



Standard Practice for Examination of Paper Machine Rolls Using Acoustic Emission from Crack Face Rubbing¹

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1. Scope

1.1 This practice provides guidelines for acoustic emission (AE) examinations of non-pressure, paper machine rolls.

1.2 This practice utilizes a slow rotation of the roll to produce a full load cycle where load is provided by the weight of the roll suspended from its bearings or other journal support mechanism(s).

1.3 This practice is used for detection of cracks and other discontinuities in rolls that produce frictional acoustic emission during rotation.

1.4 The AE measurements are used to detect or locate emission sources, or both. Other nondestructive test (NDT) methods must be used to evaluate the significance of AE sources. Procedures for other NDT techniques are beyond the scope of this practice. See [Note 1](#).

NOTE 1—Traditional AE examination, magnetic particle examination, shear wave ultrasonic examination and radiography are commonly used to establish the exact position and dimensions of flaws that produce AE.

1.5 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standards.

1.6 *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. Specific precautionary statements are given in Section 8.*

¹ This practice is under the jurisdiction of ASTM Committee E07 on Nondestructive Testing and is the direct responsibility of Subcommittee E07.04 on Acoustic Emission Method.

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2. Referenced Documents

2.1 ASTM Standards:²

E543 Specification for Agencies Performing Nondestructive Testing

E650 Guide for Mounting Piezoelectric Acoustic Emission Sensors

E976 Guide for Determining the Reproducibility of Acoustic Emission Sensor Response

E1316 Terminology for Nondestructive Examinations

E2075 Practice for Verifying the Consistency of AE-Sensor Response Using an Acrylic Rod

E2374 Guide for Acoustic Emission System Performance Verification

E2598 Practice for Acoustic Emission Examination of Cast Iron Yankee and Steam Heated Paper Dryers

2.2 ASNT Standards:³

SNT-TC-1A Recommended Practice for Nondestructive Testing Personnel Qualification and Certification

ANSI/ASNT CP-189 Standard for Qualification and Certification of Nondestructive Testing Personnel

2.3 AIA Document⁴

NAS-410 Certification and Qualification of Nondestructive Testing Personnel

3. Terminology

3.1 *Definitions*—See Terminology E1316 for general terminology applicable to this practice.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *crack face rubbing*—physical displacement of existing crack surfaces as load is changed.

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.

³ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.

⁴ Available from Aerospace Industries Association of America, Inc. (AIA), 1000 Wilson Blvd., Suite 1700, Arlington, VA 22209-3928, <http://www.aia-aerospace.org>.