Reserve Bank of India
Department of Currency Management

Note Authentication and Fitness Sorting Parameters

1. Introduction

These parameters provide the minimum standards for cash handling machines used by banks (hereinafter called 'the machines'). Notes can only be recycled/reissued if they are evaluated as genuine and fit according to these parameters. Authenticity check is a prerequisite for fitness sorting. Fitness sorting can be done only in case of genuine notes. The machines shall be able to identify and separate suspected counterfeits and notes which are unfit for circulation in terms of these standards in a reliable and consistent fashion.

The machines shall have provision for regular updates and to accommodate new features/ designs/ substrata/ denominations etc. As and when the Reserve Bank of India decides to phase out a specific series (issue) of a specific denomination of notes, the machines shall sort all the phased out notes as unfit.

2. Applicability

These parameters are applicable to machines operated by banks, either directly by their staff or indirectly by their agents. These machines can be of any of the following: (i) machines which check the authenticity and fitness of notes, i.e. note processing machines/ note sorting machines, (ii) machines which check only the authenticity of notes, i.e. note authentication machines. All these machines shall classify the individual notes as either genuine or suspect without the intervention of the machine operator.

3. Authenticity Check

The machines shall perform authenticity check with reference to the features of genuine notes as disclosed by the Reserve Bank of India from time to time. Any note which is not found to be having all the features of a genuine note shall be classified by the machine as suspect.

4. Fitness Sorting

As a part of fitness sorting, notes with any visual or physical defects are to be sorted as unfit as per the criteria set out in Table 1.

Table 1: Sorting Criteria

Sl. No.	Feature	Criteria
1	Soiling	General distribution of dirt across the entire note
2	Limpness	Structural deterioration resulting in a marked lack of stiffness
3	Dog-ears	Corner folds
4	Tears	Lengthwise and crosswise cuts
5	Holes	Holes of a specific diameter
6	Stains	Localised concentration of dirt
7	Graffiti	Deliberate graphic alteration of the note
8	Crumples	Multiple random folds
9	Decolouration	Lack of ink on part or whole of the note, e.g. a washed note
10	Folds	Folds reducing the length or width of the note
11	Repair	Note repaired using adhesive tape/ paper/ glue

(i) Soiling

Soiling refers to the general distribution of dirt across the entire note or in some patterns. Soiling increases the optical density and decreases the reflectance of the notes. Notes exceeding the soiling levels set out in Table 2 shall be sorted as unfit. Both the obverse and the reverse of the note shall be checked for soiling.

Table 2: Soiling Levels

Sl. No.	Denomination	Maximum Density difference	Minimum Reflectance
1	Rs. 5	0.07	85 %
2	Rs. 10	0.07	85 %
3	Rs. 20	0.06	87 %
4	Rs. 50	0.06	87 %
5	Rs. 100	0.05	90 %
6	Rs. 500	0.04	93 %
7	Rs. 1000	0.03	95 %

(ii) Limpness

Limpness relates to structural deterioration or wear resulting in a marked lack of stiffness in the note paper. Notes with a very low stiffness shall be sorted as unfit. Notes with very low stiffness of paper, i.e. with paper which is worn out in circulation or mechanically mutilated shall be sorted out as unfit. Detectors for paper quality shall be adapted to the same level as for soiling.

(iii) Dog-Ears

Notes with dog-ears with an area of more than 130 mm² and a minimum length of the smaller edge greater than 10 mm shall be sorted as unfit. Chipped notes shall also be sorted as unfit.

(iv) Tears

Notes exhibiting at least one tear at the edge shall be classified as those having tears. Notes with tears larger than those indicated in Table 3 shall be sorted as unfit.

Table 3: Tears

Sl. No.	Direction	Width	Length
1	Vertical	4 mm	8 mm
2	Horizontal	4 mm	15 mm
3	Diagonal *	4 mm	18 mm

* Measured by drawing a straight line from the peak of the tear to the edge of the note where the tear begins (rectangular projection), rather than measuring the length of the tear itself.

(v) Holes

This refers to notes with at least one visible hole. Notes with holes with area exceeding 10 mm² shall be sorted as unfit.

(vi) Stains

Notes shall be detected as unfit if localized - i.e. with limited extension – stain can be recognised on its surface. In case the total area covered by stains exceeds 2,000 mm², the note shall be sorted as unfit. Both the obverse and the reverse of the note shall be checked for stains.

(vii) Graffiti

Graffiti refers to deliberate graphic alteration of the note with for example, figures or letters. Fitness sorting criteria in case of graffiti shall be the same as those for stains. Both the obverse and the reverse of the note shall be checked for graffiti.

(viii) Crumples/ Folds

Crumpled/ folded notes shall be sorted as unfit if the folds result in reduction of the original note in length or width greater than 3 mm.

(ix) Decolouration

Notes affected by decolouration shall be sorted as unfit if the ink is partially or wholly missing from its surface. Both the obverse and the reverse of the note shall be checked for decolouration.

(x) Repair

A repaired note is created by joining parts of the same note together, for example, by using extraneous matter such as tape, paper or glue. Repairs covering an area greater

than 100 mm² and where the thickness of the extraneous matter is more than 50 µm thick shall be sorted as unfit.

5. Mutilated, Imperfect and Mismatched Notes

A mutilated note is note, of which a portion is missing or which is composed of more than two pieces. An imperfect note is a note, which is wholly or partially, obliterated, shrunk, washed, altered or indecipherable but does not include a mutilated note. A mismatched note is a note, which has been formed by joining a half note of any one note to a half note of another note. The machine shall separately identify mutilated, imperfect and mismatched notes within the notes classified as unfit and sort them to the Reject pocket.

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