TECHNICAL SPECIFICATION

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Imaging materials — Lenticular lens sheet — Measurements and specifications of dimensions

Matériaux pour l'image — Feuille lenticulaire — Mesurages et spécifications des dimensions

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 42, *Photography*.

Introduction

Lenticular lens are an array of magnifying lenses, which can generate a desired visual perception, including 3D effect, animation and flips, when the underlying interlaced printed image is viewed from different angles. The most widespread use of this technology is in lenticular printing, for use in packages, display posters, promotional buttons, magnets, coasters, collectibles, signs, menu boards, postcards and business cards.

It is reported that the market size of lenticular sheets is over 100 million m^2 and the market is growing. Moreover, the image qualities of lenticular printing have improved dramatically, and further improvement is expected in the future. While production of lenticular sheets with a lens frequency of 100 lines per inch (lpi) is routine, products with 200 lpi are also currently available. To produce the optimal perceptive experience, the right choice of lenticular sheet is crucial. Different use cases require different lens frequencies. For a 2D view application, a 200 lpi material can be optimal, and for multiview 3D effect viewed from one meter or further, a 12 lpi material can be optimal. On a separate note, lenticular sheets with higher lens frequency can be thinner; therefore, increasing its potential in high quality packaging and a variety of printings.

The multi-step process of lenticular printing involves creation of a lenticular image from at least two existing images and its combination with a lenticular sheet. The combining process can either be a 1) direct printing of the images on the lenticular sheets or 2) pasting the lenticular sheet and printed images. This process can be used to create various frames of animation (motion perception), offsetting the various layers at different increments (3D perception) or simply to show a set of alternate images which appear to transform into each other.

Major factors influencing the quality of a lenticular image is the precision in the dimensions of the lenticules in the lenticular sheet and the printed interlaced image and the precision in the positioning of the lens array and the interlaced images. Poor precision results in poor image quality and poor precision in the dimensions of lenticules in the lenticular lens sheet can result in low production yield, consequently resulting in higher costs.

Therefore, the demand for improving the precision in the dimensions of the lenticules in a lenticular lens sheet has been high. The standardization of the measurements of the dimension of the lenticules in a lenticular lens sheet has been requested from the market.

Imaging materials — Lenticular lens sheet — Measurements and specifications of dimensions

1 Scope

This Technical Specification specifies the measurements and specifications of the dimensions of a lenticular lens sheet. It describes measurement methods and specifies the nominal sizes and target dimensions with tolerance. It also describes methods to test the stability of dimensions of the lenticular lens sheet.

This Technical Specification is applicable to lenticular lens sheets used in lenticular prints, including those that give an image the illusion of depth or make images appear to change/move as the image is viewed from different angles. Both impact and non-impact printing can be used to generate the images. Examples of the former are off-set, gravure and flexography, while the examples of the latter are silver halide, inkjet, dye diffusion thermal transfer and electrophotography.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
lenticular lens
array of magnifying semi-cylindrical lenses, designed to produce a desired perception, such as 3D, motion or morphing, to the underlying interlaced image

EXAMPLE This technique is widely used in lenticular printing, wherein the lenticular lens is used to provide an illusion of depth, change or motion to an underlying interlaced image when viewed from different angles.

Note 1 to entry: Schematic diagrams of a lenticular sheet is shown in Figure 1 (top view) and Figure 2 (side view).

