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Tobacco and tobacco products — Non-destructive determination of strips density variation ratio in case — Ionizing radiation method

Tabac et produits du tabac — Détermination non destructive de la variation de densité des strips en caisse — Méthode par radiations ionisantes

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Foreword

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Introduction

The density variation ratio (DVR) is one of the significant factors that influence tobacco aging and primary processing (see Reference [1]). For example, the phenomena of oil loss, caking or even carbonization is easy to take place in an aging process because of the larger DVR. The block of strips, which has a larger DVR, is difficult to loosen in a conditioning cylinder. The larger DVR can lead to deterioration of taste and quality of cigarette and hence it is important to detect DVR of strips still in its case (i.e. before introducing it into a primary processing stream).

The standard method for detecting DVR of strips in case, used at present, is based on “9-point Static Detection’’ (see Reference [2]). This method results in damage to strips, being applicable for only off-line measurements and needing longer testing time. A non-destructive method, on the other hand, would be quicker, amenable to both off-line and on-line measurements and would result in no damage to strips and hence has been a subject of analytical research and development.

X-rays can easily penetrate the strips' case and their intensity correlates to the density of the material they pass through, which would be a strips column in the case. The ionizing method has been widely used in many other areas (see IEC 60692[3]) and IEC has developed relevant standards for safe X-ray apparatus (see IEC 60405[4]). The X-ray apparatus used in the proposed method complies with these International Standards and can therefore be considered to be a completely safe radiation source.

Thus the ionizing radiation (X-ray attenuation) method retains the advantages of a non-destructive method for measurement of density of strips in the case, is amenable for on-line as well off-line measurements, is quick, safe and relatively inexpensive. The present proposal elaborates on its application for measurement of density of strips in the case.

There are more possibilities of measuring the density variation ratio in case. Any system with the same accuracy can be used.

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