

Just the Technical Facts



With its history of technical expertise, Corning Cable Systems has tested to provide assurance that the deployment of its Plug & Play™ Universal Systems today will support the migration path to 100G Ethernet in the future.

100G Ethernet Transmission

What standard addresses 100G and when will this standard be complete?

The IEEE 802.3ba Task Force is currently developing the standard for 40 Gigabit and 100 Gigabit Ethernet transmission speeds. This standard is expected to be completed in May 2010.

When is customer implementation of 100G expected?

Early end-user adoption is expected in 2010. Industry adoption is anticipated in 2013.

Where will 100G be used (in what applications)?

Core networking applications will have a future need for bandwidth beyond existing capabilities. Switching, routing and aggregation in data centers, internet exchanges and service provider peering points, and high-bandwidth applications such as video on demand and high-performance computing environments will drive the need for 100 Gb/s Ethernet interfaces.

What parameters affect a product's ability to support 100G? Which of these is the limiting factor?

Skew, bandwidth and insertion loss each impact the ability to meet the standard's proposed transmission distance of at least 100 meters over OM3 fiber. Currently, transceiver specifications are being defined that impact distance, transceiver cost and the amount of loss allocated for the fiber and connectors in the system. Products manufactured with OM3 fiber meet the bandwidth requirements. For products that meet the bandwidth and the anticipated skew performance criteria, system loss will be the limiting factor in transmission distance.

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100G Ethernet Transmission

What are the expected distances and insertion loss budgets for 100 GbE?

For multimode systems, the objectives for 40 and 100 GbE are currently worded to require a minimum distance of 100 meters over OM3 fiber. OM3 fiber is the only multimode fiber included in the objectives. Discussions are ongoing to extend this distance beyond the 100 meters. Current discussions for distance and insertion loss budgets include 150 meters with 2.0 dB total connector loss over OM3 fiber. Additionally, longer distances (up to 250 meters) over higher-bandwidth laser-optimized 50 μm multimode fiber such as Pretium™ 550 Solutions fiber with total connector loss budgets of 1.5 to 2.0 dB are being considered.

What is skew?

Skew is the difference in time of flight between light signals traveling on different fibers. This is relevant to the 100 Gigabit Ethernet standard, and several other transmission protocols, that use parallel optics. In parallel optic systems, one data stream is divided into multiple data streams and transmitted over different optical fibers to enable lower-cost transceivers to be used. In the case of 100 Gigabit Ethernet over OM3 fiber, the expected solution is for the data stream to be divided into 10 signals traveling at 10 Gigabits/second each over 10 separate fibers for a transmit path, and 10 separate fibers for the receive path.

How will polarity work for 100G?

100G transceiver multi-source agreement (MSA) activities are expected to begin soon. Corning Cable Systems' Plug & Play™ Universal Systems trunks will be compatible with the final polarity scheme.

What has Corning Cable Systems done to ensure performance of its Universal Systems for 100G transmission?

To ensure 100G Ready performance, skew, bandwidth and insertion loss are parameters that must be considered.

Bandwidth

Based on the IEEE objective for OM3 fiber, a minimum EMB of 2000 MHz-km is required. Corning Cable Systems' Pretium 300 and Pretium 550 Solutions fibers meet and exceed the bandwidth specifications for OM3 fiber; bandwidth performance is ensured via EMBc measurement.

Skew

To provide assurance that Corning Cable Systems standard Plug & Play System MTP® trunk assemblies will exceed the anticipated skew requirement for 100G, skew measurements were completed to distances of 300 meters using a maximum skew criteria of 0.75 ns.

Loss

Channel insertion loss requirements have not been finalized; however, discussions of 2.0 dB (for total connector loss allocation) have been made for the minimum channel distances of 100 meters. Discussions are ongoing to extend this distance to 150 m, also with a 2.0 dB total connector loss allocation. Additionally, longer distances (up to 250 meters) over higher-bandwidth laser-optimized 50 μm multimode fiber such as Pretium 550 Solutions fiber with total connector loss budgets of 1.5 to 2.0 dB are being considered. Plug & Play Universal Systems meet and exceed the 100G proposed connector loss allocation budgets of 1.5 to 2.0 dB. With industry-leading standard loss (0.5 dB) and low-loss performance (0.35 dB) MTP connectivity, Plug & Play Systems can be deployed in TIA-942 compliant structured cabling topologies, while adhering to the strict loss budgets anticipated for 100G performance.

What about 40G transmission?

The IEEE standard will address both 40G and 100G Ethernet transmission, so the same parameters apply. 100G Ready solutions will be backwards-compatible with 40G.

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