

**Improving Value Recovery of OSB from  
Post-Mountain Pine Beetle Wood**

**Martin W. Feng and Robert M. Knudson**

**Mountain Pine Beetle Initiative  
Working Paper 2005–13**

**Natural Resources Canada, Canadian Forest Service,  
Pacific Forestry Centre 506 West Burnside Road, Victoria, BC V8Z 1M5  
(250) 363-0600 • [www.pfc.cfs.nrcan.gc.ca](http://www.pfc.cfs.nrcan.gc.ca)**



Natural Resources  
Canada

Ressources naturelles  
Canada

**Canada**

**Improving Value Recovery of OSB from  
Post-Mountain Pine Beetle Wood**

Martin W. Feng and Robert M. Knudson

Mountain Pine Beetle Initiative  
Working Paper 2005–13

Forintek Canada Corp.  
2665 East Mall  
Vancouver, British Columbia, Canada  
V6T 1W5

Natural Resources Canada  
Canadian Forest Service  
Pacific Forestry Centre  
506 West Burnside Road  
Victoria, British Columbia V8Z 1M5  
Canada

Mountain Pine Beetle Initiative PO #3.25

2005

## Abstract

This project examined methods of log hydration and strander operation for OSB manufacture using mountain pine beetle (MPB)-killed wood. The results are potentially beneficial to all kinds of wood product manufacture involving log conditioning (lumber, plywood, OSB, etc.).

The grey stage MPB logs used in this study had little bark and were heavily checked and had relatively even moisture gradients (15%-25%). Their average dry density (0.447) was about the same as that of green pine, but about 23% higher than the dry density of aspen.

Water sprinkling was an effective method for reducing the production of fines and increasing the proportion of larger strands from MPB logs. The generation of fines during stranding was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. To restore physical properties of dry MPB wood, the optimal hydration appeared to be close to the fibre saturation point.

Similar to vat conditioning, water sprinkling is effective in increasing moisture content in only the outer sections of the logs. There is high potential for improvement of log conditioning to increase moisture uptake in the inner portions of MPB wood. Further development of industrially viable log hydration methods (industrial scale-up of sprinkled log storage, changes to log pond operation, etc.) is strongly recommended.

Strander knife package set-up can have a significant impact on strand size distribution. However, the differences between the outcomes of 50°, 60° and 70° counter knife angles were unexpectedly small in this study.

## Résumé

Ce projet a consisté à examiner les méthodes d'hydratation des grumes et le fonctionnement des déchiqueteuses dans le contexte de la fabrication des panneaux OSB avec du bois provenant d'arbres tués par le Dendroctone du pin ponderosa (DPP). Les résultats peuvent être utiles à toutes les installations de fabrication d'objets en bois mettant en jeu le conditionnement du bois (bois brut, contreplaqué, panneaux OSB, etc.).

Les grumes utilisées dans cette étude, tuées par le DPP et au stade gris, n'avaient que peu d'écorce, ont été soigneusement contrôlées et présentaient des gradients d'humidité relativement uniforme (15 %-25 %). Leur densité moyenne à sec (0,447) était pratiquement la même que celle des pins verts, mais environ 23 % plus élevée que la densité à sec des trembles.

L'aspersion d'eau s'est révélée une méthode efficace pour réduire la production de fines et accroître la production de copeaux plus gros à partir des grumes provenant d'arbres tués par le DPP. La production de fines lors du déchiquetage était réduite de 28 % après 10 jours d'aspersion, de 30 % après 20 jours d'aspersion et de 35 % après 30 jours d'aspersion.

L'hydratation optimale permettant de restaurer les propriétés physiques du bois sec provenant d'arbres tués par le DPP s'est révélée proche du point de saturation des fibres.

Semblable au conditionnement en cuve, l'aspersion ne permet d'accroître le taux humidité que dans les couches superficielles des grumes. Il existe donc une réelle opportunité d'amélioration du conditionnement des grumes qui viserait à augmenter le taux d'humidité en profondeur dans le bois provenant des arbres tués par le DPP. Les auteurs recommandent fortement la mise au point de méthodes d'hydratation des grumes fiables pour l'industrie (mise à l'échelle industrielle des entrepôts de grumes avec aspersion, passage aux bassins de flottage, etc.).

La disposition des couteaux de la déchiqueteuse peut avoir une incidence importante sur la distribution de la taille des copeaux. Contre toute attente, les copeaux obtenus avec des angles de contre-couteaux de 50°, 60° et 70° dans le cadre de cette étude se sont cependant révélés très peu différents.

## Table of Contents

Abstract.....	i
List of Tables .....	iv
List of Figures.....	iv
1 Introduction.....	1
2 Material and Methods .....	2
2.1 Material.....	2
2.2 Test Methods.....	2
2.3 Material Preparations and Measurement .....	3
2.3.1 Log Sample Preparations	3
2.3.2 Debarking	5
2.3.3 Water Conditioning	5
2.3.4 Stranding	6
2.3.5 Screening	8
2.3.6 Optical Analysis of Strand Geometry	9
2.3.7 Moisture and density distributions	9
3 Results and Discussion .....	10
3.1 Properties of Grey Stage MPB Wood.....	10
3.2 Strander Set-up Tests .....	12
3.3 Log Storage Tests .....	20
3.4 Vacuum-Pressure Treatment.....	28
4 Conclusions.....	30
5 Recommendations.....	31
6 Acknowledgements.....	31
7 Literature Cited .....	31
Appendix I Data from Strander Set-up Tests.....	34
Appendix II Data from Log Conditioning and Vacuum-Pressure Tests.....	53

### List of Tables

Table 1	Sample identifications for the strander set-up tests .....	4
Table 2	Sample Identifications for the log storage tests and vacuum-pressure tests .....	5
Table 3	Properties of Grey Stage MPB Wood, Green Pine and Green Aspen .....	11
Table 4	Moisture contents and moisture gradients before and after vat conditioning .....	13
Table 5	Moisture content and moisture gradient of MPB logs before and after water sprinkling and vat conditioning .....	21
Table 6	Percentages of different strand size categories from each wood log group .....	27

### List of Figures

Figure 1	End-sealed 2-foot long samples .....	3
Figure 2	Water sprinkling on 2-foot MPB log samples .....	6
Figure 3	Strander cross-section .....	7
Figure 4	Knives and counter-knife set-up inside the strander .....	7
Figure 5	Carmanah laboratory drum strander .....	8
Figure 6	Samples for moisture and density gradient determination .....	10
Figure 7	Grey stage MPB logs (standing dead for 20 years) .....	11
Figure 8	Moisture contents of 20 MPB wood logs before water vat conditioning .....	13
Figure 9	Screen fractions of different sizes from an MPB wood strand sample .....	14
Figure 10	Strand size distribution derived from 50° counter-knife angle .....	15
Figure 11	Strand size distribution derived from 60° counter-knife angle .....	15
Figure 12	Strand size distribution derived from 70° counter-knife angle .....	16
Figure 13	Strand size distribution derived from modified 70° counter-knife angle .....	16
Figure 14	Strand size distributions derived from different counter-knife angles .....	17
Figure 15	Per cent of fines and pan vs. counter-knife angle .....	17
Figure 16	Screen fractions of 1.5” through 0.75” vs. counter-knife angle .....	18
Figure 17	Average strand width vs. screen size between 50° and 60° counter-knife angles	19
Figure 18	Average strand length vs. screen size between 50° and 60° counter-knife angles	19
Figure 19	Average strand area vs. screen size between 50° and 60° counter-knife angles	20
Figure 20	MPB wood log moisture content vs. water sprinkling time .....	21

Figure 21	Moisture Gradient across MPB Log Section vs. Sprinkling Time .....	22
Figure 22	Checking in MPB logs prior to sprinkling.....	22
Figure 23	Checks in MPB logs have closed up after 10 days sprinkling.....	23
Figure 24	Strand Size distribution without water sprinkling .....	23
Figure 25	Strand size distribution of MPB wood after 10 days of water sprinkling.....	24
Figure 26	Strand size distribution of MPB wood after 20 days of water sprinkling.....	24
Figure 27	Strand size distribution of MPB wood after 30 days of water sprinkling.....	25
Figure 28	Strand size distribution of green pine .....	25
Figure 29	Strand size distribution of green aspen .....	26
Figure 30	Percentage of larger strands (1.5” to 0.75”) from each wood log group .....	27
Figure 31	Percentage of small flakes and particles from each wood log group.....	28
Figure 32	Strand Size Distribution of Vacuum-Pressure Treated MPB Logs .....	29

## 1 Introduction

Mountain pine beetle-killed lodgepole pine trees (*Pinus contorta* Dougl.) which are left standing become grey and dry approximately two years after death. The amount of grey stage beetle-killed wood currently being processed is relatively small as harvesting tries to keep up with recently attacked trees in the green or red stage. However, at some point decisions will have to be made about processing the large quantities of grey stage material and if this can be done economically. A full understanding of the processing of mountain pine beetle (MPB) wood will support decisions to capture value from the MPB wood resource, especially from material that is left standing to be harvested years after attack. The results from research will allow more efficient and economical manufacturing of products from the resource.

One possible end-use for dry lodgepole pine is to manufacture it into oriented strandboard (OSB). British Columbia (BC)-based OSB manufacturers want to know how they might best handle an expected flood of low-quality post-MPB wood in their operations. However, the technical and economic feasibility of milling the wood specifically for this purpose remains to be determined. As with lumber production, the MPB wood has a major effect on value for oriented strandboard plants. Few researchers have looked at the effects of processing beetle, fire and storm-damaged wood on the processing of OSB (Maloney, et al. 1976 and Maloney 1981). Although not specifically looking at beetle- or fire-killed timber, the most relevant published study for increasing wood recovery in OSB would be a recent Forintek/Alberta Research Council (ARC) evaluation of the effect of log moisture content (Knudson and Chen 2001). That study showed that the amount of fines nearly doubled when stranding logs dried to an average 50% moisture content as compared with stranding fresh logs. Since the average moisture content of MPB wood can go below 20%, the amount of fines would be expected to be much higher. As the amount of fines increases, the OSB property values decrease, wood recovery decreases, and the amount of resin required increases, thereby increasing product manufacturing costs. There are two BC OSB plants and a third under construction in the heavily infested area that could process beetle-killed wood. If the two currently operating OSB plants were to use beetle-killed timber for 50% of their wood requirements they could use approximately 600,000 m<sup>3</sup> of this wood per year. When the third plant comes on stream the amount could jump to 1,000,000 m<sup>3</sup>. Based on data derived in the Forintek/ARC log moisture content and fines studies (Knudson and Chen 2001), savings of approximately \$0.7 million per plant per year are expected through reduced wood and resin costs if impacts of low log moisture content wood on OSB manufacture can be reduced or reversed.

Although grey stage logs are dry, recent work at Forintek has shown significantly increased permeability and wettability of blue-stained beetle-killed sapwood (McFarling and Byrne 2003). Taking advantage of the rapid uptake of water by this material, it might be feasible to sprinkle logs prior to processing into OSB strands. (Submerged water storage, which would probably be more effective, is not a feasible operation at the OSB plants that would receive this material.) Water vat conditioning is already a normal part of the operation of OSB plants and it is possible that modifications to normal practice can result in improved yield of strands. It has been well established that wood can be impregnated with liquids by vacuum-pressure treatment. It is an



effective technique to saturate wood with water, which represents the extreme case of wetting the dry logs and sets the ultimate that can be achieved.

## **2 Material and Methods**

### **2.1 Material**

Grey stage MPB logs (standing dead for 20 years), green lodgepole pine logs and green aspen logs were used for this study. The following logs were shipped to the Forintek western laboratory from the Ainsworth OSB mill in 100 Mile House, B.C.:

- a) beetle-killed lodgepole pine from the 1980 outbreak – fifty 10-foot long logs of 7” to 11” (18 cm to 28 cm) in diameter. These logs were separated into two piles of similar diameters for the strander set-up tests and log storage tests.
- b) green pine – ten 10-foot long logs of 7” to 11” (18 to 28 cm) in diameter.
- c) aspen – ten 10-foot long logs of 6” to 11” (15 to 28 cm) in diameter.

### **2.2 Test Methods**

The study included:

- **Strander Set-up Tests**

The stranding was done on a pilot scale strander (drum cut strander) at Carmanah Design and Manufacturing Inc. Four different counter-knife angles (50°, 60°, 70° and modified 70°) were examined for MPB logs after water vat conditioning at 15°C for 6 hours. In the modified counter-knife set-up the counter-knife was set back from the knife tips an additional 1/16” (1.6 mm) compared to the normal 1/8” (3.2 mm) set back used for the other test conditions. The intended result was a less aggressive counter-knife arrangement. Twenty log samples were used for each strander set-up condition. Density and moisture uptake and distribution in the logs were measured at the time of stranding. Screening and strand geometry analyses were carried out to measure strand quality. Eighty 2-foot (610 mm) long beetle-killed logs were used in this experiment.

- **Log Storage Tests**

The control was logs in a dry condition as received plus water vat conditioning. The tests involved sprinkled storage plus water vat conditioning. The sprinkling was done for three different time periods (10, 20 and 30 days respectively) prior to water vat conditioning at 15°C for 6 hours. Twenty log samples were used for each condition. Density and moisture uptake and distribution in the logs were measured at the time of stranding. A counter-knife angle of 50° was used for the strander. Screening and strand geometry analyses were carried out to measure strand quality and recovery of OSB quality strands. Eighty 2-foot long beetle-killed log samples were used in this experiment.

For comparisons, twenty 2-foot long green pine log samples and twenty 2-foot long green aspen log samples were also tested without sprinkling but with water vat conditioning at 15°C (60°F) for 6 hours in this experiment.

- **Vacuum-Pressure Treatment**

Seven 2-foot long beetle-killed log samples were cut. The log samples were submerged in water at approximately 20°C in a vacuum chamber and subjected to a vacuum at about 22-inch Hg for 0.5 hour, followed by a pressure of about 150 psi for one hour. The treated log samples were then stranded using a counter-knife angle of 50° and tested for strand quality. Density and moisture uptake, and distribution in the logs were measured at the time of stranding. Screening and strand geometry analyses were carried out to measure strand quality and recovery of OSB quality strands.

## 2.3 Material Preparations and Measurement

### 2.3.1 Log Sample Preparations

#### 2.3.1.1 Strander Set-up Tests

For the strander set-up tests, eighty 2-foot long beetle-killed log samples were cut from 20 grey logs. Each log was cut into four 2-foot pieces with a foot on either end as waste. In the center of each log two disks were cut – one for density and moisture content and the other for moisture gradient analysis. The four individual 2-foot log samples were labelled as 1, 2, 3 and 4 starting from the butt end of the log. Each log segment was brush end-sealed on both ends with a wax-based sealant, as shown in [Figure 1](#). Four matched groups, of 20 log samples each, were separated from these 80 samples for four different strander set-up conditions, as shown in Table 1.



**Figure 1** End-sealed 2-foot long samples

**Table 1 Sample identifications for the strander set-up tests**

<b>Log #</b>	<b>Set 1 50° counter- knife angle</b>	<b>Set 2 60° counter- knife angle</b>	<b>Set 3 70° counter- knife angle</b>	<b>Set 4 Modified 70° counter-knife angle</b>
1	1-1	1-2	1-3	1-4
2	2-2	2-3	2-4	2-1
3	3-3	3-4	3-1	3-2
4	4-4	4-1	4-2	4-3
5	5-1	5-2	5-3	5-4
6	6-2	6-3	6-4	6-1
7	7-3	7-4	7-1	7-2
8	8-4	8-1	8-2	8-3
9	9-1	9-2	9-3	9-4
10	10-2	10-3	10-4	10-1
11	11-3	11-4	11-1	11-2
12	12-4	12-1	12-2	12-3
13	13-1	13-2	13-3	13-4
14	14-2	14-3	14-4	14-1
15	15-3	15-4	15-1	15-2
16	16-4	16-1	16-2	16-3
17	17-1	17-2	17-3	17-4
18	18-2	18-3	18-4	18-1
19	19-3	19-4	19-1	19-2
20	20-4	20-1	20-2	20-3

*2.3.1.2 Log Storage Tests*

For the log storage tests, eighty 2-foot long beetle-killed log samples were cut from 20 grey logs (four samples from each log and labelled as A, B, C and D). Four matched groups were separated from these 80 samples for four different sprinkling conditions (0, 10, 20 and 30 days). Twenty 2-foot long green pine logs and twenty 2-foot long green aspen logs were also cut. Table 2 shows the identification of log samples in each matched group of the log storage tests.

*2.3.1.3 Vacuum-Pressure Tests*

For the vacuum-pressure tests, seven 2-foot long beetle-killed log samples were cut. Identification of MPB log samples in the vacuum-pressure tests are also included in Table 2. Overall, a total of 207 log samples of 2-foot length were cut for all three experiments.

**Table 2 Sample Identifications for the log storage tests and vacuum-pressure tests**

<b>Log #</b>	<b>Set 1 Sprinkling for 0 day</b>	<b>Set 1 Sprinkling for 10 days</b>	<b>Set 1 Sprinkling for 20 days</b>	<b>Set 1 Sprinkling for 30 days</b>	<b>Green Aspen</b>	<b>Green Pine</b>	<b>MPB Logs vacuum- pressure treatment</b>
1	1-A	1-B	1-C	1-D	A1-1	P1-1	V1
2	2-B	2-C	2-D	2-A	A1-2	P1-2	V2
3	3-C	3-D	3-A	3-B	A1-3	P1-3	V3
4	4-D	4-A	4-B	4-C	A1-4	P1-4	V4
5	5-A	5-B	5-C	5-D	A2-1	P2-1	V5
6	6-B	6-C	6-D	6-A	A2-2	P2-2	V6
7	7-C	7-D	7-A	7-B	A2-3	P2-3	V7
8	8-D	8-A	8-B	8-C	A2-4	P2-4	
9	9-A	9-B	9-C	9-D	A3-1	P3-1	
10	10-B	10-C	10-D	10-A	A3-2	P3-2	
11	11-C	11-D	11-A	11-B	A3-3	P3-3	
12	12-D	12-A	12-B	12-C	A3-4	P3-4	
13	13-A	13-B	13-C	13-D	A4-1	P4-1	
14	14-B	14-C	14-D	14-A	A4-2	P4-2	
15	15-C	15-D	15-A	15-B	A4-3	P4-3	
16	16-D	16-A	16-B	16-C	A4-4	P4-4	
17	17-A	17-B	17-C	17-D	A5-1	P5-1	
18	18-B	18-C	18-D	18-A	A5-2	P5-2	
19	19-C	19-D	19-A	19-B	A5-3	P5-3	
20	20-D	20-A	20-B	20-C	A5-4	P5-4	

### 2.3.2 Debarking

All log samples were debarked after water sprinkling and before vat water soaking.

### 2.3.3 Water Conditioning

Figure 2 shows how water sprinkling was done at Forintek:

- sprinkling time: 30, 20, 10 and 0 days (started with sample set of 30-days sprinkling first, followed by 20-days and then 10-days so that stranding could be done for all sample sets at about the same time)
- sprinkling temperature: 15°C
- vat conditioning temperature: 15°C
- vat conditioning time: 6 hours



**Figure 2** Water sprinkling on 2-foot MPB log samples

#### **2.3.4 *Stranding***

Figure 3 shows the cross-section of a drum strander, which illustrates how stranding is accomplished by rotation of knife packages. Figure 4 illustrates knives and counter-knife setting of each knife package inside a drum strander.

Stranding was carried out on the Carmanah lab drum strander (see Figure 5). Knives were 12-inches (305 mm) long, mounted in the strander ring to cut into the log. Two scoring knives were used to cut 4-inch (102 mm) long strands. A single 12-inch long cutting pass was made through each log. After each log the strander was halted and furnish from the one cutting pass was collected and separately bagged. Each bag was labelled with the log segment identification number. Care was taken to collect all strands and fines generated by the strander from the one cutting pass. Two moisture content sample disks approximately 1-inch (25 mm) thick were cut from the end next to the stranded portion of the log segment of the remaining one-foot section of each log. One sample disk was oven dried to determine log moisture content and density. The other sample disk was used for determining moisture gradient. The moisture content sample disks were also used to measure log diameter.

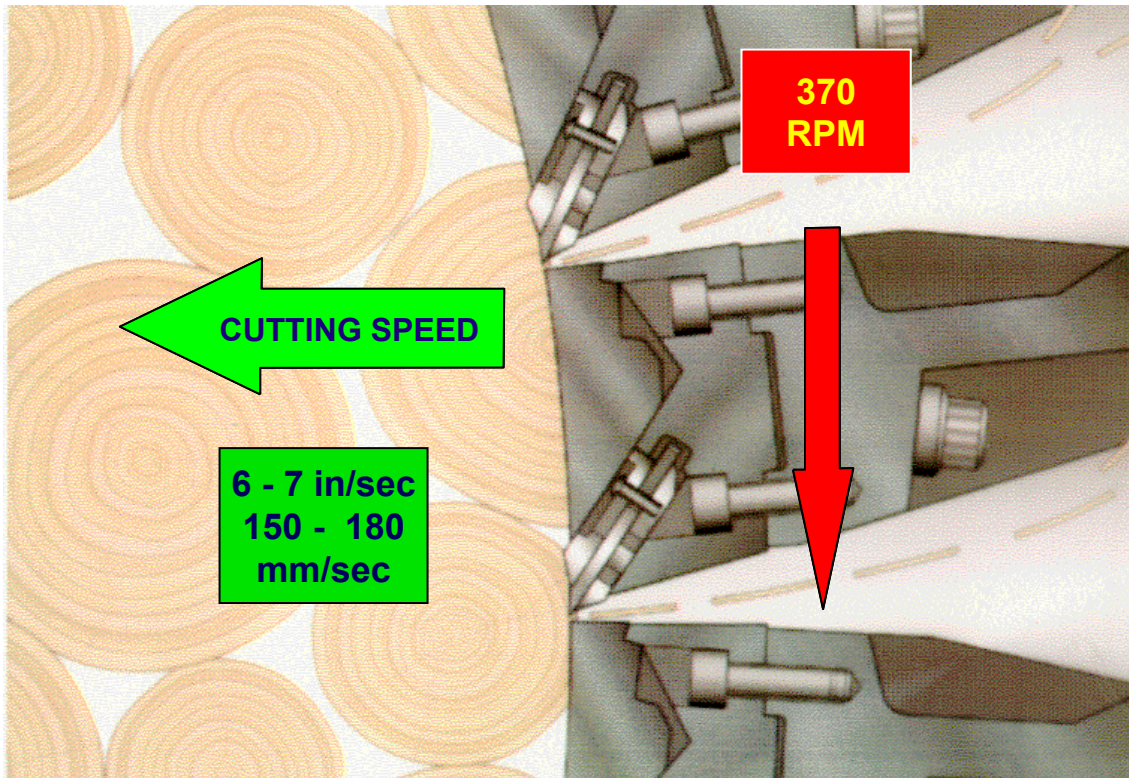


Figure 3 Strander cross-section

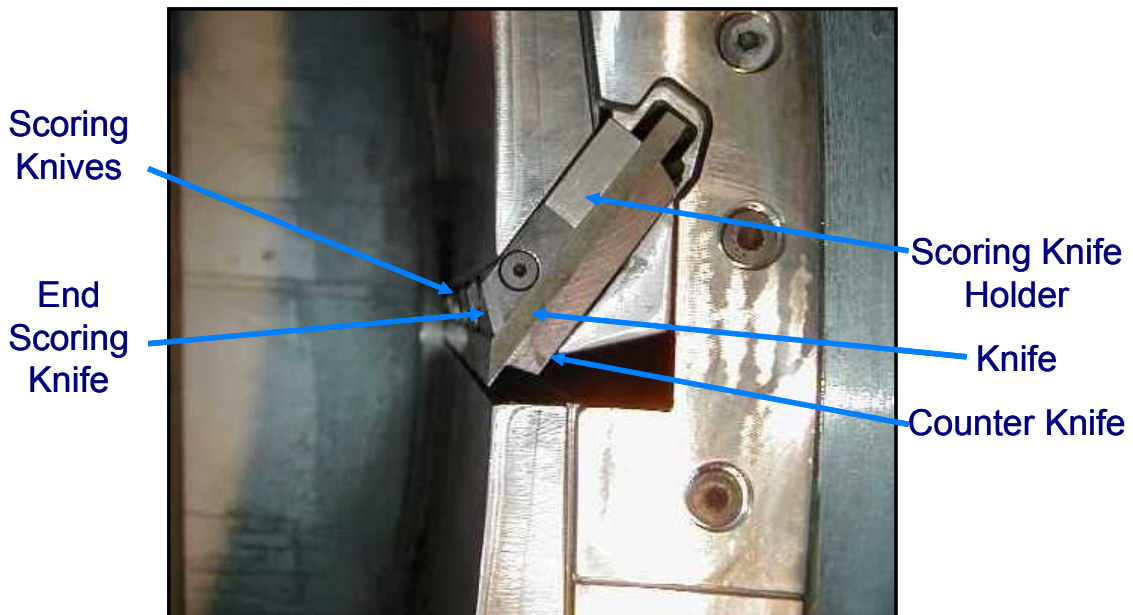


Figure 4 Knives and counter-knife set-up inside the strander



**Figure 5** Carmanah laboratory drum strander

### **2.3.5 Screening**

Screen analyses were carried out at Carmanah. The strands collected from each log segment were placed on the floor and mixed with a pitchfork to give a mat of strands with an even consistency. This produced an even horizontal distribution of strands. Three samples of strands (labelled as A, B and C) for screening were taken by pulling out vertical sections of appropriate size from the strand mat. Therefore, 60 screen analyses were performed for each matched group of MPB log samples. Screened fractions were weighed to the nearest gram and screen recoveries were calculated as a percentage of the total weight of strands screened from the overall sample. A Gilson screen equipped with wire mesh decks of 1.5", 1.25", 1", 0.75", 0.5", 0.25" (38.1, 31.8, 25.4, 19.0, 12.7, 6.4 mm) and a pan was used first. Material collected on the bottom pan of the Gilson screen was then classified on a Williams Classifier equipped with round punch plate decks of 0.25" (6.4 mm) and a pan. Screening times were 10 minutes on the Gilson screen and three minutes on the Williams Classifier. The Gilson screen operates with a vertical motion that tends to classify strands by width. Strands less than ¼" wide and of varying lengths were able to pass through the ¼" deck of the Gilson screen onto the bottom pan. The Williams Classifier operates on a horizontal-circulatory motion that tends to classify by length. The result of the dual screening operation is that the material ending up on the bottom pan of the Williams Classifier is the finest material. Material collected on the top of the screen of the Williams Classifier was classified as fines and the material that passed through the screen was classified as pan.

A total of 621 screen analyses were performed, from which 4968 furnish fractions were examined. After the screen analyses were completed, all fractions of strands were classified, bagged, labelled and sent to Forintek's western laboratory for optical analysis of strand geometry.

### ***2.3.6 Optical Analysis of Strand Geometry***

Fractions of different strand size were obtained from the screen analyses. Image analysis was performed to measure the distribution of strand length and width. Strand shapes were also evaluated visually. Before picking the samples for strand geometry analyses, the bags were tumbled around by hand to ensure that the strands were well mixed and that representative samples were taken from each bag.

Approximately 200 strands were picked for length and width measurements from a bag of sample strands. Strand length and width were measured with an image analysis system in which a video camera captured the strand images, and software called Optimas® was used to collect data and measure strand dimensions. The camera's field of view was set to cover an area of 16" x 22" in which strands were evenly laid without any overlapping. A dark coloured cloth was used as the background to enhance the contrast of the strand images. After setting the proper threshold to differentiate the strands and background, images of strands were captured and the length and width of individual strands were recorded. The minimum dimension that the image analysis system with this particular configuration could handle was in the range of 0.05" to 0.06" (1.3 to 1.5 mm).

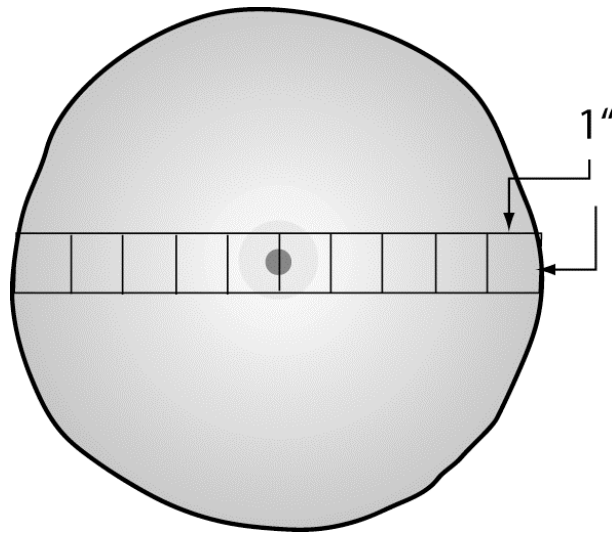
### ***2.3.7 Moisture and density distributions***

Moisture and density distributions were measured at the time the logs were initially bucked into 2-foot segments and again immediately after stranding. Two 1-inch (25 mm) disks were cut from the centre sections of the logs after bucking and two 1-inch disks were cut from the remaining 1-foot piece after stranding. Sampling procedures are described in previous sections. From each pair of disks, one was used for overall moisture content and density determination, and the other was used to determine moisture and density gradient.

- Sample size: 1-inch thick log disk
- Sampling time: during bucking of logs into four segments and after stranding
- Method for moisture determination: oven dry
- Method for density determination: water submersion

For overall moisture and density determination the entire disk was weighed immediately, immersed in water to determine its volume, and then oven dried to determine oven-dry weight. For moisture and density gradient samples the disks were cut into 1" x 1" (25 x 25 mm) samples across the disk diameter (Figure 6). The samples were individually weighed, immersed in water to determine volume, and then oven dried to determine oven weight. Moisture content and density at the time of sampling were then calculated.





**Figure 6** Samples for moisture and density gradient determination

### **3 Results and Discussion**

#### **3.1 Properties of Grey Stage MPB Wood**

The grey stage MPB logs used in the tests had very little bark, heavy blue stain in the sap wood area and lots of checks, as shown in Figure 7. From a panel product manufacturing point of view, grey stage beetle-killed lodgepole pine can be considered as a new type of wood material due to its dryness, brittle nature, blue stain and high permeability. Some properties of the MPB logs, in comparison with the green aspen logs and green lodgepole pine logs used in this study, are summarized in Table 3.



**Figure 7** Grey stage MPB logs (standing dead for 20 years)

**Table 3** Properties of Grey Stage MPB Wood, Green Pine and Green Aspen

Log Type	Bark	Checks	Log Diameter (inches)	Moisture %	Density (green, lbs/ft <sup>3</sup> )	Density (green, g/cm <sup>3</sup> )	Density (O.D, g/cm <sup>3</sup> )
<b>MPB Wood</b>	little	large, bark to pith	9.65	21.7	33.89	0.543	0.447
<b>Green Pine</b>	largely intact	little	8.44	38.6	38.28	0.613	0.443
<b>Green Aspen</b>	largely intact	little	9.30	61.4	36.57	0.586	0.364

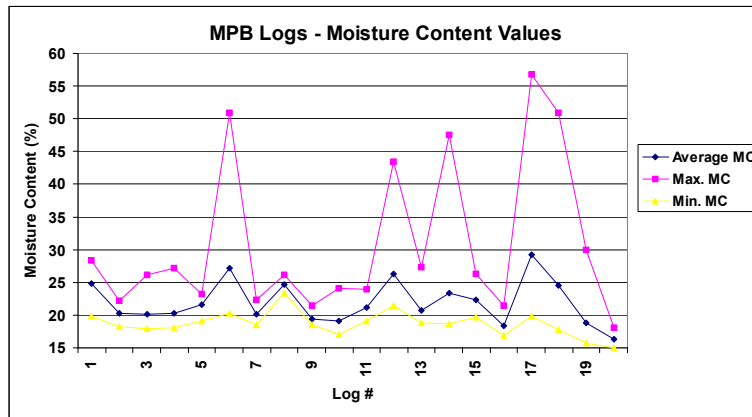
The data in Table 3 are the average values from forty MPB logs, five green pine logs and five green aspen logs, respectively. Among the three types of wood, MPB wood had the lowest moisture content (21.7%) while green pine contained nearly twice as much moisture (38.6%) and green aspen nearly three times as much moisture (61.4%) as that of the MPB wood. For this reason, the MPB wood showed about 12% lower green density than that of green pine and about 7% lower green density (as received and tested) than that of green aspen. This may be positive in terms of transportation cost of MPB wood. The fact that grey stage MPB wood has very little bark may also contribute positively to the cost of debarking and debarking efficiency in the OSB mills. The MPB wood showed almost the same dry density as that of green pine and about 23% higher dry density than that of the aspen. This suggests that higher OSB product density may be required from MPB wood to achieve the same bonding strength as that of aspen because of different compression ratios for mat consolidation and panel pressing. Higher panel density would likely increase transportation costs.

It is also noteworthy that the average MPB log diameter was large. This may affect the resulting strand size when using the lab strander. Because the lab strander is much smaller than an industrial strander of similar type, large log diameters could yield more large size strands than expected. Strand size (width) in this study was larger than anticipated for MPB wood.

### **3.2 Strander Set-up Tests**

Counter-knife angle is a key factor in determining strand size. Wood species also has great influence on the outcome of strand production. In order to minimize the generation of fines during stranding, MPB wood may require a counter-knife angle that is different from that being used for aspen or southern yellow pine. Therefore, this part of the study was to principally examine the effect of counter-knife angles on the generation of fines during MPB wood stranding.

Most of these logs showed relatively even moisture gradients, as determined before water vat conditioning (see moisture gradient data in Appendix I). They gave moisture contents mostly between 15% and 25%. Derived from the moisture gradient data, Figure 8 illustrates the maximum, minimum and average moisture contents of each log. For each log the average MC value represents the moisture content of the one disk measured in its entirety, while the maximum and minimum MC values came from the 1" x 1" samples cut from the other disk for determining moisture and density gradients.



**Figure 8** Moisture contents of 20 MPB wood logs before water vat conditioning

Water vat conditioning of logs is a standard practice in OSB production. Moisture gradient across a log section was determined for each log sample after vat conditioning (a total of 665 MC samples). These moisture gradient data clearly showed that vat conditioning is only effective in increasing moisture to the outermost portion of a log (see Table 4 and moisture gradient data in Appendix I). They strongly suggest that there is room for improvement in the area of log conditioning, which could lead to a substantial increase in wood recovery and productivity. Table 4 shows how moisture contents of the MPB log samples changed after water vat conditioning at 15°C for 6 hours. Overall, the moisture content increased an average of 7.6%. The moisture content of the outer 1-inch section of the MPB logs was raised to 35.0% while the moisture of the inner sections remained at 20.7% on average.

**Table 4** Moisture contents and moisture gradients before and after vat conditioning

Test Group	Moisture % (before) <sup>1</sup>	Moisture % (after) <sup>2</sup>	Moisture %, outer 1-inch (after) <sup>2</sup>	Moisture %, innermost sections (after) <sup>2</sup>
50° CKA <sup>3</sup>	23.8	33.0	36.3	20.9
60° CKA	23.8	32.1	36.0	21.3
70° CKA	23.8	30.7	35.5	20.7
Modified 70° CKA	23.8	29.9	32.2	19.9
<b>Overall Average</b>	<b>23.8</b>	<b>31.4</b>	<b>35.0</b>	<b>20.7</b>

<sup>1</sup>Average values from all MPB logs.

<sup>2</sup>Average values from each matched group of MPB log samples.

<sup>3</sup>CKA stands for counter-knife angle.

Three strand samples from each MPB log section were screened into 8 fractions of different sizes (1.5”, 1.25”, 1”, 0.75”, 0.5”, 0.25”, fines and pan), as shown in Figure 9. Strand size distributions derived from each counter-knife angle are illustrated in Figure 10, 11, 12 and 13, respectively. To better compare these strand size distributions, they are illustrated together in Figures 14, 15 and 16. All data from the screen analyses of the strand set-up tests are attached in Appendix I.



**Figure 9** Screen fractions of different sizes from an MPB wood strand sample

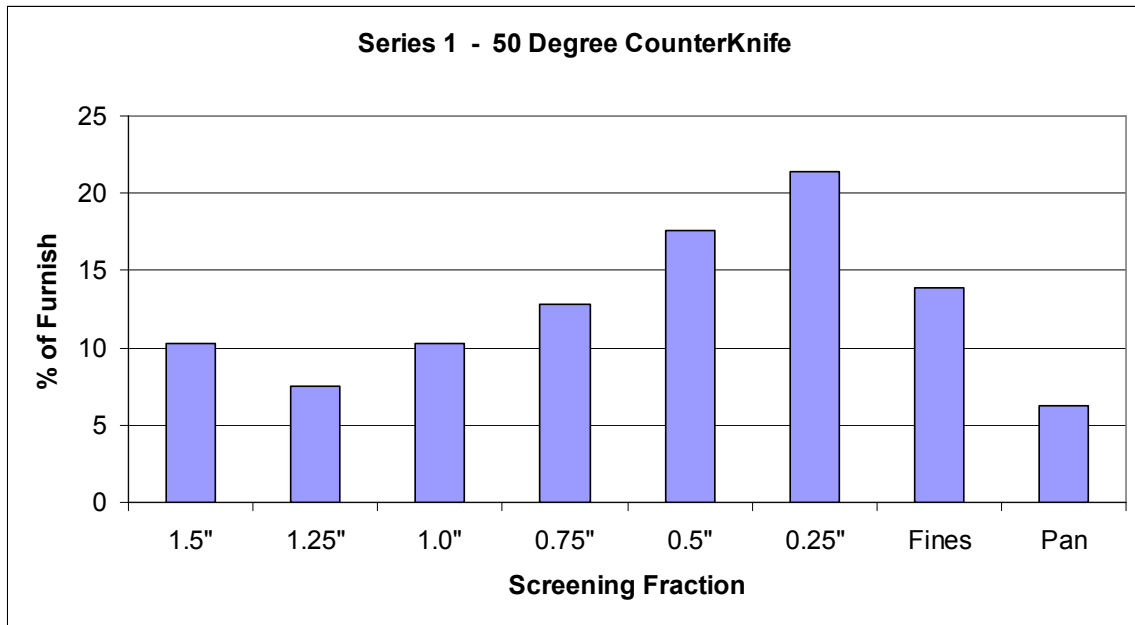


Figure 10 Strand size distribution derived from 50° counter-knife angle

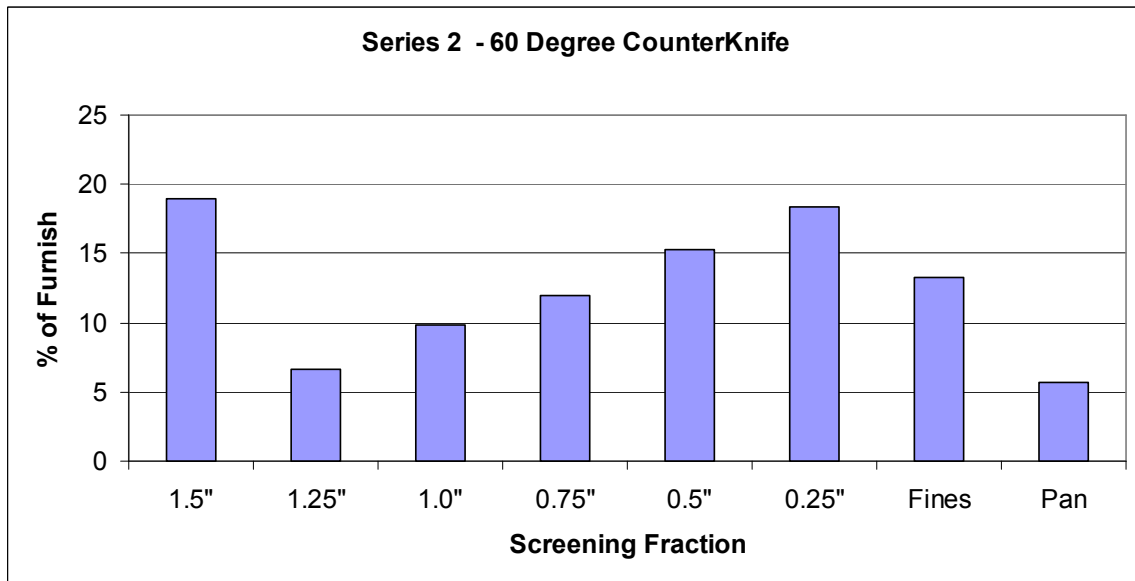


Figure 11 Strand size distribution derived from 60° counter-knife angle

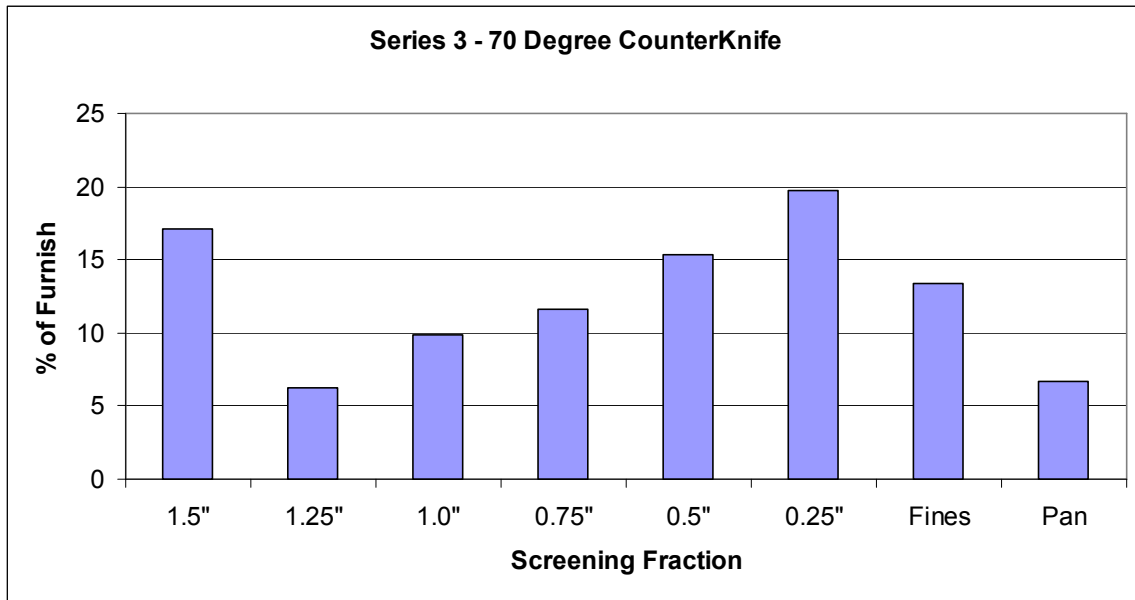


Figure 12 Strand size distribution derived from 70° counter-knife angle

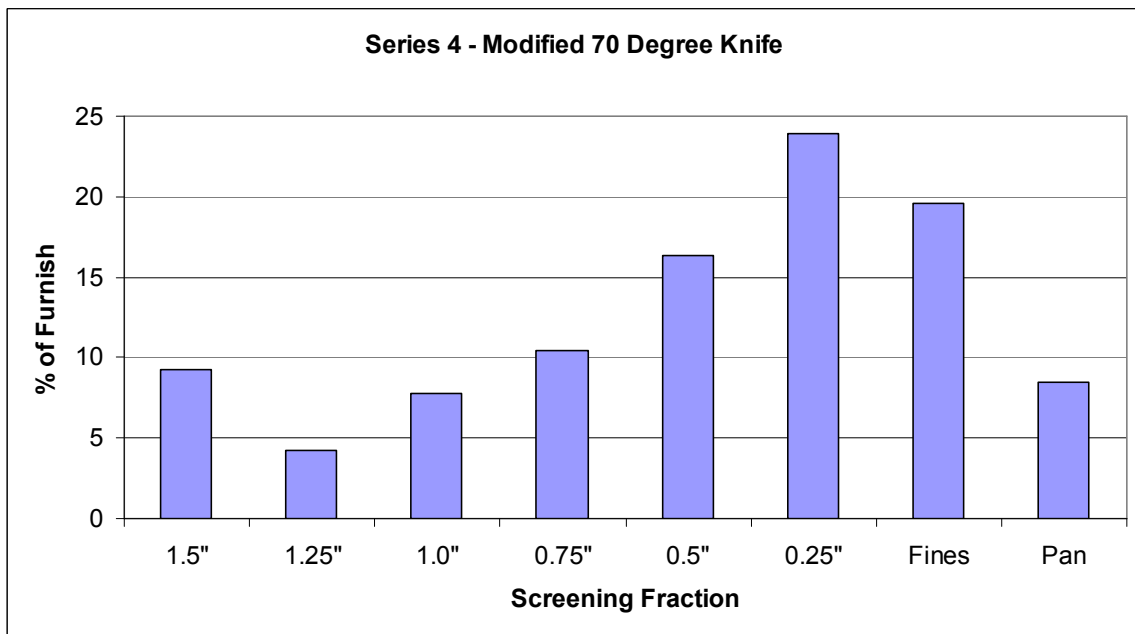


Figure 13 Strand size distribution derived from modified 70° counter-knife angle

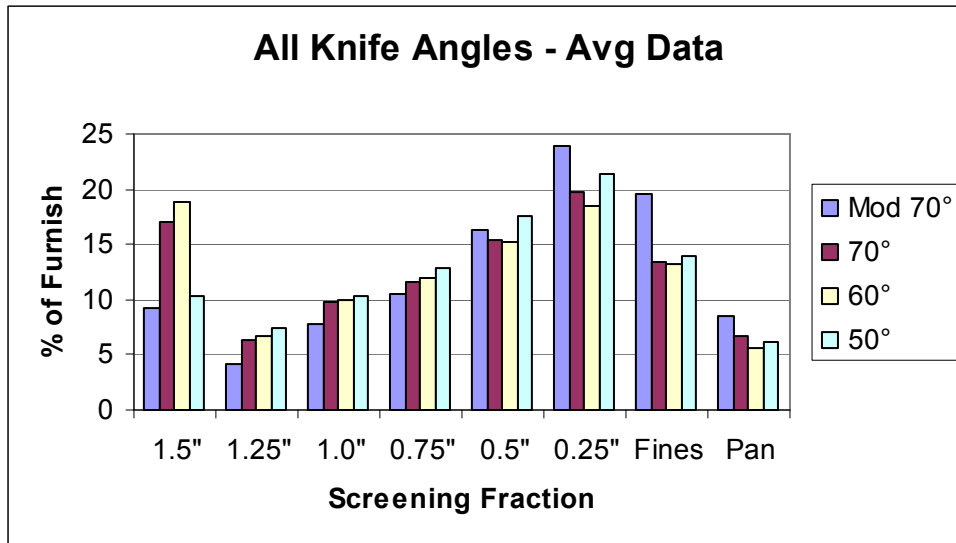


Figure 14 Strand size distributions derived from different counter-knife angles

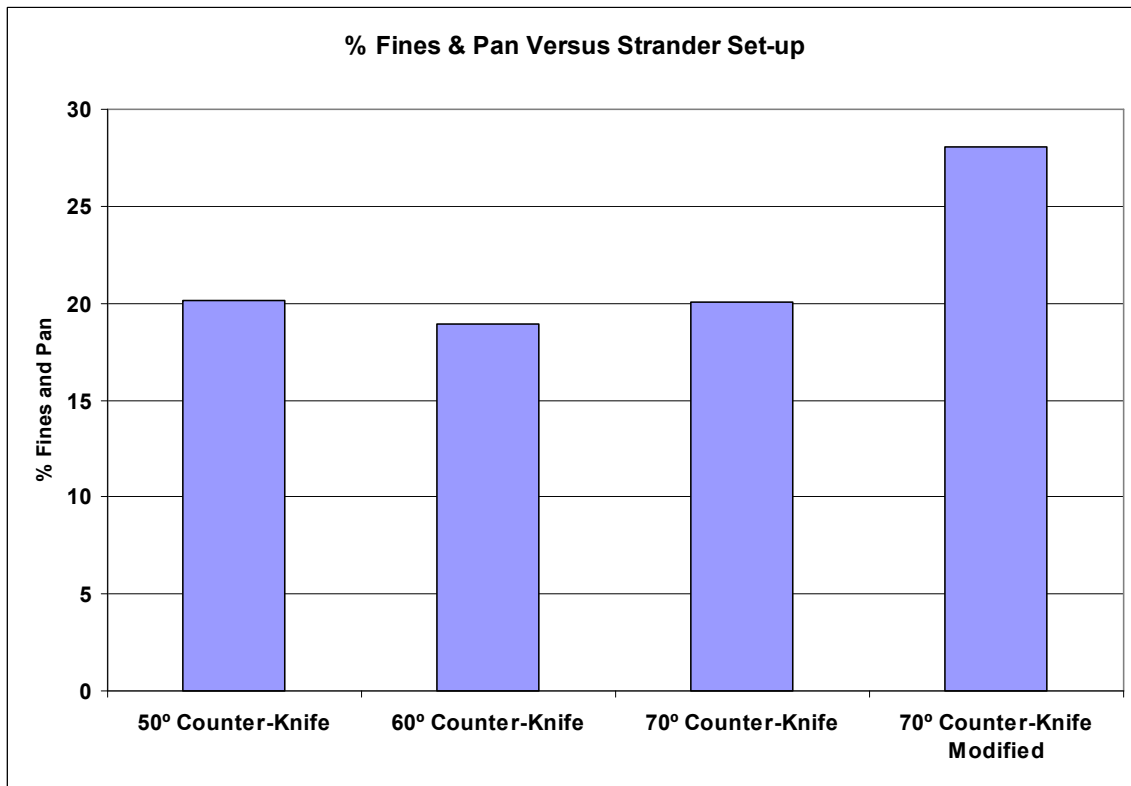
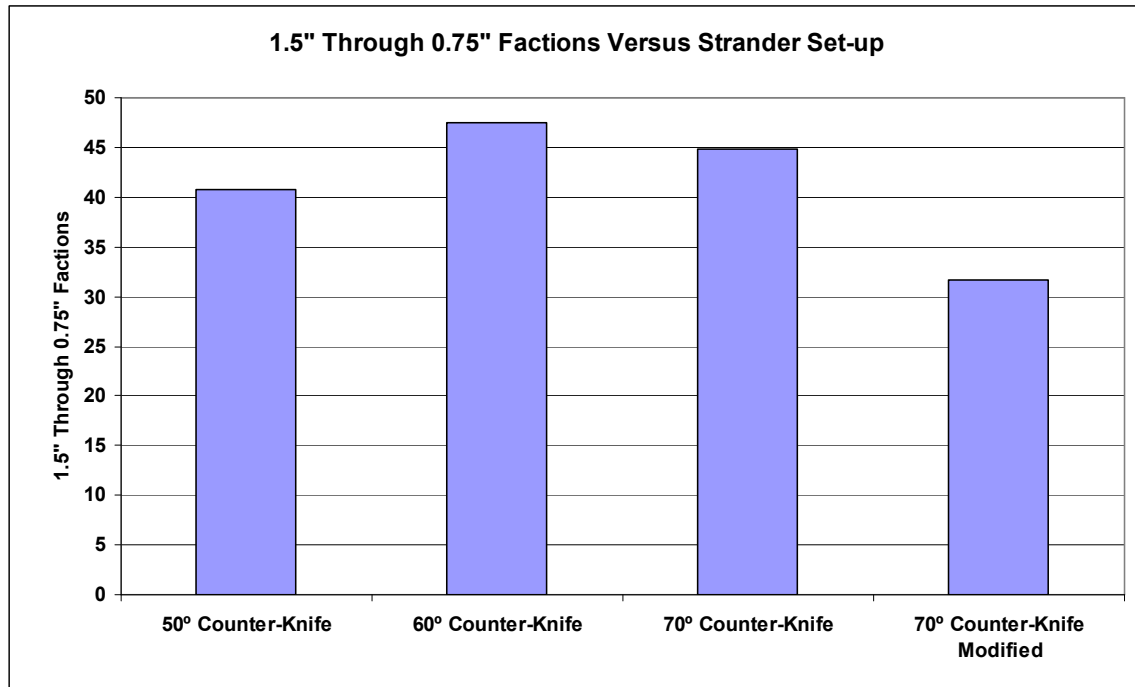


Figure 15 Percent of fines and pan vs. counter-knife angle





**Figure 16** Screen fractions of 1.5" through 0.75" vs. counter-knife angle

As can be seen in Figures 14, 15 and 16, strander knife package set-up can have a significant impact on the strand size distribution. This is particularly the case for the modified 70° counter-knife angle, where significantly more fines and fewer large size strands were generated. However, the differences among the outcomes of 50°, 60° and 70° counter-knife angles were small and not as anticipated based on the experience of Carmanah Design and Manufacturing Inc.'s stranding of aspen and other species (McDonald 2004; Macey 2004). Normal experience has been for strand width to decrease and fines to increase as the counter-knife angle increases. Strand width typically increases as the distance between the counter-knife and knife tip increases. Softwood species like southern pine tend to break more readily during stranding and the industry uses lower counter-knife angles than for aspen to produce strands of the desired widths and reduce fines generation. It is unclear why these trends were not observed in the MPB wood in this study. To investigate this question, each screen fraction of strands derived from 50° and 60° counter-knife angles was analyzed for strand geometry (width, length and area) using an optical image analysis method that was developed at Forintek. The results are shown in Figures 17, 18 and 19. These data again indicate that the difference of strand geometry between 50° and 60° counter-knife angles was very small. It remains to be seen whether the results of this study are representative of all MPB wood, or a characteristic of the particular wood used in this study.

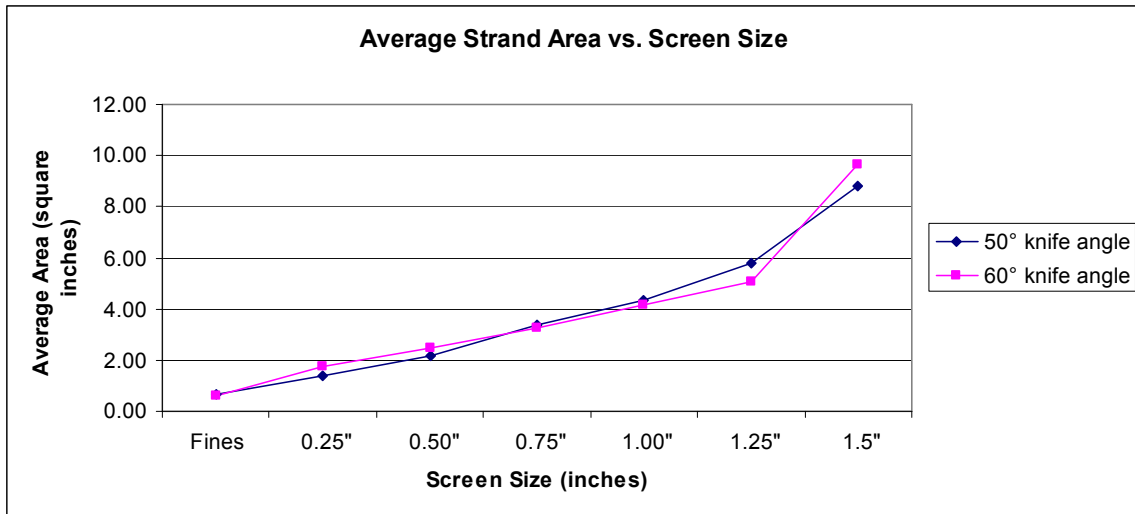


Figure 17 Average strand width vs. screen size between 50° and 60° counter-knife angles

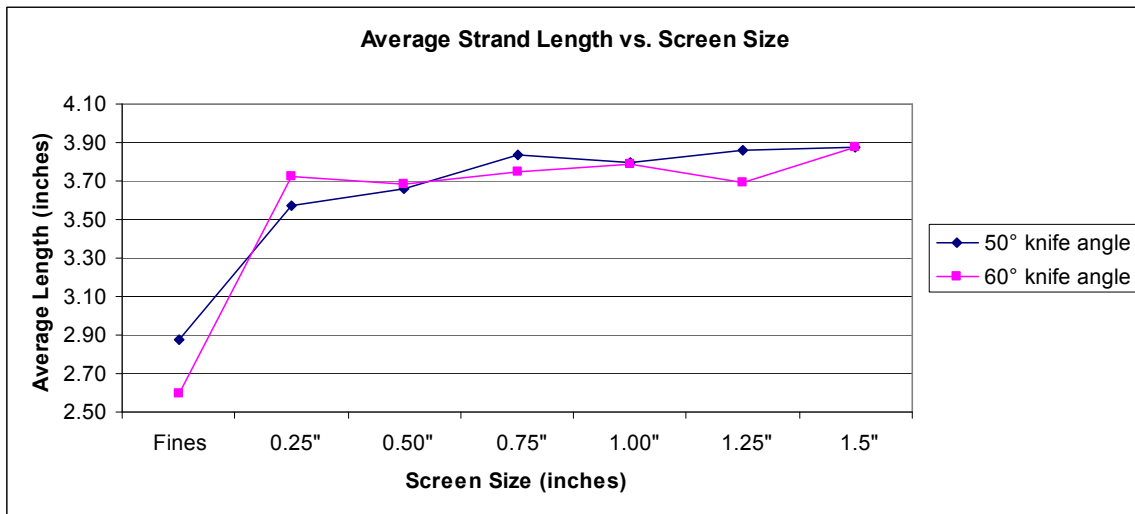


Figure 18 Average strand length vs. screen size between 50° and 60° counter-knife angles

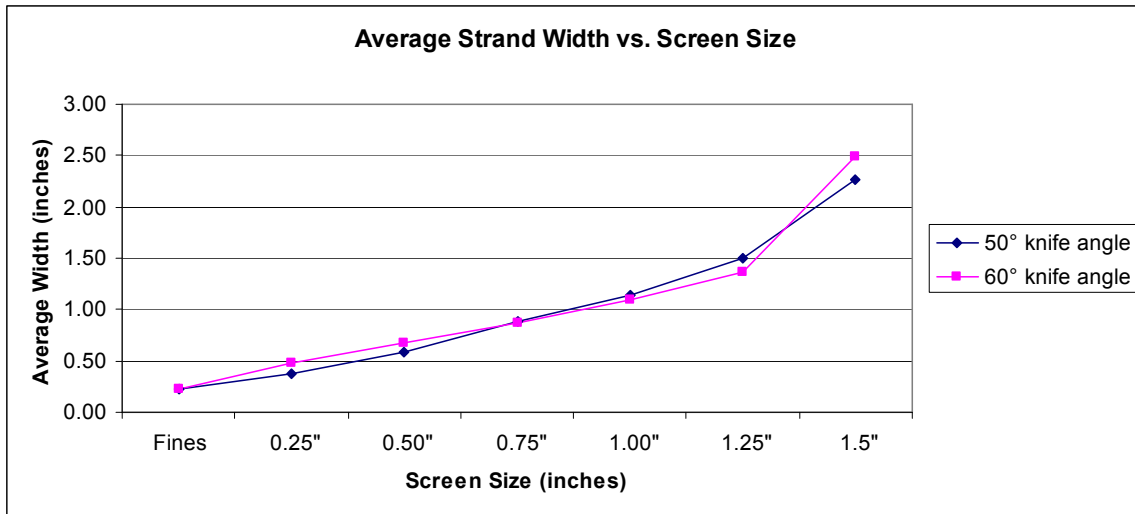


Figure 19 Average strand area vs. screen size between 50° and 60° counter-knife angles

### 3.3 Log Storage Tests

Grey stage MPB wood is dry and brittle. This part of the study examined the effectiveness of water sprinkling on increasing MPB log moisture and reducing fines during strand production. The tests involved sprinkled storage plus water vat conditioning. The control was dry logs as received plus water vat conditioning.

Detailed test data is found in Appendix II. Table 5 and Figure 20 show how the moisture contents of the MPB wood logs changed after sprinkling and vat conditioning. Without sprinkling, vat conditioning alone was able to raise the average moisture content from 19.5% to 30.8%. After 10 days sprinkling, moisture content increased to 48.9%. After 20 days sprinkling, moisture content increased to 59.3%. After 30 days sprinkling, moisture content increased to 61.2%. Clearly, water sprinkling is an effective method in increasing MPB log moisture contents. As illustrated by Figure 20, the data show that almost three-quarters of the moisture gain was already achieved after 10 days sprinkling; 95% of the moisture gain was achieved after 20 days sprinkling; not much more was achieved with additional 10 days sprinkling (30 days).

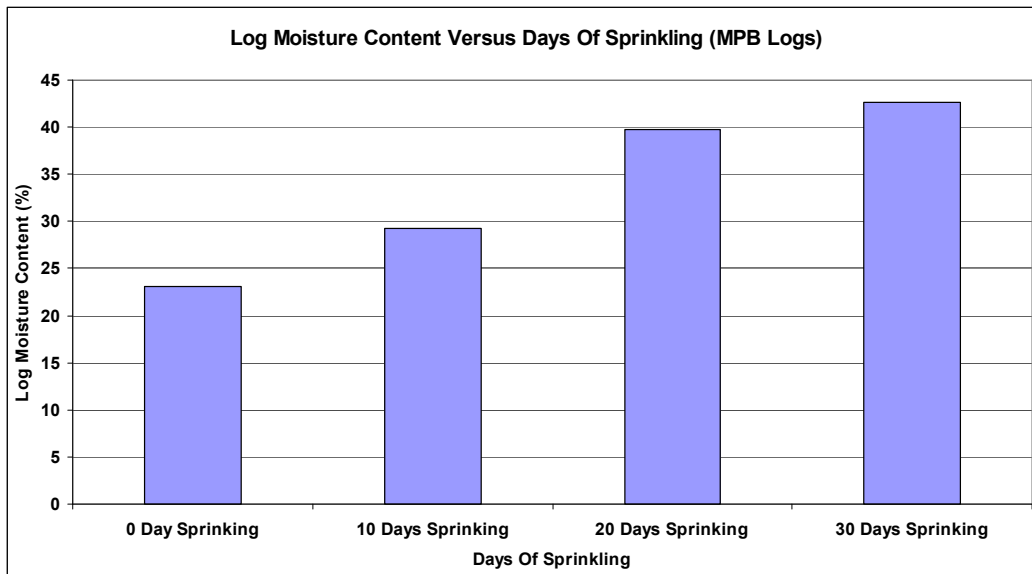


Figure 20 MPB wood log moisture content vs. water sprinkling time

Table 5 Moisture content and moisture gradient of MPB logs before and after water sprinkling and vat conditioning

Sprinkling Time	Moisture % (before) <sup>1</sup>	Moisture % (after) <sup>2</sup>	Moisture %, outer 1-inch (after) <sup>2</sup>	Moisture %, innermost sections (after) <sup>2</sup>
<b>0 Day</b>	19.5	30.8	33.8	19.5
<b>10 Days</b>	19.5	48.9	63.9	23.7
<b>20 Days</b>	19.5	59.3	78.9	28.4
<b>30 Days</b>	19.5	61.2	-	-

<sup>1</sup>Average values from all 20 MPB logs

<sup>2</sup>Average values from each matched group of MPB log samples

Moisture gradient was also determined for each log sample after sprinkling and vat conditioning (a total of 788 MC samples) (Table 5, Figure 21). Similar to the observations on vat conditioning described in the strand set-up tests (see Section 3.2), the moisture gradient data showed that water sprinkling is mostly effective in increasing moisture in the outermost portions of the logs (see moisture gradient data in Appendix II for details). The majority of the mass inside a log was considerably less affected by water sprinkling. This phenomenon is illustrated in Figure 21. Blue-stained lodgepole pine sapwood is known to be very permeable to water whereas lodgepole pine heartwood is rated as difficult to impregnate with water and water-borne preservatives. Visually, virtually all of the checks in the logs had closed up after 10 days or longer sprinkling (Figure 22 and 23). Results suggest that there is much potential for improvement in the area of log conditioning – an area where technological innovations could produce substantial benefits.

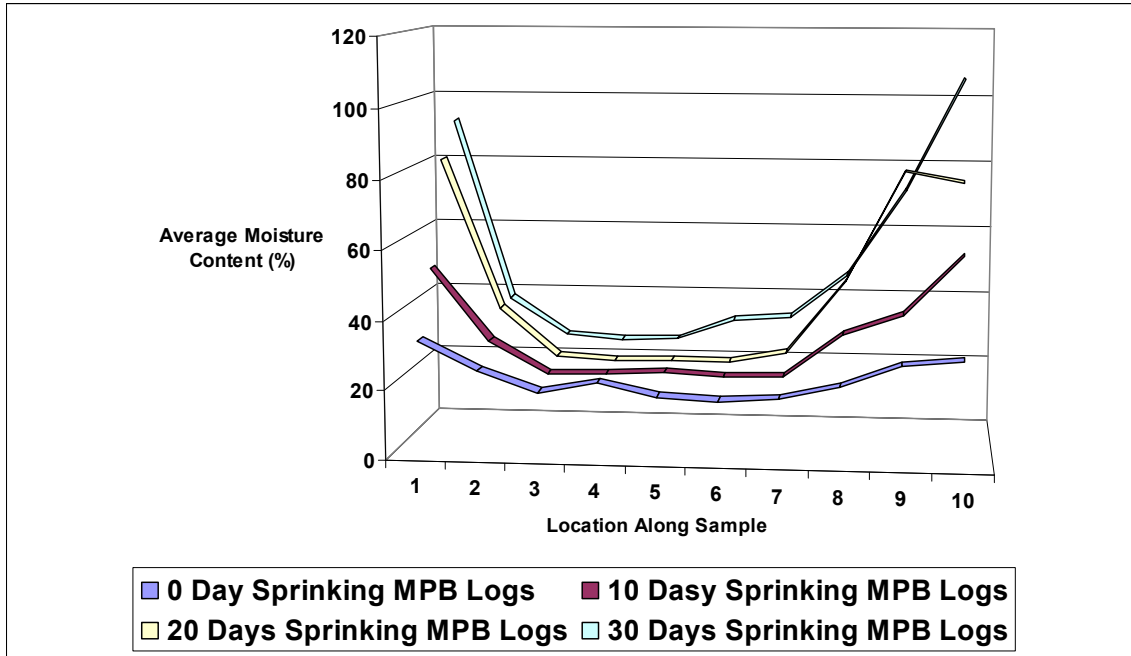


Figure 21 Moisture gradient across MPB log section vs. sprinkling time

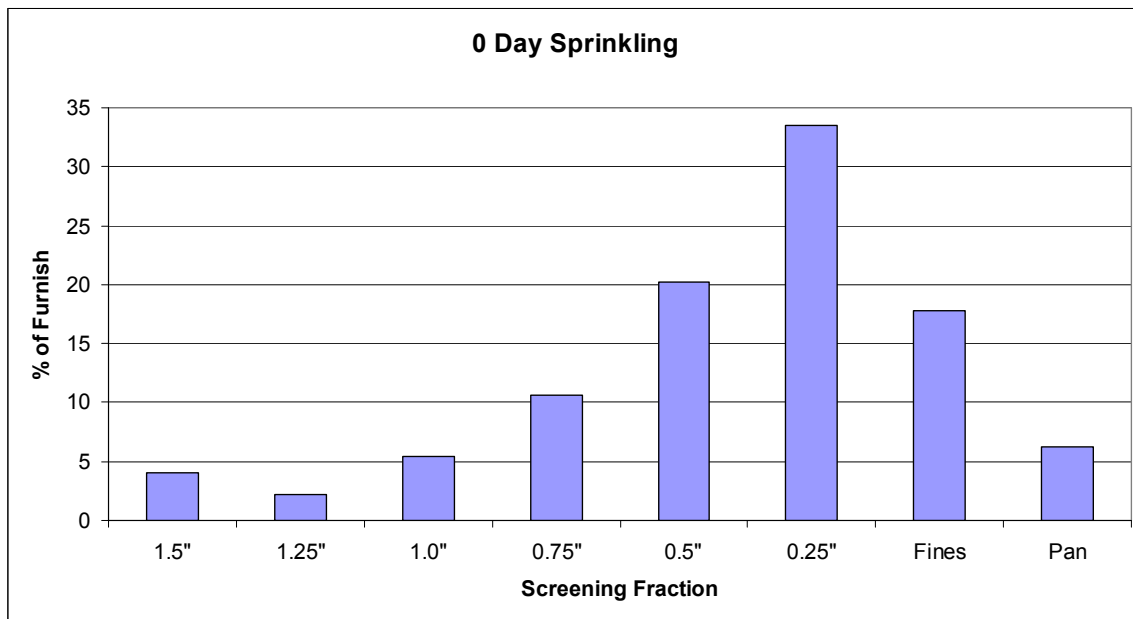


Figure 22 Checking in MPB logs prior to sprinkling



**Figure 23 Checks in MPB logs have closed up after 10 days sprinkling**

Strand size distributions for the MPB wood after 0, 10, 20 and 30 days of water sprinkling are shown in Figures 24 through 27. For comparison, strand size distributions for green lodgepole pine and green aspen stranded at the same time are shown in Figures 28 and 29.



**Figure 24 Strand Size distribution without water sprinkling**

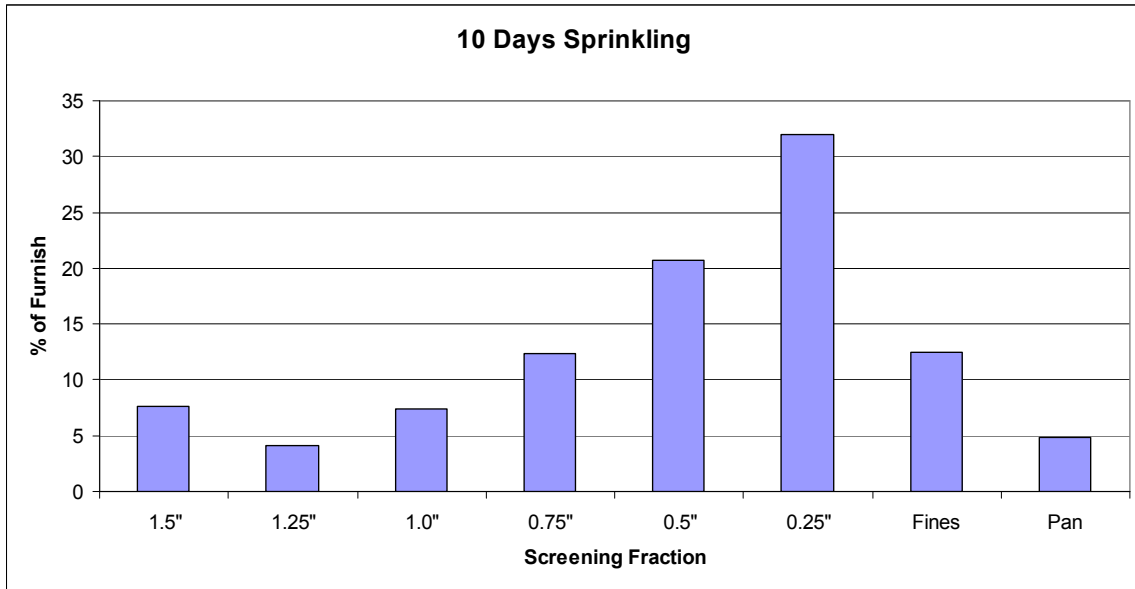


Figure 25 Strand size distribution of MPB wood after 10 days of water sprinkling

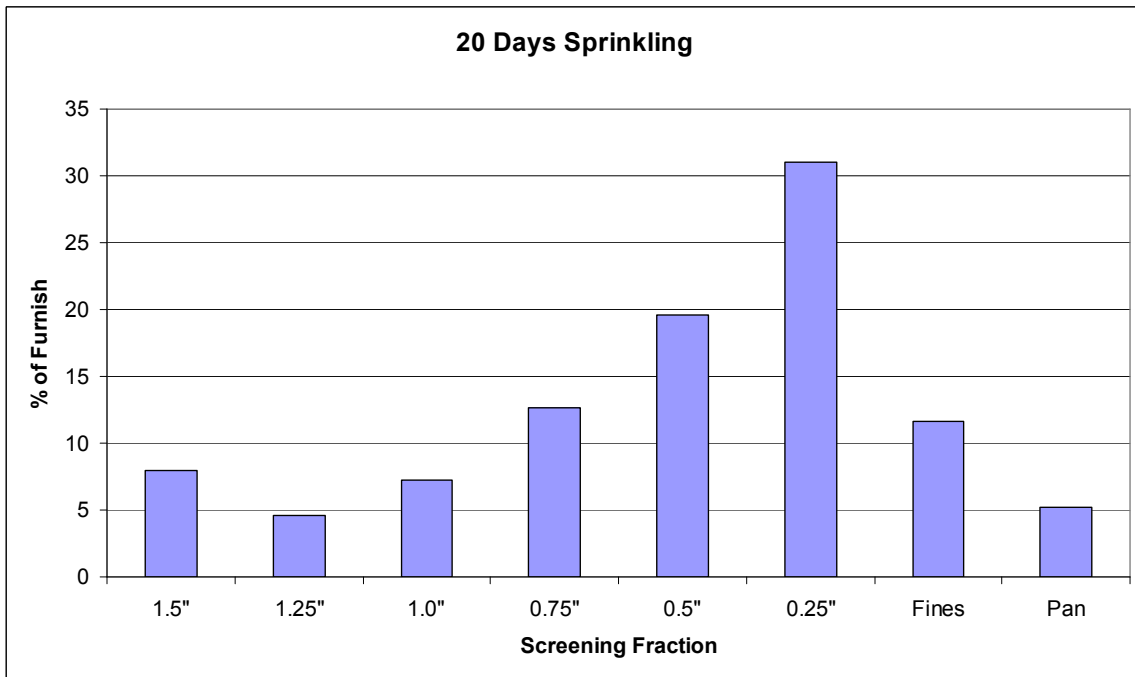


Figure 26 Strand size distribution of MPB wood after 20 days of water sprinkling

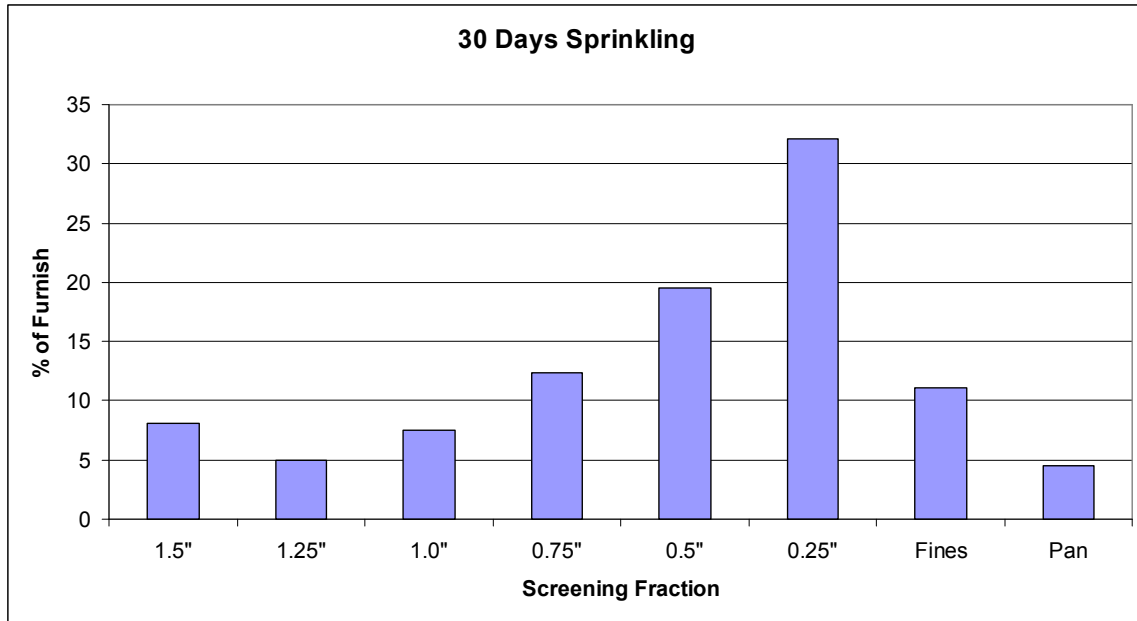


Figure 27 Strand size distribution of MPB wood after 30 days of water sprinkling

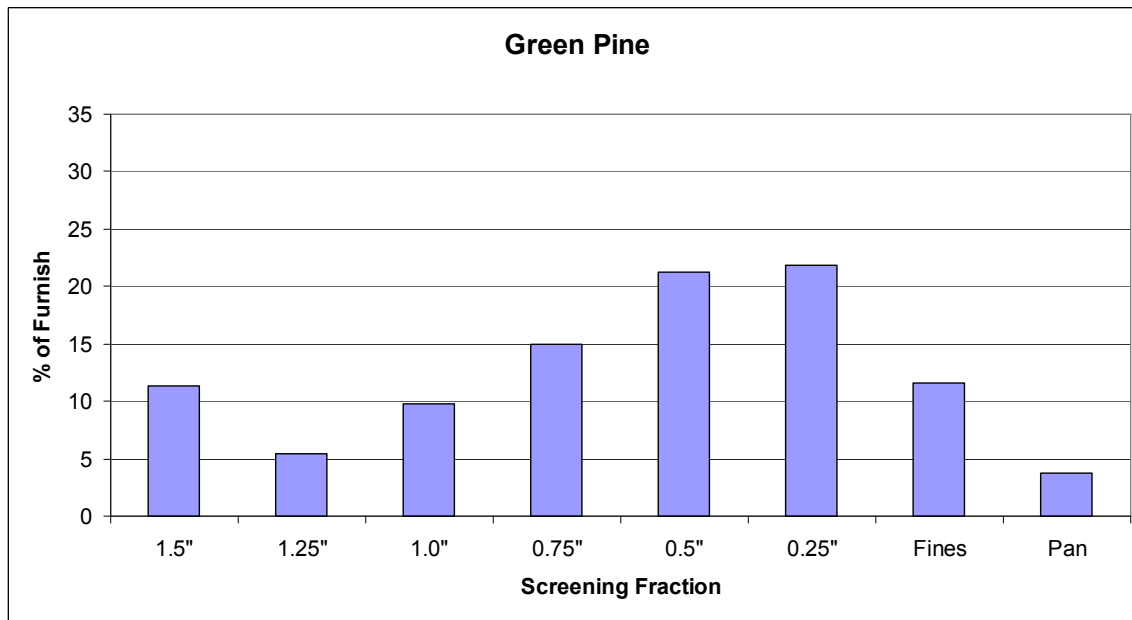
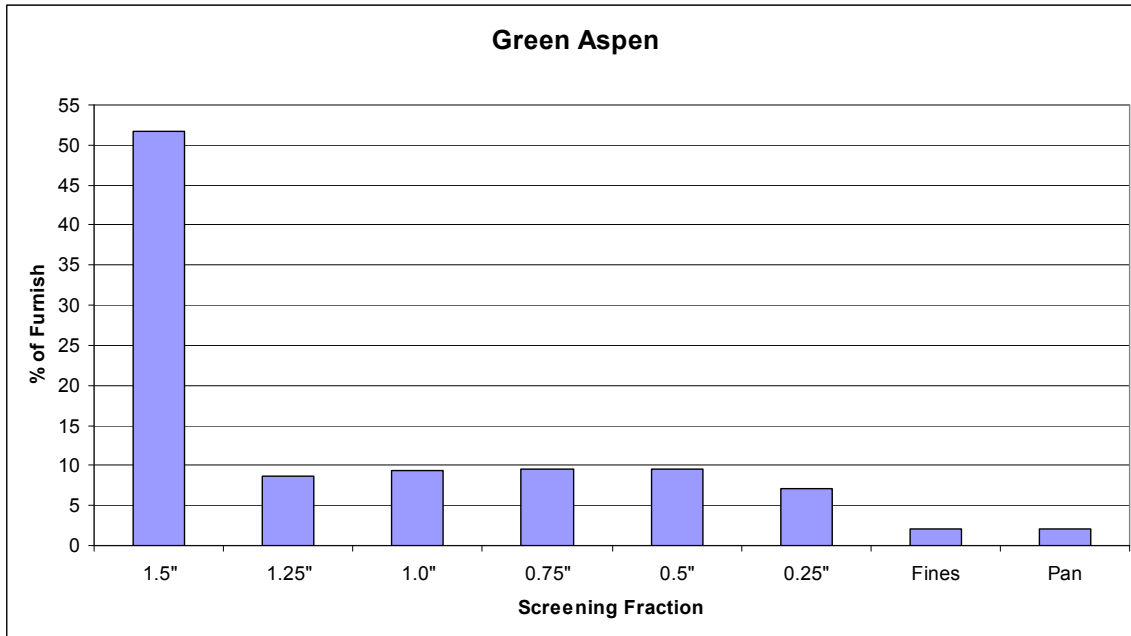


Figure 28 Strand size distribution of green pine



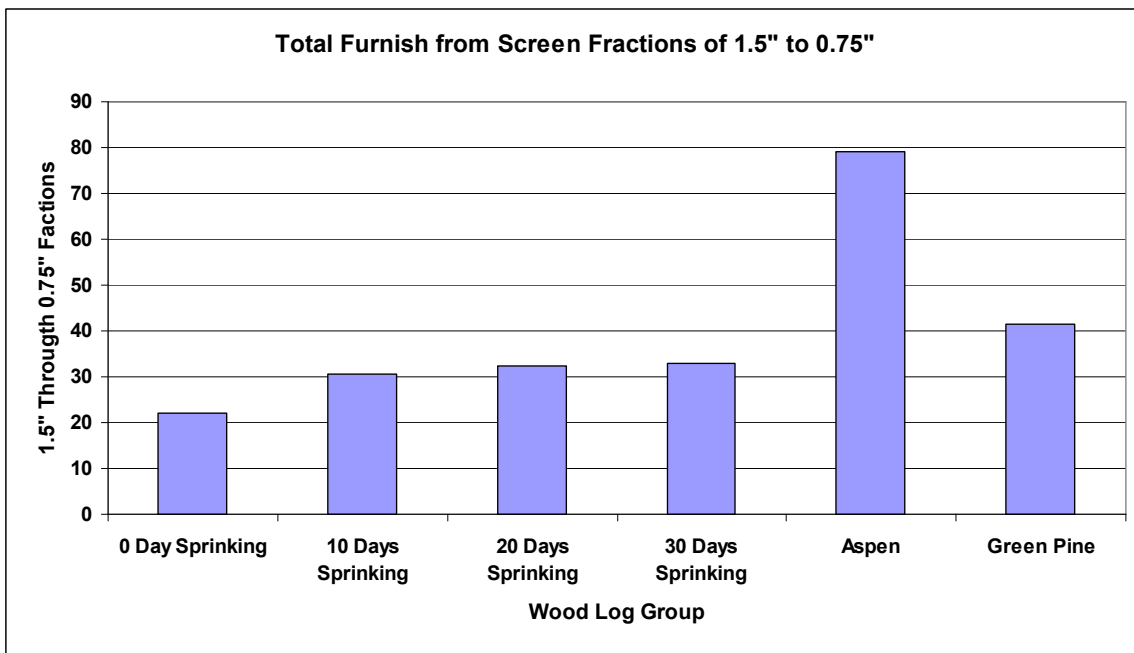


**Figure 29 Strand size distribution of green aspen**

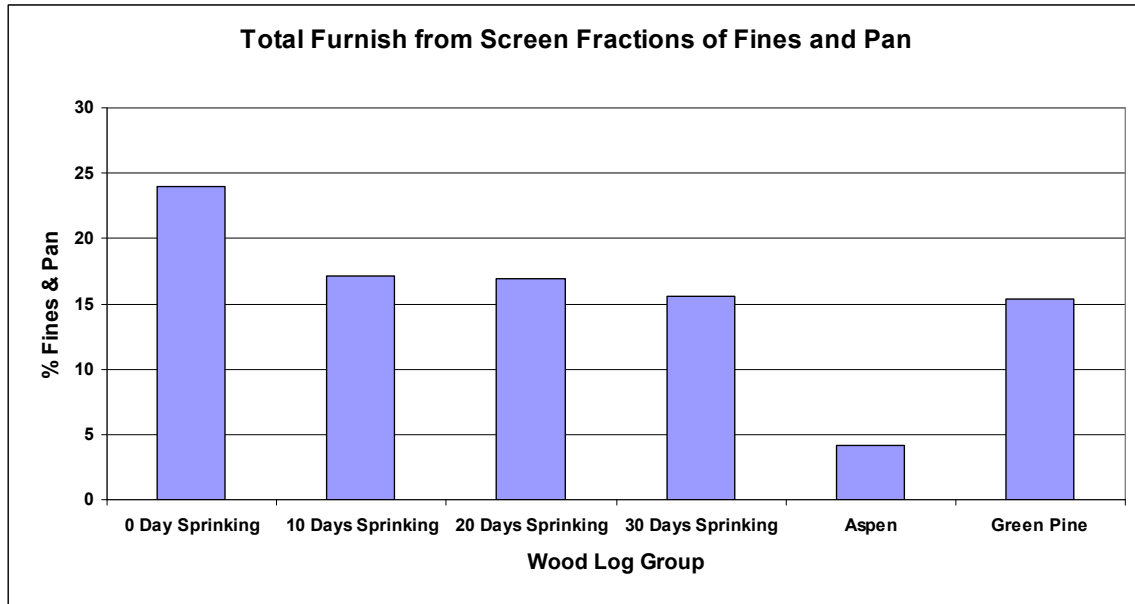
The patterns of strand size distribution among the four MPB matched groups are similar but somewhat different from those of green pine and very different from those of green aspen. As can be seen in Table 6 and Figures 30 and 31, water sprinkling was clearly an effective method for reducing the production of undesirable small wood flakes and particles (fines and pan) and increasing the proportion of larger strands from MPB logs. Without water sprinkling, the MPB logs produced more fines and fewer large strands than green pine. Despite the moisture gradient data indicating that water sprinkling effectively increased moisture content of only the outer portion of the MPB logs, after 10 days sprinkling, the production of undesirable small wood flakes and particles (fines and pan) was reduced from 24% to about 17%. The production of large strands (screen sizes 1.5" to 0.75") was also increased dramatically from 22% to about 32%. An additional 10 days sprinkling, however, further reduced fines by only about 0.4%. In comparison with 10 days sprinkling, 30 days sprinkling reduced the production of fines by only an additional 1.7% more. Therefore, most of the benefits were already realized after 10 days sprinkling. Interestingly, 30 days sprinkling reduced fines production to a level similar to that of green pine but it still resulted in fewer large strands (screen 1.5" to 0.75") than in green pine. The reason was likely that the MPB logs contained checks. Even though the sprinkling closed these up, the MPB wood was still broken into smaller size strands by the checking. Overall, green aspen produced the least fines and the most large strands.

**Table 6 Percentages of different strand size categories from each wood log group**

<b>Wood Log Group</b>	<b>Screens 1.5" to 0.75" (%)</b>	<b>Screens 0.5" to 0.25" (%)</b>	<b>Fines + Pan (%)</b>
0 Day Sprinkling	22.18	53.81	24.01
10 Days Sprinkling	31.49	51.27	17.24
20 Days Sprinkling	32.43	50.69	16.88
30 Days Sprinkling	32.89	51.53	15.58
Green Pine	41.47	43.12	15.41
Green Aspen	79.26	16.59	4.15
Vacuum-Pressure on MPB Logs	23.33	56.28	20.39



**Figure 30 Percentage of larger strands (1.5" to 0.75") from each wood log group**



**Figure 31 Percentage of small flakes and particles from each wood log group**

In relative terms, the generation of fines during stranding of the MPB logs was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. As a result of water sprinkling, the percentage of larger strands (1.5” to 0.75” screen sizes) was also increased.

The effect of sprinkling for 10, 20 or 30 days should be looked at in relative times rather than absolute terms. The important message is that the addition of moisture to MPB wood will reduce generation of fines and increase the yield of high quality strands. Specific mill scale testing will be required to equate the amount of moisture uptake in log storage piles with the amount of moisture uptake seen in these studies.

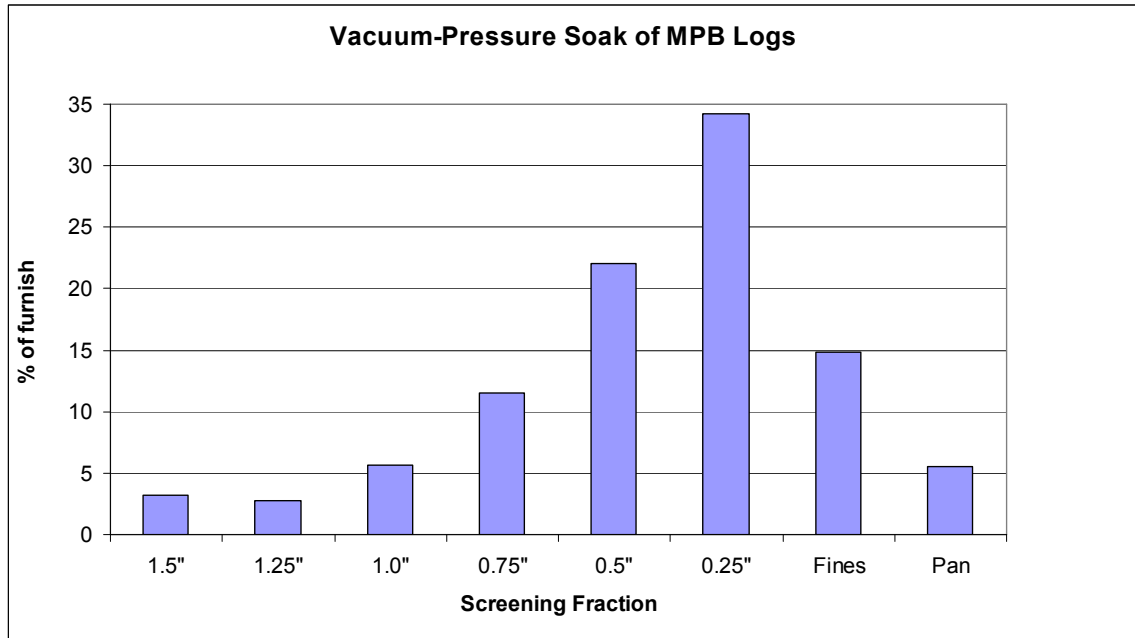
### 3.4 Vacuum-Pressure Treatment

The objective of vacuum-pressure treating dry MPB logs in a water chamber was to examine the effects of extreme hydration on the stranding of these logs. Limited by the scope of this project, only seven MPB log samples of 2-foot lengths were examined.

After being subjected to the vacuum-pressure treatment, the seven water-treated log samples showed average moisture content ranging from 92.7% to 174.1%. The moisture gradient of log sections showed that this treatment effectively increased moisture content of the outer two-inch layer. Moisture contents ranged from below 29% in the core to over 200% in the surface layer. However, as shown by one of the seven log samples, it was possible to introduce moisture into the core of the MPB logs using this kind of treatment.

Figure 32 shows the strand size distribution from these treated MPB logs. The pattern of distribution was similar to that of sprinkled MPB logs. As shown in Table 6, although vacuum-pressure treatment was also effective in reducing the production of fines, it did not seem to be as effective as 10 days of water sprinkling. It appeared to favour the production of mid-size strands

(screen sizes 0.5” to 0.25”) over the large strands (1.5” to 0.75”). Although the study size was small, the results were consistent with those from an earlier study of aspen stranded at different moisture contents (Knudson and Chen 2001). In that study, aspen impregnated with water to get a very high moisture content produced relatively few fines, a large volume of mid-size strands, and few wide strands. It was postulated that the greater mass of the very high moisture content strands created more impact when the strands contacted the counter-knife in the strander, causing more breakage of the wood. The results suggested that achieving an intermediate moisture content will provide the greatest improvement in strand quality manufactured from MPB wood.



**Figure 32 Strand Size Distribution of Vacuum-Pressure Treated MPB Logs**

Results from the conditioning studies pointed out the time-dependent nature of adding moisture to the MPB wood. Conventional water soak conditioning as practised in all Canadian OSB mills is clearly insufficient to introduce moisture, except to the extreme outer regions of the MPB logs. Vacuum-pressure treatment rapidly added large amounts of moisture to the extremely permeable blue-stained sapwood, but added little moisture to the difficult-to-penetrate heartwood. The slower moisture uptake from log sprinkling allowed time for a limited, but apparently important, amount of moisture uptake throughout the logs resulting in reduced fines and an increase in the amount of larger strands. In sprinkling, the amount of moisture increase in the heartwood was small because of the low permeability of the heartwood. However, the normal heartwood moisture content of fresh lodgepole pine heartwood is low at 41% (US Wood Products Laboratory 1999), so high moisture content is probably not necessary for the heartwood of MPB wood to strand similarly to heartwood from fresh, healthy lodgepole pine. Study results suggested that heartwood moisture content near the fibre saturation point was sufficient to reduce fines and increase the amount of large strands.

## 4 Conclusions

The grey stage MPB logs used in this study had little bark, were heavily checked and had relatively even moisture gradients. Their moisture averaged 15% to 25%, about one-half that of the green pine logs and one-third that of green aspen. Their average dry density was about the same as that of green pine but about 23% higher than the dry density of aspen.

Vat conditioning is only effective for increasing moisture in the extreme outer portions of the logs. After water vat conditioning at 15°C for six hours, the moisture content of the MPB logs used in the strander tests increased to an average of 31.4% from 23.8%. The moisture content of the outer 1-inch section of the MPB logs was raised to 35.0% while the moisture content of the inner sections remained at 20.7%.

Strander knife package set-up can have a significant impact on the outcome of strand size distribution as in the case of modified 70° counter-knife angle, where significantly more fines and fewer large size strands were generated. However, the differences between the outcomes of 50°, 60° and 70° counter-knife angles were small. The lack of significant differences among the three counter-knife angles was unexpected as previous experience with other wood types had shown strand width to increase as the counter-knife angle decreased. It remains to be seen whether the results observed in this study are representative of MPB wood or a characteristic of this particular wood sample.

The moisture content of the MPB logs increased after sprinkling and vat conditioning. Vat conditioning alone without sprinkling raised the average moisture content from 19.5% to 30.8%. After 10 days sprinkling, moisture content increased to 48.9%; after 20 days sprinkling, moisture content increased to 59.3%; and after 30 days sprinkling, moisture content increased to 61.2%. Almost three-quarters of the moisture gain was already achieved after 10 days sprinkling; 95% of the moisture gain was achieved after 20 days sprinkling; and not much more was achieved with the additional 10 days sprinkling (30 days).

Similar to vat conditioning, water sprinkling is effective in increasing moisture content in only the outer sections of the logs.

Water sprinkling was an effective method for reducing the production of fines and increasing the proportion of larger strands from MPB logs. The generation of fines during stranding of the MPB logs was reduced by 28% after 10 days sprinkling, by 30% after 20 days sprinkling and by 35% after 30 days sprinkling. Water sprinkling increased the percentage of larger strands (1.5" to 0.75" screen sizes). With most of the benefits already realized after 10 days sprinkling, extending sprinkling time beyond 10 days produced only a small gain. Water sprinkling for 30 days reduced fines to a level similar to that of green pine but it still produced fewer large strands than green pine.

Green aspen produced the smallest amount of fines and the largest amount of large strands.

## 5 Recommendations

There is good potential for improvement in the area of log conditioning to increase moisture uptake in the inner portions of MPB wood. Further development of industrially viable methods to increase the moisture content of MPB wood is strongly recommended. Such work should address both industrial scale-up of sprinkled log storage, and changes to log pond operation as means to increase MPB wood moisture content.

## 6 Acknowledgements

This project was funded by the Government of Canada through the Mountain Pine Beetle Initiative, a six-year, \$40 million program administered by Natural Resources Canada, Canadian Forest Service. Publication does not necessarily signify that the contents of this report reflect the views or policies of Natural Resources Canada – Canadian Forest Service.

Forintek Canada Corp. would also like to thank its industry members, Natural Resources Canada, and the Provinces of British Columbia, Alberta, Quebec, Saskatchewan, Manitoba, Ontario, New Brunswick, Nova Scotia and Newfoundland and Labrador, for their guidance and financial support for this research.

The authors also wish to acknowledge Ritch McDonald and Todd Macey of Carmanah Design and Manufacturing Inc. and the other project liaisons (Dam Nguyen, Louisiana-Pacific; Leo Regnier, Tolko Industries and Ken Lau, Ainsworth Forest Products) for their assistance in planning and carrying out the project. The authors also wish to acknowledge Ainsworth Forest Products for donating the wood.

## 7 Literature Cited

- Knudson, R.M. and Chen, L. 2001. Effect of aspen log moisture content on stranding, strand quality and properties of OSB. Forintek Canada Corp. Report, Contract No. 2001-2322.
- Macey, T. 2004. Personal communication to Bob Knudson.
- Maloney, T.M.; Talbott, J.W.; Strickler, J.W.; Lenz, M.D. and Martin, T. 1976. Composition board from standing dead white pine and dead lodgepole pine. *In*: Proceeding of the 10<sup>th</sup> international particleboard symposium; 1976 March; Pullman, WA: Washington State University, Extension Service 27-104.
- Maloney, T.M. 1981. Comparative economics of manufacturing composition boards from dead timber. *Forest Products Journal* 31(5). 28-36.
- McDonald, R. 2004. Personal communication to Bob Knudson.
- US Forest Products Laboratory. Rev. 1999. *Wood Handbook: Wood as an Engineering Material*. p. 14-16.

**Contacts:**

Martin Feng and Bob Knudson  
Forintek Canada Corp.  
2665 East Mall  
Vancouver, BC V6T 1W5  
Tel: (604) 224-3221  
Fax: (604) 222-5690  
Email: [martin@van.forintek.ca](mailto:martin@van.forintek.ca)  
[knudson@van.forintek.ca](mailto:knudson@van.forintek.ca)





**Appendix I**  
**Data from Strander Set-up Tests**

**MPB Log diameters, moisture and densities before strander set-up tests**

LOG#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	BUTT DIAMETER (in)	TIP DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
1	4665	9260	11.00	10.75	10.88	0.504	31.44	3820	22.1	0.413
2	3615	7365	10.00	9.75	9.88	0.491	30.63	3005	20.3	0.408
3	3875	7985	10.75	10.25	10.50	0.485	30.28	3230	20.0	0.405
4	4420	8825	11.50	10.75	11.13	0.501	31.25	3665	20.6	0.415
5	3320	6750	9.75	9.25	9.50	0.492	30.69	2685	23.6	0.398
6	4400	7410	11.00	9.50	10.25	0.594	37.05	3520	25.0	0.475
7	3760	6235	9.75	9.00	9.38	0.603	37.63	3015	24.7	0.484
8	2490	4332	7.75	7.50	7.63	0.575	35.87	1945	28.0	0.449
9	3200	6435	9.75	9.38	9.56	0.497	31.03	2675	19.6	0.416
10	3620	6780	9.88	9.25	9.56	0.534	33.32	2985	21.3	0.440
11	4155	7295	12.00	10.00	11.00	0.570	35.54	3395	22.4	0.465
12	3575	5860	9.25	9.00	9.13	0.610	38.07	2855	25.2	0.487
13	3715	7345	10.50	9.75	10.13	0.506	31.56	3000	23.8	0.408
14	4420	7455	10.75	10.00	10.38	0.593	37.00	3540	24.9	0.475
15	3175	6200	10.00	9.50	9.75	0.512	31.95	2555	24.3	0.412
16	4965	8625	11.50	10.50	11.00	0.576	35.92	4080	21.7	0.473
17	3690	6640	10.75	9.50	10.13	0.556	34.68	2810	31.3	0.423
18	4155	7245	11.00	10.00	10.50	0.573	35.79	3175	30.9	0.438
19	2600	5400	9.50	8.00	8.75	0.481	30.04	2075	25.3	0.384
20	4085	8090	11.25	10.50	10.88	0.505	31.51	3365	21.4	0.416
					9.99	0.538	33.56	3070	23.8	0.434

## Log diameters, moisture and densities after strander set-up tests

## Set 1 for 50 degree strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity	
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)						
1-1	866.90	1560	11.00	10.75	10.88	0.556	34.68	591.21	46.6	0.379	decay
2-2	663.25	1250	10.00	9.75	9.88	0.531	33.11	507.86	30.6	0.406	
3-3	789.74	1525	10.75	10.25	10.50	0.518	32.31	598.65	31.9	0.393	
4-4	799.72	1465	11.50	10.75	11.13	0.546	34.06	616.61	29.7	0.421	
5-1	641.41	1135	9.75	9.25	9.50	0.565	35.26	448.02	43.2	0.395	decay
6-2	810.10	1300	11.00	9.50	10.25	0.623	38.88	586.85	38.0	0.451	
7-3	652.77	1120	9.75	9.00	9.38	0.583	36.37	500.46	30.4	0.447	
8-4	406.09	698	7.75	7.50	7.63	0.582	36.30	310.88	30.6	0.445	
9-1	442.45	925	9.75	9.38	9.56	0.478	29.85	344.36	28.5	0.372	
10-2	651.83	1190	9.88	9.25	9.56	0.548	34.18	532.46	22.4	0.447	
11-3	703.69	1195	12.00	10.00	11.00	0.589	36.74	526.37	33.7	0.440	
12-4	597.71	1015	9.25	9.00	9.13	0.589	36.75	459.07	30.2	0.452	
13-1	665.66	1250	10.50	9.75	10.13	0.533	33.23	503.92	32.1	0.403	
14-2	809.25	1350	10.75	10.00	10.38	0.599	37.41	637.54	26.9	0.472	
15-3	559.56	1080	10.00	9.50	9.75	0.518	32.33	437.95	27.8	0.406	
16-4	866.55	1450	11.50	10.50	11.00	0.598	37.29	675.44	28.3	0.466	
17-1	775.73	1315	10.75	9.50	10.13	0.590	36.81	500.72	54.9	0.381	
18-2	784.06	1320	11.00	10.00	10.50	0.594	37.06	568.88	37.8	0.431	
19-3	612.78	1180	9.50	8.00	8.75	0.519	32.40	473.09	29.5	0.401	
20-4	721.33	1350	11.25	10.50	10.88	0.534	33.34	567.39	27.1	0.420	
<b>Average</b>					<b>9.99</b>	<b>0.560</b>	<b>34.92</b>	<b>519.39</b>	<b>33.0</b>	<b>0.421</b>	
<b>St. Dev.</b>					<b>0.88</b>	<b>0.037</b>	<b>2.32</b>	<b>92.17</b>	<b>7.7</b>	<b>0.030</b>	

## Set 2 for 60 degree strander counter knife set-up

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity	
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)						
1-2	831.46	1445	11.00	10.75	10.88	0.575	35.91	600.54	38.5	0.416	
2-3	652.46	1260	10.00	9.75	9.88	0.518	32.31	504.09	29.4	0.400	
3-4	684.30	1255	10.75	10.25	10.50	0.545	34.02	511.50	33.8	0.408	
4-1	728.34	1280	11.50	10.75	11.13	0.569	35.51	547.57	33.0	0.428	
5-2	640.42	1135	9.75	9.25	9.50	0.564	35.21	436.30	46.8	0.384	
6-3	761.09	1205	11.00	9.50	10.25	0.632	39.41	558.66	36.2	0.464	
7-4	616.34	1030	9.75	9.00	9.38	0.598	37.34	476.88	29.2	0.463	
8-1	444.20	735	7.75	7.50	7.63	0.604	37.71	331.19	34.1	0.451	
9-2	555.92	1100	9.75	9.38	9.56	0.505	31.54	427.78	30.0	0.389	
10-3	606.05	1115	9.88	9.25	9.56	0.544	33.92	458.25	32.3	0.411	
11-4	670.03	1140	12.00	10.00	11.00	0.588	36.68	508.78	31.7	0.446	
12-1	642.02	1050	9.25	9.00	9.13	0.611	38.15	502.81	27.7	0.479	
13-2	676.09	1270	10.50	9.75	10.13	0.532	33.22	503.95	34.2	0.397	
14-3	762.56	1280	10.75	10.00	10.38	0.596	37.17	594.83	28.2	0.465	
15-4	510.30	1005	10.00	9.50	9.75	0.508	31.68	403.07	26.6	0.401	
16-1	883.24	1525	11.50	10.50	11.00	0.579	36.14	693.03	27.4	0.454	
17-2	670.32	1115	10.75	9.50	10.13	0.601	37.51	494.62	35.5	0.444	
18-3	715.96	1195	11.00	10.00	10.50	0.599	37.39	519.28	37.9	0.435	
19-4	477.84	910	9.50	8.00	8.75	0.525	32.77	380.63	25.5	0.418	
20-1	882.61	1605	11.25	10.50	10.88	0.550	34.31	707.08	24.8	0.441	
<b>Average</b>					<b>9.99</b>	<b>0.567</b>	<b>35.40</b>	<b>508.04</b>	<b>32.1</b>	<b>0.430</b>	
<b>St. Dev.</b>					<b>0.88</b>	<b>0.037</b>	<b>2.32</b>	<b>94.03</b>	<b>5.3</b>	<b>0.028</b>	

**Log diameters, moisture and densities after strander set-up tests**

**Set 3 for 70 degree strander counter knife set-up**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL			AVERAGE		DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1-3	937.87	1465	11.00	10.75	10.88	0.640	39.95	694.66	35.0	0.474		
2-4	574.65	1140	10.00	9.75	9.88	0.504	31.45	460.97	24.7	0.404		
3-1	685.09	1265	10.75	10.25	10.50	0.542	33.79	526.94	30.0	0.417		
4-2	736.78	1460	11.50	10.75	11.13	0.505	31.49	569.64	29.3	0.390		
5-3	580.27	1070	9.75	9.25	9.50	0.542	33.84	438.00	32.5	0.409		
6-4	762.29	1145	11.00	9.50	10.25	0.666	41.54	569.94	33.7	0.498		
7-1	657.18	1055	9.75	9.00	9.38	0.623	38.87	500.21	31.4	0.474		
8-2	370.41	625	7.75	7.50	7.63	0.593	36.98	286.33	29.4	0.458		
9-3	524.97	1020	9.75	9.38	9.56	0.515	32.12	403.29	30.2	0.395		
10-4	525.02	990	9.88	9.25	9.56	0.530	33.09	418.87	25.3	0.423		
11-1	679.13	1120	12.00	10.00	11.00	0.606	37.84	510.71	33.0	0.456		
12-2	659.15	990	9.25	9.00	9.13	0.666	41.55	512.72	28.6	0.518		
13-3	639.28	1120	10.50	9.75	10.13	0.571	35.62	468.34	36.5	0.418		
14-4	675.32	1125	10.75	10.00	10.38	0.600	37.46	544.86	23.9	0.484		
15-1	539.12	1075	10.00	9.50	9.75	0.502	31.29	426.52	26.4	0.397		
16-2	820.02	1390	11.50	10.50	11.00	0.590	36.81	659.07	24.4	0.474		
17-3	628.31	1050	10.75	9.50	10.13	0.598	37.34	436.51	43.9	0.416		
18-4	665.80	1070	11.00	10.00	10.50	0.622	38.83	465.13	43.1	0.435		
19-1	427.50	860	9.50	8.00	8.75	0.497	31.02	333.43	28.2	0.388		
20-2	714.33	1350	11.25	10.50	10.88	0.529	33.02	570.67	25.2	0.423		
<b>Average</b>					<b>9.99</b>	<b>0.572</b>	<b>35.69</b>	<b>489.84</b>	<b>30.7</b>	<b>0.438</b>		
<b>St. Dev.</b>					<b>0.88</b>	<b>0.056</b>	<b>3.48</b>	<b>98.74</b>	<b>5.7</b>	<b>0.039</b>		

**Set 4 for 70 degree modified strander counter knife set-up**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL			AVERAGE		DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1-4	905.47	1565	11.00	10.75	10.88	0.579	36.10	682.68	32.6	0.436		
2-1	671.45	1285	10.00	9.75	9.88	0.523	32.61	542.95	23.7	0.423		
3-2	800.43	1450	10.75	10.25	10.50	0.552	34.45	615.73	30.0	0.425		
4-3	854.04	1520	11.50	10.75	11.13	0.562	35.06	670.37	27.4	0.441		
5-4	597.86	1095	9.75	9.25	9.50	0.546	34.07	435.87	37.2	0.398		
6-1	874.89	1450	11.00	9.50	10.25	0.603	37.65	673.17	30.0	0.464		
7-2	704.56	1130	9.75	9.00	9.38	0.624	38.91	530.92	32.7	0.470		
8-3	432.57	735	7.75	7.50	7.63	0.589	36.72	336.53	28.5	0.458		
9-4	580.01	1090	9.75	9.38	9.56	0.532	33.20	441.48	31.4	0.405		
10-1	675.35	1270	9.88	9.25	9.56	0.532	33.18	553.99	21.9	0.436		
11-2	850.48	1400	12.00	10.00	11.00	0.607	37.91	652.25	30.4	0.466		
12-3	620.92	1025	9.25	9.00	9.13	0.606	37.80	485.18	28.0	0.473		
13-4	662.27	1195	10.50	9.75	10.13	0.554	34.58	480.09	37.9	0.402		
14-3	855.99	1385	10.75	10.00	10.38	0.618	38.57	684.92	25.0	0.495		
15-2	620.76	1210	10.00	9.50	9.75	0.513	32.01	493.26	25.8	0.408		
16-3	889.28	1465	11.50	10.50	11.00	0.607	37.88	701.65	26.7	0.479		
17-4	716.49	1180	10.75	9.50	10.13	0.607	37.89	507.14	41.3	0.430		
18-1	855.91	1440	11.00	10.00	10.50	0.594	37.09	648.47	32.0	0.450		
19-2	450.96	890	9.50	8.00	8.75	0.507	31.62	350.55	28.6	0.394		
20-3	792.57	1410	11.25	10.50	10.88	0.562	35.08	627.67	26.3	0.445		
<b>Average</b>					<b>9.99</b>	<b>0.571</b>	<b>35.62</b>	<b>555.74</b>	<b>29.9</b>	<b>0.440</b>		
<b>St. Dev.</b>					<b>0.88</b>	<b>0.037</b>	<b>2.33</b>	<b>113.10</b>	<b>4.9</b>	<b>0.029</b>		

MPBI Project # 3.25  
 Improving Value Recovery of OSB from Post-Mountain Pine Beetle Wood

**Moisture Gradient**  
 Beetle Killed Logs  
 Measured initially after cutting

	Green wt	Dry Wt	%MC		Green wt	Dry Wt	%MC		Green wt	Dry Wt	%MC	
1-1	44.56	36.05	23.6		8-1	44.27	35.56	24.5	14-1	32.38	25.71	25.9
1-2	44.43	35.2	26.2		8-2	47.43	38.05	24.7	14-2	30.82	25.85	19.2
1-3	52.36	41.44	26.4		8-3	44.86	35.74	25.5	14-3	26.34	22.1	19.2
1-4	49.93	39.18	27.4		8-4	44.83	35.52	26.2	14-4	29.17	24.49	19.1
1-5	48.82	38.02	28.4		8-5	44.41	35.67	24.5	14-5	22.13	18.64	18.7
1-6	46.83	37.14	26.1		8-6	26.63	21.43	24.3	14-6	25.94	21.81	18.9
1-7	49.99	40.46	23.6		8-7	35.17	28.52	23.3	14-7	18.8	15.71	19.7
1-8	56.55	46.6	21.4						14-8	25.93	21.21	22.3
1-9	63.07	52.63	19.8		9-1	40.78	34.38	18.6	14-9	31.43	21.31	47.5
					9-2	43.42	36.63	18.5				pitch
2-1	32.07	27.11	18.3		9-3	40.94	34.53	18.6	15-1	33.64	27.54	22.1
2-2	32.62	27.18	20.0		9-4	46.6	39.21	18.8	15-2	32.98	27.56	19.7
2-3	32.67	26.98	21.1		9-5	38.58	32.32	19.4	15-3	29.68	24.52	21.0
2-4	37.22	30.74	21.1		9-6	39.79	32.92	20.9	15-4	31.72	25.87	22.6
2-5	34.72	28.4	22.3		9-7	46.41	38.22	21.4	15-5	30.76	25.17	22.2
2-6	31.41	25.98	20.9						15-6	26.06	21.22	22.8
2-7	30.49	25.41	20.0		10-1	40.64	32.76	24.1	15-7	25.91	20.52	26.3
2-8	40.94	34.54	18.5		10-2	42.84	36.31	18.0				
					10-3	44.2	37.75	17.1	16-1	37.66	31	21.5
3-1	38.57	30.59	26.1		10-4	42.82	36.35	17.8	16-2	41.93	35.63	17.7
3-2	43.09	35.72	20.6		10-5	41.88	35.78	17.0	16-3	42.15	35.91	17.4
3-3	39.48	33.46	18.0		10-6	44.18	36.68	20.4	16-4	40.81	34.79	17.3
3-4	39.77	33.41	19.0						16-5	35.17	29.43	19.5
3-5	40.64	34.45	18.0		11-1	40.56	33.68	20.4	16-6	36.02	30.74	17.2
3-6	42.48	35.66	19.1		11-2	46.24	38.8	19.2	16-7	37.00	31.61	17.1
3-7	28.77	23.92	20.3		11-3	48.1	40.09	20.0	16-8	36.91	31.56	17.0
					11-4	45.6	37.6	21.3	16-9	39.15	32.26	21.4
4-1	40.25	33.9	18.7		11-5	47.5	39.15	21.3				
4-2	46.07	39.03	18.0		11-6	51.31	42.52	20.7	17-1	30.79	25.7	19.8
4-3	43.08	35.96	19.8		11-7	60.43	50.03	20.8	17-2	35.83	29.48	21.5
4-4	39.78	32.24	23.4		11-8	39.28	31.69	24.0	17-3	36.76	30.39	21.0
4-5	42.34	33.3	27.1		11-9	42.47	34.41	23.4	17-4	31.37	25.5	23.0
4-6	46.21	38.21	20.9						17-5	31.54	25.85	22.0
4-7	47.91	40.35	18.7		12-1	38.01	31.3	21.4	17-6	34.68	28.24	22.8
4-8	39.25	33.26	18.0		12-2	27.97	21.7	28.9	17-7	22.04	17.39	26.7
4-9	31.42	26.59	18.2		12-3	32.25	26.3	22.6	17-8	23.68	15.84	49.5
					12-4	27.71	22.46	23.4	17-9	33.57	21.42	56.7
5-1	39.26	32.34	21.4		12-5	28.15	22.65	24.3				
5-2	46.56	39.1	19.1		12-6	28.18	22.56	24.9	18-1	47.33	31.37	50.9
5-3	49.39	41.48	19.1		12-7	26.82	21.37	24.6	18-2	43.51	34.26	27.0
5-4	52.39	42.65	22.8		12-8	29.86	24.1	23.9	18-3	42.44	34.44	23.2
5-5	47.37	38.72	22.3		12-9	31.96	25.62	24.7	18-4	43.94	36.18	21.4
5-6	37.33	30.31	23.2		12-10	30.50	21.26	43.5	18-5	46.35	38.82	19.4
5-7	43.69	35.55	22.9						18-6	43.09	36.38	18.4
					13-1	38.63	30.35	27.3	18-7	30.15	25.61	17.7
6-1	60.09	39.8	51.0	decay	13-2	40.41	33.9	19.2	18-8	37.27	31.47	18.4
6-2	56.16	45.58	23.2		13-3	40.24	33.88	18.8	18-9	45.02	36.43	23.6
6-3	55.00	45.25	21.5		13-4	38.37	31.77	20.8				
6-4	50.41	41.89	20.3		13-5	37.75	31.58	19.5	19-1	20.8	17.32	20.1
6-5	48.18	40.03	20.4		13-6	35.49	29.58	20.0	19-2	20.81	17.73	17.4
6-6	49.61	39.92	24.3		13-7	13.75	11.48	19.8	19-3	23.51	20.31	15.8
6-7	52.85	40.79	29.6		13-8	29.41	24.33	20.9	19-4	23.46	20.25	15.9
									19-5	25.76	21.86	17.8
7-1	29.06	23.87	21.7						19-6	24.51	20.97	16.9
7-2	29.89	25.22	18.5						19-7	25.4	21.69	17.1
7-3	29.5	24.89	18.5						19-8	16.36	13.87	18.0
7-4	26.79	22.43	19.4						19-9	37.05	28.52	29.9
7-5	27.45	22.71	20.9									
7-6	29.6	24.82	19.3						20-1	25.89	21.93	18.1
7-7	32.1	26.85	19.6						20-2	29.53	25.21	17.1
7-8	30.83	25.19	22.4						20-3	27.78	23.97	15.9
7-9	17.18	14.16	21.3						20-4	26.48	22.89	15.7
									20-5	26.36	22.92	15.0
									20-6	27.35	23.7	15.4
									20-7	23.85	20.57	15.9
									20-8	25.79	22.25	15.9
									20-9	24.52	21.13	16.0
									20-10	29.33	24.95	17.6
									20-11	15.70	13.39	17.3

MPBI Project # 3.25  
 Improving Value Recovery of OSB from Post-Mountain Pine Beetle Wood

**Moisture Gradient for set #1**  
 MPB log samples after stranding

Set 1	50 deg knife		22-Apr										
Log#	Green wt	Dry Wt	%MC		Log#	Green wt	Dry Wt	%MC		Log#	Green wt	Dry Wt	%MC
<b>1-1</b>					<b>8-4</b>					<b>15-3</b>			
1-1	26.40	16.65	58.56	decay	8-1	26.22	21.49	22.01		15-1	7.50	5.90	27.12
1-2	19.09	15.44	23.64		8-2	17.73	14.49	22.36		15-2	17.99	15.06	19.46
1-3	16.63	13.43	23.83		8-3	18.81	15.15	24.16		15-3	16.56	13.78	20.17
1-4	15.54	12.44	24.92		8-4	20.18	16.20	24.57		15-4	17.68	14.69	20.35
1-5	16.60	12.93	28.38		8-5	21.22	16.92	25.41		15-5	20.79	17.08	21.72
1-6	16.10	12.57	28.08		8-6	21.36	15.47	38.07		15-6	18.50	15.40	20.13
1-7	17.42	13.63	27.81							15-7	17.41	14.51	19.99
1-8	18.54	14.24	30.20		<b>9-1</b>					15-8	17.99	15.06	19.46
1-9	12.71	6.64	91.42	decay	9-1	19.66	16.03	22.65		15-9	17.39	14.24	22.12
					9-2	17.04	14.53	17.27					
<b>2-2</b>					9-3	15.47	13.11	18.00		<b>16-4</b>			
2-1	10.08	8.16	23.53		9-4	16.09	13.51	19.10		16-1	37.23	30.26	23.03
2-2	18.81	15.58	20.73		9-5	17.15	14.27	20.18		16-2	20.88	17.76	17.57
2-3	16.90	14.02	20.54		9-6	16.60	14.03	18.32		16-3	21.77	18.54	17.42
2-4	16.31	13.54	20.46		9-7	16.89	14.38	17.45		16-4	19.18	16.25	18.03
2-5	16.18	13.26	22.02		9-8	16.71	14.07	18.76		16-5	20.19	16.85	19.82
2-6	17.03	13.71	24.22							16-6	21.23	18.17	16.84
2-7	17.10	13.88	23.20		<b>10-2</b>					16-7	20.90	17.91	16.69
2-8	18.85	15.50	21.61		10-1	30.19	24.90	21.24		16-8	20.87	17.42	19.80
2-9	19.71	16.20	21.67		10-2	17.80	15.29	16.42		16-9	20.78	15.34	35.46
					10-3	16.05	13.76	16.64					
<b>3-3</b>					10-4	18.84	15.92	18.34		<b>17-1</b>			
3-1	33.68	23.44	43.69	decay	10-5	20.21	17.49	15.55		17-1	22.18	11.07	100.36
3-2	16.73	14.10	18.65		10-6	17.97	15.43	16.46		17-2	19.21	13.89	38.30
3-3	17.26	14.66	17.74		10-6	18.19	15.42	17.96		17-3	18.62	14.57	27.80
3-4	15.92	13.53	17.66		10-7	18.16	14.75	23.12		17-4	18.60	14.63	27.14
3-5	15.94	13.29	19.94							17-5	17.03	13.67	24.58
3-6	15.84	13.37	18.47		<b>11-3</b>					17-6	17.69	14.38	23.02
3-7	16.78	14.09	19.09		11-1	26.55	18.59	42.82	decay	17-7	19.29	15.76	22.40
3-8	18.22	14.53	25.40		11-2	20.80	17.32	20.09		17-8	18.43	14.99	22.95
3-9	17.22	12.54	37.32	decay	11-3	19.83	16.48	20.33		17-9	19.14	14.74	29.85
					11-4	17.95	14.83	21.04					
<b>4-4</b>					11-5	18.17	14.96	21.46		<b>18-2</b>			
4-1	24.47	19.43	25.94		11-6	18.76	15.51	20.95		18-1	24.82	20.54	20.84
4-2	17.09	14.09	21.29		11-7	19.25	15.99	20.39		18-2	20.84	17.74	17.47
4-3	16.75	13.66	22.62		11-8	19.63	15.91	23.38		18-3	20.56	17.46	17.75
4-4	16.73	13.43	24.57		11-9	21.93	14.23	54.11	decay	18-4	19.30	16.29	18.48
4-5	17.79	14.42	23.37							18-5	20.17	16.87	19.56
4-6	15.87	13.24	19.86		<b>12-4</b>					18-6	19.38	15.95	21.50
4-7	16.25	13.78	17.92		12-1	17.02	13.01	30.82		18-7	19.10	15.63	22.20
4-8	16.25	13.81	17.67		12-2	22.68	18.70	21.28		18-8	19.51	15.37	26.94
4-9	17.60	14.40	22.22		12-3	21.79	17.78	22.55		18-9	21.84	13.57	60.94
					12-4	18.74	15.16	23.61					
<b>5-1</b>					12-5	19.12	15.22	25.62		<b>19-3</b>			
5-1	19.77	12.50	58.16	decay	12-6	18.80	15.07	24.75		19-1	13.99	11.70	19.57
5-2	18.21	14.83	22.79		12-7	22.06	17.84	23.65		19-2	16.58	14.11	17.51
5-3	17.17	14.30	20.07		12-8	22.03	17.43	26.39		19-3	16.57	14.22	16.53
5-4	17.43	14.44	20.71							19-4	15.98	13.51	18.28
5-5	15.97	13.16	21.35		<b>13-1</b>					19-5	15.85	13.66	16.03
5-6	17.82	15.02	18.64		13-1	14.41	8.51	69.33	decay	19-6	17.63	15.17	16.22
5-7	17.93	15.06	19.06		13-2	20.14	14.78	36.27	decay	19-7	20.94	17.35	20.69
5-8	18.32	13.91	31.70	decay	13-3	17.74	14.98	18.42		19-8			
5-9	7.76	4.59	69.06	decay	13-4	18.73	15.82	18.39					
					13-5	16.39	13.70	19.64		<b>20-4</b>			
<b>6-2</b>					13-6	16.17	13.54	19.42		20-1	20.73	16.80	23.39
6-1	22.73	15.36	47.98	decay	13-7	17.49	14.85	17.78		20-2	18.43	15.62	17.99
6-2	21.62	16.58	30.40		13-8	16.72	14.04	19.09		20-3	16.66	14.35	16.10
6-3	19.77	16.37	20.77		13-9	15.15	12.09	25.31		20-4	16.27	14.05	15.80
6-4	19.65	16.39	19.89							20-5	16.22	13.54	19.79
6-5	19.25	16.11	19.49		<b>14-2</b>					20-6	16.01	13.77	16.27
6-6	18.91	15.38	22.95		14-1	16.11	13.18	22.23		20-7	17.73	15.30	15.88
6-7	20.73	16.94	22.37		14-2	23.08	19.58	17.88		20-8	19.06	15.76	20.94
6-8	21.02	16.61	26.55		14-3	22.15	18.81	17.76		20-9	16.71	12.71	31.47
6-8	20.08	14.96	34.22	decay	14-4	19.30	16.43	17.47					
					14-5	19.46	15.62	24.58					
<b>7-3</b>					14-6	18.61	15.76	18.08					
7-1	19.59	16.24	20.63		14-7	21.00	17.77	18.18					
7-2	21.04	17.86	17.81		14-8	21.48	17.91	19.83					
7-3	19.00	16.07	18.23		14-9	17.35	13.86	25.18					
7-4	18.91	15.50	22.00	check									
7-5	19.06	15.94	19.57										
7-6	20.56	17.25	19.19										
7-7	20.18	16.63	21.35										
7-8	21.25	15.08	40.92	decay									

MPBI Project # 3.25  
 Improving Value Recovery of OSB from Post-Mountain Pine Beetle Wood

Moisture Gradient for set #2

MPB log samples after stranding

Set 2	60 deg knife		23-Apr		Log#				Log#			
Log#	Green wt	Dry Wt	%MC		Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC
<b>1-2</b>					<b>8-1</b>				<b>15-4</b>			
1-1	17.99	12.76	40.99		8-1	17.01	13.89	22.46	15-1	14.34	11.54	24.26
1-2	17.31	14.16	22.25		8-2	19.97	16.50	21.03	15-2	17.21	14.18	21.37
1-3	17.55	14.51	20.95		8-3	19.58	16.05	21.99	15-3	16.63	13.82	20.33
1-4	16.27	13.37	21.69		8-4	19.27	15.52	24.16	15-4	15.41	12.74	20.96
1-5	16.12	13.06	23.43		8-5	18.49	14.67	26.04	15-5	17.10	14.01	22.06
1-6	16.28	12.96	25.62		8-6	21.19	16.78	26.28	15-6	16.05	13.37	20.04
1-7	17.05	13.58	25.55		8-7	18.48	13.71	34.79	15-7	17.48	14.58	19.89
1-8	18.15	14.35	26.48						15-8	22.21	18.37	20.90
1-9	19.42	13.12	48.02	decay	<b>9-2</b>				<b>16-1</b>			
1-10	16.31	8.64	88.77	decay	9-1	20.39	15.41	32.32	16-1	21.36	16.08	32.84
					9-2	18.33	14.96	22.53	16-2	23.35	19.64	18.89
<b>2-3</b>					9-3	16.67	14.06	18.56	16-3	22.19	18.81	17.97
2-1	18.37	14.87	23.54		9-4	15.63	13.14	18.95	16-4	22.36	18.88	18.43
2-2	18.16	15.23	19.24		9-5	17.73	14.95	18.60	16-5	19.25	16.05	19.94
2-3	15.78	13.15	20.00		9-6	15.61	13.24	17.90	16-6	18.75	15.75	19.05
2-4	14.90	12.39	20.26		9-7	16.50	13.95	18.28	16-7	17.88	15.16	17.94
2-5	16.58	13.43	23.45		9-8	14.25	11.71	21.69	16-8	18.79	15.86	18.47
2-6	15.11	12.43	21.56						16-9	20.60	16.43	25.38
2-7	15.88	13.24	19.94		<b>10-3</b>				16-10	13.19	9.68	36.26
2-8	17.80	14.84	19.95		10-1	19.18	14.52	32.09				
2-9	22.17	18.08	22.62		10-2	19.06	16.03	18.90				
					10-3	19.27	16.54	16.51	<b>17-2</b>			
<b>3-4</b>					10-4	20.01	17.05	17.36	17-1	19.11	12.32	55.11
3-1	20.09	13.98	43.71		10-5	23.02	19.85	15.97	17-2	19.27	15.46	24.64
3-2	19.65	15.09	30.22		10-6	18.14	15.60	16.28	17-3	18.30	15.07	21.43
3-3	17.14	14.51	18.13		10-7	19.99	16.99	17.66	17-4	16.76	13.68	22.51
3-4	17.31	14.21	21.82		10-8	24.37	18.50	31.73	17-5	17.26	14.07	22.67
3-5	15.89	13.19	20.47						17-6	17.42	14.24	22.33
3-6	16.51	14.01	17.84		<b>11-4</b>				17-7	18.70	15.08	24.01
3-7	16.91	14.43	17.19		11-1	21.42	15.02	42.61	17-8	21.67	13.79	57.14
3-8	18.65	15.36	21.42		11-2	19.35	15.90	21.70	17-9	16.18	9.71	66.63
3-9	18.01	14.16	27.19		11-3	18.60	15.43	20.54				
					11-4	18.51	15.25	21.38	<b>18-3</b>			
<b>4-1</b>					11-5	18.32	14.96	22.46	18-1	16.93	12.89	31.34
4-1	17.61	13.21	33.31		11-6	17.74	14.56	21.84	18-2	18.58	15.85	17.22
4-2	16.32	12.89	26.61		11-7	18.46	15.22	21.29	18-3	19.27	16.34	17.93
4-3	18.56	15.39	20.60		11-8	19.16	15.58	22.98	18-4	19.37	16.03	20.84
4-4	18.33	15.31	19.73		11-9	20.25	15.63	29.56	18-5	20.71	17.23	20.20
4-5	17.28	14.27	21.09						18-6	18.48	15.07	22.63
4-6	18.10	14.97	20.91		<b>12-1</b>				18-7	18.63	14.88	25.20
4-7	20.36	16.90	20.47		12-1	22.11	18.05	22.49	18-8	18.95	14.12	34.21
4-8	28.67	21.16	35.49		12-2	22.11	18.10	22.15	18-9	8.94	5.15	73.59
					12-3	18.84	15.43	22.10				
<b>5-2</b>					12-4	18.45	15.03	22.75	<b>19-4</b>			
5-1	16.89	12.31	37.21		12-5	18.48	14.99	23.28	19-1	26.90	22.47	19.72
5-2	17.40	14.32	21.51		12-6	19.45	16.02	21.41	19-2	21.12	18.20	16.04
5-3	16.01	13.53	18.33		12-7	21.91	18.11	20.98	19-3	18.76	16.12	16.38
5-4	15.78	13.25	19.09		12-8	21.09	17.18	22.76	19-4	17.21	14.27	20.60
5-5	16.52	13.34	23.84						19-5	17.18	14.83	15.85
5-6	17.02	13.85	22.89		<b>13-2</b>				19-6	21.57	18.71	15.29
5-7	18.57	15.10	22.98		13-1	22.02	12.98	69.65	19-7	23.46	19.57	19.88
5-8	22.23	15.04	47.81		13-2	20.48	15.40	32.99				
5-9	9.70	5.87	65.25		13-3	18.60	15.82	17.57	<b>20-1</b>			
					13-4	19.06	16.15	18.02	20-1	17.44	14.64	19.13
<b>6-3</b>					13-5	16.82	14.07	19.55	20-2	18.47	15.85	16.53
6-1	22.31	15.85	40.76	decay	13-6	17.44	14.84	17.52	20-3	16.19	14.09	14.90
6-2	21.96	18.01	21.93		13-7	17.55	15.00	17.00	20-4	16.30	14.18	14.95
6-3	20.78	17.55	18.40		13-8	16.87	13.93	21.11	20-5	17.58	15.16	15.96
6-4	19.73	16.50	19.58		13-9	10.45	7.37	41.79	20-6	21.70	18.90	14.81
6-5	18.74	15.38	21.85						20-7	17.15	14.81	15.80
6-6	21.41	17.65	21.30		<b>14-3</b>				20-8	19.94	17.16	16.20
6-7	22.32	17.92	24.55		14-1	19.76	16.05	23.12	20-9	18.00	15.22	18.27
6-8	13.18	8.35	57.84		14-2	21.77	18.42	18.19	20-10	22.21	17.63	25.98
6-9	25.46	16.12	57.94		14-3	20.23	17.31	16.87				
					14-4	18.47	15.70	17.64				
<b>7-4</b>					14-5	18.00	14.62	23.12				
7-1	20.70	15.93	29.94		14-6	18.43	15.73	17.16				
7-2	21.11	17.76	18.86		14-7	20.47	17.49	17.04				
7-3	19.63	16.78	16.98		14-8	21.58	18.21	18.51				
7-4	22.19	18.93	17.22		14-9	18.77	15.33	22.44				
7-5	23.96	20.34	17.80									
7-6	22.54	19.21	17.33									
7-7	22.59	19.25	17.35									
7-8	23.83	19.86	19.99									

**Moisture Gradient for set #3**

MPB log samples after stranding

Set 3 Log#	70 deg knife Green wt	Dry Wt	29-Apr %MC	Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC
1-3				8-2				15-1			
1-1	18.69	12.07	54.85	8-1	20.53	14.75	39.19	15-2	14.23	11.64	22.25
1-2	16.85	13.46	25.19	8-2	19.25	15.63	23.16	15-3	15.28	12.87	18.73
1-3	16.87	13.35	26.37	8-3	19.12	15.55	22.96	15-4	14.67	12.17	20.54
1-4	15.72	12.47	26.06	8-4	17.82	14.35	24.18	15-5	14.04	11.41	23.05
1-5	15.87	12.65	25.45	8-5	17.78	14.57	22.03	15-6	15.52	12.76	21.63
1-6	17.25	14.07	22.60	8-6	19.81	16.40	20.79	15-7	14.23	11.87	19.88
1-7	17.43	15.55	12.09	8-7	17.57	14.47	21.42	15-8	15.32	12.89	18.85
1-8	17.34	14.41	20.33					15-8	21.86	18.46	18.42
1-9	17.35	14.37	20.74	9-3				16-2			
1-10	17.32	10.27	68.65	9-1	16.70	12.24	36.44	16-1	17.87	15.73	13.60
				9-2	16.19	13.39	20.91	16-2	18.67	15.42	21.08
2-4				9-3	14.43	12.11	19.16	16-3	18.15	15.48	17.25
2-1	17.83	14.98	19.03	9-4	15.58	13.07	19.20	16-4	18.19	15.50	17.35
2-2	17.57	14.72	19.36	9-5	15.24	12.86	18.51	16-5	18.44	15.85	16.34
2-3	14.68	12.30	19.35	9-6	15.10	12.84	17.60	16-6	18.76	15.80	18.73
2-4	13.69	11.36	20.51	9-7	15.51	13.21	17.41	16-7	21.11	17.94	17.67
2-5	14.78	12.19	21.25	9-8	17.62	13.70	28.61	16-8	19.49	16.58	17.55
2-6	13.35	11.09	20.38					16-9	20.13	17.01	18.34
2-7	13.58	11.35	19.65	10-4				16-10	12.48	9.96	25.30
2-8	21.85	18.27	19.59	10-1	19.80	14.89	32.98				
2-9	11.94	9.88	20.85	10-2	16.55	14.04	17.88	17-3			
				10-3	16.59	14.29	16.10	17-1	22.65	13.73	64.97
3-1				10-4	17.69	15.20	16.38	17-2	18.94	14.92	26.94
3-1	19.93	13.55	47.08	10-5	16.47	14.06	17.14	17-3	17.42	14.10	23.55
3-2	16.29	13.66	19.25	10-6	17.40	14.92	16.62	17-4	17.06	13.86	23.09
3-3	15.91	13.56	17.33	10-7	15.68	13.00	20.62	17-5	16.00	13.18	21.40
3-4	20.58	17.72	16.14	10-8	22.36	14.27	56.69	17-6	18.33	15.22	20.43
3-5	18.17	15.50	17.23					17-7	19.06	15.42	23.61
3-6	17.68	15.21	16.24	11-1				17-8	21.56	14.52	48.48
3-7	16.21	13.88	16.79	11-1	10.90	8.46	28.84				
3-8	17.69	14.95	18.33	11-2	15.10	12.47	21.09	18-4			
3-9	17.19	14.29	20.29	11-3	18.02	14.70	22.59	18-1	22.57	14.20	58.94
				11-4	18.75	15.23	23.11	18-2	21.88	15.21	43.85
4-2				11-5	19.13	15.54	23.10	18-3	19.14	15.63	22.46
4-1	20.19	13.76	46.73	11-6	19.45	15.93	22.10	18-4	18.26	14.92	22.39
4-2	17.22	14.22	21.10	11-7	18.40	15.15	21.45	18-5	20.51	16.62	23.41
4-3	17.57	14.40	22.01	11-8	17.94	14.55	23.30	18-6	19.39	15.49	25.18
4-4	16.11	12.86	25.27	11-9	9.20	7.59	21.21	18-7	18.73	14.69	27.50
4-5	17.08	13.71	24.58	11-10	18.46	13.90	32.81	18-8	22.18	14.49	53.07
4-6	17.31	14.46	19.71					18-9	18.16	11.21	62.00
4-7	17.39	14.84	17.18	12-2				19-1			
4-8	16.29	14.03	16.11	12-1	20.96	16.44	27.49	19-1	18.42	13.54	36.04
4-9	22.59	18.62	21.32	12-2	19.71	15.97	23.42	19-2	16.14	13.49	19.64
				12-3	17.91	14.52	23.35	19-3	17.52	15.02	16.64
5-3				12-4	21.35	17.38	22.84	19-4	16.13	13.27	21.55
5-1	25.91	17.69	46.47	12-5	21.44	17.38	23.36	19-5	15.86	13.53	17.22
5-2	17.83	14.77	20.72	12-6	13.81	11.21	23.19	19-6	15.41	13.27	16.13
5-3	16.21	13.59	19.28	12-7	21.31	16.78	27.00	19-7	8.89	7.58	17.28
5-4	15.49	12.95	19.61	12-8	26.31	20.53	28.15	19-8	12.79	10.61	20.55
5-5	15.60	13.09	19.17					20-2			
5-6	15.97	13.50	18.30	13-3				20-1	16.82	13.41	25.43
5-7	16.74	14.00	19.57	13-1	16.76	10.59	58.26	20-2	17.22	14.66	17.46
5-8	17.18	12.65	35.81	13-2	17.42	13.94	24.96	20-3	15.16	13.06	16.08
				13-3	17.15	14.23	20.52	20-4	15.49	13.36	15.94
6-1	21.35	17.75	20.28	13-4	15.78	12.80	23.28	20-5	15.52	13.39	15.91
6-2	22.65	18.91	19.78	13-5	16.72	13.97	19.69	20-6	15.57	13.50	15.33
6-3	20.89	17.49	19.44	13-6	16.75	14.15	18.37	20-7	16.14	13.88	16.28
6-4	20.24	16.90	19.76	13-7	16.86	14.29	17.98	20-8	17.76	15.29	16.15
6-5	18.58	15.18	22.40	13-8	9.57	8.16	17.28	20-9	17.78	15.10	17.75
6-6	19.32	15.95	21.13	13-9	14.32	11.87	20.64	20-10	14.93	12.50	19.44
6-7	21.88	17.54	24.74								
6-8	31.24	18.25	71.18	14-4							
				14-1	20.75	16.67	24.48				
7-1				14-2	21.80	18.59	17.27				
7-1	20.14	16.07	25.33	14-3	20.99	17.95	16.94				
7-2	20.14	16.83	19.67	14-4	20.03	16.72	19.80				
7-3	19.45	16.41	18.53	14-5	18.28	15.20	20.26				
7-4	18.31	15.22	20.30	14-6	18.40	15.31	20.18				
7-5	17.96	15.00	19.73	14-7	16.78	14.18	18.34				
7-6	19.92	16.70	19.28	14-8	20.92	16.52	26.63				
7-7	20.18	16.62	21.42	14-9	9.75	7.47	30.52				
7-8	31.94	22.72	40.58								



MPBI Project # 3.25  
 Improving Value Recovery of OSB from Post-Mountain Pine Beetle Wood

Moisture Gradient for set #4

MPB log samples after stranding

Set 4	70 deg knife (modified)		18-May			MPB log samples after stranding					MPB log samples after stranding				
Log#	Green wt	Dry Wt	%MC		Log#	Green wt	Dry Wt	%MC		Log#	Green wt	Dry Wt	%MC		
1-4					8-3					15-2					
1-1	20.73	14.14	46.61	decay	8-1	17.21	12.43	38.46	decay	15-1	18.35	15.48	18.54		
1-2	19.12	15.75	21.40		8-2	21.77	17.85	21.96		15-2	18.26	15.52	17.65		
1-3	18.32	14.87	23.20		8-3	19.74	16.14	22.30		15-3	17.07	14.32	19.20		
1-4	17.42	13.96	24.79		8-4	18.15	14.87	22.06		15-4	19.91	16.59	20.01		
1-5	18.33	13.60	34.78		8-5	19.38	16.12	20.22		15-5	20.11	16.57	21.36		
1-6	16.88	13.37	26.25		8-6	18.46	15.56	18.64		15-6	20.05	16.81	19.27		
1-7	19.37	15.74	23.06		8-7	11.99	10.07	19.07		15-7	18.25	15.39	18.58		
1-8	21.36	17.69	20.75							15-8	20.88	17.10	22.11		
1-9	23.44	19.07	22.92		9-4					16-3					
2-1					9-1	15.65	13.38	16.97		16-1	18.95	15.87	19.41		
2-1	12.57	10.57	18.92		9-2	17.69	15.20	16.38		16-2	20.45	17.56	16.46		
2-2	18.63	15.80	17.91		9-3	18.80	16.06	17.06		16-3	18.91	16.13	17.23		
2-3	17.24	14.56	18.41		9-4	17.94	15.12	18.65		16-4	18.42	15.66	17.62		
2-4	15.89	13.30	19.47		9-5	19.44	16.38	18.68		16-5	18.35	15.33	19.70		
2-5	19.31	16.27	18.68		9-6	17.49	14.79	18.26		16-6	18.69	15.91	17.47		
2-6	17.68	14.84	19.14		9-7	19.51	16.36	19.25		16-7	21.37	18.21	17.35		
2-7	15.57	13.08	19.04		9-8	22.32	17.33	28.79		16-8	23.19	19.83	16.94		
2-8	17.05	14.43	18.16		10-1					16-9	32.31	27.30	18.35		
2-9	16.81	13.95	20.50		10-1	21.83	18.36	18.90		17-4					
3-2					10-2	20.20	17.46	15.69		17-1	18.89	13.26	42.46	decay	
3-1	22.09	14.83	48.95	decay	10-3	18.32	15.80	15.95		17-2	19.51	15.40	26.69		
3-2	19.09	15.99	19.39		10-4	17.94	15.19	18.10		17-3	19.23	15.77	21.94		
3-3	17.93	15.15	18.35		10-5	19.33	16.55	16.80		17-4	17.92	14.77	21.33		
3-4	19.19	16.18	18.60		10-6	18.58	15.97	16.34		17-5	17.32	14.21	21.89		
3-5	20.12	17.17	17.18		10-7	18.70	16.15	15.79		17-6	18.16	15.02	20.91		
3-6	16.83	14.43	16.63		10-8	19.97	16.97	17.68		17-7	18.84	15.64	20.46		
3-7	18.42	15.89	15.92		11-2					17-8	20.53	16.53	24.20		
3-8	19.09	15.93	19.84		11-1	15.45	12.43	24.30		17-9	11.44	7.32	56.28	decay	
3-9	14.55	12.01	21.15		11-2	19.81	16.69	18.69		18-1					
4-3					11-3	18.77	15.75	19.17		18-1	21.92	15.03	45.84	decay	
4-1	10.94	8.65	26.47		11-4	19.98	16.58	20.51		18-2	18.88	15.30	23.40		
4-2	20.14	17.27	16.62		11-5	18.99	15.68	21.11		18-3	18.74	15.42	21.53		
4-3	18.77	15.94	17.75		11-6	19.99	16.50	21.15		18-4	20.63	16.93	21.85		
4-4	16.10	13.34	20.69		11-7	19.53	16.38	19.23		18-5	21.19	17.72	19.58		
4-5	18.30	14.83	23.40		11-8	20.97	17.88	17.28		18-6	19.96	16.86	18.39		
4-6	17.62	14.51	21.43		11-9	10.92	7.72	41.45	decay	18-7	21.08	17.79	18.49		
4-7	17.72	14.89	19.01		12-3					18-8	22.44	18.97	18.29		
4-8	18.64	15.91	17.16		12-1	22.88	18.67	22.55		18-9	22.26	18.81	18.34		
4-9	18.63	15.93	16.95		12-2	22.54	18.93	19.07		18-10	15.37	12.73	20.74		
4-10	17.07	14.41	18.46		12-3	22.10	18.17	21.63		19-2					
5-4					12-4	18.24	14.82	23.08		19-1	18.71	15.96	17.23		
5-1	23.11	13.33	73.37	decay	12-5	19.55	15.85	23.34		19-2	18.67	16.24	14.96		
5-2	19.28	15.67	23.04		12-6	19.17	15.70	22.10		19-3	17.84	15.40	15.84		
5-3	18.02	15.24	18.24		12-7	22.46	18.36	22.33		19-4	17.29	14.62	18.26		
5-4	21.03	17.79	18.21		12-8	17.21	14.28	20.52		19-5	15.37	12.80	20.08		
5-5	21.61	18.02	19.92		13-4					19-6	16.18	13.88	16.57		
5-6	21.85	18.55	17.79		13-1	16.57	13.07	26.78		19-7	13.86	11.91	16.37		
5-7	17.49	14.86	17.70		13-2	19.47	16.29	19.52		19-8	8.96	6.46	38.70	decay	
5-8	32.30	20.23	59.66	decay	13-3	18.63	15.79	17.99		20-3					
6-1					13-4	20.33	17.14	18.61		20-1	20.15	14.41	39.83	decay	
6-1	18.92	15.63	21.05		13-5	15.48	12.83	20.65		20-2	20.94	16.61	26.07	decay	
6-2	19.80	16.61	19.21		13-6	19.05	16.00	19.06		20-3	16.67	14.29	16.66		
6-3	21.15	17.67	19.69		13-7	17.60	14.69	19.81		20-4	16.66	14.25	16.91		
6-4	22.46	18.82	19.34		13-8	22.52	12.83	75.53	decay	20-5	18.86	15.94	18.32		
6-5	20.81	17.35	19.94		13-9	14.54	6.62	119.64	decay	20-6	16.96	14.48	17.13		
6-6	20.81	17.15	21.34		14-1					20-7	19.28	16.66	15.73		
6-7	21.81	17.83	22.32		14-1	22.77	19.04	19.59		20-8	20.41	16.46	24.00		
6-8	20.92	17.24	21.35		14-2	25.10	21.50	16.74		20-9	25.84	18.67	38.40	decay	
6-9	29.52	21.64	36.41		14-3	24.07	20.53	17.24							
7-2					14-4	21.33	17.88	19.30							
7-1	23.68	17.63	34.32	decay	14-5	21.46	17.66	21.52							
7-2	20.64	17.32	19.17		14-6	19.96	16.94	17.83							
7-3	21.93	18.39	19.25		14-7	20.50	17.56	16.74							
7-4	19.91	16.63	19.72		14-8	20.26	17.35	16.77							
7-5	19.76	16.27	21.45		14-9	10.97	8.91	23.12							
7-6	19.35	16.13	19.96												
7-7	21.54	18.26	17.96												
7-8	19.95	17.03	17.15												
7-9	10.41	8.41	23.78												

Inner/Outer Moisture Content Results

\* - grand means (average of averages)

Average Moisture Contents of Outer 1-inch Section and Inner Sections

50 deg knife				60 deg knife				70 deg knife				70 deg knife - mod			
Set 1	* inner avg		20.91888	Set 2	* inner avg		21.28092	Set 3	* inner avg		20.67186	Set 4	* inner avg		19.87735
Log#	* outer avg		36.30548	Log#	* outer avg		36.04587	Log#	* outer avg		35.50981	Log#	* outer avg		32.20676
knife angle	log #	location	value	knife angle	log #	location	value	knife angle	log #	location	value	knife angle	log #	location	value
50 deg knife	1-1	inner avg.	26.7	60 deg knife	1-2	inner avg.	26.7	70 deg knife	1-3	inner avg.	22.4	70 deg knife	1-4	inner avg.	24.9
50 deg knife	2-2	inner avg.	21.8	60 deg knife	2-3	inner avg.	20.6	70 deg knife	2-4	inner avg.	20.0	70 deg knife	2-1	inner avg.	18.7
50 deg knife	3-3	inner avg.	19.6	60 deg knife	3-4	inner avg.	21.0	70 deg knife	3-1	inner avg.	17.3	70 deg knife	3-2	inner avg.	18.0
50 deg knife	4-4	inner avg.	21.0	60 deg knife	4-1	inner avg.	21.6	70 deg knife	4-2	inner avg.	20.9	70 deg knife	4-3	inner avg.	19.1
50 deg knife	5-1	inner avg.	22.0	60 deg knife	5-2	inner avg.	25.2	70 deg knife	5-3	inner avg.	19.4	70 deg knife	5-4	inner avg.	19.2
50 deg knife	6-2	inner avg.	23.2	60 deg knife	6-3	inner avg.	26.5	70 deg knife	6-4	inner avg.	21.2	70 deg knife	6-1	inner avg.	20.5
50 deg knife	7-3	inner avg.	19.7	60 deg knife	7-4	inner avg.	17.6	70 deg knife	7-1	inner avg.	19.8	70 deg knife	7-2	inner avg.	19.2
50 deg knife	8-4	inner avg.	24.1	60 deg knife	8-1	inner avg.	23.9	70 deg knife	8-2	inner avg.	22.6	70 deg knife	8-3	inner avg.	21.0
50 deg knife	9-1	inner avg.	18.4	60 deg knife	9-2	inner avg.	19.1	70 deg knife	9-3	inner avg.	18.8	70 deg knife	9-4	inner avg.	18.0
50 deg knife	10-2	inner avg.	16.9	60 deg knife	10-3	inner avg.	17.1	70 deg knife	10-4	inner avg.	17.5	70 deg knife	10-1	inner avg.	16.4
50 deg knife	11-3	inner avg.	21.1	60 deg knife	11-4	inner avg.	21.7	70 deg knife	11-1	inner avg.	22.2	70 deg knife	11-2	inner avg.	19.6
50 deg knife	12-4	inner avg.	23.6	60 deg knife	12-1	inner avg.	22.1	70 deg knife	12-2	inner avg.	23.9	70 deg knife	12-3	inner avg.	21.9
50 deg knife	13-1	inner avg.	21.3	60 deg knife	13-2	inner avg.	20.5	70 deg knife	13-3	inner avg.	20.3	70 deg knife	13-4	inner avg.	27.3
50 deg knife	14-2	inner avg.	19.1	60 deg knife	14-3	inner avg.	18.4	70 deg knife	14-4	inner avg.	19.9	70 deg knife	14-1	inner avg.	18.0
50 deg knife	15-3	inner avg.	20.2	60 deg knife	15-4	inner avg.	20.8	70 deg knife	15-1	inner avg.	20.4	70 deg knife	15-2	inner avg.	19.3
50 deg knife	16-4	inner avg.	18.0	60 deg knife	16-1	inner avg.	19.5	70 deg knife	16-2	inner avg.	18.0	70 deg knife	16-3	inner avg.	17.5
50 deg knife	17-1	inner avg.	26.6	60 deg knife	17-2	inner avg.	27.8	70 deg knife	17-3	inner avg.	23.2	70 deg knife	17-4	inner avg.	22.5
50 deg knife	18-2	inner avg.	20.6	60 deg knife	18-3	inner avg.	22.6	70 deg knife	18-4	inner avg.	31.1	70 deg knife	18-1	inner avg.	20.0
50 deg knife	19-3	inner avg.	16.9	60 deg knife	19-4	inner avg.	16.8	70 deg knife	19-1	inner avg.	18.1	70 deg knife	19-2	inner avg.	17.0
50 deg knife	20-4	inner avg.	17.5	60 deg knife	20-1	inner avg.	15.9	70 deg knife	20-2	inner avg.	16.4	70 deg knife	20-3	inner avg.	19.3
<b>Overall Average</b>			<b>20.9</b>				<b>21.3</b>				<b>20.7</b>				<b>19.9</b>
50 deg knife	1-1	outer avg.	75.0	60 deg knife	1-2	outer avg.	64.9	70 deg knife	1-3	outer avg.	61.7	70 deg knife	1-4	outer avg.	34.8
50 deg knife	2-2	outer avg.	22.6	60 deg knife	2-3	outer avg.	23.1	70 deg knife	2-4	outer avg.	19.9	70 deg knife	2-1	outer avg.	19.7
50 deg knife	3-3	outer avg.	40.5	60 deg knife	3-4	outer avg.	35.4	70 deg knife	3-1	outer avg.	33.7	70 deg knife	3-2	outer avg.	35.1
50 deg knife	4-4	outer avg.	24.1	60 deg knife	4-1	outer avg.	34.4	70 deg knife	4-2	outer avg.	34.0	70 deg knife	4-3	outer avg.	22.5
50 deg knife	5-1	outer avg.	63.6	60 deg knife	5-2	outer avg.	51.2	70 deg knife	5-3	outer avg.	41.1	70 deg knife	5-4	outer avg.	66.5
50 deg knife	6-2	outer avg.	41.1	60 deg knife	6-3	outer avg.	49.3	70 deg knife	6-4	outer avg.	45.7	70 deg knife	6-1	outer avg.	28.7
50 deg knife	7-3	outer avg.	30.8	60 deg knife	7-4	outer avg.	25.0	70 deg knife	7-1	outer avg.	33.0	70 deg knife	7-2	outer avg.	29.0
50 deg knife	8-4	outer avg.	30.0	60 deg knife	8-1	outer avg.	28.6	70 deg knife	8-2	outer avg.	30.3	70 deg knife	8-3	outer avg.	28.8
50 deg knife	9-1	outer avg.	20.7	60 deg knife	9-2	outer avg.	27.0	70 deg knife	9-3	outer avg.	32.5	70 deg knife	9-4	outer avg.	22.9
50 deg knife	10-2	outer avg.	22.2	60 deg knife	10-3	outer avg.	31.9	70 deg knife	10-4	outer avg.	44.8	70 deg knife	10-1	outer avg.	18.3
50 deg knife	11-3	outer avg.	48.5	60 deg knife	11-4	outer avg.	36.1	70 deg knife	11-1	outer avg.	30.8	70 deg knife	11-2	outer avg.	32.9
50 deg knife	12-4	outer avg.	28.6	60 deg knife	12-1	outer avg.	22.6	70 deg knife	12-2	outer avg.	27.8	70 deg knife	12-3	outer avg.	21.5
50 deg knife	13-1	outer avg.	47.3	60 deg knife	13-2	outer avg.	55.7	70 deg knife	13-3	outer avg.	39.5	70 deg knife	13-4	outer avg.	73.2
50 deg knife	14-2	outer avg.	23.7	60 deg knife	14-3	outer avg.	22.8	70 deg knife	14-4	outer avg.	27.5	70 deg knife	14-1	outer avg.	21.4
50 deg knife	15-3	outer avg.	24.6	60 deg knife	15-4	outer avg.	22.6	70 deg knife	15-1	outer avg.	20.3	70 deg knife	15-2	outer avg.	20.3
50 deg knife	16-4	outer avg.	29.2	60 deg knife	16-1	outer avg.	34.5	70 deg knife	16-2	outer avg.	19.5	70 deg knife	16-3	outer avg.	18.9
50 deg knife	17-1	outer avg.	65.1	60 deg knife	17-2	outer avg.	60.9	70 deg knife	17-3	outer avg.	56.7	70 deg knife	17-4	outer avg.	49.4
50 deg knife	18-2	outer avg.	40.9	60 deg knife	18-3	outer avg.	52.5	70 deg knife	18-4	outer avg.	60.5	70 deg knife	18-1	outer avg.	33.3
50 deg knife	19-3	outer avg.	20.1	60 deg knife	19-4	outer avg.	19.8	70 deg knife	19-1	outer avg.	28.3	70 deg knife	19-2	outer avg.	28.0
50 deg knife	20-4	outer avg.	27.4	60 deg knife	20-1	outer avg.	22.6	70 deg knife	20-2	outer avg.	22.4	70 deg knife	20-3	outer avg.	39.1
<b>Overall Average</b>			<b>36.3</b>				<b>36.0</b>				<b>35.5</b>				<b>32.2</b>

Screen Fractions by Weight Series 1- 50 Degree Counter Knife									% Furnish in Each Screen Fraction Series 1- 50 Degree Counter Knife											
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fine & Pan	1.5" to 0.75"
1-1A	127	58	66	66	72	123	79	59	650	1-1A	19.54	8.92	10.15	10.15	11.08	18.92	12.15	9.08	21.23	48.77
B	104	52	74	71	82	113	72	34	602	B	17.28	8.64	12.29	11.79	13.62	18.77	11.96	5.65	17.61	50.00
C	112	24	57	70	82	101	61	33	540	C	20.74	4.44	10.56	12.96	15.19	18.70	11.30	6.11	17.41	48.70
2-2A	43	35	67	97	78	104	61	31	516	2-2A	8.33	6.78	12.98	18.80	15.12	20.16	11.82	6.01	17.83	46.90
B	110	28	70	81	80	89	56	27	541	B	20.33	5.18	12.94	14.97	14.79	16.45	10.35	4.99	15.34	53.42
C	79	43	80	96	94	95	62	39	588	C	13.44	7.31	13.61	16.33	15.99	16.16	10.54	6.63	17.18	50.68
3-3A	101	56	76	80	114	144	87	68	726	3-3A	13.91	7.71	10.47	11.02	15.70	19.83	11.98	9.37	21.35	43.11
B	101	41	70	75	90	103	61	34	575	B	17.57	7.13	12.17	13.04	15.65	17.91	10.61	5.91	16.52	49.91
C	73	35	72	74	98	120	68	26	566	C	12.90	6.18	12.72	13.07	17.31	21.20	12.01	4.59	16.61	44.88
4-4A	43	28	41	68	82	125	81	51	519	4-4A	8.29	5.39	7.90	13.10	15.80	24.08	15.61	9.83	25.43	34.68
B	57	64	48	99	120	161	89	49	687	B	8.30	9.32	6.99	14.41	17.47	23.44	12.95	7.13	20.09	39.01
C	36	61	54	77	122	163	91	34	638	C	5.64	9.56	8.46	12.07	19.12	25.55	14.26	5.33	19.59	35.74
5-1A	29	70	86	128	169	177	97	49	805	5-1A	3.60	8.70	10.68	15.90	20.99	21.99	12.05	6.09	18.14	38.88
B	34	30	39	57	74	105	65	28	432	B	7.87	6.94	9.03	13.19	17.13	24.31	15.05	6.48	21.53	37.04
C	21	37	72	65	109	133	78	27	542	C	3.87	6.83	13.28	11.99	20.11	24.54	14.39	4.98	19.37	35.98
6-2A	21	51	60	83	114	139	86	34	588	6-2A	3.57	8.67	10.20	14.12	19.39	23.64	14.63	5.78	20.41	36.56
B	13	44	77	83	114	167	90	34	622	B	2.09	7.07	12.38	13.34	18.33	26.85	14.47	5.47	19.94	34.89
C	18	33	55	56	168	166	99	46	641	C	2.81	5.15	8.58	8.74	26.21	25.90	15.44	7.18	22.62	25.27
7-3A	33	40	41	116	131	161	93	33	648	7-3A	5.09	6.17	6.33	17.90	20.22	24.85	14.35	5.09	19.44	35.49
B	43	24	54	51	89	120	87	28	496	B	8.67	4.84	10.89	10.28	17.94	24.19	17.54	5.65	23.19	34.68
C	51	34	45	81	132	135	107	38	623	C	8.19	5.46	7.22	13.00	21.19	21.67	17.17	6.10	23.27	33.87
8-4A	78	76	60	116	152	153	81	27	743	8-4A	10.50	10.23	8.08	15.61	20.46	20.59	10.90	3.63	14.54	44.41
B	35	38	48	62	101	129	80	35	528	B	6.63	7.20	9.09	11.74	19.13	24.43	15.15	6.63	21.78	34.66
C	47	33	74	102	120	162	83	22	643	C	7.31	5.13	11.51	15.86	18.66	25.19	12.91	3.42	16.33	39.81
9-1A	64	66	68	101	116	137	82	26	660	9-1A	9.70	10.00	10.30	15.30	17.58	20.76	12.42	3.94	16.36	45.30
B	43	42	37	50	81	101	59	21	434	B	9.91	9.68	8.53	11.52	18.66	23.27	13.59	4.84	18.43	39.63
C	51	37	48	76	91	130	71	25	529	C	9.64	6.99	9.07	14.37	17.20	24.57	13.42	4.73	18.15	40.08
10-2A	13	51	59	117	153	215	112	32	752	10-2A	1.73	6.78	7.85	15.56	20.35	28.59	14.89	4.26	19.15	31.91
B	23	28	61	64	117	151	102	29	575	B	4.00	4.87	10.61	11.13	20.35	26.26	17.74	5.04	22.78	30.61
C	22	39	54	80	127	151	101	33	607	C	3.62	6.43	8.90	13.18	20.92	24.88	16.64	5.44	22.08	32.13
11-3A	53	75	69	81	145	153	96	51	723	11-3A	7.33	10.37	9.54	11.20	20.06	21.16	13.28	7.05	20.33	38.45
B	71	65	74	96	130	151	103	40	730	B	9.73	8.90	10.14	13.15	17.81	20.68	14.11	5.48	19.59	41.92
C	67	66	76	110	110	138	94	37	698	C	9.60	9.46	10.89	15.76	15.76	19.77	13.47	5.30	18.77	45.70
12-4A	140	88	63	91	104	91	42	14	633	12-4A	22.12	13.90	9.95	14.38	16.43	14.38	6.64	2.21	8.85	60.35
B	113	90	68	82	120	97	56	25	651	B	17.36	13.82	10.45	12.60	18.43	14.90	8.60	3.84	12.44	54.22
C	98	76	74	94	121	98	55	32	648	C	15.12	11.73	11.42	14.51	18.67	15.12	8.49	4.94	13.43	52.78
13-1A	46	64	59	69	119	145	98	23	623	13-1A	7.38	10.27	9.47	11.08	19.10	23.27	15.73	3.69	19.42	38.20
B	80	46	64	68	88	139	91	22	598	B	13.38	7.69	10.70	11.37	14.72	23.24	15.22	3.68	18.90	43.14
C	49	45	54	83	106	113	82	28	560	C	8.75	8.04	9.64	14.82	18.93	20.18	14.64	5.00	19.64	41.25
14-2A	57	55	74	78	109	139	109	22	643	14-2A	8.86	8.55	11.51	12.13	16.95	21.62	16.95	3.42	20.37	41.06
B	75	68	72	86	113	150	100	42	706	B	10.62	9.63	10.20	12.18	16.01	21.25	14.16	5.95	20.11	42.63
C	48	27	65	94	132	151	105	21	643	C	7.47	4.20	10.11	14.62	20.53	23.48	16.33	3.27	19.60	36.39
15-3A	68	36	64	86	107	112	89	71	633	15-3A	10.74	5.69	10.11	13.59	16.90	17.69	14.06	11.22	25.28	40.13
B	68	32	66	61	85	83	68	109	572	B	11.89	5.59	11.54	10.66	14.86	14.51	11.89	19.06	30.94	39.69
C	53	26	55	65	80	80	64	60	483	C	10.97	5.38	11.39	13.46	16.56	16.56	13.25	12.42	25.67	41.20

Screen Fractions by Weight Cont'd									% Furnish in Each Screen Fraction Cont'd											
Series 1- 50 Degree Counter Knife									Series 1- 50 Degree Counter Knife											
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fine & Pan	1.5" to 0.75"
16-4A	33	23	61	66	101	126	90	30	530	16-4A	6.23	4.34	11.51	12.45	19.06	23.77	16.98	5.66	22.64	34.53
B	44	28	61	79	123	156	97	32	620	B	7.10	4.52	9.84	12.74	19.84	25.16	15.65	5.16	20.81	34.19
C	33	35	63	82	148	143	86	20	610	C	5.41	5.74	10.33	13.44	24.26	23.44	14.10	3.28	17.38	34.92
17-1A	198	123	105	86	77	70	54	41	754	17A	26.26	16.31	13.93	11.41	10.21	9.28	7.16	5.44	12.60	67.90
B	261	130	65	72	66	87	53	37	771	B	33.85	16.86	8.43	9.34	8.56	11.28	6.87	4.80	11.67	68.48
C	100	63	66	60	56	56	42	14	457	C	21.88	13.79	14.44	13.13	12.25	12.25	9.19	3.06	12.25	63.24
18-2A	34	22	51	53	93	120	110	47	530	18-2A	6.42	4.15	9.62	10.00	17.55	22.64	20.75	8.87	29.62	30.19
B	21	24	29	56	71	142	127	51	521	B	4.03	4.61	5.57	10.75	13.63	27.26	24.38	9.79	34.17	24.95
C	31	16	35	41	83	118	100	25	449	C	6.90	3.56	7.80	9.13	18.49	26.28	22.27	5.57	27.84	27.39
19-3A	32	20	60	72	96	120	69	41	510	19-3A	6.27	3.92	11.76	14.12	18.82	23.53	13.53	8.04	21.57	36.08
B	48	36	55	61	105	111	70	48	534	B	8.99	6.74	10.30	11.42	19.66	20.79	13.11	8.99	22.10	37.45
C	43	13	41	54	97	112	60	51	471	C	9.13	2.76	8.70	11.46	20.59	23.78	12.74	10.83	23.57	32.06
20-4A	43	32	60	56	122	170	127	55	665	20-4A	6.47	4.81	9.02	8.42	18.35	25.56	19.10	8.27	27.37	28.72
B	38	34	79	61	121	147	102	37	619	B	6.14	5.49	12.76	9.85	19.55	23.75	16.48	5.98	22.46	34.25
C	53	22	39	44	55	84	73	30	400	C	13.25	5.50	9.75	11.00	13.75	21.00	18.25	7.50	25.75	39.50
									600	Average	10.25	7.50	10.24	12.81	17.63	21.42	13.93	6.22	20.15	40.80
										St. Dev.	6.26	3.05	1.88	2.18	3.08	4.15	3.40	2.72	4.68	9.38

Screen Fractions by Weight										% Furnish in Each Fraction											
Series 2- 60 Degree Counter Knife																					
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
1-2A	204	45	57	67	76	72	43	18	582	1-2A	35.05	7.73	9.79	11.51	13.06	12.37	7.39	3.09	100.00	10.48	64.09
B	168	41	63	52	75	71	38	18	526	B	31.94	7.79	11.98	9.89	14.26	13.50	7.22	3.42	100.00	10.65	61.60
C	175	37	52	57	78	89	61	36	585	C	29.91	6.32	8.89	9.74	13.33	15.21	10.43	6.15	100.00	16.58	54.87
2-3A	142	32	57	80	89	110	62	34	606	2-3A	23.43	5.28	9.41	13.20	14.69	18.15	10.23	5.61	100.00	15.84	51.32
B	153	45	77	75	88	87	49	21	595	B	25.71	7.56	12.94	12.61	14.79	14.62	8.24	3.53	100.00	11.76	58.82
C	233	54	42	69	72	75	42	19	606	C	38.45	8.91	6.93	11.39	11.88	12.38	6.93	3.14	100.00	10.07	65.68
3-4A	95	24	45	67	84	102	70	32	519	3-4A	18.30	4.62	8.67	12.91	16.18	19.65	13.49	6.17	100.00	19.65	44.51
B	105	21	36	67	72	84	61	19	465	B	22.58	4.52	7.74	14.41	15.48	18.06	13.12	4.09	100.00	17.20	49.25
C	125	24	55	58	65	89	75	45	536	C	23.32	4.48	10.26	10.82	12.13	16.60	13.99	8.40	100.00	22.39	48.88
4-1A	96	34	71	76	113	154	113	53	710	4-1A	13.52	4.79	10.00	10.70	15.92	21.69	15.92	7.46	100.00	23.38	39.01
B	67	27	60	58	71	108	64	25	480	B	13.96	5.63	12.50	12.08	14.79	22.50	13.33	5.21	100.00	18.54	44.17
C	158	58	70	80	82	115	81	45	689	C	22.93	8.42	10.16	11.61	11.90	16.69	11.76	6.53	100.00	18.29	53.12
5-2A	122	40	82	91	106	116	54	16	627	5-2A	19.46	6.38	13.08	14.51	16.91	18.50	8.61	2.55	100.00	11.16	53.43
B	97	44	62	86	96	84	62	24	555	B	17.48	7.93	11.17	15.50	17.30	15.14	11.17	4.32	100.00	15.50	52.07
C	112	50	59	66	94	83	60	28	552	C	20.29	9.06	10.69	11.96	17.03	15.04	10.87	5.07	100.00	15.94	51.99
6-3A	78	48	79	143	136	149	107	58	798	6-3A	9.77	6.02	9.90	17.92	17.04	18.67	13.41	7.27	100.00	20.68	43.61
B	107	41	66	69	69	110	73	39	574	B	18.64	7.14	11.50	12.02	12.02	19.16	12.72	6.79	100.00	19.51	49.30
C	112	41	33	65	94	94	80	27	546	C	20.51	7.51	6.04	11.90	17.22	17.22	14.65	4.95	100.00	19.60	45.97
7-4A	90	18	41	43	117	107	69	18	503	7-4A	17.89	3.58	8.15	8.55	23.26	21.27	13.72	3.58	100.00	17.30	38.17
B	70	40	77	83	105	143	105	53	676	B	10.36	5.92	11.39	12.28	15.53	21.15	15.53	7.84	100.00	23.37	39.94
C	69	26	51	46	118	123	97	30	560	C	12.32	4.64	9.11	8.21	21.07	21.96	17.32	5.36	100.00	22.68	34.29
8-1A	158	80	94	95	108	145	108	46	834	8-1A	18.94	9.59	11.27	11.39	12.95	17.39	12.95	5.52	100.00	18.47	51.20
B	141	61	77	90	114	130	95	44	752	B	18.75	8.11	10.24	11.97	15.16	17.29	12.63	5.85	100.00	18.48	49.07
C	186	43	55	64	68	84	59	25	584	C	31.85	7.36	9.42	10.96	11.64	14.38	10.10	4.28	100.00	14.38	59.59
9-2A	81	38	54	62	101	125	71	30	562	9-2A	14.41	6.76	9.61	11.03	17.97	22.24	12.63	5.34	100.00	17.97	41.81
B	50	30	40	51	70	96	78	30	445	B	11.24	6.74	8.99	11.46	15.73	21.57	17.53	6.74	100.00	24.27	38.43
C	80	21	28	44	69	104	79	29	454	C	17.62	4.63	6.17	9.69	15.20	22.91	17.40	6.39	100.00	23.79	38.11
10-3A	61	21	55	67	90	116	85	38	533	10-3A	11.44	3.94	10.32	12.57	16.89	21.76	15.95	7.13	100.00	23.08	38.27
B	84	30	46	72	98	128	80	43	581	B	14.46	5.16	7.92	12.39	16.87	22.03	13.77	7.40	100.00	21.17	39.93
C	55	24	43	59	74	106	75	37	473	C	11.63	5.07	9.09	12.47	15.64	22.41	15.86	7.82	100.00	23.68	38.27
11-4A	85	45	53	68	92	107	82	48	580	11-4A	14.66	7.76	9.14	11.72	15.86	18.45	14.14	8.28	100.00	22.41	43.28
B	83	53	65	62	79	104	71	36	553	B	15.01	9.58	11.75	11.21	14.29	18.81	12.84	6.51	100.00	19.35	47.56
C	129	61	56	59	58	84	66	34	547	C	23.58	11.15	10.24	10.79	10.60	15.36	12.07	6.22	100.00	18.28	55.76
12-1A	135	37	75	81	128	123	65	27	671	12-1A	20.12	5.51	11.18	12.07	19.08	18.33	9.69	4.02	100.00	13.71	48.88
B	78	25	71	65	64	86	69	21	479	B	16.28	5.22	14.82	13.57	13.36	17.95	14.41	4.38	100.00	18.79	49.90
C	79	43	45	69	87	84	57	27	491	C	16.09	8.76	9.16	14.05	17.72	17.11	11.61	5.50	100.00	17.11	48.07
13-2A	97	75	66	94	101	136	91	32	692	13-2A	14.02	10.84	9.54	13.58	14.60	19.65	13.15	4.62	100.00	17.77	47.98
B	94	56	59	66	110	118	86	28	617	B	15.24	9.08	9.56	10.70	17.83	19.12	13.94	4.54	100.00	18.48	44.57
C	80	31	55	57	74	88	73	32	490	C	16.33	6.33	11.22	11.63	15.10	17.96	14.90	6.53	100.00	21.43	45.51
14-3A	108	38	51	77	94	137	127	36	668	14-3A	16.17	5.69	7.63	11.53	14.07	20.51	19.01	5.39	100.00	24.40	41.02
B	120	36	68	70	93	130	99	29	645	B	18.60	5.58	10.54	10.85	14.42	20.16	15.35	4.50	100.00	19.84	45.58
C	147	35	52	69	95	144	147	38	727	C	20.22	4.81	7.15	9.49	13.07	19.81	20.22	5.23	100.00	25.45	41.68

Screen Fractions by Weight Cont'd										% Furnish in Each Fraction Cont'd													
Series 2- 60 Degree Counter Knife																							
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"		
15-4A	41	16	64	49	67	91	69	40	437	15-4A	9.38	3.66	14.65	11.21	15.33	20.82	15.79	9.15	100.00	24.94	38.90		
B	128	27	69	68	80	80	62	40	554	B	23.10	4.87	12.45	12.27	14.44	14.44	11.19	7.22	100.00	18.41	52.71		
C	158	36	58	69	69	81	65	41	577	C	27.38	6.24	10.05	11.96	11.96	14.04	11.27	7.11	100.00	18.37	55.63		
16-1A	115	60	58	91	90	112	94	29	649	16-1A	17.72	9.24	8.94	14.02	13.87	17.26	14.48	4.47	100.00	18.95	49.92		
B	90	61	71	89	138	137	117	37	740	B	12.16	8.24	9.59	12.03	18.65	18.51	15.81	5.00	100.00	20.81	42.03		
C	94	54	77	92	113	121	85	27	663	C	14.18	8.14	11.61	13.88	17.04	18.25	12.82	4.07	100.00	16.89	47.81		
17-2A	224	44	44	61	71	95	53	23	615	17-2A	36.42	7.15	7.15	9.92	11.54	15.45	8.62	3.74	100.00	12.36	60.65		
B	120	44	41	53	70	75	48	22	473	B	25.37	9.30	8.67	11.21	14.80	15.86	10.15	4.65	100.00	14.80	54.55		
C	224	49	115	90	103	107	69	28	785	C	28.54	6.24	14.65	11.46	13.12	13.63	8.79	3.57	100.00	12.36	60.89		
18-3A	54	21	49	63	84	122	109	48	550	18-3A	9.82	3.82	8.91	11.45	15.27	22.18	19.82	8.73	100.00	28.55	34.00		
B	59	27	35	79	113	134	112	32	591	B	9.98	4.57	5.92	13.37	19.12	22.67	18.95	5.41	100.00	24.37	33.84		
C	82	18	75	84	113	134	128	37	671	C	12.22	2.68	11.18	12.52	16.84	19.97	19.08	5.51	100.00	24.59	38.60		
19-4A	111	31	45	50	53	69	56	43	458	19-4A	24.24	6.77	9.83	10.92	11.57	15.07	12.23	9.39	100.00	21.62	51.75		
B	123	33	49	74	86	113	63	37	578	B	21.28	5.71	8.48	12.80	14.88	19.55	10.90	6.40	100.00	17.30	48.27		
C	113	89	48	47	57	89	70	38	551	C	20.51	16.15	8.71	8.53	10.34	16.15	12.70	6.90	100.00	19.60	53.90		
20-1A	89	45	59	88	136	153	92	38	700	20-1A	12.71	6.43	8.43	12.57	19.43	21.86	13.14	5.43	100.00	18.57	40.14		
B	60	29	51	82	101	130	80	35	568	B	10.56	5.11	8.98	14.44	17.78	22.89	14.08	6.16	100.00	20.25	39.08		
C	105	34	57	82	95	135	90	29	627	C	16.75	5.42	9.09	13.08	15.15	21.53	14.35	4.63	100.00	18.98	44.34		
											Average	18.91	6.69	9.88	11.94	15.25	18.41	13.24	5.67			18.91	47.43
											St. Dev.	6.96	2.27	1.97	1.69	2.56	2.94	3.14	1.60			4.12	7.78

Screen Fractions by Weight Cont'd  
Series 3- 70 Degree Counter Knife

% Furnish in Each Fraction Cont'd

Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
1-3A	168	45	91	55	73	80	62	53	627	1-3A	26.79	7.18	14.51	8.77	11.64	12.76	9.89	8.45	100.00	18.34	57.26
B	178	91	61	78	91	117	81	45	742	B	23.99	12.26	8.22	10.51	12.26	15.77	10.92	6.06	100.00	16.98	54.99
C	170	61	40	61	64	74	53	35	558	C	30.47	10.93	7.17	10.93	11.47	13.26	9.50	6.27	100.00	15.77	59.50
2-4A	107	57	36	48	50	74	59	41	472	2-4A	22.67	12.08	7.63	10.17	10.59	15.68	12.50	8.69	100.00	21.19	52.54
B	190	37	29	51	56	74	58	47	542	B	35.06	6.83	5.35	9.41	10.33	13.65	10.70	8.67	100.00	19.37	56.64
C	230	47	54	77	91	124	80	59	762	C	30.18	6.17	7.09	10.10	11.94	16.27	10.50	7.74	100.00	18.24	53.54
3-1A	180	72	72	84	88	136	77	42	751	3-1A	23.97	9.59	9.59	11.19	11.72	18.11	10.25	5.59	100.00	15.85	54.33
B	109	35	68	89	101	136	79	36	653	B	16.69	5.36	10.41	13.63	15.47	20.83	12.10	5.51	100.00	17.61	46.09
C	106	35	44	59	79	103	58	29	513	C	20.66	6.82	8.58	11.50	15.40	20.08	11.31	5.65	100.00	16.96	47.56
4-2A	110	46	71	93	90	136	84	42	672	4-2A	16.37	6.85	10.57	13.84	13.39	20.24	12.50	6.25	100.00	18.75	47.62
B	97	44	64	89	87	111	90	32	614	B	15.80	7.17	10.42	14.50	14.17	18.08	14.66	5.21	100.00	19.87	47.88
C	77	42	37	66	102	137	93	53	607	C	12.69	6.92	6.10	10.87	16.80	22.57	15.32	8.73	100.00	24.05	36.57
5-3A	88	30	45	59	76	98	84	46	526	5-3A	16.73	5.70	8.56	11.22	14.45	18.63	15.97	8.75	100.00	24.71	42.21
B	170	95	75	115	123	159	97	36	870	B	19.54	10.92	8.62	13.22	14.14	18.28	11.15	4.14	100.00	15.29	52.30
C	61	48	40	67	69	100	63	28	476	C	12.82	10.08	8.40	14.08	14.50	21.01	13.24	5.88	100.00	19.12	45.38
6-4A	87	33	58	71	112	136	87	45	629	6-4A	13.83	5.25	9.22	11.29	17.81	21.62	13.83	7.15	100.00	20.99	39.59
B	95	24	57	55	101	128	80	27	567	B	16.75	4.23	10.05	9.70	17.81	22.57	14.11	4.76	100.00	18.87	40.74
C	129	33	65	79	93	125	77	39	640	C	20.16	5.16	10.16	12.34	14.53	19.53	12.03	6.09	100.00	18.13	47.81
7-1A	60	40	65	89	90	151	97	60	652	7-1A	9.20	6.13	9.97	13.65	13.80	23.16	14.88	9.20	100.00	24.08	38.96
B	117	32	70	80	85	121	71	26	602	B	19.44	5.32	11.63	13.29	14.12	20.10	11.79	4.32	100.00	16.11	49.67
C	57	44	63	57	90	132	92	30	565	C	10.09	7.79	11.15	10.09	15.93	23.36	16.28	5.31	100.00	21.59	39.12
8-2A	66	28	31	50	70	97	87	38	467	8-2A	14.13	6.00	6.64	10.71	14.99	20.77	18.63	8.14	100.00	26.77	37.47
B	109	31	55	62	85	102	71	34	549	B	19.85	5.65	10.02	11.29	15.48	18.58	12.93	6.19	100.00	19.13	46.81
C	57	32	34	49	80	99	75	37	463	C	12.31	6.91	7.34	10.58	17.28	21.38	16.20	7.99	100.00	24.19	37.15
9-3A	94	30	68	87	88	106	78	61	612	9-3A	15.36	4.90	11.11	14.22	14.38	17.32	12.75	9.97	100.00	22.71	45.59
B	77	30	59	56	54	74	55	45	450	B	17.11	6.67	13.11	12.44	12.00	16.44	12.22	10.00	100.00	22.22	49.33
C	69	25	57	74	87	120	79	52	563	C	12.26	4.44	10.12	13.14	15.45	21.31	14.03	9.24	100.00	23.27	39.96
10-4A	61	19	44	56	86	122	76	35	499	10-4A	12.22	3.81	8.82	11.22	17.23	24.45	15.23	7.01	100.00	22.24	36.07
B	54	19	51	73	94	139	110	75	615	B	8.78	3.09	8.29	11.87	15.28	22.60	17.89	12.20	100.00	30.08	32.03
C	89	31	48	62	109	122	78	31	570	C	15.61	5.44	8.42	10.88	19.12	21.40	13.68	5.44	100.00	19.12	40.35
11-1A	111	36	63	49	82	86	58	53	538	11-1A	20.63	6.69	11.71	9.11	15.24	15.99	10.78	9.85	100.00	20.63	48.14
B	136	47	47	56	54	73	55	27	495	B	27.47	9.49	9.49	11.31	10.91	14.75	11.11	5.45	100.00	16.57	57.78
C	144	35	58	53	69	81	66	53	559	C	25.76	6.26	10.38	9.48	12.34	14.49	11.81	9.48	100.00	21.29	51.88
12-2A	156	97	85	104	97	111	67	27	744	12-2A	20.97	13.04	11.42	13.98	13.04	14.92	9.01	3.63	100.00	12.63	59.41
B	94	43	78	73	99	101	60	29	577	B	16.29	7.45	13.52	12.65	17.16	17.50	10.40	5.03	100.00	15.42	49.91
C	116	53	62	92	102	126	66	33	650	C	17.85	8.15	9.54	14.15	15.69	19.38	10.15	5.08	100.00	15.23	49.69
13-3A	98	44	69	75	118	153	97	44	698	13-3A	14.04	6.30	9.89	10.74	16.91	21.92	13.90	6.30	100.00	20.20	40.97
B	67	35	38	49	64	84	53	17	407	B	16.46	8.60	9.34	12.04	15.72	20.64	13.02	4.18	100.00	17.20	46.44
C	72	24	47	56	78	96	71	27	471	C	15.29	5.10	9.98	11.89	16.56	20.38	15.07	5.73	100.00	20.81	42.25
14-4A	79	19	48	87	89	152	97	32	603	14-4A	13.10	3.15	7.96	14.43	14.76	25.21	16.09	5.31	100.00	21.39	38.64
B	50	10	64	76	115	145	109	44	613	B	8.16	1.63	10.44	12.40	18.76	23.65	17.78	7.18	100.00	24.96	32.63
C	52	18	62	75	133	154	126	36	656	C	7.93	2.74	9.45	11.43	20.27	23.48	19.21	5.49	100.00	24.70	31.55

Screen Fractions by Weight Cont'd										% Furnish in Each Fraction Cont'd											
Series 3- 70 Degree Counter Knife																					
15-1A	149	36	51	57	76	83	61	33	546	15-1A	27.29	6.59	9.34	10.44	13.92	15.20	11.17	6.04	100.00	17.22	53.66
B	183	39	54	52	73	85	57	29	572	B	31.99	6.82	9.44	9.09	12.76	14.86	9.97	5.07	100.00	15.03	57.34
C	105	24	51	52	75	83	52	22	464	C	22.63	5.17	10.99	11.21	16.16	17.89	11.21	4.74	100.00	15.95	50.00
16-2A	46	15	63	51	64	79	61	21	400	16-2A	11.50	3.75	15.75	12.75	16.00	19.75	15.25	5.25	100.00	20.50	43.75
B	71	22	65	82	94	108	64	21	527	B	13.47	4.17	12.33	15.56	17.84	20.49	12.14	3.98	100.00	16.13	45.54
C	72	15	44	77	114	135	68	12	537	C	13.41	2.79	8.19	14.34	21.23	25.14	12.66	2.23	100.00	14.90	38.73
17-3A	110	56	54	59	61	85	49	18	492	17-3A	22.36	11.38	10.98	11.99	12.40	17.28	9.96	3.66	100.00	13.62	56.71
B	102	43	104	70	121	124	97	45	706	B	14.45	6.09	14.73	9.92	17.14	17.56	13.74	6.37	100.00	20.11	45.18
C	146	49	42	72	96	86	56	26	573	C	25.48	8.55	7.33	12.57	16.75	15.01	9.77	4.54	100.00	14.31	53.93
18-4A	75	30	79	73	112	119	85	30	603	18-4A	12.44	4.98	13.10	12.11	18.57	19.73	14.10	4.98	100.00	19.07	42.62
B	32	10	51	59	118	149	98	36	553	B	5.79	1.81	9.22	10.67	21.34	26.94	17.72	6.51	100.00	24.23	27.49
C	43	23	91	66	138	148	91	53	653	C	6.58	3.52	13.94	10.11	21.13	22.66	13.94	8.12	100.00	22.05	34.15
19-1A	126	49	66	62	93	119	85	55	655	19-1A	19.24	7.48	10.08	9.47	14.20	18.17	12.98	8.40	100.00	21.37	46.26
B	64	35	42	55	70	94	69	55	484	B	13.22	7.23	8.68	11.36	14.46	19.42	14.26	11.36	100.00	25.62	40.50
C	73	10	46	44	55	82	60	44	414	C	17.63	2.42	11.11	10.63	13.29	19.81	14.49	10.63	100.00	25.12	41.79
20-2A	41	19	34	60	84	129	102	38	507	20-2A	8.09	3.75	6.71	11.83	16.57	25.44	20.12	7.50	100.00	27.61	30.37
B	42	12	38	48	111	136	84	20	491	B	8.55	2.44	7.74	9.78	22.61	27.70	17.11	4.07	100.00	21.18	28.51
C	37	23	63	72	115	186	127	72	695	C	5.32	3.31	9.06	10.36	16.55	26.76	18.27	10.36	100.00	28.63	28.06
										Average	17.08	6.28	9.82	11.64	15.40	19.70	13.40	6.69		20.09	44.82
										St. Dev.	6.82	2.67	2.15	1.62	2.78	3.60	2.71	2.17		3.93	8.41



Screen Fractions by Weight										% Furnish in Each Fraction											
Series 4- 70 Degree Counter Knife - Modified																					
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	%	Fine & Pan	1.5" to 0.75"
1-4A	111	40	44	66	87	121	63	22	554	1-4A	20.04	7.22	7.94	11.91	15.70	21.84	11.37	3.97	100.00	15.34	47.11
B	263	81	60	82	73	93	47	13	712	B	36.94	11.38	8.43	11.52	10.25	13.06	6.60	1.83	100.00	8.43	68.26
C	107	54	52	68	86	123	69	26	585	C	18.29	9.23	8.89	11.62	14.70	21.03	11.79	4.44	100.00	16.24	48.03
2-1A	57	27	49	69	113	129	86	29	559	2-1A	10.20	4.83	8.77	12.34	20.21	23.08	15.38	5.19	100.00	20.57	36.14
B	38	12	39	50	88	103	62	18	410	B	9.27	2.93	9.51	12.20	21.46	25.12	15.12	4.39	100.00	19.51	33.90
C	87	43	54	79	89	121	66	22	561	C	15.51	7.66	9.63	14.08	15.86	21.57	11.76	3.92	100.00	15.69	46.88
3-2A	75	17	64	80	116	129	96	48	625	3-2A	12.00	2.72	10.24	12.80	18.56	20.64	15.36	7.68	100.00	23.04	37.76
B	51	16	56	75	105	116	67	27	513	B	9.94	3.12	10.92	14.62	20.47	22.61	13.06	5.26	100.00	18.32	38.60
C	58	30	70	69	87	100	68	25	507	C	11.44	5.92	13.81	13.61	17.16	19.72	13.41	4.93	100.00	18.34	44.77
4-3A	20	22	52	49	89	122	88	32	474	4-3A	4.22	4.64	10.97	10.34	18.78	25.74	18.57	6.75	100.00	25.32	30.17
B	7	5	14	34	63	131	106	50	410	B	1.71	1.22	3.41	8.29	15.37	31.95	25.85	12.20	100.00	38.05	14.63
C	21	10	45	55	88	145	110	47	521	C	4.03	1.92	8.64	10.56	16.89	27.83	21.11	9.02	100.00	30.13	25.14
5-4A	40	17	54	44	87	132	116	45	535	5-4A	7.48	3.18	10.09	8.22	16.26	24.67	21.68	8.41	100.00	30.09	28.97
B	25	16	29	63	93	140	126	53	545	B	4.59	2.94	5.32	11.56	17.06	25.69	23.12	9.72	100.00	32.84	24.40
C	16	18	37	51	79	118	114	40	473	C	3.38	3.81	7.82	10.78	16.70	24.95	24.10	8.46	100.00	32.56	25.79
6-1A	105	35	58	86	92	130	102	56	664	6-1A	15.81	5.27	8.73	12.95	13.86	19.58	15.36	8.43	100.00	23.80	42.77
B	61	19	28	38	55	97	84	44	426	B	14.32	4.46	6.57	8.92	12.91	22.77	19.72	10.33	100.00	30.05	34.27
C	77	22	30	34	58	76	83	44	424	C	18.16	5.19	7.08	8.02	13.68	17.92	19.58	10.38	100.00	29.95	38.44
7-2A	25	26	56	71	96	149	109	45	577	7-2A	4.33	4.51	9.71	12.31	16.64	25.82	18.89	7.80	100.00	26.69	30.85
B	31	20	49	66	107	171	111	33	588	B	5.27	3.40	8.33	11.22	18.20	29.08	18.88	5.61	100.00	24.49	28.23
C	29	5	28	59	95	141	116	53	526	C	5.51	0.95	5.32	11.22	18.06	26.81	22.05	10.08	100.00	32.13	23.00
8-3A	40	8	32	37	87	101	107	44	456	8-3A	8.77	1.75	7.02	8.11	19.08	22.15	23.46	9.65	100.00	33.11	25.66
B	70	12	44	37	70	105	94	48	480	B	14.58	2.50	9.17	7.71	14.58	21.88	19.58	10.00	100.00	29.58	33.96
C	27	8	34	53	102	155	110	45	534	C	5.06	1.50	6.37	9.93	19.10	29.03	20.60	8.43	100.00	29.03	22.85
9-4A	40	31	23	50	68	95	78	26	411	9-4A	9.73	7.54	5.60	12.17	16.55	23.11	18.98	6.33	100.00	25.30	35.04
B	29	14	26	50	58	104	91	56	428	B	6.78	3.27	6.07	11.68	13.55	24.30	21.26	13.08	100.00	34.35	27.80
C	19	17	26	39	62	92	112	63	430	C	4.42	3.95	6.05	9.07	14.42	21.40	26.05	14.65	100.00	40.70	23.49
10-1A	13	17	34	43	95	138	132	89	561	10-1A	2.32	3.03	6.06	7.66	16.93	24.60	23.53	15.86	100.00	39.39	19.07
B	12	16	33	39	84	125	109	47	465	B	2.58	3.44	7.10	8.39	18.06	26.88	23.44	10.11	100.00	33.55	21.51
C	22	10	22	45	78	146	108	40	471	C	4.67	2.12	4.67	9.55	16.56	31.00	22.93	8.49	100.00	31.42	21.02
11-2A	61	33	17	54	63	129	97	35	489	11-2A	12.47	6.75	3.48	11.04	12.88	26.38	19.84	7.16	100.00	26.99	33.74
B	53	16	51	36	80	100	91	45	472	B	11.23	3.39	10.81	7.63	16.95	21.19	19.28	9.53	100.00	28.81	33.05
C	48	7	31	51	80	104	96	37	454	C	10.57	1.54	6.83	11.23	17.62	22.91	21.15	8.15	100.00	29.30	30.18
12-3A	71	31	58	79	107	132	89	27	594	12-3A	11.95	5.22	9.76	13.30	18.01	22.22	14.98	4.55	100.00	19.53	40.24
B	68	30	50	51	84	98	55	11	447	B	15.21	6.71	11.19	11.41	18.79	21.92	12.30	2.46	100.00	14.77	44.52
C	43	39	40	88	100	127	78	21	536	C	8.02	7.28	7.46	16.42	18.66	23.69	14.55	3.92	100.00	18.47	39.18
13-4A	42	22	36	41	68	119	108	34	470	13-4A	8.94	4.68	7.66	8.72	14.47	25.32	22.98	7.23	100.00	30.21	30.00
B	26	26	19	49	66	109	103	41	439	B	5.92	5.92	4.33	11.16	15.03	24.83	23.46	9.34	100.00	32.80	27.33
C	46	21	27	50	76	128	117	55	520	C	8.85	4.04	5.19	9.62	14.62	24.62	22.50	10.58	100.00	33.08	27.69
14-1A	12	11	52	61	90	124	113	52	515	14-1A	2.33	2.14	10.10	11.84	17.48	24.08	21.94	10.10	100.00	32.04	26.41
B	15	4	24	41	73	111	124	27	419	B	3.58	0.95	5.73	9.79	17.42	26.49	29.59	6.44	100.00	36.04	20.05
C	18	12	31	42	98	138	123	58	520	C	3.46	2.31	5.96	8.08	18.85	26.54	23.65	11.15	100.00	34.81	19.81

Screen Fractions by Weight Cont'd										% Furnish in Each Fraction Cont'd											
Series 4- 70 Degree Counter Knife - Modified																					
15-2A	91	27	41	61	102	118	84	31	555	15-2A	16.40	4.86	7.39	10.99	18.38	21.26	15.14	5.59	100.00	20.72	39.64
B	62	30	39	32	57	97	69	26	412	B	15.05	7.28	9.47	7.77	13.83	23.54	16.75	6.31	100.00	23.06	39.56
C	113	26	46	51	72	106	67	25	506	C	22.33	5.14	9.09	10.08	14.23	20.95	13.24	4.94	100.00	18.18	46.64
16-3A	14	15	30	36	81	133	125	22	456	16-3A	3.07	3.29	6.58	7.89	17.76	29.17	27.41	4.82	100.00	32.24	20.83
B	13	15	28	42	73	90	104	32	397	B	3.27	3.78	7.05	10.58	18.39	22.67	26.20	8.06	100.00	34.26	24.69
C	30	24	62	69	97	180	149	44	655	C	4.58	3.66	9.47	10.53	14.81	27.48	22.75	6.72	100.00	29.47	28.24
17-4A	59	48	69	77	81	95	89	22	540	17-4A	10.93	8.89	12.78	14.26	15.00	17.59	16.48	4.07	100.00	20.56	46.85
B	87	42	64	76	98	112	83	31	593	B	14.67	7.08	10.79	12.82	16.53	18.89	14.00	5.23	100.00	19.22	45.36
C	60	47	60	73	73	110	102	27	552	C	10.87	8.51	10.87	13.22	13.22	19.93	18.48	4.89	100.00	23.37	43.48
18-1A	11	27	63	42	123	169	152	63	650	18-1A	1.69	4.15	9.69	6.46	18.92	26.00	23.38	9.69	100.00	33.08	22.00
B	17	12	14	30	61	148	123	61	466	B	3.65	2.58	3.00	6.44	13.09	31.76	26.39	13.09	100.00	39.48	15.67
C	18	9	24	38	74	139	157	118	577	C	3.12	1.56	4.16	6.59	12.82	24.09	27.21	20.45	100.00	47.66	15.42
19-2A	38	12	28	33	74	114	93	49	441	19-2A	8.62	2.72	6.35	7.48	16.78	25.85	21.09	11.11	100.00	32.20	25.17
B	59	16	54	67	94	136	103	79	608	B	9.70	2.63	8.88	11.02	15.46	22.37	16.94	12.99	100.00	29.93	32.24
C	49	16	28	44	63	104	84	35	423	C	11.58	3.78	6.62	10.40	14.89	24.59	19.86	8.27	100.00	28.13	32.39
20-3A	19	9	29	54	91	131	111	68	512	20-3A	3.71	1.76	5.66	10.55	17.77	25.59	21.68	13.28	100.00	34.96	21.68
B	42	10	26	42	75	145	125	101	566	B	7.42	1.77	4.59	7.42	13.25	25.62	22.08	17.84	100.00	39.93	21.20
C	62	12	35	57	105	138	106	72	587	C	10.56	2.04	5.96	9.71	17.89	23.51	18.06	12.27	100.00	30.32	28.28
									Average	9.25	4.20	7.75	10.46	16.36	23.95	19.60	8.43		28.03	31.67	
									St. Dev.	6.27	2.31	2.38	2.23	2.27	3.46	4.74	3.71		7.67	10.29	



## **Appendix II**

### **Data from Log Conditioning and Vacuum-Pressure Tests**

## Log diameters, moisture and densities taken before log storage tests

**Green Aspen and Pine**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	BUTT	TIP	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
Aspen1	699	1148	9.88	9.38	9.63	0.609	37.99	383	82.5	0.334
Aspen2	767	1412	10.38	9.38	9.88	0.543	33.90	507	51.3	0.359
Aspen3	936	1562	10.20	9.75	9.98	0.599	37.39	560	67.1	0.359
Aspen4	1166	1907	10.50	10.00	10.25	0.611	38.15	753	54.8	0.395
Aspen5	1086	1913	7.50	6.00	6.75	0.568	35.42	717	51.5	0.375
<b>Average</b>					<b>9.30</b>	<b>0.586</b>	<b>36.57</b>	<b>584</b>	<b>61.4</b>	<b>0.364</b>
<b>St. Dev.</b>					<b>1.44</b>	<b>0.030</b>	<b>1.85</b>	<b>153</b>	<b>13.4</b>	<b>0.023</b>
Pine1	557	913	8.00	7.20	7.60	0.610	38.07	408	36.5	0.447
Pine2	751	1232	9.75	7.50	8.63	0.610	38.04	553	35.8	0.449
Pine3	573	972	8.50	7.00	7.75	0.590	36.79	410	39.8	0.422
Pine4	624	946	8.25	7.00	7.63	0.660	41.16	438	42.5	0.463
Pine5	504	842	11.00	10.20	10.60	0.599	37.35	364	38.5	0.432
<b>Average</b>					<b>8.44</b>	<b>0.613</b>	<b>38.28</b>	<b>435</b>	<b>38.6</b>	<b>0.443</b>
<b>St. Dev.</b>					<b>1.28</b>	<b>0.027</b>	<b>1.70</b>	<b>71</b>	<b>2.7</b>	<b>0.016</b>

**Mountain Pine Beetle**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	BUTT	TIP	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1	737	1276	8.50	7.63	8.07	0.578	36.04	619	19.1	0.485
2	885	1877	9.75	7.25	8.50	0.471	29.42	756	17.1	0.403
3	524	926	8.88	8.00	8.44	0.566	35.31	443	18.3	0.478
4	740	1472	8.13	9.25	8.69	0.503	31.37	633	16.9	0.430
5	952	1885	10.25	9.75	10.00	0.505	31.51	813	17.1	0.431
6	690	1365	9.13	8.75	8.94	0.505	31.54	575	20.0	0.421
7	1060	1772	10.75	9.75	10.25	0.598	37.33	879	20.6	0.496
8	568	1177	9.75	8.88	9.32	0.483	30.11	468	21.4	0.398
9	636	1245	9.50	8.75	9.13	0.511	31.88	534	19.1	0.429
10	976	1610	9.75	9.38	9.57	0.606	37.83	782	24.8	0.486
11	1143	1993	10.38	10.25	10.32	0.574	35.79	935	22.2	0.469
12	890	1668	11.25	9.00	10.13	0.534	33.29	747	19.1	0.448
13	1541	2532	11.25	10.63	10.94	0.609	37.98	1237	24.6	0.489
14	1104	1933	10.50	9.25	9.88	0.571	35.64	944	16.9	0.488
15	801	1435	9.63	9.13	9.38	0.558	34.83	649	23.4	0.452
16	734	1282	8.75	8.38	8.57	0.573	35.73	604	21.5	0.471
17	918	1620	9.75	9.00	9.38	0.567	35.36	788	16.5	0.486
18	623	1091	9.00	8.50	8.75	0.571	35.63	541	15.2	0.496
19	829	1572	10.25	9.63	9.94	0.527	32.91	680	21.9	0.433
20	440	791	8.00	8.00	8.00	0.556	34.71	385	14.3	0.487
<b>Average</b>					<b>9.31</b>	<b>0.548</b>	<b>34.21</b>		<b>19.5</b>	<b>0.459</b>
<b>St. Dev.</b>					<b>0.81</b>	<b>0.041</b>	<b>2.54</b>		<b>3.0</b>	<b>0.032</b>

**Log diameters, moisture and densities taken after stranding**

(50 degree counter knife angle throughout stranding)

**Control - Aspen**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
A1-1	544.77	1020	9.38	10.25	9.82	0.534	33.33	346.80	57.1	0.340
A1-2	564.97	1010	9.25	10.25	9.75	0.559	34.91	341.70	65.3	0.338
A1-3	664.07	1180	9.88	9.00	9.44	0.563	35.12	409.75	62.1	0.347
A1-4	507.42	945	9.63	8.75	9.19	0.537	33.51	323.90	56.7	0.343
A2-1	641.38	1110	9.75	10.00	9.88	0.578	36.06	434.90	47.5	0.392
A2-2	642.92	1155	9.25	10.13	9.69	0.557	34.73	456.30	40.9	0.395
A2-3	526.09	990	9.50	10.00	9.75	0.531	33.16	382.80	37.4	0.387
A2-4	576.38	1100	9.00	9.75	9.38	0.524	32.70	394.60	46.1	0.359
A3-1	726.03	1270	10.13	9.75	9.94	0.572	35.67	467.60	55.3	0.368
A3-2	797.30	1310	9.75	10.00	9.88	0.609	37.98	505.70	57.7	0.386
A3-3	649.20	1200	9.75	9.50	9.63	0.541	33.76	426.70	52.1	0.356
A3-4	727.66	1215	9.50	9.50	9.50	0.599	37.37	483.10	50.6	0.398
A4-1	709.08	1275	10.25	10.88	10.57	0.556	34.70	487.80	45.4	0.383
A4-2	672.42	1265	10.63	9.63	10.13	0.532	33.17	466.60	44.1	0.369
A4-3	571.08	1090	9.63	10.13	9.88	0.524	32.69	402.50	41.9	0.369
A4-4	548.00	1050	9.63	10.25	9.94	0.522	32.57	392.90	39.5	0.374
A5-1	723.31	1330	10.63	10.88	10.76	0.544	33.94	511.90	41.3	0.385
A5-2	739.10	1310	10.50	10.50	10.50	0.564	35.21	510.80	44.7	0.390
A5-3	735.53	1295	11.00	10.25	10.63	0.568	35.44	508.70	44.6	0.393
A5-4	680.90	1220	10.13	10.63	10.38	0.558	34.83	471.20	44.5	0.386
<b>Average</b>					<b>9.93</b>	<b>0.554</b>	<b>34.54</b>	<b>436.31</b>	<b>48.7</b>	<b>0.373</b>
<b>St. Dev.</b>					<b>0.44</b>	<b>0.024</b>	<b>1.51</b>	<b>59.69</b>	<b>7.9</b>	<b>0.020</b>

**Control - Green Pine**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL DIAMETER (in)	INITIAL DIAMETER (in)	AVERAGE DIAMETER (in)	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
P1-1	421.37	710	7.50	7.50	7.50	0.593	37.03	340.50	23.8	0.480
P1-2	353.85	630	7.38	7.38	7.38	0.562	35.05	277.60	27.5	0.441
P1-3	361.20	605	7.25	7.13	7.19	0.597	37.25	262.30	37.7	0.434
P1-4	345.65	585	7.00	7.00	7.00	0.591	36.87	269.00	28.5	0.460
P2-1	480.86	755	8.00	8.50	8.25	0.637	39.74	366.70	31.1	0.486
P2-2	485.00	755	7.75	7.25	7.50	0.642	40.08	351.80	37.9	0.466
P2-3	395.35	640	7.25	7.50	7.38	0.618	38.55	296.60	33.3	0.463
P2-4	380.56	600	7.25	7.50	7.38	0.634	39.58	301.00	26.4	0.502
P3-1	389.81	660	7.50	7.50	7.50	0.591	36.85	301.40	29.3	0.457
P3-2	337.67	580	7.00	7.00	7.00	0.582	36.33	261.40	29.2	0.451
P3-3	327.30	580	6.75	6.75	6.75	0.564	35.21	257.80	27.0	0.444
P3-4	311.66	550	6.75	6.75	6.75	0.567	35.36	242.70	28.4	0.441
P4-1	443.42	675	7.75	7.00	7.38	0.657	40.99	350.40	26.5	0.519
P4-2	389.80	620	7.00	7.00	7.00	0.629	39.23	302.40	28.9	0.488
P4-3	361.51	580	7.50	6.75	7.13	0.623	38.89	288.50	25.3	0.497
P4-4	358.68	585	7.00	6.50	6.75	0.613	38.26	278.90	28.6	0.477
P5-1	276.64	485	6.25	6.50	6.38	0.570	35.59	214.70	28.8	0.443
P5-2	255.44	445	6.25	6.00	6.13	0.574	35.82	197.70	29.2	0.444
P5-3	242.24	425	6.00	6.00	6.00	0.570	35.57	193.60	25.1	0.456
P5-4	235.14	425	5.75	6.00	5.88	0.553	34.52	187.20	25.6	0.440
<b>Average</b>					<b>7.01</b>	<b>0.598</b>	<b>37.34</b>	<b>277.11</b>	<b>28.9</b>	<b>0.464</b>
<b>St. Dev.</b>					<b>0.59</b>	<b>0.031</b>	<b>1.94</b>	<b>52.64</b>	<b>3.7</b>	<b>0.024</b>

**Log diameters, moisture and densities taken after stranding**

(50 degree counter knife angle throughout stranding)

**Vacuum- Pressure Treated MPB Wood**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
V1	825.78	825	9.25	8.75	9.00	1.057	65.97	301.30	174.1	0.386
V2	705.14	860	9.25	8.75	9.00	0.820	51.16	324.20	117.5	0.377
V3	762.76	855	9.25	8.80	9.03	0.892	55.67	323.80	135.6	0.379
V4	516.73	580	7.75	7.25	7.50	0.891	55.59	268.10	92.7	0.462
V5	489.92	540	7.50	7.50	7.50	1.036	64.63	251.10	95.1	0.531
V6	452.76	515	7.25	7.00	7.13	0.879	54.86	233.10	94.2	0.453
V7	457.20	505	7.00	7.00	7.00	0.905	56.49	229.40	99.3	0.454
<b>Average</b>					<b>8.02</b>	<b>0.926</b>	<b>57.77</b>	<b>275.86</b>	<b>115.5</b>	<b>0.434</b>
<b>St. Dev.</b>					<b>0.94</b>	<b>0.087</b>	<b>5.43</b>	<b>40.71</b>	<b>30.2</b>	<b>0.057</b>

**Beetle Killed wood - 0 day sprinkling**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1A	449.25	685	8.00	9.00	8.50	0.656	40.92	325.60	38.0	0.475
2B	546.79	1085	9.75	10.00	9.88	0.504	31.45	442.90	23.5	0.408
3C	356.34	580	8.25	8.38	8.32	0.614	38.34	282.10	26.3	0.486
4D	431.72	830	8.50	8.88	8.69	0.520	32.46	357.50	20.8	0.431
5A	613.27	1105	9.88	10.00	9.94	0.555	34.63	495.20	23.8	0.448
6B	476.08	900	8.75	9.25	9.00	0.529	33.01	369.70	28.8	0.411
7C	843.44	1200	10.50	10.38	10.44	0.703	43.86	604.70	39.5	0.504
8D	473.71	860	8.88	9.13	9.01	0.551	34.37	332.00	42.7	0.386
9A	532.37	935	9.50	9.75	9.63	0.569	35.53	403.90	31.8	0.432
10B	734.11	1180	9.63	10.13	9.88	0.622	38.82	551.70	33.1	0.468
11C	827.11	1285	10.50	10.88	10.69	0.644	40.16	590.80	40.0	0.460
12D	494.63	925	8.75	9.75	9.25	0.535	33.37	417.80	18.4	0.452
13A	937.14	1465	10.50	11.50	11.00	0.640	39.92	629.90	48.8	0.430
14B	566.87	940	9.25	10.13	9.69	0.603	37.63	452.10	25.4	0.481
15C	572.98	860	9.50	9.50	9.50	0.666	41.57	384.20	49.1	0.447
16D	585.63	910	8.75	9.00	8.88	0.644	40.16	439.00	33.4	0.482
17A	629.54	1085	9.13	10.13	9.63	0.580	36.21	522.90	20.4	0.482
18B	505.44	835	8.75	9.00	8.88	0.605	37.77	403.30	25.3	0.483
19C	666.48	1205	9.25	10.75	10.00	0.553	34.51	521.90	27.7	0.433
20D	399.22	690	8.00	8.13	8.07	0.579	36.10	336.40	18.7	0.488
<b>Average</b>					<b>9.44</b>	<b>0.594</b>	<b>37.04</b>	<b>443.18</b>	<b>30.8</b>	<b>0.454</b>
<b>St. Dev.</b>					<b>0.79</b>	<b>0.055</b>	<b>3.41</b>	<b>100.89</b>	<b>9.5</b>	<b>0.032</b>

**Beetle Killed wood - 10 days sprinkling**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1B	493.16	705	8.00	8.50	8.25	0.700	43.65	323.70	52.4	0.459
2C	566.11	940	9.50	9.75	9.63	0.602	37.58	383.80	47.5	0.408
3D	415.69	640	8.25	8.25	8.25	0.650	40.53	313.10	32.8	0.489
4A	579.60	940	9.25	8.75	9.00	0.617	38.48	416.30	39.2	0.443
5B	671.88	1045	9.50	10.50	10.00	0.643	40.12	451.80	48.7	0.432
6C	545.69	870	8.75	9.13	8.94	0.627	39.14	374.20	45.8	0.430
7D	805.50	985	10.50	10.50	10.50	0.818	51.03	480.50	67.6	0.488
8A	679.44	935	9.50	9.75	9.63	0.727	45.34	430.10	58.0	0.460
9B	558.27	900	9.25	9.50	9.38	0.620	38.71	373.40	49.5	0.415
10C	706.83	990	9.75	10.13	9.94	0.714	44.55	476.60	48.3	0.481
11D	896.79	1195	10.50	10.75	10.63	0.750	46.83	545.00	64.5	0.456
12A	614.91	1080	9.00	10.50	9.75	0.569	35.53	462.80	32.9	0.429
13A	1032.19	1340	11.25	12.00	11.63	0.770	48.07	610.80	69.0	0.456
14C	624.02	905	9.75	9.50	9.63	0.690	43.03	414.40	50.6	0.458
15D	695.78	935	9.25	9.25	9.25	0.744	46.43	383.70	81.3	0.410
16A	576.68	850	9.13	8.75	8.94	0.678	42.34	403.80	42.8	0.475
17B	662.75	1070	9.63	10.00	9.81	0.619	38.65	495.50	33.8	0.463
18C	500.37	795	9.00	8.75	8.88	0.629	39.27	355.90	40.6	0.448
19D	673.40	1105	9.75	10.50	10.13	0.609	38.03	472.20	42.6	0.427
20A	419.88	670	7.75	8.25	8.00	0.627	39.11	320.70	30.9	0.479
<b>Average</b>					<b>9.51</b>	<b>0.670</b>	<b>41.82</b>	<b>424.42</b>	<b>48.9</b>	<b>0.450</b>
<b>St. Dev.</b>					<b>0.87</b>	<b>0.066</b>	<b>4.13</b>	<b>76.69</b>	<b>13.5</b>	<b>0.025</b>

**Log diameters, moisture and densities taken after stranding**

(50 degree counter knife angle throughout stranding)

**Beetle Killed wood - 20 days sprinkling**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1C	505.79	690	7.88	8.25	8.07	0.733	45.74	312.90	61.6	0.453
2D	592.53	940	9.50	9.75	9.63	0.630	39.33	373.30	58.7	0.397
3A	565.77	730	8.75	9.00	8.88	0.775	48.36	343.20	64.9	0.470
4B	564.60	865	8.75	9.00	8.88	0.653	40.73	357.70	57.8	0.414
5C	717.35	1060	9.75	10.63	10.19	0.677	42.23	476.80	50.5	0.450
6D	565.95	830	8.75	9.50	9.13	0.682	42.55	363.80	55.6	0.438
7A	939.72	1160	10.25	11.00	10.63	0.810	50.55	577.00	62.9	0.497
8B	676.09	930	9.50	9.63	9.57	0.727	45.36	340.10	98.8	0.366
9C	633.34	945	9.00	9.50	9.25	0.670	41.82	392.60	61.3	0.415
10D	721.94	975	9.50	9.50	9.50	0.740	46.20	478.90	50.7	0.491
11A	945.04	1255	10.75	11.00	10.88	0.753	46.99	566.60	66.8	0.451
12B	582.32	955	9.00	10.50	9.75	0.610	38.05	428.50	35.9	0.449
13C	1044.18	1395	10.75	12.00	11.38	0.749	46.71	637.20	63.9	0.457
14D	688.34	940	9.50	9.75	9.63	0.732	45.69	447.30	53.9	0.476
15A	741.50	970	9.50	9.75	9.63	0.764	47.70	408.50	81.5	0.421
16B	575.09	810	9.00	8.75	8.88	0.710	44.30	371.10	55.0	0.458
17C	670.38	975	9.50	10.00	9.75	0.688	42.90	445.60	50.4	0.457
18D	495.15	765	8.25	8.75	8.50	0.647	40.39	354.40	39.7	0.463
19C	776.56	1195	11.38	10.13	10.76	0.650	40.55	432.30	79.6	0.362
20B	428.69	680	7.75	8.25	8.00	0.630	39.34	314.40	36.4	0.462
<b>Average</b>					<b>9.54</b>	<b>0.702</b>	<b>43.78</b>	<b>421.11</b>	<b>59.3</b>	<b>0.442</b>
<b>St. Dev.</b>					<b>0.90</b>	<b>0.056</b>	<b>3.47</b>	<b>89.83</b>	<b>15.1</b>	<b>0.037</b>

**Beetle Killed wood - 30 days sprinkling**

SAMPLE#	Wet Wt (gms)	VOLUME (cm <sup>3</sup> )	INITIAL	INITIAL	AVERAGE	DENSITY (gm/cm <sup>3</sup> )	DENSITY (lbs/cu.ft)	Dry Wt. (gm)	MC% Dry Base	Specific Gravity
			DIAMETER (in)	DIAMETER (in)	DIAMETER (in)					
1D	509.71	660	8.00	7.75	7.88	0.772	48.19	297.20	71.5	0.450
2A	668.21	990	9.75	10.00	9.88	0.675	42.12	398.50	67.7	0.403
3B	405.00	540	9.00	8.50	8.75	0.750	46.80	255.80	58.3	0.474
4C	516.10	800	9.00	8.50	8.75	0.645	40.26	338.30	52.6	0.423
5D	707.66	1070	10.50	9.75	10.13	0.661	41.27	442.60	59.9	0.414
6A	550.00	845	9.25	8.75	9.00	0.651	40.62	354.70	55.1	0.420
7B	935.00	1145	10.75	10.50	10.63	0.817	50.96	545.40	71.4	0.476
8C	620.00	870	9.00	8.75	8.88	0.713	44.47	323.30	91.8	0.372
9D	590.00	850	9.13	8.50	8.82	0.694	43.31	339.70	73.7	0.400
10A	727.26	1040	10.00	9.75	9.88	0.699	43.64	506.20	43.7	0.487
11B	929.31	1205	11.00	10.75	10.88	0.771	48.12	555.70	67.2	0.461
12C	618.15	975	10.25	8.75	9.50	0.634	39.56	440.00	40.5	0.451
13D	966.63	1315	11.25	10.25	10.75	0.735	45.87	585.80	65.0	0.445
14A	793.77	1025	10.50	9.50	10.00	0.774	48.32	471.70	68.3	0.460
15B	660.84	830	9.50	9.50	9.50	0.796	49.68	344.20	92.0	0.415
16C	525.00	695	8.88	8.75	8.82	0.755	47.14	331.90	58.2	0.478
17D	707.59	990	9.75	9.00	9.38	0.715	44.60	500.60	41.3	0.506
18A	563.96	820	9.25	8.75	9.00	0.688	42.92	380.90	48.1	0.465
19B	745.00	1145	11.00	9.50	10.25	0.651	40.60	474.40	57.0	0.414
20C	458.91	700	8.13	8.00	8.07	0.656	40.91	325.60	40.9	0.465
<b>Average</b>					<b>9.43</b>	<b>0.713</b>	<b>44.47</b>	<b>410.63</b>	<b>61.2</b>	<b>0.444</b>
<b>St. Dev.</b>					<b>0.85</b>	<b>0.056</b>	<b>3.48</b>	<b>95.57</b>	<b>15.0</b>	<b>0.035</b>



**Moisture Gradient after Stranding**  
Green Aspen

Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC
<b>A1-1</b>											
1	21.56	11.35	89.96	1	20.68	12.45	66.10	1	19.26	11.94	61.31
2	18.68	10.37	80.14	2	19.83	12.33	60.83	2	18.25	12.12	50.58
3	15.85	10.19	55.54	3	20.00	14.03	42.55	3	16.66	11.51	44.74
4	16.61	11.90	39.58	4	18.81	14.04	33.97	4	17.16	13.34	28.64
5	15.19	11.15	36.23	5	18.30	13.94	31.28	5	14.33	11.49	24.72
6	15.46	10.50	47.24	6	19.57	13.74	42.43	6	14.81	11.52	28.56
7	20.87	11.77	77.32	7	18.06	12.40	45.65	7	19.49	13.49	44.48
8	21.09	11.27	87.13	8	22.27	13.64	63.27	8	19.37	13.08	48.09
								9	17.85	11.66	53.09
<b>A1-2</b>											
1	23.88	11.48	108.01	1	22.16	11.82	87.48	1	20.03	11.86	68.89
2	16.79	10.34	62.38	2	19.66	11.20	75.54	2	17.79	12.12	46.78
3	18.42	11.90	54.79	3	18.65	11.44	63.02	3	16.61	12.58	32.03
4	16.77	10.91	53.71	4	21.48	16.72	28.47	4	14.42	11.71	23.14
5	15.25	11.23	35.80	5	14.20	11.16	27.24	5	11.34	9.32	21.67
6	16.39	10.73	52.75	6	16.10	11.58	39.03	6	17.19	13.43	28.00
7	18.37	11.35	61.85	7	21.41	12.37	73.08	7	18.35	12.69	44.60
8	24.61	12.40	98.47	8	21.03	11.66	80.36	8	21.02	12.68	65.77
<b>A1-3</b>											
1	25.76	14.94	72.42	1	25.53	12.12	110.64	1	21.88	12.41	76.31
2	20.96	12.41	68.90	2	22.67	11.84	91.47	2	20.25	13.74	47.38
3	17.86	11.53	54.90	3	20.42	12.12	68.48	3	16.68	11.49	45.17
4	13.27	8.94	48.43	4	23.78	16.94	40.38	4	18.84	14.06	34.00
5	16.23	12.45	30.36	5	17.12	13.92	22.99	5	15.09	12.20	23.69
6	14.39	9.56	50.52	6	18.88	13.00	45.23	6	22.92	17.11	33.96
7	19.43	11.94	62.73	7	23.32	12.82	81.90	7	18.67	12.97	43.95
8	16.47	9.60	71.56	8	23.37	11.59	101.64	8	17.26	11.81	46.15
								9	19.03	12.50	52.24
<b>A1-4</b>											
1	21.98	11.56	90.14	1	22.62	11.60	95.00	1	22.64	13.24	71.00
2	18.36	10.50	74.86	2	21.47	12.05	78.17	2	17.41	11.93	45.93
3	17.07	11.01	55.04	3	19.53	11.69	67.07	3	16.87	11.88	42.00
4	24.02	16.48	45.75	4	31.02	22.86	35.70	4	17.61	13.03	35.15
5	15.84	11.67	35.73	5	15.75	12.10	30.17	5	16.88	13.48	25.22
6	18.83	12.76	47.57	6	19.22	13.13	46.38	6	17.65	13.58	29.97
7	20.29	12.56	61.54	7	23.91	13.47	77.51	7	19.40	13.71	41.50
8	20.15	11.50	75.22	8	23.52	12.32	90.91	8	17.68	12.22	44.68
								9	21.25	13.67	55.45
<b>A2-1</b>											
1	18.96	12.29	54.27	1	25.22	12.58	100.48	1	20.75	13.54	53.25
2	18.76	12.59	49.01	2	24.25	12.70	90.94	2	17.83	11.94	49.33
3	16.99	12.53	35.59	3	21.52	13.10	64.27	3	19.42	13.09	48.36
4	27.60	20.69	33.40	4	17.40	12.98	34.05	4	18.44	13.36	38.02
5	17.17	13.36	28.52	5	22.09	18.82	17.38	5	16.96	13.11	29.37
6	16.11	11.97	34.59	6	17.48	12.62	38.51	6	23.81	18.15	31.18
7	17.80	12.33	44.36	7	23.66	13.69	72.83	7	18.85	13.45	40.15
8	19.33	12.83	50.66	8	24.34	12.48	95.03	8	18.37	12.31	49.23
								9	19.52	13.02	49.92
<b>A2-2</b>											
1	16.07	12.28	30.86	1	21.54	12.78	68.54	1	24.29	14.51	67.40
2	17.14	13.28	29.07	2	18.93	11.86	59.61	2	20.80	13.58	53.17
3	18.50	14.71	25.76	3	19.52	13.52	44.38	3	19.71	13.47	46.33
4	20.03	16.36	22.43	4	18.20	13.71	32.75	4	19.18	13.97	37.29
5	15.72	12.59	24.86	5	22.31	17.40	28.22	5	16.73	12.96	29.09
6	18.74	14.83	26.37	6	15.35	11.89	29.10	6	18.48	13.59	35.98
7	17.56	13.49	30.17	7	17.97	12.60	42.62	7	18.24	13.10	39.24
				8	19.11	12.45	53.49	8	18.04	12.26	47.15
				9	20.63	12.31	67.59	9	19.94	12.46	60.03
<b>A2-3</b>											
1	20.79	12.15	71.11	1	18.36	11.91	54.16	1	18.04	12.26	47.15
2	19.64	12.46	57.62	2	20.18	11.97	68.59	2	19.94	12.46	60.03
3	16.20	12.55	29.08	3	19.03	12.86	47.98				
4	14.65	12.40	18.15	4	16.09	12.35	30.28				
5	20.08	17.00	18.12	5	18.30	13.34	37.18				
6	15.91	12.46	27.69	6	18.61	12.21	52.42				
7	16.64	11.84	40.54	7	17.69	13.03	35.76				
8	18.97	11.59	63.68	8	18.78	12.64	48.58				
				9	18.14	12.13	49.55				

**Moisture Gradient after Stranding**  
Green Pine

Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC	Log#	Green wt	Dry Wt	%MC
<b>P1-1</b>				<b>P2-4</b>				<b>P4-3</b>			
1	19.01	14.68	29.50	1	16.86	13.26	27.14932	1	15.49	12.19	27.07
2	17.25	13.65	26.37	2	17.28	13.91	24.23	2	19.57	15.86	23.39
3	17.14	14.41	18.95	3	19.98	16.43	21.61	3	17.41	14.29	21.83
4	18.39	15.82	16.25	4	16.53	13.69	20.75	4	17.66	14.83	19.08
5	6.37	5.40	17.96	5	19.15	15.46	23.87	5	17.98	14.96	20.19
6	18.43	15.22	21.09	6	17.70	14.05	25.98	6	18.20	14.78	23.14
7	19.29	15.19	26.99					7	17.55	13.88	26.44
<b>P1-2</b>				<b>P3-1</b>				<b>P4-4</b>			
1	17.10	13.20	29.55	1	17.95	13.96	28.58	1	16.76	13.19	27.07
2	19.52	15.31	27.50	2	17.74	13.91	27.53	2	18.27	14.64	24.80
3	19.75	15.79	25.08	3	17.86	14.30	24.90	3	20.36	16.45	23.77
4	19.56	15.95	22.63	4	17.24	14.03	22.88	4	16.57	13.58	22.02
5	26.42	21.37	23.63	5	17.82	14.24	25.14	5	22.86	18.43	24.04
6	18.56	14.57	27.39	6	20.14	15.79	27.55	6	16.92	13.33	26.93
7	17.34	13.46	28.83								
<b>P1-3</b>				<b>P3-2</b>				<b>P5-1</b>			
1	17.22	13.13	31.15	1	18.42	14.61	26.08	1	13.47	10.81	24.61
2	18.83	14.86	26.72	2	19.30	15.59	23.80	2	17.74	14.29	24.14
3	18.04	14.68	22.89	3	23.20	18.95	22.43	3	16.62	13.63	21.94
4	20.88	17.28	20.83	4	16.51	13.64	21.04	4	16.38	13.45	21.78
5	17.79	14.44	23.20	5	17.16	14.01	22.48	5	17.73	14.47	22.53
6	19.41	15.26	27.20	6	18.55	14.84	25.00	6	17.13	13.77	24.40
<b>P1-4</b>				<b>P3-3</b>				<b>P5-2</b>			
1	18.59	14.35	29.55	1	16.78	13.27	26.45	1	17.16	12.78	34.27
2	18.88	14.93	26.46	2	19.70	15.82	24.53	2	17.69	14.46	22.34
3	17.86	14.26	25.25	3	17.99	14.67	22.63	3	17.73	14.86	19.31
4	16.62	13.38	24.22	4	15.90	13.09	21.47	4	8.58	7.23	18.67
5	18.84	15.03	25.35	5	19.47	15.72	23.85	5	16.85	13.90	21.22
6	17.47	13.70	27.52	6	18.08	14.44	25.21	6	17.26	14.05	22.85
<b>P2-1</b>				<b>P3-4</b>				<b>P5-3</b>			
1	18.20	13.92	30.75	1	16.01	12.62	26.86	1	8.49	6.87	23.58
2	18.02	14.07	28.07	2	17.31	13.92	24.35	2	10.63	8.70	22.18
3	18.15	14.80	22.64	3	18.28	14.79	23.60	3	15.28	12.55	21.75
4	17.00	14.55	16.84	4	15.45	12.57	22.91	4	16.12	13.43	20.03
5	16.86	13.83	21.91	5	17.99	14.52	23.90	5	14.54	11.92	21.98
6	18.13	14.25	27.23	6	18.84	15.04	25.27	6	14.61	11.87	23.08
7	5.93	4.62	28.35					<b>P5-4</b>			
<b>P2-2</b>				<b>P4-1</b>				1	18.08	14.58	24.01
1	16.07	12.28	30.86	1	18.05	13.96	29.30	2	17.37	14.23	22.07
2	17.14	13.28	29.07	2	22.68	18.01	25.93	3	23.70	19.72	20.18
3	18.50	14.71	25.76	3	20.38	16.71	21.96	4	16.31	13.45	21.26
4	20.03	16.36	22.43	4	16.79	14.11	18.99	5	17.56	14.33	22.54
5	15.72	12.59	24.86	5	19.42	15.70	23.69				
6	18.74	14.83	26.37	6	16.22	12.75	27.22				
7	17.56	13.49	30.17								
<b>P2-3</b>				<b>P4-2</b>							
1	15.29	11.77	29.91	1	18.64	14.26	30.72				
2	18.25	14.37	27.00	2	25.20	20.10	25.37				
3	17.49	14.07	24.31	3	20.21	16.59	21.82				
4	16.90	13.83	22.20	4	20.90	17.42	19.98				
5	26.53	21.22	25.02	5	21.76	17.37	25.27				
6	15.89	12.38	28.35	6	19.92	15.52	28.35				



**Moisture Gradient after Stranding**  
10 Day Sprinkling MPB Logs

Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.	Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.	Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.
<b>1B</b>				29.73		<b>8A</b>				224.60		<b>15D</b>					
1	17.08	12.21	39.89			1	23.98	6.84	250.58			1	41.01	17.92	128.85		
2	17.18	13.88	23.78	inner avg.	22.02	2	15.61	12.40	25.89	inner avg.	36.37	2	15.56	11.51	35.19		
3	16.14	12.95	24.63			3	14.27	11.08	23.79			3	15.53	12.51	24.14		
4	15.42	12.66	21.80			4	14.69	11.63	26.31			4	15.78	12.82	23.09		
5	16.53	13.70	20.66			5	13.69	10.54	29.89			5	16.76	13.43	24.80		
6	14.93	12.52	19.25			6	14.40	11.34	26.98			6	16.43	13.27	23.81		
7	15.58	13.03	19.57			7	21.39	11.86	80.35			7	15.24	12.35	23.40		
						8	25.95	8.69	198.62			8	21.48	13.54	58.64		
<b>2C</b>				68.78		<b>9B</b>				54.84		<b>16A</b>					
1	17.94	9.86	81.95	outer avg.	20.69	1	40.75	21.45	89.98	outer avg.	21.42	1	19.43	15.29	27.08		outer avg.
2	13.96	11.30	20.00	inner avg.		2	14.90	11.92	25.00	inner avg.		2	19.28	15.86	21.56		inner avg.
3	15.87	12.21	29.98			3	15.14	12.55	20.64			3	18.75	15.23	23.11		
4	14.90	12.43	19.87			4	14.98	12.42	20.61			4	23.36	16.19	44.29		
5	13.28	11.02	20.51			5	16.05	13.30	20.68			5	16.88	13.69	23.30		
6	13.76	11.78	16.81			6	15.18	12.63	20.19			6	17.09	13.95	22.51		
7	12.55	10.56	18.84			7	14.58	12.18	19.70			7	15.75	12.75	23.53		
8	12.44	10.47	18.82									8	17.97	11.54	55.72		
9	13.01	8.36	55.62			<b>10C</b>				60.17		<b>17B</b>					
						1	19.42	14.10	37.73	outer avg.	28.23	1	17.55	13.62	28.85		outer avg.
<b>3D</b>				38.21		2	15.94	12.85	24.05	inner avg.		2	17.76	15.09	17.69		inner avg.
1	12.12	8.52	42.25	outer avg.	18.51	3	16.37	13.32	22.90			3	16.68	14.23	17.22		
2	17.27	14.35	20.35	inner avg.		4	19.00	15.51	22.50			4	15.16	12.81	18.35		
3	18.81	15.88	18.45			5	22.50	15.09	49.11			5	14.43	12.24	17.89		
4	18.06	15.27	18.27			6	17.54	13.89	26.28			6	15.36	12.63	21.62		
5	17.68	14.99	17.95			7	14.90	11.76	26.70			7	14.37	12.17	18.08		
6	17.19	14.50	18.55			8	16.42	13.02	26.11			8	15.39	13.09	17.57		
7	16.48	14.03	17.46			9	33.71	18.46	82.61			9	20.12	15.14	32.89		
8	17.55	13.08	34.17			<b>11D</b>				45.33		<b>18C</b>					
						1	23.93	14.65	63.34	outer avg.	25.43	1	19.70	14.31	37.67		outer avg.
<b>4A</b>				51.64		2	16.32	12.88	26.71	inner avg.		2	17.72	14.91	18.85		inner avg.
1	25.66	15.78	62.61	outer avg.	18.53	3	15.53	12.26	26.67			3	18.12	15.40	17.66		
2	16.32	13.65	19.56	inner avg.		4	15.07	12.12	24.34			4	17.66	14.86	18.84		
3	16.02	13.50	18.67			5	15.71	12.77	23.02			5	16.87	14.11	19.56		
4	14.63	12.35	18.46			6	18.22	14.41	26.44			6	16.14	13.68	17.98		
5	15.15	13.77	17.28			7	15.64	12.47	25.42			7	15.20	12.88	18.01		
6	15.95	13.49	18.24			8	19.58	15.38	27.31			8	16.99	11.52	47.48		
7	19.86	16.69	18.99														
8	17.88	12.71	40.68			<b>12A</b>				40.80		<b>19D</b>					
						1	27.55	20.81	32.39	outer avg.	18.89	1	17.27	10.16	69.98		outer avg.
<b>5B</b>				63.26		2	15.33	12.84	19.39	inner avg.		2	14.29	11.46	24.69		inner avg.
1	18.11	10.10	79.31	outer avg.	18.69	3	15.72	13.36	17.66			3	14.62	11.86	23.27		
2	11.83	9.70	21.96	inner avg.		4	15.01	12.81	17.17			4	14.34	11.60	23.62		
3	14.39	12.04	19.52			5	14.78	12.40	19.19			5	14.63	11.70	25.04		
4	13.63	11.58	17.70			6	16.81	14.18	18.55			6	15.84	12.74	24.33		
5	11.69	9.88	18.32			7	16.09	13.10	22.82			7	15.62	12.52	24.76		
6	12.03	10.25	17.25			8	14.48	12.33	17.44			8	24.56	16.59	48.04		
7	13.38	11.27	18.72			9	18.71	12.54	49.20								
8	11.50	9.80	17.35									<b>20A</b>					
9	18.74	12.73	47.21			<b>13A</b>				103.78		1	16.51	12.18	35.55		outer avg.
						1	27.98	14.10	98.44	outer avg.	30.02	2	16.42	14.24	15.31		inner avg.
<b>6C</b>				80.12		2	16.08	12.92	24.46	inner avg.		3	14.67	12.43	18.02		
1	26.77	18.11	47.82	outer avg.	25.38	3	15.32	12.11	26.51			4	16.92	14.47	16.93		
2	13.82	11.27	22.63	inner avg.		4	15.89	12.33	23.87			5	14.63	12.55	16.57		
3	14.36	11.91	20.57			5	14.72	11.31	30.15			6	14.72	12.56	17.20		
4	13.88	11.49	20.80			6	16.51	13.40	23.21			7	19.49	15.20	28.22		
5	14.93	12.39	20.50			7	18.59	14.72	26.29								
6	15.11	12.37	22.15			8	18.01	14.11	27.64								
7	19.21	13.19	45.64			9	20.69	13.52	53.03								
8	23.60	11.11	112.42			10	24.53	11.73	109.12								
						<b>14C</b>				30.65							
<b>7D</b>				86.84		1	16.83	14.15	18.94	outer avg.	20.31						
1	32.71	25.27	29.44	outer avg.	38.98	2	17.40	14.67	18.61	inner avg.							
2	17.40	14.49	20.08	inner avg.		3	14.71	12.18	20.77								
3	19.47	16.24	19.89			4	15.60	12.72	22.64								
4	20.79	17.27	20.38			5	16.87	14.06	19.99								
5	16.57	13.03	27.17			6	16.96	14.19	19.52								
6	15.69	12.63	24.23			7	19.66	13.81	42.36								
7	16.14	12.47	29.43														
8	29.96	12.93	131.71														
9	27.72	11.35	144.23														

**Moisture Gradient after Stranding**  
20 Day Sprinkling MPB Logs

Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.	Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.	Log#	Green wt	Dry Wt	%MC	outer avg.	inner avg.
<b>1C</b>				69.57						175.33		<b>15A</b>					
1	20.20	10.23	97.46			1	33.58	13.59	147.09			1	24.29	10.58	129.58		
2	15.45	12.74	21.27	inner avg.	23.62	2	13.73	10.78	27.37	inner avg.	34.26	2	14.21	11.58	22.71		
3	16.84	13.49	24.83			3	13.07	10.23	27.76			3	22.37	11.35	97.09		
4	14.38	11.61	23.86			4	13.29	10.37	28.16			4	14.77	11.79	25.28		
5	14.84	12.34	20.26			5	14.68	11.49	27.76			5	14.01	11.38	23.11		
6	14.67	11.47	27.90			6	20.62	12.26	68.19			6	14.44	11.28	28.01		
7	22.88	16.15	41.67			7	14.72	11.65	26.35			7	20.52	12.69	61.70		
				outer avg.	71.29							8	15.92	12.94	23.03		
				inner avg.	21.33							9	11.83	5.43	117.86		
<b>2D</b>				71.29		<b>9C</b>				98.17		<b>16B</b>					
1	28.35	16.31	73.82			1	28.02	18.58	50.81	outer avg.	22.31	1	14.74	9.25	59.35		outer avg.
2	13.44	11.14	20.85	inner avg.	21.33	2	14.57	12.10	20.41	inner avg.		2	18.89	13.13	43.87		inner avg.
3	13.24	11.12	19.06			3	13.04	10.61	22.90			3	17.28	13.56	27.43		
4	14.07	11.78	19.44			4	14.38	11.91	20.74			4	14.67	11.58	26.68		
5	13.17	10.60	24.25			5	13.75	11.37	20.93			5	14.79	11.75	25.87		
6	13.78	11.40	20.88			6	14.13	11.19	26.27			6	15.32	11.96	28.09		
7	12.74	10.30	23.69			7	14.16	11.55	22.60			7	17.54	13.39	30.99		
8	17.94	10.63	68.77			8	22.00	8.96	145.54			8	22.60	12.14	86.16		
				outer avg.	64.13					50.42							
				inner avg.	51.04	<b>10D</b>				27.79		<b>17C</b>					
<b>3A</b>				64.13		1	17.34	12.28	41.21	outer avg.		1	18.95	9.88	91.80		
1	21.81	12.26	77.90			2	22.14	15.58	42.11	inner avg.		2	14.48	11.98	20.87		
2	14.99	12.24	22.47			3	14.16	11.30	25.31			3	14.01	11.71	19.64		
3	15.50	12.19	27.15			4	17.68	14.07	25.66			4	20.89	14.76	41.53		
4	15.57	12.41	25.46			5	20.18	16.04	25.81			5	17.32	14.44	19.94		
5	15.34	11.70	31.11			6	15.84	12.32	28.57			6	13.94	11.37	22.60		
6	20.04	11.48	74.56			7	15.56	12.71	22.42			7	13.10	10.83	20.96		
7	20.43	9.06	125.50			8	18.89	15.15	24.69			8	16.05	13.49	18.98		
8	29.38	19.54	50.36			9	22.22	13.92	59.63			9	15.83	8.02	97.38		
				outer avg.	74.61	<b>11A</b>				106.89		<b>18D</b>					
<b>4B</b>				74.61		1	20.10	9.94	102.21	outer avg.		1	15.95	10.48	52.19		outer avg.
1	32.99	17.17	92.14			2	21.46	13.01	64.95	inner avg.		2	17.30	14.25	21.40		inner avg.
2	13.44	11.34	18.52			3	15.16	12.10	25.29			3	15.56	12.92	20.43		
3	13.92	11.05	25.97			4	13.79	10.93	26.17			4	15.27	12.92	18.19		
4	14.14	11.43	23.71			5	15.38	12.02	27.95			5	16.27	13.77	18.16		
5	13.89	11.32	22.70			6	15.84	12.55	24.62			6	16.37	13.80	18.62		
6	14.22	11.75	21.02			7	14.36	11.41	25.85			7	16.59	13.92	19.18		
7	14.11	10.93	29.09			8	14.78	11.53	28.19			8	18.30	12.03	52.12		
8	16.43	10.46	57.07			9	20.67	12.60	64.05								
				outer avg.	23.50	10	25.77	12.18	111.58			<b>19C</b>					
<b>5C</b>				23.50		<b>12B</b>				57.41		1	22.25	15.32	45.23		outer avg.
1	18.90	10.28	83.85			1	27.66	17.84	55.04	outer avg.		2	15.95	12.86	24.03		inner avg.
2	12.06	10.25	17.66			2	14.85	12.31	20.63	inner avg.	21.48	3	15.60	12.38	26.01		
3	13.22	11.27	17.30			3	13.75	11.30	21.68			4	17.35	13.95	24.37		
4	14.28	11.86	20.40			4	14.42	12.00	20.17			5	18.69	14.90	25.44		
5	11.67	9.65	20.93			5	15.61	13.08	19.34			6	13.19	10.37	27.19		
6	11.52	9.63	19.63			6	14.61	12.29	18.88			7	14.58	11.63	25.37		
7	12.65	10.69	18.33			7	15.67	12.37	26.68			8	15.77	12.63	24.86		
8	27.71	17.31	60.08			8	14.02	11.40	22.98			9	21.05	12.65	66.40		
9	19.23	11.01	74.66			9	16.25	10.17	59.78			<b>20B</b>					
				outer avg.	79.26	<b>13C</b>				94.45		1	26.32	20.27	29.85		outer avg.
<b>6D</b>				79.26		1	18.46	11.59	59.28	outer avg.		2	16.38	13.56	20.80		inner avg.
1	16.83	10.79	55.98			2	15.19	11.95	27.11	inner avg.	44.71	3	13.24	10.84	22.14		
2	15.93	12.72	25.24			3	14.48	11.26	28.60			4	12.37	10.51	17.70		
3	14.70	11.94	23.12			4	14.83	11.68	26.97			5	14.14	12.13	16.57		
4	13.59	10.59	28.33			5	14.87	11.56	28.63			6	13.52	11.02	22.69		
5	14.29	11.55	23.72			6	14.62	11.30	29.38			7	15.84	11.76	34.69		
6	12.13	9.81	23.65			7	10.77	8.32	29.45								
7	13.14	10.58	24.20			8	16.05	6.61	142.81								
8	15.71	11.20	40.27			9	14.89	6.48	129.63								
				outer avg.	48.12	<b>14D</b>				81.63							
<b>7A</b>				48.12		1	33.40	18.60	79.57	outer avg.							
1	22.06	15.66	40.87			2	17.09	14.43	18.43	inner avg.	22.11						
2	19.49	15.94	23.04			3	17.60	14.20	23.94								
3	14.65	11.80	24.15			4	15.08	12.24	23.20								
4	15.78	12.88	22.52			5	14.76	12.32	19.81								
5	17.11	14.16	20.83			6	16.23	13.29	22.12								
6	16.44	13.46	22.14			7	15.81	12.63	25.18								
7	22.79	12.87	77.08			8	20.26	11.03	83.68								
8	24.16	11.48	110.45														
				outer avg.	75.66												
				inner avg.	31.63												

**Green Pine Screen Test after Log Conditioning and Stranding**

Screen Fractions by Weight										% Furnish of Each Screen Fraction										
Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Total Wts	Log #	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	Fines & Pan	1.5" to 0.75"
P1-1A	29	21	39	50	108	136	80	29	492	P1-1A	5.89	4.27	7.93	10.16	21.95	27.64	16.26	5.89	22.15	28.25
B	42	12	51	62	145	144	84	31	571	B	7.36	2.10	8.93	10.86	25.39	25.22	14.71	5.43	20.14	29.25
C	27	10	28	62	92	123	63	13	418	C	6.46	2.39	6.70	14.83	22.01	29.43	15.07	3.11	18.18	30.38
P1-2A	32	18	41	87	115	115	63	14	485	P1-2A	6.60	3.71	8.45	17.94	23.71	23.71	12.99	2.89	15.88	36.70
B	43	34	37	86	96	97	60	33	486	B	8.85	7.00	7.61	17.70	19.75	19.96	12.35	6.79	19.14	41.15
C	48	23	37	82	102	135	74	31	532	C	9.02	4.32	6.95	15.41	19.17	25.38	13.91	5.83	19.74	35.71
P1-3A	61	25	59	90	126	121	54	16	552	P1-3A	11.05	4.53	10.69	16.30	22.83	21.92	9.78	2.90	12.68	42.57
B	30	20	50	80	135	121	60	31	527	B	5.69	3.80	9.49	15.18	25.62	22.96	11.39	5.88	17.27	34.16
C	39	23	55	74	112	148	67	34	552	C	7.07	4.17	9.96	13.41	20.29	26.81	12.14	6.16	18.30	34.60
P1-4A	109	27	60	68	96	104	64	24	552	P1-4A	19.75	4.89	10.87	12.32	17.39	18.84	11.59	4.35	15.94	47.83
B	62	28	60	58	101	91	58	23	481	B	12.89	5.82	12.47	12.06	21.00	18.92	12.06	4.78	16.84	43.24
C	88	30	33	60	95	81	61	19	467	C	18.84	6.42	7.07	12.85	20.34	17.34	13.06	4.07	17.13	45.18
P2-1A	53	30	43	58	99	107	57	18	465	P2-1A	11.40	6.45	9.25	12.47	21.29	23.01	12.26	3.87	16.13	39.57
B	94	29	58	82	106	115	62	24	570	B	16.49	5.09	10.18	14.39	18.60	20.18	10.88	4.21	15.09	46.14
C	73	33	51	71	101	114	70	35	548	C	13.32	6.02	9.31	12.96	18.43	20.80	12.77	6.39	19.16	41.61
P2-2A	83	39	66	96	127	132	58	17	618	P2-2A	13.43	6.31	10.68	15.53	20.55	21.36	9.39	2.75	12.14	45.95
B	79	61	46	96	105	106	60	20	573	B	13.79	10.65	8.03	16.75	18.32	18.50	10.47	3.49	13.96	49.21
C	71	54	68	78	119	113	65	25	593	C	11.97	9.11	11.47	13.15	20.07	19.06	10.96	4.22	15.18	45.70
P2-3A	136	46	68	66	124	100	53	14	607	P2-3A	22.41	7.58	11.20	10.87	20.43	16.47	8.73	2.31	11.04	52.06
B	77	60	81	112	119	109	62	19	639	B	12.05	9.39	12.68	17.53	18.62	17.06	9.70	2.97	12.68	51.64
C	80	72	50	74	81	84	44	15	500	C	16.00	14.40	10.00	14.80	16.20	16.80	8.80	3.00	11.80	55.20
P2-4A	54	43	67	98	116	137	58	14	587	P2-4A	9.20	7.33	11.41	16.70	19.76	23.34	9.88	2.39	12.27	44.63
B	59	43	59	75	127	125	58	28	574	B	10.28	7.49	10.28	13.07	22.13	21.78	10.10	4.88	14.98	41.11
C	56	36	65	90	108	109	53	19	536	C	10.45	6.72	12.13	16.79	20.15	20.34	9.89	3.54	13.43	46.08
P3-1A	51	26	42	54	84	75	48	13	393	P3-1A	12.98	6.62	10.69	13.74	21.37	19.08	12.21	3.31	15.52	44.02
B	64	23	40	47	90	89	46	17	416	B	15.38	5.53	9.62	11.30	21.63	21.39	11.06	4.09	15.14	41.83
C	79	22	51	82	120	109	54	11	528	C	14.96	4.17	9.66	15.53	22.73	20.64	10.23	2.08	12.31	44.32
P3-2A	68	34	53	74	70	79	36	15	429	P3-2A	15.85	7.93	12.35	17.25	16.32	18.41	8.39	3.50	11.89	53.38
B	63	27	45	80	68	57	37	12	389	B	16.20	6.94	11.57	20.57	17.48	14.65	9.51	3.08	12.60	55.27
C	108	37	71	76	83	51	30	14	470	C	22.98	7.87	15.11	16.17	17.66	10.85	6.38	2.98	9.36	62.13
P3-3A	31	15	61	82	88	89	59	13	438	P3-3A	7.08	3.42	13.93	18.72	20.09	20.32	13.47	2.97	16.44	43.15
B	41	23	47	62	113	113	63	11	473	B	8.67	4.86	9.94	13.11	23.89	23.89	13.32	2.33	15.64	36.58
C	36	12	33	66	106	82	43	8	386	C	9.33	3.11	8.55	17.10	27.46	21.24	11.14	2.07	13.21	38.08
P3-4A	29	15	25	67	116	100	41	14	407	P3-4A	7.13	3.69	6.14	16.46	28.50	24.57	10.07	3.44	13.51	33.42
B	37	30	35	74	109	80	30	7	402	B	9.20	7.46	8.71	18.41	27.11	19.90	7.46	1.74	9.20	43.78
C	21	5	30	49	134	141	56	18	454	C	4.63	1.10	6.61	10.79	29.52	31.06	12.33	3.96	16.30	23.13
P4-1A	24	13	31	48	80	111	97	16	420	P4-1A	5.71	3.10	7.38	11.43	19.05	26.43	23.10	3.81	26.90	27.62
B	11	11	32	64	98	110	92	28	446	B	2.47	2.47	7.17	14.35	21.97	24.66	20.63	6.28	26.91	26.46
C	45	5	48	106	167	173	120	31	695	C	6.47	0.72	6.91	15.25	24.03	24.89	17.27	4.46	21.73	29.35
P4-2A	113	40	52	87	116	105	48	12	573	P4-2A	19.72	6.98	9.08	15.18	20.24	18.32	8.38	2.09	10.47	50.96
B	93	23	65	95	82	66	36	11	471	B	19.75	4.88	13.80	20.17	17.41	14.01	7.64	2.34	9.98	58.60
C	89	16	41	73	117	102	49	12	499	C	17.84	3.21	8.22	14.63	23.45	20.44	9.82	2.40	12.22	43.89

**Green Pine Screen Test after Log Conditioning and Stranding Cont'd**

Screen Fractions by Weight										% Furnish of Each Screen Fraction										
P4-3A	29	5	25	47	104	136	85	14	445	P4-3A	6.52	1.12	5.62	10.56	23.37	30.56	19.10	3.15	22.25	23.82
B	12	2	15	37	70	120	67	18	341	B	3.52	0.59	4.40	10.85	20.53	35.19	19.65	5.28	24.93	19.35
C	6	8	10	37	115	151	78	19	424	C	1.42	1.89	2.36	8.73	27.12	35.61	18.40	4.48	22.88	14.39
P4-4A	96	34	68	102	87	86	38	26	537	P4-4A	17.88	6.33	12.66	18.99	16.20	16.01	7.08	4.84	11.92	55.87
B	95	56	78	84	107	94	53	24	591	B	16.07	9.48	13.20	14.21	18.10	15.91	8.97	4.06	13.03	52.96
C	92	66	109	93	120	102	55	26	663	C	13.88	9.95	16.44	14.03	18.10	15.38	8.30	3.92	12.22	54.30
P5-1A	69	22	49	92	73	78	27	5	415	P5-1A	16.63	5.30	11.81	22.17	17.59	18.80	6.51	1.20	7.71	55.90
B	73	35	59	103	108	93	34	10	515	B	14.17	6.80	11.46	20.00	20.97	18.06	6.60	1.94	8.54	52.43
C	47	35	56	67	91	102	30	7	435	C	10.80	8.05	12.87	15.40	20.92	23.45	6.90	1.61	8.51	47.13
P5--2A	83	24	52	65	97	88	51	15	475	P5--2A	17.47	5.05	10.95	13.68	20.42	18.53	10.74	3.16	13.89	47.16
B	55	14	60	78	115	96	51	16	485	B	11.34	2.89	12.37	16.08	23.71	19.79	10.52	3.30	13.81	42.68
C	34	11	29	55	111	97	62	25	424	C	8.02	2.59	6.84	12.97	26.18	22.88	14.62	5.90	20.52	30.42
P5-3A	16	16	27	57	80	108	47	14	365	P5-3A	4.38	4.38	7.40	15.62	21.92	29.59	12.88	3.84	16.71	31.78
B	22	18	35	55	94	142	59	19	444	B	4.95	4.05	7.88	12.39	21.17	31.98	13.29	4.28	17.57	29.28
C	12	27	30	73	121	121	61	20	465	C	2.58	5.81	6.45	15.70	26.02	26.02	13.12	4.30	17.42	30.54
P5-4A	71	18	60	82	96	99	44	17	487	P5-4A	14.58	3.70	12.32	16.84	19.71	20.33	9.03	3.49	12.53	47.43
B	32	22	41	77	102	89	46	20	429	B	7.46	5.13	9.56	17.95	23.78	20.75	10.72	4.66	15.38	40.09
C	47	30	55	58	71	73	40	15	389	C	12.08	7.71	14.14	14.91	18.25	18.77	10.28	3.86	14.14	48.84
									492	Average	11.34	5.41	9.80	14.92	21.30	21.82	11.64	3.77	15.41	41.47
										St. Dev.	5.26	2.64	2.72	2.84	3.17	5.03	3.55	1.32	4.37	10.42

Green Aspen Screen Test after Log Conditioning and Stranding

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Pan	%	Fines & Pan	1.5" to 0.75"
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan				
A1-1A	300	69	75	63	63	52	24	20	666	A1-1A	45.05	10.36	11.26	9.46	9.46	7.81	3.60	3.00	100.00	6.61	76.13	
B	422	99	136	99	61	55	17	21	910	B	46.37	10.88	14.95	10.88	6.70	6.04	1.87	2.31	100.00	4.18	83.08	
C	320	98	103	63	69	62	19	15	749	C	42.72	13.08	13.75	8.41	9.21	8.28	2.54	2.00	100.00	4.54	77.97	
A1-2A	402	53	89	52	69	45	15	17	742	A1-2A	54.18	7.14	11.99	7.01	9.30	6.06	2.02	2.29	100.00	4.31	80.32	
B	392	99	105	55	67	47	22	19	806	B	48.64	12.28	13.03	6.82	8.31	5.83	2.73	2.36	100.00	5.09	80.77	
C	348	96	76	61	69	43	19	13	725	C	48.00	13.24	10.48	8.41	9.52	5.93	2.62	1.79	100.00	4.41	80.14	
A1-3A	228	42	70	39	34	35	20	30	498	A1-3A	45.78	8.43	14.06	7.83	6.83	7.03	4.02	6.02	100.00	10.04	76.10	
B	281	93	71	73	65	45	19	14	661	B	42.51	14.07	10.74	11.04	9.83	6.81	2.87	2.12	100.00	4.99	78.37	
C	352	40	81	65	48	42	19	19	666	C	52.85	6.01	12.16	9.76	7.21	6.31	2.85	2.85	100.00	5.71	80.78	
A1-4A	303	56	87	61	58	44	17	11	637	A1-4A	47.57	8.79	13.66	9.58	9.11	6.91	2.67	1.73	100.00	4.40	79.59	
B	287	73	58	68	53	35	13	13	600	B	47.83	12.17	9.67	11.33	8.83	5.83	2.17	2.17	100.00	4.33	81.00	
C	318	68	46	72	49	42	15	14	624	C	50.96	10.90	7.37	11.54	7.85	6.73	2.40	2.24	100.00	4.65	80.77	
A2-1A	212	48	56	50	71	55	11	7	510	A2-1A	41.57	9.41	10.98	9.80	13.92	10.78	2.16	1.37	100.00	3.53	71.76	
B	393	39	49	51	53	44	14	10	653	B	60.18	5.97	7.50	7.81	8.12	6.74	2.14	1.53	100.00	3.68	81.47	
C	233	40	51	66	75	62	13	7	547	C	42.60	7.31	9.32	12.07	13.71	11.33	2.38	1.28	100.00	3.66	71.30	
A2-2A	255	27	61	62	56	48	21	8	538	A2-2A	47.40	5.02	11.34	11.52	10.41	8.92	3.90	1.49	100.00	5.39	75.28	
B	266	32	30	41	47	46	18	11	491	B	54.18	6.52	6.11	8.35	9.57	9.37	3.67	2.24	100.00	5.91	75.15	
C	260	38	29	31	43	44	19	10	474	C	54.85	8.02	6.12	6.54	9.07	9.28	4.01	2.11	100.00	6.12	75.53	
A2-3A	267	30	34	51	64	47	18	11	522	A2-3A	51.15	5.75	6.51	9.77	12.26	9.00	3.45	2.11	100.00	5.56	73.18	
B	258	23	30	39	38	39	11	5	443	B	58.24	5.19	6.77	8.80	8.58	8.80	2.48	1.13	100.00	3.61	79.01	
C	237	44	34	48	60	49	15	8	495	C	47.88	8.89	6.87	9.70	12.12	9.90	3.03	1.62	100.00	4.65	73.33	
A2-4A	318	71	68	80	93	49	7	11	697	A2-4A	45.62	10.19	9.76	11.48	13.34	7.03	1.00	1.58	100.00	2.58	77.04	
B	308	68	54	70	68	52	12	10	642	B	47.98	10.59	8.41	10.90	10.59	8.10	1.87	1.56	100.00	3.43	77.88	
C	280	77	63	81	81	41	14	24	661	C	42.36	11.65	9.53	12.25	12.25	6.20	2.12	3.63	100.00	5.75	75.79	
A3-1A	384	57	40	52	50	29	7	13	632	A3-1A	60.76	9.02	6.33	8.23	7.91	4.59	1.11	2.06	100.00	3.16	84.34	
B	410	58	41	60	62	36	9	16	692	B	59.25	8.38	5.92	8.67	8.96	5.20	1.30	2.31	100.00	3.61	82.23	
C	431	38	49	67	50	30	8	18	691	C	62.37	5.50	7.09	9.70	7.24	4.34	1.16	2.60	100.00	3.76	84.66	
A3-2A	451	47	57	35	34	24	6	17	671	A3-2A	67.21	7.00	8.49	5.22	5.07	3.58	0.89	2.53	100.00	3.43	87.93	
B	413	42	41	53	50	24	14	31	668	B	61.83	6.29	6.14	7.93	7.49	3.59	2.10	4.64	100.00	6.74	82.19	
C	324	45	49	63	50	25	9	18	583	C	55.57	7.72	8.40	10.81	8.58	4.29	1.54	3.09	100.00	4.63	82.50	
A3-3A	237	16	32	37	49	36	11	10	428	A3-3A	55.37	3.74	7.48	8.64	11.45	8.41	2.57	2.34	100.00	4.91	75.23	
B	361	55	59	68	54	25	7	7	636	B	56.76	8.65	9.28	10.69	8.49	3.93	1.10	1.10	100.00	2.20	85.38	
C	410	58	58	57	55	22	6	6	672	C	61.01	8.63	8.63	8.48	8.18	3.27	0.89	0.89	100.00	1.79	86.76	
A3-4A	365	32	36	29	33	17	6	8	526	A3-4A	69.39	6.08	6.84	5.51	6.27	3.23	1.14	1.52	100.00	2.66	87.83	
B	288	35	44	44	34	26	9	5	485	B	59.38	7.22	9.07	9.07	7.01	5.36	1.86	1.03	100.00	2.89	84.74	
C	339	21	32	42	35	24	9	9	511	C	66.34	4.11	6.26	8.22	6.85	4.70	1.76	1.76	100.00	3.52	84.93	
A4-1A	312	56	55	57	52	33	4	4	573	A4-1A	54.45	9.77	9.60	9.95	9.08	5.76	0.70	0.70	100.00	1.40	83.77	
B	368	64	65	72	60	42	6	7	684	B	53.80	9.36	9.50	10.53	8.77	6.14	0.88	1.02	100.00	1.90	83.19	
C	256	78	98	68	67	44	5	8	624	C	41.03	12.50	15.71	10.90	10.74	7.05	0.80	1.28	100.00	2.08	80.13	
A4-2A	512	58	52	59	52	46	10	14	803	A4-2A	63.76	7.22	6.48	7.35	6.48	5.73	1.25	1.74	100.00	2.99	84.81	
B	480	41	72	44	55	39	19	23	773	B	62.10	5.30	9.31	5.69	7.12	5.05	2.46	2.98	100.00	5.43	82.41	
C	401	48	53	43	52	43	11	26	677	C	59.23	7.09	7.83	6.35	7.68	6.35	1.62	3.84	100.00	5.47	80.50	
A4-3A	280	49	60	58	75	39	5	7	573	A4-3A	48.87	8.55	10.47	10.12	13.09	6.81	0.87	1.22	100.00	2.09	78.01	
B	244	51	52	53	60	44	11	14	529	B	46.12	9.64	9.83	10.02	11.34	8.32	2.08	2.65	100.00	4.73	75.61	
C	298	42	59	64	70	53	13	17	616	C	48.38	6.82	9.58	10.39	11.36	8.60	2.11	2.76	100.00	4.87	75.16	



Green Aspen Screen Test after Log Conditioning and Stranding Cont'd

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Pan	%	Fines & Pan	1.5" to 0.75"
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan				
A4-4A	340	45	46	46	49	46	14	11	597	A4-4A	56.95	7.54	7.71	7.71	8.21	7.71	2.35	1.84	100.00	4.19	79.90	
B	305	55	43	35	42	31	11	5	527	B	57.87	10.44	8.16	6.64	7.97	5.88	2.09	0.95	100.00	3.04	83.11	
C	270	54	44	48	55	45	20	10	546	C	49.45	9.89	8.06	8.79	10.07	8.24	3.66	1.83	100.00	5.49	76.19	
A5-1A	196	59	77	109	83	64	11	10	609	A5-1A	32.18	9.69	12.64	17.90	13.63	10.51	1.81	1.64	100.00	3.45	72.41	
B	278	65	60	78	84	70	10	12	657	B	42.31	9.89	9.13	11.87	12.79	10.65	1.52	1.83	100.00	3.35	73.21	
C	273	54	55	64	79	60	14	12	611	C	44.68	8.84	9.00	10.47	12.93	9.82	2.29	1.96	100.00	4.26	73.00	
A5-2A	280	50	51	61	47	43	4	10	546	A5-2A	51.28	9.16	9.34	11.17	8.61	7.88	0.73	1.83	100.00	2.56	80.95	
B	280	73	77	76	73	60	11	8	658	B	42.55	11.09	11.70	11.55	11.09	9.12	1.67	1.22	100.00	2.89	76.90	
C	357	54	53	67	62	50	12	9	664	C	53.77	8.13	7.98	10.09	9.34	7.53	1.81	1.36	100.00	3.16	79.97	
A5-3A	284	45	58	61	50	36	5	6	545	A5-3A	52.11	8.26	10.64	11.19	9.17	6.61	0.92	1.10	100.00	2.02	82.20	
B	218	57	67	65	74	53	11	16	561	B	38.86	10.16	11.94	11.59	13.19	9.45	1.96	2.85	100.00	4.81	72.55	
C	382	57	69	89	81	56	13	16	763	C	50.07	7.47	9.04	11.66	10.62	7.34	1.70	2.10	100.00	3.80	78.24	
A5-4A	372	49	85	66	87	66	25	26	776	A5-4A	47.94	6.31	10.95	8.51	11.21	8.51	3.22	3.35	100.00	6.57	73.71	
B	190	23	29	31	33	23	5	6	340	B	55.88	6.76	8.53	9.12	9.71	6.76	1.47	1.76	100.00	3.24	80.29	
C	281	74	70	45	49	49	16	13	597	C	47.07	12.40	11.73	7.54	8.21	8.21	2.68	2.18	100.00	4.86	78.73	
										Average	51.71	8.61	9.45	9.49	9.53	7.06	2.08	2.07		4.15	79.26	
										St. Dev.	7.74	2.37	2.38	2.10	2.15	1.99	0.89	0.93		1.51	4.25	

MPB Log Screen Test after 0 Day Sprinkling and Stranding

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan 1.5" to 0.75"		
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			100.00	20.10	20.10
1A-A	9	14	12	42	82	147	62	15	383	1A-A	2.35	3.66	3.13	10.97	21.41	38.38	16.19	3.92	100.00	20.10	20.10		
B	10	14	24	51	122	170	86	27	504	B	1.98	2.78	4.76	10.12	24.21	33.73	17.06	5.36	100.00	22.42	19.64		
C	18	25	26	50	126	173	72	20	510	C	3.53	4.90	5.10	9.80	24.71	33.92	14.12	3.92	100.00	18.04	23.33		
2B-A	7	4	12	36	90	142	80	21	392	2B-A	1.79	1.02	3.06	9.18	22.96	36.22	20.41	5.36	100.00	25.77	15.05		
B	10	6	21	50	102	153	91	30	463	B	2.16	1.30	4.54	10.80	22.03	33.05	19.65	6.48	100.00	26.13	18.79		
C	21	14	27	61	87	139	89	29	467	C	4.50	3.00	5.78	13.06	18.63	29.76	19.06	6.21	100.00	25.27	26.34		
3C-A	5	5	12	60	95	150	87	18	432	3C-A	1.16	1.16	2.78	13.89	21.99	34.72	20.14	4.17	100.00	24.31	18.98		
B	10	0	17	35	78	137	82	23	382	B	2.62	0.00	4.45	9.16	20.42	35.86	21.47	6.02	100.00	27.49	16.23		
C	11	3	17	42	72	152	79	24	400	C	2.75	0.75	4.25	10.50	18.00	38.00	19.75	6.00	100.00	25.75	18.25		
4D-A	2	0	4	16	80	173	93	25	393	4D-A	0.51	0.00	1.02	4.07	20.36	44.02	23.66	6.36	100.00	30.03	5.60		
B	2	2	17	22	104	183	117	49	496	B	0.40	0.40	3.43	4.44	20.97	36.90	23.59	9.88	100.00	33.47	8.67		
C	0	0	4	17	76	174	105	28	404	C	0.00	0.00	0.99	4.21	18.81	43.07	25.99	6.93	100.00	32.92	5.20		
5A-A	9	9	33	62	119	160	99	32	523	5A-A	1.72	1.72	6.31	11.85	22.75	30.59	18.93	6.12	100.00	25.05	21.61		
B	6	11	30	69	134	193	103	54	600	B	1.00	1.83	5.00	11.50	22.33	32.17	17.17	9.00	100.00	26.17	19.33		
C	8	3	23	50	109	169	94	47	503	C	1.59	0.60	4.57	9.94	21.67	33.60	18.69	9.34	100.00	28.03	16.70		
6B-A	23	18	29	48	71	100	93	45	427	6B-A	5.39	4.22	6.79	11.24	16.63	23.42	21.78	10.54	100.00	32.32	27.63		
B	21	11	34	57	73	127	68	20	411	B	5.11	2.68	8.27	13.87	17.76	30.90	16.55	4.87	100.00	21.41	29.93		
C	21	15	22	47	65	131	80	23	404	C	5.20	3.71	5.45	11.63	16.09	32.43	19.80	5.69	100.00	25.50	25.99		
7C-A	15	8	35	38	64	108	109	70	447	7C-A	3.36	1.79	7.83	8.50	14.32	24.16	24.38	15.66	100.00	40.04	21.48		
B	20	18	34	70	106	187	99	19	553	B	3.62	3.25	6.15	12.66	19.17	33.82	17.90	3.44	100.00	21.34	25.68		
C	28	19	35	37	84	145	110	39	497	C	5.63	3.82	7.04	7.44	16.90	29.18	22.13	7.85	100.00	29.98	23.94		
8D-A	36	21	45	67	101	154	56	21	501	8D-A	7.19	4.19	8.98	13.37	20.16	30.74	11.18	4.19	100.00	15.37	33.73		
B	18	18	45	91	137	176	67	26	578	B	3.11	3.11	7.79	15.74	23.70	30.45	11.59	4.50	100.00	16.09	29.76		
C	25	19	32	45	65	120	66	40	412	C	6.07	4.61	7.77	10.92	15.78	29.13	16.02	9.71	100.00	25.73	29.37		
9A-A	12	10	27	76	116	166	72	32	511	9A-A	2.35	1.96	5.28	14.87	22.70	32.49	14.09	6.26	100.00	20.35	24.46		
B	16	12	46	80	101	144	65	31	495	B	3.23	2.42	9.29	16.16	20.40	29.09	13.13	6.26	100.00	19.39	31.11		
C	14	6	23	55	121	130	65	39	453	C	3.09	1.32	5.08	12.14	26.71	28.70	14.35	8.61	100.00	22.96	21.63		
10B-A	31	11	21	47	113	180	65	14	482	10B-A	6.43	2.28	4.36	9.75	23.44	37.34	13.49	2.90	100.00	16.39	22.82		
B	31	8	33	66	101	162	58	16	475	B	6.53	1.68	6.95	13.89	21.26	34.11	12.21	3.37	100.00	15.58	29.05		
C	40	8	38	56	124	171	66	15	518	C	7.72	1.54	7.34	10.81	23.94	33.01	12.74	2.90	100.00	15.64	27.41		
11C-A	39	17	33	68	122	172	98	30	579	11C-A	6.74	2.94	5.70	11.74	21.07	29.71	16.93	5.18	100.00	22.11	27.12		
B	35	11	33	69	135	162	75	17	537	B	6.52	2.05	6.15	12.85	25.14	30.17	13.97	3.17	100.00	17.13	27.56		
C	41	17	44	75	92	144	84	35	532	C	7.71	3.20	8.27	14.10	17.29	27.07	15.79	6.58	100.00	22.37	33.27		
12D-A	5	0	7	28	93	192	107	34	466	12D-A	1.07	0.00	1.50	6.01	19.96	41.20	22.96	7.30	100.00	30.26	8.58		
B	0	6	7	27	90	201	106	32	469	B	0.00	1.28	1.49	5.76	19.19	42.86	22.60	6.82	100.00	29.42	8.53		
C	6	0	8	22	68	158	84	22	368	C	1.63	0.00	2.17	5.98	18.48	42.93	22.83	5.98	100.00	28.80	9.78		
13A-A	96	19	51	76	95	118	65	26	546	13A-A	17.58	3.48	9.34	13.92	17.40	21.61	11.90	4.76	100.00	16.67	44.32		
B	34	21	40	57	98	145	94	53	542	B	6.27	3.87	7.38	10.52	18.08	26.75	17.34	9.78	100.00	27.12	28.04		
C	35	16	29	63	94	163	96	57	553	C	6.33	2.89	5.24	11.39	17.00	29.48	17.36	10.31	100.00	27.67	25.86		
14B-A	5	0	3	27	98	139	68	24	364	14B-A	1.37	0.00	0.82	7.42	26.92	38.19	18.68	6.59	100.00	25.27	9.62		
B	4	0	9	12	51	128	70	49	323	B	1.24	0.00	2.79	3.72	15.79	39.63	21.67	15.17	100.00	36.84	7.74		
C	5	6	12	28	88	178	84	42	443	C	1.13	1.35	2.71	6.32	19.86	40.18	18.96	9.48	100.00	28.44	11.51		

MPB Log Screen Test after 0 Day Sprinkling and Stranding Cont'd

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan 1.5" to 0.75"		
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	0.75"	
15C-A	60	18	46	82	122	157	51	16	552	15C-A	10.87	3.26	8.33	14.86	22.10	28.44	9.24	2.90	100.00	12.14	37.32		
B	69	46	64	115	168	192	57	19	730	B	9.45	6.30	8.77	15.75	23.01	26.30	7.81	2.60	100.00	10.41	40.27		
C	51	25	71	92	122	173	56	18	608	C	8.39	4.11	11.68	15.13	20.07	28.45	9.21	2.96	100.00	12.17	39.31		
16D-A	54	12	41	80	127	193	57	23	587	16D_A	9.20	2.04	6.98	13.63	21.64	32.88	9.71	3.92	100.00	13.63	31.86		
B	29	27	68	95	153	162	51	18	603	B	4.81	4.48	11.28	15.75	25.37	26.87	8.46	2.99	100.00	11.44	36.32		
C	12	12	42	69	132	152	44	15	478	C	2.51	2.51	8.79	14.44	27.62	31.80	9.21	3.14	100.00	12.34	28.24		
17A-A	0	0	6	24	51	176	102	29	388	17A-A	0.00	0.00	1.55	6.19	13.14	45.36	26.29	7.47	100.00	33.76	7.73		
B	0	0	2	18	46	132	110	22	330	B	0.00	0.00	0.61	5.45	13.94	40.00	33.33	6.67	100.00	40.00	6.06		
C	0	0	5	22	65	174	118	28	412	C	0.00	0.00	1.21	5.34	15.78	42.23	28.64	6.80	100.00	35.44	6.55		
18B-A	0	0	5	19	74	189	132	31	450	18B-A	0.00	0.00	1.11	4.22	16.44	42.00	29.33	6.89	100.00	36.22	5.33		
B	3	0	8	18	116	192	125	29	491	B	0.61	0.00	1.63	3.67	23.63	39.10	25.46	5.91	100.00	31.36	5.91		
C	0	0	3	21	93	207	132	51	507	C	0.00	0.00	0.59	4.14	18.34	40.83	26.04	10.06	100.00	36.09	4.73		
19C-A	62	45	62	101	113	136	44	22	585	19C-A	10.60	7.69	10.60	17.26	19.32	23.25	7.52	3.76	100.00	11.28	46.15		
B	90	30	75	131	140	129	46	25	666	B	13.51	4.50	11.26	19.67	21.02	19.37	6.91	3.75	100.00	10.66	48.95		
C	69	23	51	89	103	102	41	10	488	C	14.14	4.71	10.45	18.24	21.11	20.90	8.40	2.05	100.00	10.45	47.54		
20D-A	0	0	20	36	60	136	85	40	377	20D-A	0.00	0.00	5.31	9.55	15.92	36.07	22.55	10.61	100.00	33.16	14.85		
B	0	4	14	29	85	173	80	17	402	B	0.00	1.00	3.48	7.21	21.14	43.03	19.90	4.23	100.00	24.13	11.69		
C	0	8	10	38	88	184	85	24	437	C	0.00	1.83	2.29	8.70	20.14	42.11	19.45	5.49	100.00	24.94	12.81		
											Average	4.06	2.15	5.38	10.59	20.27	33.53	17.76	6.25			24.01	22.19
											St. Dev.	3.95	1.80	3.07	4.05	3.30	6.40	6.01	2.88			8.00	11.73

MPB Log Screen Test after 10 Days Sprinkling and Stranding

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan	1.5" to 0.75"
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan				
1B-A	18	14	24	71	132	143	83	22	507	1B-A	3.55	2.76	4.73	14.00	26.04	28.21	16.37	4.34	100.00	20.71	25.05	
B	24	11	48	97	136	195	80	28	619	B	3.88	1.78	7.75	15.67	21.97	31.50	12.92	4.52	100.00	17.45	29.08	
C	46	26	60	107	178	278	107	23	825	C	5.58	3.15	7.27	12.97	21.58	33.70	12.97	2.79	100.00	15.76	28.97	
2C-A	73	43	64	96	124	139	56	24	619	2C-A	11.79	6.95	10.34	15.51	20.03	22.46	9.05	3.88	100.00	12.92	44.59	
B	65	30	44	84	127	166	62	38	616	B	10.55	4.87	7.14	13.64	20.62	26.95	10.06	6.17	100.00	16.23	36.20	
C	79	44	50	85	91	132	56	26	563	C	14.03	7.82	8.88	15.10	16.16	23.45	9.95	4.62	100.00	14.56	45.83	
3D-A	7	12	31	54	110	171	66	20	471	3D-A	1.49	2.55	6.58	11.46	23.35	36.31	14.01	4.25	100.00	18.26	22.08	
B	13	14	34	54	100	185	64	21	485	B	2.68	2.89	7.01	11.13	20.62	38.14	13.20	4.33	100.00	17.53	23.71	
C	20	19	38	57	116	183	63	20	516	C	3.88	3.68	7.36	11.05	22.48	35.47	12.21	3.88	100.00	16.09	25.97	
4A-A	37	15	18	41	94	136	59	19	419	4A-A	8.83	3.58	4.30	9.79	22.43	32.46	14.08	4.53	100.00	18.62	26.49	
B	30	13	31	49	89	136	58	21	427	B	7.03	3.04	7.26	11.48	20.84	31.85	13.58	4.92	100.00	18.50	28.81	
C	75	22	39	59	117	179	57	16	564	C	13.30	3.90	6.91	10.46	20.74	31.74	10.11	2.84	100.00	12.94	34.57	
5B-A	50	42	63	86	107	106	41	21	516	5B-A	9.69	8.14	12.21	16.67	20.74	20.54	7.95	4.07	100.00	12.02	46.71	
B	62	20	51	84	97	105	40	14	473	B	13.11	4.23	10.78	17.76	20.51	22.20	8.46	2.96	100.00	11.42	45.88	
C	95	58	62	94	103	104	42	18	576	C	16.49	10.07	10.76	16.32	17.88	18.06	7.29	3.13	100.00	10.42	53.65	
6C-A	33	9	36	56	99	164	62	24	483	6C-A	6.83	1.86	7.45	11.59	20.50	33.95	12.84	4.97	100.00	17.81	27.74	
B	29	19	25	54	95	171	79	28	500	B	5.80	3.80	5.00	10.80	19.00	34.20	15.80	5.60	100.00	21.40	25.40	
C	39	16	42	61	99	164	75	30	526	C	7.41	3.04	7.98	11.60	18.82	31.18	14.26	5.70	100.00	19.96	30.04	
7D-A	18	8	16	42	107	274	128	30	623	7D-A	2.89	1.28	2.57	6.74	17.17	43.98	20.55	4.82	100.00	25.36	13.48	
B	21	15	16	42	124	303	138	33	692	B	3.03	2.17	2.31	6.07	17.92	43.79	19.94	4.77	100.00	24.71	13.58	
C	22	8	29	40	112	207	87	21	526	C	4.18	1.52	5.51	7.60	21.29	39.35	16.54	3.99	100.00	20.53	18.82	
8A-A	30	27	49	49	97	169	113	101	635	8A-A	4.72	4.25	7.72	7.72	15.28	26.61	17.80	15.91	100.00	33.70	24.41	
B	39	30	38	85	102	147	76	74	591	B	6.60	5.08	6.43	14.38	17.26	24.87	12.86	12.52	100.00	25.38	32.49	
C	89	29	56	94	103	140	70	60	641	C	13.88	4.52	8.74	14.66	16.07	21.84	10.92	9.36	100.00	20.28	41.81	
9B-A	23	21	35	93	137	197	60	28	594	9B-A	3.87	3.54	5.89	15.66	23.06	33.16	10.10	4.71	100.00	14.81	28.96	
B	52	15	52	76	121	193	71	35	615	B	8.46	2.44	8.46	12.36	19.67	31.38	11.54	5.69	100.00	17.24	31.71	
C	30	22	40	91	112	199	67	40	601	C	4.99	3.66	6.66	15.14	18.64	33.11	11.15	6.66	100.00	17.80	30.45	
10C-A	63	24	61	91	157	202	51	15	664	10C-A	9.49	3.61	9.19	13.70	23.64	30.42	7.68	2.26	100.00	9.94	35.99	
B	42	40	34	84	135	164	49	18	566	B	7.42	7.07	6.01	14.84	23.85	28.98	8.66	3.18	100.00	11.84	35.34	
C	46	24	39	69	121	133	39	14	485	C	9.48	4.95	8.04	14.23	24.95	27.42	8.04	2.89	100.00	10.93	36.70	
11D-A	93	43	60	97	142	165	60	23	683	11D-A	13.62	6.30	8.78	14.20	20.79	24.16	8.78	3.37	100.00	12.15	42.90	
B	61	35	68	130	156	285	99	44	878	B	6.95	3.99	7.74	14.81	17.77	32.46	11.28	5.01	100.00	16.29	33.49	
C	48	27	35	112	174	212	85	51	744	C	6.45	3.63	4.70	15.05	23.39	28.49	11.42	6.85	100.00	18.28	29.84	
12A-A	46	39	39	85	126	183	58	15	591	12A-A	7.78	6.60	6.60	14.38	21.32	30.96	9.81	2.54	100.00	12.35	35.36	
B	21	31	49	70	89	138	42	20	460	B	4.57	6.74	10.65	15.22	19.35	30.00	9.13	4.35	100.00	13.48	37.17	
C	73	22	45	77	121	160	42	17	557	C	13.11	3.95	8.08	13.82	21.72	28.73	7.54	3.05	100.00	10.59	38.96	
13B-A	57	23	46	91	174	241	114	49	795	13B-A	7.17	2.89	5.79	11.45	21.89	30.31	14.34	6.16	100.00	20.50	27.30	
B	18	23	43	72	116	236	104	31	643	B	2.80	3.58	6.69	11.20	18.04	36.70	16.17	4.82	100.00	21.00	24.26	
C	30	14	21	65	93	185	91	41	540	C	5.56	2.59	3.89	12.04	17.22	34.26	16.85	7.59	100.00	24.44	24.07	
14C-A	7	12	27	35	106	270	76	25	558	14C-A	1.25	2.15	4.84	6.27	19.00	48.39	13.62	4.48	100.00	18.10	14.52	
B	24	11	42	68	137	242	91	28	643	B	3.73	1.71	6.53	10.58	21.31	37.64	14.15	4.35	100.00	18.51	22.55	
C	19	12	25	58	111	215	88	46	574	C	3.31	2.09	4.36	10.10	19.34	37.46	15.33	8.01	100.00	23.34	19.86	

MPB Log Screen Test after 10 Days Sprinkling and Stranding Cont'd

Screen Fractions by Weight										% Furnish of Each Screen Fraction											
15D-A	19	29	66	139	176	240	55	25	749	15D-A	2.54	3.87	8.81	18.56	23.50	32.04	7.34	3.34	100.00	10.68	33.78
B	52	26	64	115	176	210	44	13	700	B	7.43	3.71	9.14	16.43	25.14	30.00	6.29	1.86	100.00	8.14	36.71
C	13	36	35	125	215	273	71	25	793	C	1.64	4.54	4.41	15.76	27.11	34.43	8.95	3.15	100.00	12.11	26.36
16A-A	38	16	43	72	103	163	51	18	504	16A-A	7.54	3.17	8.53	14.29	20.44	32.34	10.12	3.57	100.00	13.69	33.53
B	24	23	32	79	123	174	47	22	524	B	4.58	4.39	6.11	15.08	23.47	33.21	8.97	4.20	100.00	13.17	30.15
C	174	52	52	85	127	147	39	24	700	C	24.86	7.43	7.43	12.14	18.14	21.00	5.57	3.43	100.00	9.00	51.86
17B-A	0	4	13	47	131	246	122	31	594	17B-A	0.00	0.67	2.19	7.91	22.05	41.41	20.54	5.22	100.00	25.76	10.77
B	8	5	15	43	107	175	73	19	445	B	1.80	1.12	3.37	9.66	24.04	39.33	16.40	4.27	100.00	20.67	15.96
C	5	8	19	32	115	198	80	28	485	C	1.03	1.65	3.92	6.60	23.71	40.82	16.49	5.77	100.00	22.27	13.20
18C-A	19	5	16	42	84	197	102	38	503	18C-A	3.78	0.99	3.18	8.35	16.70	39.17	20.28	7.55	100.00	27.83	16.30
B	8	14	17	48	110	201	120	36	554	B	1.44	2.53	3.07	8.66	19.86	36.28	21.66	6.50	100.00	28.16	15.70
C	9	0	19	29	94	195	96	31	473	C	1.90	0.00	4.02	6.13	19.87	41.23	20.30	6.55	100.00	26.85	12.05
19D-A	99	61	76	89	123	153	45	21	667	19D-A	14.84	9.15	11.39	13.34	18.44	22.94	6.75	3.15	100.00	9.90	48.73
B	77	57	86	77	114	136	39	19	605	B	12.73	9.42	14.21	12.73	18.84	22.48	6.45	3.14	100.00	9.59	49.09
C	173	51	71	101	122	129	31	13	691	C	25.04	7.38	10.27	14.62	17.66	18.67	4.49	1.88	100.00	6.37	57.31
20A-A	44	17	43	59	130	190	61	18	562	20A-A	7.83	3.02	7.65	10.50	23.13	33.81	10.85	3.20	100.00	14.06	29.00
B	22	13	48	68	118	205	76	20	570	B	3.86	2.28	8.42	11.93	20.70	35.96	13.33	3.51	100.00	16.84	26.49
C	34	9	24	50	83	164	77	21	462	C	7.36	1.95	5.19	10.82	17.97	35.50	16.67	4.55	100.00	21.21	25.32
										Average	7.19	3.93	6.95	12.38	20.58	31.79	12.35	4.83		17.17	30.45
										St. Dev.	5.23	2.26	2.55	3.10	2.63	6.64	4.26	2.36		5.78	11.03

MPB Log Screen Test after 20 Days Sprinkling and Stranding

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan 1.5" to 0.75"		
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			Fines	Pan	1.5" to 0.75"
1C-A	27	12	20	66	145	223	68	20	581	1C-A	4.65	2.07	3.44	11.36	24.96	38.38	11.70	3.44	100.00	15.15	21.51		
B	18	10	31	69	88	207	64	21	508	B	3.54	1.97	6.10	13.58	17.32	40.75	12.60	4.13	100.00	16.73	25.20		
C	13	28	24	95	143	226	78	24	631	C	2.06	4.44	3.80	15.06	22.66	35.82	12.36	3.80	100.00	16.16	25.36		
2D-A	76	30	56	69	118	116	53	37	555	2D-A	13.69	5.41	10.09	12.43	21.26	20.90	9.55	6.67	100.00	16.22	41.62		
B	93	20	32	63	100	105	50	32	495	B	18.79	4.04	6.46	12.73	20.20	21.21	10.10	6.46	100.00	16.57	42.02		
C	50	32	46	74	109	164	87	58	620	C	8.06	5.16	7.42	11.94	17.58	26.45	14.03	9.35	100.00	23.39	32.58		
3A-A	6	7	33	108	166	228	101	39	688	3A-A	0.87	1.02	4.80	15.70	24.13	33.14	14.68	5.67	100.00	20.35	22.38		
B	5	7	32	55	98	206	94	30	527	B	0.95	1.33	6.07	10.44	18.60	39.09	17.84	5.69	100.00	23.53	18.79		
C	5	3	26	51	113	228	103	39	568	C	0.88	0.53	4.58	8.98	19.89	40.14	18.13	6.87	100.00	25.00	14.96		
4B-A	46	32	36	66	121	153	72	23	549	4B-A	8.38	5.83	6.56	12.02	22.04	27.87	13.11	4.19	100.00	17.30	32.79		
B	46	38	72	99	179	221	73	39	767	B	6.00	4.95	9.39	12.91	23.34	28.81	9.52	5.08	100.00	14.60	33.25		
C	44	45	74	65	158	225	91	49	751	C	5.86	5.99	9.85	8.66	21.04	29.96	12.12	6.52	100.00	18.64	30.36		
5C-A	124	51	66	124	153	182	41	13	754	5C-A	16.45	6.76	8.75	16.45	20.29	24.14	5.44	1.72	100.00	7.16	48.41		
B	60	66	92	159	162	204	63	23	829	B	7.24	7.96	11.10	19.18	19.54	24.61	7.60	2.77	100.00	10.37	45.48		
C	69	70	96	130	150	176	56	27	774	C	8.91	9.04	12.40	16.80	19.38	22.74	7.24	3.49	100.00	10.72	47.16		
6D-A	17	19	23	49	75	170	77	21	451	6D-A	3.77	4.21	5.10	10.86	16.63	37.69	17.07	4.66	100.00	21.73	23.95		
B	73	25	23	61	77	161	62	13	495	B	14.75	5.05	4.65	12.32	15.56	32.53	12.53	2.63	100.00	15.15	36.77		
C	31	14	30	47	80	155	75	35	467	C	6.64	3.00	6.42	10.06	17.13	33.19	16.06	7.49	100.00	23.55	26.12		
7A-A	29	16	35	71	141	335	155	69	851	7A-A	3.41	1.88	4.11	8.34	16.57	39.37	18.21	8.11	100.00	26.32	17.74		
B	25	4	17	39	97	264	122	37	605	B	4.13	0.66	2.81	6.45	16.03	43.64	20.17	6.12	100.00	26.28	14.05		
C	50	7	39	48	118	268	110	59	699	C	7.15	1.00	5.58	6.87	16.88	38.34	15.74	8.44	100.00	24.18	20.60		
8B-A	46	14	50	70	148	197	77	64	666	8B-A	6.91	2.10	7.51	10.51	22.22	29.58	11.56	9.61	100.00	21.17	27.03		
B	45	47	44	47	105	181	79	53	601	B	7.49	7.82	7.32	7.82	17.47	30.12	13.14	8.82	100.00	21.96	30.45		
C	33	33	30	47	128	283	156	106	816	C	4.04	4.04	3.68	5.76	15.69	34.68	19.12	12.99	100.00	32.11	17.52		
9C-A	71	39	89	102	128	138	40	18	625	9C-A	11.36	6.24	14.24	16.32	20.48	22.08	6.40	2.88	100.00	9.28	48.16		
B	36	33	39	62	88	132	51	24	465	B	7.74	7.10	8.39	13.33	18.92	28.39	10.97	5.16	100.00	16.13	36.56		
C	48	24	50	87	102	128	47	19	505	C	9.50	4.75	9.90	17.23	20.20	25.35	9.31	3.76	100.00	13.07	41.39		
10D-A	43	32	62	97	148	217	68	14	681	10D-A	6.31	4.70	9.10	14.24	21.73	31.86	9.99	2.06	100.00	12.04	34.36		
B	61	37	38	77	108	176	48	18	563	B	10.83	6.57	6.75	13.68	19.18	31.26	8.53	3.20	100.00	11.72	37.83		
C	84	44	68	96	148	165	52	26	683	C	12.30	6.44	9.96	14.06	21.67	24.16	7.61	3.81	100.00	11.42	42.75		
11A-A	31	13	37	65	142	207	51	18	564	11A-A	5.50	2.30	6.56	11.52	25.18	36.70	9.04	3.19	100.00	12.23	25.89		
B	74	30	47	69	129	204	69	32	654	B	11.31	4.59	7.19	10.55	19.72	31.19	10.55	4.89	100.00	15.44	33.64		
C	69	46	60	117	150	254	95	51	842	C	8.19	5.46	7.13	13.90	17.81	30.17	11.28	6.06	100.00	17.34	34.68		
12B-A	129	50	72	98	103	134	47	29	662	12B-A	19.49	7.55	10.88	14.80	15.56	20.24	7.10	4.38	100.00	11.48	52.72		
B	98	56	58	76	113	139	42	36	618	B	15.86	9.06	9.39	12.30	18.28	22.49	6.80	5.83	100.00	12.62	46.60		
C	154	66	107	84	97	149	42	24	723	C	21.30	9.13	14.80	11.62	13.42	20.61	5.81	3.32	100.00	9.13	56.85		
13C-A	20	30	34	93	143	287	116	50	773	13C-A	2.59	3.88	4.40	12.03	18.50	37.13	15.01	6.47	100.00	21.47	22.90		
B	21	22	39	87	146	266	112	48	741	B	2.83	2.97	5.26	11.74	19.70	35.90	15.11	6.48	100.00	21.59	22.81		
C	80	36	53	97	131	226	78	48	749	C	10.68	4.81	7.08	12.95	17.49	30.17	10.41	6.41	100.00	16.82	35.51		
14D-A	16	6	14	61	102	174	73	30	476	14D-A	3.36	1.26	2.94	12.82	21.43	36.55	15.34	6.30	100.00	21.64	20.38		
B	43	14	30	67	141	249	82	33	659	B	6.53	2.12	4.55	10.17	21.40	37.78	12.44	5.01	100.00	17.45	23.37		
C	16	12	24	80	119	245	96	57	649	C	2.47	1.85	3.70	12.33	18.34	37.75	14.79	8.78	100.00	23.57	20.34		

MPB Log Screen Test after 20 Days Sprinkling and Stranding Cont'd

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan 1.5" to 0.75"	
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			Fines	Pan
15A-A	25	29	45	81	108	178	48	14	528	15A-A	4.73	5.49	8.52	15.34	20.45	33.71	9.09	2.65	100.00	11.74	34.09	
B	120	39	54	93	156	225	56	15	758	B	15.83	5.15	7.12	12.27	20.58	29.68	7.39	1.98	100.00	9.37	40.37	
C	62	18	35	73	132	157	55	22	554	C	11.19	3.25	6.32	13.18	23.83	28.34	9.93	3.97	100.00	13.90	33.94	
16B-A	42	37	73	106	123	165	46	13	605	16B-A	6.94	6.12	12.07	17.52	20.33	27.27	7.60	2.15	100.00	9.75	42.64	
B	58	41	67	103	136	185	31	15	636	B	9.12	6.45	10.53	16.19	21.38	29.09	4.87	2.36	100.00	7.23	42.30	
C	76	57	79	138	189	227	42	18	826	C	9.20	6.90	9.56	16.71	22.88	27.48	5.08	2.18	100.00	7.26	42.37	
17C-A	20	22	41	65	98	205	118	42	611	17C-A	3.27	3.60	6.71	10.64	16.04	33.55	19.31	6.87	100.00	26.19	24.22	
B	40	23	47	81	98	204	112	52	657	B	6.09	3.50	7.15	12.33	14.92	31.05	17.05	7.91	100.00	24.96	29.07	
C	35	35	42	69	120	244	117	47	709	C	4.94	4.94	5.92	9.73	16.93	34.41	16.50	6.63	100.00	23.13	25.53	
18D-A	15	6	21	51	130	224	86	28	561	18D-A	2.67	1.07	3.74	9.09	23.17	39.93	15.33	4.99	100.00	20.32	16.58	
B	22	14	23	54	122	230	101	25	591	B	3.72	2.37	3.89	9.14	20.64	38.92	17.09	4.23	100.00	21.32	19.12	
C	31	5	24	80	139	216	82	35	612	C	5.07	0.82	3.92	13.07	22.71	35.29	13.40	5.72	100.00	19.12	22.88	
19A-A	169	50	47	111	106	110	23	17	633	19A-A	26.70	7.90	7.42	17.54	16.75	17.38	3.63	2.69	100.00	6.32	59.56	
B	66	47	57	100	104	145	32	19	570	B	11.58	8.25	10.00	17.54	18.25	25.44	5.61	3.33	100.00	8.95	47.37	
C	67	58	71	107	105	146	37	25	616	C	10.88	9.42	11.53	17.37	17.05	23.70	6.01	4.06	100.00	10.06	49.19	
20B-A	16	17	27	90	149	180	70	45	594	20B-A	2.69	2.86	4.55	15.15	25.08	30.30	11.78	7.58	100.00	19.36	25.25	
B	34	25	31	71	115	159	66	29	530	B	6.42	4.72	5.85	13.40	21.70	30.00	12.45	5.47	100.00	17.92	30.38	
C	20	41	51	74	132	239	79	34	670	C	2.99	6.12	7.61	11.04	19.70	35.67	11.79	5.07	100.00	16.87	27.76	
										Average	7.95	4.60	7.21	12.67	19.63	31.07	11.67	5.21		16.88	32.42	
										St. Dev.	5.40	2.44	2.83	3.03	2.75	6.20	4.21	2.28		5.98	11.17	

MPB Log Screen Test after 30 Days Sprinkling and Stranding

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan	1.5" to 0.75"
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan				
1D-A	29	27	36	86	143	194	57	19	591	1D-A	4.91	4.57	6.09	14.55	24.20	32.83	9.64	3.21	100.00	12.86	30.12	
B	24	21	49	73	160	246	89	29	691	B	3.47	3.04	7.09	10.56	23.15	35.60	12.88	4.20	100.00	17.08	24.17	
C	46	28	62	105	172	292	111	40	856	C	5.37	3.27	7.24	12.27	20.09	34.11	12.97	4.67	100.00	17.64	28.15	
2A-A	74	31	53	59	106	193	63	20	599	2A-A	12.35	5.18	8.85	9.85	17.70	32.22	10.52	3.34	100.00	13.86	36.23	
B	97	45	74	83	149	234	90	53	825	B	11.76	5.45	8.97	10.06	18.06	28.36	10.91	6.42	100.00	17.33	36.24	
C	118	30	66	64	146	205	75	37	741	C	15.92	4.05	8.91	8.64	19.70	27.67	10.12	4.99	100.00	15.11	37.52	
3B-A	11	26	42	76	123	265	108	29	680	3B-A	1.62	3.82	6.18	11.18	18.09	38.97	15.88	4.26	100.00	20.15	22.79	
B	20	20	41	67	160	287	91	39	725	B	2.76	2.76	5.66	9.24	22.07	39.59	12.55	5.38	100.00	17.93	20.41	
C	17	13	64	91	172	309	131	42	839	C	2.03	1.55	7.63	10.85	20.50	36.83	15.61	5.01	100.00	20.62	22.05	
4C-A	36	28	65	80	116	194	64	30	613	4C-A	5.87	4.57	10.60	13.05	18.92	31.65	10.44	4.89	100.00	15.33	34.09	
B	59	41	67	141	159	255	79	48	849	B	6.95	4.83	7.89	16.61	18.73	30.04	9.31	5.65	100.00	14.96	36.28	
C	55	36	54	79	136	188	63	33	644	C	8.54	5.59	8.39	12.27	21.12	29.19	9.78	5.12	100.00	14.91	34.78	
5D-A	107	73	81	155	132	140	47	18	753	5D-A	14.21	9.69	10.76	20.58	17.53	18.59	6.24	2.39	100.00	8.63	55.25	
B	144	64	82	133	149	140	44	26	782	B	18.41	8.18	10.49	17.01	19.05	17.90	5.63	3.32	100.00	8.95	54.09	
C	68	61	100	151	182	178	57	35	832	C	8.17	7.33	12.02	18.15	21.88	21.39	6.85	4.21	100.00	11.06	45.67	
6A-A	60	42	49	64	109	248	88	22	682	6A-A	8.80	6.16	7.18	9.38	15.98	36.36	12.90	3.23	100.00	16.13	31.52	
B	53	34	62	63	112	233	86	37	680	B	7.79	5.00	9.12	9.26	16.47	34.26	12.65	5.44	100.00	18.09	31.18	
C	28	45	55	77	102	264	95	34	700	C	4.00	6.43	7.86	11.00	14.57	37.71	13.57	4.86	100.00	18.43	29.29	
7B-A	10	9	24	49	103	199	124	49	567	7B-A	1.76	1.59	4.23	8.64	18.17	35.10	21.87	8.64	100.00	30.51	16.23	
B	10	23	25	46	86	223	96	34	543	B	1.84	4.24	4.60	8.47	15.84	41.07	17.68	6.26	100.00	23.94	19.15	
C	10	9	13	48	84	247	129	34	574	C	1.74	1.57	2.26	8.36	14.63	43.03	22.47	5.92	100.00	28.40	13.94	
8C-A	54	20	41	65	135	238	110	44	707	8C-A	7.64	2.83	5.80	9.19	19.09	33.66	15.56	6.22	100.00	21.78	25.46	
B	85	41	56	95	128	269	84	26	784	B	10.84	5.23	7.14	12.12	16.33	34.31	10.71	3.32	100.00	14.03	35.33	
C	59	40	50	104	152	297	92	47	841	C	7.02	4.76	5.95	12.37	18.07	35.32	10.94	5.59	100.00	16.53	30.08	
9D-A	35	24	26	45	68	112	66	35	411	9D-A	8.52	5.84	6.33	10.95	16.55	27.25	16.06	8.52	100.00	24.57	31.63	
B	24	29	49	70	116	160	65	27	540	B	4.44	5.37	9.07	12.96	21.48	29.63	12.04	5.00	100.00	17.04	31.85	
C	45	41	53	136	121	204	66	27	693	C	6.49	5.92	7.65	19.62	17.46	29.44	9.52	3.90	100.00	13.42	39.68	
10A-A	78	57	36	81	128	185	46	13	624	10A-A	12.50	9.13	5.77	12.98	20.51	29.65	7.37	2.08	100.00	9.46	40.38	
B	124	35	54	66	106	126	46	13	570	B	21.75	6.14	9.47	11.58	18.60	22.11	8.07	2.28	100.00	10.35	48.95	
C	81	44	77	65	166	211	50	17	711	C	11.39	6.19	10.83	9.14	23.35	29.68	7.03	2.39	100.00	9.42	37.55	
11B-A	21	6	26	61	114	196	77	36	537	11B-A	3.91	1.12	4.84	11.36	21.23	36.50	14.34	6.70	100.00	21.04	21.23	
B	13	18	24	50	120	303	95	36	659	B	1.97	2.73	3.64	7.59	18.21	45.98	14.42	5.46	100.00	19.88	15.93	
C	52	32	28	94	160	243	76	27	712	C	7.30	4.49	3.93	13.20	22.47	34.13	10.67	3.79	100.00	14.47	28.93	
12C-A	59	59	83	117	141	191	51	19	720	12C-A	8.19	8.19	11.53	16.25	19.58	26.53	7.08	2.64	100.00	9.72	44.17	
B	70	46	88	108	140	166	38	12	668	B	10.48	6.89	13.17	16.17	20.96	24.85	5.69	1.80	100.00	7.49	46.71	
C	134	74	78	94	117	155	40	22	714	C	18.77	10.36	10.92	13.17	16.39	21.71	5.60	3.08	100.00	8.68	53.22	
13D-A	24	27	41	60	135	299	133	60	779	13D-A	3.08	3.47	5.26	7.70	17.33	38.38	17.07	7.70	100.00	24.78	19.51	
B	60	41	52	112	162	314	132	79	952	B	6.30	4.31	5.46	11.76	17.02	32.98	13.87	8.30	100.00	22.16	27.84	
C	33	36	58	103	168	340	100	39	877	C	3.76	4.10	6.61	11.74	19.16	38.77	11.40	4.45	100.00	15.85	26.23	
14A-A	20	14	41	93	160	253	73	25	679	14A-A	2.95	2.06	6.04	13.70	23.56	37.26	10.75	3.68	100.00	14.43	24.74	
B	15	22	37	67	117	231	73	34	596	B	2.52	3.69	6.21	11.24	19.63	38.76	12.25	5.70	100.00	17.95	23.66	
C	29	23	47	104	178	251	63	13	708	C	4.10	3.25	6.64	14.69	25.14	35.45	8.90	1.84	100.00	10.73	28.67	



MPB Log Screen Test after 30 Days Sprinkling and Stranding Cont'd

Log #	Screen Fractions by Weight								Total Wts	Log #	% Furnish of Each Screen Fraction								Fines	Pan	Fines & Pan	1.5" to 0.75"
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan			1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan				
15B-A	70	38	84	108	168	258	52	18	796	15B-A	8.79	4.77	10.55	13.57	21.11	32.41	6.53	2.26	100.00	8.79	37.69	
B	103	38	67	133	179	286	67	36	909	B	11.33	4.18	7.37	14.63	19.69	31.46	7.37	3.96	100.00	11.33	37.51	
C	109	70	69	122	167	277	70	23	907	C	12.02	7.72	7.61	13.45	18.41	30.54	7.72	2.54	100.00	10.25	40.79	
16C-A	56	34	68	129	174	294	67	27	849	16C-A	6.60	4.00	8.01	15.19	20.49	34.63	7.89	3.18	100.00	11.07	33.80	
B	48	54	74	106	143	204	46	22	697	B	6.89	7.75	10.62	15.21	20.52	29.27	6.60	3.16	100.00	9.76	40.46	
C	95	37	61	79	131	169	32	7	611	C	15.55	6.06	9.98	12.93	21.44	27.66	5.24	1.15	100.00	6.38	44.52	
17D-A	18	20	35	79	161	202	73	28	616	17D-A	2.92	3.25	5.68	12.82	26.14	32.79	11.85	4.55	100.00	16.40	24.68	
B	13	20	44	78	141	226	87	27	636	B	2.04	3.14	6.92	12.26	22.17	35.53	13.68	4.25	100.00	17.92	24.37	
C	12	20	50	106	166	241	86	43	724	C	1.66	2.76	6.91	14.64	22.93	33.29	11.88	5.94	100.00	17.82	25.97	
18A-A	19	6	26	46	106	209	85	25	522	18A-A	3.64	1.15	4.98	8.81	20.31	40.04	16.28	4.79	100.00	21.07	18.58	
B	20	6	24	54	129	270	105	37	645	B	3.10	0.93	3.72	8.37	20.00	41.86	16.28	5.74	100.00	22.02	16.12	
C	52	23	50	74	127	232	99	41	698	C	7.45	3.30	7.16	10.60	18.19	33.24	14.18	5.87	100.00	20.06	28.51	
19B-A	169	46	66	139	150	178	69	47	864	19B-A	19.56	5.32	7.64	16.09	17.36	20.60	7.99	5.44	100.00	13.43	48.61	
B	148	56	72	93	121	142	53	35	720	B	20.56	7.78	10.00	12.92	16.81	19.72	7.36	4.86	100.00	12.22	51.25	
C	184	82	96	130	127	181	51	31	882	C	20.86	9.30	10.88	14.74	14.40	20.52	5.78	3.51	100.00	9.30	55.78	
20C-A	58	43	48	71	122	234	70	22	668	20C-A	8.68	6.44	7.19	10.63	18.26	35.03	10.48	3.29	100.00	13.77	32.93	
B	56	37	54	86	163	237	52	16	701	B	7.99	5.28	7.70	12.27	23.25	33.81	7.42	2.28	100.00	9.70	33.24	
C	87	38	37	60	110	156	74	34	596	C	14.60	6.38	6.21	10.07	18.46	26.17	12.42	5.70	100.00	18.12	37.25	
										Average	8.11	4.91	7.56	12.31	19.48	32.06	11.11	4.47		15.59	32.88	
										St. Dev.	5.51	2.22	2.33	2.93	2.63	6.34	3.94	1.70		5.33	10.63	

**MPB Log Screen Test after Vacuum-Pressure Soak**

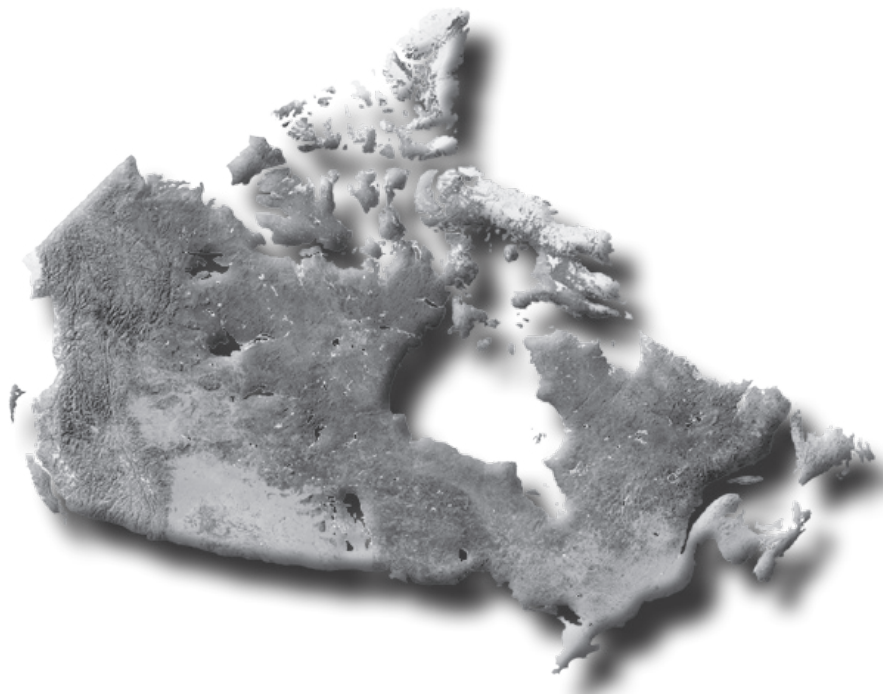
Log #	Screen Fractions by Weight							Total Wts	Log #	% Furnish of Each Screen Fraction									
	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines			Pan	1.5"	1.25"	1.0"	0.75"	0.5"	0.25"	Fines	Pan	
V1-A	30	58	56	94	175	297	133	113	956	V1-A	3.14	6.07	5.86	9.83	18.31	31.07	13.91	11.82	100.00
B	28	11	62	123	170	305	138	105	942	B	2.97	1.17	6.58	13.06	18.05	32.38	14.65	11.15	100.00
C	37	34	69	83	150	306	155	128	962	C	3.85	3.53	7.17	8.63	15.59	31.81	16.11	13.31	100.00
V2-A	24	15	58	98	173	198	98	49	713	V2-A	3.37	2.10	8.13	13.74	24.26	27.77	13.74	6.87	100.00
B	21	5	41	75	160	225	105	55	687	B	3.06	0.73	5.97	10.92	23.29	32.75	15.28	8.01	100.00
C	44	27	39	88	145	153	42	23	561	C	7.84	4.81	6.95	15.69	25.85	27.27	7.49	4.10	100.00
V3-A	35	22	48	87	161	180	75	38	646	V3-A	5.42	3.41	7.43	13.47	24.92	27.86	11.61	5.88	100.00
B	29	46	72	132	202	276	114	41	912	B	3.18	5.04	7.89	14.47	22.15	30.26	12.50	4.50	100.00
C	30	41	59	88	188	254	116	61	837	C	3.58	4.90	7.05	10.51	22.46	30.35	13.86	7.29	100.00
V4-A	8	6	14	65	155	357	105	18	728	V4-A	1.10	0.82	1.92	8.93	21.29	49.04	14.42	2.47	100.00
B	9	9	20	57	188	276	106	27	692	B	1.30	1.30	2.89	8.24	27.17	39.88	15.32	3.90	100.00
C	10	21	24	119	208	269	84	19	754	C	1.33	2.79	3.18	15.78	27.59	35.68	11.14	2.52	100.00
V5-A	12	6	18	39	92	179	69	14	429	V5-A	2.80	1.40	4.20	9.09	21.45	41.72	16.08	3.26	100.00
B	33	15	26	49	95	221	100	16	555	B	5.95	2.70	4.68	8.83	17.12	39.82	18.02	2.88	100.00
C	9	16	29	54	76	143	83	33	443	C	2.03	3.61	6.55	12.19	17.16	32.28	18.74	7.45	100.00
V6-A	26	10	40	69	124	214	92	18	593	V6-A	4.38	1.69	6.75	11.64	20.91	36.09	15.51	3.04	100.00
B	43	55	58	88	158	244	130	21	797	B	5.40	6.90	7.28	11.04	19.82	30.61	16.31	2.63	100.00
C	17	12	51	93	209	284	134	25	825	C	2.06	1.45	6.18	11.27	25.33	34.42	16.24	3.03	100.00
V7-A	20	5	25	57	126	158	91	18	500	V7-A	4.00	1.00	5.00	11.40	25.20	31.60	18.20	3.60	100.00
B	7	19	34	101	161	305	95	21	743	B	0.94	2.56	4.58	13.59	21.67	41.05	12.79	2.83	100.00
C	2	7	21	63	143	207	120	34	597	C	0.34	1.17	3.52	10.55	23.95	34.67	20.10	5.70	100.00
									708	Average	3.24	2.82	5.70	11.57	22.07	34.21	14.86	5.53	
										St. Dev.	1.86	1.83	1.77	2.29	3.45	5.47	2.86	3.28	

This publication is funded by the Government of Canada through the Mountain Pine Beetle Initiative, a program administered by Natural Resources Canada, Canadian Forest Service (web site: [mpb.cfs.nrcan.gc.ca](http://mpb.cfs.nrcan.gc.ca)).

**Contact:**

For more information on the Canadian Forest Service, visit our web site at:  
[www.nrcan.gc.ca/cfs-scf](http://www.nrcan.gc.ca/cfs-scf)

or contact the Pacific Forestry Centre  
506 West Burnside Road  
Victoria, BC V8Z 1M5  
Tel: (250) 363-0600 Fax: (250) 363-0775  
[www.pfc.cfs.nrcan.gc.ca](http://www.pfc.cfs.nrcan.gc.ca)



To order publications on-line, visit the Canadian Forest Service Bookstore at:  
[bookstore.cfs.nrcan.gc.ca](http://bookstore.cfs.nrcan.gc.ca)