variance in binder/matrix and percentage of asbestos type or types in the binder/matrix of the AIB, in my 30 year experience in the asbestos industry, is a common occurrence in most ACMs removed from the same area in an asbestos abatement project.

## **EMSL PLM Tests Results of The Original Three AIB Samples (see pages 3 & 4):**

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## EMSL Analytical, Inc.

1056 Stelton Road, Piscataway, NJ 08854  
Phone/Fax: (732) 981-0550 / (732) 981-0551  
<http://www.EMSL.com> [piscatawaylab@emsl.com](mailto:piscatawaylab@emsl.com)

EMSL Order: 051403654  
CustomerID: ABCS25  
CustomerPO: CC-134867  
ProjectID:

Attn: **Tony Nocito**  
**Abcov Conversion System**  
**291 Broadway**  
**Suite 1101**  
**New York, NY 10007**

Phone: (212) 571-9125  
Fax: (212) 571-9328  
Received: 08/13/14 1:50 PM  
Analysis Date: 8/14/2014  
Collected:

Project: U.K. - AIB

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1 051403654-0001	Cement Board (AIB)	Gray Fibrous Homogeneous		60% Ca Carbonate 20% Non-fibrous (other)	20% Amosite

Analyst(s)

Susan Pollack (1)

Chaiyut Sae Lao, Laboratory Manager  
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Piscataway, NJ NYS ELAP 11423, NVLAP Lab Code 101048-2, NJ NELAC 12037, PA DEP 68-03406

Initial report from 08/14/2014 11:48:36

Test Report PLM-7.28.9 Printed: 8/14/2014 11:48:36 AM

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## EMSL Analytical, Inc.

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<http://www.EMSL.com> [piscatawaylab@emsl.com](mailto:piscatawaylab@emsl.com)

EMSL Order: 051403744  
CustomerID: ABCS25  
CustomerPO: CC-140383  
ProjectID: U.K. - AIB

Attn: **Tony Nocito**  
**Abcov Conversion System**  
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**Suite 1101**  
**New York, NY 10007**

Phone: (212) 571-9125  
Fax: (212) 571-9328  
Received: 08/18/14 3:45 PM  
Analysis Date: 8/18/2014  
Collected: 8/18/2014

Project: **UK AIB**

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
UK-AIB-#2 051403744-0001	Transite Board	Gray Fibrous Homogeneous		65% Ca Carbonate 11% Non-fibrous (other)	24% Amosite
UK-AIB-#3 051403744-0002	Transite Board	Gray Fibrous Homogeneous		70% Ca Carbonate 14% Non-fibrous (other)	16% Amosite

Analyst(s)

Colin Slattery (2)

Chaiyut Sae Lao, Laboratory Manager  
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Piscataway, NJ NYS ELAP 11423, NVLAP Lab Code 101048-2, NJ NELAC 12037, PA DEP 68-03406

Initial report from 08/19/2014 08:42:56

Test Report PLM-7.28.9 Printed: 8/19/2014 8:42:56 AM

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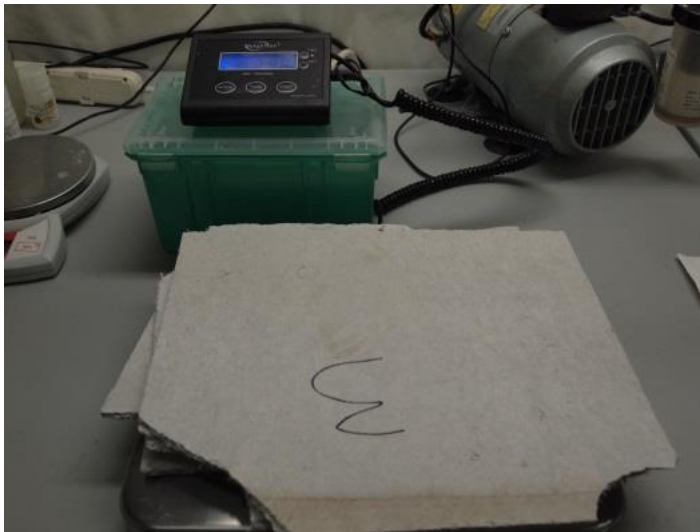
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## AIB Testing Pretreatment:

The three sample of AIB were weighed in kilograms and pounds and measured in Metric and U.S. Standard, see photos below:

Total Weight of all 3 AIBs: 1.45 kg / 3.20 lbs



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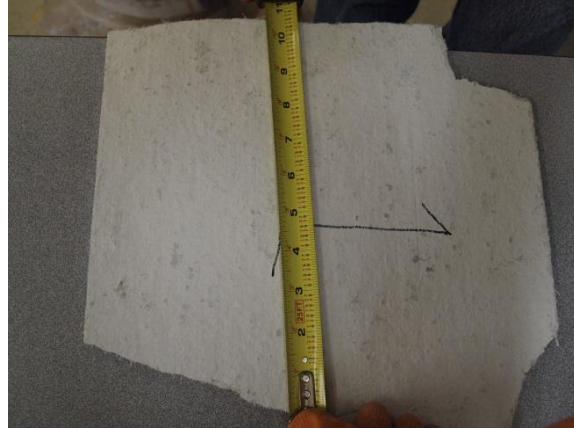
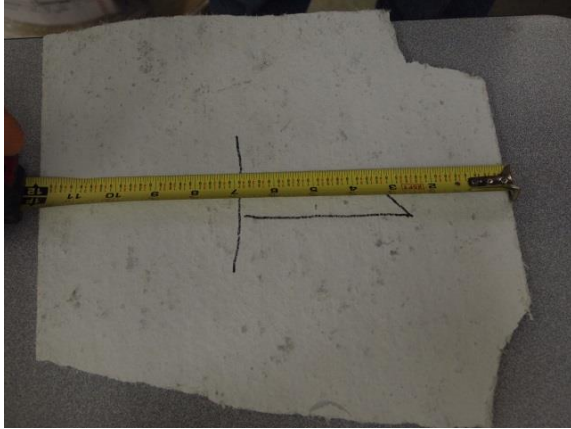
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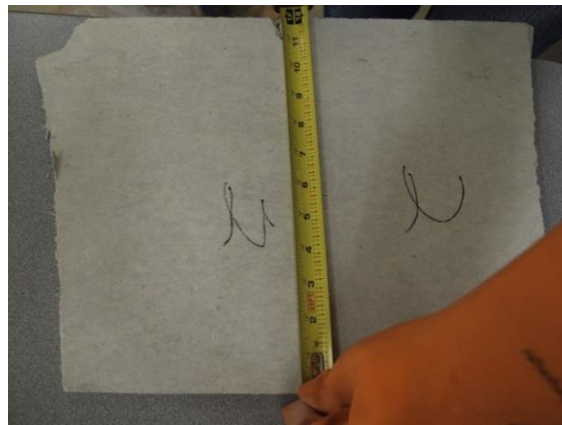
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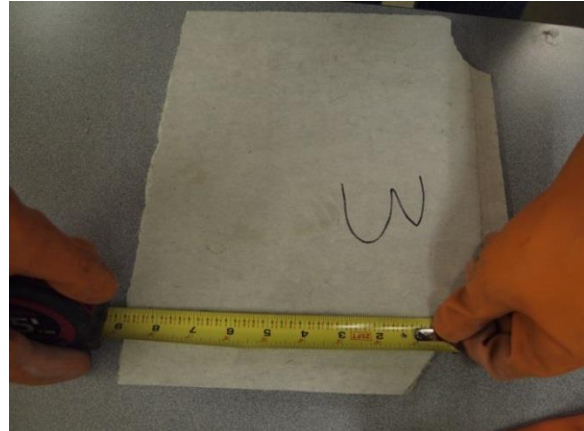
Board 1: .2667m by .3048m (10 ½ in by 1ft)



Board 2: .3683m by .3048m (14 ½ in by 1 ft.)



Board 3: .25146m by .3948m (10 ¾ in by 1 ft. / 9 in by 1 ft. [average length 9.9in])



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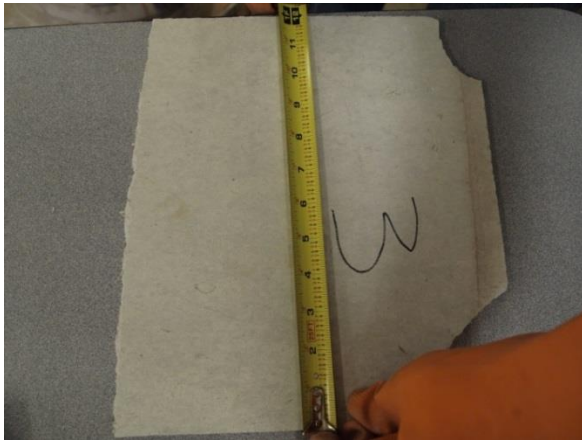
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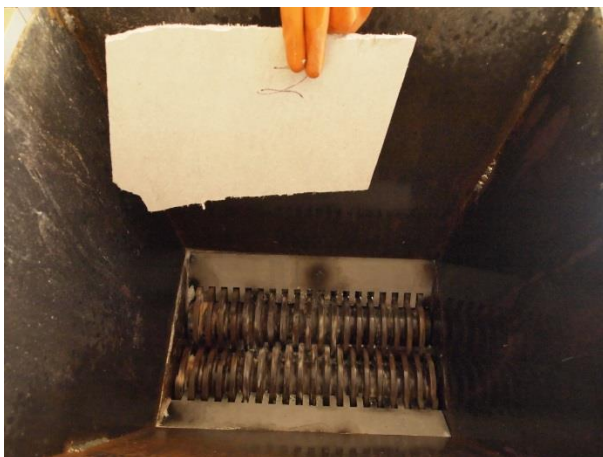
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The next step was to wet shred the AIB through ABCOV®'s Pilot facility shredder, shredding the AIB two times, then mixing the shredded AIB to provide a homogeneous sample for treatment. Note: The AIB shredding was done in the Pilot plant negative air containment.



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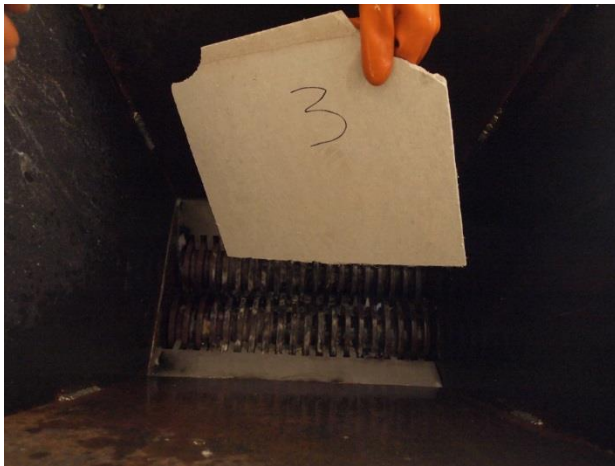
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When homogeneous mixing was completed the wet shredded AIB was put into an 18.9271 liter (5 gallon) bucket. The bucket was covered and brought into the Pilot Facility laboratory where a grab sample was taken to the EMSL laboratory for PLM reading, see photos below.



Once in the laboratory, the bucket was opened under the HEPA negative air hood and tested for pH: pH 9.

## **Asbestos Destruction AIB:**

There are 3,500+ types ACM that are made up of many different binder/matrices that contain one or more of the following asbestos minerals: Chrysotile, belonging to the Serpentine family, and/or Amosite, Crocidolite, Actinolite, Tremolite, and Anthophyllite, belonging to the Amphibole family.

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The ABCOV® process starts with a basic formula or variances of the basic formula, ABCOV®-C, but due to the many different binder/matrices and percentage of asbestos type and/or types that are found in ACMs, ABCOV®-C formula is adjusted through process to maintain best operating conditions of a pH of 3 to 3 1/2. By the end of asbestos destruction (ND) the ideal pH range should be 4 to 5, which will minimize Calcium Carbonate 325 use for the end product non-asbestos, non-hazardous sludge neutralization. Calcium Carbonate 325 is used to neutralize the converted non-asbestos, non-hazardous sludge.

Because of the high Alkalinity of the AIB, different ABCOV® chemical formulas were tested to bring down the pH9 and to understand the effects of the different ABCOV® formulas would have on the asbestos and equipment.

Please note: the ABCOV® chemicals are built to ABCOV®'s specification and singularly they carry a pH 1.

## **AIB Test Chart and EMSL Test Results (see all charts below on pages 16 through 20):**

The samples, AIB 1, 2 and 3, confirmed by the EMSL analysis of the constituents, Calcium Carbonate, Non-Fibrous material and Amosite asbestos.

The fourth sample, Grab Sample, was taken from the homogeneous mix of the shredded AIB 1, 2 and 3 and was used as the base sample for asbestos conversion. The base sample was read by PLM, and consisted of 65% of Calcium Carbonate, 15% of non-fibrous (other) and 20% Amosite, pH 9.

NOTE1: All ABCOV® formulas were added with and mixed with drops of ABCOV® A to prevent foaming.

NOTE 2: All samples were vacuum-filtered through a Buchner Funnel equipped with a 41 Watt filter and Flask. While the samples were being filtered they were neutralized with a mixture of Bicarbonate of Soda and water to freeze the sample, therefore stopping any further chemical reaction before drying under heat lamp in preparation for PLM reading, see photo 1.

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NOTE 3: All samples were dried under a heat lamp in preparation for PLM reading, see photo 2.



NOTE 4: After asbestos destruction Formula 5 was poured into a plastic container and allowed to settle overnight. This left a recyclable non-asbestos, non-hazardous sludge and reusable

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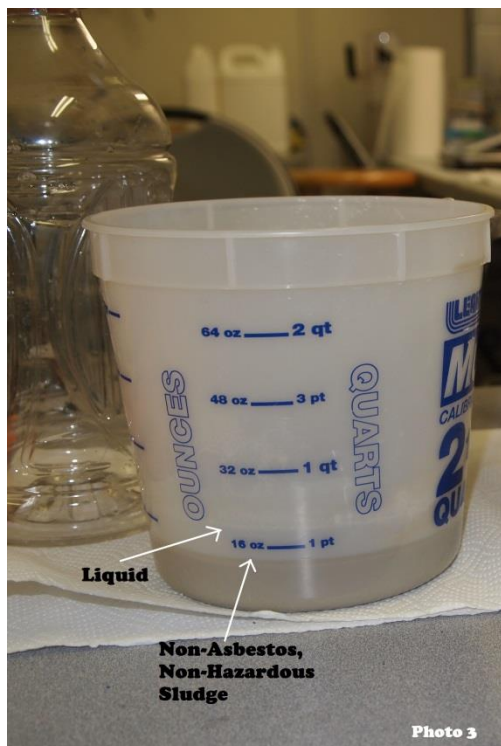
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ABCOV® -C chemical of approximately 30% to be recycled back through the process for asbestos conversion, see photo 3.



NOTE 5: The ABCOV® process works the same in a house hold Waring blender as it does in a scaled-up mixer.

NOTE 6: All samples of the first four ABCOV® formulas, R-1, R-1 and R, R and O were taken every half hour or less. The fifth formula, ABCOV® C, the samples were taken every 15 minutes.

NOTE 7: Please note: ABCOV® C is the basic starting formula. ABCOV® R, R-1 and O are added through process to regenerate ABCOV® C, although ABCOV®-O and ABCOV® R are generally used through process and ABCOV® R-1 o is used on certain ACMS, however to better understand the best regeneration and cost effective asbestos destruction of the AIB, ABCOV® - R-1, was tested singularly, ABCOV® R-1 and R in combination; ABCOV®- R was tested singularly and ABCOV®-O was tested singularly. These tests were done to adjust pH9 and to provide the most efficient asbestos destruction formula that would minimize chemical use and maximize material throughput and work cleanly and efficiently with the ABCOV® conversion equipment.

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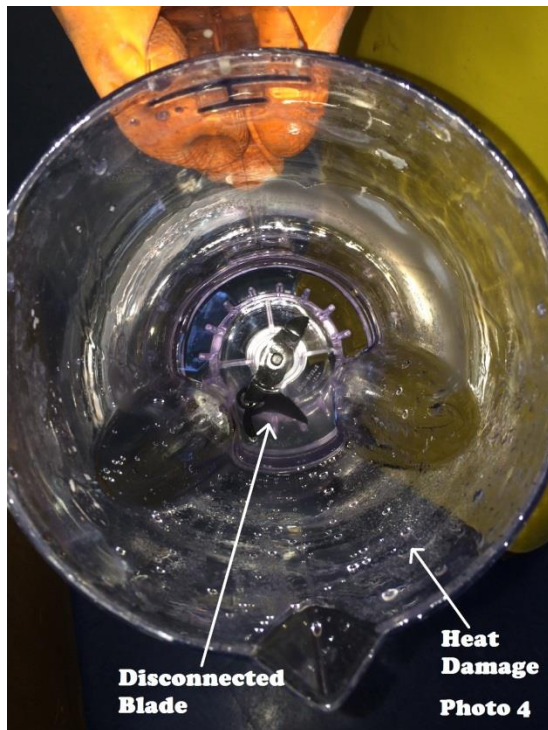
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## Test Formula 1:

500 ml of ABCOV® R-1 was added to the blender; the blender was started and 225.4 grams of grab sample AIB were added to the blender and mixed for 53 minutes until no asbestos was detected (ND) the ABCOV® R-1 formula proved to run hot and proved to be highly corrosive to the blender blades, separating the top blade from the bottom blade, photo 4. The blade separating indicates that the ABCOV® R-1 chemical could be highly corrosive to the ABCOV® conversion equipment.



## Test Formula 2:

500 ml of a mixture of ABCOV® R-1 and ABCOV® R were added to the blender; the blender was started and 225.6 grams of grab sample AIB were added to the blender and mixed for 10 minutes until no asbestos was detected (ND). The ABCOV® R and ABCOV® R-1 formula proved to run hot and to be highly corrosive to the blender blades totally separating the two blades from the shaft, see photo 5. The blades separating from the shaft indicates that the ABCOV® R and ABCOV® R-1 chemical could be highly corrosive to the ABCOV® conversion equipment.

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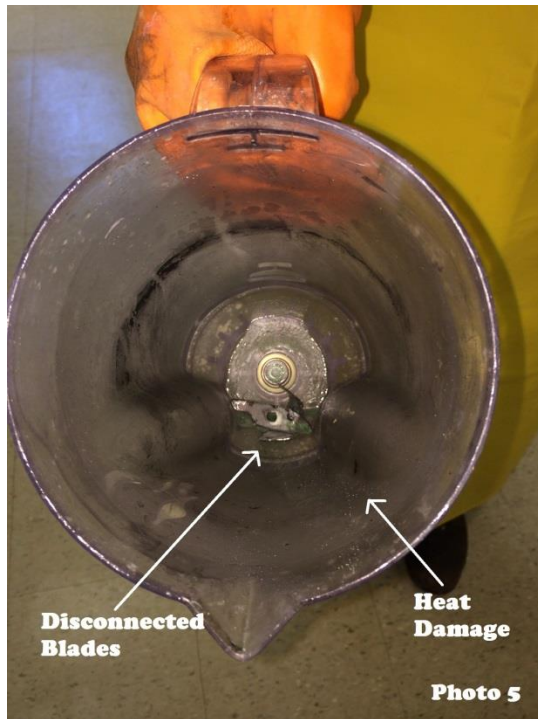
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## **Test Formula 3:**

500 ml of ABCOV® R was added to the blender; the blender was started and 225.2 grams of grab sample AIB were added to the blender and mixed for 10 minutes until no asbestos was detected (ND) the ABCOV® R formula proved to run hot and to be harsh and corrosive on the blender blades, which seized up and stopped operating. The blades seizing up indicate that the ABCOV® R chemical could be highly corrosive to the ABCOV® conversion equipment.

## **Test Formula 4:**

500 ml of ABCOV® O was added to the blender; the blender was started and 225.8 grams of grab sample AIB were added to the blender and mixed. The pH immediately rose to 5. Two minutes into the process 28.3 grams of ABCOV® O were added, which lowered the pH to 1. The blender ran for 1.5 hours. Destruction of asbestos went from 30% Amosite to a consistent 4%. The ABCOV® O formula did not totally destroy the Amosite asbestos.

## **Test Formula 5:**

500 ml of ABCOV® C was added to the blender; the blender was started and 225.4 grams of grab sample AIB were added to the blender and mixed. The pH immediately rose to 5. Three minutes into the process 56.4 grams of ABCOV® O were added, lowering the pH to the most

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efficient operating range of pH 3. The blender ran for 44 minutes when the pH increased between 4 and 5. 28.3 grams of ABCOV® O were added bringing the pH down to 2 and then holding the pH at 3 for 45 minutes until no asbestos was detected (ND). To further verify no asbestos detected (ND) the blender ran for another 15 minutes. The 15 minute time allowed after final asbestos destruction (ND) is standard ABCOV® conversion system requirement, as well as standard operating procedure. Further very little of the Calcium Carbonate was eaten up by Formula 5, needing less Calcium Carbonate to neutralize the non-asbestos, non-hazardous sludge.

The ABCOV®-C with addition of ABCOV® O through process proved to be the safest and most cost effective formula for equipment longevity, maximum material throughput and minimum ABCOV® Chemical use, see photo 6.



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## AIB Test Chart:

### ABCOV® Treatment of Asbestos Insulation Board (AIB)

#### Project: Fire Service College, U.K.

Samples	Materials	Start Time	Added	Time	pH	Non-Asbestos	Asbestos	Note
AIB # 1						60% Ca Carbonate 20% Non-Fibrous (other)	20% Amosite	
AIB # 2						65% Ca Carbonate 11% Non-Fibrous (other)	24% Amosite	
AIB # 3						70% Ca Carbonate 14% Non-Fibrous (other)	16% Amosite	
Grab Sample					9	65% Ca Carbonate 15% Non-Fibrous (other)	20% Amosite	
Test Formula 1 ABCOV® R -1	500mL of ABCOV® R-1, 225.4g of Sample, ABCOV® A	11:38 AM			1			
Sample 1				12:05 PM	1	20% Ca Carbonate 70% Non-Fibrous (other)	10% Amosite	
Sample 2				12:35 PM	1	2% Quartz 95% Non-Fibrous (other)	3% Amosite	
Sample 3				12:58 PM	1	100% Non-Fibrous (other)	ND	Blender Blades Broke Off
Test Formula 2 ABCOV® R-1 & ABCOV® R	500mL of ABCOV® R-1 & ABCOV® R, 225.6g of Sample, ABCOV® A	12:05 PM			1			
Sample 1				12:35 PM	1	2% Quartz 98% Non-Fibrous (other)	ND	
Sample 2				12:45 PM	1	100% Non-Fibrous (other)	ND	Blender Blades Broke Off
Test Formula 3 ABCOV® R	500mL of ABCOV® R, 225.2g of Sample, ABCOV® A	12:28 PM						
Sample 1				12:58 PM	4	100% Non-Fibrous (other)	ND	
				1:17 PM	4			
Sample 2				1:28 PM	4	100% Non-Fibrous (other)	ND	
Sample 3				1:58 PM	4	100% Non-Fibrous (other)	ND	
Sample 4				2:00 PM	4	100% Non-Fibrous (other)	ND	Blender Froze
Test Formula 4 ABCOV® O	500mL of ABCOV® O, 225.8g of Sample, ABCOV® A	4:16 PM			1			
Sample 1				4:46 PM	5	70% Non-Fibrous (other)	30% Amosite	
			28.3g of O	4:48 PM	1			
Sample 2				5:16 PM	1	88% Non-Fibrous (other)	12% Amosite	
Sample 3				5:46 PM	1	96% Non-Fibrous (other)	4% Amosite	
Sample 4				6:16 PM	1	96% Non-Fibrous (other)	4% Amosite	
Test Formula 5 ABCOV® C	500mL of ABCOV® C, 225.4g of Sample, ABCOV® A	4:19 PM			3			
				4:20 PM	5			
			56.4g of O	4:23 PM	3			
				4:30 PM	3			
Sample 1				4:34 PM	3-4	65% Ca Carbonate 10% Non-Fibrous (other)	25% Amosite	
				4:44 PM	3-4			
Sample 2				4:49 PM	4	55% Ca Carbonate 33% Non-Fibrous (other)	12% Amosite	
Sample 3				5:04 PM	4-5	45% Ca Carbonate 52% Non-Fibrous (other)	3% Amosite	
			28.3g of O	5:06 PM	2			
Sample 4				5:19 PM	2-3	40% Ca Carbonate 60% Non-Fibrous (other)	<1% Amosite	
Sample 5				5:34 PM	3	40% Ca Carbonate 60% Non-Fibrous (other)	<1% Amosite	
Sample 6				5:49 PM	3	40% Ca Carbonate 60% Non-Fibrous (other)	<1% Amosite	
Sample 7				6:04 PM	3	40% Ca Carbonate 60% Non-Fibrous (other)	ND	
Sample 8				6:19 PM	3-4	40% Ca Carbonate 60% Non-Fibrous (other)	ND	

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EMSL Order: 051404255  
CustomerID: ABCS25  
CustomerPO: CC-111093  
ProjectID: U.K. - AIB

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Received: 09/12/14 7:45 PM  
Analysis Date: 9/16/2014  
Collected:

Project: M.K. Fire Service College

## Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
Grab Sample 051404255-0001	AIB	Tan Fibrous Homogeneous		65% Ca Carbonate 15% Non-fibrous (other)	20% Amosite
ABCOV R-1 Sample #1 051404255-0002	AIB	Gray Fibrous Homogeneous		20% Ca Carbonate 70% Non-fibrous (other)	10% Amosite
ABCOV R-1 Sample #2 051404255-0003	AIB	Gray Non-Fibrous Homogeneous		2% Quartz 95% Non-fibrous (other)	3% Amosite
ABCOV R-1 Sample #3 051404255-0004	AIB	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
ABCOV R-1 & R Sample #1 051404255-0005	AIB	Gray Non-Fibrous Homogeneous		2% Quartz 98% Non-fibrous (other)	None Detected
ABCOV R-1 & R Sample #2 051404255-0006	AIB	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected
ABCOV R Sample #1 051404255-0007	AIB	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	None Detected

Analyst(s)

Susan Pollack (22)

Chaiyut Sae Lao, Laboratory Manager  
or other approved signatory

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ABCOV R Sample #2 051404255-0008	AIB	Gray Non-Fibrous  Homogeneous		100% Non-fibrous (other)	None Detected
ABCOV R Sample #3 051404255-0009	AIB	Gray Non-Fibrous  Homogeneous		100% Non-fibrous (other)	None Detected
ABCOV R Sample #4 051404255-0010	AIB	Gray Non-Fibrous  Homogeneous		100% Non-fibrous (other)	None Detected
ABCOV O Sample #1 051404255-0011	AIB	Gray Fibrous  Homogeneous		70% Non-fibrous (other)	30% Amosite
ABCOV O Sample #2 051404255-0012	AIB	Gray Fibrous  Homogeneous		88% Non-fibrous (other)	12% Amosite
ABCOV O Sample #3 051404255-0013	AIB	Gray Fibrous  Homogeneous		96% Non-fibrous (other)	4% Amosite
ABCOV O Sample #4 051404255-0014	AIB	Gray Non-Fibrous  Homogeneous		96% Non-fibrous (other)	4% Amosite

Analyst(s)

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ABCOV C Sample #1 051404255-0015	AIB	Gray Fibrous  Homogeneous		65% Ca Carbonate 10% Non-fibrous (other)	25% Amosite
ABCOV C Sample #2 051404255-0016	AIB	Gray Fibrous  Homogeneous		55% Ca Carbonate 33% Non-fibrous (other)	12% Amosite
ABCOV C Sample #3 051404255-0017	AIB	Gray Fibrous  Homogeneous		45% Ca Carbonate 52% Non-fibrous (other)	3% Amosite
ABCOV C Sample #4 051404255-0018	AIB	Gray Fibrous  Homogeneous		40% Ca Carbonate 60% Non-fibrous (other)	<1% Amosite
ABCOV C Sample #5 051404255-0019	AIB	Gray Non-Fibrous  Homogeneous		40% Ca Carbonate 60% Non-fibrous (other)	<1% Amosite
ABCOV C Sample #6 051404255-0020	AIB	Gray Non-Fibrous  Homogeneous		40% Ca Carbonate 60% Non-fibrous (other)	<1% Amosite
ABCOV C Sample #7 051404255-0021	AIB	Gray Non-Fibrous  Homogeneous		40% Ca Carbonate 60% Non-fibrous (other)	None Detected

Analyst(s)  
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or other approved signatory

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Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ABCOV C Sample #8	AIB	Gray		40% Ca Carbonate	None Detected
		Non-Fibrous		60% Non-fibrous (other)	
051404255-0022		Homogeneous			

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## **Qualification:**

As verified by the EMSL PLM AIB test results, each AIB contained different percentages of Calcium Carbonate, non-fibrous (other) and a different percentages of Amosite asbestos. The variation of binder/matrix and asbestos percentage holds true with most projects containing ACMs.

When converting asbestos to a non-asbestos, non-hazardous material (ND) using the ABCOV® process, ACM resonance-mixing times usually remain close to the same, i.e. 1.5 to 2.5 hours, to achieve a non-asbestos, non-hazardous material (ND), but ABCOV®-C regeneration is driven by the different combinations of binders/matrices and the percentage of asbestos type or types that make up the ACMs.

Usually, the Amphibole asbestos types take longer to convert to non-asbestos, non-hazardous material (ND) than Serpentine asbestos, but this could vary in resonance time and cost per kilogram, which is driven by a combination of binder/matrix and percentage of type or types of asbestos in the binder/matrix of the ACMs and also dictates how many kilograms of ACM can be fed into the primary mixer per 3.79 liters.

## **ABCOV® Chemical Cost Analysis of AIB Conversion to a Non-Hazardous, Asbestos Free Material:**

Please Note: ABCOV® Chemical costs are based on current market price sold in shipping containers of 1996 Kilograms, FOB.

The cost estimate below is calculated for ABCOV® Chemical requirements to treat the AIB matrix as set forth in the EMSL PLM analysis on pages 3 and 4 of this document. It is estimated that with a slow feed of the shredded AIB into the primary mixing vessel loaded with 379 liters of ABCOV®-C, treating 3.18 Kilogram of AIB in 3.79 liters of ABCOV® C equaling  $317.5 \pm$  Kilograms of AIB treated every 2 to 3 hours, including chemical and converted asbestos transfer times. This estimate is based on knowledge gained from treating the AIB, as well as experience destroying asbestos in many different asbestos matrices with the ABCOV® process.

The cost estimate takes into consideration that most asbestos abatement projects, depending the size of the project, sends approximately 10 to 30% of peripheral debris (Tyvek protective clothing, boots, gloves, plastic enclosures, bags and/or plastic wrappings, respirator and negative air machine filters, and miscellaneous asbestos contaminated debris) to the landfill.

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This peripheral debris can be made asbestos free by washing through the ABCOV® wash system and recycling for an increase in cost savings, allowing zero asbestos waste to the landfill.

The estimate also takes into consideration that 10 to 30% of the ABCOV® C chemical can be recaptured after solids settling and recycled back through process with minimum ABCOV® C formula adjustments, if necessary, leaving zero chemical discharge.

The estimated cost below to treat the AiB incorporates a minimum deduction of 20% combined peripheral debris recycling and ABCOV® chemical recapture, but does not take into the estimate the value payback of the recyclables and the elimination of asbestos liability.

## ABCOV Conversion Costs of AIB

680 Liter in the primary Mixing Vessel filled with 379 liters of ABCOV®-C

### ABCOV® Chemical Cost

	ABCOV-C	379	Liter*	£0.30	=	£113.55
Regenerate with	ABCOV-R	1	kilo*	£2.00	=	£2.27
Regenerate with	ABCOV-O	34	kilo*	£1.15	=	£39.12
						£154.94
	AIB Treated					318.00 Kilos
	Cost per kilo					£0.49
	Additional 20% savings					-£0.10
	(ABCOV® chemical reuse, Peripheral debris recycling)					
	Net Cost Per Kilo:					£0.39

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## ABCOV® Pilot Facility

**Photo 1:** A front view of the negative air containment required for the ABCOV® conversion system. In the front of photo 1 is a 50 gallon (189.271 liters) mixing vessel with mixer blade, to the right are the piggy backed negative air machines equipped with HEPA filters backed by activated charcoal filters that provides six to eight air changes an hour pulling the required make-up air through the containment and across the top of the shredder, holding vessel, special engineered cement mixer and asbestos conversion mixer. The ABCOV® process, unlike thermal asbestos destruction processes, does not require a complicated scrubber system. To the left are a ladder and extra buckets.

This photo was taken through a double Plexiglas window from outside the containment. The double Plexiglas window is a requirement for all viewing windows into the negative air containment plant operating rooms.

The mixing vessel is purposely left open for the viewer to see the ABCOV®-C and asbestos containing material fed into the mixer, as well as see how the ABCOV chemical regeneration system works, i.e. add one or two or a combination of the following: ABCOV® Chemicals: ABCOV®-A, ABCOV®-R and/or ABCOV®-O and/or ABCOV®- R1 to one of the basic ABCOV® starting formulas.



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**Photo 2:** The electrical panel powers the ABCOV® conversion system pilot facility.

The top left electrical panel provides power to the mixer, pump, neutralizing mixer, negative air machines, size reduction shredder, air compressor, peripheral debris wash system, and lighting.

Below the top left electrical panel is the main power shut-off switch, which instantly shuts down the whole ABCOV® conversion system except the negative air machines that are on a separate circuit and always should be on a separate circuit for safety purposes.

To the far right of top left electrical panel is the inverter that adjusts the speed of the mixer.

Of course top center is a clock used to time the sample taking.

Not shown is the amp meter that is hooked up to the main lines of the inverter to watch amperage usage to maximize asbestos containing material throughput. A commercial ABCOV® conversion system is equipped with a standalone NEMA 12 Type control panel that will be enclosed and equipped with inverters; amp meters connectors and a full color touch screen.



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**Photo 3:** The white communications board, to the right, used to communicate with the plant operators to let them know the type or types of asbestos and the percentage of those type or types of asbestos and the binder/matrix. The board is also used to report how much asbestos is left in the mix and to answer any questions the plant operators may have. In the left background through the Plexiglas is the non- asbestos converted solids neutralizing mixer.



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**Photo 4:** The sample pass through portal with red flag and to left is the entrance to the clean room, through the shower and into the plant.



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**Photo 5:** The entrance to the clean room, followed by the entrance through the shower and the into the ABCOV® asbestos conversion plant.

Please Note: The pilot plant facility only has one shower; where as a full commercial facility requires two showers.



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**Photo 6:** The exit from the plant into the dirty or tool room through the shower to the clean room and clean room exit.



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**Photo 7:** The chemical makeup room where the required ABCOV®-C formulas are formulated and mixed.

For the pilot plant facility we use a 30 gallon (113.562 liters) mixing vessel to makeup the starting formulas, using a small mixer.

A commercial facility would use a 500 gallon (1892.710 liters) mixing vessel with a 100 gallon (378.541 liters) day tank; both would use mixers that would sufficiently mix the ABCOV®-C required starting formulas.

The day tank is used for safety purposes to control the amount of ABCOV® -C chemical pumped into the primary mixing vessel.



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**Photo 8:** The ABCOV®-C chemical used in the pilot plant is fed into the mixer by hand from 5 gallon containers (18.9271 liters) for demonstration purposes for the viewer, i.e. potential customer.

A commercial ABCOV® conversion system pumps the ABCOV®-C chemical directly from the day tank into the primary mixer.



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**Photo 9:** The ABCOV® Chemicals A and R1 used to regenerate the ABCOV®-C chemical, when and if needed through process, the communications board used by the plant operators, also shown on the outside of the containment, paper towel and test bottle storage bin and garbage bag for paper towels after use of clean-up. To the left is the bottom of the mixer.

The garbage bag can be washed asbestos free through the wash system and the paper towels can be put through mixer or wash system to be cleaned asbestos free, leaving no asbestos waste.



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**Photo 10:** Two 5 gallon buckets (18.9271 liters each) one with ABCOV®-R and one with ABCOV®-O chemicals used to regenerate the ABCOV®-C solution, when and if needed.

Please note: The asbestos converted solids are settled out of ABCOV®-C and the ABCOV®-C recaptured for reuse, 20 to 40%, depending on the starting matrix/binder of the converted asbestos containing material, and is tested for pH, and if necessary, regenerated for reuse. If regeneration is not necessary the ABCOV®-C can be reused back in the system.

The two 2ltr containers are used to measure and weigh the ABCOV®-R and O chemicals when needed for regeneration. On top of the R pale is pH paper used for testing the pH of the ABCOV®-C formula to determine if regeneration is needed.



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**Photo 11:** A scale used to weigh ABCOV®-R and ABCOV®-O for regeneration of ABCOV®-C through process.



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**Photo 12:** A ladder and empty pales. The small bins are used to feed and capture asbestos containing material through the shredder. Once shred to desirable size the asbestos containing material is fed into the primary mixer.

Asbestos is brought into the pilot ABCOV® asbestos conversion facility in double bags. The double bags, once opened, are thoroughly wet with water from a hose to insure that the asbestos containing material is completely wetted before it is put into the bins.

Once the asbestos containing material is put into the bins it is wetted again and it is kept wet while being fed into the shredder.

A commercial shredder is closed to minimize asbestos release and the asbestos containing material is kept wet by water nozzles.



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**Photo 13:** The front of the shredder with a hose and nozzle hanging off of the hopper used to keep the asbestos containing material wet before shredding and during the asbestos containing material feed through the shredder. The hose is able to reach all aspects of the plant to clean all equipment at the end of a shift.

The water used to clean the equipment is reused back in the formulation of ABCOV®-C, therefore there is zero liquid discharge.

The shredder control panel is to the right and is equipped with a safety shut-off switch and a forward and reverse shredder operational switch.



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**Photo 14:** A sample is taken from the mixer poured into a testing cup; the testing cup is capped; washed and dried to be passed through the testing portal from the pilot plant side, which is pulling negative air back into the pilot plant so no asbestos can escape into the clean area.



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**Photo 15:** A sample testing jar; covered, washed and dried then passed through the testing portal from the pilot plant side.



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**Photo 16:** The clean side of the pass through portal where the asbestos sample is taken into the laboratory to be read by Polarized Light Microscope (PLM) to determine the matrix/binder and amount or amounts of asbestos type or types: Serpentine and/or Amphibole or a combination of both, and also determine the percentage of asbestos being destroyed through process, to verification of complete asbestos destruction, i.e. no asbestos detected (ND).



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**Photo 17:** On site Polarized Light Microscope used to read asbestos samples from starting sample and through process samples to total asbestos destruction.



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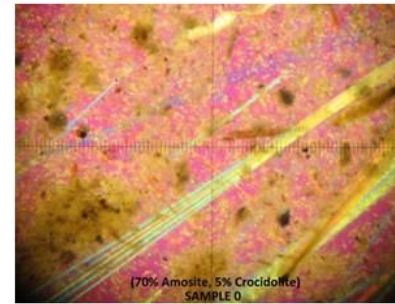
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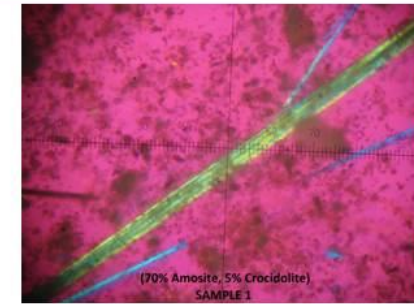
**Photos 18, 19 and 20:** Show PLM readings of the progression of asbestos destruction, by percentage being destroyed, until the asbestos is completely destroyed photos 20.

**Photos 18**

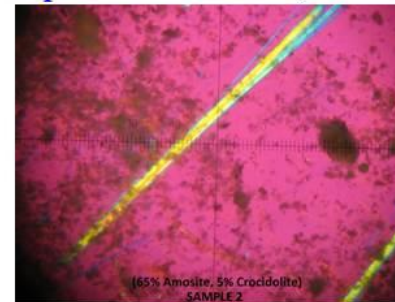
## Destruction Progression- Initial Phase



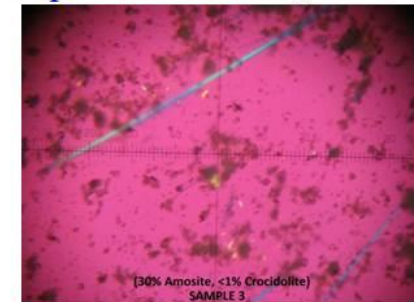
**Sample 0:** 70% Amosite, 5% Crocidolite



**Sample 1:** 70% Amosite, 5% Crocidolite



**Sample 2:** 65% Amosite, 5% Crocidolite



**Sample 3:** 30% Amosite, <1% Crocidolite

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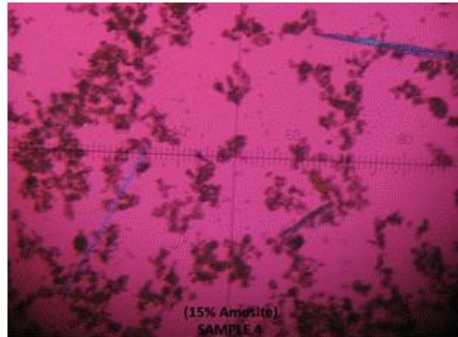
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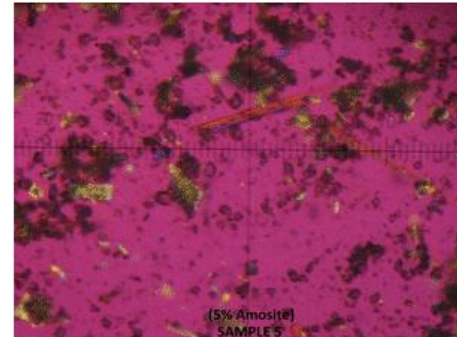
## Photo 19



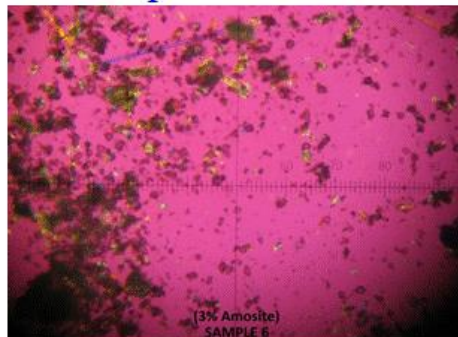
## Destruction Progression- Intermediate Phase



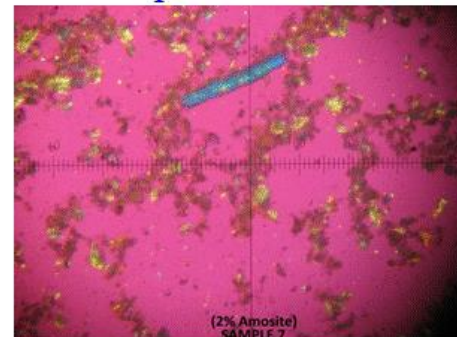
Sample 4: 15% Amosite



Sample 5: 5% Amosite



Sample 6: 3% Amosite



Sample 7: 2% Amosite

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## Photo 20

### Total Destruction of Asbestos- Process Completed

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Sample 8: No Asbestos Detected

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**Photo 21:** Is the 100 gallon (378.541 liter) settling vessel.

A commercial ABCOV® conversion system would be equipped with two 500 gallon (1892.71 liter) settling vessels.

Once the converted non-asbestos is settled the remaining ABCOV®-C is siphoned off to be reused, and regenerated, if necessary, back into the conversion mixers. This is a chemical cost savings that leaves zero discharge.

Please note: The amount of asbestos containing material treated in a shift of a commercial facility will predicate the amount and size of the setting vessel that would be required for that facility.



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**Photo 22:** Once the solids have settled in the settling vessel and the liquid is syphoned off by pump, the settled non-asbestos is then pumped into a mixing tank and neutralized for recycling. The enclosed photo is of a polyethylene mixing tank, which is used in the pilot facility, but would not be used in a commercial ABCOV® conversion system.

For a commercial ABCOV® conversion system a specially engineered 316 stainless steel mixing tank is designed and built at 3 cubic yards (2.2937m<sup>3</sup>) for the final converted non-asbestos solids neutralization process.



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