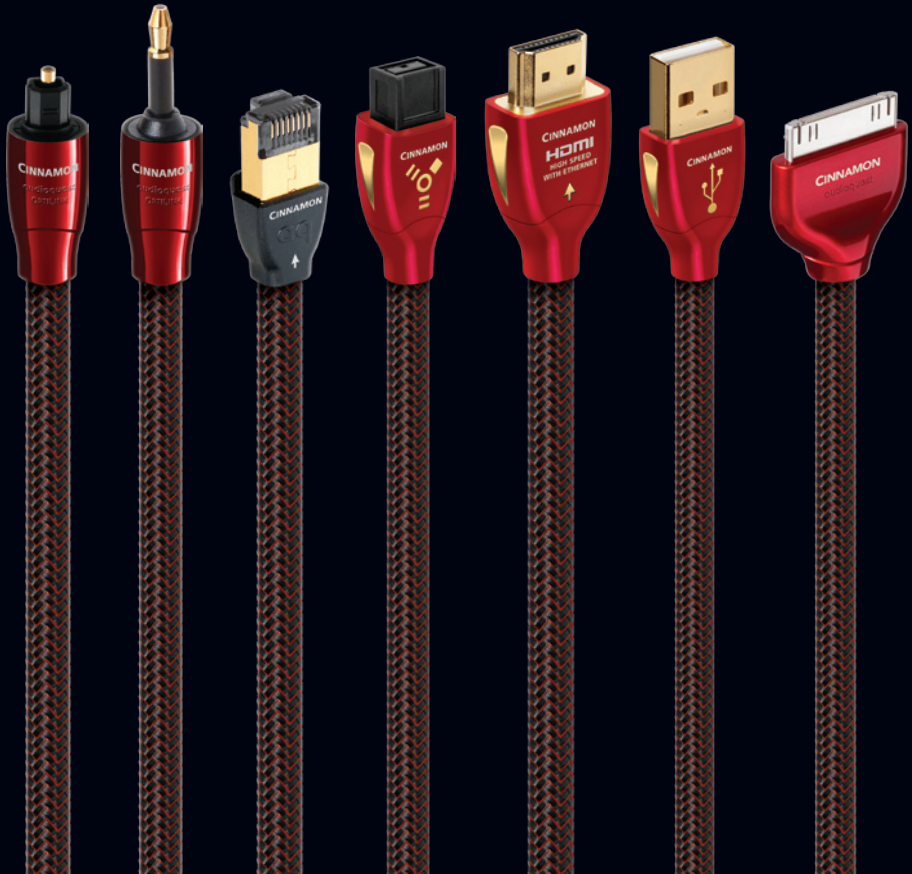# DIGITAL!

HDMI

For decades, AudioQuest has had a well-earned reputation as a manufacturer of exceptional analog audio and video cables. When DVI became an industry standard for digital video, AudioQuest was there with the best cables available. In 2004, HDMI® began to replace DVI in consumer electronics, but as the AV receivers of the day were not yet putting out audio over HDMI, analog or Toslink audio connections ruled the day.

In 2008 AudioQuest sales of Toslink cables went down over 50% … HDMI audio had become the dominant audio connection in the world of home theater. This was wonderful for AudioQuest! Video differences between well-made HDMI cables are somewhere between don't-exist and a difference one has to look for, but audio differences are slap-in-the-ears audible between almost any two cables made.

A note of caution: The lack of in-your-face video differences acknowledged above is true when comparing all AudioQuest models, despite huge price differences, and is also true for many other respected brands of cable. However, in the no-name world, many HDMI cables will cause a lower-contrast, clearly inferior picture not unlike what was seen on earlier generation LCD TVs.

The basic blueprint for HDMI cable construction was established by the HDMI steering committee (HDMI, LLC). These are "givens" that all HDMI cables must follow. However, not only is the quality of implementation a very important variable, but the choice of materials and other "ingredients" such as AudioQuest's patented Dielectric-Bias System (DBS) (US Patent #s 7,126,055 & 7,872,195 B1), make it possible to manufacture a series of cables with obvious performance hierarchy.

All of the design and material elements that have proven so effective in AudioQuest's digital coax (S/PDIF) and balanced digital (AES/EBU) cables are exactly as meaningful for HDMI. Solid-core conductors, conductor metallurgy, insulation material and overall precision of manufacture are no more or less important for maximum HDMI performance than they are for older methods of digital transfer … and as you'll see

elsewhere in this brochure, are no different than at the frontier of digital audio through USB, FireWire® and Ethernet.

AudioQuest begins with Long-Grain Copper (LGC) and adds increasing amounts of silver-plate, culminating in Diamond HDMI, whose primary signal pairs are made using solid Perfect-Surface Silver (PSS). Prior to manufacture, in order to determine proper conductor orientation, AudioQuest listens to the metal that will be used for every signal conductor in every audio cable we make, including every HDMI cable. Most lengths use Solid High-Density Polyethylene Insulation in order to ensure stable conductor geometry while minimizing insulation-induced phase distortion. The two top HDMI cables, Coffee and Diamond, use AudioQuest's patented DBS, which polarizes and saturates the insulation of the signal pairs, significantly reducing dielectric-induced phase corruption, providing a drop in the perceived noise floor and an increase in dynamic contrast.

Despite the dramatic effectiveness of DBS in analog and digital audio, AudioQuest analog-video and digital-video cables have never used DBS. The data package necessary for 24Hz or 60Hz moving pictures is simply not vulnerable to the non-linear phase distortion caused by dielectric. There is much discussion of dielectric in video, but only because of signal loss … a total non-issue for most residential systems.

While HDMI cable test equipment is excellent at tracking gross error-rate or ensuring data pass-through, the current testing procedure is incapable of measuring the more subtle ways in which a digital-audio information package can be compromised, whether it's a real-time with-clock signal (as with coax and balanced digital audio), or the more robust digital packet information transferred through HDMI, USB, FireWire and Ethernet. Probably because HDMI is thought of as a video cable, its ability to transfer audio often doesn't get as much attention.

As an example, there are "active" HDMI cables which package the data such that it can be transferred through

thinner cables or longer cables. However, the particular processor used most often so severely damages the audio quality that even the worst practically-free HDMI cable usually sounds better. Such a compromise might be justified for a mobile-phone cable (though not for AQ's coming A-D HDMI cables), or a long video-only cable to a projector, however at present AudioQuest has elected not to make any such bad-audio cables.

While the focus of AudioQuest's HDMI cables is ground-breaking audio quality, video performance is not an afterthought. All AudioQuest HDMI cables are High Speed compliant up to and including 10 meters, and all will transfer 1080p and 4k video, as well as 3D video from Blu-ray. All AudioQuest HDMI cables deliver 100% of the data required for 120Hz/240Hz/600Hz displays. All AudioQuest HDMI cables are 100% QC tested to pass 1080p at every length and all containthe fifth twisted pair required to enable Ethernet connectivity over HDMI. All HDMI cables ever made enable the Audio Return Channel (from the HDTV to the AV receiver), though performance is better when the additional Ethernet pair is available to carry this signal.

Look, listen, and enjoy!

Pearl HDMI

- Solid Long-Grain Copper (LGC) Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in dark PVC jacket w/white stripes. 5m to 12m in white PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI w/Ethernet connection. 12m Standard Speed HDMI w/Ethernet Connection.

Forest HDMI

- Solid LGC Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in dark PVC jacket w/green stripes. 5m to 20m in white PVC CL3/FT4 rated jacket. 0.6m to 10.0m High Speed HDMI w/Ethernet connection. 12m-20m Standard Speed HDMI w/Ethernet Connection.

Cinnamon HDMI

- Solid 1.25% Silver LGC Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in braided jacket. 5m to 20m in white PVC CL3/FT4 rated jacket. 0.6m to 10.0m High Speed HDMI w/Ethernet connection. 12m-20m Standard Speed HDMI w/Ethernet Connection.

Chocolate HDMI

- Solid 2.5% Silver LGC Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in braided jacket. 5m to 20m in white PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI w/Ethernet connection. 12m-20m Standard Speed HDMI w/Ethernet Connection. Dark grey with black stripes PVC is available from 5m to 20m.

Carbon HDMI

- Solid 5% Silver LGC Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in braided jacket. 5m to 20m in white PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI w/Ethernet connection. 12m-20m Standard Speed HDMI w/Ethernet Connection. Dark grey with black stripes PVC is available from 5m to 20m.

Vodka HDMI

- Solid 10% Silver LGC Conductors
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in braided jacket. 5m to 16m in white PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI w/Ethernet connection. 12m-16m Standard Speed HDMI w/Ethernet Connection.

Coffee HDMI

- Solid 10% Silver LGC Conductors
- 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 3m in braided jacket. 5m to 16m in white PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI w/Ethernet connection. 12m-16m Standard Speed HDMI w/Ethernet Connection.

Diamond HDMI

- Solid 100% Perfect-Surface Silver (PSS) Conductors
- 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
- Low-Jitter, Low-Distortion Audio
- Signal Conductors Controlled for Digital Audio Directionality
- Bi-Directional Ethernet Communication and Audio Return Channel Enabled

Lengths up to 5m in braided jacket. 8m to 16m in gray with black stripes PVC CL3/FT4 rated jacket. 0.6m to 8.0m High Speed HDMI W/Ethernet connection. 12m-16m Standard Speed HDMI w/Ethernet Connection.

USB (2.0)

The acronym, *USB*, stands for Universal Serial Bus. True to its name, this is an honest to goodness "universal" standard that is open to all hardware and software developers. All modern personal computers feature one or more USB ports and include all the necessary USB device driver support to communicate between a host and client, such as from a computer (host) to a digital-to-analog converter or AV receiver / surround-sound processor (client). Additionally, many smart phones and tablets are capable of connecting to audio systems over USB. While you can use the internal DAC (digital-to-analog converter) in your computer or mobile device, substantially better performance will be attained by connecting your devices to a high-performance external USB-enabled digital decoder.

But no matter how predictable and trouble-free the USB 2.0 standard is, and regardless of the data transfer accuracy of both the host and client device, cable-induced distortions will still compromise the potential performance of any USB-based audio system. Even when either adaptive or asynchronous-enabled USB protocols are implemented, or when a low-resolution 128Kbps MP3 file is played back, significant differences among USB cables can and will be heard. Electrons simply don't differentiate between analog and digital packets or protocol standards. The cable-induced distortion mechanisms remain universal.

USB 2.0 has become the prevailing method with which to connect a computer to a digital to analog convertor. While USB 2.0's speed (480 Mbit/s, or 60 MB/s) is above and beyond what is required to move the highest speed packets of data (192KHz), USB 3.0 does have the advantage of moving stored data at speeds 10 times that of USB 2.0 (5 Gbit/s or 640 MB/s). As USB 3.0 continues to gain momentum and market share, AudioQuest will continue to explore ways in which we can add value and performance to your system through this standard. Stay tuned…

As with all AudioQuest's other digital cables (HDMI, USB, FireWire, Coax and balanced AES/EBU), AudioQuest's USB cables benefit from the use of superior metals, solid-core conductors, individual signal-pair shielding, and critical signal-pair geometry. The top two models, Coffee and Diamond, use AudioQuest's patented Dielectric-Bias System (DBS), which polarizes and saturates the insulation of the signal pairs, significantly reducing dielectric-induced phase corruption, providing a drop in the perceived noise floor and an increase in dynamic contrast.

Why short-change your beloved music collection with inferior-sounding generic USB cables when you can choose to use low-distortion, superior-sounding AudioQuest USB digital interconnects. Sit back, relax, listen, and enjoy!

Available in 0.75m, 1.5m, 3m and 5m lengths.

FOREST USB
• Solid Long-Grain Copper (LGC) Conductors
• Gold-Plated Pins
• Low-Jitter, Low-Distortion Audio
• Signal Conductors Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

CINNAMON USB
• Solid 1.25% Silver LGC Conductors
• Gold-Plated Pins
• Low-Jitter, Low-Distortion Audio
• Signal Conductors Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

CARBON USB
• Solid 5% Silver LGC Conductors
• Direct-Silver Plated Pins
• Low-Jitter, Low-Distortion Audio
• Signal Conductors Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

COFFEE USB
• Solid 10% Silver LGC Conductors
• 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
• Direct-Silver Plated Pins
• Low-Jitter, Low-Distortion Audio
• Signal Conductors Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

DIAMOND USB
• Solid 100% Perfect-Surface Silver (PSS) Conductors
• 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
• Direct-Silver Plated Pins
• Low-Jitter, Low-Distortion Audio
• Signal Conductors Controlled for Digital Audio Directionality

Choice of Applications:

Made for
iPod iPhone iPad

FireWire (1394)

Over twenty years ago, FireWire was created to move large digital files such as photos and video from one location to another. But, more important to music lovers like us, the developers of FireWire also had the foresight to include specific audio protocols so professional recording studios could achieve high-performance, low-jitter transfer of digital audio information.

Even though FireWire-enabled DACs are fairly rare, FireWire still plays a relevant and important role in many high-performance computer audio systems. Since digital music libraries are storage intensive, external hard drives have become a crucial ingredient in many computer audio systems. Connecting both a DAC and an external hard drive to the same data path causes unwanted and unnecessary distortion in your computer. A computer's USB bus, for example, doesn't perform at its maximum audio performance potential while it is simultaneously pulling data from an external hard drive and pushing data to an external DAC. Using FireWire between an external hard drive and the computer is an especially effective way to maximize computer audio performance when the computer is connected to a USB-enabled DAC.

Because high-speed digital audio data is just as susceptible to cable-induced distortions as analog signals are, AudioQuest's FireWire cables employ a series of superior materials and construction techniques to avoid corrupting and distorting the audio data. AudioQuest's FireWire cables start with solid Long-Grain Copper conductors and add increasing amounts of silver-plate to reduce distortion, with the top-of-the-line Diamond using solid 100% Perfect-Surface Silver conductors. Advanced manufacturing techniques and Solid High-Density Polyethylene Insulation ensure that stable geometry is attained, and also guarantees that the critical signal-pair geometry will not be compromised as a result of twisting and bending in everyday use. Both signal pairs are optimized for directionality, and in our top model Diamond, AQ's remarkably effective Dielectric-Bias System (DBS) dramatically lowers the perceived noise floor and raises dynamic contrast. All AudioQuest FireWire cables provide 100% internal shielding between highly-sensitive signal conductors and active power conductors. Please don't compromise the sonic performance of your computer-based audio system with generic FireWire cables.

FOREST FIREWIRE

- Solid Long-Grain Copper (LGC) Conductors
- Gold-Plated Pins
- Low-Jitter, Low-Distortion Audio
- Both Signal-Path Conductor Pairs Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

CINNAMON FIREWIRE

- Solid 1.25% Silver LGC Conductors
- Gold-Plated Pins
- Low-Jitter, Low-Distortion Audio
- Both Signal-Path Conductor Pairs Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

CARBON FIREWIRE

- Solid 5% Silver LGC Conductors
- Direct-Silver Plated Pins
- Low-Jitter, Low-Distortion Audio
- Both Signal-Path Conductor Pairs Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

DIAMOND FIREWIRE

- Solid 100% Perfect-Surface Silver (PSS) Conductors
- 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
- Direct-Silver Plated Pins
- Low-Jitter, Low-Distortion Audio
- Both Signal-Path Conductor Pairs Controlled for Digital Audio Directionality

Available in 0.75m, 1.5m, 3m and 5m lengths.

Choice of Applications:

ETHERNET

Over the past several years there's been a revolution in the way people store, distribute, and access digital media (in real time), including photos, movies, and, of course, music. No longer dependent on physical media, our media is often data that's moved from multiple devices to multiple locations.

For audio applications and protocols, audio over Ethernet offers the virtues of high-speed, low time delay (latency), significant distance capability (1000 feet without an active booster or repeater), and extremely low-jitter, bit-perfect communication. Who wouldn't want all of these things?

Organizations such as DLNA (Digital Living Network Alliance) and UPnP (Universal Plug and Play) have worked hard to create open standards that allow consumers to choose components from various manufacturers and create a networked system that works seamlessly and predictably every time.

But no matter how robust, predictable, and precise audio over Ethernet is, poor cable design will still affect the playback quality of any Ethernet-based audio system. The same cable-distortion mechanisms which affect analog information also prey on digital information. Poor metal quality, skin effect, poor signal geometry, strand-interaction distortion, will all reduce sound quality.

As with all AudioQuest's other digital cables (HDMI, USB, FireWire, Coax and balanced AES/EBU), AudioQuest's Ethernet cables benefit from the use of solid-core conductors, superior metals, and critical signal-pair geometry. The top model Diamond uses AudioQuest's patented Dielectric-Bias System (DBS), which polarizes and saturates the insulation of the signal pairs, significantly reducing dielectric-induced phase corruption, providing a drop in the perceived noise floor and an increase in dynamic contrast.

All AudioQuest RJ/E cables use the Category 7 (Cat7) standard as a foundation and starting point. A particular feature of Cat7 is that each of the four pairs are individually shielded and drained. This is common in HDMI, USB and FireWire cables (and of course is true for AQ's cables), but is extremely unusual in an Ethernet cable, whether a terminated cable like our RJ/E models, or a bulk Cat cable used for multi-room distribution.

In order to maximize a total system, AudioQuest also offers AQ Cat6/600 and Cat7/700 bulk cables. This larger cable is meant to be terminated with female RJ45 wall plates. It should be used as whole-house data plumbing; however, using the RJ/E series of cables directly from source to destination whenever possible will clearly offer superior performance.

Please don't handicap your Ethernet-based audio system by using standard cables. AudioQuest's Ethernet Cat6 and Cat7 cables provide a substantial improvement over "stock" cables.

FOREST RJ/E
• Solid 0.5% Silver Conductors
• Gold-Plated Connectors Provide 100% Shield Coverage and Feature Extra-Strong Tab
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

CMG (CL3 & FT4) rated Black/green stripe PVC. Available in 0.75m, 1.5m, 3m, 5m, 8m and 12m lengths.

CINNAMON RJ/E
• Solid 1.25% Silver Conductors
• Gold-Plated Connectors Provide 100% Shield Coverage and Feature Extra-Strong Tab
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

Up to 3.0 m. - Black/red braid 5.0 m. and longer – CMG (CL3 & FT4) rated Black/red PVC. Available in 0.75m, 1.5m, 3m, 5m, 8m and 12m lengths.

VODKA RJ/E
• Solid 10% Silver Conductors
• Ultra-Performance Plugs, 100% Shielding, Strongest Possible Tab
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

Up to 3.0 m. - Black/blue braid 5.0 m. and longer – CMG (CL3 & FT4) rated Black/blue PVC. Available in 0.75m, 1.5m, 3m, 5m, 8m and 12m lengths.

DIAMOND RJ/E
• Solid 100% Perfect-Surface Silver (PSS) Conductors
• 72V Dielectric-Bias System (DBS) Saturates and Polarizes Dielectric
• Ultra-Performance Plugs, 100% Shielding, Strongest Possible Tab
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

Available in 0.75m, 1.5m, 3m, 5m, 8m and 12m lengths.

CAT600
• Solid Long-Grain Copper (LGC) Conductors
• Central Spline Stabilizes Critical Geometry
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

CMG (CL3 & FT4) rated PVC in White, Gray, Blue, Green, Yellow, or Purple. Available in 1,000 ft. spools.

CAT700
• Solid LGC Conductors
• All Pairs Individually Shielded and Drained
• Conductors Controlled for Digital Audio Directionality
• Minimum Skew and Phase Smearing

CMG (CL3 & FT4) rated PVC Charcoal w/ white stripes, Off-White w/ charcoal stripes. Available in 500 ft. spools.

TosLink

The audio frontier is all abuzz these days with the pleasure possible though HDMI, USB, FireWire and Ethernet connections. However, these current generation digital technologies are only part of the story, just as the challenge of designing, manufacturing and choosing the best analog interconnects and speaker cables is as important as ever. The S/PDIF (Sony®/Philips® Digital InterFace), which arrived in 1983 along with the CD, is still very much a part of our world today. S/PDIF is transmitted through Digital Coax and Toslink fiber optics (EIA-J), making them still some of the most important cables in electronic entertainment.

While thanks to HDMI, Toslink is not so often used to connect a DVD player to an A/V receiver, Toslink connectors are common on cable and Internet streaming set-top boxes, TV sets, subwoofers, all sorts of products. And now, the 3.5mm Mini Optical connector, also somewhat incorrectly known as Mini-Toslink, is everywhere ... from the 3.5mm dual-purpose headphone jack on a Mac® laptop, to inputs on some of the finest portables.

For these many reasons, AudioQuest has refined and renewed our line of serious high-performance OptiLink cables. All models and all lengths are now available Toslink ↔ Toslink and Toslink ↔ 3.5mm Mini Optical.

When the question is "how can a fiber-optic cable change the sound?" ... the answer is easier to explain than for almost any other type of cable. If the light source were a coherent laser, firing into a vacuum, all the light would stay straight, arriving at its destination at the same time. Even if the LED light source in a Toslink system were coherent, the light entering a fiber-optic cable is scattered and dispersed by imperfections and impurities in the fiber. This can be measured as a loss of amplitude ... but amplitude is not the problem. A 50% true loss would have no effect on sound quality.

The problem is that the dispersed light does get through the cable, but only after it has taken a longer path, like a pool ball bouncing off the side-rails, causing it to arrive later. This delayed part of the signal prevents the computer charged with decoding this information from being able to decode properly, or even at all. The inability to decode shows first at higher frequencies (not audio frequencies, this is a mono stream of digital audio information), so reduced bandwidth is a measurable signature of light being dispersed by a fiber. The punch line: The less dispersion in the fiber, the less distortion in the final analog audio signal presented to our ears.

There is another serious dispersal mechanism in the Toslink system. The fiber is a relatively huge 1.0mm in diameter, and the LED light source is also relatively large, spraying light into the fiber at many different angles. Even if the fiber were absolutely perfect, the signal would be spread across time because light rays entering at different angles take different length paths and arrives with different amounts of delay.

The almost complete solution to this problem is to use hundreds of much smaller fibers in a 1.0mm bundle. Because each fiber is limited as to what angle of input can enter the fiber, there is far less variety, and far less dispersion over time. This narrow-aperture-effect is similar to how a pin-hole camera can take a picture without a lens ... by letting in light at only a very limited range of angles, a picture can be taken, whereas removing the lens from a wider aperture would make photography impossible. Less light gets through a multi-fiber cable, but the light that does get into the fibers comes out within a much smaller time-envelope.

So there is one problem, the dispersion of light across time ... and two avenues towards a better result: less dispersion in the fiber (better polymers and ultimately quartz), and less dispersion by filtering the input angle. How simple is that! Listen and enjoy.

Forest OptiLink
• Low-Dispersion Fiber
• Low-Jitter (Digital Timing Errors)
• Precision-Polished Fiber Ends
Available in 0.75m, 1.5m, 3m, 5m, 8m, 12m and 16m lengths.

Cinnamon OptiLink
• Low-Dispersion Higher-Purity Fiber
• Low-Jitter (Digital Timing Errors)
• Precision-Polished Fiber Ends
Available in 0.75m, 1.5m, 3m, 5m, 8m, 12m and 16m lengths.

Vodka OptiLink
• 217 Narrow-Aperture Synthetic Fibers
• Low-Jitter (Digital Timing Errors)
• Precision-Polished Fiber Ends
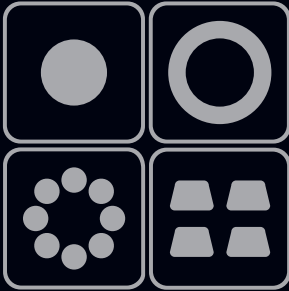Available in 0.75m, 1.5m, 3m and 5m lengths.

Diamond OptiLink
• 280 Narrow-Aperture Quartz (Fused-Silica) Fibers
• Low-Jitter (Digital Timing Errors)
• Precision-Polished Fiber Ends
Available in 0.75m, 1.5m, 3m and 5m lengths.

Choice of Applications: