

MIL-DTL-17 Coaxial Cables

- including M17/176-00001 Twinaxial Data Bus Cable

Harbour Industries is a QPL approved manufacturer of high temperature, high performance coaxial cables supplied in exact accordance with the MIL-DTL-17 specification. The information referenced has been taken from the MIL-DTL-17 "slant sheets" which define complete physical and electrical characteristics for each MIL-DTL-17 part number including dimensional parameters, dielectric materials, shield constructions, VSWR, and maximum attenuation over various frequency ranges. For complete individual slant sheets, see the Defense Supply Center Columbus (DSCC) link in the Industry Links section of Harbour's website.

The Importance of VSWR Sweep Testing

When selecting a 50 ohm coaxial cable, constructions with VSWR requirements are highly recommended. Manufacturing and sweep testing cables with concern for VSWR ensures a quality cable free of spikes over the frequency range referenced on the slant sheet.

Precision PTFE Dielectrics Used

All of the PTFE dielectric coax cables listed are high temperature, high performance constructions exhibiting high dielectric strength and low capacitance in proportion to the cable's dielectric constant. Harbour manufactures all PTFE dielectric cable constructions with tolerances tighter than the MIL-DTL-17 specification to ensure uniformity of electrical characteristics, especially impedance, attenuation, and VSWR.

Constructions with PTFE Tape Wrapped Jackets

Harbour manufactures PTFE tape wrapped cables - specifically RG187 A/U, RG188 A/U, RG195 A/U, and RG196 A/U - in accordance with a previous revision of the MIL-DTL-17 specification. These constructions can withstand operating temperatures up to 250 ° versus 200° C for FEP jacketed cables. PTFE tape wrapped cables are generally more flexible than their FEP jacketed counterpart. Alternative 250° constructions are also available with PFA jackets.

| M17 Part | Center Conductor | Dielectric Diameter | Shield | Shield Diameter | Jacket | Overall Diameter | Bend Radius | Weight (lbs/mft) | Comments |
|-----------------|-------------------------|---------------------|---------|-----------------|---------|------------------|-------------|------------------|----------------------|
| M17/60-RG142 | .037" SCCS | .116" | SPC (2) | .160" | FEP | .195" | 1.0" | 43.0 | |
| M17/93-RG178 | .0120" (7/.004")SCCS | .033" | SPC | .051" | FEP | .071" | 0.4" | 6.3 | |
| M17/94-RG179 | .0120" (7/.004")SCCS | .063" | SPC | .080" | FEP | .100" | 0.4" | 10.8 | |
| M17/95-RG180 | .0120" (7/.004")SCCS | .102" | SPC | .118" | FEP | .141" | 0.7" | 19.8 | |
| M17/111-RG303 | .037" SCCS | .116" | SPC | .136" | FEP | .170" | 0.9" | 31.0 | |
| M17/112-RG304 | .059" SCCS | .185" | SPC (2) | .240" | FEP | .280" | 1.4" | 94.0 | |
| M17/113-RG316 | .0201" (7/.0067")SCCS | .060" | SPC | .075" | FEP | .098" | 0.5" | 12.2 | |
| M17/127-RG393 | .094" (7/.0312") SPC | .285" | SPC (2) | .314" | FEP | .390" | 2.0" | 165.0 | |
| M17/128-RG400 | .0384" (19/.008") SPC | .116" | SPC (2) | .156" | FEP | .195" | 1.0" | 50.0 | |
| M17/131-RG403 | .0120" (7/.004")SCCS | .033" | SPC (2) | .090" | FEP (2) | .116" | 0.6" | 15.0 | Triaxial RG-178 |
| M17/152-00001 | .0201" (7/.0067")SCCS | .060" | SPC (2) | .091" | FEP | .114" | 0.6" | 18.5 | Double Shield RG-316 |
| M17/158-00001** | .037" SCCS | .116" | SPC (2) | .160" | FEP | .195" | 1.0" | 56.0 | Use M17/60-RG142 |
| M17/169-00001** | .0120" (7/.004")SCCS | .033" | SPC | .051" | FEP | .071" | 0.4" | 6.3 | Use M17/93-RG178 |
| M17/170-00001** | .037" SCCS | .116" | SPC | .136" | FEP | .170" | 0.9" | 39.0 | Use M17/111-RG303 |
| M17/172-00001** | .0120" (7/.004")SCCS | .060" | SPC | .075" | FEP | .098" | 0.5" | 11.5 | Use M17/113-RG316 |
| M17/175-00001** | .0384"(19/.008")SPC | .116" | SPC (2) | .156" | FEP | .195" | 1.0" | 50.0 | Use M17/128-RG400 |
| M17/176-00002 | .0235" (19/.005")SPA(2) | .042" | SPA | .100" | PFA | .129" | 0.6" | 18.0 | Twinax |
| RG187 A/U | .0120" (7/.004")SCCS | .063" | SPC | .079" | PTFE | .100" | 0.5" | 10.0 | Tape Wrapped Jacket |
| RG188 A/U | .0201" (7/.0067")SCCS | .060" | SPC | .080" | PTFE | .100" | 0.5" | 11.0 | Tape Wrapped Jacket |
| RG195 A/U | .0129" (7/.004")SCCS | .102" | SPC | .117" | PTFE | .141" | 0.7" | 18.0 | Tape Wrapped Jacket |
| RG196 A/U | .0120" (7/.004")SCCS | .034" | SPC | .050" | PTFE | .067" | 0.4" | 6.0 | Tape Wrapped Jacket |

** DSCC has removed these part numbers from MIL-DTL-17.

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| M17 Part | Impedance (ohms) | Capacitance (pF/ft) | Max Voltage | Attenuation (dB/100 ft) | | | | | | | Max Frequency (GHz) |
|-----------------|------------------|---------------------|-------------|-------------------------|-----------------|---------------|-----------------|---------------|----------------|------|---------------------|
| | | | | 100 MHz Typ/Max | 400 MHz Typ/Max | 1 GHz Typ/Max | 2.4 GHz Typ/Max | 5 GHz Typ/Max | 10 GHz Typ/Max | | |
| M17/60-RG142 | 50 +/-2 | 29.4 | 1900 | 4.0 / 4.4 | 8.1 / 9.3 | 13.4 / 15.3 | 21.3 / 25.0 | 33.3 / 41.8 | 55.5 / 70.7 | 12.4 | |
| M17/93-RG178 | 50 +/-2 | 29.4 | 1000 | 13.0 / 16.0 | 27.2 / 33.0 | 44.2 / 52.0 | 61.9 / 83.3 | | | | |
| M17/94-RG179 | 75 +/-3 | 19.4 | 1200 | 8.0 / 9.2 | 15.5 / 21.0 | 26.7 / 30.7 | | | | | |
| M17/95-RG180 | 95 +/-5 | 17.4 | 1500 | 5.7 / 6.6 | 11.7 / 17.4 | 19.2 / 23.0 | | | | | |
| M17/111-RG303 | 50 +/-2 | 29.4 | 1900 | 4.0 / 4.4 | 8.1 / 9.3 | 13.4 / 15.3 | | | | | |
| M17/112-RG304 | 50 +/-2 | 29.4 | 3000 | 2.4 / 2.7 | 5.8 / 6.4 | 10.0 / 11.1 | 17.6 / 19.6 | 25.4 / 28.2 | | 8.0 | |
| M17/113-RG316 | 50 +/-2 | 29.4 | 1200 | 7.6 / 11.0 | 16.0 / 21.0 | 26.2 / 38.0 | 41.2 / 55.4 | | | 3.0 | |
| M17/127-RG393 | 50 +/-2 | 29.4 | 1500 | 2.3 / 2.5 | 4.4 / 5.0 | 7.7 / 9.2 | 12.4 / 14.2 | 21.3 / 26.8 | 30.1 / 37.9 | 11.0 | |
| M17/128-RG400 | 50 +/-2 | 29.4 | 1900 | 4.3 / 4.5 | 8.6 / 10.5 | 14.1 / 18.1 | 22.6 / 30.2 | 35.6 / 52.1 | 61.6 / 78.0 | 12.4 | |
| M17/131-RG403 | 50 +/-2 | 29.4 | 1000 | | 33.3 / 37.0 | | | | | | |
| M17/152-00001 | 50 +/-2 | 29.4 | 1200 | 7.6 / 11.0 | 16.0 / 21.0 | 26.2 / 38.0 | 41.2 / 55.4 | 61.3 / 110.0 | 90.0 / 170.0 | 12.4 | |
| M17/158-00001** | 50 +/-2 | 29.4 | 1900 | | 8.1 / 9.5 | | | | | | |
| M17/169-00001** | 50 +/-2 | 29.4 | 1000 | | 27.2 / 29.0 | | | | | | |
| M17/170-00001** | 50 +/-2 | 29.4 | 1900 | | 7.7 / 8.6 | | | | | | |
| M17/172-00001** | 50 +/-2 | 29.4 | 1200 | | 15.5 / 21.0 | | | | | | |
| M17/175-00001** | 50 +/-2 | 29.4 | 1900 | | 8.6 / 10.5 | | | | | | |
| M17/176-00002 | 77 +/-7 | 19.0 | 1000 | | | | | | | | |
| RG187 A/U | 75 +/-3 | 19.4 | 1200 | | 15.5 / 21.0 | | | | | | |
| RG188 A/U | 50 +/-2 | 29.4 | 1200 | 7.6 / 11.0 | 16.0 / 21.0 | 26.2 / 38.0 | 41.2 / 55.4 | | | 3.0 | |
| RG195 A/U | 95 +/-5 | 17.4 | 1500 | | 11.7 / 17.4 | | | | | | |
| RG196 A/U | 50 +/-2 | 29.4 | 1000 | 13.0 / 16.0 | 27.2 / 33.0 | 41.7 / 52.0 | 64.0 / 80.0 | | | 3.0 | |

° UL approvals for many of the MIL-DTL-17 cables listed are available upon request.

° Maximum frequencies are those referenced on individual slant sheets of the MIL-DTL-17 specification. No values are given above 400MHz for unswept constructions because MIL-DTL-17 specification recommends these cables should not be used above this frequency.

° The MIL-DTL-17 specification references maximum attenuation values as shown in the above chart, however typical values are substantially lower. For the more popular constructions, the following K factors may be used to calculate typical attenuation at any specific frequency.

| | M17/60-RG142 | M17/93-RG178 | M17/94-RG179 | M17/113-RG316 | M17/128-RG400 | M17/127-RG393 |
|----|--------------|--------------|--------------|---------------|---------------|---------------|
| K1 | .395 | 1.422 | .750 | .760 | .408 | .223 |
| K2 | 0.00155 | 0.00160 | 0.00119 | 0.00226 | 0.00185 | 0.00143 |