

TNZ T/5: 1987

**METHOD OF DETERMINING SIZE SHAPE AND
GRADING OF GRADES 1-4 SEALING CHIPS**

1. SCOPE

This test method covers the procedure for sampling and for determination of percentage fines, average least dimension (ALD), average greatest dimension (AGD), distribution of least dimensions, and incidence of broken faces in grades 1-4 stone sealing chips.

2. APPARATUS

- (1) A balance capable of weighing up to at least 10kg with a readability of 10g or less and an accuracy of ± 10 g or better.
- (2) One 450mm diameter, 4.75mm mesh NZS sieve and pan.
- (3) ALD apparatus comprising a pedestal-mounted dial gauge or comparable electronic linear measuring device, readable to 0.02mm, with an attached 16mm nominal diameter measuring foot (see figure 1).
- (4) AGD measuring trough, at least 1.0m long and graduated in divisions of 1mm (see figure 1).
- (5) A suitable source of heat to secure effective drying such as a ventilated oven, hot plate or radiant heater.

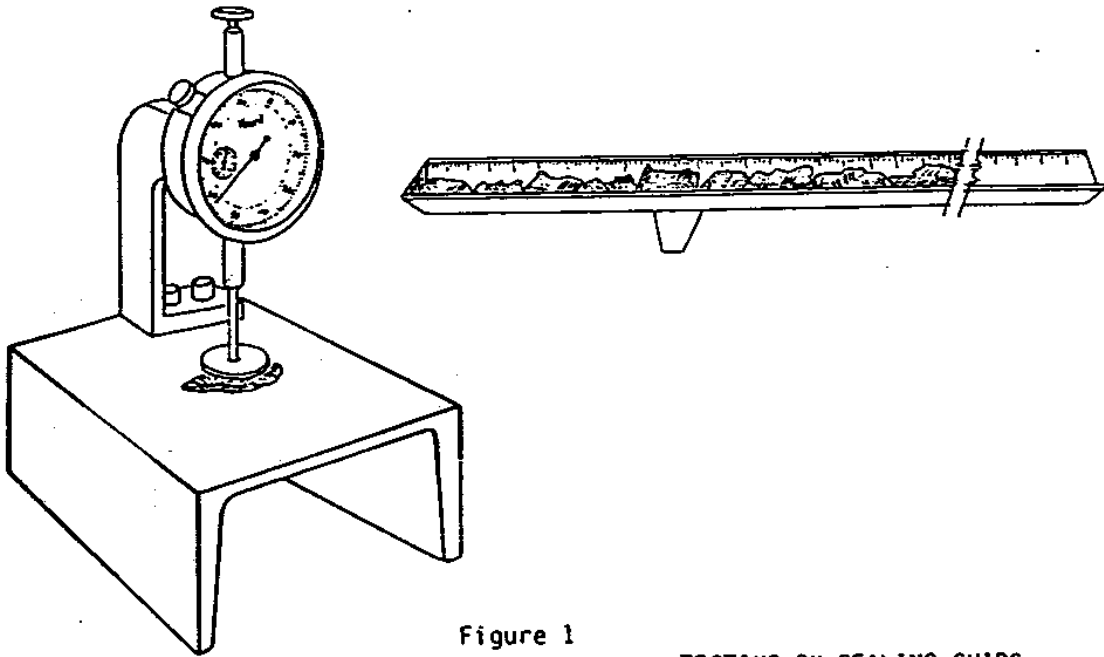


Figure 1

TESTING ON SEALING CHIPS

3. SAMPLING

For routine chip production control, samples should be taken as close as possible to the point of production, preferably by removing all the material from a fixed length of the belt feeding the stockpile. These samples should be taken at random times in the course of production and tested individually.

Samples for acceptance evaluation of chips already stockpiled should be taken from random points on the surface of the pile and tested individually. The samples should be taken by shovel or scoop from a levelled area at each of the selected locations, and batter boards should be used to prevent chips at a higher level tumbling into the sampling area. Samples for acceptance testing should not be taken from trucks.

Samples for checking the quality or uniformity of chips delivered to a sealing site should be taken as close as possible to the point of use, preferably from randomly-selected trucks just before discharge. The procedure for sampling should be that employed on stockpiles.

Samples must have a least 10kg.

4. PROCEDURE

Samples of chips must be tested as follows:

Operation

- (1) Dry the sample to constant mass (see note 1).

Note 1

Care must be taken to ensure that the chip does not reach a temperature at which splitting or decomposition could occur.

- (2) Weigh the sample and record its mass (see notes 2 and 3)

Note 2

All weighings in this test are to the nearest 10g.

- (3) Divide the sample into subsamples not exceeding 1 kg.

Note 3

All test information must be recorded on the appropriate worksheet WS 169.

- (4) Dry sieve each subsample in the following manner:

Place the subsample on the 4.75mm sieve with pan attached.

Agitate the sieve so that the sample rolls in an irregular motion over the sieve for at least 2 minutes. During this time continually vary the motion with frequent jarring. Do not attempt to force material through the mesh.

Continue sieving until only individual particles are retained.

- (5) Weigh the total material retained on the 4.75mm sieve and record its mass.

- (6) Obtain a sample of at least 100 chips (see note 4).

Note 4

The 100 chip sample is obtained by quartering, riffing or other suitable means of splitting the material retained on the 4.75 mm sieve

(7) Measure each individual chip in the 100 chip sample (see note 5).

Note 5

Place the chip, on the face which gives minimum thickness, centrally under the foot of the ALD gauge.

(8) Record the reading obtained on the ALD gauge (see note 6).

Note 6

Reading obtained for each chip is recorded as a tally mark in the appropriate thickness range as shown in the example on attached WS 169.

(9) Using the AGD trough, line up a group of the chips end to end in their longest direction. Record the length of line and the number of chips in the group (see notes 7 and 8).

Note 7

Length of line is measured to the nearest 1 mm.

Note 8

Measure all of the chips in the 100 chip sample in this way.

(10) Examine each chip in the 100 chip sample to determine whether it has two distinctly separate broken faces. Record the number of chips which do not have at least two broken faces.

5. CALCULATION

Examples of the following essential calculations are shown on the attached WS 169.

$$(1) \text{ Percentage passing 4.75 mm sieve} = \frac{\text{loss of mass (g)}}{\text{original mass (g)}} \times 100$$

$$(2) \text{ ALD} = \left[\frac{\sum(f)}{\sum(c)} - 0.5 \right]$$

(3) Percentage of chips within 2.5 mm of ALD.

$$(4) \text{ ALD} = \frac{\sum(h)}{\sum(g)}$$

(5) Express the number of chips with at least two broken faces as a percentage of the total number of chips in the 100 chip sample.

$$(6) \text{ Determine the ratio } \frac{\text{AGD}}{\text{ALD}}$$

6. REPORT

For each test report:

- (1) The percentage passing the 4.75 mm sieve expressed to the nearest 0.1%.
- (2) The ALD expressed to the nearest 0.01 mm.
- (3) The percentage of chips with least dimension within 2.5 mm of the ALD expressed to the nearest 1%.
- (4) The ratio $\frac{AGD}{ALD}$
expressed to the nearest 0.01.
- (5) The percentage of chips with at least two broken faces expressed to the nearest 1%.
- (6) The number of chips in the 100 chip sample.

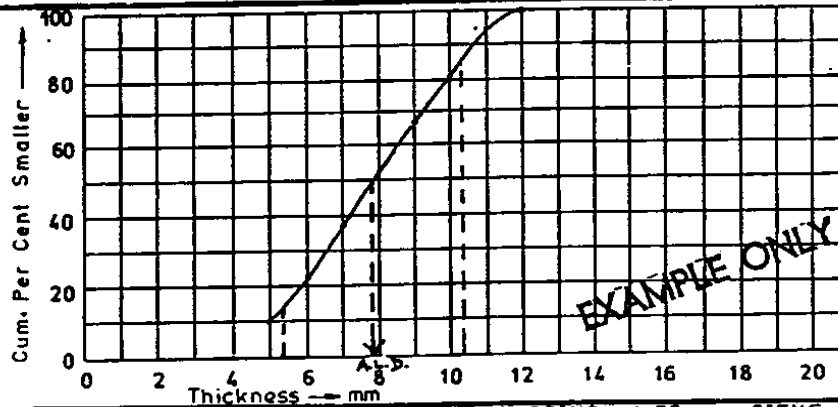
DETERMINATION OF SIZE, SHAPE AND GRADING OF GRADES 1-4 SEALING CHIPS

Sample Description: Date:

LEAST DIMENSIONS

Class No (a)	Thickness Range mm (b)	Tally Stones in Class	Total Tally (c)	Cum Tally (d)	Cum Per Cent (e)	(a) x (c) (f)
1	< 1					
2	1 - 2					
3	2 - 3					
4	3 - 4					
5	4 - 5		14	14	10	70
6	5 - 6		17	31	22	102
7	6 - 7		21	52	37	147
8	7 - 8		22	74	52	176
9	8 - 9		21	95	67	189
10	9 - 10		20	115	81	200
11	10 - 11		18	133	94	198
12	11 - 12		9	142	100	108
13	12 - 13					
14	13 - 14					
15	14 - 15					
16	15 - 16					
17	16 - 17					
18	17 - 18					
19	18 - 19					
20	19 - 20					

Σ (c) = 142 Σ (f) = 1190



GREATEST DIMENSIONS

No. Stones (g)	Length mm (h)
29	424
22	310
40	565
28	410
23	324
Σ (g) = 142	Σ (h) = 2033

PERCENT PASSING 4.75 mm SIEVE

Original Oven dried	Mass in g		Per Cent Passing
	Retained on sieve	Loss	
2480	2460	20	0.8

RESULTS

% Passing 4.75 mm sieve. 0.8

% Within 2.5 mm A.L.D. $\frac{86}{14} = 7.2$

% With 2 broken faces. 99.

A.L.D. = $\left[\frac{M(f)}{M(c)} - 0.5 \right] = 7.88$ mm

A.G.D. = $\frac{M(h)}{M(g)} = 14.32$ mm

A.G.D. = 1.82

A.L.D.