Development History & Related Standards – MPO/MTP®

White paper

Introduction

Nowadays fibre optic connector comes in several varieties. However, choosing an optical connector was proved to be extremely difficult in the earlier fibre cabling constructions.

After several years of rapid development, plastic rectangular ferrule from the original MT-RJ slowly evolved into a multi-core MPO connector. Used by all the leading high density fibre manufacturers, the MTP® Connector is at the heart of the Complete Connect solution.

MPO connectors are used around the world today to support not only multiple-dwelling unit (MDU) applications but also those in the core network, including central offices, switching centers, data centers, radio network controllers, base station controllers and cell sites.
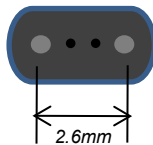
This white paper explores the development history of MPO/MTP connector and their related standards.

Development History

After several years of rapid development, plastic rectangular ferrule from the original MT-RJ slowly evolved into a multi-core MPO connector.
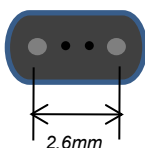
i.   IEC61754-18-2001 -
     MT-RJ appears

Ferrule	Core	Fibre Space	Hole Space
4.4*2.5	1, 2, 4	0.25, 0.75	2.6

- 1st time to achieve multi-core connection
- 1st appearance of plastic rectangular ferrule
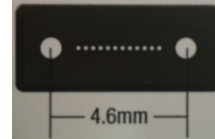
ii. IEC61754-10-2005 -
     MINI-MPO appears

Ferrule	Core	Fibre Space	Hole Space
4.4*2.5	2	0.25, 0.75	2.6
4.4*2.5	4	0.25	2.6

The so called MINI-MPO is MT-RJ.

iii. IEC61754-5-2005 -
     MT appears

Ferrule	Core	Fibre Space	Hole Space
6.4*2.5	2, 4, 8, 10, 12	0.25	4.6

Use 6.4*2.5 of the ferrule, no kits, adaptor is simple, while the concept of 2,4,8,10,12 core

iv. IEC61754-7-2008 -
     MPO connector, adaptor appears
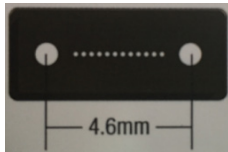
Ferrule	Core	Fibre Space	Hole Space
6.4*2.5	2, 4, 8, 10, 12	0.25	4.6
6.4*2.5	16, 20, 24 dual-line	0.25*0.5	4.6

MT ferrule with kits, 1st proposed dual-line expansion to the concept of 24core
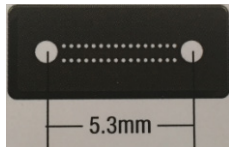
v.   IEC61754-25-2009 -
RAO connector appears

Ferrule	Core	Fibre Space	Hole Space
6.4*2.5	2, 4, 8, 10, 12	0.25	4.6

Using a 6.4*2.5 ferrule, a collection of four MT ferrule, theoretically 12*4=48f, 24*4=96f, 48*4=192f

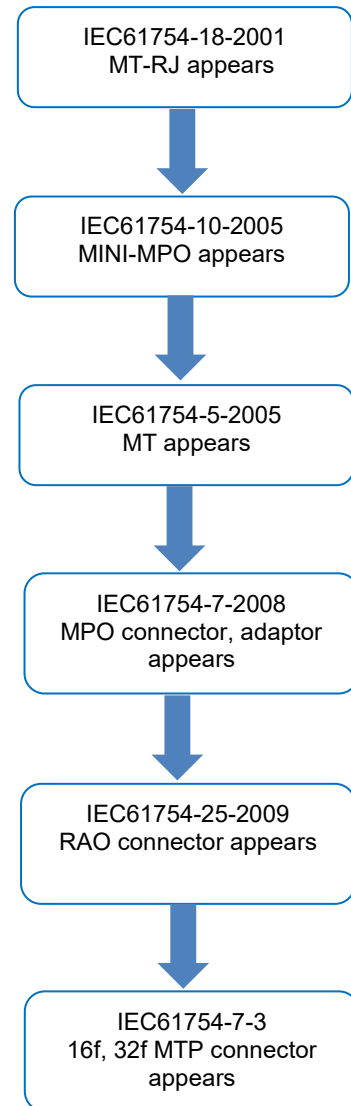vi.   IEC61754-7-3 -
16f, 32f MTP connector appears

Ferrule	Core	Fibre Space	Hole Space
6.4*2.5	16, 32	0.25	5.3

Using a 6.4*2.5 ferrule, bit space distance is 5.3mm, supporting a slight change of the kits structure

History Flow

IEC61754-18-2001
MT-RJ appears

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IEC61754-10-2005
MINI-MPO appears

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IEC61754-5-2005
MT appears

↓

IEC61754-7-2008
MPO connector, adaptor appears

↓

IEC61754-25-2009
RAO connector appears

↓

IEC61754-7-3
16f, 32f MTP connector appears

Related Standards

The MPO connector family is defined by two different standards. Internationally the MPO is defined by IEC-61754-7. In the USA, the MPO is defined by TIA-604-5 (FOCIS 5). Below are the related standards:

- IEC61754-18-2001
  MT-RJ optical connector interface series

- IEC61754-10-2005
  MINI-MPO Optical connector interface series

- IEC61754-5-2005
  MT Optical connector interface series

- IEC61754-7-2008
  MPO Optical connector interface series

- BS EN61754-25-2009
  RAO Optical connector interface series

- BS EN61755-3-32
  Single-mode APC-type MT ferrule (grading)

- GR1435-2008
  Common standard for multi - core connectors

- TIA568-C.3-2008
  Optical device requirements

Conclusion

The MTP multi-fibre connector is US Conec's trademarked name for their MPO connector. It is fully compliant with both FOCIS 5 and IEC-61754-7; therefore, it is an MPO connector. The MTP connector design is distinctly different than the MPO. The MTP connector is a high performance MPO. The MTP/MPO is a connector manufactured specifically for a multifibre ribbon cable.

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