National Institute of Standards & Technology

Certificate

Standard Reference Material 3201

Secondary Standard 12.65 mm (0.5 in) Magnetic Tape Cartridge

This Standard Reference Material (SRM) is intended for use in the calibration of the typical field, average signal amplitude, resolution, overwrite and peak shift of 12.65 mm (0.5 in), serial serpentine, 22-track, 262 ftpmm (6 667 ftpi) and 48-track, 394 ptpmm (10 000 ftpi) unrecorded magnetic tape.

This SRM is certified to support specific requirements contained in the following standards: American National Standards Institute (ANSI) X3.181-1990 and X3.197-1991.

The National Institute of Standards and Technology (NIST) maintains a SRM 3201 Master Standard Reference Tape in a 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 3201 tapes.

The NIST test system uses logical track 02/physical track 26 of the high density format, which is near the middle of the tape, for tests at both densities. Calibration is done on a read-while-write pass. The first 30 m (100 ft) of tape are skipped over during calibration.

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

	Certified Value	Uncertainty[*]
Signal Amplitude (262 ftpmm)		± 0.039
Signal Amplitude (394 ftpmm)		± 0.053
Typical Field (262 ftpmm)		± 0.013
Typical Field (394 ftpmm)		± 0.015
Resolution (262 ftpmm)		± 0.034
Resolution (394 ftpmm)		± 0.110
Overwrite (262 ftpmm)		± 0.035
Overwrite (394 ftpmm)		± 0.009
Peak Shift (262 ftpmm)		± 0.065
Peak Shift (394 ftpmm)		± 0.042

[*](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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(Revision of certificate dated 01-21-92)

Thomas E. Gills, Chief
Standard Reference Materials Program

(over)

Certification of Secondary Magnetic Tape Cartridges was performed in the Advanced Systems Division of the Computer Systems Laboratory. The system was designed by D.S. Grubb. The SRM 3201 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 and revision of this certificate were coordinated through the Standard Reference Materials Program by N.M. Trahey.

The following documents accompany each SRM 3201:

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

    (a)   One of the curves is produced by the NIST master standard reference tape on a read-while-write pass.

    (b)   The other curve is produced within the certified region of SRM 3201, Serial No._____ on a read-while-write pass.

(2)   Step-by-step procedure for use of the SRM.

Application Notes:

(1)   SRM 3201 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 3201 for calibration purposes.

(3)   A partial pass should never be made on SRM 3201.

(4)   All measurements on SRM 3201 should be made on a read-while-write pass.

Table 1. Components of Uncertainty

Source	Type	Signal Ampl.	Typical Field	Resolution	Overwrite	Peak Shift
262 ftpmm:						
Within-day median[1]	"A"[2]	0.0024	0.0028	0.017	0.0059	0.016
Between-day[1]	"A"[2]	0.019	0.0058	0	0.0163	0.028
Expanded uncertainty[3]	"U"	0.039	0.013	0.034	0.035	0.065
394 ftpmm:						
Within-day median[1]	"A"[2]	0.0071	0.0025	0.056	0.0035	0.011
Between-day[1]	"A"[2]	0.026	0.0071	0	0.0028	0.018
Expanded uncertainty[3]	"U"	0.053	0.015	0.112	0.009	0.042

[1]Uncertainty based on historical data.
[2]Type "A" denotes evaluation of uncertainty by 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.