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# New Product Bulletin

**NP 111E**

Meeting the highest standards for HD cameras:

New Belden Brilliance® Heat-Resistant Hybrid Optical Fiber Cable SMPTE311M


## Brilliance® Heat-Resistant Hybrid Optical Fiber Cable SMPTE311M – 7804Ex

Belden's Brilliance® hybrid optical fiber cables are designed to meet the SMPTE311M standard for HD television cameras and beyond. Each composite cable includes a high-voltage power line for HDTV cameras, two control lines and two optical fibers for video and audio transmission. Three types of cable are available. Halogen-free and PVC versions for studios and permanent installations and a PUR version for mobile applications. All of them are available with put-ups of 305 m, 500 m and 1000 m.

Belden Brilliance® Hybrid Optical Fiber Cables now available:

| 7804ENH | 7804EPU | 7804E |
|---|---|---|
| FRNC/LSNH | PUR | PVC |
| Halogen-free | Heavy-duty | Flexible |
| Studio applications | Field applications | Studio applications |

### Heat-Resistance

Belden Brilliance® hybrid optical fiber cables overcome one of the biggest hazards of outdoor HDTV broadcasting. Most HD cameras are fitted with a safety feature that continually measures the insulation resistance between a cable's power conductors and the overall braid. If a resistance of less than 3M Ohms/km is detected, the camera automatically shuts down in case of a short circuit. This creates havoc in outdoor conditions where direct sunlight can heat up black cables and reduce their internal resistance to below the critical level. Belden Brilliance® hybrid optical fiber cables use insulation material with a higher thermal stability. As a result, they heat up less easily. In addition, the black outer jacket is UV-resistant offering even further protection.

### Benefits and Features

- SMPTE311M compliant
- Heat-resistant
- Tight-buffered single-mode fiber meets ITU-G.652.D
- Indoor and mobile use
- Available with special put-up for easy connectorization on the drum
- Strength member for extra durability
- Black Brilliance® outer jacket is UV-resistant
- Halogen-free version complies with IEC 60332-1 meaning no toxic gas formation and low smoke density in fire situations
- Cable jackets are meter marked

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## Applications

As we enter the digital broadcasting era, optical fiber is now an indispensable component for HDTV camera systems. In mobile applications pre-terminated SMPTE311 cables connect different cameras around the venue to FOP units. From here bulk SMPTE311M cables conduct the signal to a camera terminal board in the OB van. In permanent applications pre-terminated SMPTE311 cables connect cameras around the studio to camera terminal boards. The signal is then routed to the sub-control room by bulk SMPTE311M cables. When a patch panel is used a whole range of video images on different channels becomes available.

Brilliance® hybrid optical fiber cables meet all these requirements. As a result, they are ideal for use by HDTV video installers, HDTV system integrators, OB van users and manufacturers, equipment rental companies and camera teams in:

- Professional broadcasting
- Studios
- Sports stadiums
- Concert venues
- Live outdoor broadcasts

## Cable Construction

The cable incorporates two single-mode tight-buffered optical fibers for video and audio signals, two 24 AWG (0.61 mm) stranded conductors for control and four 20 AWG (0.94 mm) stranded conductors for power. A 14 AWG (1.8 mm) stranded steel strength member runs along the center of the cable core. An overall braid shield delivers structural integrity while maintaining good flexibility and prolonging cable life. All elements now feature heat-resistant polyethylene insulation.

Brilliance® hybrid optical fiber cables can be used with the following HDTV connectors: Lemo 3k.93c, Fischer 1053, Furukawa FWX-SUS, Neutrik's® OpticalCon and ADC's ProAX™.

If required, the standard 9.2 mm sheath can be fitted with an additional 12 mm sheath to prevent the cable from being crushed between camera pedestals and studio floors.

Cables can also be produced in line with Japanese standards.

| Description | U.S., Europe | Japan |
|---|---|---|
| Standard | ANSI/SMPTE | ARIB |
| Color code - OFC | Blue/Yellow | Yellow/Blue |
| Color code - Control | Red/Grey | Red/Green |
| Conductor - Power | Black(2)/White(2) 7 wire x 0.20 mm | Black(2)/White(2) 7 wire x 0.18 mm |
| Outside O.D. | 9.2 mm | 9.2 mm |
| Outside O.D. (double jacketed) | 12.0 mm | 16.0 mm |

## Special put-up

A special put-up version has been optimised for broadcast applications and offers the tails inside the flange of the reel as an additional field-installation feature, as shown in the picture.

To terminate connectors to the cable it is necessary to have access to both ends of the cable. Therefore the user has to re-spool the cable to another drum. Belden's "easy-access" put-up enables to connectorize the connector on the drum. Belden's Brilliance® hybrid optical fiber cable has 5 meter tails inside the drum.

## Single Mode Fiber G.652D

Belden's Brilliance® SMPTE311M camera cables are based on excellent strippable tight buffered optical fibers.

The Single-Mode Fiber complies with the ITU-T Recommendation G.652.D and delivers brilliant performance from the wavelength spectrum of 1310 nm wavelength spectrum. It has a low dispersion and low attenuation in the 1310 nm window.

| European Part Number Coding (position 5) | Fiber-Type | Mode-Field Diameter / Cladding Diameter (µm) | Wavelength (nm) | Dispersion (ps / (nm • km)) | PMD (ps / √km) | Cable Cut-off Wavelength (nm) | Refractive Index | Attenuation | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Loose Tube Cables average / max. (dB / km) | (Semi-) Tight average / max. (dB / km) |
| **Characteristics (Cabled) Single-Mode – Matched-Cladded Optical Fibers according to ITU-G.652** | | | | | | | | | |
| **9** | 9/125-0S1<br>ITU-G.652.D | 9.2 ± 0.4<br>125 ± 0.7 | 1310 | ≤ 3.5 | | | 1.467 | 0.32 / 0.4 | 0.35 / 0.5 |

## Belden at Your Service

Belden offers a complete line of cables available from a single source. All Belden Brillance cables are featured in the EMEA Master Catalog (sections 16 and 19).

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## Optical Fiber Cables

SMPTE 311M HDTV Cables

| De-scription | Part No. | UL NEC/ C(UL)CEC Type IEC | Standard Lengths ft. | Standard Lengths m | Standard Unit Weight lbs. | Standard Unit Weight kg | Conductor (Stranding) Diameter Nom. DCR | Shielding Material | Nominal OD inch | Nominal OD mm | Compo-nent | Description | Shielding Material & Nom. DCR | Jacket Material & Colors | Component OD inch | Component OD mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SMPTE 311M • 4 Power Conductors • SM Fiber w/24 and 20 AWG** • Stranded (7x32 and 19x32) TC • Overall 80 % Tinned Copper Braid | | | | | | | | | | | | | | | | |
| **PE Insulation • Black FRNC/LSNH Jacket** | | | | | | | | | | | | | | | | |
| | **7804ENH** | IEC 332-1 | 1000 | 305 | 90.8 | 41.2 | – | > 80 % TC Braid | 0.362 | 9.20 | Fiber | 2 Tight Buffer Fiber Single Mode 9/125-G.652D | Unshielded | Thermo-plastic Blue Yellow | 0.035 | 0.90 |
| | | | S-1000 | S-305 | 90.8 | 41.2 | | | | | | | | | | |
| | | | 1640 | 500 | 148.8 | 67.5 | | | | | | | | | | |
| | | | S-1640 | S-500 | 148.8 | 67.5 | | | | | | | | | | |
| | | | 3280 | 1000 | 297.6 | 135.0 | | | | | | | | | | |
| | | | S-3280 | S-1000 | 297.6 | 135.0 | | | | | | | | | | |
| | | | | | | | | | | | Signal (Control) | 2 Conductors 24 AWG 0.61 mm (7x32) TC | Unshielded | HDPE Red Grey | 0.048 | 1.22 |
| | | | | | | | | | | | Auxiliary (Power) | 4 Conductors 20 AWG 0.94 mm (19x32) TC | Unshielded | HDPE Black White White/Black Black/White | 0.062 | 1.57 |
| | | | | | | | | | | | Strength Member | 1 Conductor 14 AWG 1.80 mm (19x0.35) stainless Steel | Unshielded | HDPE Violet | 0.085 | 2.16 |
| On special request with additional sheath, O.D. 12 mm.<br>On special request ARIB specification with 9.2 mm or with additional sheath, O.D. 16 mm. | | | | | | | | | | | | | | | | |
| **PE Insulation • Black PUR Jacket** | | | | | | | | | | | | | | | | |
| | **7804EPU** | | 1000 | 305 | 82.0 | 37.2 | – | > 80 % TC Braid | 0.362 | 9.20 | Fiber | 2 Tight Buffer Fiber Single Mode 9/125-G.652D | Unshielded | Thermo-plastic Blue Yellow | 0.035 | 0.90 |
| | | | S-1000 | S-305 | 90.8 | 41.2 | | | | | | | | | | |
| | | | 1640 | 500 | 134.5 | 61.0 | | | | | | | | | | |
| | | | S-1640 | S-500 | 148.8 | 67.5 | | | | | | | | | | |
| | | | 3280 | 1000 | 269.0 | 122.0 | | | | | | | | | | |
| | | | S-3280 | S-1000 | 297.6 | 135.0 | | | | | | | | | | |
| | | | | | | | | | | | Signal (Control) | 2 Conductors 24 AWG 0.61 mm (7x32) TC | Unshielded | HDPE Red Grey | 0.048 | 1.22 |
| | | | | | | | | | | | Auxiliary (Power) | 4 Conductors 20 AWG 0.94 mm (19x32) TC | Unshielded | HDPE Black White White/Black Black/White | 0.062 | 1.57 |
| | | | | | | | | | | | Strength Member | 1 Conductor 14 AWG 1.80 mm (19x0.35) stainless Steel | Unshielded | HDPE Violet | 0.085 | 2.16 |
| On special request with additional sheath, O.D. 12 mm.<br>On special request ARIB specification with 9.2 mm or with additional sheath, O.D. 16 mm. | | | | | | | | | | | | | | | | |
| **PE Insulation • Black PVC Jacket** | | | | | | | | | | | | | | | | |
| | **7804E** | | 1000 | 305 | 89.5 | 40.6 | – | > 80 % TC Braid | 0.362 | 9.20 | Fiber | 2 Tight Buffer Fiber Single Mode 9/125-G.652D | Unshielded | Thermo-plastic Blue Yellow | 0.035 | 0.90 |
| | | | S-1000 | S-305 | 90.8 | 41.2 | | | | | | | | | | |
| | | | 1640 | 500 | 146.6 | 66.5 | | | | | | | | | | |
| | | | S-1640 | S-500 | 148.8 | 67.5 | | | | | | | | | | |
| | | | 3280 | 1000 | 293.2 | 133.0 | | | | | | | | | | |
| | | | S-3280 | S-1000 | 297.6 | 135.0 | | | | | | | | | | |
| | | | | | | | | | | | Signal (Control) | 2 Conductors 24 AWG 0.61 mm (7x32) TC | Unshielded | HDPE Red Grey | 0.048 | 1.22 |
| | | | | | | | | | | | Auxiliary (Power) | 4 Conductors 20 AWG 0.94 mm (19x32) TC | Unshielded | HDPE Black White White/Black Black/White | 0.062 | 1.57 |
| | | | | | | | | | | | Strength Member | 1 Conductor 14 AWG 1.80 mm (19x0.35) stainless Steel | Unshielded | HDPE Violet | 0.085 | 2.16 |
| On special request with additional sheath, O.D. 12 mm.<br>On special request ARIB specification with 9.2 mm or with additional sheath, O.D. 16 mm. | | | | | | | | | | | | | | | | |

TC = Tinned Copper • DCR = DC resistance • S = special put-up for easy connectorization on the drum