MAXIMIZER™

HIGH PERFORMANCE SEMI-RIGID

Extend your system's performance with Storm's **MAXIMIZER™** line of cable products.

For the most demanding applications, **phase stable low loss Maximizer™ Gold** products offer the highest performance in terms of low loss, high power handling, and increased electrical length stability over temperature.

Low loss RG replacement Maximizer™ Silver products offer significantly lower loss at higher frequencies than standard, solid PTFE microwave semi-rigid cables. And since they fit readily available connectors, they provide a very cost-effective solution to many design challenges.

Maximizer™ Cables:

- Custom-built assemblies, coils, or straight lengths
- Copper, tin, or silver-plated finish; custom finishes on request

FEATURES	BENEFITS
Maximizer™ Gold	
~ *Larger solid SPC center conductor than standard solid PTFE semi-rigid cables*	~ *Reduced cable attenuation over operating frequency range* ~ *Increased power handling*
~ *MicroForm™ tape-wrapped dielectric*	~ *Increased electrical length stability over wide temperature range* ~ *Reduced cable attenuation at high frequencies…up to 33%*
Maximizer™ Silver	
~ *Standard size solid center conductor*	~ *Accepts standard connectors, increasing cost effectiveness*
~ *Low density PTFE tape-wrapped dielectric*	~ *Increased mechanical stability over wide temperature range… stable during exposure to soldering temperatures* ~ *Reduced cable attenuation at high frequencies... up to 18%*

TELEDYNE
STORM MICROWAVE
Everywhere**you**look™

High value microwave and electronic interconnect solutions

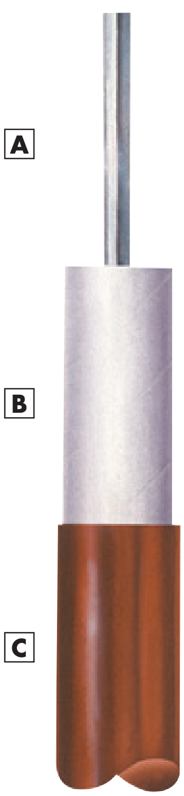
www.teledynestorm.com

SPECIFICATIONS	PHASE STABLE LOW LOSS MAXIMIZER™ GOLD 086	116	141	250	LOW LOSS RG REPLACEMENT MAXIMIZER™ SILVER 086	141
Diameter (in/mm)	0.086 / 2.18	0.116 / 2.95	0.141 / 3.58	0.250 / 6.35	0.086 / 2.18	0.141 / 3.58
Operating Frequency (Max, GHz)	40	40	26.5	20	40*	26.5
Cutoff Frequency (GHz)	82.5	46	36	21	75	38
Attenuation–Nom @ 10 GHz (dB/ft)	0.61	0.39	0.28	0.17	0.61	0.34
Attenuation–Nom @ 18 GHz (dB/ft)	0.84	0.54	0.38	0.24	0.83	0.46
Attenuation–Nom @ 20 GHz (dB/ft)	0.87	0.57	0.40	0.25	0.86	0.49
Attenuation–Nom @ 26.5 GHz (dB/ft)	1.00	0.66	0.47	–	1.00	0.57
Attenuation–Nom @ 40 GHz (dB/ft)	1.24	0.84	–	–	1.24	–
Power Handling–Avg. (watts @ 1 GHz)	197	401	610	1514	205	523
Phase vs. Temp Stability (ppm, nominal)	600	980	560	870	835	2100
Min Bend Radius (centerline, mechanical) (in/mm)	0.375 / 9.53	0.50 / 12.70	0.57 / 14.50	1.00 / 25.40	0.375 / 9.53	0.500 / 12.70
Weight (grams/ft/m, nominal)	6.72 / 22.05	10.09 / 33.10	12.50 / 41.01	41.58 / 136.42	6.95 / 22.80	14.80 / 48.56
Velocity of Propagation (%, nominal)	82.5	78.0	81.0	80.0	78.0	74.0
Operating Temperature Range (°C)	–55 to +200	–65 to +200	–65 to +200	–65 to +200	–65 to +200	–65 to +200

***** Some versions of this cable operate to 65 GHz.*

Specifications subject to change without notice.

CABLE CONSTRUCTION



A Silver-plated, solid OFHC copper center conductor

Maximizer™ Silver 141 only:
Silver-plated, copper-clad steel wire center conductor

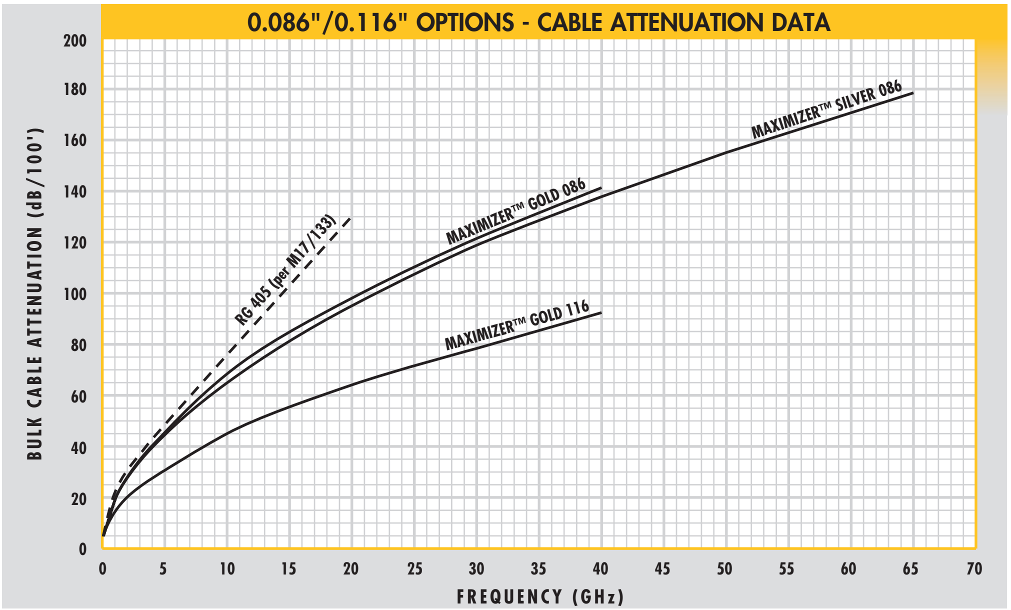
B Low density or microporous PTFE dielectric

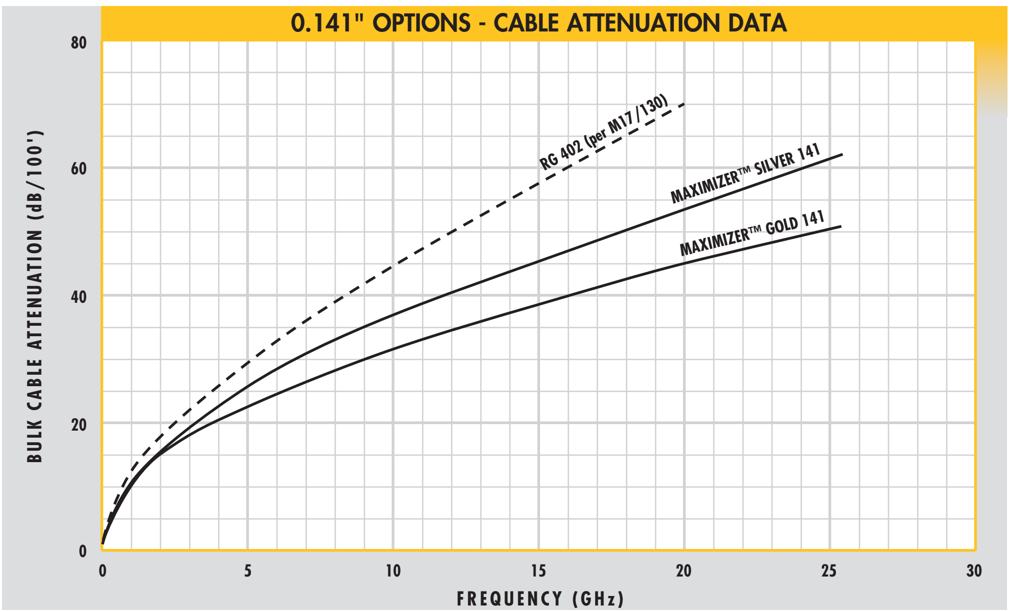
C Material used as outer conductor:

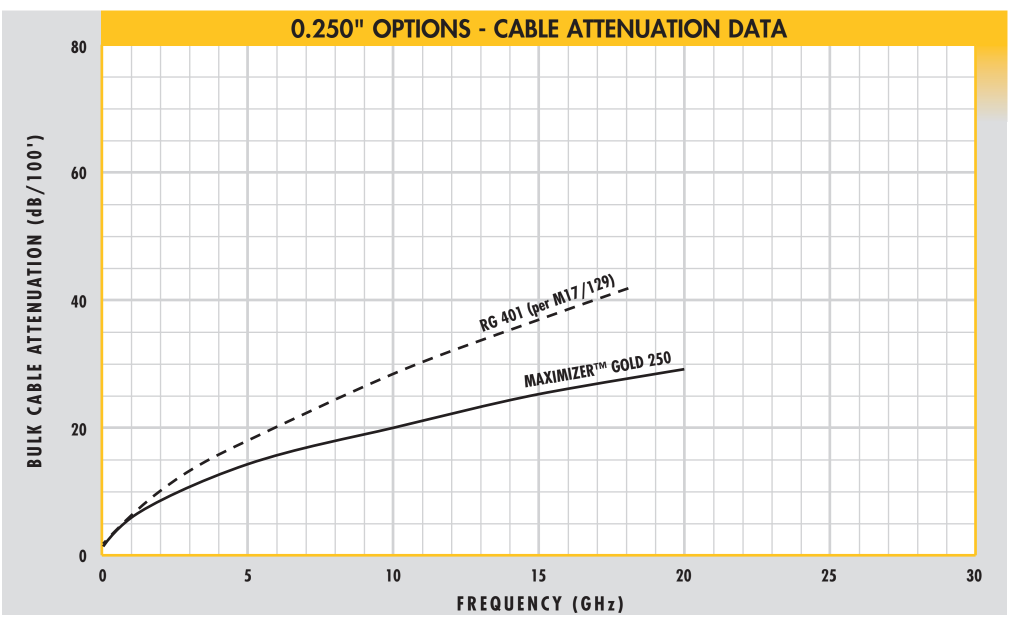
*Seamless, OFHC **copper** tubing (CDA Alloy 101 or 102). Available with:*

- *Tin-plate finish per ASTM–B–545 Class C 0.0003″ minimum thickness or*
- *Silver-plate finish per QQ–S–365, Type I, Grade B 0.0002″ minimum thickness*

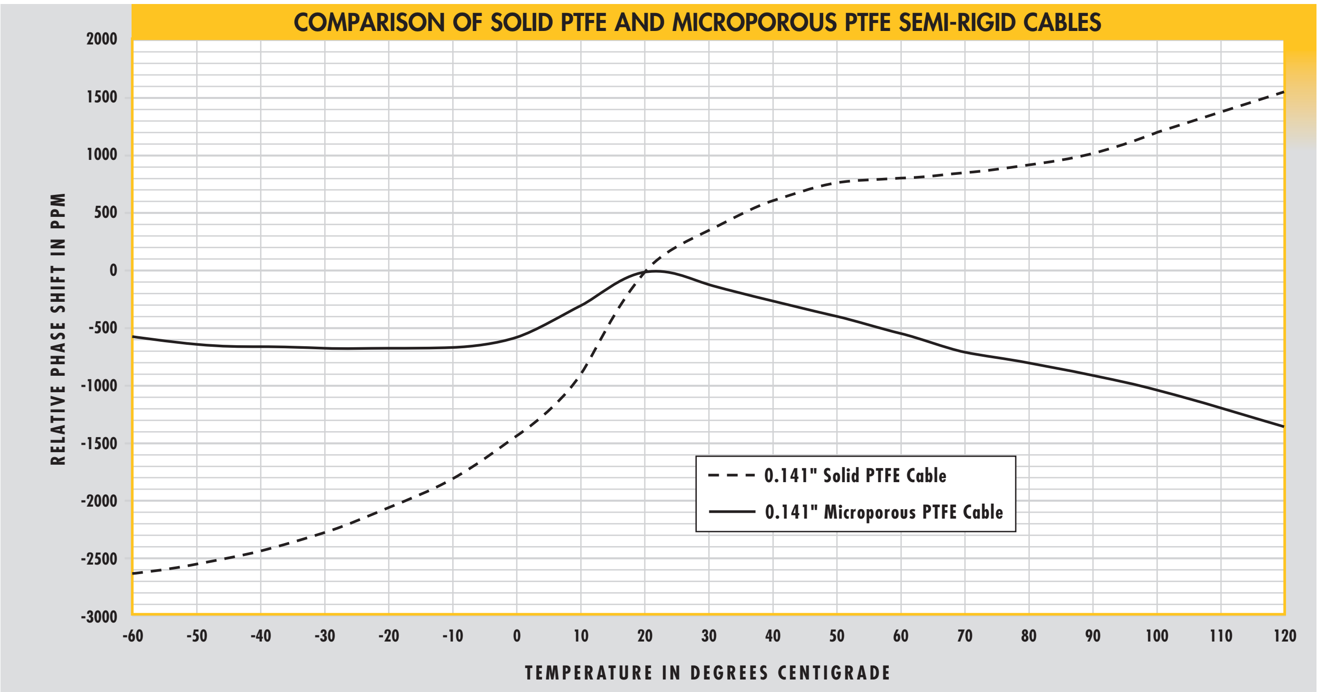
*Lightweight, seamless **aluminum** tubing (Alloy 1060–F) with an irridite finish per MIL–C–5541 is available on certain cables. Call us for details.*


0.086"/0.116" OPTIONS - CABLE ATTENUATION DATA
BULK CABLE ATTENUATION (dB/100')
FREQUENCY (GHz)
0 20 40 60 80 100 120 140 160 180 200
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
RG 405 (per M17/133)
MAXIMIZER™ GOLD 086
MAXIMIZER™ SILVER 086
MAXIMIZER™ GOLD 116


0.141" OPTIONS - CABLE ATTENUATION DATA
BULK CABLE ATTENUATION (dB/100')
FREQUENCY (GHz)
0 20 40 60 80
0 5 10 15 20 25 30
RG 402 (per M17/130)
MAXIMIZER™ SILVER 141
MAXIMIZER™ GOLD 141


0.250" OPTIONS - CABLE ATTENUATION DATA
BULK CABLE ATTENUATION (dB/100')
FREQUENCY (GHz)
0 20 40 60 80
0 5 10 15 20 25 30
RG 401 (per M17/129)
MAXIMIZER™ GOLD 250

PHASE VS. TEMPERATURE RELATIONSHIP



Performance shown is based on a 25-foot section of 0.141" diameter microporous cable with an approximate velocity of 81.5%. Actual results will be highly dependant on cable velocity and test procedure used. The factory should be consulted for specific phase-temperature performance of a given cable type.

Calculate Phase Shift Versus Temperature

To determine a rough estimate of the phase shift (due to temperature) that is contributed to your system by any particular semi-rigid cable assembly or assemblies:

FIRST find the difference in PPM between the two temperatures in question from the above plot.
(Other sizes of solid and microporous PTFE cables have plots that are similar to the ones above.)

THEN calculate the phase shift (Θ) using $\Theta = 0.00036 \times PPM \times L \times T \times F$ where:

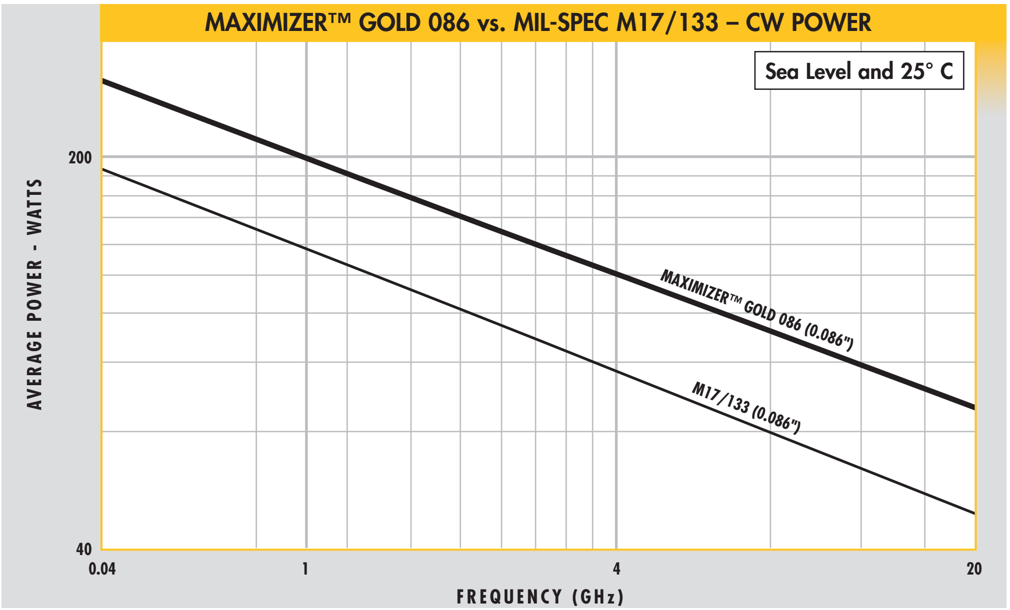
Θ = Predicted phase shift in degrees

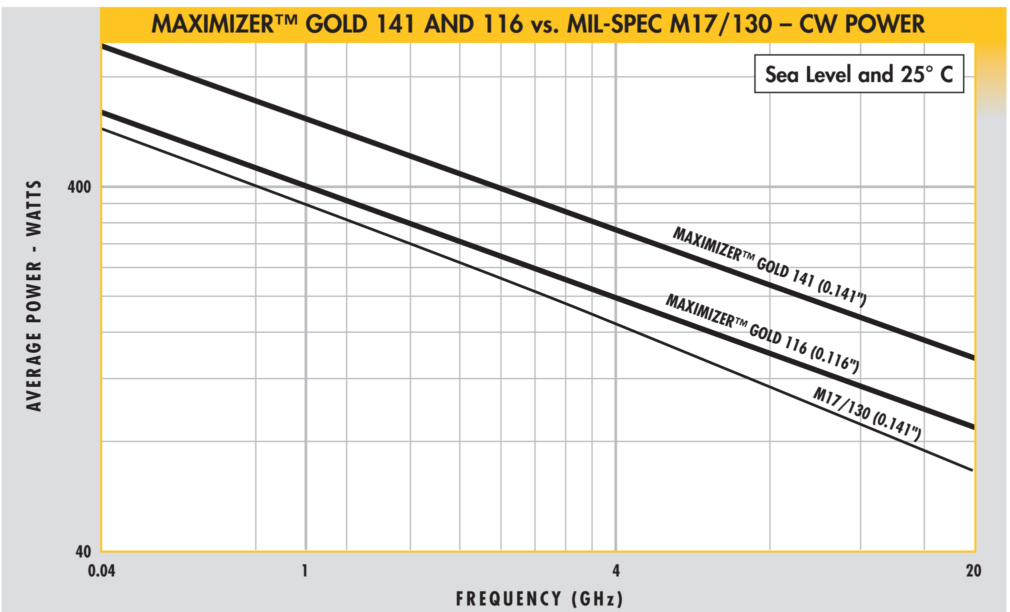
PPM = Difference in PPM beween the two temperatures in question (from the above plot)

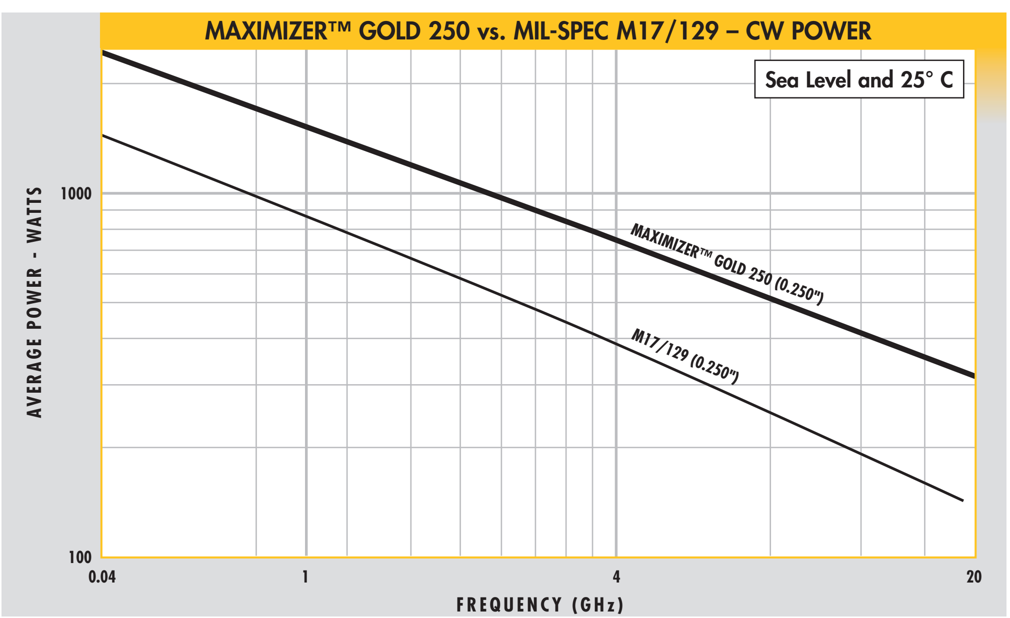
L = Total length of cable that is exposed to the temperature change (expressed in feet)

T = Time delay (ns/ft). This is approximately 1.25 for our microporous PTFE cables and 1.44 for solid PTFE cables.

F = Frequency in GHz







POWER HANDLING CAPABILITIES*

Power ratings are conservative; actual ratings depend on specific applications. Please consult us regarding your application.

* For information on derating for altitude and temperature, please contact us.

DESIGN CONSIDERATIONS WITH LOW DENSITY DIELECTRICS

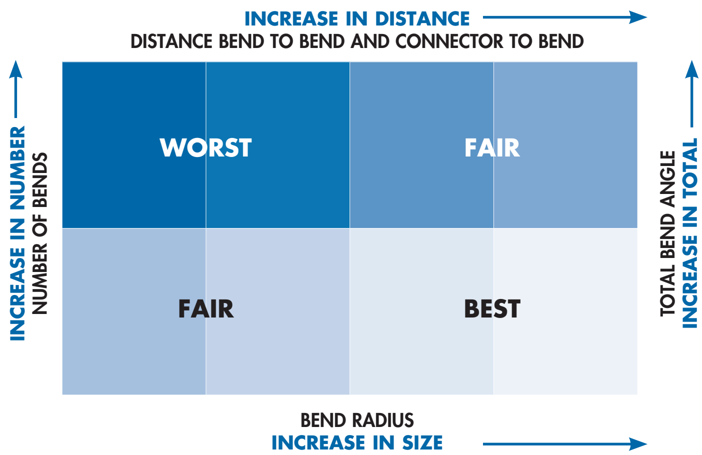
When designing semi-rigid cable assemblies constructed from low density or microporous PTFE products, a number of factors should be taken into consideration to ensure optimum performance:

BENDING AND VSWR EFFECTS

The low density dielectric provides considerably less support for the cable's outer conductor than solid PTFE configurations. This results in greater amounts of deformation around the bend during forming. Such deformation causes proportional changes in impedance, resulting in larger signal reflections and higher VSWR. Additionally, since the reflections are vector quantities, they will combine constructively at a frequency relating to their spacing along the cable.

Semi-rigid cables constructed with low density PTFE dielectrics should be designed with the largest bend radius possible to ensure optimum VSWR performance. This is particularly critical in high power and ultra-low loss applications. Whenever possible, a single bend radius should be used throughout a cable assembly. This allows use of automated bending equipment, which reduces production costs.

Good design practices can be illustrated as follows:



NOTE: Minimum bend radii listed in this sheet are the absolute minimums recommended, based solely on mechanical considerations.

ELECTRICAL LENGTH OR PHASE MATCHING

When using microporous or low density semi-rigid products in applications where matched electrical length or insertion phase is important, consideration must be given to both the mechanical length of the cable assembly and the variation in dielectric constant along the developed length of cable. Microporous or low density dielectrics typically are not as homogeneous as solid PTFE dielectrics.

To avoid changes in electrical length due to normal variation in cable properties, electrical length requirements should be explicitly stated during discussion with an applications engineer and on any engineering drawings.

Phase Related Options. Access **www.teledynestorm.com/PhaseRelatedOptions.pdf** for an illustrated discussion of relative and absolute phase match and electrical length tracking between assemblies over temperature.