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LONG PLAY VERSION OF SM911

- Width: 1/4"
- Backcoated
- Same formulation as SM911
- Excellent winding properties
- Low-speed recording compatible

RECORDING THE MASTERS

TECHNICAL DATA

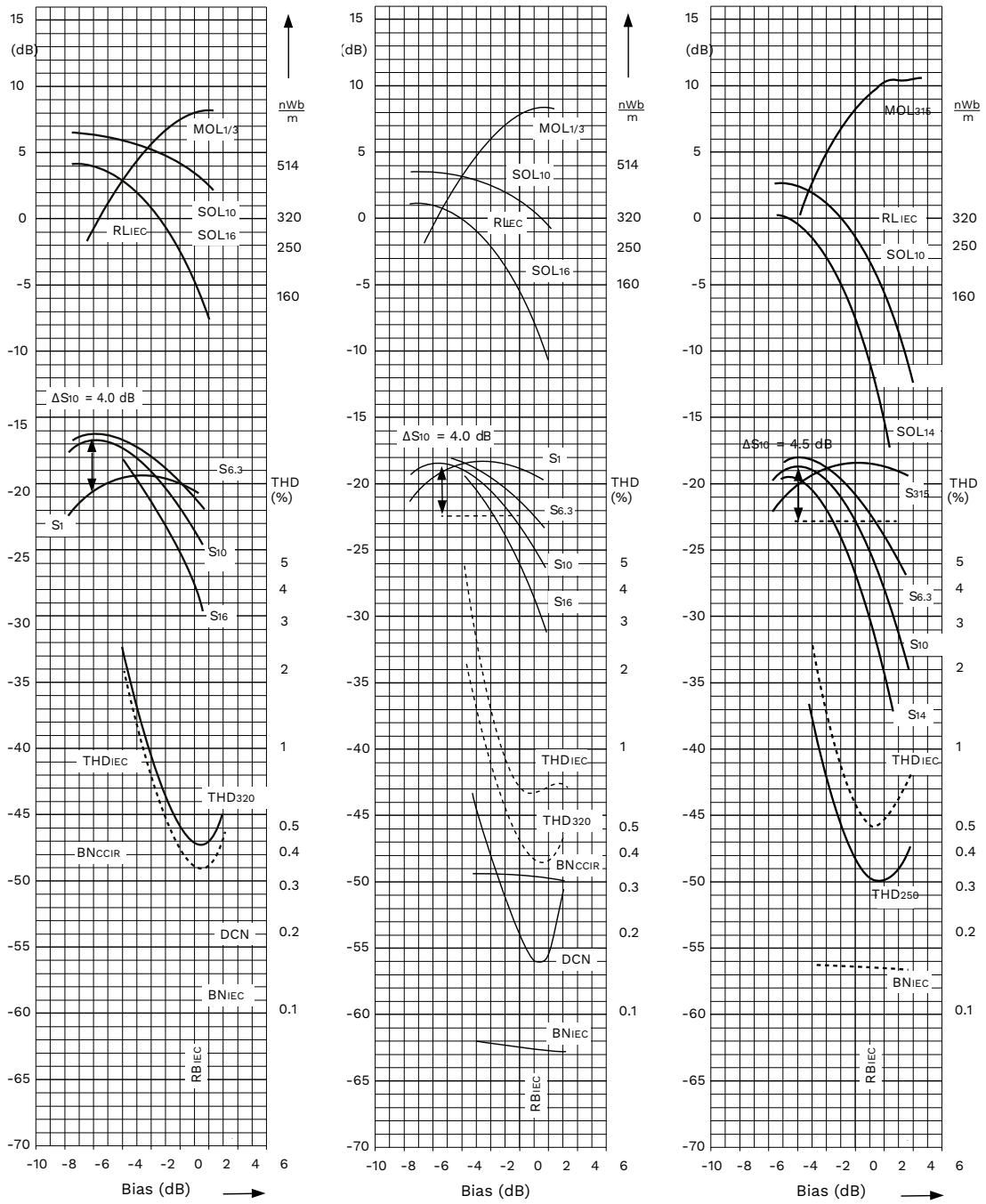
1. Recording Performance Specifications

(depending on bias settings)

Tape speed	19.05 cm/s 7.5 ips
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	70 µs
Reference level	320 nWb/m

Tape speed	19.05 cm/s 7.5 ips
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	50+3180 µs
Reference level	320 nWb/m

Tape speed	9.53 cm/s 3.75 ips
Recording head gap length	7.0 µm
Playback head gap length	3.0 µm
Equalisation	90+3180 µs
Reference level	250 nWb/m



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2. Measurement Conditions

Tape speed		19.05 cm/s	19.05 cm/s	9.53 cm/s	Ref.
		7.5 ips	7.5 ips	3.75 ips	
Recording head:					
Gap length		7.0 µm	7.0µm)	7.0µm	**1.1**
Track width		6.3 mm	6.3 mm	6.3 mm	
Playback head:					
Gap length		3.0 µm	3.0µm)	3.0µm	**1.1**
Track width		2.575 mm	2.575 mm	2.575 mm	
Playback equalisation		70 µs	50+3180 µs	90+3180 µs	**1.2**
RLIEC IEC	Reference Level at 315 Hz			250 nWb/m	**1.3**
RLIEC IEC	Reference Level at 1kHz	320 nWb/m	320 nWb/m		**1.3**
	IEC reference tape:batch	A 342 D	C 264 Z	C 264 Z	
	IEC reference tape bias definition	Min.THD320	Min.THD320	Min.THD250	**1.4**
RBIEC	IEC reference bias	0.0 dB			**1.5**
Rec.Bias	Recommended bias setting	0.0 dB	0.0 dB	0.0 dB	
$\Delta S_{6.3}$	Sensitivity drop for recommended bias setting			4.5 dB	**1.6**
ΔS_{10}	Sensitivity drop for recommended bias setting	4.0 dB	4.0 dB		**1.6**

3. Recording Performance Specifications

The table below presents the main parameters in the recommended bias setting.
All figures given represent nominal values.

$MOL_{315/3}$	Maximum Output Level at 315 Hz			+10.0 dB	**2.1**
$MOL_{1/3}$	Maximum Output Level at 1 kHz	+7.5 dB	+7.5 dB		**2.1**
SOL_{10}	Saturation Output Level at 10 kHz	+5.0 dB	+2.0 dB	-4.0 dB	**2.2**
SOL_{14}	Saturation Output Level at 14 kHz			-12.5 dB	**2.2**
SOL_{16}	Saturation Output Level at 16 kHz	-1.0 dB	-4.0 dB		**2.2**
S_{315}	Relative tape sensitivity at 315 Hz			+1.5 dB	**2.3**
S_1	Relative tape sensitivity at 1 kHz	1.0 dB	1.5 dB		**2.3**
$S_{6.3}$	Relative tape sensitivity at 6.3 kHz	1.5 dB	2.0 dB	1.0 dB	**2.3**
S_{10}	Relative tape sensitivity at 10 kHz	1.0 dB	1.0 dB	1.0 dB	**2.3**
S_{14}	Relative tape sensitivity at 14 kHz			1.5 dB	**2.3**
S_{16}	Relative tape sensitivity at 16 kHz	1.0 dB	1.0 dB		**2.3**
THD250	Third harmonic distortion level at 250 nWb/m			-50.0 dB	**2.4**
THD250	Third harmonic distortion factor at 250 nWb/m			0.32 %	**2.4**
THD320	Third harmonic distortion level at 320 nWb/m	-47.0 dB	-48.5 dB		**2.4**
THD320	Third harmonic distortion factor at 320 nWb/m	0.44 %	0.40 %		**2.4**
DCN	DC noise, weighted, rel. RLIEC	-55.0 dB	-56.0 dB		**2.5**
BNIEC	Bias noise level (IEC 94; A curve)	-60.5 dB	-63.5 dB	-57.5 dB	**2.6**
BNCCIR	Bias noise level (CCIR 468-3)	-47.0 dB	-50.0 dB		**2.6**
MOL/BNIEC	Signal to bias noise at 1 kHz	68.0 dB	71.0 dB	67.5 dB	**2.7**
MOL/BNCCIR	Signal to bias noise at 1 kHz	54.5 dB	57.5 dB		**2.7**
P	Print-through	56.0 dB	56.0 dB	56.0 dB	**2.8**

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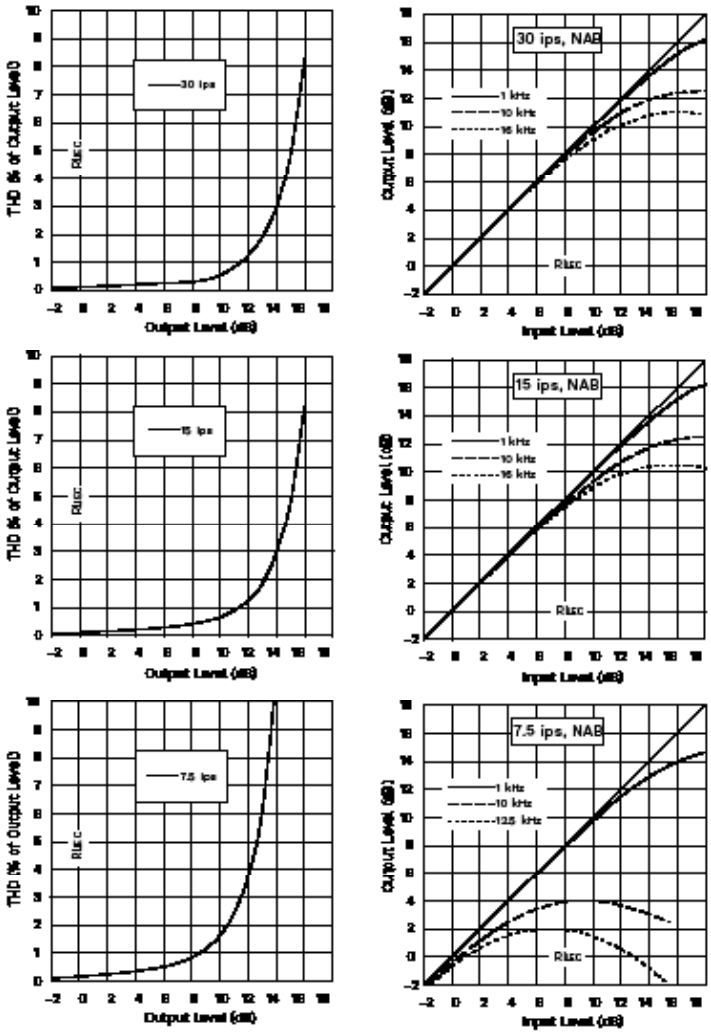
4. Magnetic Properties

				Ref
HC	Coercivity	25.5 kA/m	320 Oe	**3.1**
BRS	Retentivity	165 mT	1650 G	**3.2**
ØRS	Saturation flux	1800 nWb/m	180 mM/mm	**3.3**

5. Physical Properties

			Ref
Base material	Polyester		
Tape widths available	6.3 mm	¼ inch	
Tolerances of tape width	+0.0 /-0.06 mm	+0.0 /-2.4 mil	
Base thickness	20.0 µm	0.78 mil	**4.1**
Coating thickness	11.0 µm	0.43 mil	**4.1**
Matt back	colour black		
Total thickness	5.0 µm	1.38 mil	**4.1**
Surface resistance of the magnetic coating	<50 MΩ	< 50,000 GΩ	**4.2**
Surface resistance of matt back	≤ 100 kΩ		
Load for elongation of 3% (F 3)	≥ 17 N	≥ 79 MPa	**4.3**
Load for elongation of 5% (F 5)	≥ 20 N	≥ 92 MPa	**4.3**
Breaking tensile strength (6.3 mm tape width)	≥ 50 N	≥ 225 MPa	**4.4**



Level versus Third Harmonic Distortion Factor at frequency 1 kHz for tape speeds 30 ips (76.2 cm/s), 15 ips (38.1 cm/s) and 7½ ips (19.05 cm/s). See also Reference 2.1.

Input Level versus Output Level at the given frequencies 1 kHz, 10 kHz, and 16 kHz (resp. 12.5 kHz for 7½ ips) for tape speeds 30 ips (76.2 cm/s), 15 ips

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References

The data in this publication are based on test methods described in IEC Publication 94. References are given only in the case of deviations or particularities.

1.1 For the measurements magnetic heads are used whose properties are very similar to the standard reference heads specified in IEC Publication 94-5. Record heads with a gap length of 7 µm (0.25 mil) and playback heads with a gap length of 3 µm (0.12 mil) are required.

1.2 Playback equalisation on the tape testing equipment is adjusted to provide a flat frequency response of the output voltage when playing back the frequency response section of the relevant calibration tape for the selected tape speed and equalisation.

1.3 RLIEC (IEC reference level): The reference level is obtained when playing back the reference level section of the relevant IEC calibration tape for the selected tape speed. The reference level corresponds to a magnetic flux in the tape per metre trackwidth of 320 nWb/m.

1.4 IEC reference tape bias definition: Using the relevant IEC reference tape and heads according to Ref. 1.1, the bias current providing the minimum third harmonic distortion ratio for a 1 kHz signal recorded at the reference level is the reference bias setting.

1.5 RBIEC (IEC reference bias): These data represent the ratio of the bias for the relevant IEC reference tape (see Ref. 1.4) to the recommended bias for the tape under test (see Ref. 1.6).

1.6 ΔS10 (Sensitivity drop for recommended bias setting): Operationally, the recommended bias is set while recording an input signal of 10 kHz at –20 dB. Based on the peak of the sensitivity curve S10, the bias is increased until the playback level is reduced by the given value ΔS10.

2.1 MTL and THD (Maximum Twin tone Level and Third Harmonic Distortion): For MTL measurement the frequency distance of the primary tones is 40 Hz. During the THD measurement the playback output is held both at IEC reference level (see Ref. 1.3), and at the increased output level RL+...dB. From the corresponding curves the distortion factor can be obtained directly as a percentage of the output level. (The dBscale can only be used for RLIEC as the output level. In order to derive the distortion ratio in dB for increased output levels at RL+...dB, this output level has to be subtracted from the value read in dB. These resulting values in dB are given in the table).

2.2 S (Sensitivity): All the sensitivity curves are measured using a constant record current, which is necessary to obtain an output level of approximately –20 dB for a 1 kHz input signal. A record equalisation is not used. The distances between the sensitivity curves thus reflect the record equalisation necessary to achieve a flat frequency response. The values given in the table represent the sensitivity of the tape under test at the recommended bias. As relative sensitivity values they refer to the corresponding values of the relevant IEC reference tape at its own reference bias corresponding to the definition in Ref. 1.4.

2.3 BN (Bias Noise level): The index ...IEC refers to measurement using the weighting A-filter specified in IEC Publication 651, while ...CCIR refers to the use of the weighting filter and quasi peak meter specified in CCIR 468-3.

2.4 MOL/BN (Dynamic range): The signal to bias noise

level ratio MOL/BN results from the difference of the maximum output level MOL and the bias noise level BN. Regarding the index IEC or CCIR respectively see Ref. 2.3.

2.5 P (Print-through): Print-through is the ratio of a reference level recording to the highest signal level transferred to the next tape layer after 24 hours storage at 20°C (68°F).

3 The magnetic measurements are made by means of a magnetic field having a strength of 100 kA/m (1,250 Oe) in order to obtain a practically saturated magnetisation in the magnetic material of the sample.

3.1 HC (Coercivity): The coercitive magnetic field strength is required to reduce the longitudinal magnetisation in the magnetic material to zero after the sample has been magnetised to saturation.

3.2 BRS (Retentivity): Retentivity is the remaining magnetic flux density in the magnetic material when the magnetising field is reduced to zero after the sample has been magnetised to saturation.

3.3 ØRS (Remanent, or residual saturation flux): the so- called “residual saturation flux” is the retentivity multiplied by the thickness of the magnetic coating.

4.1 Tape width and its tolerances correspond to the specifications given in IEC Publication 94-4.

4.2 Thicknesses: Values given are mean averages.

4.3 Yield strength (F3) and breaking tensile strength: According to the methods specified in IEC publication 94-4 the force necessary to produce 3% elongation, or to break the tape using a test sample length of 200 mm and an elongation rate of 100 mm/min. The value given in MPa results from the measured strength related to the cross section of the tape sample. The strengths increase a little less than proportionally with tape width.

All data given in the specification are subject to change without prior notice due to technical progress.

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