

སྤྱི་རྒྱུ་འཛུལ་ཆས། བརྟག་དཔྱད་སྒྲིག་ལུགས། གོ་ཁྲིམ་ 2 ལ།

BHUTAN STANDARD

Cereal Flaking Machine- Test Code (Part 2)



ICS 65.060.10

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BHUTAN STANDARDS BUREAU

The National Standards Body of Bhutan

THIMPHU 11001

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Published in October 2018

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FOREWORD

This Bhutan Standards for Power Tillers–Test Code (Part 2) was adopted by Bhutan Standards Bureau after the draft finalization by the Mechanical Engineering Technical Committee and endorsed by BSB Board

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Cereal Flaking Machine- Test Code (Part 2)

1 Scope

This test code specifies the test methods for cereal flaking machines.

2 Normative Reference

There are no normative references for this document

3 Definitions

For the purpose of this document, the definitions have given in the standard of cereal flaking machines, BTS March, 2017.

3.1 Flaking time

It is a time taken to convert the input cereal to flakes by the flaking machine.

3.2 Others

Any additional verifications that may be required to be undertaken for enhancing the precision of any test items.

3.3 Flake

The final product that is retained on the sieve size of 5mm for maize flake and 3 mm for rice flake.

4 General conditions of the test

4.1 The cereal flaking machine subjected to the test shall be run as per the manufacture's indication and specifications.

4.2 The cereal flaking machine subjected to the test shall be well adjusted and prepared as per the requirements and the manufacturer's indication.

4.3 The prime mover used for the tests shall be selected from those indicated by the manufacturer.

4.4 All measuring instruments used for the test shall be calibrated with relevant agencies or certification body.

5 Test items and methods

5.1 Verification of structure

The objective of this test is to confirm the specifications of a cereal flaking machine given by the manufacturer. The items to be verified are as per the Annex A.

5.2 Safety test

The objective of this test is to ascertain the safety features of the cereal flaking machine. It shall be performed by;

- a) Verifying safety devices
- b) Inspection of the caution labels
- c) Availability of instruction and operation manuals.
- d) Others

5.3 Operation test

The objective of this test is to assess the flaking recovery rate, flaking recovery index, flaking capacity and handling. To carry out these tests, following conditions shall be maintained;

- a) The manufacturer's specification and instruction or operation manual shall be followed for fitting the accessories and any other adjustments.
- b) The cereal flaking machine shall be operated by at least two experienced operators.
- c) The manual pounding will be used to determine the reference value for estimating flaking recovery index.
- d) Flaking recovery index will be estimated to assess the efficiency of the flaking cereal crops.

5.3.1 The items to be measured or investigated are;

- 1) Test condition of cereal
- 2) Mechanical condition of the cereal flaking machine
- 3) Operating condition of cereal flaking machine
- 4) Flaking recovery
- 5) Flaking capacity
- 6) Energy consumption
- 7) Ease of handling
- 8) Noise level
- 9) Others

6 Formulae

The flaking recovery rate, flaking recovery index and flaking capacity shall be calculated as follows;

6.1 Flaking Recovery Rate

$$FR (\%) = \frac{W_2}{W_1} \times 100$$

Where:

FR= Flaking recovery (%) by machine

W1= Weight of roasted cereal (kg)

W2= Weight of flake (kg)

$$FRR (\%) = \frac{W_2}{W_1} \times 100$$

Where:

FRR= Flaking recovery for reference (%) by manual

78 W1 = Weight of roasted cereal (kg)
 79 W2= Weight of flake (kg)
 80

81 6.2 Flaking Recovery Index

82

$$84 \quad \text{FRI} = \frac{\text{FR}}{\text{FRR}}$$

83

85 Where:

86

87 FRI: Flaking recovery index

88 FRR: Flaking recovery for reference by manual

89 FR: Flaking recovery by machine

90

91 6.3 Flaking Capacity

$$93 \quad \text{CF} \left(\frac{\text{kg}}{\text{h}} \right) = \frac{W}{\text{TF}}$$

92

94 Where:

95 CF: Flaking capacity (kg/h)

96 W: Weight of input sample after roasting (kg)

97 TF: Flaking time (h)

98

99 7. Inspection after disassembling

100 If any abnormalities are observed during any of the above tests, causes may be investigated by
 101 disassembling the specific parts.

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112 **Annexure A (Normative)**113 **SPECIFICATION SHEET FOR CEREAL FLAKING MACHINE**

114

115 **A Corn flake machine**

116 a) Model:

117 b) Make:

118 c) Type :

119 d) Serial number:

120 e) Overall dimensions

121 a. Length:

122 b. Width:

123 c. Height:

124 **B Prime Mover**

125 a) Power source:

126 b) Type:

127 c) Make:

128 d) Rated power :

129 e) Type of starter:

130 f) Type of fuel:

131 g) Others

132 a. Diameter of driving pulley:

133 b. Diameter of main shaft pulley:

134 c. Diameter of sieve hole:

135 d. Diameter of flaking chamber:

136 e. Diameter of main shaft:

137 **C. Roller**

138 a. Thickness:

139 b. Diameter:

140 **D. Adjustable range of drum and roller:**

141

142 **Note: All dimensions in millimeters (mm)**

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147 **Bibliography**

148 Design and development of a small/ medium scale rice flaking machinery for manufacture of rice flake

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