



AMPEX MAGNETIC TAPE

Mastering Tapes 400 Series

AMPEX

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		
PHYSICAL PROPERTIES							
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 ₂ O ₃ —————→						
Width: 1/4"	.248 ^{+0.000} / _{-.004} mil	.248 ^{+0.000} / _{-.004} mil	.248 ^{+0.000} / _{-.004} mil	.248 ^{+0.000} / _{-.004} mil	.248 ^{+0.000} / _{-.004} mil		
Width Other Than 1/4" (nominal)	^{+0.000} / _{-.004} mil	^{+0.000} / _{-.004} mil	^{+0.000} / _{-.004} mil	^{+0.000} / _{-.004} mil	^{+0.000} / _{-.004} mil		
Length Tolerance	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.	-0 +30 ft.		
Strength Properties (1/4" tape)						All measurements taken at 70° F, 50% RH, unless otherwise noted	
Ultimate Tensile Strength	5.6 lbs.	4.2 lbs.	11.0 lbs.	7.7 lbs.	7.3 lbs.	Instron tensile tester lbs. / 1/4" tape	
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.		
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	
Dimensional Stability							
Coefficient of Thermal Expansion	30 x 10 ⁻⁶	30 x 10 ⁻⁶	15 x 10 ⁻⁶	15 x 10 ⁻⁶	15 x 10 ⁻⁶	Inches / inch / °F, 70°—120°	
Coefficient of Humidity Expansion	150 x 10 ⁻⁶	150 x 10 ⁻⁶	11 x 10 ⁻⁶	11 x 10 ⁻⁶	11 x 10 ⁻⁶	Inches / inch / % RH, 20—92% RH	

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

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-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.

500 SERIES-AUDIO

AMPEX MAGNETIC TAPE

Ampex Recording Tape

Specifications



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

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 ± 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 ± 1.5	-0.5 ± 1.5	-0.5 ± 1.5	-0.5 ± 1.5	-0.5 ± 1.5	
1.5 mil wavelength	-0.5 ± 1.5	-0.5 ± 1.5	-0.5 ± 1.5	-0.5 ± 1.5	-0.5 ± 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 ± 0.4	-0.5 ± 0.4	-0.5 ± 0.4	-0.5 ± 0.4	-0.5 ± 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 Tensilized	
Width Variation	Nominal $+.000-.004$	Nominal $+.000-.004$	Nominal $+.000-.004$	Nominal $+.000-.004$	Nominal $+.000-.004$	Nominal for $\frac{1}{4}$ " 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, $\frac{1}{4}$ " 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	30×10^{-6}	30×10^{-6}	15×10^{-6}	15×10^{-6}	15×10^{-6}	Inches/Inch/°F, 70°-120°F
Coefficient of Humidity Expansion	150×10^{-6}	150×10^{-6}	11×10^{-6}	11×10^{-6}	11×10^{-6}	Inches/Inch/% RH, 20%-92% RH
Environmental Range for Safe Operation	-40°F to $+140^\circ\text{F}$, 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)

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.



600 SERIES-AUDIO

AMPEX MAGNETIC TAPE

Professional 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.	
Erase 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
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.	7.3 lbs.
	150°F	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.
Elongation at Break		15%	15%	100%	100%	50%
Residual Elongation		0.8%	1.5%	0.4%	0.5%	0.7%
Tear Strength		4 grams	2 grams	25 grams	15 grams	8 grams
Impact Strength		40 kg-cm	20 kg-cm	100 kg-cm	70 kg-cm	50 kg-cm
Coefficient of Thermal Expansion		30 X 10 ⁻⁶	30 X 10 ⁻⁶	15 X 10 ⁻⁶	15 X 10 ⁻⁶	15 X 10 ⁻⁶
Coefficient of Humidity Expansion		150 X 10 ⁻⁶	150 X 10 ⁻⁶	11 X 10 ⁻⁶	11 X 10 ⁻⁶	11 X 10 ⁻⁶
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)