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Standard Test Methods for Determining Acceptability of Ribbon Welds in Fabric Cartridges[1]

This standard is issued under the fixed designation F1509; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods are for evaluating ribbon welds in fabric cartridges that do not contain endless woven loops. These test methods apply to ribbon welds made with ultrasonic energy but do not cover special-purpose welds such as overlap or butt welds. Physical characteristics of ribbon welds and test performance may be used to predict acceptable function and printing life of the weld in the finished cartridge. These test methods are suitable both for comparative evaluations by end-users and for manufacturing control within the ribbon product industry.

1.2 Since types of ribbon welds and equipment vary, similar fabric cartridges may not contain the same type of ribbon weld. Any evaluation comparing products from different sources should note this.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1174 Practice for Using a Personal Computer Printer as a Test Instrument

3. Terminology

3.1 *Definition*

3.1.1 *hot spotting*—printed images produced with an inked fabric ribbon where occasional individual images are darker than those around them; this condition occurs when the amount of ink is not consistent throughout the fabric ribbon.

4. Summary of Test Methods

4.1 Fabric ribbon welds can be evaluated on the basis of the following characteristics:

4.1.1 Appearance,
4.1.2 Width,
4.1.3 Alignment,
4.1.4 Strength,
4.1.5 Printability, and
4.1.6 Durability.

4.2 Test methods for evaluating welds in these areas are described. These test methods are divided into sections by ribbon weld characteristic. Each section consists of a test procedure, results that can be obtained, and what these results may indicate. Each user must determine the tests that are reasonable considering the needs and the equipment available.

5. Significance and Use

5.1 The test methods described can be used to evaluate acceptability of fabric ribbon welds on a comparative basis. Some, though not all, tests may also be used for manufacturing control. The weld durability test is exclusively for manufacturing control, since it involves in-process testing.

5.2 Users may choose to perform any or all of the tests described, depending upon results desired and equipment available.

6. Interferences

6.1 Interferences that may impact test results are listed for each test method to which they apply.

6.2 *Weld Width*—Weld width is best determined with the use of polarized light, due to the difference between filament deformation and physical property changes (that is, melting).

6.3 *Weld Strength*:

6.3.1 The type of welding equipment used and operator technique may cause variability in weld strength. For weld equipment that does not automatically tension the fabric, the tension applied by the operator when securing the fabric in the fixture can significantly alter the weld strength.

6.3.2 The type of nylon, thickness, style, finishing, and slitting of the fabric may cause variability in weld strength. Ink properties and level of inking of the fabric also contribute to variability in optimum weld strength. Such ink characteristics

[1] These test methods are under the jurisdiction of ASTM Committee F05 on Business Imaging Products and are the direct responsibility of Subcommittee F05.02 on Inked Transfer Imaging Products.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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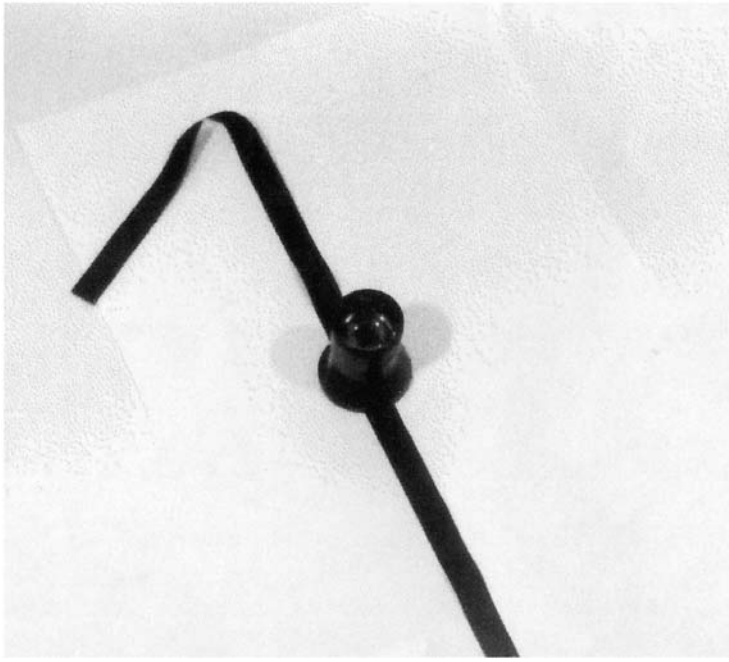

FIG. 1 Hand Held Comparator

as oil color carriers, type of solids, if present, and quality of dispersion may be considered. Samples being compared should be classified as closely as possible and tested under equal conditions.

6.4 *Weld Printability*:

6.4.1 Certain types of ribbon welds may cause print defects peculiar to the type of weld. Some welds are not designed to be overprintable.

6.4.2 Some types of ink formulations and nylon types will be more prone to hotspotting than others. Hotspotting at the weld could, therefore, be a function of the material rather than the welding process. Note evidence of hotspotting elsewhere in printout.

6.5 *Weld Durability*:

6.5.1 The zipper test may not produce meaningful results when welding certain special-application fabrics (that is, twill fabric that does not have a regular weave pattern).

6.5.2 Any short loop length and equivalent end of life can be calculated for a product. However, some cartridge designs will not function properly with radically reduced amounts of nylon.

6.5.3 Certain cartridge internal designs can induce more wear on a ribbon weld. Any comparative testing of ribbon welds should use the same design.

6.5.4 Different prints (even of the same model), impact adjustments, and print modes will cause variability in amount of weld wear.

7. Test Methods

7.1 *Weld Appearance*:

7.1.1 *Apparatus—Hand-held Comparator*[3] *and Contrasting Paper*, for ease in viewing sample.

7.1.2 Advance the ribbon in a finished cartridge until the ribbon weld is outside the cartridge. Place the ribbon on a flat surface and view the weld with a hand-held comparator. See Fig. 1.

7.1.3 Examine the weld for surface smoothness and uniformity. Note glazed or melted appearance that may indicate a brittle, weaker weld. Examine ribbon edges adjacent to the weld for fraying or extraneous fibers ("tails") produced by the welding process.

7.2 *Weld Alignment*:

7.2.1 *Apparatus*—See 7.1.1.

7.2.2 Weld alignment is the result of tolerances on ribbon slit width and physical alignment.

7.2.3 Examine the edges of the ribbon weld for proper alignment using hand-held comparator, as shown in Fig. 2. Position zero crosshair of printed scale at outer edge of the nylon. Measurement is taken to the inner edge. Amount of offset at Position A1 is added to the amount of offset at Position A2 for the total misalignment.

7.2.4 Amount of misalignment to be allowed shall be determined by the overall width of the nylon being welded and by product application.

[3] The sole source of supply of the apparatus known to the committee at this time is Bishop Graphics, P.O. Box 6012, Agonra Hills, CA 91376-6012. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee [1], which you may attend.

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