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SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Transmission media and optical systems characteristics –
Optical fibre cables

**Characteristics of a 50/125 μm multimode
graded index optical fibre cable for the optical
access network**

Recommendation ITU-T G.651.1

ITU-T

ITU-T G-SERIES RECOMMENDATIONS

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Recommendation ITU-T G.651.1

Characteristics of a 50/125 μm multimode graded index optical fibre cable for the optical access network

Summary

Recommendation ITU-T G.651.1 recommends a quartz multimode fibre to be used for the access network in specific environments. These environments are multi-tenant building sub-networks in which broadband services have to be delivered to individual apartments. The recommended multimode fibre supports the cost-effective use of 1 Gbit/s Ethernet systems over link lengths up to 550 m, usually based upon the use of 850 nm transceivers.

The recommended fibre type is an improved version of the well-known 50/125 μm multimode graded-index fibre as recommended in Recommendation ITU-T G.651. Its cost effective use is very common in datacom systems applied in enterprise buildings throughout the world for quite a number of years.

History

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IEC 60793-2-10, IEEE 802.3 Ethernet system standards, ISO/IEC 11801-1, multimode fibre, OMx cabled fibre categories.

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FOREWORD

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Introduction

Worldwide, various technologies for broadband access networks are advancing rapidly to provide the high capacity needed for the increasing customer demands with respect to new services. Apart from the technologies, the network structures and customer densities also vary considerably. A specific segment, which is in the main scope of this Recommendation, is the network in a multi-tenant building. Due to the high connection density and the short distribution cable lengths, cost-effective high capacity optical networks can be designed and installed by making use of 50/125 μm graded-index multimode fibres. Recommendation ITU-T G.651.1 was originally developed based on the previous multimode Recommendation ITU-T G.651. The use of the multimode fibre is currently uncommon for telecom networks owing to the development of the single-mode fibre as described in Appendix I of this Recommendation. On the other hand, the multimode fibres continue to be widely used in premises cabling application such as Ethernet for datacom systems in enterprise buildings, which supports system bit rate of more than 10 Gbit/s. This use is supported by a large series of IEEE system standards. The latest multimode specifications can be found in IEC or ISO/IEC fibre and cable standards, which have higher bandwidth characteristics than Recommendation ITU-T G.651.1. The cross reference table between Recommendation ITU-T G.651.1 and the latest multimode fibre standards is summarized in ITU-T G-series Supplement 40.