



MINES BRANCH

REPORT  
of the  
ORE DRESSING AND METALLURGICAL LABORATORIES.

Report No. 210

The cleaning of mica preparatory to trimming  
and splitting.

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Shipment: Two barrels of mica, net weight 564 pounds, were received January 28, 1924, at the Ore Dressing and metallurgical laboratories from Blackburn Bros. Ottawa.

Characteristics of the mica: The mica received was amber mica in pieces ranging in size from about 4" by 3" by  $\frac{1}{2}$ " thick down to very small flakes. All of the larger pieces had small thin flakes of mica adhering to their faces. A small amount of small rock was present in the shipment.

Purpose of Experimental tests: Tests were desired on the mica submitted to see what could be done to remove the unattached fine flakes and to loosen and remove the adhering fine particles from the faces of the larger flakes. At present it is customary to split off a layer of mica from each face of the larger pieces so as to remove all adhering matter. It was thought that this method was wasteful, and could be improved on.

Arrangements for experimental tests: Mr. H. L. Forbes of Blackburn Bros Ltd. was present during most of the test work and gave valuable advice.

Test No. 1 (Suction) A lot of 167.5 pounds of mica was dried and then run over a 1" shaking Ferraris screen. A suction pipe was arranged at the discharge end of the screen to remove any thin flakes of mica which were too large to pass through the 1" screen. This pipe led to a large collector used to collect the mica sucked off the screen. A fan was used to create the suction and was connected by pipe to the collector. A small amount of rock was picked off the screen by hand.

<u>Product</u>	<u>Weight lbs.</u>	<u>Weight %</u>
Rock	6.5	3.9
Oversize +1"	134	80.0
Suction +1"	3.5	2.1
Fines -1"	18	10.7
Loss	3	1.8
Moisture	2.5	1.5
<u>Heads</u>	<u>167.5</u>	<u>100.0</u>



Test No. 2 (Washing and Suction)

A lot of 283 pounds of mica was washed in a small revolving trommel fitted with  $\frac{1}{2}$ " screens. The mica was placed in the trommel which was closed at both ends, through a small door. This door was closed and the trommel was revolved while half submerged in a tank of water. The faces of the larger pieces are cleaned and the finer flakes pass through the screen and settle down to the bottom of the tank. After washing the mica was dried and run over the Ferraris screen fitted with a suction pipe as described under test no. 1

<u>Product</u>		<u>Weight lbs.</u>	<u>Weight %</u>
Rock		12.5	4.4
Washings	$-\frac{1}{2}$ "	45	15.9
Oversize	+1"	152.5	53.9
Suction	+1"	12.5	4.4
Fines	-1"	46.5	16.5
Loss		10	3.5
Moisture in heads		4	1.4
Heads		283.0	100.0

Test No. 3 (Suction, washing and suction)

A lot of 113.5 pounds of mica was dried and put over the 1" Ferraris shaking screen fitted with a suction pipe. The oversize +1" product was washed in the revolving trommel. This washed product after drying, was run over the 1" Ferraris shaking screen fitted with a suction pipe. Similar products from the two runs on the Ferraris screen were combined.

<u>Product</u>		<u>Weight lbs.</u>	<u>Weight %</u>
Rock		3.5	3.1
Washings	$-\frac{1}{2}$ "	15	13.2
Oversize	+1"	63.5	55.9
Suction	+1"	5	4.4
Fines	-1"	22	19.4
Loss		3.0	2.7
Moisture in heads		1.5	1.3
Heads		113.5	100.0

Summary of Experimental Tests:

<u>Product.</u>	<u>Test No. 1</u> <u>Weight %</u>	<u>Test No. 2</u> <u>Weight %</u>	<u>Test No. 3</u> <u>Weight %</u>
Rock	3.9	4.4	3.1
Washings $-\frac{1}{2}$ "		15.9	13.2
Oversize +1"	80.0	53.9	55.9
Suction +1"	2.1	4.4	4.4
Fines -1"	10.7	16.5	19.4
Loss	1.8	3.5	2.7
Moisture	1.5	1.4	1.3

Conclusions:

Running the mica over the 1" shaking Ferraris screen fitted with a suction pipe is very beneficial. All the free fine mica is removed and even some of that adhering to the faces of the larger pieces. This results in an oversize +1" product that would be ideal for trimming, except that there is still a small amount of fine mica adhering to the faces of the larger pieces. The fines from the screen would be suitable for making ground mica. The suction product consists of flake mica all +1" and ranging up to about 2"x2". Some of it is rather too thick to allow the whole product to be sold as split mica, but it seems quite probable that either by more careful adjustment of the size of screen and amount of suction used, or

210



re-running, a suction product could be made which would sell as split mica.

Washing in the trommel followed by treatment in the shaking screen with suction results in a very nice oversize product quite free of any small pieces of mica adhering to the faces of the larger flakes, it has the disadvantage, though, of cutting down the percent of oversize from 80 to 55. The trommel must crush the mica up as well as wash it, and on this account it cannot be recommended. If, instead of washing in the trommel the washing was done by passing the mica under water sprays on a moving belt and some suitable arrangement was used to turn the mica over, so as to wash both sides, it is quite likely that a large percentage of oversize free from adhering particles would be obtained.