

This document was produced
by scanning the original publication.

Ce document est le produit d'une
numérisation par balayage
de la publication originale.

~~INDUSTRIAL CONFIDENTIAL~~

Declassified
Déclassifié

CANADA

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

OTTAWA

MINES BRANCH INVESTIGATION REPORT IR 58-130

STANDARDIZATION OF SIEVES FROM ELDORADO MINING AND
REFINING LIMITED RESEARCH AND DEVELOPMENT LABORATORY,
OTTAWA, ONTARIO

by

R. S. KINASEVICH

MINERAL DRESSING AND PROCESS METALLURGY DIVISION

Mines Branch Investigation Report IR 58-130

STANDARDIZATION OF SIEVES FROM ELDORADO MINING
AND REFINING LIMITED RESEARCH AND DEVELOPMENT LABORATORY,
OTTAWA, ONTARIO

by

R. S. Kinasevich^{*}

SUMMARY OF RESULTS

Both sets of the Eldorado screens were standardized in parallel with the Mines Branch No. 3 master sieves which were of the same mesh sizes as the Eldorado sets.

The total screening time used for each of the three sets of screens was the same as that outlined in Technical Paper No. 16 for 65, 100, 150, and 200 mesh sieves.

The master correction factors of all the screens tested were calculated and were found to vary from -1.40% to +1.11%. Table 10 later in the report contains the correction factor to be applied to each corresponding screen.

Some delay was encountered in the completion of the tests, due to other projects which were being carried out at the time. A letter, dated July 21, 1958, was sent to Mr. Thumaes to inform him of the delay in the standardization of his screens. The tests were finally completed on July 31, when the screens were returned to the Company.

^{*}Scientific Officer, Mineral Dressing and Process Metallurgy Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa, Canada.

CONTENTS

	<u>Page</u>
Summary of Results	i
Introduction	1
Shipment	1
Purpose of Investigation	1
Details of Standardization Tests	1
Standardization of 65 mesh sieves	1
Standardization of 100 mesh sieves	3
Standardization of 150 mesh sieves	4
Standardization of 200 mesh sieves	5
Method of Calculation	8
Conclusions	9

** ** **

(9 pages, 0 illus.)

INTRODUCTION

Shipment

Two sets of screens, designated as "Pachuca" and "Head" sets, of 65, 100, 150, and 200 mesh sizes, and a sample of finely ground uranium ore, weighing about 22 lb, were received at the Mines Branch laboratories on July 3, 1958, from the Eldorado Mining and Refining Limited Research and Development Laboratory, Ottawa, Ontario.

Purpose of Investigation

Mr. A. Thunæs, of the Eldorado Mining and Refining Limited, Box 379, Tunney's Pasture, Ottawa, Ontario, requested that the sieves be standardized according to the procedure outlined in the Mines Branch Bulletin, Technical Paper No. 16, 1956^{*}.

DETAILS OF STANDARDIZATION TESTS

The sample of dry ore, as received, consisted of two lots of approximately 11 lb, which were mixed together and thoroughly rolled at least 100 times. Six 100 g samples were cut from the entire sample for the tests on the 65 and 100 mesh screens, and six 200 g samples were cut from the remainder of the sample for tests on the 150 and 200 mesh screens.

As outlined in Technical Paper No. 16, the same standard procedure was used for all of the tests, except that the sieving time intervals were different for the various screen sizes.

1. Standardization of 65 mesh sieves

- (a) A 100 g sample was weighed, pulped, and washed on the master standard 200 mesh sieve.
- (b) The plus fraction was dried, rewashed, and dried, while all of the minus fraction was filtered, dried, and weighed.

^{*}For reference, see page 9.

- (c) The plus 200 mesh fraction was weighed, and then screened on a 35, 48 and the standard 65 mesh sieve for 25 min on the Rotap.
- (d) Each plus fraction was washed on the standard 65 mesh sieve and dried. Upon drying, the fractions were weighed, and then returned to their respective screens and given 5 min on the Rotap.

The same procedure was used for the Eldorado "Head" and "Pachuca" 65 mesh sieves. Table 1 shows the results of the tests done on the 65 mesh sieves.

TABLE 1

Results of Screen Standardization - 65 Mesh

Mines Standard - Test No. 1

Mesh	Weight Retained, g	Percent Retained	Sieving Time	Min
+35	0.2	0.2	After first wash " second "	25 5
+48	0.8	0.8		
+65	1.7	1.7		
-65	97.3	97.3		
Total	100.0	100.0		30

Eldorado Head Set - Test No. 2

+35	0.2	0.2	Same as above	
+48	0.8	0.8		
+65	1.8	1.8		
-65	97.2	97.2		
Total	100.0	100.0		

Eldorado Pachuca Set - Test No. 3

+35	0.3	0.3	Same as above	
+48	0.7	0.7		
+65	1.6	1.6		
-65	97.4	97.4		
Total	100.0	100.0		

2. Standardization of 100 mesh sieves

- (a) A 100 g sample was weighed, pulped, and washed on the master standard 200 mesh sieve by the same method as for the standardization of the 65 mesh sieve, except that the sample had three washings on the 200 mesh sieve instead of two.
- (b) The plus 200 mesh fraction was weighed, and then screened on a 48, 65 and the standard 100 mesh sieve for 15 min on the Rotap.
- (c) Each plus fraction was washed on the standard 100 mesh sieve and dried. The fractions were then weighed, returned to their respective screens, and given 20 min on the Rotap.

Once again, a similar procedure was used for the Eldorado 100 mesh screen. Results of the 100 mesh screen tests are shown in Table 2.

TABLE 2

Results of Screen Standardization - 100 Mesh

Mines Standard - Test No. 4

Mesh	Weight Retained, g	Percent Retained	Sieving Time	Min
+48	1.0	1.0		
+65	2.0	2.0	After first wash	15
+100	4.0	4.0	" second "	20
-100	93.0	93.0		
Total	100.0	100.0		35

(cont'd)

TABLE 2 - Results of Screen Standardization - 100 Mesh (cont'd)

Eldorado Head Set - Test No. 5

Mesh	Weight Retained, g	Percent Retained	Sieving Time	Min
+48	1.0	1.0		
+65	1.9	1.9	After first wash	15
+100	5.3	5.3	" second "	20
-100	91.8	91.8		
Total	100.0	100.0		35

Eldorado Pachuca Set - Test No. 6

+48	1.0	1.0		
+65	1.9	1.9	Same as above	
+100	4.8	4.8		
-100	92.3	92.3		
Total	100.0	100.0		

3. Standardization of 150 mesh sieves

- (a) A 200 g sample was weighed, pulped, and washed on the master standard 200 mesh sieve in the same manner as for the 100 mesh sieve.
- (b) The plus 200 mesh fraction was weighed, and then screened on the 65, 100, and the standard 150 mesh sieve for 15 min on the Rotap.
- (c) Each plus fraction was washed on the standard 150 mesh screen and dried. The fractions were then weighed, returned to their respective screens, and given 25 min on the Rotap.

Table 3 contains the results obtained in this series of tests on the 150 mesh screens.

TABLE 3

Results of Screen Standardization - 150 Mesh

Mines Standard - Test No. 7

Mesh	Weight Retained, g	Percent Retained	Sieving Time	Min
+65	6.2	3.1	After first wash " second "	15 25
+100	8.2	4.1		
+150	15.9	7.95		
-150	169.7	84.85		
Total	200.0	100.0		40

Eldorado Head Set - Test No. 8

+65	6.0	3.0	Same as above	
+100	8.1	4.05		
+150	13.5	6.75		
-150	172.4	86.2		
Total	200.0	100.0		

Eldorado Pachuca Set - Test No. 9

+65	6.1	3.05	Same as above	
+100	8.4	4.2		
+150	13.4	6.7		
-150	172.1	86.05		
Total	200.0	100.0		

4. Standardization of 200 mesh sieves

- (a) A 200 g sample was weighed, pulped, and washed on the master standard 200 mesh screen, in the same manner as for the 150 mesh screen.
- (b) The plus 200 mesh fraction was weighed, and then screened on the 100, 150, and the standard 200 mesh screen for 15 min

on the Rotap.

- (c) Each plus fraction was washed on the standard 200 mesh screen and dried. The fractions were then weighed, returned to their respective screens, and given 20 min on the Rotap.
- (d) Each fraction was washed again on the 200 mesh screen, dried, weighed, and given a final 5 min on the Rotap.

The results of the 200 mesh screen tests are shown in Table

4.

TABLE 4

Results of Screen Standardization - 200 Mesh

Mines Standard - Test No. 10

Mesh	Weight Retained, g	Percent Retained	Sieving Time	Min
+100	13.7	6.85		
+150	6.2	3.1	After first wash	15
+200	25.8	12.9	" second "	20
-200	154.3	77.15	" third "	5
Total	200.0	100.0		40

Eldorado Head Set - Test No. 11

+100	13.8	6.9		
+150	2.5	1.25	Same as above	
+200	27.2	13.6		
-200	156.5	78.25		
Total	200.0	100.0		

Eldorado Pachuca Set - Test No. 12

+100	14.0	7.0		
+150	3.4	1.7	Same as above	
+200	31.0	15.5		
-200	151.6	75.8		
Total	200.0	100.0		

Results showing the percentage retained on each of the sieves, the percent coarseness (+) or fineness (-) as compared with Mines Branch sieves, and the total screening time, are summarized in Tables 5 to 8.

TABLE 5

Standardization of 65 Mesh Sieves

Test No.	Screen tested	Percent of sample retained	Percent Coarseness	Total Screening Time, min
1	Mines Branch	2.7		30
2	Eldorado H	2.8	-0.1	30
3	Eldorado P	2.6	+0.1	30

TABLE 6

Standardization of 100 Mesh Sieves

4	Mines Branch	7.0		35
5	Eldorado H	8.2	-1.2	35
6	Eldorado P	7.7	-0.7	35

TABLE 7

Standardization of 150 Mesh Sieves

7	Mines Branch	15.15		40
8	Eldorado H	13.80	+1.35	40
9	Eldorado P	13.95	+1.20	40

TABLE 8

Standardization of 200 Mesh Sieves

10	Mines Branch	22.85		40
11	Eldorado H	21.75	+1.10	40
12	Eldorado P	24.20	-1.35	40

TABLE 9

Corrected Values for Percentage Retained on
Mines Branch No. 3 Sieves

Mesh	Initial Percent of Sample Retained	Percent Correction Factor	Corrected Percent of Sample Retained
65	2.7	+0.10	2.8
100	7.0	+0.12	7.12
150	15.15	+0.05	15.20
200	22.85	+0.24	23.09

From the percent coarseness values in Tables 5 to 8, and from the corrected values for percentages retained on the Mines Branch No. 3 sieves, the master correction factor for each of the tested screens was determined. These correction factors are listed in Table 10.

TABLE 10

Master Correction Factors to be Applied to
the Respective Eldorado Screens

Screen Tested	Mesh	Master Correction Factor to be added to weight percent passing
Eldorado Head Sieves	65	0.0 %
	100	+1.08%
	150	-1.40%
	200	-1.34%
Eldorado Pachuca Sieves	65	-0.2 %
	100	+0.58%
	150	-1.25%
	200	+1.11%

Method of Calculation

Percent of sample retained on Mines Branch 65 = 2.7
 Percent of sample retained on Eldorado "P" 65 = 2.6
 Corrected percent of sample retained on Mines Branch 65 = 2.8
 . . . correction factor to be applied = 0.2 %
 i.e. add 0.2% to weight percent retained,
 or subtract 0.2% from weight percent passing.

CONCLUSIONS

Master Correction Factors to be applied to the respective Eldorado screen are shown in Table 10.

It is suggested that this report be read in conjunction with Technical Paper No. 16, "Master Sieves at the Mines Branch for Standardization of the Sieves of the Mining Industry", by J. Brannen and L. E. Djingheuzian, Mineral Dressing and Process Metallurgy Division, Mines Branch, Department of Mines and Technical Surveys, Ottawa, Canada, 1956.

- - -

RSK/DV