

- **The High Performance Audio Mastering Tape**  
Designed for critical applications where absolutely the highest analog audio performance is required, 499 has the highest output, and the lowest noise floor to provide the widest dynamic range available. Low distortion characteristics, low modulation noise and superior print-through capabilities make Ampex 499 appropriate for critical studio and film work.
- **Available in all widths**  
1/4", 1/2", 1", and 2" width
- **Designed for Optimum Tape Path Performance on Today's Sophisticated Tape Transports.**  
Ampex proprietary backcoat and lubrication package combine to provide excellent tape handling for modern tape transports while preserving very low modulation noise.
- **Consistency**  
Led by our continuing commitment to consistent performance, the manufacturing of Ampex 499 is carefully controlled to ensure unmatched uniformity of product. In addition, every roll of 2" Ampex 499 is end-to-end tested, giving the end user unique assurance of performance.
- **Unique Ampex Packaging**  
Ampex packaging is designed to provide maximum tape protection, together with large write-on space for more recording information. All 2" product includes an Ampex-designed heavy duty plastic reel band, providing protection from environmental contamination and from tape edge damage due to flange distortion. New dark grey flanges and boxes rapidly identify Ampex 499, the high performance leader.



# 499 Studio Mastering Tape

Grand Master® Gold

Test Conditions	Units	Data	Notes
Record head gap length	µm	7	2
Replay head gap length	µm	3	2
Record head track width	mm	6.3	2
Replay head track width	mm	2.6	2
Replay equalisation	µm	$t_1 = 35; t_2 = \infty$	3
Reference level at 1kHz	nWb/m	320	4
IEC Reference tape		MT82472	5
Reference bias of reference tape	dB	0	6

Electroacoustic properties	Tape Speed					
	19.05 cm/s (7.5 in/s)	38.1 cm/s (15 in/s)	76.2 cm/s (30 in/s)			
Sensitivity reduction at 10kHz for conventional test bias	dB	14.0	7.5	3.0	7	
Bias ratio	dB	5.0	+5.0	5.0	8	
Maximum output level for 3% THD at 1kHz	MOL 1kHz	dB	15.7	15.5	14.6	9
Maximum output level for saturation at 10kHz	MOL 10kHz	dB	-3.5	8.5	16.5	10
Relative sensitivity						
1kHz	S 1kHz	dB	-0.5	-0.5	+1.0	11
10kHz	S 10kHz	dB	-4.5	-1.5	+0.5	11
12.5kHz	S 12.5kHz	dB	-5.0	-3.0	-0.5	11
Percentage third harmonic distortion at 320 nWb/m at 1kHz	% THD	%	0.04	0.07	0.08	12
Reference level to bias noise ratio, weighted		dB	64.5	66.0	62.5	13
Signal to bias noise ratio, weighted		dB	80.2	81.5	77.1	14
Reference level to DC noise ratio, filtered	RL/DC	dB	52.0	59.0	59.0	15
Reference level to print ratio		dB	54.5	56.5	56.5	16
Reference level to erase ratio		dB	≥70.0	≥70.0	≥70.0	17

Magnetic Properties			
Coercivity	kA/m (Oe)	27.7 (348)	18
Retentivity	mT/ (G)	165 (1650)	19
Remanent Saturation Flux	nWb/m (mM/mm)	1795 (179.5)	20

Mechanical Properties			
Tape thickness base	µm (in x 10 <sup>-3</sup> )	36 (1.42)	21
coating	µm (in x 10 <sup>-3</sup> )	16.5 (0.65)	
back coating	µm (in x 10 <sup>-3</sup> )	1.5 (0.06)	
total	µm (in x 10 <sup>-3</sup> )	54 (2.13)	
Width		see table on page 4	22
Width tolerance	mm	+0/-0.06	
Breaking strength: width 6.3 mm (0.25 in)	N (lb f)	37.8 (8.5)	23
Yield force (F3): width 6.3 mm (0.25 in)	N (lb f)	26.524 (5.96)	24
Residual elongation	%	<0.1	25
Electrical resistance of back coating	MΩ	<0.05	26

## Notes and Explanations of Test Methods

### 1. Test Conditions

The test conditions used to prepare these technical data sheets are in accordance with IEC Publication 94, Part 4 "Mechanical Magnetic Tape Properties" and Part 5 "Electrical Magnetic Tape Properties".

### 2. Record and Replay Heads

The record and replay heads used to determine the electrical properties are the standard IEC measuring heads types AB 22-7 and WC 30a-3 respectively.

### 3. IEC Calibration Tape

The calibration tapes used to produce this data are in accordance with IEC Publication 94, Part 2 "Calibration Tapes". The calibration tapes have flux response characteristics ( $t_1 = 35\mu\text{s}$ ,  $t_2 = \infty$  at 38.1 cm/s and 76.2 cm/s;  $t_1 = 70\mu\text{s}$ ,  $t_2 = \infty$  at 19.05 cm/s) in accordance with Clause 15, IEC Publication 94, Part 1 "General Conditions and Requirements" and are used to align the reproducing chain to give a flat frequency response.

### 4. Reference Level

The reference level is 320nWb/m at 1000Hz and is contained on the IEC calibration tape.

### 5. IEC Reference Tape

The IEC Reference tape is an unrecorded tape with specified characteristics used primarily for determining the bias ratio and for relative sensitivity measurements.

### 6. Reference Bias

The Reference bias is obtained from the Reference tape. It is determined by finding the value of bias current which is necessary to produce a minimum third harmonic distortion at a frequency of 1kHz, when recording at the reference level, contained on the IEC calibration tape.

An alternative method for obtaining the Reference bias, when using the standard IEC measuring heads, is to determine the higher of the two bias currents at which the output on the 10 kHz curve is a known amount below the obtainable maximum.

### 7. Sensitivity Reduction at 10kHz for Conventional Test Bias

The sensitivity reduction at 10kHz for conventional test bias is the difference in sensitivity at 10kHz between the obtainable maximum output and the output using conventional test bias (see note 8). It is expressed in dB.

### 8. Bias Ratio

The bias ratio is expressed in dB as the ratio of the conventional test bias current required for the product to the Reference bias current required for the Reference tape. The conventional test bias for this product is that which will produce minimum third harmonic distortion at a frequency of 1kHz, when recording at the reference level.

### 9. Maximum Output Level at 1 kHz (MOL 1kHz)

The maximum output level at 1kHz is expressed in dB relative to the reference level and is the value of recorded level at which 3% third harmonic distortion is generated by the tape, when using conventional test bias.

### 10. Maximum Output Level at 10kHz (MOL 10kHz)

The maximum output level at 10kHz is expressed in dB relative to the reference level and is the value of recorded level at which the magnetic tape has attained saturation, when using conventional test bias.

### 11. Relative Sensitivity (S 1 kHz, S 10 kHz, S 12.5kHz, S 16kHz)

Relative sensitivity is the difference expressed in dB, between two levels of the same signal, one recorded on this product at the conventional test bias and the other on the Reference tape at the Reference bias.

Measurements at all specified frequencies are made using the same value of audio current, which produces an output level at 1kHz of -20dB relative to the reference level when recording the Reference tape using Reference bias.

### 12. Percentage Third Harmonic Distortion (THD)

The figure published represents the percentage third harmonic distortion of the 1kHz signal recorded at a level of 320nWb/m, when using conventional test bias.

### 13. Reference Level to Bias Noise Ratio, Weighted

Reference level to bias noise ratio is the ratio expressed in dB, of the reference level from the calibration tape to the level of weighted bias noise. Bias noise is the remaining level of tape noise, after the tape has been subjected to a high frequency erase and bias magnetic field from the erase and record heads.

The bias noise is measured at conventional test bias using a RMS meter and a weighting network with the characteristics specified for the "A" curve in IEC Publication 651.

### 14. Signal to Bias Noise Ratio, Weighted

Signal to bias noise ratio is the ratio expressed in dB, of the MOL at 1 kHz to the level of weighted bias noise (see note 13).

### 15. Reference Level to DC Noise Ratio (RL/DC)

Reference level to DC noise ratio is the ratio, expressed in dB, of the reference level from the calibration tape to the level of filtered DC noise. DC noise is the level of tape noise measured at the output of a replay chain after the tape has been recorded with a specified value of direct current and conventional test bias.

### 16. Reference Level to Print Ratio

Reference level to print ratio is the ratio expressed in dB, of the reference level from the calibration tape to the highest value of print-through signal at 1kHz from this product. The print-through signal is measured after an incubation period at a nominal temperature of 20°C for 24 hours.

### 17. Reference Level to Erase Ratio

Reference level to erase ratio is the ratio expressed in dB, of the replay voltage of a 1kHz signal, recorded at reference level using conventional test bias, to the residual signal after erasure.

### 18. Coercivity

Coercivity is the magnetic field strength required to reduce the remanent magnetisation of saturated tape to zero. It is expressed in Amperes per metre and in Oersteds, where 1 Oersted is equal to 79.577 A/m.

### 19. Retentivity

Retentivity is the flux density remaining in the tape after exposure to a saturating field which has been reduced to zero. It is expressed in Teslas and in Gauss, where 1 Tesla is equal to 10,000 Gauss.

### 20. Remanent Saturation Flux

Remanent saturation flux is the total flux remaining in a tape after saturation. It is expressed in nanoWebers per metre width and in milliMaxwells per millimetre width where 1 Weber is equal to 10<sup>9</sup> Maxwells.

### 21. Mechanical Properties

Mechanical properties are measured in accordance with IEC Publication 94, Part 4 "Mechanical Magnetic Tape Properties". The rate of elongation for all tensile tests is 100 mm/min.

### 22. Width Tolerance

The width tolerances stated are in accordance with those specified in IEC Publication 94, Part 1 "General Conditions and Requirements".

### 23. Breaking Strength

The breaking strength is the minimum force, expressed in newtons, that is required to break the tape sample. The tape samples were 500 mm in original length.

### 24. Yield Force (F3)

The yield force is the applied force, expressed in newtons, that is required to produce a 3% increase in the original tape length. The tape samples were 500 mm in original length.

### 25. Residual Elongation

The residual elongation is the percentage increase in length of a tape sample, after it has been subjected to a force of 30N/mm<sup>2</sup> (total cross-section of base film only) for a period of 3 min. The length of the tape sample is then measured with negligible force (<0.25N) 3 min after the applied force has been removed. The tape samples were 1000 mm in original length.

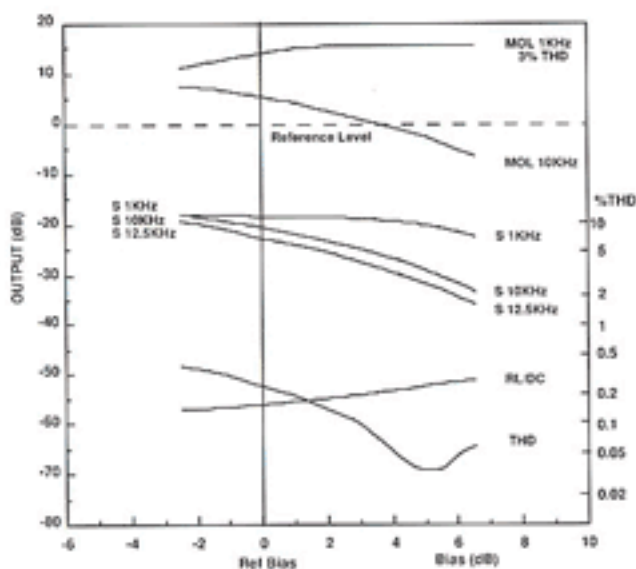
### 26. Electrical Resistance to Back Coating

The electrical resistance of a coating is the resistance of a tape specimen, the length of which is equal to its width. It is expressed in megohms.

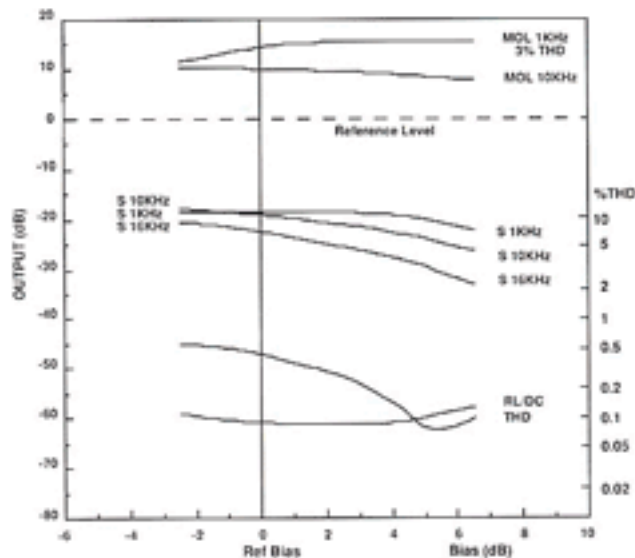
# 499 Studio Mastering Tape

Grand Master® Gold

AMPEX 499 PROFESSIONAL 19.05 cm/s (7.5 in/s)



AMPEX 499 PROFESSIONAL 38.1 cm/s (15 in/s)



### RECOMMENDED BIAS SETTINGS 10 KHZ OVERBIAS

SPEED	AMPEX GRAND MASTER GOLD 499	ALL OTHER AMPEX TAPES
7.5 IPS	7.0	5.0
15 IPS	4.0	3.0
30 IPS	1.8	1.2

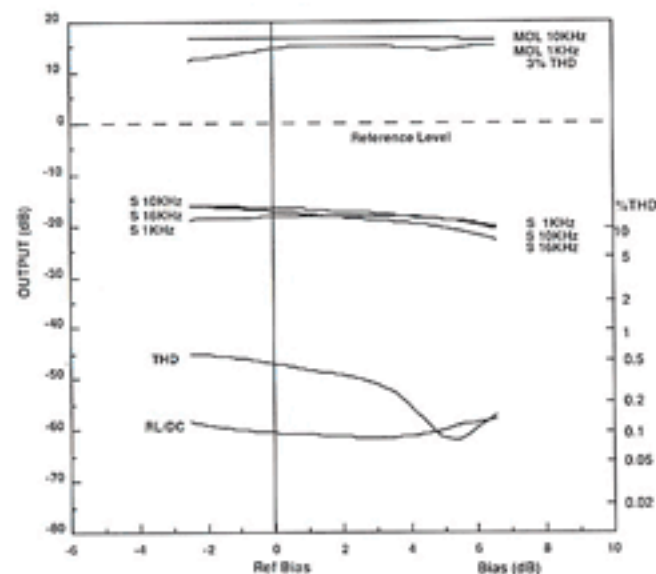
### Recommended Maximum Operating Levels

Ampex Grand Master® Gold 499	520 nW/m (+9)
Ampex Grand Master® 456	370 nW/m (+6)
Ampex 478	250 nW/m (+3)
Ampex 406/407 Mastering	250 nW/m (+3)

### STANDARD WIDTHS AND TOLERANCES (Note 22)

millimetres		inches	
6.274	$\pm 0.0254$	0.247	$\pm 0.001$
12.598	all	0.496	all
25.324	+0.058	0.997	+0.002
50.698	-0.000	1.996	-0.000

AMPEX 499 PROFESSIONAL 76.2 cm/s (30 in/s)



### Product Configuration

Catalogue Number	Description	Reel Size		Tape Length		Carton Weight		Carton Quantity
		in	cm	Feet	Metres	lb	kg	
499-151111	1.5 mil - Plastic Reel	1/2" x 7"	18 cm	1200'	366 m	37	16.8 kg	40
499-174111	1.5 mil - NAB Reel	1/2" x 10 1/2"	27 cm	2500'	762 m	27	12.2 kg	10
499-17611T	1.5 mil - Plastic Hub (bulk)	1/2" Hub		2500'	762 m	13	5.9 kg	10
499-274111	1.5 mil - NAB Reel	1/2" x 10 1/2"	27 cm	2500'	762 m	27	12.2 kg	7
499-574111	1.5 mil - NAB Reel	1" x 10 1/2"	27 cm	2500'	762 m	28	12.7 kg	5
499-97M111	1.5 mil - Precision Reel	2" x 10 1/2"	27 cm	2500'	762 m	24	10.9 kg	2
499-99M11F	1.5 mil - Precision Reel	2" x 14"	36 cm	5000'	1524 m	44	20.0 kg	2

## AMPEX

Ampex Media Europa, Marketing,  
Unit 3, Commerce Park, Theale, ENGLAND

### European Sales Offices

- England: Unit 3, Commerce Park, Brunel Road, Theale, Berkshire RG7 4AB ENGLAND Tel: +44 734 302 208 Fax: +44 734 302 383 (Great Britain, Ireland, Greece, Middle East, Africa)
- France: Immeuble "L'OCTROI", 3 et 5 Rue du 8 Mai 1945, 92110 Clichy, FRANCE Tel: +33 1 4731 7171 Fax: +33 1 4731 7476 (France, North Africa)
- Germany: Otto-Volger Strasse 7c, 65842 Sulzbach im Taunus, GERMANY Tel: +49 6 1967 6555 Fax: +49 6 1967 4511 (Germany, Austria)
- Italy: Via Idebrando Vivanti 157, 00144 Rome, ITALY Tel: +39 6 529 3330 Fax: +39 6 529 3430 (Italy, Malta, Spain, Portugal)  
Via Boito 3, 20026 Novate, Milan, ITALY Tel: +39 2 3324 0086 Fax: +39 2 3324 0432 (Northern Italy)
- Netherlands: Binderskampweg 31, 6545 CA Nijmegen, NETHERLANDS Tel: +31 80 730484 Fax: +31 80 783898 (Benelux) also European Finance, Administration, Warehousing and Distribution
- Sweden: Skoggränd 2, 194 51 Upplands-Vasby, SWEDEN Tel: +46 8 5907 5100 Fax: +46 8 5907 5900 (Nordic Countries)