National Institute of Standards & Technology

Certificate

Standard Reference Material 3217

Secondary Standard for 6.30 mm (0.25 in) Magnetic Tape Cartridge

This Standard Reference Material (SRM) is intended for use in the calibration of the average signal amplitude of 6.30 mm (0.25 in), 252 flux transitions per millimeter (ftpmm) [6 400 flux transitions per inch (ftpi)] and 394 flux transitions per millimeter (ftpmm) [10 000 flux transitions per inch (ftpi)]. The SRM 3217 tape consists of oriented ferromagnetic oxide particles dispersed in a suitable polymeric binder material that has been coated over the surface of a flexible polyester or equivalent base material.

This SRM is certified to support specific requirements contained in the following standards: American National Standards Institute (ANSI) X3.116, X3.127 and X3.136.

NOTE: This SRM should not be confused with SRM 3203. SRM 3203 uses a similar cartridge and a similar density, but has a higher coercivity tape and supports a different set of ANSI standards.

The National Institute of Standards and Technology (NIST) maintains a SRM 3217 Master Standard Reference Tape in repository that is used to calibrate selected working tapes. These working tapes are then used to calibrate the NIST test system used for measuring and documenting the performance of SRM 3217 tapes.

Each unit of SRM 3217 is calibrated for average signal amplitude with reference to the Master Standard Reference Tape at the test recording densities of 252 flux transitions per millimeter (ftpmm) [6 400 flux transitions per inch (ftpi)] and 394 flux transitions per millimeter (ftpmm) [10 000 flux transitions per inch (ftpi)].

The NIST test system uses Track 0, which is near the middle of the tape. Calibration is done on a read-while-write pass.

The certified parameter values and associated uncertainties for this tape relative to the Master Standard Reference tape are:

	Certified Value	Uncertainty*
Signal Amplitude (252 ftpmm)		± 0.017
Signal Amplitude (394 ftpmm)		± 0.031

*(See Table 1, Components of Uncertainty)

The above uncertainties were calculated according to NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results. Technical Note 1297 is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

No characteristics other than the preceding parameters are implied or ascribed to this SRM.

Gaithersburg, MD 20899
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Thomas E. Gills, Chief
Standard Reference Materials Program

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Certification of Secondary Standard Magnetic Tape Cartridges was performed in the Advanced Systems Division of the Computer Systems Laboratory. The system was designed by F. Podio. The SRM calibration was performed by L.D. Gilmore.

Statistical consultation was provided by L.M. Oakley of the NIST Statistical Engineering Division.

The support aspects involved in the issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

The following documents accompany each SRM 3217:

(1) For each recording density, there are two saturation curves showing the average signal amplitude in terms of Amplitude Units (A.U.) versus the write current.

   (a) One of the curves is produced from the NIST Master Standard Reference Tape on a read-while-write pass.

   (b) The other curve is produced within the certified region of the SRM 3217, Serial No. _____, on a read-while-write pass.

(2) Two percentage curves that show the signal amplitude percentage values (R%) of the SRM 3217 relative to the NIST Master Standard Reference Tape. These curves are produced from the SRM 3217 and the NIST Master Standard Reference Tape at each of the two recording densities on a read-while-write pass.

Application Notes:

(1) SRM 3217 should be ac bulk-erased before each use.

(2) At least one full forward and one rewind pass must always be made before using SRM 3217 for calibration purposes.

(3) A partial pass should never be made on SRM 3217.

(4) All measurements on SRM 3217 should be made on a read-while-write pass.

Table 1. Components of Uncertainty

Source	Type	Signal Ampl. 252 ftpmm	Signal Ampl. 394 ftpmm
Within-day median[1]	"A"[2]	0.007	0.004
Between-day[1]	"A"[2]	0.004	0.015
Expanded Uncertainty[3]	"U"	0.017	0.031

[1]Uncertainty based on historical data.
[2]Type "A" denotes evaluation of uncertainty by the statistical methods.
[3]The expanded uncertainty, $U = ku_c$, is determined by the coverage factor, $k = 2$, and the combined standard uncertainty, u_c, which is the root sum of squares of within-day and between-day standard uncertainties.