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Report No. 285

The Wet Milling of Asbestos Rock from Danville, Que.

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Shipments: A shipment of 60 bags, gross weight 6,777 pounds, was received July 21, 1927. It was submitted by Selective Treatment Limited of Montreal, and consisted of three lots of rock from different parts of the Nicolet mine, situated $8\frac{1}{2}$ miles from Danville, Quebec.

Purpose of Tests: It was desired to determine how much asbestos fiber could be recovered from each of the three lots by the wet milling process for asbestos rock.

Arrangements for Experimental Tests: Arrangements were made by Samuel H. Dolbear of Selective Treatment Limited, holders of the wet process patents, whereby he would supervise the test work. It was the intention of this company to erect a mill on the property, employing the wet treatment process, should the rock be of high enough grade to warrant it.

Characteristics of the Rock: The three lots consisted of typical corss fiber rock of the Quebec district. The rock was medium green in colour and the fiber was white and soft. There was not a great deal of long fiber present.

Sampling: Each lot was crushed separately to about $1\frac{1}{2}$ inch in an 8 x 12" jaw crusher, and one-twentieth cut out for a head sample by a Vezin sampler.

Experimental Tests: Each of the lots was ground in a $4\frac{1}{2}'$ x 16" Hardinge mill, the rock being fed with as much water as possible, extra water being added by means of a pipe through the mill discharge. The idea of this excess of water was to float the fiber out of the

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mill as soon as it was free. A charge of 500 pounds of large steel balls was used so that the rock would be cracked open and not ground fine. The mill discharge was screened on a 1/32-inch round punched hole brass screen mounted over a tank. The fiber deposited on this screen was raked off and put into a tub by hand. The overflow from the tank under the screen went to another tank and then to a large Callow cone. The cone overflow was clear and flowed to waste. The screen oversize was run through a 2-compartment James Jig to remove sand. The jig fiber discharge was screened on the 1/32" punched screen the screen oversize being raked to one side and removed by hand. The screen through went into a tank underneath the screen, the overflow from this tank going to another tank and then to a Callow cone which had not been emptied since the mill run. The contents of tank 1 mill run, tank 1 jig run, and jig hutch were mixed and tabled on a large Wilfley table. The contents of tank 2 mill run, and tank 2 jig run were mixed and tabled. The contents of the Callow cone were discarded although containing a lot of fine fiber. It was felt that it was not worth while to recover this fiber as what would really show if the ore was worth milling was the amount of long and medium fibers that could be recovered.

The fiber obtained from the screen and by tabling was put into bags and pressed to remove most of the water, then dried and fluffed up or fiberized in a fiberizer. This machine consists of a horizontal cylinder with a revolving central shaft carrying beater arms. After fiberizing the table fiber was screened on a 16-mesh vibrating screen

Summary: The following tables show the weights of products and results of the tests on the three lots:

Lot No. 1

Weight of rock treated	2159 lbs.
Oversize fiber from screen	65 "
Fiber from table	543 "
Fiber from table +16 mesh	279 "
Fiber from table -16 mesh	264 "
Average test oversize fiber	0-5.03-5.93-4.99
Average test table fiber +16	0 - 0 -0.67-15.33

	<u>Per cent</u>	<u>Lbs/ton</u>
First box fiber		trace
Second " "	.946	18.92
Third " "	1.666	33.32
Fourth " "	<u>25.548</u>	<u>510.96</u>
	<u>28.160</u>	<u>563.20</u>

Lot No. 2

Weight of rock treated	1920 lbs.
Oversize fiber from screen	124.85 "
Fiber from table	459 "
Fiber from table +16 mesh	122 "
Fiber from table -16 mesh	337 "
Average test oversize fiber	0 - 0 - 8.78 - 7.22
Average test table fiber +16	0 - 0 - 1.11 - 14.89

	<u>Per cent</u>	<u>Lbs/ton</u>
First box fiber		nil
Second " "		nil
Third " "	4.009	80.18
Fourth " "	<u>26.399</u>	<u>527.98</u>
	<u>30.408</u>	<u>608.16</u>

Lot No. 3

Weight of rock treated	2288 lbs.
Oversize fiber from screen	158 "
Fiber from table	426 "
Fiber from table +16 mesh	154 "
Fiber from table -16 mesh	272 "
Average test oversize fiber	0 - 0 - 9.78 - 6.22
Average test table fiber +16	0 - 0 - 0.24 - 15.76

	<u>Per cent</u>	<u>Lbs/ton</u>
First box fiber		nil
Second " "		nil
Third " "	4.322	86.44
Fourth " "	<u>21.203</u>	<u>424.06</u>
	<u>25.525</u>	<u>510.50</u>

Average of three lots:

	<u>Per cent</u>	<u>Lbs/ton</u>
First box fiber		trace
Second " "	0.315	6.30
Third " "	3.332	66.64
Fourth " "	<u>24.383</u>	<u>487.66</u>
	<u>28.030</u>	<u>560.60</u>

	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
	<u>2nd.box</u>	<u>3rd.box</u>	<u>4th.box</u>
Recovered from one ton of rock	6.30	66.64	487.66
67.2 lb/of 0 - 1½ - 9½ - 5 -	<u>6.30</u>	<u>39.90</u>	<u>21.00</u>
Leaving		26.74	466.66
85.57 lb of 0 - 0 - 5 - 11 -		<u>26.74</u>	<u>58.83</u>
Leaving			<u>407.83</u>

Therefore, from one ton of rock there would be recovered 67.2 lbs of 1½ - 9½ - 5, 85.57 lbs of 5 - 11, and 407.83 lbs. of fourth box material

67.2 pounds of 1½ - 9½ - 5 @ \$70.00 per ton	\$ 2.35
85.57 " " " 5 - 11 @ 25.00 " "	1.07
407.83 " " " fourth box @ 10.00 " "	<u>2.04</u> \$5.46

(Approximate market prices Thetford mines as of February 1928)
 This shows that there would be recovered from one ton of rock fiber having a value of \$5.46 at the mine.

Conclusions: An average recovery of fiber having a value of \$5.46 can be made from a ton of the asbestos rock submitted, by the wet process of milling. It is commercially possible to mine and mill asbestos rock of this grade.