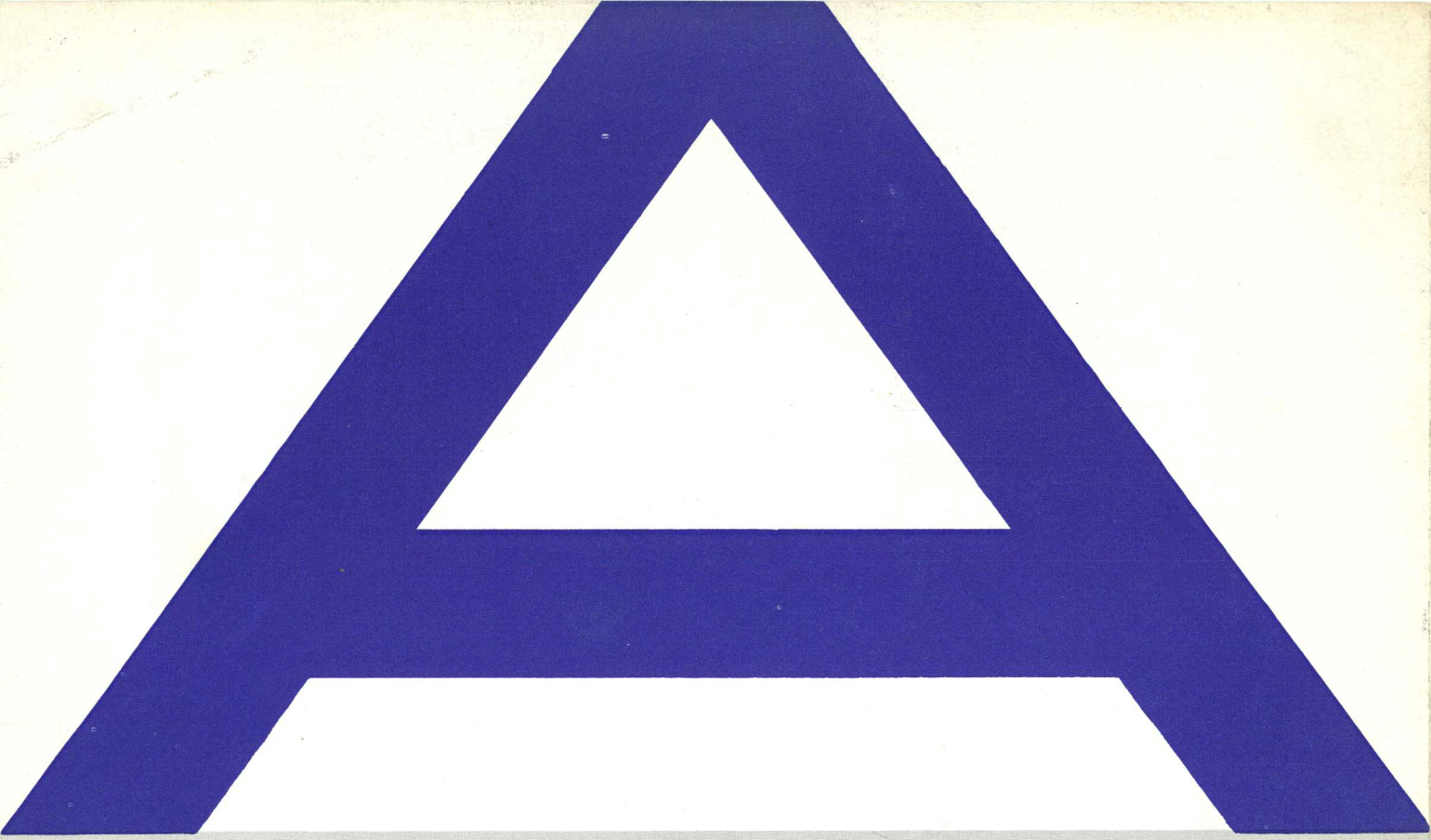


AMPEX Mastering Tapes 400 Series

ELECTRO-MAGNETIC PROPERTIES	411	421	431	441	451	REMARKS
Intrinsic Coercivity $H_{ci}$	290 oes.	290 oes.	290 oes.	290 oes.	290 oes.	60 cps BH Loop Tracer with 1000 oersted magnetizing field
Retentivity $B_r$	950 gauss	950 gauss	950 gauss	950 gauss	950 gauss	
Long Wave Length Sensitivity	0.0 db	0.0 db	0.0 db	0.0 db	0.0 db	Referenced to input level for 1% 3rd harmonic distortion @ optimum bias (15 mil wave length) BUSHIPS standard reference tape for MIL-T-21029
Long Wave Length Output	0.0 db	0.0 db	0.0 db	0.0 db	0.0 db	Referenced to output level for 1% 3rd harmonic distortion @ optimum bias (15 mil wave length) BUSHIPS standard reference tape for MIL-T-21029
Optimum Biasing Field	+7%	+7%	+7%	+7%	+7%	Referenced to that field which produces maximum 15 mil wave length output @ 1% distortion level. BUSHIPS standard reference tape MIL-T-21029
Normalized Output (15 mil wave length 1% 3rd Harmonic Distortion)	0.0 db	0.0 db	0.0 db	0.0 db	0.0 db	
Relative High Frequency Output .5 mil wave length	+5.0 db	+5.0 db	+5.0 db	+5.0 db	+5.0 db	Constant current record, zero post-emphasis—output corrected for head and gap losses and referred to normalized output
Relative Saturation Output 15 mil wave length	+13.5 db	+13.5 db	+13.5 db	+13.5 db	+13.5 db	Referred to normalized output
.5 mil wave length	+12.5 db	+12.5 db	+12.5 db	+12.5 db	+12.5 db	Zero post-emphasis—output corrected for head and gap losses and referred to normalized output
Dynamic Range 15 mil wave length	113.5 db	113.5 db	113.5 db	113.5 db	113.5 db	Saturation output to noise measured in 1 cycle bandwidths in presence of bias
3 mil wave length	117.5 db	117.5 db	117.5 db	117.5 db	117.5 db	
.75 mil wave length	107.5 db	107.5 db	107.5 db	107.5 db	107.5 db	
Layer to Layer Signal Transfer	-56.0 db	-52.0 db	-56.0 db	-52.0 db	-48.0 db	
Erasure Field	1000 oes.	1000 oes.	1000 oes.	1000 oes.	1000 oes.	For better than 60 db signal reduction
Output Uniformity (15 mil wave length)						
Within A Reel	± 0.25 db	± 0.25 db	± 0.25 db	± 0.25 db	± 0.25 db	
Reel to Reel	± 1.0 db	± 1.0 db	± 1.0 db	± 1.0 db	± 1.0 db	
After 1000 Record-Reproduce Cycles	No Change	No Change	No Change	No Change	No Change	
Output Uniformity (.5 mil wave length)						
Within A Reel	± 0.5 db	± 0.5 db	± 0.5 db	± 0.5 db	± 0.5 db	
Reel to Reel	± 1.5 db	± 1.5 db	± 1.5 db	± 1.5 db	± 1.5 db	
After 1000 Record-Reproduce Cycles	Negligible	Negligible	Negligible	Negligible	Negligible	
<b>PHYSICAL PROPERTIES</b>						
Substrate Film Material	Cellulose Acetate	Cellulose Acetate	Mylar (A)	Mylar (A)	Mylar (T)	Mylar is a registered DuPont Trademark
Substrate Film Thickness	1.5 mil	1.0 mil	1.5 mil	1.0 mil	0.5 mil	
Magnetic Layer Material	← Bonded Gamma Fe <sub>2</sub> O <sub>3</sub> →					
Width: 1/4"	.248 <sup>+0.000</sup> / <sub>-.004</sub> mil	.248 <sup>+0.000</sup> / <sub>-.004</sub> mil	.248 <sup>+0.000</sup> / <sub>-.004</sub> mil	.248 <sup>+0.000</sup> / <sub>-.004</sub> mil	.248 <sup>+0.000</sup> / <sub>-.004</sub> mil	
Width Other Than 1/4" (nominal)	<sup>+0.000</sup> / <sub>-.004</sub> mil	<sup>+0.000</sup> / <sub>-.004</sub> mil	<sup>+0.000</sup> / <sub>-.004</sub> mil	<sup>+0.000</sup> / <sub>-.004</sub> mil	<sup>+0.000</sup> / <sub>-.004</sub> mil	
Length Tolerance	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.	
<b>Strength Properties (1/4" tape)</b>						
Ultimate Tensile Strength	5.6 lbs.	4.2 lbs.	11.0 lbs.	7.7 lbs.	7.3 lbs.	All measurements taken at 70°F, 50% RH, unless otherwise noted
150°	4.4 lbs.	3.4 lbs.	9.1 lbs.	5.8 lbs.	5.5 lbs.	
Yield Point	4.5 lbs.	2.8 lbs.	5.4 lbs.	3.8 lbs.	2.9 lbs.	Instron tensile tester lbs. / 1/4" tape
Elongation at Break	15%	15%	100%	100%	20%	Instron tensile tester %
Residual Elongation	0.8%	1.5%	0.4%	0.5%	0.7%	Per MIL-T-21029
Tear Strength	4 grams	2 grams	25 grams	15 grams	8 grams	Elmendorf tear tester
Impact Strength	40 kg-cm	20 kg-cm	100 kg-cm	70 kg-cm	50 kg-cm	Per MIL-T-21029
<b>Dimensional Stability</b>						
Coefficient of Thermal Expansion	30 x 10 <sup>-6</sup>	30 x 10 <sup>-6</sup>	15 x 10 <sup>-6</sup>	15 x 10 <sup>-6</sup>	15 x 10 <sup>-6</sup>	Inches / inch / °F, 70°—120°
Coefficient of Humidity Expansion	150 x 10 <sup>-6</sup>	150 x 10 <sup>-6</sup>	11 x 10 <sup>-6</sup>	11 x 10 <sup>-6</sup>	11 x 10 <sup>-6</sup>	Inches / inch / % RH, 20—92% RH

NOTE: All values given in specifications may vary ±10%, except as noted.



**AMPEX MAGNETIC TAPE**

*Mastering Tapes 400 Series*

**AMPEX Recording Tapes 500 Series**

A. MAGNETIC PROPERTIES	511	521	531	541	551	REMARKS
Intrinsic Coercivity, $H_{ci}$ , in Oersteds	260	260	260	260	260	60 cps B-H loop tracer with 1000 Oersted peak field. All values $\pm 10$ per cent.
Retentivity, $B_r$ , in Gauss	900	900	900	900	900	
Sensitivity, at 7.5 mil wavelength, in db	$+0.5 \pm 1.5$	$+0.5 \pm 1.5$	$+0.5 \pm 1.5$	$+0.5 \pm 1.5$	$+0.5 \pm 1.5$	Measurements made according to MIL-T-21029A (Ships) and W-T-0061b (Navy-Ships), military Specifications for sound recording tapes. Measurements are made on Ampex Professional type tape recorders.
Relative frequency response, in db: 37.5 mil wavelength	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	
1.5 mil wavelength	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	$-0.5 \pm 1.5$	
0.94 mil wavelength	-2.0 min.	-2.0 min.	-2.0 min.	-2.0 min.	-2.0 min.	
0.75 mil wavelength	-3.0 min.	-3.0 min.	-3.0 min.	-3.0 min.	-3.0 min.	
0.5 mil wavelength *See Note 1	-4.0 min.	-4.0 min.	-4.0 min.	-4.0 min.	-4.0 min.	
Distortion: Standard Record Level	1.0% max.	1.0% max.	1.0% max.	1.0% max.	1.0% max.	
Maximum Record Level	4.0% max.	4.0% max.	4.0% max.	4.0% max.	4.0% max.	
Erasure with 1000 Oersted Field	— BETTER THAN 60 DB —					
Signal to DC Noise Ratio, in db	-56 min.	-56 min.	-56 min.	-56 min.	-56 min.	
Layer-to-layer signal transfer, in db	-45 max.	-41 max.	-45 max.	-41 max.	-38 max.	
Relative Saturation Output, in db: 15.0 mil wavelength	+16 min.	+16 min.	+16 min.	+16 min.	+16 min.	Referred to standard output level of Navy Standard Reference Tape.
0.5 mil wavelength	-8.5 min.	-8.5 min.	-8.5 min.	-8.5 min.	-8.5 min.	
Erased Noise, in db	-57 max.	-57 max.	-57 max.	-57 max.	-57 max.	1 to 5 kc. bandpass—referred to the standard output level of the Navy Standard Reference Tape.
Optimum Biasing Field, in db	$-0.5 \pm 0.4$	$-0.5 \pm 0.4$	$-0.5 \pm 0.4$	$-0.5 \pm 0.4$	$-0.5 \pm 0.4$	At 15 mil wavelength, referred to operating bias defined in W-T-0061b (Navy-Ships).

B. PHYSICAL PROPERTIES						
Substrate Thickness	1.5 mil	1 mil	1.5 mil	1 mil	0.5 mil	
Substrate Material	Acetate	Acetate	Polyester	Polyester	Polyester Tensitized	
Width Variation	Nominal $+0.000-0.004$	Nominal $+0.000-0.004$	Nominal $+0.000-0.004$	Nominal $+0.000-0.004$	Nominal $+0.000-0.004$	Nominal for 1/4" is 0.248
Length Variation	Nominal $-0+30$	Nominal $-0+30$	Nominal $-0+30$	Nominal $-0+30$	Nominal $-0+30$	
Ultimate Tensile	Room	5.6 lbs.	4.2 lbs.	11 lbs.	7.7 lbs.	Instron Tensile Tester, 1/4" Tape Samples
	150°F	4.4 lbs.	3.4 lbs.	9.1 lbs.	5.8 lbs.	
Yield Point	4.5 lbs.	2.8 lbs.	5.4 lbs.	3.8 lbs.	2.9 lbs.	
Elongation at Break	15%	15%	100%	100%	50%	
Residual Elongation	0.8%	1.5%	0.4%	0.5%	0.7%	Per W-T-0061b (Navy-Ships)
Tear Strength	4 grams	2 grams	25 grams	15 grams	8 grams	Elmendorf Tear Tester
Impact Strength	40 kg-cm	20 kg-cm	100 kg-cm	70 kg-cm	50 kg-cm	Per W-T-0061b (Navy Ships)
Coefficient of Thermal Expansion	$30 \times 10^{-6}$	$30 \times 10^{-6}$	$15 \times 10^{-6}$	$15 \times 10^{-6}$	$15 \times 10^{-6}$	Inches/Inch/°F, 70°-120°F
Coefficient of Humidity Expansion	$150 \times 10^{-6}$	$150 \times 10^{-6}$	$11 \times 10^{-6}$	$11 \times 10^{-6}$	$11 \times 10^{-6}$	Inches/Inch/% RH, 20%-92% RH
Environmental Range for Safe Operation	$-40^\circ\text{F}$ to $+140^\circ\text{F}$ , 10% to 90% RH					
Suggested Storage	$60^\circ$ to $80^\circ\text{F}$ , 40% to 60% RH					

NOTE: All Measurements Are Average, and Taken at Room Temperature (68° to 72°F), Unless Otherwise Stated or Specified in W-T-0061b (Navy-Ships)

## CHARACTERISTICS OF AMPEX 500 SERIES— AMPEX RECORDING TAPE

- 511 1.5 mil Acetate—General purpose tape, lower priced than Mylar.\*
- 521 1.0 mil Acetate. Offers half again the playing time of 511. Ideal for duplicating use, gives economy *and* performance.
- 531 1.5 mil Mylar—For maximum durability, can withstand thousands of stop/starts.
- 541 1.0 mil Mylar—Like 1.0 mil Acetate, offers half again the playing time, but on tougher, more durable Mylar base.
- 551 0.5 mil Mylar—Double Play\*\* tape on pre-tensitized Mylar, gives twice the playing time of 1.5 mil types with excellent high frequency response.

\*TM Dupont Corporation, Reg. U.S. Pat. Off.

\*\*TM Ampex Corporation, Reg. U.S. Pat. Off.



500 SERIES—AUDIO

# AMPEX MAGNETIC TAPE

**Ampex Recording Tape**

## Specifications



AMPEX CORPORATION  
MAGNETIC TAPE DIVISION  
934 CHARTER STREET • REDWOOD CITY • CALIFORNIA

**AMPEX Professional Tapes 600 Series**

A. MAGNETIC PROPERTIES	611	621	631	641	651	REMARKS
Intrinsic Coercivity, $H_{ci}$ , in Oersteds	260	260	260	260	260	60 cps B-H loop tracer with 1000 Oersted peak field. All values $\pm$ 5 per cent.
Retentivity, $B_r$ , in Gauss	900	900	900	900	900	
Sensitivity, at 7.5 mil wavelength, in db	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	Measurements made according to MIL-T-21029-A (Ships) and W-T-0061b (Navy-Ships), military Specifications for sound recording tapes.  Measurements are made on Ampex Professional type tape recorders.
Relative frequency response, in db: 37.5 mil wavelength	0 $\pm$ 1.0	0 $\pm$ 1.0	0 $\pm$ 1.0	0 $\pm$ 1.0	0 $\pm$ 1.0	
1.5 mil wavelength	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	+1.0 $\pm$ 1.0	
0.94 mil wavelength	0 min.	0 min.	0 min.	0 min.	0 min.	
0.75 mil wavelength	0 min.	0 min.	0 min.	0 min.	0 min.	
0.5 mil wavelength *See Note 1	-3 min.	-3 min.	-3 min.	-3 min.	-3 min.	
Distortion: Standard Record Level	0.5% max.	0.5% max.	0.5% max.	0.5% max.	0.5% max.	
Maximum Record Level	3.9% max.	3.9% max.	3.9% max.	3.9% max.	3.9% max.	
Erasure with 1000 Oersted Field	— BETTER THAN 60 DB —					
Signal to DC Noise Ratio, in db	-59 min.	-59 min.	-59 min.	-59 min.	-59 min.	
Layer-to-layer signal transfer, in db	-47 max.	-43 max.	-47 max.	-43 max.	-40 max.	
Relative Saturation Output, in db: 15.0 mil wavelength	+17 min.	+17 min.	+17 min.	+17 min.	+17 min.	Referred to standard output level on Navy Standard Reference Tape.
0.5 mil wavelength	-6.5 min.	-6.5 min.	-6.5 min.	-6.5 min.	-6.5 min.	
Erased Noise, in db	-58.5 max.	-58.5 max.	-58.5 max.	-58.5 max.	-58.5 max.	1 to 5 kc. bandpass— referred to the standard output level of the Navy Standard Reference Tape.
Optimum Biasing Field, in db	-0.5 $\pm$ 0.3	-0.5 $\pm$ 0.3	-0.5 $\pm$ 0.3	-0.5 $\pm$ 0.3	-0.5 $\pm$ 0.3	At 15 mil wavelength, referred to operating bias defined in W-T-0061b (Navy-Ships).

B. PHYSICAL PROPERTIES						
Substrate Thickness	1.5 mil	1 mil	1.5 mil	1 mil	0.5 mil	
Substrate Material	Acetate	Acetate	Polyester	Polyester	Polyester Tensitized	
Width Variation	Nominal +.000—.004	Nominal +.000—.004	Nominal +.000—.004	Nominal +.000—.004	Nominal +.000—.004	Nominal for 1/4" is 0.248
Length Variation	Nominal -0+30	Nominal -0+30	Nominal -0+30	Nominal -0+30	Nominal -0+30	
Ultimate Tensile	Room	5.6 lbs.	4.2 lbs.	11 lbs.	7.7 lbs.	Instron Tensile Tester, 1/4" Tape Samples
	150°F	4.4 lbs.	3.4 lbs.	9.1 lbs.	5.8 lbs.	
Yield Point	4.5 lbs.	2.8 lbs.	5.4 lbs.	3.8 lbs.	2.9 lbs.	
Elongation at Break	15%	15%	100%	100%	50%	
Residual Elongation	0.8%	1.5%	0.4%	0.5%	0.7%	Per W-T-0061b (Navy-Ships)
Tear Strength	4 grams	2 grams	25 grams	15 grams	8 grams	Elmendorf Tear Tester
Impact Strength	40 kg—cm	20 kg—cm	100 kg—cm	70 kg—cm	50 kg—cm	Per W-T-0061b (Navy Ships)
Coefficient of Thermal Expansion	30 X 10 <sup>-6</sup>	30 X 10 <sup>-6</sup>	15 X 10 <sup>-6</sup>	15 X 10 <sup>-6</sup>	15 X 10 <sup>-6</sup>	Inches/Inch/°F, 70°-120°F
Coefficient of Humidity Expansion	150 X 10 <sup>-6</sup>	150 X 10 <sup>-6</sup>	11 X 10 <sup>-6</sup>	11 X 10 <sup>-6</sup>	11 X 10 <sup>-6</sup>	Inches/Inch/% RH, 20%-92% RH
Environmental Range for Safe Operation	-40°F to +140°F, 10% to 90% RH					
Suggested Storage	60° to 80°F, 40% to 60% RH					

NOTE: All Measurements Are Average, and Taken at Room Temperature (68° to 72°F), Unless Otherwise Stated or Specified in W-T-0061b (Navy-Ships)



**600 SERIES-AUDIO**

**CHARACTERISTICS OF AMPEX 600 SERIES-  
PROFESSIONAL TAPE**

- 611 1.5 mil Acetate—General purpose tape, lower priced than Mylar.\*
- 621 1.0 mil Acetate. Offers half again the playing time of 611. Ideal for duplicating use, gives economy *and* performance.
- 631 1.5 mil Mylar—For maximum durability, can withstand thousands of stop/starts.
- 641 1.0 mil Mylar—Like 1.0 mil Acetate, offers half again the playing time, but on tougher, more durable Mylar base.
- 651 0.5 mil Mylar—Double Play\*\* tape on pre-tensilized Mylar, gives twice the playing time of 1.5 mil types with excellent high frequency response.

\*TM Dupont Corporation, Reg. U.S. Pat. Off.

\*\*TM Ampex Corporation, Reg. U.S. Pat. Off.

**AMPEX MAGNETIC TAPE**

**Professional Tape**

**Specifications**



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