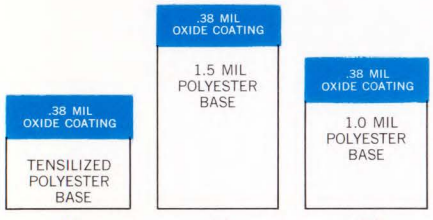
HIGH RESOLUTION

"Scotch" Brand Magnetic Tape for Instrumentation

Superior high frequency response of "Scotch" Brand High Resolution Tapes* lets you pack more information in less space

Every day "Scotch" Brand High Resolution Tapes are getting the nod for more instrumentation jobs. The reason? Performance. In taping high frequency data, their sharper resolution lets you pack more pulses to the inch—a greater density of information to each foot of tape.

At the root of this advance is the high potency oxide used in the magnetic coating. Since 3M's high potency oxide is more efficient than ordinary oxide, a thinner coating can be applied to the polyester base, and the sensitivity at short wave lengths is still several db greater than that of ordinary oxides. Even so, you don't

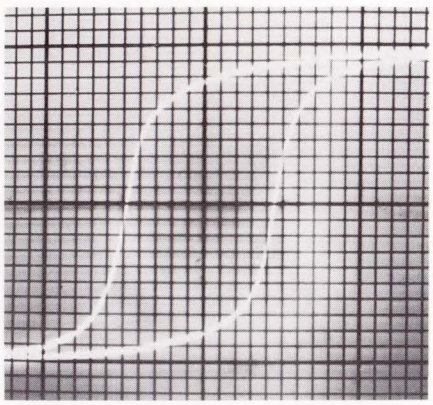


High Resolution Tapes shown in cross section

have to sacrifice output in low frequencies. For in addition to the marked increase in sensitivity to short wave lengths, High Resolution Tapes show an increase in sensitivity even to long wave lengths.

The thinner coating of High Resolution Tapes means a more flexible tape, permitting the intimate tape-to-head contact so necessary to sharp resolution in the high frequencies. And, because of this improved tape-to-head contact, there is less chance that a dropout might occur.

The thin coating, moreover, concentrates the flux in a very narrow region right next to the gap where the head can use it. This is important because the head, at short wave


The superior magnetic properties of High Resolution Tapes show up in oscilloscope tests—producing a good squared-up hysteresis loop like that shown in the photograph above.

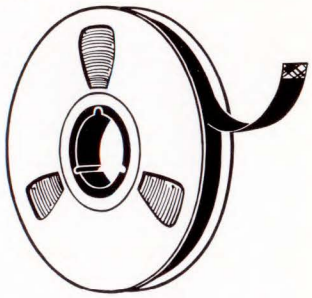
lengths, can "see" only that flux immediately next to it.

There's an additional benefit when you select a "Scotch" Brand instrumentation tape: excellent uniformity, both within a roll and from roll to roll. This is a direct result of 3M's more than a half century of experience in precision coating techniques. During the tape-making process the oxide coating is held to microscopic tolerances on equipment custom designed by 3M's own engineering staff.

Check all three High Resolution Tapes. All have the same thin .38 mil coating of high potency oxide, and thus identical magnetic characteristics. The difference is in the base. No. 458 has a 1.5 mil polyester base for maximum strength. No. 459 has a 1.0 mil polyester base for 50% extra recording time. No. 457, with a .65 mil tensilized polyester base, offers twice the standard recording time. All three High Resolution Tapes are designed to line up your wave shapes as densely as a close order drill, so sharp and clean you'll never miss a bit.

SILICONE LUBRICATION

Like all "Scotch" Brand magnetic tapes, High Resolution Tapes have 3M's exclusive silicone dry lubrication (U. S. Patent No. 2654681). Thanks to the silicone lubricated binder formulation, base and oxide are locked together as a *system*. Tape passes over heads friction-free, with even motion, minimizing phase and frequency shift distortion. Impregnated throughout the coating, the silicone lubricant lasts the life of each tape.



STANDARD SIZES

Popular standard widths of High Resolution Tapes are ¼", ½", ¾", and 1". Standard lengths for 458 (1.5 mil base) are 1250', 2500', and 5000'. Standard lengths for 459 (1.0 mil base) are 1800', 3600', and 7200'. For 457 (.65 mil base), the standard lengths are 2400', 4800', and 9600'. High Resolution Tapes are supplied, in standard widths and lengths, on NAB hubs, on NAB reels, on semi-precision reels, and on precision reels.

SPECIAL ORDERS

Widths and lengths of High Resolution Tapes to meet any specialized requirements can be provided on special order. Contact your 3M Representative for details.

*Note: *The numbers shown for High Resolution Tapes are new designations. No. 457 was formerly No. 201; No. 458 was No. 158; No. 459 was No. 159.*

FORMERLY 201 | FORMERLY 158 | FORMERLY 159

457 458 459

.65 MIL BASE | 1.5 MIL BASE | 1.0 MIL BASE

PHYSICAL PROPERTIES

	457	458	459
Color Base Material	Dark Red Tensilized Polyester	Dark Red Polyester	Dark Red Polyester
Thickness in Mils			
Base	.65	1.45	.92
Coating	.38	.38	.38
Total	1.03	1.83	1.30
Slitting Tolerances—inches	+.000 −.004	+.000 −.004	+.000 −.004
Ultimate Tensile Strength			
¼″ Wide—Room Conditions	6.8#	9#	7#
PSI	42,000	25,000	25,000
PSI @ 150°F.	38,000	20,500	20,500
Yield Strength			
5% Stretch in ¼″ Width	3.5#	5.4#	3.6#
Elongation at Break	50%	100%	100%
Coefficient of Friction	0.33	0.33	0.33
Residual Elongation	0.5%	0.5%	0.5%
Toughness			
Tear—grams	8	26	12
Impact—kg—cms	25	100	70
Coefficient of Expansion*			
Humidity (units per % RH change)	1.1×10^{-5}	1.1×10^{-5}	1.1×10^{-5}
Temperature (units per °F.)	2×10^{-5}	2×10^{-5}	2×10^{-5}
Temperature Limits for Safe Use**			
Low	− 40°F.	− 40°F.	− 40°F.
High	+140°F.	+140°F.	+140°F.
Wear Ability***	1	1	1

*These coefficients are unitless and represent the change per % relative humidity or degree Fahrenheit over the following ranges:
Humidity: 20% RH to 80% RH
Temperature: +30°F. to +130°F.

**These tapes will not cup or show layer-to-layer adhesion within the indicated temperature limits for safe use.

***Wear ability of standard instrumentation tape No. 408 is considered as "1". Relative wear ability of each additional tape is expressed as a multiple of this figure.

MAGNETIC PROPERTIES

	457	458	459
Intrinsic Coercivity (H_{ci})—oersteds	230	230	230
Retentivity (B_{rs})—gauss	1050	1050	1050
Remanence (flux lines/¼″ tape)	0.6	0.6	0.6
Output at 1% Distortion—db†			
15 Mil Wave Length	0	0	0
Sensitivity—db†			
15 Mil Wave Length	+1.0	+1.0	+1.0
1 Mil Wave Length	+2.0	+2.0	+2.0
½ Mil Wave Length	+4.0	+4.0	+4.0
Erasing Field—oersteds	800	800	800
Uniformity at 15 Mil Wave Length			
Within a Roll	± 3%	± 3%	± 3%
Roll to Roll	±10%	±10%	±10%
Dropout Count††			
Errors/1 Roll	1 or less	1 or less	1 or less
	MIL-T-21029A	MIL-T-21029A	

†At optimum bias for each tape. Output and sensitivity are referred to standard instrumentation tape No. 408, which is designated as "0". All other tapes are expressed as gradations from this reference point.

††Measured by recording 200 non-return-to-zero (NRZ) pulses per inch on a 0.035″ track. A reduction to less than 50% normal signal amplitude constitutes a signal error. Zero errors are measured by saturating the tape unidirectionally. Each spurious signal greater than 10% of normal signal amplitude constitutes a zero error. Errors per roll based on recording 7 tracks on rolls ½″ x 2500′.

NOTE: *These tapes conform to the requirements of specification MIL-T-21029A.*

GENERAL OFFICES

900 Bush Avenue
St. Paul 6, Minnesota

BRANCH OFFICE LOCATIONS

ATLANTA
732 Ashby Street N.W.
Atlanta 18, Georgia

BOSTON
1330 Centre Street
Newton Center 59, Massachusetts

BUFFALO
330 Green Street
All Mail: P.O. Box 2012
Buffalo 5, New York

CHICAGO
6850 South Harlem Avenue
Argo P.O.
Bedford Park, Illinois

CINCINNATI
4835 Para Drive
Cincinnati 37, Ohio

CLEVELAND
12200 Brookpark Road
Cleveland 30, Ohio

DALLAS
2121 Santa Anna Avenue
Dallas 28, Texas

DETROIT
411 Piquette Avenue
Detroit 2, Michigan

GRAND RAPIDS
815 Monroe Avenue
Grand Rapids 4, Michigan

HIGH POINT
2401 Brevard Street
All Mail: P.O. Box 151
High Point, North Carolina

HONOLULU
1410 Kapiolani Boulevard
Honolulu 14, Hawaii

LOS ANGELES
6023 South Garfield Avenue
Los Angeles 22, California

PHILADELPHIA
5698 Rising Sun Avenue
Philadelphia 20, Pennsylvania

RIDGEFIELD (NEW YORK)
700 Grand Avenue
Ridgefield, New Jersey

ST. LOUIS
10725 Baur Boulevard
St. Louis 32, Missouri

ST. PAUL
Benz Building
367 Grove Street
St. Paul 1, Minnesota

SAN FRANCISCO
320 Shaw Road
South San Francisco, California

SEATTLE
3663 1st Avenue South
Seattle 4, Washington

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