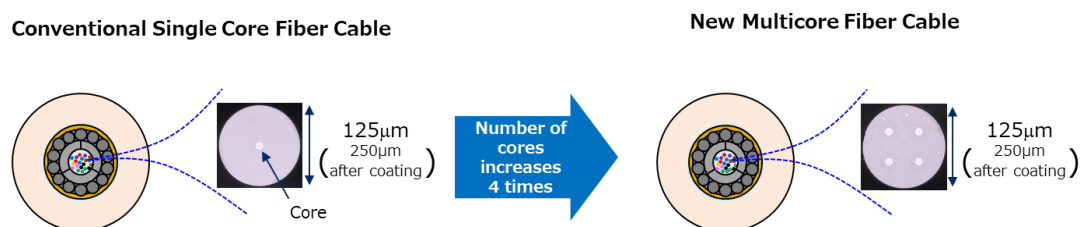


NEC Corporation, OCC Corporation and Sumitomo Electric Industries, Ltd. complete first trial of submarine cable with multicore fiber

Submarine cables to feature a 4-fold increase in the number of independent data channels with the next generation of space division multiplexing (SDM) technology

Tokyo, October 4, 2021, NEC Corporation (NEC; TSE: 6701), its subsidiary OCC Corporation and Sumitomo Electric Industries, Ltd. (Sumitomo Electric; TSE: 5802) announced today that they have completed the first trial of uncoupled (*1) 4-core submarine fiber cable (*2), and verified its transmission performance to meet the exacting demands of global telecommunications networks.

International data usage is expected to expand by 30-40% CAGR from 2020-2026 (*3), driven by factors such as the growth of 5G mobile data, and the need to share ever more content between data centers distributed around the world. To meet this demand, submarine networks are adopting space division multiplexing (SDM) technology, where the number of independent spatial channels is increased to maximize total system capacity, reduce power consumption and optimize cost per bit. Multicore fiber is now expected to further increase the number of parallel optical fiber cores without increasing the submarine cable size and structure, enabling the second generation of submarine SDM systems.



Comparison of conventional and multicore fiber cables

Multicore fiber submarine cable features

Conventional single mode fiber has a single core within an individual fiber. In contrast, each multicore fiber contains multiple cores (4 cores in this case). This represents a four-fold enlargement in the number of spatial channels for the same amount of optical fibers and with the same fiber structure: each fiber being 250 μ m diameter (0.25mm) after coating.

The uncoupled 4-core fiber is being deployed within the OCC SC500 series LW (Lightweight) cable, which has a 17mm outer diameter and withstands 8,000 meter water depth. This cable can accommodate up to 32 fibers. With multicore fiber, the number of cores can be increased without increasing the cable diameter, with corresponding benefits in the cost per bit of the cable system.

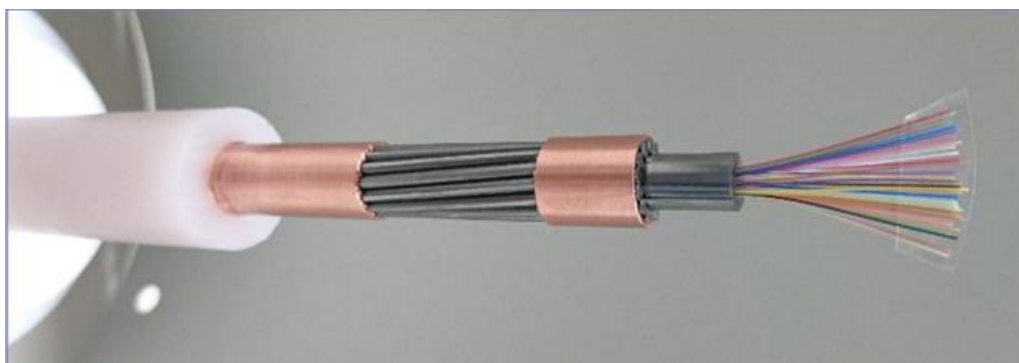


Image of OCC SC500 LW cable

Transmission performance demonstration

NEC and OCC have demonstrated that the cable's optical transmission performance in the water fully meets the exacting requirements of modern long-haul submarine cables. They further showed that the process of cabling Sumitomo Electric's multicore fiber has no effect on its optical characteristics, achieving excellent attenuation properties.

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Development of Innovative Optical Network Technology for a Novel Social Infrastructure" (JPMI00316).

Notes:

(*1) Uncoupled multicore fiber

Multicore fiber cables can be broadly divided into *uncoupled* and *coupled* multicore fibers. In coupled multicore fibers, the optical signals propagating in the respective cores tend to interfere with each other, requiring special signal processing at the optical receiver. In contrast, uncoupled multicore fibers minimize the interference between the cores, allowing conventional (lower complexity) transmitters/receivers to be used.

(*2) Source: NEC Corporation, OCC Corporation and Sumitomo Electric Industries, Ltd. research

(*3) Source: Telegeography